BHP

Newman Hub (Orebody 32 Below Water Table Creek Discharge)

Derived Proposal Request
Ministerial Statement 1105

15 December 2025

Document amendment record

Version	Description of version	Key changes	Date
0	Draft for Traditional Owner review	Original document	25/09/2025
1	Version submitted to EPA	Updated in response to Traditional Owner review	12/12/2025

Glossary

Term	Meaning
Derived Proposal	A future proposal identified in the Strategic Proposal, that has been referred under s38 and is declared to be a Derived Proposal by the EPA under s38E of the EP Act
Development Envelope	The maximum area within which the Proposal will be located
Development Envelope – OB32 BWT	The Development Envelope of the Orebody 32 below water table mine, approved under MS1105, where dewatering occurs and the surplus water originates
Development Envelope – OB32 BWT Creek Discharge	The proposed Development Envelope where activities related to the Orebody 32 below water table creek discharge proposal will occur
Disturbance Footprint	The area within the Indicative Footprint where direct disturbance (clearing) is proposed for the Proposal (excludes areas that are already cleared within the Development Envelope)
Eastern Ridge mining operations	Mining operations in the Eastern Ridge area, comprised of the Eastern Ridge Iron Ore Revised Proposal (Orebodies 24, 25, 25 West and 32) approved by Ministerial Statement 1037 and Orebody 23 approved by Ministerial Statement 478, and OB32 BWT approved under Ministerial Statement 1105
Indicative Footprint	The location within the Development Envelope where the physical project elements of the Proposal are planned to occur
Proposal	Orebody 32 Below Water Table Creek Discharge Proposal
Other environmental factors	EPA's environmental factors that BHP identifies are not key environmental factors relevant for the Derived Proposal
Relevant environmental factor	EPA environmental factor where BHP has identified potential significant impacts to a factor that requires further consideration for the Derived Proposal and for which BHP has undertaken a comprehensive validation process
Scope 1 emissions	Greenhouse gas emissions released to the atmosphere as a direct result of an activity, or a series of activities at a facility level
Scope 2 emissions	Indirect greenhouse gas emissions from the consumption of an energy product
Strategic Proposal	BHP's planned development of future iron ore mining and associated activities and operations (as approved under Part IV of the EP Act, Ministerial Statement 1105)
Strategic Proposal Boundary	The boundary within which future proposals identified in the Strategic Proposal are located (as set out in Schedule 1 of Ministerial Statement 1105)
Verification	BHP internal process to verify the potential impacts to the environmental factors that were assessed for the Strategic Proposal using updated and/or project-specific information (e.g. using baseline or targeted surveys, site-specific models, studies etc.)
Validation	BHP internal process to demonstrate how relevant environmental factors for a Derived Proposal meet the environmental outcomes defined through the assessment of the Strategic Proposal

Abbreviations

Term	Meaning
ACH Act	*Aboriginal Cultural Heritage Act 1972*
AH Act	*Aboriginal Heritage Act 1972*
ARI	Average Recurrence Interval
BC Act	*Biodiversity Conservation Act 2016*
BC Regulations	*Biodiversity Conservation Regulations 2018*
bgl	Below ground level
BHP	BHP Iron Ore Pty Ltd
BWT	below water table
CEO	Chief Executive Officer
CS Act	*Contaminated Sites Act 2003*
CSIRO	Commonwealth Scientific and Industrial Research Organisation
DBCA	Department of Biodiversity, Conservation and Attractions
DMPE	Department of Mines, Petroleum and Exploration (previously the Department of Energy, Mines, Industry Regulation and Safety)
DoW	Department of Water (now DWER)
DPaW	Department of Parks and Wildlife
DWER	Department of Water and Environmental Regulation
Ethel Gorge TEC	Ethel Gorge Aquifer Stygobiont Community Threatened Ecological Community
EPA	Environmental Protection Authority
EP Act	*Environmental Protection Act 1986 (*WA)
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999* (Commonwealth)
EPH	Eastern Pilbara Hub
EPWRMP	Eastern Pilbara Water Resource Management Plan
ERMCP	Eastern Ridge Mine Closure Plan
FVEMP	Flora and Vegetation Environmental Management Plan
FY	Financial Year
GDV	Groundwater dependent vegetation
GHG	Greenhouse gas
GL/a	gigalitres per annum
ha	hectare
IBRA	Interim Biogeographic Regionalisation for Australia
IBSA	Index of Biodiversity Surveys for Assessments
ILUA	Indigenous Land Use Agreement
ISA	Interim storage area
km	kilometre
KNAC	Karlka Nyiyaparli Aboriginal Corporation RNTBC
m	metre
mbgl	metres below ground level

Term	Meaning
ML/a	megalitres per annum
MNES	Matter of National Environmental Significance
MS	Ministerial Statement
NEMP	(PFAS) National Environmental Management Plan
Newman Agreement Act	*Iron Ore (Mount Newman) Agreement Act 1964*
NGER Act	*National Greenhouse and Energy Reporting Act 2007*
NVCPs	Native Vegetation Clearing Permits
OB	Orebody
OSA	Overburden storage area
PDWSA	Public Drinking Water Source Area
PEOF	Pilbara Environmental Offsets Fund
PERSP	*Pilbara Public Environmental Review Strategic Proposal* (BHP Billiton 2016) - Environmental Review Document for the Strategic Proposal
PFAS	per-and poly-fluoroalkyl substances
PFHxS	Perfluoro hexane sulfonate
PFOS	Perfluoro octane sulfonate
RiWI Act	*Rights in Water and Irrigation Act 1914*
SRE	short-range endemic
TBA	To be advised
TDS	total dissolved solids
TEC	Threatened Ecological Community
WA	Western Australia
WAIO	Western Australia Iron Ore
WEMP	Water Environmental Management Plan
WS Act	*Water Services Act 2012*

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Executive summary

This document supports BHP's request to the Environmental Protection Authority (EPA) under section 38E of the *Environmental Protection Act 1986* (EP Act) that the Orebody 32 Below Water Table Creek Discharge referred proposal (the Proposal) be declared a Derived Proposal. The Proposal is consistent with section 38E of the EP Act and meets the following requirements:

- MS1105 Guidelines for submitting a Derived Proposal
- MS1105 Schedule 1 location and authorised extent of physical and operational elements
- *Environmental Impact Assessment (Part IV Divisions 1 and 2) Administrative Procedures* (EIA Procedures) (EPA 2016).

Tables 1 and 2 below identify the scope and extent of the Proposal.

Table 1: General Proposal Content Description

Proposal title	Orebody 32 Below Water Table Creek Discharge
Proponent name	BHP Iron Ore Pty Ltd
Short description	The Proposal includes the construction of a creek discharge at Homestead Creek to manage up to 60 ML/d of surplus water from the OB32 Below Water Table mine (OB32 BWT). OB32 BWT, approved under MS1105, already includes below water table mining and the construction of a surplus water pipeline to Ophthalmia Dam. This Proposal aims to provide an alternate surplus water management strategy for OB32 BWT for when Ophthalmia Dam is nearing capacity, or the surplus water pipeline is undergoing maintenance. The Proposal includes a series of aeration ponds, which will be constructed, if required, to prevent the persistent deposition of calcium carbonate precipitate on Homestead Creek sediments. It also includes the construction of a short offtake pipe from the existing OB32 BWT surplus water pipeline, and a discharge outlet to Homestead Creek. The creek discharge will operate for up to 9 months a year resulting in a maximum discharge of 16.2 GL/a of surplus water to Homestead Creek The Proposal is not seeking any other changes to the existing Orebody 32 BWT mine approved under MS1105.

Table 2: Proposal Content Elements

Proposal element	Location and description	Maximum extent, capacity or range
Physical elements		
Infrastructure elements: Homestead Creek discharge infrastructure and aeration ponds	Appendix 1 - Figure 1-3	Disturbance footprint of up to 40 ha within an Indicative Footprint of 50 ha, and Development Envelope of 174 ha. A short offtake from the existing OB32 BWT surplus water pipeline, and a discharge outlet to Homestead Creek. Aeration ponds are to be constructed, if required, to prevent persistent calcium carbonate precipitation forming in Homestead Creek.
Operational elements		
Management of surplus water to Homestead Creek	Appendix 3 - Figure 5-2	Continuous discharge of up to 60 ML/day to Homestead Creek for a maximum of 9 months per year (270 days). The creek discharge will cease for 3 consecutive months per year during the dry season.

Proposal element	Location and description	Maximum extent, capacity or range
		This will result in a maximum of 16.2 GL/a being discharged to Homestead Creek.
Aeration pond capacity	Appendix 10 - Figure 5-2	Aeration pond capacity of 240 ML Two parallel pond systems each rated at 30 ML/day to provide a residence time of 4 days (4 days x 60 ML/day = 240 ML)
Greenhouse Gas Emissions		
Peak annual average		
Scope 1	Diesel consumption during civil works, earthworks and clearing of vegetation	5,036 tCO_2-e per annum (2028)
Scope 2	N/A	N/A
Total (based on average Scope 1)		5,036 tCO_2-e per annum (2028)
Commissioning		
Commissioning of the Homestead Creek discharge is to be undertaken subject to operational limits of Ophthalmia Dam and dewatering activities at BHP Newman Operations including OB32 BWT.		
Rehabilitation and closure		
Undertake progressive rehabilitation following BHP's closure principles. Following the closure of OB32 BWT, the creek discharge infrastructure will be decommissioned and removed, closure earthworks completed, and a natural and stable surface for creek health will be reinstated. BHP aims to restore land with native vegetation that is naturally self-sustaining. The aeration ponds will be dewatered and remaining sediment will be removed and encapsulated within an overburden storage area (OSA) or interim storage area (ISA). The ponds will be backfilled using embankment material and / or material from the flood bund. The flood bund will be pushed down to reinstate natural surface water drainage lines and the remaining footprint will be profiled and rehabilitated using standard surface treatments. The Eastern Ridge Mine Closure Plan has been revised to include the Proposal and is included with the referral.		
Other elements which affect the extent of the environment		
Proposal time Financial Year 2027	Maximum project life 50 years	While OB32 BWT mining occurs – estimated project life of 50 years

Table 3: Summary of potential impacts, proposed mitigation and proposed environmental outcomes

Inland Waters	
Potential impacts	Due to the Proposal, the following impacts to Inland Waters may occur: • altered surface water regime in Homestead Creek and upper Fortescue River • changes to water quality in Homestead Creek • increased erosion within Homestead Creek and upper Fortescue River.
Mitigation hierarchy	**Avoid** • visual inspections of Homestead Creek will be undertaken to monitor for calcium carbonate precipitate • aeration ponds to be constructed if monitoring detects the persistent formation of calcium carbonate precipitate in Homestead Creek

	• No chemicals containing PFAS will be used at Eastern Ridge. **Minimise** • dewatering water from OB32 BWT will continue to be reused at BHP's Eastern Ridge operations where possible to reduce the quantity of surplus water • surplus water from OB32 BWT will be preferentially discharged to Ophthalmia Dam • the discharge of surplus water to Homestead Creek will occur when Ophthalmia Dam is nearing capacity, or the surplus water pipeline to Ophthalmia Dam is undergoing maintenance • the discharge of surplus water to Homestead Creek will be limited to a maximum of 9 months per year and will cease for 3 consecutive months per year during the Pilbara dry season (generally between May to November) • the wetting front from the Homestead Creek discharge will be restricted to not going beyond the Jigalong Road crossing over the Fortescue River during natural no flow conditions (which excludes the release of water from Ophthalmia Dam). The distance from the Homestead Creek discharge location to the Jigalong Road crossing on the Fortescue River is approximately 75 km • the wetting front will not go within 55 km of Fortescue Marsh during natural no flow conditions (which excludes the release of water from Ophthalmia Dam). The distance between the Jigalong Road crossing over the Fortescue River to Fortescue Marsh is approximately 55 km • water monitoring gauges will be installed in Homestead Creek and Fortescue River to measure flow and provide a trigger for when the wetting front is approaching the Jigalong Road crossing (wetting front threshold) • water quality monitoring of surplus water will be undertaken prior to discharge to Homestead Creek. **Rehabilitate** • continue to manage rehabilitation and closure according to the measures in the updated Orebody 32 Below Water Table Mine Closure Plan.
Residual impacts, including assessment of significance	Residual impacts on Inland Waters following application of the mitigation hierarchy: 1. The ephemeral nature of Homestead Creek and upper Fortescue River will be altered. • the discharge of 60 ML/day of surplus water to Homestead Creek is equal to 2.24% of the peak discharge which would flow in Homestead Creek during a 1 in 2-year ARI event. • for this reason, the wetting front is anticipated to remain in the low flow channel, and not increase the risk of flooding at Homestead Creek or the Fortescue River • the creek discharge will cease for 3 consecutive months during the Pilbara dry season (between May to November) to allow Homestead Creek and Fortescue River to dry Direct and indirect impacts to Inland Waters are not anticipated to be significant.
Proposed environmental outcomes	Environmental outcomes for the residual impacts on Inland Waters: • hydrological changes are restricted to the lower Homestead Creek and upper (altered) Fortescue River and are not widespread. Effective management measures are available to mitigate the impacts • water quality can be monitored and managed to prevent significant impacts to environmental values in Homestead Creek • the current (altered) surface water regime to the Fortescue River downstream of Ophthalmia Dam will be maintained. no adverse impact on environmental values of Homestead Creek and Fortescue River are anticipated.
Assessment of offsets (if relevant)	N/A: No significant residual impacts after mitigation.

Flora and Vegetation	
Potential impacts	Due to the Proposal, the following impacts to Flora and Vegetation may occur. • loss of native vegetation from clearing (direct) • changes to vegetation and flora due to the creek discharge, including the potential spread of weeds and increased vegetation growth (indirect).
Mitigation hierarchy	**Avoid** • the Proposal has a small disturbance footprint and is in an area of previous disturbance • no Threatened flora species have been recorded in the Development Envelope • to reduce the disturbance footprint, the clearing of native vegetation for the purpose of constructing the aeration ponds will be undertaken only if water monitoring detects the persistent formation of calcium carbonate precipitate in Homestead Creek. **Minimise** • vegetation clearing has been limited to 40 ha of native vegetation • the offtake from the existing surplus water pipeline to Homestead Creek has been located close to Homestead Creek to reduce the extent of the pipe and disturbance footprint • the Homestead Creek wetting front will not extend beyond the Jigalong Road crossing over the Fortescue River, during natural no flow conditions, to maintain a drying pattern in the upper Fortescue River • to minimise impacts to riparian vegetation and reduce weed growth, the Homestead Creek discharge will cease for 3 consecutive months each year during the Pilbara dry season (generally May to November) to allow Homestead Creek and Fortescue River to dry **Rehabilitate** • continue to manage rehabilitation and closure according to the measures in the *Eastern Ridge Mine Closure Plan.*
Residual impacts, including assessment of significance	Residual impact on Flora and Vegetation following application of the mitigation hierarchy: • clearing of up to 38.86 ha of native vegetation in Good to Excellent condition, of which 100% is within the Pilbara IBRA region • clearing of less than 0.01% of each Beard vegetation association • the Proposal will not impact regional vegetation associations to the extent that the ecological integrity of any vegetation association is threatened, as each Beard vegetation association will have more than 99% of their pre-European extent remaining • the associations are widespread beyond the Development Envelope and outside of the Pilbara bioregion. Clearing of vegetation in Good to Excellent condition for the Proposal is a significant residual impact due to the cumulative impacts of clearing in the Pilbara and requires an offset.
Proposed environmental outcomes	Environmental outcomes for the residual impacts on Flora and Vegetation: 1. increase to the cumulative clearing of Good to Excellent condition vegetation in the Pilbara bioregion 2. the representation of each Beard vegetation association in the Pilbara and Gascoyne bioregions will be maintained. 3. no impacts to regionally significant vegetation (TECs and PECs); and locally significant vegetation will be maintained to an extent that ecological integrity is not threatened 4. The extent of flora and vegetation representation in the region will not be significantly impacted.

Assessment of offsets (if relevant)	BHP proposes to contribute funds to the Pilbara Environmental Offsets Fund for the clearing of up to 40 ha of Good to Excellent condition vegetation in the Pilbara IBRA region.
Social Surroundings	
Potential impacts	Due to the Proposal, the following impacts to Social Surroundings may occur. • while there are no known Aboriginal cultural heritage sites within the Development Envelope, the Proposal could lead to disturbance of unknown cultural heritage sites and values (direct and indirect) including • impacts to access, landscape, and amenity (direct) • degradation of cultural heritage places and values (indirect).
Mitigation hierarchy	**Avoid** • works to be undertaken in compliance with the *Aboriginal Heritage Act (1972)* • the Homestead Creek discharge location avoids all known sites of cultural heritage significance • the risk of flooding in Homestead Creek or the Fortescue River will not increase and access across the Fortescue River at Jigalong Road crossing will not be impacted. **Minimise** • install flow gauges in Homestead Creek and Fortescue River to ensure the Homestead Creek wetting front threshold on the Fortescue River is achieved • undertake water monitoring to ensure water quality in Homestead Creek and Fortescue River is maintained and complies with relevant regulatory guidelines including for PFAS • Indirect impacts associated with noise, dust and vibration will occur for a short duration and be intermittent during the construction phase which is expected to be short given the small Indicative Footprint of the Proposal. **Rehabilitation** • continue to manage rehabilitation and closure according to the measures in the Orebody 32 Mine Closure Plan
Residual impacts, including assessment of significance	Residual impact on Social Surroundings following application of the mitigation hierarchy: • There will be no direct impacts to Aboriginal cultural heritage sites • The potential indirect impacts to Aboriginal social, cultural and heritage values No significant residual impacts on Social Surrounding values are predicted.
Proposed environmental outcomes	Environmental outcomes for the residual impacts on Social Surroundings: • There are no Aboriginal cultural heritage sites located within the Development Envelope and therefore the Proposal will not directly impact any Aboriginal cultural heritage sites • There will be no significant indirect impacts associated with the wetting front along Homestead Creek, Fortescue River and Fortescue Marsh. • The identification of potential impacts on values was undertaken in consultation with the Nyiyaparli Traditional Owners Impacts to Social Surroundings are not predicted be significant.
Assessment of offsets (if relevant)	N/A

Derived Proposal implementation conditions

BHP's view is that the following conditions set out in the Strategic Proposal Ministerial Statement 1105 should apply to the Proposal:

- administrative conditions 1 to 5
- Condition 6 Condition Environmental Management Plans
- Condition 7 Flora and Vegetation Environmental Management Plan
- Condition 10 Water Environmental Management Plan
- Condition 15 Rehabilitation and Decommissioning
- Condition 16 Offsets.

BHP's view is that none of the implementation conditions in Ministerial Statement 1105 should be changed.

1 Proposal

1.1 Proposal content

BHP proposes to implement the Orebody 32 Below Water Table Creek Discharge proposal (OB32 BWT Creek Discharge) (the Proposal) located within BHP's Newman (Eastern Ridge) mining operations (Figure 1-1). The Proposal includes the construction and operation of a creek discharge at Homestead Creek to manage up to 60 ML/d of surplus water from the OB32 Below Water Table mine (OB32 BWT). This Proposal is an extension of existing mining operations, authorised under Ministerial Statement 1105 (MS1105) for the Pilbara Expansion Strategic Proposal (Figure 1-2).

The OB32 BWT mine approved under MS1105 in September 2023 is located approximately 4 km northeast of Newman and includes below water table mining and the construction of a surplus water pipeline to Ophthalmia Dam. This Proposal will provide an alternate surplus water management option to OB32 BWT for when Ophthalmia Dam is nearing capacity, or the surplus water pipeline is undergoing maintenance. Surplus water from OB32 BWT will continue to be preferentially discharged to Ophthalmia Dam, as far as practicable and the release of surplus water from Ophthalmia Dam will continue to operate in accordance with the Eastern Pilbara Water Resource Management Plan (BHP 2025).

The creek discharge will operate for up to 9 months per year resulting in a maximum discharge of 16.2 GL/a of surplus water to Homestead Creek and will cease operation for three consecutive months during the Pilbara dry season (generally during May to November) to maintain a drying pattern within Homestead Creek and upper Fortescue River.

The Proposal also includes the option to construct a series of aeration ponds to prevent the persistent formation of calcium carbonate precipitate in Homestead Creek. To minimise land disturbance and clearing of native vegetation, the aerations pond will be constructed only if water monitoring indicates they are required.

BHP has referred the Proposal with a request that it be declared a Derived Proposal, subject to Strategic Proposal Ministerial Statement 1105 (Section 2.1.5)

The general Proposal content description and proposal content elements are described in the separate *Proposal Content Document* (Appendix 1).

1.1.1 Exclusions from the Proposal

The Proposal does not include any changes to OB32 BWT mine approved under MS1105 or the Eastern Ridge mining operations approved under MS1037 including:

- mine pits and mining rates at the Eastern Ridge operations approved under MS1105 and MS1037
- the groundwater abstraction rate of 70.4 ML/d (25.7 GL/a) or dewatering footprint approved under MS1105 or 5C Licence GWL 182237 (5), approved under the *Rights is Water and Irrigation Act 1914* (RIWI Act)
- the OB32 BWT surplus water discharge rate of 60 ML/d (21.9 GL/a) to Ophthalmia Dam approved under MS1105.

1.1.2 Validation areas

The Development Envelope is illustrated on Figure 1-3 and detailed in Table 1-1 below. Within the Development Envelope, the Indicative Footprint is the location where the physical elements of the Proposal are planned to occur. This includes:

- an offtake from the OB32 BWT surplus water pipeline to Homestead Creek

- a pipeline from the OB32 BWT surplus water pipeline to a series of aeration ponds and discharge swale to Homestead Creek.

The Development Envelope encroaches within the OB32 BWT Development Envelope approved under MS1105. The Indicative Footprint abuts the OB32 BWT Indicative Footprint approved under MS1105, as seen in Figure 1-3.

Table 1-1: General Proposal content description

Area	Development Envelope	Indicative Footprint	Disturbance Footprint
OB32 BWT Creek Discharge	173.93	49.72	39.72
TOTAL	**174.0 (rounded)**	**50.0 rounded)**	**40.0 (rounded)**

A summary of the potential impacts, proposed mitigation and environmental outcomes is detailed in Table 1-2.

Table 1-2: Summary of potential impacts, proposed mitigation, and environmental outcomes

Inland Waters	
Potential impacts	Due to the Proposal, the following impacts to Inland Waters may occur. • altered surface water regimes in Homestead Creek and upper Fortescue River • changes to water quality in Homestead Creek and upper Fortescue River • increased erosion within Homestead Creek and upper Fortescue River
Mitigation hierarchy	**Avoid** • aeration pond will be constructed if monitoring detects the persistent formation of calcium carbonate precipitate in Homestead Creek • the use of chemicals containing PFAS has ceased at Eastern Ridge. No chemicals containing PFAS will be used at Eastern Ridge **Minimise** • dewatering water from OB32 BWT will continue to be reused at BHP's Eastern Ridge operations where possible to reduce the quantity of surplus water • surplus water from OB32 BWT will be preferentially discharged to Ophthalmia Dam • the discharge of surplus water to Homestead Creek will occur when Ophthalmia Dam is nearing capacity, or the surplus water pipeline to Ophthalmia Dam is undergoing maintenance • the discharge of surplus water to Homestead Creek will be limited to a maximum of 9 months per year and will cease for 3 consecutive months per year during the Pilbara dry season (between May to November) to allow Homestead Creek and Fortescue River to dry each year. • the wetting front from the Homestead Creek discharge will be restricted to not going beyond the Jigalong Road crossing over the Fortescue River during natural no flow conditions. The distance from the Homestead Creek discharge location to the Jigalong Road crossing on the Fortescue River is approximately 75 km • the wetting front will not go within 55 km of Fortescue Marsh during natural no flow conditions. The distance between the Jigalong Road crossing over the Fortescue River to Fortescue Marsh is approximately 55 km • water monitoring gauges will be installed at critical locations in Homestead Creek and Fortescue River to measure flow and provide a trigger for when the wetting front is approaching the Jigalong Road crossing (wetting front threshold) • water quality monitoring of surplus water will be undertaken prior to discharge to Homestead Creek

	Rehabilitate • continue to manage rehabilitation and closure according to the measures in the updated Orebody 32 Below Water Table Mine Closure Plan
Residual impacts, including assessment of significance	Residual impacts on Inland Waters following application of the mitigation hierarchy: 1. The ephemeral nature of Homestead Creek and upper Fortescue River will be altered. • the discharge of 60 ML/day of surplus water to Homestead Creek is equal to 2.24% of the peak discharge which would flow in Homestead Creek during a 1 in 2-year ARI event. • for this reason, the wetting front is anticipated to remain in the low flow channel, and not increase the risk of flooding at Homestead Creek or the Fortescue River • the creek discharge will cease for 3 consecutive months during the Pilbara dry season (between May to November) to allow Homestead Creek and Fortescue River to dry Direct and indirect impacts to Inland Waters are not anticipated to be significant.
Proposed environmental outcomes	Environmental outcomes for the residual impacts on Inland Waters: • hydrological changes are generally restricted to the lower Homestead Creek and upper (altered) Fortescue River and are not widespread. Effective management measures are available to mitigate the impacts • water quality can be monitored and managed to prevent significant impacts to environmental values in Homestead Creek • the current (altered) surface water regime to the Fortescue River downstream of Ophthalmia Dam will be maintained no adverse impact on environmental values of Homestead Creek and Fortescue River are anticipated.
Assessment of offsets (if relevant)	N/A: No significant residual impacts after mitigation
Flora and Vegetation	
Potential impacts	Due to the Proposal, the following impacts to Flora and Vegetation may occur. • loss of native vegetation from clearing (direct) • changes to vegetation and flora due to the creek discharge, including weeds and increased vegetation growth (indirect)
Mitigation hierarchy	**Avoid** • the Proposal has a small disturbance footprint and is in an area of previous disturbance • no Threatened flora species have been recorded in the Development Envelope • the clearing of native vegetation for the purpose of constructing the aeration ponds will be undertaken if water monitoring detects the persistent formation of calcium carbonate precipitate and or armouring of sediments to reduce the disturbance footprint **Minimise** • additional clearing has been limited to 40 ha of native vegetation • the offtake from the existing surplus water pipeline to Homestead Creek has been located close to Homestead Creek to reduce the extent of the pipe and disturbance footprint • the Homestead Creek wetting front will not extend beyond the Jigalong Crossing over the Fortescue River, during natural no flow conditions, to maintain the ephemeral nature of the Fortescue River

	• to minimise impacts to riparian vegetation and reduce weed growth, the Homestead Creek discharge will cease for 3 consecutive months each year during the Pilbara dry season (May to November) to allow Homestead Creek and Fortescue River to dry **Rehabilitate** • continue to manage rehabilitation and closure according to the measures in the *Orebody 32 Mine Closure Plan*
Residual impacts, including assessment of significance	Residual impact on Flora and Vegetation following application of the mitigation hierarchy: • clearing of up to 40 ha of native vegetation, of which 38.85 ha of native vegetation in Good to Excellent condition, of which 100% is within the Pilbara IBRA region • clearing of less than 0.01% of each Beard vegetation association • the Proposal will not impact regional vegetation associations to the extent that the ecological integrity of any vegetation association is threatened, as each Beard vegetation association will have more than 99% of their pre-European extent remaining • the associations are widespread beyond the Development Envelope and outside of the Pilbara bioregion. Clearing of vegetation in Good to Excellent condition for the Proposal is a significant residual impact due to the cumulative impacts of clearing in the Pilbara and requires an offset.
Proposed environmental outcomes	Environmental outcomes for the residual impacts on Flora and Vegetation: • increase the cumulative clearing of Good to Excellent condition vegetation in the Pilbara bioregion • the representation of each Beard vegetation association in the Pilbara and Gascoyne bioregions will be maintained. • no impacts to regionally significant vegetation (TECs and PECs); and locally significant vegetation will be maintained to an extent that ecological integrity is not threatened • The extent of flora and vegetation representation in the region will not be significantly impacted
Assessment of offsets (if relevant)	BHP proposes to contribute funds to the Pilbara Environmental Offsets Fund for the clearing of up to 38.85 ha of Good to Excellent condition vegetation in the Pilbara IBRA region
Social Surroundings	
Potential impacts	Due to the Proposal, the following impacts to Social Surroundings may occur. • while there are no known Aboriginal cultural heritage sites within the Development Envelope, the Proposal could lead to disturbance of unknown cultural heritage sites and values (direct and indirect) including • impacts to access, landscape, and amenity (direct) • degradation of cultural heritage places and values (indirect)
Mitigation hierarchy	**Avoid** • works to be undertaken in compliance with the *Aboriginal Heritage Act (1972)* • the Homestead Creek discharge location avoids all known sites of cultural heritage significance • the risk of flooding in Homestead Creek or the Fortescue River will not increase and access across the Fortescue River at Jigalong Road crossing will not be impacted **Minimise** • install flow gauges on Homestead Creek and Fortescue River to ensure the Homestead Creek wetting front threshold on the Fortescue River is achieved

	• undertake water monitoring to ensure water quality in Homestead Creek and Fortescue River is maintained and complies with relevant regulatory guidelines including for PFAS • indirect impacts associated with noise, dust and vibration will occur for a short duration and be intermittent during the construction phase which is expected to be short given the small Indicative Footprint of the Proposal. **Rehabilitation** • continue to manage rehabilitation and closure according to the measures in the Orebody 32 Mine Closure Plan
Residual impacts, including assessment of significance	Residual impact on Social Surroundings following application of the mitigation hierarchy: • there will be no direct impacts to known Aboriginal cultural heritage sites • the potential indirect impacts to Aboriginal social, cultural and heritage values
Proposed environmental outcomes	Environmental outcomes for the residual impacts on Social Surroundings: • no known heritage sites located within the Development Envelope and no indirect impacts associated with the wetting front along Homestead Creek and the Fortescue River. Identification of potential impacts on values undertaken in consultation with the Nyiyaparli Traditional Owners Impacts to Social Surroundings are not anticipated to be significant.
Assessment of offsets (if relevant)	N/A

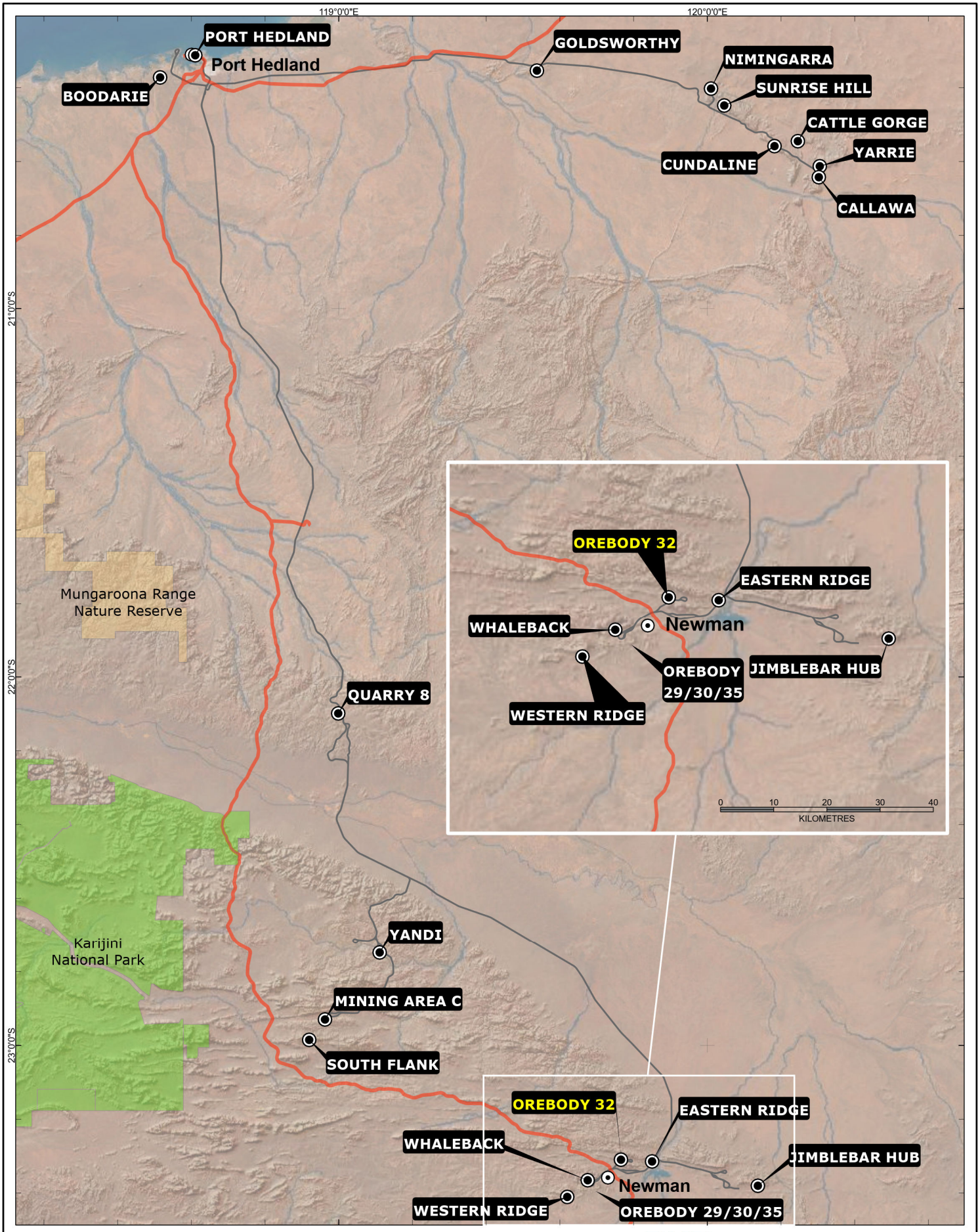
1.2 Proposal alternatives

To avoid the persistent formation of calcium carbonate precipitate on sediments in Homestead Creek, the Proposal includes the construction of aeration ponds which will be constructed, if required. The Proposal did not initially include the aeration ponds; however a precautionary approach has been taken by BHP, and the aeration ponds have been included in the Indicative Footprint. To minimise ground disturbance and clearing of native vegetation, the aeration ponds will only be constructed if required, further details are provided in Section 5.5.

The location of the aeration ponds is constrained by existing infrastructure including power and telecommunication lines and the BHP railway line. In addition, efforts to place the aeration ponds away from Homestead Creek has been made. The location of the ponds has changed throughout the development of the project to consider all the above constraints.

The Homestead Creek discharge location was originally located further upstream, north of critical infrastructure including the access road into BHPs Eastern Ridge mining operations and bridge over Homestead Creek. To minimise the potential damage to this infrastructure, the Homestead Creek discharge location was moved further downstream to its current proposed location.

BHP currently has approval to use managed aquifer recharge (MAR) at several of its mining operations to manage surplus water and is in the process of investigating further opportunities for MAR to be constructed. As discussed above, the Ophthalmia Dam water balance modelling completed to date demonstrates the dam has capacity during an average rainfall year to manage surplus water from BHP's eastern operations, including OB32 BWT and will continue to be the preferential option for managing surplus water from OB32 BWT. The creek discharge is proposed to be used when the dam is nearing capacity.



BHP mine
National Park
Nature Reserve
Highway
Rail

N

0 20 40 60 80
KILOMETRES
GCS GDA 1994

BHP

PUBLIC

OB32 BWT CREEK DISCHARGE DERIVED PROPOSAL

Regional Location

WAIO PLANNING, TECHNICAL & ENVIRONMENT

SCALE @ A4:	1:1,500,000	PREPARED:	GEOMATICS	FIGURE:	1-1
DATE:	25/02/2025	REQUESTOR:	ENV. APPROVALS	NO:	A1079_104_RevA

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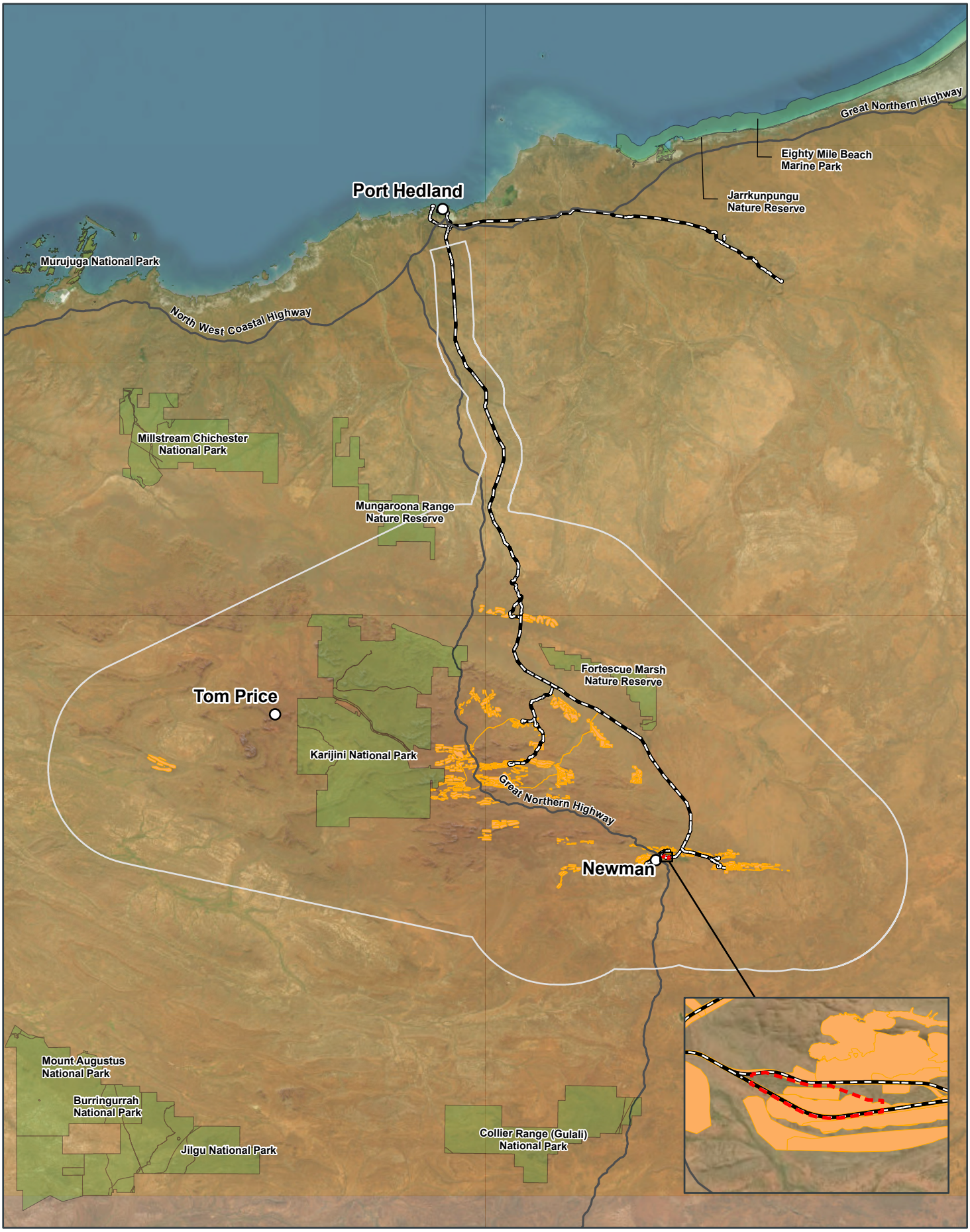


Legend

- OB32 BWT Creek Discharge Development Envelope
- Strategic Proposal Area (7,650,074 ha)
- Strategic Proposal Full Conceptual Development Scenario (98,500 ha)
- Conservation Area
- Townsite
- Major Roads
- Rail (BHP)

N

0 25 50 75 100

KILOMETRES

GDA 1994 MGA ZONE 50

BHP

PUBLIC

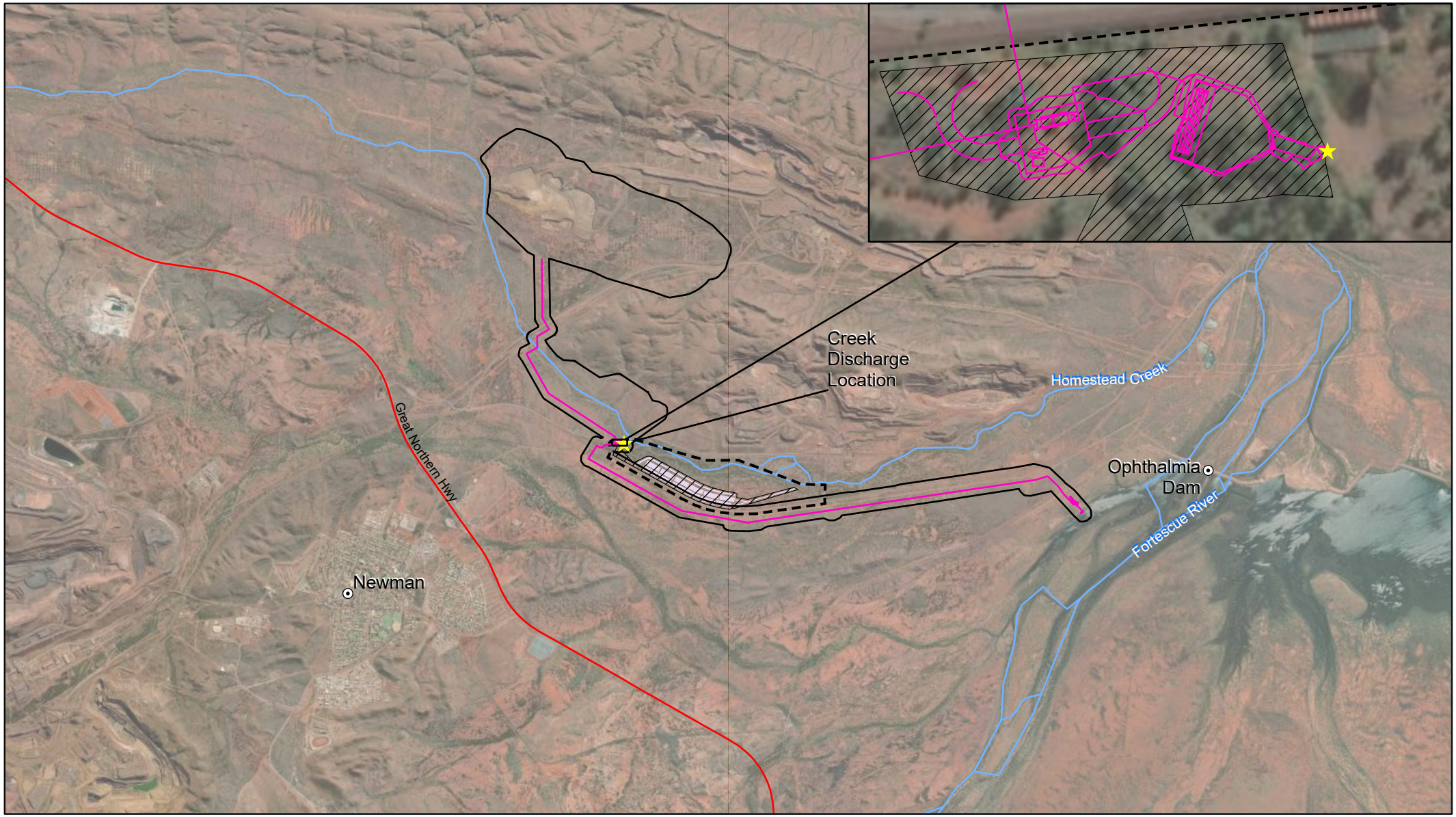
OB32 BWT CREEK DISCHARGE DERIVED PROPOSAL

PROPOSAL LOCATION AND BHP STRATEGIC PROPOSAL BOUNDARY

WAIO PLANNING, TECHNICAL & ENVIRONMENT

SCALE @ A4:	1:2,607,553	REQUESTOR:	PROJECTS	FIGURE:	1-2
DATE:	4/09/2025	PREPARED:	GEOMATICS	NO:	A1317-007 RevE
		REVIEWED:			

Document Path: Y:\Jobs\A1001_A1500\A1079\3Project\A1079_129_OB32_DP_Location_RevA.aprx



- OB32 BWT Derived Proposal
- OB32 BWT Pipeline
- Development Envelope
- Indicative Footprint
- OB32 Creek Discharge Location
- Aeration Ponds and Swale
- Highways
- Watercourse

N

0 0.5 1 1.5 2 2.5

KILOMETRES

GDA 1994 MGA ZONE 50

BHP

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OB32 BWT CREEK DISCHARGE DERIVED PROPOSAL

DEVELOPMENT ENVELOPE AND INDICATIVE FOOTPRINT

WAIO PLANNING, TECHNICAL & ENVIRONMENT

SCALE @ A4:	1:75,000	REQUESTOR:	ENV. APPROVALS	FIGURE:	1-3
DATE:	1/05/2025	PREPARED:	GEOMATICS	NO:	A1079_106_RevA

Document Path: Y:\Jobs\A1001_A1500\A1079\3Project\A1079_106_OB32_DP_DE_&_IF_RevA.aprx\A1079_106_OB32_DP_DE_&_IF_RevA

1.3 Local and regional context

The Proposal is in the eastern Pilbara region, approximately 3.6 km northeast of the town of Newman. The dominant land use is pastoral and iron ore mining operations, including BHP's Newman Operations which includes Mt Whaleback, Western Ridge, and Eastern Ridge. The Proposal is located within BHP's existing mining operations at Eastern Ridge. The nearest third-party iron ore mining operation is Rio Tinto's Hope Downs 4 operation, located approximately 24 km northwest in the central Pilbara region. The nearest National Park or Conservation Reserve is the Karijini National Park, approximately 118 km northwest and Fortescue Marsh Nature Reserve, approximately 60 km north and of the Proposal.

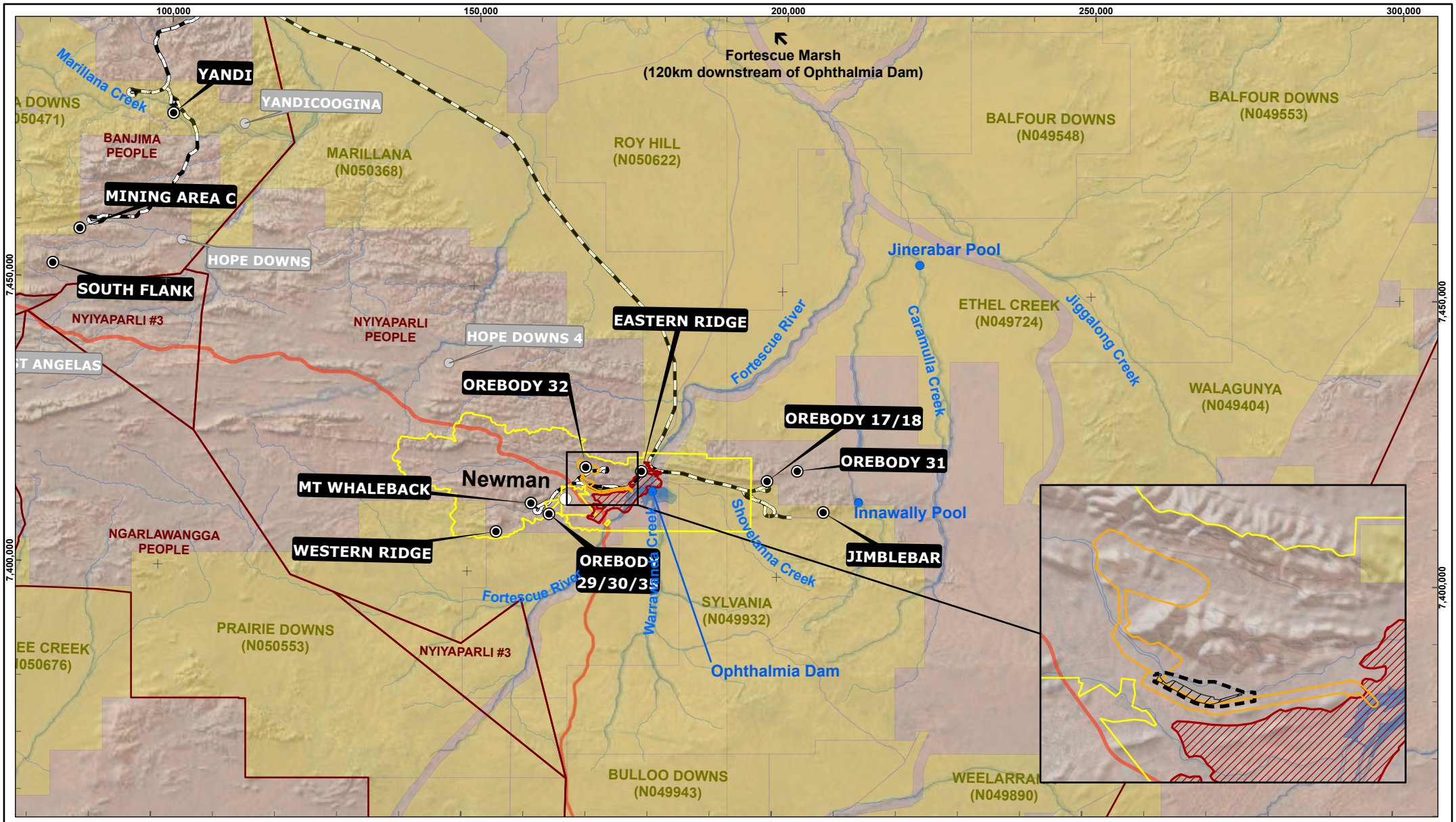
The terrain within the Proposal is mostly flat with areas of lower elevation along Homestead Creek. The Proposal is located within the centre of the Nyiyaparli Native Title Determination Area (Figure 1-4).

1.3.1 Regional threats to environmental values

The EPA discussed the following threats to the regional environmental values in the Pilbara in EPA Report 1619 (EPA 2018a):

- clearing of native vegetation
- invasive plants
- introduced fauna
- fire regimes
- hydrologic changes.

There are additional threats, not listed above that BHP has considered in this document. BHP has addressed threats, where the Proposal has the potential to be a significant cause or contribution, under the validation of the relevant environmental factors (see Sections 5 to 8 below). BHP will manage potential significant impacts relevant to the threats, in accordance with MS1105 through the relevant Condition Environmental Management Plans (EMPs), or through other statutory decision-making processes. Where BHP has not proposed an EMP or other statutory decision-making process, BHP will continue to manage these threats using BHP's regional management approach and standard business management practices outlined in the PERSP (BHP Billiton 2016).



BHP

PUBLIC

OB32 BWT CREEK DISCHARGE DERIVED PROPOSAL

Local and Regional Context

WAIO PLANNING, TECHNICAL & ENVIRONMENT

SCALE @ A4:	1:900,000	PREPARED:	GEOMATICS	FIGURE:	1-4
DATE:	1/05/2025	REQUESTOR:	ENV. APPROVALS	NO:	A1079_107_RevA

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2 Legislative context

2.1 State Strategic Proposal approval

BHP referred the Pilbara Expansion Strategic Proposal (Strategic Proposal) to the EPA under Part IV of the EP Act on 6 July 2012. Having devised a long-term mine development plan, BHP's aim was to consider a more regional approach to environmental management across all its current and future operations. The Strategic Proposal included new mining operations and future expansions to existing mining operations, and associated infrastructure and activities in the Pilbara. The EPA assessed the Strategic Proposal at the level of Public Environmental Review and published its report on 9 July 2018 (EPA Report 1619, EPA 2018a).

The Minister for Environment issued Ministerial Statement 1105 (MS1105) for the Strategic Proposal on 11 July 2019. The Statement states that in the event that the EPA declares a future proposal as identified in EPA Report 1619 and described in Schedule 1 of MS 1105 under section 38E to be a Derived Proposal, the Derived Proposal may be implemented, subject to the Minister for Environment's identification of relevant conditions under section 45B(3) from the conditions set out in the Statement.

2.1.1 Validation Process

BHP proposed an internal, non-statutory validation process in the PERSP as part of the assurance framework for Derived Proposals (BHP Billiton 2016 - Sections 10 and 11). The purpose of the validation process is to demonstrate how the Proposal meets the environmental outcomes defined through the assessment of the Strategic Proposal for the relevant environmental factors.

BHP's validation process includes, but is not limited to, the following:

- contemporary legislation, policy and guidance, including the EPA environmental factor guidelines
- the Strategic Proposal impact assessment and outcomes discussed in the PERSP (BHP Billiton 2016)
- environmental issues and outcomes discussed in the EPA report 1619 on the Strategic Proposal (EPA 2018a)
- whether existing information is sufficient or whether BHP has undertaken additional verification (e.g. through surveys or studies) or validation work (including MS1105 requirements)
- updated data, and detailed mine planning and design
- whether targeted management is required in addition to standard management practices.

2.1.2 Verification process

BHP has used project-specific information for the Proposal (including, but not limited to, the mine plan and design, baseline and targeted surveys, models and studies, and other up to date local and regional information) to verify the potential impacts of the Proposal to the environmental factors that were assessed for the Strategic Proposal.

2.1.3 Strategic Proposal development scenarios

BHP presented two future scenarios in the PERSP for the impact assessment: 30% Conceptual Development Scenario (30CDS) and Full Conceptual Development Scenario (FCDS) (BHP Billiton 2016 - Section 7.4). The two scenarios are conceptual only and were used for the assessment of the potential cumulative impacts of the Strategic Proposal (see Section 4.3.3). Given the Proposal was included in the 30CDS (referred to as Newman expansion) (BHP Billiton 2016), BHP has compared the potential impacts of the Proposal against the predicted Strategic Proposal outcomes for both development scenarios.

2.1.4 Derived Proposal environmental outcomes

For the Strategic Proposal, BHP proposed regional outcome-based objectives for each factor aligned to the EPA's objectives (BHP Billiton 2016 - Table 2), 'to mitigate risks (in accordance with the mitigation hierarchy) to an acceptable level'.

BHP discussed in the PERSP that targeted management may be required in addition to management practices. For the Proposal, each relevant environmental factor, BHP has provided the following information relating to environmental outcomes:

- the Derived Proposal residual impact
- identification of the proposed environmental outcomes for the Derived Proposal
- proposed mitigation and monitoring of environmental outcomes
- application of limits on the extent of a proposal element/s, relevant Strategic Proposal MS1105 condition, and/or other statutory decision-making processes that can mitigate the potential impacts of the Derived Proposal
- how the Proposal meets environmental objectives specified in the relevant conditions (as required by 2(b) of MS1105 Table 2, Column 3 Description of limits/extent).

2.1.5 Derived Proposal request

In requesting that a Proposal be declared a Derived Proposal, subject to MS1105, BHP is required to demonstrate compliance with:

- MS1105 Guidelines for submitting a Derived Proposal
- MS1105 Schedule 1 location and authorised extent of physical and operational elements
- Environmental Impact Assessment (Part IV Divisions 1 and 2) Administrative Procedures (EIA Procedures) (EPA 2016).

The following Tables 2-1, 2-2 and 2-3 demonstrate compliance with these requirements.

Table 2-1 Demonstration that the Proposal meets MS1105 Guidelines

MS1105 Guidelines requirement	Requirement	Addressed? Yes/No	Section and Appendix number
1(a)	Targeted surveys identifying conservation significant flora and vegetation, terrestrial fauna and subterranean fauna species	Yes	*Section 6 and Section 8.0. Appendix 6, Appendix 13, Appendix 14*
1(b)	A demonstration of how the results of the targeted surveys have been used to apply the mitigation hierarchy to the Proposal.	*Yes*	*Section 6 and Section 8.0*
1(c)	A report that details the following information: i. The types of ecosystems and total area of rehabilitation that the proponent with be required to rehabilitate across their iron ore tenure including the Derived Proposal	*Yes*	Appendix 11

MS1105 Guidelines requirement	Requirement	Addressed? Yes/No	Section and Appendix number
	ii. An analysis of the history of rehabilitation that the proponent has undertaken in the Pilbara and the demonstrated success of this rehabilitation. iii. The likely success of future rehabilitation activities in establishing self-sustaining areas of rehabilitation (Appendix 11)		
1(d)	Draft management plan for: Condition 7: Flora and Vegetation Environmental Management Plan Condition 10: Water Environmental Management Plan Condition 15: Rehabilitation and Decommissioning	*Yes*	Appendix 15 Appendix 11 Appendix 12
1(e)	Consultation engagements and outcomes	*Yes*	Section 3

Table 2-2 Consistency with MS1105 Schedule 1, Table 2

Requirement	Consistent? (Yes/No)
Developments Iron ore mines and associated activities and operations, being new operations at the locations identified in MS1105 Schedule 1 Table 2 and future expansions to new mining operations listed and existing mining operations.	**Yes** The Proposal is located within BHP's Strategic Proposal Boundary (Figure 1-1) and is identified as a future proposal in Schedule 1 of MS1105, as is an expansion to existing mining operations at Newman (Eastern Ridge). The proposed management of surplus water and creek discharge is consistent with the associated activity and operations described in Activity (xix) of Table 3 of Schedule 1 in Ministerial Statement 1105 which includes. • Water Supply, water disturbance, water use, water storage, water treatment, drainage and stormwater management and water discharge and water reinjection.
Location Associated activities and operations will be located within the Strategic Proposal boundary as identified in MS1105 Figures 1 and 2.	**Yes** The Derived Proposal is located within the Strategic Proposal boundary (see Figure 1-2).
Description of limits/extent Clearing (as defined in s51A of the *Environmental Protection Act 1986*), caused by or likely to be caused by all future proposals identified in Column 1 of Table 2, shall not exceed 98,500 hectares (ha)	**Yes** The Derived Proposal will result in clearing of up to 39.40 ha. The total clearing approved through BHPs declared Derived Proposals (OB32 BWT, Western Ridge and Ministers North (to be submitted to EPA in Sept 25) is 6,353 ha. The total combined clearing is 6,413 ha. Appendix 2 contains a summary of BHP's previously approved Derived Proposals and clearing areas.
Planned, designed and managed (demonstrated in the referral of future proposal and draft management plans submitted at the time of referral of future proposals) to ensure:	**Yes** The Proposal has been designed to minimise impacts and draft management plans have been submitted. See Section 1.2 Proposal Alternatives, and Appendix 10 Water Environmental Management Plan Appendix 11 Rehabilitation and Decommissioning and Appendix 14 Flora and Vegetation Management Plan.
Cumulative impacts to key environmental factors are minimised through use, where practicable, of existing mine infrastructure, rail, road and associated developments and do not exceed cumulative impact limit of 98,500 ha specified above	**Yes** The Proposal will utilise the OB32 BWT surplus water pipeline and existing access roads and tracks to gain access to the Development Envelope.
The environmental objectives specified in the relevant conditions will be met	**Yes**

Requirement	Consistent? (Yes/No)
	All relevant technical studies have been undertaken to inform the project design to ensure relevant conditions of MS1105 can be met.
Scientifically verifiable estimates of the likely success of future rehabilitation have been made.	**Yes** See Appendix 11 *BHP Strategic Proposal: Rehabilitation Report.*

Table 2-3 Consistency with EIA Procedures (EPA 2016)

Section	Requirement	Consistent? (Yes/No)
2.5.2 EPA to decide whether a declare a Derived Proposal		
The EPA must declare a referred proposal to be a Derived Proposal if it considers that -		
(a)	The referred proposal was identified in the Strategic Proposal (s 38E(4)(a)	Yes. The Proposal is within the scope of the Strategic Proposal as identified in BHP's PERSP (BHP Billiton 2016) and in the EPA's assessment report (EPA Report 1619) on the Strategic Proposal (EPA 2018a).
(b)	In the statement mentioned in s,38E(1)9b), it was agreed or decided under s.45 that the referred proposal could be implemented, or could be implemented subject to conditions (s.38(E0(4)(b))	Yes The Minister for Environment issued Ministerial Statement 1105 for the Strategic Proposal on 11 July 2019. The Statement states that the future Derived Proposals that meet the limitations and extent detailed in Schedule 1 may be implemented subject to the conditions and guidelines set out in the Statement. The Proposal is located within the Strategic Proposal Boundary identified in Figure 1 and is consistent with activities identified in Schedule 1 (Tables 2 and 3) of Ministerial Statement 1105.
The EPA may refuse to declare the referred proposal to be a Derived Proposal if it considers that -		
(a)	The environmental issues raised by the referred proposal were not adequately assessed in the strategic assessment (s,38E(5)(a)	No The EPA assessed the Strategic Proposal through a Public Environmental Review process. BHP addressed all potential impacts to all environmental factors. In EPA Report 1619, the EPA identified all environmental factors as key environmental factors relevant to the Strategic Proposal. The potential environmental issues related to the Proposal were adequately assessed for the Strategic Proposal.
(b)	There is significant new or additional information that justifies the reassessment of the issues raised by the proposal (s.38E(5)(b)	No BHP has reviewed EPA guidance, relevant publicly available information and has undertaken Proposal specific studies and consultation for the Proposal, to validate the impacts of the Proposal against the Strategic Proposal. The validation of these factors confirmed that there is no significant new or additional information that justifies reassessment.
(c)	There has been a significant change in the relevant environmental factors since the strategic assessment was completed (s.38E(5)(c)	No The relevant factors for the Proposal were identified as key factors for the Strategic Assessment (EPA Report 1619, EPA 2018).

2.1.6 State Agreement

The operations for the Proposal will be conducted under the *Iron Ore (Mount Newman) Agreement Act 1964* (Newman Agreement Act).

2.1.7 Commonwealth strategic approval

On 18 September 2012, the Australian Government and BHP Billiton Iron Ore Pty Ltd agreed to undertake a strategic assessment in accordance with section 146(1) of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). The *BHP Billiton Iron Ore Pilbara Strategic Assessment Program* (BHP Billiton 2017a) was endorsed by the then Minister for the Environment and Energy on 11 May 2017 and an Approval Decision (with conditions) for taking actions in accordance with the Program was issued on 19 June 2017. The approval covers activities within the Strategic Assessment Area, which is the same as the State Strategic Proposal Boundary. The relevant Program Matters are the following Matters of National Environmental Significance (MNES) threatened fauna species: Pilbara leaf-nosed bat (*Rhinonicteris aurantius*), Northern quoll (*Dasyurus hallucatus*), Greater bilby (*Macrotis lagotis*), Ghost bat (*Macroderma gigas*), and Olive python (Pilbara subspecies) (*Liasis olivaceus barroni*).

BHP administers a non-statutory validation process under Part C of the endorsed Program to decide whether an activity (action) will have an impact on Program Matters. Where BHP decides that a proposed action is notifiable, BHP will develop and issue a Validation Notice or amend and re-issue an existing Validation Notice. Actions that do not exceed the trigger for a Program Matter (and therefore are not notifiable actions) will be managed in accordance with the requirements of applicable State environmental approvals, legislation and internal business processes. BHP has determined that a Validation Notice is not required as the Proposal will have no impacts to a protected matter.

2.2 Other approvals and regulation

2.2.1 Tenure and State Agreement

BHP manages tenure holdings and legal structures on behalf of the Mount Newman Joint Venture, as the party to the *Iron Ore (Mount Newman) Agreement Act 1964 (*Newman State Agreement). The Mount Newman Joint Venture comprises of BHP Minerals Pty Ltd, Mitsui-Itochu Iron Pty Ltd, and Itochu Minerals and Energy of Australia Pty Ltd.

The Proposal is located primarily on Mineral Lease 244SA (ML244SA) (Figure 2-1) as outlined in Table 2-4 below and State Agreement approval is required prior to the commencement of activities.

Table 2-4: Tenure

Lease	Description	Legislation
ML244SA	Mineral Lease 244SA	*Iron Ore (Mount Newman) Agreement Act 1964*

The wetting front from the Homestead Creek discharge will extend along Homestead Creek to the upper Fortescue River. Sections of the upper Fortescue River are not on BHP tenure. New tenure will be secured by applying for a Miscellaneous Licence(s) under the *Mining Act 1978* and/or Access Agreements with third parties to install the proposed permanent water monitoring equipment.

2.2.2 Other approvals required for the Proposal

Table 2-5 outlines other state approvals that are required for the Proposal.

Table 2-5: Other approvals

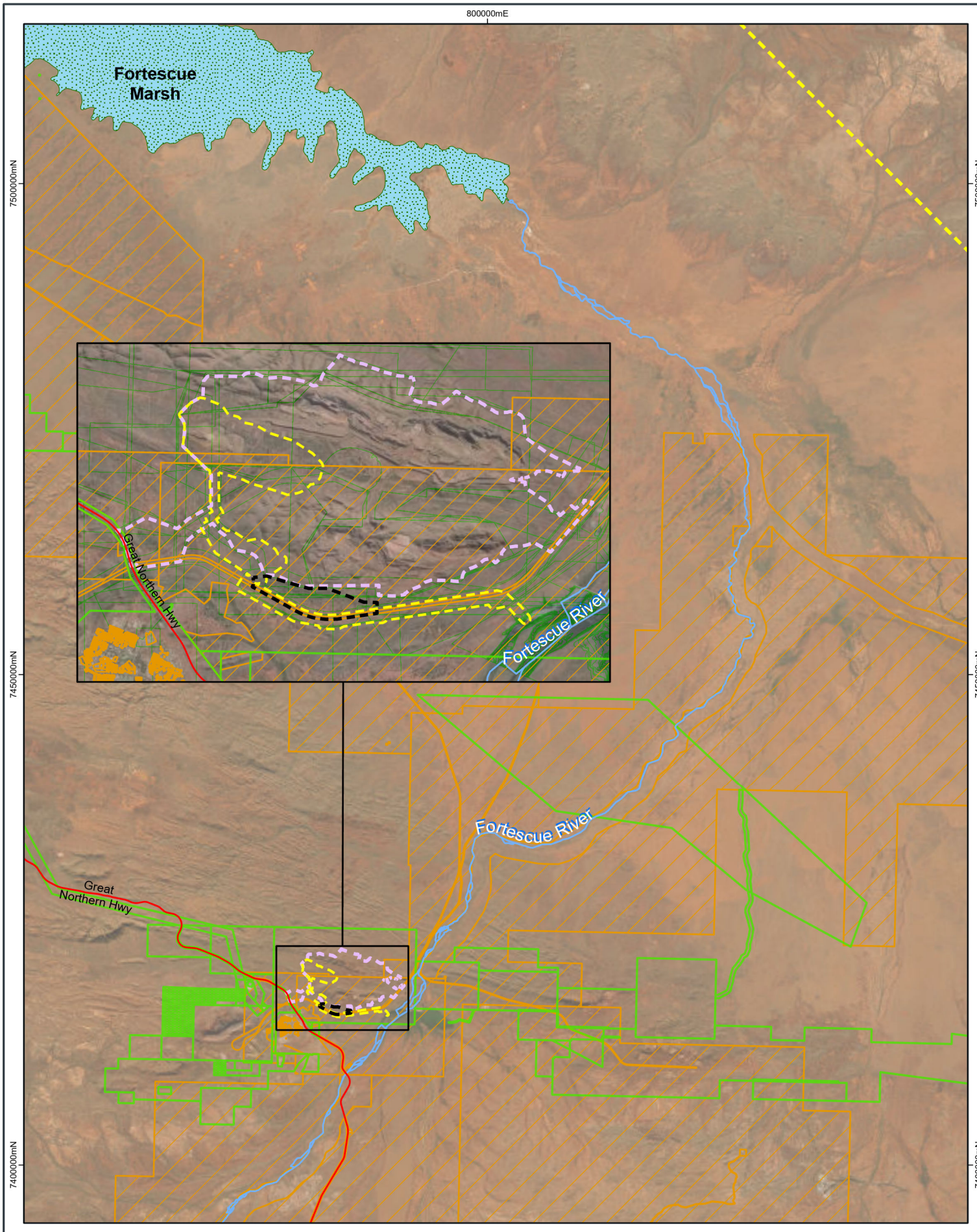
Decision-making authority	Legislation or Agreement regulating the activity	Approval required (and relevant Proposal element)	Whether and how statutory decision-making process can mitigate impacts on the environment?
Chief Executive Officer (CEO), Department of	EP Act – Part V	Works Approval and/or Licence amendment	Yes

Decision-making authority	Legislation or Agreement regulating the activity	Approval required (and relevant Proposal element)	Whether and how statutory decision-making process can mitigate impacts on the environment?
Water and Environmental Regulation (DWER)		(Surplus water management - surplus water discharge)	Licence contains limits and conditions to mitigate impacts on the environment. Regulated through amendment to existing Eastern Ridge Iron Ore Mine licence L6942/1997/13
Minister for State Development	*Iron Ore (Mount Newman) Agreement Act 1964*	State Agreement Additional Proposal	No

2.2.3 Other Part IV approvals relating to the Proposal

The Proposal will manage surplus water generated at the OB32 BWT mine, approved under MS1105 and is located at BHP's Eastern Ridge mining operations in Newman, approved under MS1037. The OB32 BWT proposal was the first Derived Proposal approved under BHP's Pilbara Expansion Strategic Proposal, MS1105.

There are no other Part IV approvals relating to the Proposal.



- OB32 BWT Creek Discharge Development Envelope
- MS 1037 Eastern Ridge
- MS 1105 Ore body 32 Below Water Table
- BHP Tenements - Granted
- BHP Freehold Leasehold Easements
- Watercourse
- Highways

N

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OB32 BWT CREEK DISCHARGE DERIVED PROPOSAL

Tenure and Existing Ministerial Statements

WAIO PLANNING, TECHNICAL & ENVIRONMENT

SCALE @ A4:	1:500,000	REQUESTOR:	ENV. APPROVALS	FIGURE:	2-1
DATE:	4/09/2025	PREPARED:	GEOMATICS	NO:	A1079_105_RevD

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3 Stakeholder engagement

3.1 Key stakeholders

Table 3-1: Key stakeholders

Stakeholder group	Stakeholder
State Government	DWER Department of Mines, Petroleum and Exploration (DMPE) (formerly the Department of Energy, Mine, Industry Regulation and Safety (DEMIRS)) Department of Biodiversity, Conservation and Attractions (DBCA) Department of Jobs, Tourism, Science and Innovation (DJTSI) Department of Planning, Lands and Heritage (DPLH)
Traditional Owners, Native Title Claimants and Representative Bodies	Nyiyaparli Traditional Owners, through Karlka Nyiyaparli Aboriginal Corporation (KNAC)

3.2 Stakeholder engagement process

As discussed in the PERSP (BHP Billiton 2016), BHP aims to facilitate regular, open and honest dialogue with the key stakeholders identified in Table 3-1 to understand expectations, concerns and interests of stakeholders and to consider them in business planning.

The stakeholder engagement addresses the requirements of MS1105 *Guidelines for submitting a Derived Proposal*: specifically, 1(e) stakeholder engagement.

3.3 Stakeholder consultation outcomes

Table 3-2 summarises the stakeholder consultation undertaken specifically for the Proposal.

Substantial stakeholder engagement was previously undertaken as part of the OB32 BWT proposal, including a site visit to the OB32 above water table mine, proposed surplus water pipeline alignment and Ophthalmia Dam by the EPA Chair and EPA Services and meetings with DMIRS, DBCA, Water Corporation and Shire of East Pilbara. Various workshops and meetings were held with KNAC, their consultants and Traditional Owners.

In addition, a dedicated engagement has been held with Nyiyaparli representatives through KNAC, for this Proposal.

BHP also held a pre-referral meeting with EPA Servicesand DWER Part V licencing officers, prior to submission of this referral, on 9 November 2025 to discuss the scope of the Proposal and relevant environmental factors.

Table 3-2: Stakeholder consultation

Description of engagement	Date	Topics/issues raised	BHP response and outcome
KNAC Implementation Committee Meeting	25 June 2025	BHP introduced the OB32 BWT Creek Discharge Proposal to KNAC to seek initial feedback about the project design components, the available design considerations including the wetting front threshold and water quality (calcium carbonate precipitate) was discussed.	Initial feedback and concerns were relayed back to the project team and considered in the project design.
Social Surroundings engagement with KNAC representatives, KNAC, Preston Consulting and Stevens Heritage Services	3 – 5 September 2024	BHP provided an overview of the OB32 BWT Creek Discharge Proposal including discussion on the proposed creek discharge location, quantity of water to be discharged, extent of the wetting front during natural no flow conditions and ongoing management of the creek discharge. Site visit locations included the proposed creek discharge location on Homestead Creek, two proposed aeration pond locations, Jigalong Road crossing over the Fortescue River and the proposed water monitoring locations on Homestead Creek and Fortescue River. The concerns of KNAC representatives regarding the OB32 BWT Creek Discharge Proposal included water use and management, impacts upon heritage sites and cultural places of importance, access to country, impacts of weeds and other introduced species, contaminants and waste management, mine closure and rehabilitation and ensure good access is maintained to the Jigalong community via the Jigalong Road crossing over the Fortescue River.	Prior to undertaking the Social Surroundings engagement, BHP focused on ensuring the Proposal did not impact upon any known cultural heritage sites and cultural places of importance were avoided and not impacted, that suitable water monitoring sites were included on Homestead Creek and Fortescue River and that access to the Jigalong community via the Jigalong Road crossing over the Fortescue River would not be impacted. This resulted in KNAC representatives not requesting any design changes to the Proposal or additional Social Surroundings engagements to be undertaken.
Provision of documents to KNAC for review	September - October 2025	BHP provided the draft OB32 BWT Creek Discharge Derived Proposal document, WEMP (BHP 2025a), and FVEMP (BHP 2025c) for review in September 2025. BHP received comments from KNAC on the Derived Proposal document in July 2025. Comments related to ensuring environmental outcomes were clear and measurable, managing weeds attributable to the creek discharge, providing detail about other surplus water management options available to BHP, addressing potential impacts to culturally important plant and animal species, the validity of the three month non discharge period to manage weeds and minimise impacts to riparian vegetation, and the management of the wetting from not encroaching Fortescue Marsh.	BHP provided KNAC a written response to comments on the Derived Proposal document in November 2025. BHP has updated the Derived Proposal document and supporting documents to address comments received from KNAC on the Derived Proposal document and from Nyiyaparli Traditional Owners to BHP during face to face engagements.
Meeting with DWER - EPA Services and DBCA	9 November 2025	*OB32 BWT Creek Discharge Proposal: Pre-referral*	BHP discussed the laboratory analysis and modelling undertaken to assess the risk of calcium carbonate precipitate forming in Homestead Creek and the

Description of engagement	Date	Topics/issues raised	BHP response and outcome
		BHP presented an overview of the OB32 BWT Creek Discharge Proposal. DWER raised queries in relation to the management of calcium carbonate precipitate and water quality (PFAS).	water quality sampling which will be undertaken prior to surplus water being discharged to Homestaed Creek to ensure the surplus water quality (PFAS) complies will all relevant guidelines.

4 Objects and Principles of the EP Act

4.1 Consideration of Object and Principles of the EP Act

The Object of the EP Act (s4A) is to protect the environment of the State, having regard to the principles in s4A of the EP Act. In undertaking its assessment of the Strategic Proposal, the EPA had regard for the Object and principles contained in s4A of the EP Act to the extent relevant to the particular matters that were considered (EPA Report 1619, EPA 2018a). The EPA's consideration of the EP Act principles in its assessment of the Strategic Proposal is detailed in EPA Report 1619 (EPA 2018a). There have been no changes to the Object and principles of the EP Act since the Strategic Proposal was assessed.

BHP considers that the Proposal is consistent with the Strategic Proposal, therefore, the EPA's consideration for the Strategic Proposal applies to the Proposal.

4.2 Key environmental factors

BHP has identified the following environmental factors as relevant for the Proposal (Table 4-1):

1. **Inland Waters**: Potential changes to surface and groundwater regimes and water quality.
2. **Flora and Vegetation**: Clearing of flora and vegetation, including cumulative clearing.
3. **Social Surroundings**: Potential changes to Aboriginal social, cultural and heritage values and interests including from changes to groundwater and surface water regimes, access, dust and noise.

For each relevant environmental factor, BHP has undertaken a comprehensive validation process (Sections 5 to Section 8).

Table 4-1 also presents other factors that were assessed as part of the Strategic Proposal, but BHP does not consider are relevant factors for the Proposal. Where BHP has identified some environmental issues relating to an 'other' factor, BHP has summarised the screening information (Section 8 Other environmental factors or matters).

Table 4-1: Identification of relevant environmental factors

Environmental factor	Key environmental factor in EPA Report 1619 on Strategic Proposal	Strategic Proposal MS condition/s	Relevant associated activities / operations for the Proposal	Environmental issues relating to the Proposal	Potential significant impacts from the Proposal	Relevant factor requiring validation for the Proposal
Land						
Flora and Vegetation	**Yes** (Impacts on flora and vegetation as a result of clearing, including increased cumulative impacts associated with other proposals)	**Yes** • Clearing authorised extent (Schedule 1, Table 2) • Flora and Vegetation Environmental Management Plan (Condition 7) • Conservation Reserve Avoidance Plan (Condition 14)[1] • Mine Closure Plan (Condition 15) • Offsets (Condition 16)	• Ground disturbance • Discharge of surplus water • Rehabilitation and decommissioning activities	• Loss of flora and vegetation • Cumulative clearing of native vegetation in the Pilbara • Changes to vegetation from surplus water discharge to waterways	• Cumulative clearing of Good to Excellent condition native vegetation	**Yes** (Section 6)
Terrestrial Fauna	**Yes** (Clearing of fauna habitat, including habitat for conservation significant fauna species)	**Yes** • Clearing authorised extent (Schedule 1, Table 2) • Terrestrial Fauna Environmental Management Plan (Condition 8) • Conservation Reserve Avoidance Plan (Condition 14)[1] • Mine Closure Plan (Condition 15) • Offsets (Condition 16)	• Ground disturbance • Discharge of surplus water • Rehabilitation and decommissioning activities	• Removal of terrestrial fauna habitats • Changes to surface water regimes	None	**No**

Environmental factor	Key environmental factor in EPA Report 1619 on Strategic Proposal	Strategic Proposal MS condition/s	Relevant associated activities / operations for the Proposal	Environmental issues relating to the Proposal	Potential significant impacts from the Proposal	Relevant factor requiring validation for the Proposal
Subterranean Fauna	**Yes** (Loss of habitat for subterranean fauna species as a result of disturbance for mining and abstraction of groundwater)	**Yes** • Subterranean Fauna Environmental Management Plan (Condition 9) • Conservation Reserve Avoidance Plan (Condition 14)[1] • Mine Closure Plan (Condition 15) • Offsets (Condition 16)	None	None • No range restricted or significant species were recorded during the Aquatic surveys undertaken of Homestead Creek or upper Fortescue River • No below ground extension to any mines; therefore, no impacts to troglofauna habitats or species • No additional ground water abstraction; therefore, no impact to stygofauna habitat or species (including the Ethel Gorge TEC) • Discharge of surplus water to Homestead Creek (direct), and Fortescue River (indirect), will not significantly alter the groundwater levels or quality of the Ethel Gorge aquifer and will not affect the Ethel Gorge TEC	None	**No**
Landforms	**Yes** (Disturbance of landforms as result	**Yes**	• Ground disturbance and earthworks	None • No removal or significant modification of existing	None	**No**

Environmental factor	Key environmental factor in EPA Report 1619 on Strategic Proposal	Strategic Proposal MS condition/s	Relevant associated activities / operations for the Proposal	Environmental issues relating to the Proposal	Potential significant impacts from the Proposal	Relevant factor requiring validation for the Proposal
	of the construction of future proposals)	• Mine Closure Plan (Condition 15)		natural landforms to construct the Proposal • The aeration ponds are shallow and will be partially constructed into the ground to minimise the visual impacts to the landscape.		
Terrestrial Environmental Quality	**Yes** (Potential for discharge of pollutants to the environment, including from mine closure activities)	**Yes** • Mine Closure Plan (Condition 15)	• Rehabilitation and decommissioning activities	• Contamination of land, through the accumulation of contaminants in aeration ponds	None	**No**
Water						
Inland Waters[2]	**Yes** (Changes to hydrological regimes and water quality)	**Yes** • Water Environmental Management Plan (Condition 10) • Mine Closure Plan (Condition 15)	• Discharge of surplus water to Homestead Creek	• Change to surface water regimes in Homestead Creek and Fortescue River • Changes to water quality in Homestead Creek	• Change to the ephemeral surface water regime of Homestead Creek and the altered upper Fortescue River • Change to water quality could potentially occur from the discharge of surplus water to Homestead Creek	**Yes** (Section 5)
Air						
Air Quality	**Yes**	**Yes**:	• Ground disturbance and earthworks	None	None	**No**

Environmental factor	Key environmental factor in EPA Report 1619 on Strategic Proposal	Strategic Proposal MS condition/s	Relevant associated activities / operations for the Proposal	Environmental issues relating to the Proposal	Potential significant impacts from the Proposal	Relevant factor requiring validation for the Proposal
	(Increased emissions of particulates associated with dust)	• Air Quality Environmental Management Plan (Condition 11) • Conservation Reserve Avoidance Plan (Condition 14)[1]		• Minor, temporary ground disturbance only for construction of aeration ponds (if required) pipeline extension and creek discharge operation		
Greenhouse Gas Emissions	**Yes** (Increased emissions of greenhouse gases)	**Yes**: • Greenhouse Gas Management Plan (Condition 12)	• Clearing of native vegetation • Discharge of surplus water	• Contribution of proposal's GHG emissions to WA's GHG emissions	• None - low levels of emissions	**No**
People						
Social Surroundings	**Yes** (Potential impacts on sites of Aboriginal heritage significance and areas where traditional cultural activities are undertaken)	**Yes**: • Clearing authorised extent (Schedule 1, Table 2) • Cultural Heritage Management Plan (Condition 13) • Conservation Reserve Avoidance Plan (Condition 14)[1] • Mine Closure Plan (Condition 15)	• Ground disturbance and earthworks • Discharge of surplus water • Rehabilitation and decommissioning activities	• Clearing of native vegetation • Changes to surface water regimes • Altered access, landscape and amenity • Rehabilitation and closure	• Potential impacts (indirect) to the Upper Fortescue River on sites of Aboriginal heritage significance and areas where traditional cultural activities are undertaken	**Yes** (Section 5)

1. Condition 14 Conservation Reserve Impact Avoidance Plan will only be applied to proposals in proximity to conservation reserve, with the potential to impact *Conservation and Land Management Act 1984* reserve lands (EPA 2018a).

2. Inland Waters was previously two factors (Hydrological Processes and Inland Waters Environmental Quality) during the preparation of the PERSP and EPA Report 1619. The EPA amalgamated these factors in June 2018.

5 Inland Waters Validation

5.1 EPA environmental factor and objective

The EPA's objective for Inland Waters is:

> *To maintain the hydrological regimes and quality of groundwater and surface water so that environmental values are protected.*

Inland Waters was previously two factors (Hydrological Processes and Inland Waters Environmental Quality) during the preparation of the PERSP and EPA Report 1619. The EPA amalgamated these factors (and objectives) in June 2018 (EPA 2018b).

5.2 Relevant policy and guidance

BHP validated this environmental factor considering the following relevant EPA policies and guidance, as outlined in Table 5-1.

Table 5-1: Inland Waters – policy and guidance

EPA, other State and Commonwealth policy and guidance	Consideration of EPA policy and guidance
Environmental Factor Guideline - Inland Waters (EPA 2018b)	• Considered the links with other environmental factors • Applied the relevant considerations for environmental impact assessment • Considered the environmental values supported by or dependent on Inland Waters, and their significance • Undertook investigations and studies consistent with the information required for EIA
Western Australian Water in Mining Guideline (DoW 2013)	Undertook the following consistent with the guideline: • consultation, project scoping, investigations, validation of impacts and post-closure management • considered options for surplus water from mine dewatering and potential impacts, including cumulative impacts
Use of mine dewatering surplus (DWER 2020)	• Determined the mine dewatering surplus • Considered regulatory requirements • Considered cumulative impacts including water quality
PFAS National Environmental Management Plan Version 3.0, (HEPA 2025)	• Reviewed the revised guideline values for Pfas that were released since the Approved Proposal was prepared to ensure ongoing compliance

Since the EPA assessed the Strategic Proposal (EPA 2018a) there has been no change to the EPA's guidance on Inland Waters.

5.3 Receiving environment

5.3.1 Studies and surveys

BHP used the following information for its assessment of Inland Waters for the Strategic Proposal (BHP Billiton 2016 - Table 9) and for the validation of Inland Waters for the Derived Proposal

Table 5-2: Inland Waters studies

Title	Author, Date	Summary	Appendix of Strategic Proposal
Strategic Proposal studies			
SEA Hydrology. Ecohydrological Change Assessment	BHP n.d	An assessment of the potential hydrological change, both surface water and groundwater associated with the Strategic Proposal was completed. The change assessment included • Conceptualisation and characterisation of landscape ecohydrological elements and processes, ecological assets and generic mine types • Identification of ecological assets and water resources that may be sensitive to hydrological change • Identification of key threatening processes contributing to ecohydrological change potential and Consideration of management approaches addressing eco hydrological change potential within the context of BHP Billiton Iron Ore's adaptive management framework.	Appendix 7
Title	**Author, Date**	**Summary**	**Appendix of Derived Proposal**
Derived Proposal studies			
Orebody 25 Pit 3 Homestead Creek Management at Closure	Tetra Tech, May 2014	A Flood Study of Homestead Creek was undertaken to assist with closure planning at Orebody 25 located adjacent to the Proposal and within Eastern Ridge.	Appendix 3
Orebody 32 Services – Surplus Water Management Definition Phase Study. Creek Discharge Modelling Report	Advisian, December 2023	Hydraulic modelling undertaken to predict the extent of the Homestead Creek wetting front under various discharge scenarios	Appendix 4
Orebody 32 BWT Surplus water Study – Summary of Creek Discharge Modelling Report. Technical Memorandum.	BHP, July 2025	The Homestead Creek Discharge Modelling Report (Advisian, 2023) was prepared. A summary of this report was provided to detail the modelling outcomes applicable to the Proposal.	Appendix 4
OB32 Stage 2 Technical Support Memo	Worley, November 2024	Additional, more detailed hydraulic modeling was undertaken to determine the wetting front characteristics including the estimated width and depth of water in Homestead Creek and Fortescue River	Appendix 4
NEBO OB25 West Targeted Vertebrate Fauna Survey	Biologic, October 2024	A Targeted Vertebrate Fauna survey focused on MNES species was completed for another project located in the vicinity of Orebody 25, also located in BHP's Eastern Ridge mining operations. Although the survey was undertaken for another project,	Appendix 5

		the study area included Homestead Creek. The assessment identified the possible occurrence of 3 ephemeral pools within the Development Envelope and an additional two identified downstream of the Development Envelope.	
OB32 Surplus Water – Homestead Creek Wetting Front Aquatic Fauna Survey 2021	IndoPacific Environmental, September 2022	A two season field assessment of aquatic fauna and habitats occurring in Homestead Creek, and a limited number of survey sites in the Fortescue River main channel was undertaken. The assessment included a habitat assessment and water quality sampling along Homestead Creek where water was present.	Appendix 6
Fortescue River Aquatic Fauna Survey 2021-2022	IndoPacific Environmental, March 2023	A two season field assessment of aquatic fauna and habitats occurring in the upper Fortescue River was undertaken. The assessment included a habitat assessment and water quality sampling where water was present.	Appendix 6
Orebody 32 Below water table: Groundwater Impact Assessment	BHP, August 2022	The impact assessment describes the hydrogeology and conceptualisation of the OB32 area in detail and includes figures of the distinct aquifer compartments and groundwater levels at the Proposal. An assessment of the impacts on water resources from groundwater abstraction for mine dewatering at OB32 BWT and the discharge of surplus water to Ophthalmia Dam was undertaken but is not discussed any further as the Proposal does not propose any changes to groundwater abstraction or dewatering at OB32 BWT or eastern Ridge.	Appendix 7
OB32 BWT groundwater monitoring data	BHP, February 2024	Groundwater quality monitoring data from 2012 to 2024	Appendix 8
OB32 Surplus Water Study: DPS Infiltration Study (Stage 2) (	Hydrobiology, March 2025	Investigates the potential for mineral precipitation to form in Homestead Creek and Fortescue River from the discharge of surplus water	Appendix 9
OB32 – Aeration Ponds Preliminary Design Summary.	Woley, December 2024	Provides a concept design of the aeration ponds which may be required to manage the surplus water prior to entering Homestead Creek	Appendix 10

5.3.2 Survey assumptions and limitations

The wetting front modelling and studies undertaken to support the assessment of Inland Waters has relied on the most recent data and two advanced software packages TUFLOW and GoldSim. The modelling of real-world environments however is complex and highly variable and modelling results and laboratory analysis is intended to provide a guide as to how the wetting front and discharge of surplus water to Homestead Creek is likely to perform. A conservative risk-based approach has been taken when developing suitable mitigation strategies which are detailed further in Section 5.5. Operational controls have been included to ensure the wetting front is managed appropriately.

The Proposal does not include any additional changes to the OB32 BWT mine including the discharge of surplus water from OB32 BWT to Ophthalmia Dam, or groundwater abstraction rates. Studies completed to inform the OB32 BWT Derived Proposal which relate to the discharge of surplus water to Ophthalmia Dam, groundwater drawdown, and per and polyfluoroalkyl substances (PFAS) have not been listed in Table 5-1. The Proposal will not result in any new, different or additional impacts from groundwater abstraction, the outcomes from these studies are however discussed and referenced where necessary.

The OB32 BWT proposal included below water table mining and discharge of surplus water to Ophthalmia Dam. An Ophthalmia Dam surplus water impact assessment (BHP 2022c) was submitted as part of the OB32 BWT referral, along with an Eastern Pilbara Hub Water Balance (EMM 2020)

The Eastern Pilbara Hub Water Balance was prepared to provide an improved and up to date estimate of the potential water management capacity of Ophthalmia Dam and to assess the potential impact of different operating and mine surplus water discharge scenarios on hydrological and water quality conditions of Ophthalmia Dam and the downstream Ethel Gorge aquifer system. The integrated GoldSim water balance model developed for BHP by Golder Associates (Golder Associates 2016, 2019) and based on earlier assessments undertaken by RPS (2014a, 2014b) to support BHP Pilbara Strategic Proposal (BHP 2016), was updated with improved input data.

The OB32 BWT Ophthalmia Dam surplus water impact assessment (BHP 2022c) details how the dam provides a location for the discharge of surplus water from BHP mines in the Eastern Pilbara Hub (currently includes Eastern Ridge, Orebody 29/30/35, Jimblebar and Orebody 31) and that BHP discharges only a portion (approximately 41% of the approved licensed rate) to the dam. It was demonstrated that the dam has the capacity to store surplus mine dewater from OB32 BWT, however the actual dam storage will depend on the catchment and climate conditions and actual discharge rates from BHP's other eastern operations to the dam.

Following the OB32 BWT referral, BHP commissioned the Eastern Pilbara Hub Water Balance – 2024 Forecast Surplus Discharge Assessment (EMM 2024) to support BHP's OB 29/30/35 Significant Amendment which was referred to the EPA in November 2024. This Proposal included the construction and operation of the OB 29/30/35 mine and all of BHP's approved surplus water discharges to Ophthalmia Dam. The 2024 Forecast Surplus Discharge Assessment included a revised cumulative discharge scenario to Ophthalmia Dam from all of BHP's eastern operations. Again, this assessment indicates that the dam has sufficient capacity to store surplus water discharges from OB 29/30/35, however the dam storage will be higher for longer periods during the years in which BHP is forecasting higher dewatering and dam discharge years. All predictions are for the 'average' hydrology scenarios, and it is acknowledged that actual dam storage and inundation is highly dependent on catchment and climate conditions, natural surface water inflows to the dam and actual discharge from BHP mines to the dam and releases of water from the dam (EMM 2024).

The water balance studies completed to date have demonstrated that Ophthalmia Dam has capacity to manage surplus mine dewater from BHP's Eastern Pilbara Hub. Ophthalmia Dam will therefore continue to be the preferential pathway for the management of surplus water from BHP's Eastern Pilbara Hub, which includes OB32 BWT. As flow into the dam from rainfall is highly variable each year, the Homestead Creek discharge has been proposed as a contingency to provide an alternate surplus water management option for OB32 BWT for when the dam is nearing capacity.

5.3.3 Environmental Values

5.3.3.1 Local and Regional Hydrology

The proposed creek discharge will occur at Homestead Creek which is a tributary of the upper Fortescue River. The Proposal is therefore located within the Homestead Creek sub-catchment of the upper Fortescue River catchment Figure 5-1).

The Fortescue River is the major river system in the eastern Pilbara region. The Fortescue River supports significant vegetation, terrestrial fauna, Aboriginal cultural heritage and amenity values. Homestead Creek is an ephemeral tributary of the Fortescue River (Figure 5-2).

5.3.3.2 Surface Water

Homestead Creek

Homestead creek is located approximately 4 km north of the Newman townsite at its closest point and runs adjacent to the southern boundary of OB32 BWT mine and the Eastern Ridge Development Envelope. Homestead Creek originates on the northern side of Mount Newman, approximately 15 km west of OB32 and flows in a southeasterly direction, downstream of OB32 BWT the creek then flows in a southeasterly direction (BHP 2022g) before entering the Fortescue River approximately 3 km north of Ophthalmia Dam, and 8 km downstream of the proposed Homestead Creek discharge point. Homestead Creek drains a catchment of approximately 300 km^2 (Tetra Tech Australia 2014, Appendix 3). Flow in Homestead Creek is ephemeral and exhibits high inter-annual variability in streamflow, with long periods of low to no flow.

Homestead Creek is approximately 40 m wide at the proposed creek discharge location and 150 m wide near the confluence with the Fortescue River (Worley 2024, Appendix 4).

Within the Development Envelope, three ephemeral pools have been identified in Homestead Creek (WER-07, WER-08 and WER-09) and an additional two (WER-10, WER-11) were recorded downstream of the Development Envelope, prior to the confluence with the Fortescue River. No permanent or semi-permanent water features were identified within the Development Envelope or downstream of the Development Envelope in Homestead Creek. The ephemeral pools were recorded during a targeted vertebrate fauna survey (Biologic 2024, Appendix 5, Figure 8-1) that was undertaken for a different BHP project at Orebody 25, located adjacent to OB32 BWT and within Eastern Ridge. The assessment had a specific focus on Matters of National Environmental Significance and included a habitat assessment of Homestead Creek. Ephemeral water features were classified as water features that are fed by rainfall or surface drainage following rainfall and persist for short periods (weeks or less than three months) after rainfall. The presence of the ephemeral pools was likely a result of the high rainfall received the month prior to the survey (Biologic 2024).

Hydraulic modelling of Homestead Creek was undertaken (Tetra Tech Australia 2014) to determine the peak flow and water level within Homestead Creek during various rainfall events. The modelling was completed to support the planning and design of closure and rehabilitation activities at Orebody 25. The Homestead Creek peak discharge developed as part of these studies is presented in Table 5-3 below, along with a comparison to the proposed Homestead Creek discharge of 60 ML/d.

Table 5-3: Homestead Creek Peak Discharge During Various Modelled Rainfall Events

Discharges	2 year ARI	5 year ARI	10 year ARI	20 year ARI	50 year ARI	100 year ARI
m^3/s	31	65	103	160	283	436
ML/day	2,678	5,616	8,899	13,824	24,451	37,670
Proposed Homestead Creek Discharge (ML/day)	60	60	60	60	60	60

Discharges	2 year ARI	5 year ARI	10 year ARI	20 year ARI	50 year ARI	100 year ARI
Proposed Homestead Creek Discharge (60 ML/day) as a Percentage of Homestead Creek Discharge during rainfall event (%)	2.24	1.1	0.67	0.43	0.25	0.16

Table 5-3 illustrates that the proposed discharge to Homestead Creek of 60 ML/day is equal to 2.24%, 1.1% and 0.16% of the peak discharge which would occur in Homestead Creek in the vicinity of the Proposal during a 1 in 2 year ARI, 1 in 5 year ARI and 1 in 100 year ARI rainfall event respectively. The information in Table 6-4 is included to assist with providing context to the scale of the proposed discharge (60 ML/day) in comparison to natural flows experienced during low and high order rainfall events, and to demonstrate that the discharge of surplus water to Homestead Creek will not increase the risk of flooding.

Homestead Creek Water Quality

A two-season field survey (Indo Pacific Environmental 2022, Appendix 6) of aquatic fauna and habitats occurring within Homestead Creek and a limited number of survey sites in Fortescue River (downstream of the confluence with Homestead Creek) was undertaken in the wet season (May) 2021 and dry season (October) 2021. Homestead Creek was found to be highly ephemeral with the majority of the catchment drying rapidly after rainfall. Five sites were found to contain water in the wet season with these sites being small remnant pools, and only one site (HC2) was found to contain surface water during the dry season survey. As Homestead Creek was dry at this time it was considered possible that HC2 was maintained by groundwater. Site HC2 is located immediately downstream of a series of large culverts at a railway crossing over Homestead Creek. The culverts concentrate flow in Homestead Creek and cause areas of deep erosion and scouring downstream of the culverts which will be significantly influencing the persistence of water ponding at HC2.

When surface water was present, a range of physiochemical parameters (pH, temp, EC, DO, and salinity) were measured in situ and water samples were analysed for multiple nutrients, anions and cations. Water quality parameters for which Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZG 2018), ANZEC 2000) Default Guideline Values (DGVs) existed, were compared to values obtained from each site. The DGVs for lowland rivers in tropical Australia were adopted for Homestead Creek.

Electrical Conductivity (EC) values were found to be higher at the majority of sites during the dry season in comparison to the wet season, which is typical of waterways in the Pilbara with higher EC concentrations being the result of overconcentration as pools contract during the wet season. One location in Homestead Creek (HC2) and sites within the upper Fortescue River, downstream of the confluence with Homestead Creek, were found to exceed the ANZG (2018) DGV for lowland rivers in both seasons.

The highest EC was recorded at WS1 (located outside the Development Envelope, just prior to the confluence with the Fortescue River) in both the wet and dry seasons being 1188 and 1175 µS/cm. Salinities below 3800 µS/cm are classified as freshwater, indicating the water quality in Homestead Creek is fresh (Indo Pacific Environmental 2023).

The pH at the majority of sites within Homestead Creek were consistent during the wet season ranging from 7.16 to 8.30 and are considered circumneutral or alkaline and due to the alkaline red soils present.

The results for turbidity during both seasons were below detection limits (<15 NTU).

The results for nitrate as nitrogen (N_NOx), total nitrogen (TN) and total phosphorus (TP) concentrations varied between sites with several sites exceeding the DGVs during both the wet and dry season. Elevated nutrient concentrations have been previously observed in the region, particularly when livestock are present. Additionally, permanent water sources can attract high densities of birds which can generate additional nutrient input. A greater

number of exceedances of the DGVs were observed in the dry season, which is likely due to the result of overconcentration of nutrients as water bodies retract (Indo Pacific Environmental 2022).

Upper Fortescue River

The Proposal is located within the catchment of the Upper Fortescue River (Figure 5-1). The Fortescue River is an ephemeral river which starts approximately 30 km south of Newman and usually flows in direct response to large and more intense rainfall events experienced during the summer months of December to April. The upper Fortescue River is approximately 100 m wide, is braided in sections and flows in a northerly direction in the vicinity of Newman and changes to a north westerly direction approximately 65 km north of Newman before entering the Indian Ocean south-west of Dampier. Approximately 100 km north of Newman, the river flows through the Fortescue Marsh.

The upper Fortescue River is an altered river system due to the construction of Ophthalmia Dam in 1981 which prevents low to medium rainfall events from flowing downstream. See further detail below under 'Ophthalmia Dam.'

The Fortescue River immediately downstream of Ophthalmia Dam is dominated by clay and silt, while further downstream is largely characterised as sandy, gravelly channels (Indo Pacific Environmental 2023, Appendix 6). The release of water from Ophthalmia Dam after the wet season can result in atypical volumes of water being present in the Fortescue River downstream of Ophthalmia Dam during the dry season. A two-season field assessment (Indo Pacific Environmental 2023) of the aquatic fauna and habitats of the upper Fortescue River identified the presence of several isolated pools, with the release of water from Ophthalmia Dam following the wet season extending the permanence of water in the upper Fortescue River. The habitat assessment found that a majority of sites scored a moderate rating, with multiple sites being classified as 'poor' primarily due to sites being impacted by cattle or lacking in stream habitat and structure (Pacific Environmental 2023).

Ophthalmia Dam

The Ophthalmia Dam system is located to the southeast of Eastern Ridge and comprises the dam, infiltration basins and recharge ponds. Ophthalmia Dam comprises three main embankments (A wall, B wall and C wall). The construction of Ophthalmia Dam in 1981 altered the natural flow regime of the upper Fortescue River. The Dam captures flow from the upper Fortescue River catchment and enables increased recharge to the Ethel Gorge aquifer beneath the Dam. This aquifer is used to supply water to Newman, and maintains habitat for the Ethel Gorge TEC. In addition, Ophthalmia Dam provides a location for the discharge of surplus water from BHP mines including Eastern Ridge, Whaleback (OB29/30/35), and Jimblebar.

Uncontrolled releases from Ophthalmia Dam to the upper Fortescue River occur when the dam fills from rainfall events and overtops the spillway. BHP also undertakes controlled releases of water from Ophthalmia Dam to the upper Fortescue River tributaries for environmental management or for dam safety and maintenance purposes, and most releases have been less than three months per year. Controlled releases are usually via the outlet valve at C Wall to Shovelanna Creek and into the downstream Fortescue River (BHP 2022j). Controlled releases via the outlet pipe are likely to emulate low flow events downstream of the dam (BHP 2019a).

Fortescue River Water Quality

A two-season field assessment (Indo Pacific Environmental 2023, Appendix 6) of the aquatic fauna and habitats in a 140 km section of the upper Fortescue River catchment was undertaken in the dry season (October) 2021 and wet season (May) 2022. The sampling locations comprised of sites within the Fortescue River upstream of Ophthalmia Dam, within Ophthalmia Dam and downstream of Ophthalmia Dam to Nullagine Bridge (just prior to Fortescue Marsh). Various water quality parameters were recorded as part of the assessment including physiochemical parameters (pH, temp, EC, DO, and salinity) that were measured in situ and water samples were analysed for multiple nutrients, anions and cations. The results were compared to the relevant Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZG 2018) Default Guideline Values (DGVs). For the riverine sites, DGVs for lowland rivers in tropical Australia were adopted and DGVs for lakes, reservoirs and wetlands in tropical Australia were adopted for sites located in Ophthalmia Dam.

The surface water quality samples of the Fortescue River varied spatially (between sites) and temporally (between seasons). The electrical conductivity (EC) was marginally higher at survey sites during the dry season, which is typical of Pilbara aquatic systems and generally the results of evapoconcentration. The highest dry season EC of 2233 µS/cm was recorded at FLCP1 (near Fortescue Marsh), while the highest wet season EC of 2073 µS/cm was recorded at OPDS3 (downstream of Ophthalmia Dam). These sites were also highest in the respective seasonal surveys in 2020 and 2021 (Indo Pacific Environmental 2022). Salinities below 3800 µS/cm are classified as freshwater, indicating the water quality in the Fortescue River is fresh (Indo Pacific Environmental 2023).

The pH at all sites ranged between 6.0 to 8.0 and are considered circumneutral or alkaline. Although many sites exceeded relevant DGVs, alkaline values are typical of the catchment area and likely to be present due to the alkaline red soils present.

Turbidity was only measured in the wet season with a majority of sites having values within the respective upper DGVs. Turbidity exceeded upper DGVs at two sites (FLCP1 and NB1 – at Nullagine Bridge) which was attributed to disturbances, primarily by cattle grazing which was present at both sites.

During the dry season, both total nitrogen (TN) and total phosphorus (TP) slightly exceeded DGVs at the majority of sites. Site FLCP1 recorded significantly higher values of TN and TP during the dry season. Similar results were evident during wet season sampling, with most sites slightly exceeding ANZG GDVs. Although most sites exceeded ANZG DGVs, due to the consistency of values displayed in both seasonal surveys, it is likely that these values are representative of natural nutrient concentrations in the catchment and not cause for concern. The significantly increased TN and TP concentrations at FLCP1 during 2021 survey is likely attributed to livestock access in the area (Indo Pacific Environmental 2023).

In summary, varying surface water quality parameters were seen to be in exceedance of ANZG (2018) at the majority of sites during both seasons including EC, DO, pH, TN, TP, and NOx. This result however is consistent with previous surveys undertaken in the same part of the Fortescue River catchment, with water quality parameters being associated with Pilbara catchment geology, time of sampling and land use (primarily livestock access to waterbodies) (Indo Pacific Environmental 2023).

Fortescue Marsh and the Fortescue Marsh Nature Reserve

The upper Fortescue River drains directly into the Fortescue Marsh which is the largest ephemeral wetland in the Pilbara located in the middle reaches of the Fortescue River. The Marsh is part of the recently established Fortescue Marsh Nature Reserve and is listed on the Directory of Important Wetlands of Australia as a wetland of regional importance due to its significant cultural and ecological values. The southern opening of the Marsh is located approximately 83 km north of the proposed Homestead Creek discharge location and approximately 55 km north of the maximum extent of the proposed creek discharge wetting front, during natural no flow conditions.

The catchment area of the wetland, recognised as the Upper Fortescue River catchment, is approximately 30,000 km^2. The water regime of Fortescue Marsh is dominated by surface water runoff from the catchment and evaporative loss. The Marsh is episodically inundated, predominately following rainfall associated with tropical low pressure cyclonic weather systems that occur between December and April. There is high inter-annual variability in rainfall and cyclonic activity meaning the inundation of the Marsh is irregular and infrequent. With restricted outflow from the system, evaporative processes dominate causing loss of water and the accumulation of salts. This process results in wetland water quality alternating between fresh, saline and hypersaline conditions (EPA 2013).

The recently registered Fortescue Marsh Nature Reserve is an A Class Nature Reserve which covers an area of 106,000 ha and includes a 70 km section of Fortescue Marsh and surrounding land. An Indigenous Land Use Agreement between KNAC and the State was recently executed and registered. The Fortescue Marsh Nature Reserve will be jointly vested with KNAC and the Conservation and Park Commission to manage and conserve the environmental and cultural significance of the Marsh.

DWER Surface Water Resources

The Proposal occurs within the DWER Upper Fortescue Surface Water Allocation Area and the Fortescue Marsh Subarea. There are two surface water licences within this area, Licence Number 181600 is located southwest of Fortescue Marsh and Licence Number 165267 is located immediately upstream of Fortescue Marsh.

5.3.3.3 Groundwater

Groundwater regime

The Proposal is part of the Eastern Ridge mining operations located in BHP's Newman Hub where the groundwater regime has been altered by groundwater abstraction for the Newman potable water supply since the 1970s from the Ophthalmia Borefield and since 2013 from Homestead Borefield.

Mine dewatering has also altered the local groundwater regime since the mid-1980s at the neighboring Mt Whaleback mine and since 2006 at Eastern Ridge. Since the commissioning of Ophthalmia Dam in 1981, groundwater recharge has been enhanced near Ethel Gorge due to seepage from Ophthalmia Dam, thereby maintaining groundwater levels in the Ethel Gorge aquifer.

A Groundwater Impact Assessment (BHP 2022, Appendix 7) was prepared to support the OB32 BWT Part IV referral and included a review of the *OB32 East and OB25 West Joffre: Detailed Hydrogeological Assessment* (BHP 2022g), The Hydrogeological Assessment included conceptual and numerical groundwater modelling to assess the potential impacts from groundwater abstraction at OB32 BWT and OB25.

The Hydrogeological Assessment confirms the Proposal is situated in the East Pilbara – Fractured Rock subarea of the Pilbara Groundwater Area. Regional groundwater throughflow is generally from west to east through the Eastern Ridge mining area and then northwards to Ethel Gorge, enhanced by seepage from Ophthalmia Dam (RPS 2015). The main regional groundwater compartments and directions of flow of the Proposal and OB32 BWT areas form a single, well connected, aquifer compartment bounded by:

- the Lone Ranger Dyke to the west
- Mt McRae Shale and Mt Sylvie Formation to the north
- a variety of different low permeability rocks to the east, including unmineralized Brockman, Weeli Wolli, Bollgeeda and Woongarra Formations
- Jeerinah, Mt Mc Rae Shale and Mt Sylia Fomations to the south.

Prior to the Homestead potable water supply borefield being operational, depth to groundwater along Homestead Creek ranged from approximately 20 to 22 m to the west of OB32, and between 16 to 18 m as it passes to the southwest of OB32. Under these conditions there is therefore no opportunity for groundwater fed flow in the stream, and dewatering does not impact flows along the creek compared to their pre-development levels (BHP 2022g).

During the preparation of the PERSP for the Strategic Proposal, the groundwater level at OB32 BWT was estimated to be approximately 520 - 530 mAHD, or 38-40 mbgl (RPS 2015). The current groundwater level at the OB32 BWT is approximately 515 - 520 mAHD in the vicinity of the OB32 pit, with an approximate depth to groundwater between 36 - 38 mbgl, and approximately 20 mbgl beneath Homestead Creek near OB32 BWT. Observed groundwater levels in the Ethel Gorge aquifer are generally higher since Ophthalmia Dam was commissioned (BHP 2022i and BHP 2022j).

Groundwater quality

During the preparation of the PERSP for the Strategic Proposal, hydrochemistry analysis indicated that regional groundwater salinity was between 500 mg/L and 2,000 mg/L TDS, with salinity increasing from west to east. The increase in salinity occurs as groundwater flows towards Ethel Gorge and results from overconcentration of salts as water flows through the shallow alluvial aquifer (RPS 2015).

Sampling of production bores in the vicinity of OB32 BWT (at bores HNPIHS0013P and HNPIHS0013P) has been undertaken intermittently between 2014 to 2024 (Appendix 8) and provides a guide to the groundwater quality to be discharged to Homestead Creek. The pH ranged between 6.88 to 8.2 which indicates the groundwater is circumneutral to alkaline. Salinity was measured to be between 650 mg/L and 810 mg/L TDS during the same period. Groundwater with a TDS concentration of less than 1000 mg/L TDS is considered fresh water.

Observed groundwater salinity in the Ethel Gorge aquifer was as high as 2,000 mg/L TDS prior to the commissioning of Ophthalmia Dam but has been up to approximately 1,000 mg/L TDS since 2013 (BHP 2022j).

PFAS modelling (Golder Associates 2022) was undertaken for OB32 BWT which included a review of historical operations in and around OB32 where PFAS containing chemicals had been used. Preliminary site investigations concluded there were no PFAS sources within OB32, however a hydrogeological assessment (groundwater model) was developed to investigate the potential risk of low levels of PFAS migrating towards the OB32 dewatering bores from BHP operations and non-BHP sources located further afield.

In evaluating the potential risk associated with PFAS in abstracted groundwater, the modelling results were compared to the below PFAS NEMP (2020) criteria.

- The 95% species protection for freshwater for PFOS which is 0.13 µg/L
- The 99% species protection for freshwater for PFOS which is 0.00023 µg/L
- The drinking water criterion for PFOS+PFH+S which is 0.07 µg/L.

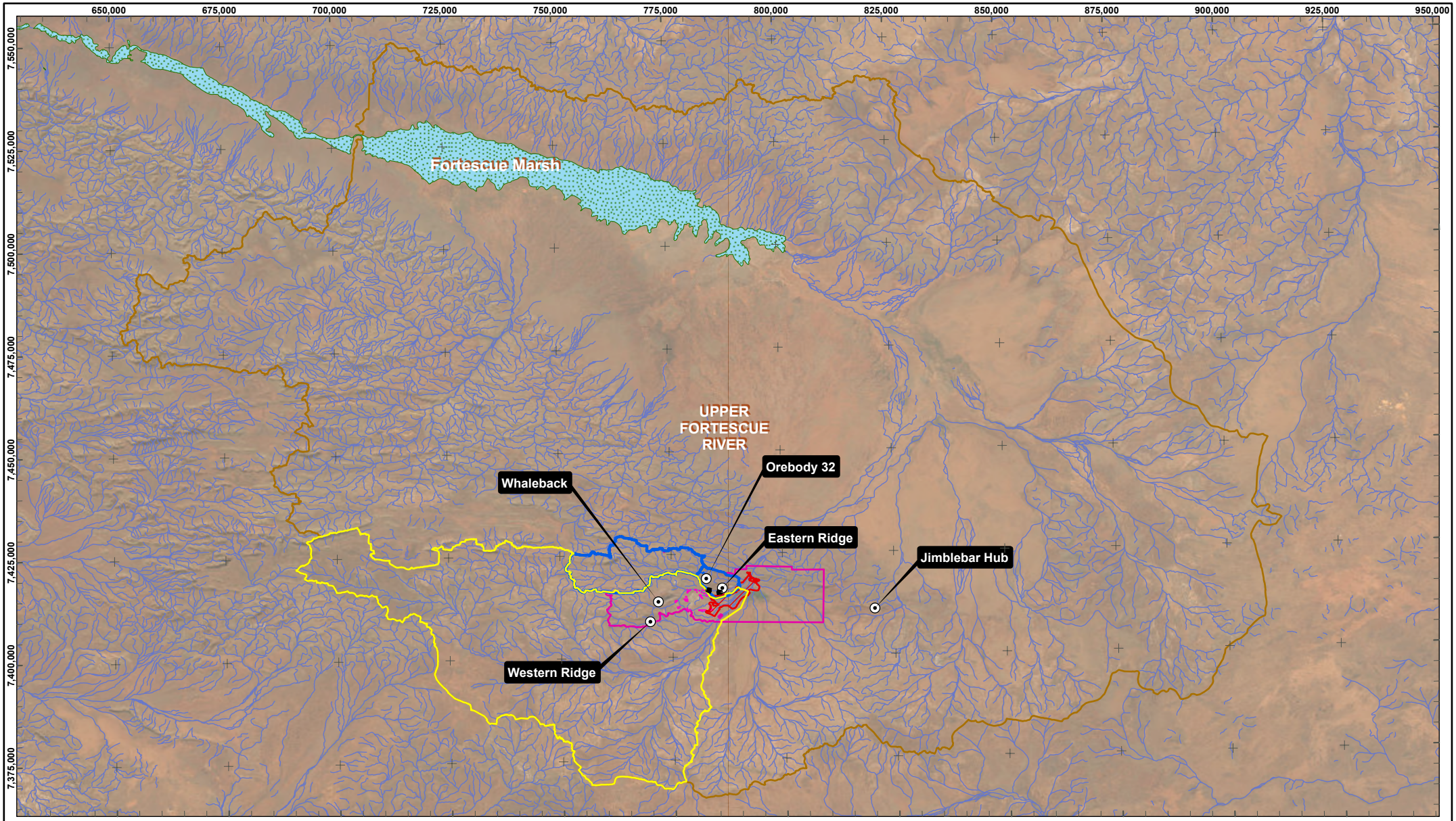
The modelling predicts that PFAS levels in the OB32 production bores as a result of the dewatering associated with OB32 BWT will be well below the PFAS NEMP human health drinking water guideline value of 0.07 µg/L, although transient detections of PFAS above the PFAS NEMP ecological freshwater 99% species protection guideline value of 0.00023 µg/L PFOS may be observed. The modelling predicts that during the initial year of dewatering, PFAS levels in the combined OB32 dewatered groundwater from all production bores may be slightly higher than the 99% value. However, after the first year of dewatering PFAS levels will be below the 99% value (Golder Associates 2022). The predicted maximum levels of PFAS are similar to observed PFAS levels in the environment including Ophthalmia Dam, Ethel Gorge aquifer and Fortescue River.

Since the original PFAS modelling was undertaken for OB32 BWT, the PFAS NEMP 3 (HEPA 2025) guidelines were released. The guideline values for drinking water, recreational water use and ecological freshwater 99% species protection remain the same. The Proposal will not introduce any new, different or additional impacts from PFAS to groundwater or surface water quality in Homestead Creek from the discharge of surplus water to Homestead Creek.

Further laboratory analysis of groundwater at OB32 BWT was undertaken to investigate the potential for mineral (calcium carbonate) precipitate to form following the discharge of 60 ML/day of surplus water to Homestead Creek for nine months per year (Hydrobiology 2025, Appendix 9). The study included bench top precipitation experiments where water from OB32 BWT was mixed with natural receiving waters at varying ratios over 31 days. The study concluded that groundwater at OB32 BWT is oversaturated with dolomite, calcite and aragonite and calcite would precipitate in Homestead Creek, this is discussed further in Section 6.4.2.

Newman Water Reserve PDWSA

This Proposal is located within the Newman Water Reserve Priority 1 PDWSA (Figure 5-1). The Newman Water Reserve was proclaimed to protect the Newman town drinking water supply, which is currently sourced from groundwater from the BHP operated Homestead and Ophthalmia Borefields.



- BHP operations
- OB32 BWT Creek Discharge Development Envelope
- Waterways
- Fortescue River at Ophthalmia Dam Catchment
- Upper Fortescue River Catchment
- Homestead Creek Catchment
- Fortescue Marsh
- Newman Drinking Water Reserve P1
- Newman Drinking Water Reserve P3
- Ethel Gorge TEC

N

0 10 20 30 40 50

KILOMETRES

GCS GDA 1994

BHP

PUBLIC

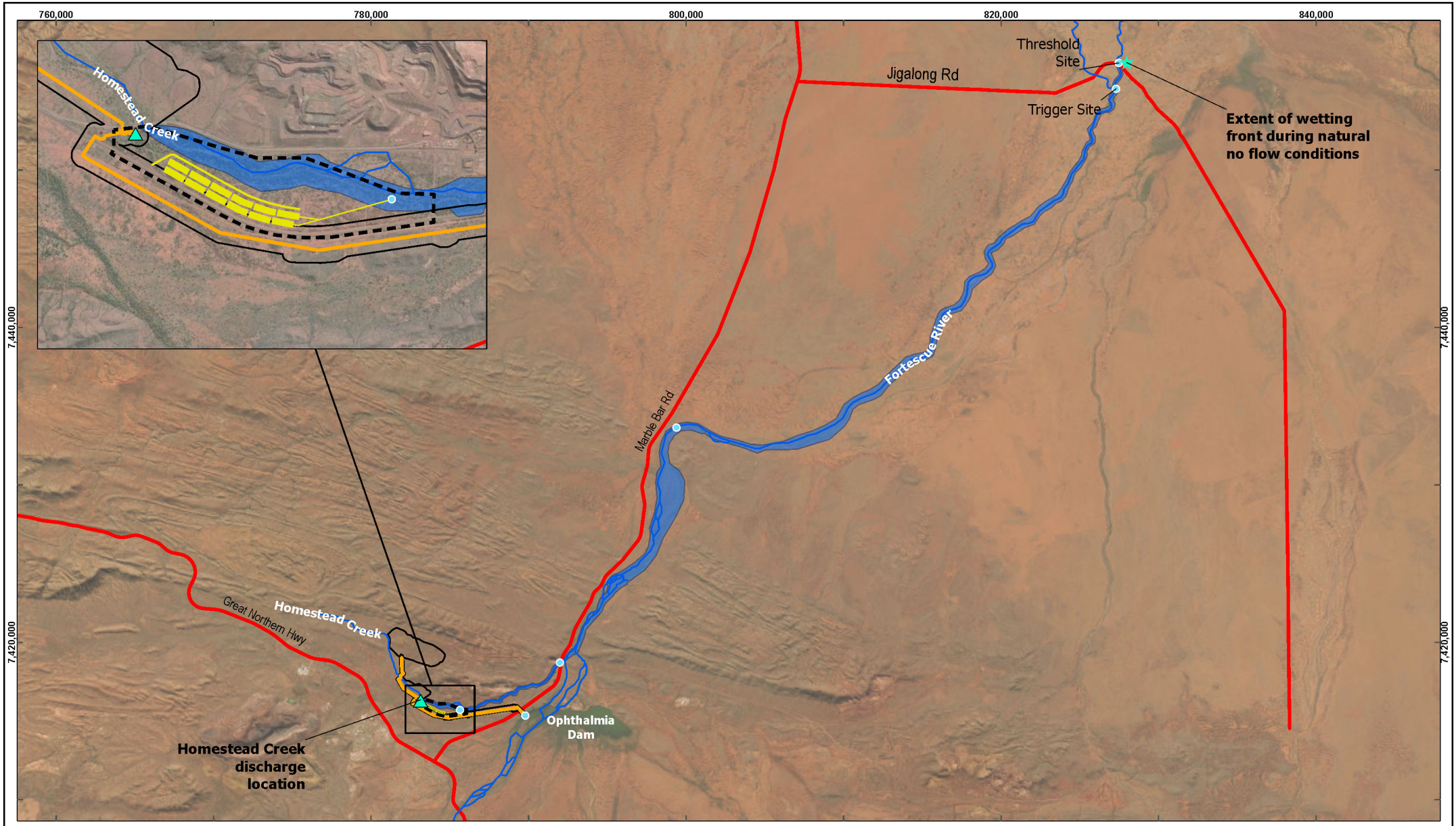
OB32 BWT CREEK DISCHARGE DERIVED PROPOSAL

Regional Hydrology

WAIO PLANNING, TECHNICAL & ENVIRONMENT

SCALE @ A4:	1:1,250,000	PREPARED:	GEOMATICS	FIGURE:	5-1
DATE:	4/09/2025	REQUESTOR:	ENV. APPROVALS	NO:	A1079_108_RevC
		REVIEWED:			

Document Path: Y:\Jobs\A1001_A1500\A1079\3Project\A1079_108_OB32_DP_RegionalHydrology_RevB.aprx



- OB32 BWT Creek Discharge Development Envelope
- OB32 BWT Surplus Water Pipeline
- Aeration Ponds and Swale
- Wetting Front
- OB32 Approval Boundary
- Watercourse
- Roads
- Homestead Creek Discharge Location
- Extent of wetting front during natural no flow conditions
- Monitoring Location

N

0 5 10 15 20

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BHP

PUBLIC

OB32 BWT CREEK DISCHARGE DERIVED PROPOSAL

LOCAL HYDROLOGY AND PROPOSAL COMPONENTS

WAIO PLANNING, TECHNICAL & ENVIRONMENT

SCALE @ A3:	1:325,000	PREPARED:	GEOMATICS	FIGURE NO:	5-2
DATE:	19/09/2025	REQUESTOR:	ENV APPROVALS		A1079-091-RevF

Document Path: Y:\Jobs\A1001_A1500\A1079\3Project\A1079_091_OB32_CD_InlandWaters_RevB.aprx\A1079_091_OB32_CD_InlandWaters_RevA

5.3.3.4 Groundwater

Groundwater regime

The Proposal is part of the Eastern Ridge mining operations located in BHP's Newman Hub where the groundwater regime has been altered by groundwater abstraction for the Newman potable water supply since the 1970s from the Ophthalmia Borefield and since 2013 from the Homestead Borefield.

Mine dewatering has also altered the local groundwater regime since the mid-1980s at the neighboring Mt Whaleback mine and since 2006 at Eastern Ridge. Since the commissioning of Ophthalmia Dam in 1981, groundwater recharge has been enhanced near Ethel Gorge due to seepage from Ophthalmia Dam, thereby maintaining groundwater levels in the Ethel Gorge aquifer.

A Groundwater Impact Assessment (BHP 2022, Appendix 7) was prepared to support the OB32 BWT Part IV referral and included a review of the *OB32 East and OB25 West Joffre: Detailed Hydrogeological Assessment* (BHP 2022g), The Hydrogeological Assessment included conceptual and numerical groundwater modelling to assess the potential impacts from groundwater abstraction at OB32 BWT and OB25. Below water table dewatering at OB32 BWT has not commenced, and the assumptions made in the preparation of this assessment are still relevant and valid to provide an appropriate basis for assessment of the groundwater impacts associated with the Proposal

The Hydrogeological Assessment confirms the Proposal is situated in the East Pilbara – Fractured Rock subarea of the Pilbara Groundwater Area. Regional groundwater throughflow is generally from west to east through the Eastern Ridge mining area and then northwards to Ethel Gorge, enhanced by seepage from Ophthalmia Dam (RPS 2015). The main regional groundwater compartments and directions of flow of the Proposal and OB32 BWT areas form a single, well connected, aquifer compartment bounded by:

- Tthe Lone Ranger Dyke to the west
- Mt McRae Shale and Mt Sylvie Formation to the north
- a variety of different low permeability rocks to the east, including unmineralized Brockman, Weeli Wolli, Bollgeeda and Woongarra Formations
- Jeerinah, Mt Mc Rae Shale and Mt Sylia Fomations to the south.

Prior to the Homestead potable water supply borefield being operational, depth to groundwater along Homestead Creek ranged from approximately 20 to 22 m to the west of OB32, and between 16 to 18 m as it passes to the southwest of OB32. Under these conditions there is therefore no opportunity for groundwater fed flow in the stream, and dewatering does not impact flows along the creek compared to their pre-development levels (BHP 2022g).

During the preparation of the PERSP for the Strategic Proposal, the groundwater level at OB32 BWT was estimated to be approximately 520 - 530 mAHD, or 38-40 mbgl (RPS 2015). The current groundwater level at the OB32 BWT is approximately 515 - 520 mAHD in the vicinity of the OB32 pit, with an approximate depth to groundwater between 36 - 38 mbgl, and approximately 20 mbgl beneath Homestead Creek near OB32 BWT. Observed groundwater levels in the Ethel Gorge aquifer are generally higher since Ophthalmia Dam was commissioned (BHP 2022i and BHP 2022j)

Groundwater quality

During the preparation of the PERSP for the Strategic Proposal, hydrochemistry analysis indicated that regional groundwater salinity was between 500 mg/L and 2,000 mg/L TDS, with salinity increasing from west to east. The increase in salinity occurs as groundwater flows towards Ethel Gorge and results from overconcentration of salts as water flows through the shallow alluvial aquifer (RPS 2015).

Sampling of production bores in the vicinity of OB32 BWT (at bores HNPIHS0013P and HNPIHS0013P) has been undertaken intermittently between 2014 to 2024 (Appendix 8) and provides a guide to the groundwater quality to be

discharged to Homestead Creek. The pH ranged between 6.88 to 8.2 which indicates the groundwater is circumneutral to alkaline. Salinity was measured to be between 650 mg/L and 810 mg/L TDS during the same period. Groundwater with a TDS concentration of less than 1000 mg/L TDS is considered fresh water.

Observed groundwater salinity in the Ethel Gorge aquifer was as high as 2,000 mg/L TDS prior to the commissioning of Ophthalmia Dam but has been up to approximately 1,000 mg/L TDS since 2013 (BHP 2022j).

PFAS modelling (Golder Associates 2022) was undertaken for OB32 BWT which included a review of historical operations in and around OB32 where PFAS containing chemicals had been used. Preliminary site investigations concluded there were no PFAS sources within OB32, however a hydrogeological assessment (groundwater model) was developed to investigate the potential risk of low levels of PFAS migrating towards the OB32 dewatering bores from BHP operations and non-BHP sources located further afield.

In evaluating the potential risk associated with PFAS in abstracted groundwater, the modelling results were compared to the below PFAS National Environmental Management Plan (NEMP)(2020) criteria.

- The 95% species protection for slightly to moderately disturbed freshwater systems for PFOS which is 0.13 µg/L
- The 99% species protection for high conservation freshwater value systems for PFOS which is 0.00023 µg/L
- The drinking water criterion for sum of PFOS and PFHxS which is 0.07 µg/L.

The modelling predicts that PFAS levels in the OB32 production bores as a result of the dewatering associated with OB32 BWT will be well below the PFAS NEMP human health drinking water guideline value of 0.07 µg/L, although transient detections of PFAS above the PFAS NEMP ecological freshwater 99% species protection guideline value of 0.00023 µg/L PFOS may be observed. The modelling predicts that during the initial year of dewatering, PFAS levels in the combined OB32 dewatered groundwater from all production bores may be slightly higher than the 99% species protection guideline value. However, after the first year of dewatering PFAS levels will be below the 99% species protection guideline value (Golder Associates 2022). The predicted maximum levels of PFAS are similar to observed PFAS levels in the environment including Ophthalmia Dam, Ethel Gorge aquifer and Fortescue River.

Since the original PFAS modelling was undertaken for OB32 BWT, the PFAS NEMP 3.0 (2025) guidelines were released in March 2025. The guidelines values for drinking water, recreational water use and ecological freshwater 99% species protection remain the same. The Proposal will not introduce any new, different or additional impacts from PFAS to groundwater (or surface water quality in Homestead Creek from the discharge of surplus water to Homestead Creek.

Further laboratory analysis of groundwater at OB32 BWT was undertaken to investigate the potential for calcium carbonate precipitate to form following the discharge of 60 ML/day of surplus water to Homestead Creek for nine months (Hydrobiology 2025, Appendix 9). The study included bench top precipitation experiments where water from OB32 BWT was mixed with natural receiving waters at varying ratios over 31 days. The study concluded that groundwater at OB32 BWT is oversaturated with dolomite, calcium carbonate and aragonite and calcium carbonate would precipitate in Homestead Creek, this is discussed further in Section 6.4.2.

Ethel Gorge Aquifer (and TEC)

Ethel Gorge is located approximately 10 km northeast of Newman and is an important feature of the Eastern Pilbara ecohydrological system, located at the convergence of surface and groundwater flows from the upstream catchment. The gorge itself is a valley incised into the Ophthalmia Range by the Fortescue River although the name is also used to refer to the alluvial and palaeochannel aquifers in the area. The area is characterised as a receiving environment, comprising channels, flood plains and calcretes of the river and land systems that dissect ridges of bedrock. It has groundwater levels of less than 10 mbgl in the valleys which allows interactions between the groundwater and terrestrial environments (through surface water connection and vegetation) (BHP 2022g). The shallow alluvial and calcrete aquifers of Ethel Gorge support the unique and diverse stygofauna assemblage of the Ethel Gorge TEC.

Ophthalmia Dam, approximately 3 km upstream of Ethel Gorge, has an important influence on the hydrological condition in Ethel Gorge. Recharge to the shallow groundwater system occurs as seepage from Ophthalmia Dam and associated infiltration structures as well as direct infiltration from channel flow events. The hydraulic behaviour of the Ethel Gorge groundwater system has been dominated by Ophthalmia Dam since its commissioning in 1981. The dam impounds and retards flood waters in the Fortescue River to allow larger volumes of infiltration over a prolonged period. Consequently, groundwater levels in the Ethel Gorge aquifer have been sustained at higher levels since the dam was constructed (BHP 2022g).

5.4 Potential environmental impacts

In the PERSP (BHP Billiton 2016 - Table 43), BHP identified and described potential impacts from the Strategic Proposal on Inland Waters. Table 5-4 identifies whether the Strategic Proposal potential impacts are relevant to the Proposal.

Table 5-4: Inland Waters - relevant impacts identified in the Strategic Proposal

Strategic Proposal potential impact	Strategic Proposal impact relevant to Proposal	Potential impacts from the Proposal
Groundwater drawdown	No	No dewatering or groundwater abstraction included in the Proposal.
Changes to groundwater quality	No	No dewatering, or groundwater reinjection included in Proposal. Infiltration through the bed of Homestead Creek and Fortescue River is not anticipated to change groundwater quality, as the surplus water quality is fresh and there is also a significant depth to groundwater (generally greater than 20 m).
Reduced surface water availability	No	No alterations to surface water catchments, realignment of waterways or taking of water is proposed. No significant impacts to surface water quality are predicted to occur.
Surplus water management	Yes	Changes to surface water regimes could occur from the discharge of surplus water from OB32 BWT to Homestead Creek.
Changes to surface water quality	Yes	Changes to surface water quality may occur as a result of discharge of surplus mine dewater (groundwater) from OB32 BWT. This groundwater is from the same aquifer as the Homestead Borefield which is currently used for potable water supply to Newman.
Pit lakes	No	No new mining or expansion to existing mines included in the Proposal.

BHP has considered the potential impacts outlined in the EPA's *Environmental Factor Guideline - Inland Waters* (EPA 2018a) and the PERSP (BHP Billiton 2016), and considers that those relevant to the Proposal are:

- surplus water management from the discharge of surplus water to Homestead Creek
- changes to surface water quality from the discharge of surplus water to Homestead Creek.

Surplus mine dewater from OB32 BWT will continue to be preferentially discharged to Ophthalmia Dam, with the Homestead Creek discharge to be operational when the dam is nearing capacity, or the surplus water pipeline to Ophthalmia Dam is undergoing maintenance.

The Proposal will not change the amount of surplus water from BHP's operations being discharged to Ophthalmia dam and will not change the maximum water level or volume of water able to be stored in Ophthalmia Dam. The dam will continue to function as a MAR scheme to maintain groundwater levels in the Ethel Gorge aquifer. Groundwater

levels in the Ethel Gorge aquifer located beneath the dam will not be impacted by the Proposal. The Proposal will not result in any new, different or additional impacts on the hydrological regime of the Ethel Gorge TEC.

Groundwater levels beneath Homestead Creek are approximately 20 mbgl. Due to the significant depth to water the infiltration of surplus water through Homestead Creek and Fortescue River is unlikely to significantly alter groundwater levels or quality.

5.4.1 Changes to surface water regimes

Given Homestead Creek is a tributary of the Fortescue River, surplus water discharge to Homestead Creek will enter the Fortescue River approximately 10 km downstream of the Homestead Creek discharge location. Modelling of the extent of the predicted wetting front associated with the creek discharge of 60 ML/d predicts that the wetting front will extend up to 75 km to Jigalong Road after approximately five years of continuous operation (Advisian 2023 and BHP 2025 (Appendix 4). This includes approximately 10 km of Homestead Creek and 65 km of Fortescue River.

The Fortescue Marsh is located a further 55 km downstream of the Jigalong Road crossing. The magnitude of potential impacts to the Fortescue River and Fortescue Marsh from the creek discharge progressively diminish with increasing distance downstream of the Jigalong Road crossing, as additional catchment area and inflows from several other waterways and drainage flow paths enter the Fortescue River. The hydrological regime of Fortescue Marsh will not be impacted by the Proposal.

Detailed hydraulic modelling was undertaken (Worley 2024, Appendix 4) to assess the likely width and depth of the wetting front associated with the discharge of 60 ML/day. The model indicates that significant variability is expected and is influenced by the waterways channel morphology and antecedent conditions. The width of the wetting front in Homestead Creek when continuously discharging 60 ML/day is predicted to range from 6 m to 40 m and the width of the wetting front in Fortescue River when continuously discharging 60 ML/day to Homestead Creek is predicted to range from 21 m to 37 m. The depth of the wetting front is anticipated to also range from 0.3 m to 0.5 m in both waterways. The wetting front is anticipated to remain in the low flow channels of both waterways and will not increase the risk of flooding.

The discharge of surplus water to Homestead Creek has the potential to alter the flow regime of Homestead Creek and Fortescue River by reducing the time in which the waterways are dry. To minimise impacts to the surface water regime of Homestead Creek and the (altered) upper Fortescue River, the creek discharge will operate for a maximum of nine months per year. The creek discharge will cease for three consecutive months during the Pilbara dry season (generally between May to November) to allow the waterways to dry.

The main potential impact from the discharge of surplus water to Homestead Creek is likely to be to riparian vegetation. These impacts have been addressed under the key environmental factor, Flora and Vegetation (Section 6.0).

5.4.2 Changes to surface water quality

The discharge of surplus water to Homestead Creek has the potential to cause erosion and sedimentation. To minimise erosion and scouring, the surplus water will enter the main branch of Homestead Creek downstream of structures including road crossings and culverts. The creek discharge outlet will be positioned away from the creek edge to reduce erosion and scouring around the outlet during high flow events, and the design of the outlet will include erosion control measures including rock armouring beneath the outlet to dissipate flow and minimise scouring, erosion, sedimentation and impacts to Homestead Creek and riparian vegetation.

Laboratory analysis has indicated that surplus water from OB32 BWT has high calcium carbonate alkalinity and has the potential to form calcium carbonate precipitate when exposed to air during the creek discharge (Hydrobiology 2025). Based on the laboratory analysis, if calcium carbonate precipitate is to form, it may occur in the initial 5 km downstream from the discharge point. Based on the hydraulic modelling of the wetting front (Advisian 2023), the wetted surface area (water-sediment interaction) for the reach 0 km to 5 km is estimated at 0.07 km^2 and a total

precipitate rate (layer depth) of 0.85 mm/yr is estimated. The study acknowledged that the rate of deposition and the formation of a visible crust in the creek bed sediments is dependent on multiple factors including the frequency and magnitude of scouring from high flow events, the mobility of existing sediments and the residence time of discharge waters within any one section of Homestead Creek. It is likely that it will take several years for sufficient precipitate deposition to occur for an observable precipitate coating to appear (Hydrobiology 2025).

As discussed in Section 5.3.3.3, when assessing the OB32 BWT proposal, the EPA was satisfied that the environmental issues relevant to Inland Waters including contamination of per- and polyfluoroalkyl substances (PFAS) were adequately assessed. A Water Environmental Management Plan (WEMP) for OB32 BWT (BHP 2022c) was prepared to provide a comprehensive PFAS monitoring program to ensure that PFAS concentrations in the environment remain below relevant guideline values with the implementation of OB32 BWT. The WEMP has been revised to include the Proposal, and it is not anticipated that the Proposal will result in any new, different or additional changes in water quality (surface water or groundwater) including PFAS contamination.

Following mitigation, no adverse impacts on groundwater or surface water are anticipated to occur as a result of the Proposal, as detailed further in Section 5.5. Mitigation.

5.5 Mitigation

5.5.1 Avoid

Surplus water from OB32 BWT will be preferentially discharged to Ophthalmia Dam. The Proposal provides an alternate surplus water management option for OB32 BWT. The creek discharge is proposed to be used when Ophthalmia Dam is nearing capacity, or the surplus water pipeline is undergoing maintenance.

Due to the OB32 BWT surplus water having a greater tendency to form calcium carbonate precipitation, visual monitoring on a quarterly basis at the Homestead Creek discharge location and up to 5 km downstream will be undertaken to monitor for calcium carbonate precipitate. As the rate of formation of a visible precipitate crust in Homestead Creek is dependent on multiple environmental and operational factors, visual inspections will be required, rather than physical water quality analysis.

If visual inspections detect the persistent formation of calcium carbonate precipitate in Homestead Creek following rainfall and natural flow events in Homestead Creek, the creek discharge may cease temporarily, and the operation of the Homestead Creek discharge will be reviewed. Surplus water from OB32 BWT will be directed to Ophthalmia Dam while the review is underway, if capacity of the dam permits.

If visual inspections detect the persistent formation of calcium carbonate precipitate on sediment across more than 10% of the low flow channel in Homestead Creek, and alternate contingency measures are unlikely to prevent the formation of calcium carbonate precipitate. Aeration ponds will be constructed if the creek discharge continues to be required. The surplus water will be piped to the ponds and then gravity fed into Homestead Creek. The ponds will provide adequate residence time and aeration to allow calcium precipitate to settle out prior to the water entering Homestead Creek, to avoid the armouring of sediment in Homestead Creek. In addition, surplus water from OB32 BWT will be directed to Ophthalmia Dam until the aeration ponds have been constructed and commissioned.

BHP is currently undertaking trials at other BHP mining operations to assess methodologies to manage calcium carbonate in surplus water. In addition to the studies completed, the outcomes from this work will guide the future detailed design of the aeration ponds for the Proposal. The Aeration Pond Preliminary Design Summary report (Worley 2024, Appendix 10) provides the preliminary pond design parameters and concept design drawings. The sizing of the pond is conservative and considered worst case, allowing for maximum storage volume.

The use of chemicals containing PFAS ceased at the Eastern Ridge operations in mid-2022. No chemicals containing PFAS will be used at OB32BWT or Eastern Ridge to avoid the risk of generating PFAS contamination and potential impacts to surface water quality in Homestead Creek and Fortescue River.

5.5.2 Minimise

To minimise impacts to the surface water regime of Homestead Creek and the (altered) upper Fortescue River, the creek discharge will operate for a maximum of nine months per year. The creek discharge will cease for three consecutive months during the Pilbara dry season (generally between May to November) to allow the waterways to dry. The release of water from Ophthalmia Dam will continue to operate in accordance with the Eastern Pilbara Water Resource Management Plan (BHP 2025).

Of the 70.4 ML/d (25.7 GL/a) to be abstracted for dewatering at the OB32 BWT mine, up to 10 ML/d will be used on site at Eastern Ridge (BHP 2022j). The remaining surplus water will be preferentially discharged to Ophthalmia Dam and alternatively, to Homestead Creek when the dam is nearing capacity, or undergoing dam maintenance. This has minimised the volume and duration of discharge of surplus water to Homestead Creek.

To maintain a drying pattern within Homestead Creek and Fortescue River, and minimise impacts to riparian vegetation, the creek discharge has been reduced from twelve months per year to a maximum of nine months per year. The maximum volume of surplus water to be discharged to Homestead Creek will be 16.2 GL/a. The maximum

dewatering volume of OB32 BWT will remain at 25.7 GL/a and the annual surplus water discharge from OB32 BWT to Ophthalmia Dam will remain at 21.9 GL/a, consistent with Schedule 1 of the Section 45 Notice subject to MS1105 for OB32 BWT. The intent is to preferentially direct water to Ophthalmia Dam, and Homestead Creek when required only.

An amendment to the Eastern Ridge Part V Licence (L6942/1997/13) will be completed to include the Homestead Creek discharge. Controls on the creek discharge including daily maximum discharge rates, wetting front extents and monitoring and annual reporting commitments will be included.

The proposed Homestead Creek discharge operational controls are provided in the WEMP (BHP 2025) provided in Appendix 11.

Water quality (other contaminants)

A WEMP for OB32 BWT (BHP 2022c) was prepared to provide a comprehensive PFAS monitoring program to ensure that PFAS concentrations in the environment remain below relevant guideline values with the implementation of OB32 BWT. The WEMP is consistent with the requirements of MS1105 for the Strategic Proposal and the EPA's EMP Instructions (EPA 2021f). The OB32 BWT WEMP has been revised to include the Proposal and the same PFAS outcome-based components relating to PFAS will apply when discharging water to Homestead Creek.

As discussed, the surplus water from OB32 BWT is from the same aquifer as the Homestead Borefield which is used to supply Newman with drinking water. BHP undertakes monitoring specifically related to drinking water quality for the Newman town water supply (Level 5 Water supply borefield and Level 6 Water treatment plant monitoring) under the *Water Services Act 2012* (WS Act). Any increases in PFAS or non-compliance with relevant guidelines will also be detected by this monitoring.

PFAS contamination is also regulated under the *Contaminated Sites Act 2003* and impacts to water quality from emissions and discharges to surface and groundwater are regulated under Part V of the EP Act. BHP considers that Part V of the EP Act is the most appropriate statutory decision-making process to manage the potential impacts of PFAS from the Proposal. Part V regulates emissions and discharges, including other substances that have the potential to contaminate surface and groundwater. BHP recently amended the Eastern Ridge Part V licence (L6942/1997/13) to include OB32 BWT and added PFAS as a chemical parameter and PFAS monitoring commitments at the Ophthalmia Dam discharge location. Similarly, the Eastern Ridge Part V licence will be amended again to include the Proposal and PFAS monitoring will be undertaken prior to discharging the surplus water to Homestead Creek.

5.5.3 Rehabilitate

BHP will implement the ERMCP (BHP 2022b, Appendix 12), to meet Condition 15 environmental objective of MS1105. The Homestead Creek discharge will not be maintained in perpetuity once dewatering at OB32 BWT has ceased. The Proposal infrastructure will therefore be decommissioned and the site rehabilitated to be safe, stable and non-polluting and in an ecologically appropriate and sustainable manner.

Management approaches in the ERMCP relating to the Proposal and Inland Waters include (BHP 2022b):

- Once discharge to Homestead Creek is no longer required, the infrastructure will be de-energised and all pipework removed to at least 600 mm bgl. Pipework will be disposed of in an appropriate landfill.
- The aerations ponds will be dewatered and remaining sediment will be removed and encapsulated within an OSA or ISA
- The ponds will be backfilled using embankment material and / or material from the flood bund.
- The flood bund will be pushed down to reinstate natural surface water drainage lines.
- The remaining footprint will be profiled and rehabilitated using standard surface treatments.

- BHP aims to restore land to a natural system with vegetation that is naturally self-sustaining. The creek discharge is to be removed at closure and a natural and stable surface for creek health will be reinstated.

5.5.4 Offset

After the application of mitigation measures, BHP predicts that there will not be significant residual impacts to Inland Waters.

5.5.5 Other statutory decision-making processes

Table 5-5 summarises the other statutory decision-making processes which can mitigate the potential environmental impacts of the Proposal on Inland Waters.

Table 5-5: Inland Waters - other statutory decision-making processes

Potential impact from the Proposal	Statutory decision-making process can mitigate impacts on the environment? Yes/No	Reasons and Proposed regulation
Alter the flow regime of Homestead Creek and Fortescue River	Yes	**EP Act Part V licence** Amendment to existing Eastern Ridge licence (L6942/1997/13): • amend conditions to include limits on creek discharge flow rate and extent • amend conditions to include limits of creek discharge operation (duration and timing) • monitoring of creek discharge water quality
Migration of PFAS contaminants in groundwater from OB32 BWT dewatering and discharge of surplus water to Homestead Creek	Yes	**EP Act Part V licence** Amendment to existing Eastern Ridge licence (L6942/1997/13): • water monitoring (creek discharge) • groundwater monitoring • PFAS concentration criteria in surface water and groundwater

5.6 Validation of impacts and environmental outcome

BHP has validated the impacts to Inland Waters from the Proposal against the Strategic Proposal, assuming relevant mitigation measures identified in Section 5.5 have been applied, to demonstrate that the environmental objective identified in MS1105 Condition 10, can be met.

Following mitigation (Section 0), BHP considers that there will not be any significant residual impacts on Inland Waters values from the Proposal. Table 5-6 summarises the residual impacts and environmental outcomes for Inland Waters and demonstrates consistency with MS1105 condition objectives.

Table 5-6: Inland Waters residual impacts, environmental outcomes and consistency with MS1105 condition objectives

Derived Proposal residual impact after application of mitigation measures	Derived Proposal environmental outcomes	Consistency with Strategic Proposal MS1105 condition objectives Condition objective/s:
Alter the flow regime of Homestead Creek and Fortescue River	• Manage the discharge of surplus water to Homestead Creek from OB32 BWT to ensure wetting front triggers and threshold in the Fortescue River are achieved • Manage the discharge of surplus water to Homestead Creek from OB32 BWT to ensure water quality in Homestead Creek is maintained to prevent the persistent formation of calcium carbonate precipitate of sediment in Homestead Creek • The approved surplus water discharge volumes to Ophthalmia Dam from BHP mines will not be altered. The Proposal will therefore not change the water levels within Ophthalmia Dam or influence the controlled releases of water from Ophthalmia Dam.	• significant hydrological changes are not widespread, and effective management measures are available to mitigate the impacts • hydrological regimes and water quality can be managed to prevent significant impacts to environmental values • the current (altered) surface water regime to the Fortescue River downstream of Ophthalmia Dam will be maintained
Migration of PFAS contaminants in groundwater from OB32 BWT dewatering and discharge of surplus water to Homestead Creek.	PFAS concentrations in the environment are expected to be similar to currently observed ambient levels and will remain well below the PFAS NEMP human health drinking water guideline value (Section 5.6.4)	The groundwater quality (PFAS) in the environment (Newman Water Reserve PDWSA, Ophthalmia Dam, Ethel Gorge aquifer and Fortescue River) will be maintained, which is consistent with the relevant Strategic Proposal outcomes (Section 5.6.1) the EPA's objective for Inland Waters (Section 5.1) and the environmental objective in MS1105 Condition 10-1(b), (c), (i) and (j)

5.7 Implementation conditions

BHP considers that the Strategic Proposal MS1105 conditions should apply to the Proposal.

- 6 Condition Environmental Management Plans
- 10 Water Environmental Management Plan
- 15 Rehabilitation and Decommissioning (ERMCP).

BHP considers that in addition to MS1105 Conditions, environmental outcomes can also be assured by the following other statutory decision-making processes identified in Section 5.5.5.

- EP Act Part V licence: to mitigate the impacts of discharge of surplus water to Homestead Creek (including from PFAS) on surface water and groundwater regimes and quality.

None of the above MS1105 implementation conditions relating to Inland Waters should be changed.

6 Flora and Vegetation Validation

6.1 EPA environmental factor and objective

The EPA's objective for Flora and Vegetation is:

> *To protect flora and vegetation so that biological diversity and ecological integrity are maintained.*

The EPA's objective for Flora and Vegetation is the same as when the EPA assessed the Strategic Proposal.

6.2 Relevant policy and guidance

BHP validated this environmental factor considering the following relevant EPA policies and guidance:

- Environmental Factor Guideline - Flora and Vegetation (EPA 2016a), as outlined in Table 6-1
- Technical Guidance - Flora and Vegetation Surveys for Environmental Impact Assessment (EPA 2016b)
- WA Environmental Offsets Policy (Government of Western Australia 2011)
- WA Environmental Offsets Guidelines (Government of Western Australia 2014)
- Guideline for assessing risks to the conservation of biodiversity associated with threatened species and threatened ecological communities (DBCA 2023).

Since the EPA assessed the Strategic Proposal (EPA 2018a) there has been no change to the EPA's guidance on Flora and Vegetation. On 1 January 2019, the *Biodiversity Conservation Act 2016* (BC Act) and *Biodiversity Conservation Regulations 2018* (BC Regulations) replaced the *Wildlife Conservation Act 1950* (WC Act) and its associated regulations. There is no policy or guidance for the BC Act relevant to the validation of Flora and Vegetation for the Proposal.

6.3 Receiving environment

6.3.1 Studies and surveys

Table 6-1 details the information BHP relied upon for its assessment of Flora and Vegetation for the Strategic Proposal (BHP Billiton 2016 - Table 9) and for the validation of Flora and Vegetation for the Derived Proposal, Figure 6-1 illustrates the boundary of the surveys undertaken within the Development Envelope.

Table 6-1: Flora and Vegetation studies

Title	Author, Date	Summary	Appendix of Strategic Proposal	IBSA
Strategic Proposal studies				
Consolidated Vegetation Mapping	Onshore Environmental 2014	BHP commissioned Onshore Environmental to consolidate BHP's years of vegetation mapping into a single regional GIS dataset and report. The consolidated dataset provides methodological and nomenclature consistency across BHPs tenure and is updated as new surveys are completed. Supplementary field assessments were undertaken to address any gaps in baseline data or to verify results from earlier surveys. The dataset includes mapping of vegetation associations and vegetation condition using the Keighery (1994) condition scale. At the time of preparing the Strategic Proposal, vegetation association and condition was mapped over 42,425 ha of BHP tenure.	N/A	
Beard Vegetation Associations Mapping	Beard 1975	Beard (1975) divides the Pilbara region into three botanical provinces: the Northern, the Eremaean and the Fortescue. Beard (1975) identified 89 broad vegetation associations within the Pilbara region, of which 41 occur within the Strategic Assessment Project Definition Boundary.	N/A	
CSIRO model - Using community-level modelling to map levels of biodiversity significance in the Pilbara bioregion	BHP Billiton 2016	BHP engaged CSIRO to undertake an assessment of spatial patterns in the distribution of biodiversity and associated levels of biodiversity significance across the Pilbara Bioregion. Biological survey data provided by BHP were combined with data from over 300 sites across the Pilbara Bioregion conducted by DPaW and with species records accessed from the Atlas of Living Australia. Modelling analysis was undertaken to assess biodiversity significance across the Pilbara Bioregion.	Appendix 3	
Flora and Vertebrate Fauna Screening Assessment	BHP Billiton 2016	An impact assessment to conservation significant flora and vertebrate fauna species at different levels (stages) of future development of the Strategic Proposal was undertaken. A total of 51 conservation significant flora species and 16 conservation significant vertebrate fauna species were considered to be Species of Interest within the Project Definition Boundary. The species that were identified during this assessment were discussed in the PERSP (BHP Billiton Iron Ore 2016)	Appendix 4	

Title	Author, Date	Summary	Appendix of Derived Proposal	IBSA
Derived Proposal studies				
OB32 Surplus Water and Homestead Creek Wetting Front Detailed Flora and Vegetation Assessment (Spectrum 2022)	March 2021 August - September 2021 February 2022	Two-season detailed flora and vegetation survey, with follow up targeted survey, encompassing riparian vegetation along Homestead Creek and Fortescue River.	Appendix 13	
OB32 Settlement Pond Flora & Vegetation Survey (Biologic 2025a)	June 2025	Targeted flora surveying and vegetation mapping within the Development Envelope with a focus on the proposed aeration pond footprint.	Appendix 14	

6.3.2 Survey assumptions and limitations

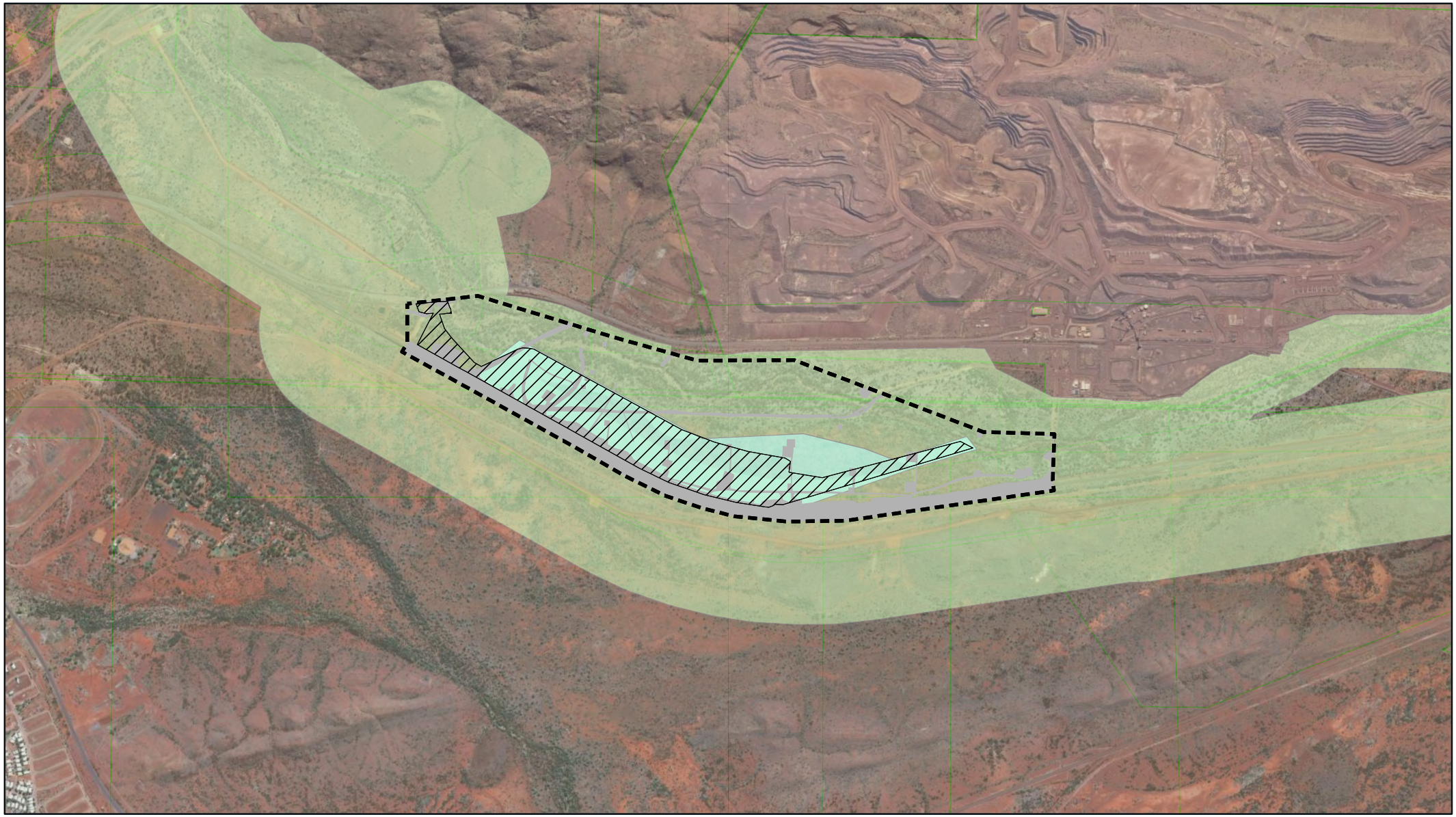
The Flora and Vegetation surveys undertaken of the Development Envelope and wetting front comply with the EPA guidance for biological surveys in Western Australia (EPA 2016a, EPA 2016b). This extends to the preparation, survey design, personnel, data analysis, reporting and submission of data by consultants to BHP.

The EPA (2016b) outlines several potential limitations to flora and vegetation surveys. These aspects have been discussed in both flora and vegetation survey reports (Biologic 2025a, Appendix 14 and Spectrum 2022, Appendix 13).

The Spectrum (2022) survey covers an area of 14,786 ha and included the full extent of the wetting front along Homestead Creek and Fortescue River. This survey had partial access restrictions within the survey area as access to some areas were restricted due to Heritage and track suitability, resulting in some sections of the survey area not being traversed. There were few locations to cross the creek line and some areas in the northeast of the survey area were only surveyed in phase 2. This was unlikely to affect the vegetation mapping; however, it may have impacted the number of species recorded and the recorded presence of annual significant flora (Spectrum 2022, p 28). No clearing of vegetation is proposed along the Fortescue River and a small area (0.8 ha) of vegetation is proposed to be cleared for the Homestead Creek discharge outlet which is located adjacent to an existing sealed road where access would not have been restricted. The partial access constraints experienced during this survey will not have an impact on the flora and vegetation values discussed in Section 6.3.3.

The Biologic (2025) survey covers an area of 59.4 ha and included the entire aeration basin location where most of the clearing may occur if the aeration ponds are required. This survey experienced no survey limitations or constraints (Biologic 2025, p 45).

No assumptions have been made during the flora and vegetation surveys. A survey boundary area was provided by BHP and surveys undertaken in accordance with relevant EPA guidance.



Development Envelope
Indicative Footprint
Indicative Cleared Area
Homestead Creek Targeted Flora and Vegetation Survey (Biologic 2025)
OB32 Surplus Water & Homestead Creek Wetting Front Detailed Flora & Vegetation Assessment (Spectrum 2022)

N

0 0.25 0.5 0.75 1
KILOMETRES

GDA 1994 MGA ZONE 50

BHP

PUBLIC

OB32 BWT CREEK DISCHARGE DERIVED PROPOSAL
FLORA AND VEGETATION SURVEYS

WAIO PLANNING, TECHNICAL & ENVIRONMENT

SCALE @ A4:	1:25,000	REQUESTOR:	ENV. APPROVALS	FIGURE:	6-1
DATE:	16/07/2025	PREPARED:	GEOMATICS	NO:	A1079_109_RevD

Document Path: Y:\Jobs\A1001_A1500\A1079\3Project\A1079_109_OB32_DP_Flora&VegSurveys_RevA.aprx\A1079_109_OB32_DP_Flora&VegSurveys_RevA

6.3.3 Environmental values

6.3.3.1 Regional biodiversity values and conservation reserves

The CSIRO modelling (BHP Billiton 2016 - Figure 19) identified areas of high biodiversity significance in the Pilbara bioregion. These areas are described in the PERSP (BHP Billiton 2016 - p93) and EPA Report 1619 (EPA 2018a). There are no areas of CSIRO mapped high biodiversity significance within the Development Envelope (Figure 6-2). The nearest area of high biodiversity significance is approximately 5.8 km northeast of the Development Envelope (at the closest point) and is associated with the area north of Ophthalmia Dam and the Ethel Gorge aquifer.

The proximity of conservation reserves to proposed projects in the Strategic Proposal is discussed in EPA Report 1619 (EPA 2018a). The nearest conservation reserves are Fortescue Marsh Nature Reserve and Karijini National Park located approximately 60 km north and 118 km northwest of the Development Envelope (Figure 3-1). These areas are therefore not relevant to the Proposal.

6.3.3.2 Threatened and Priority Ecological Communities

As documented in the PERSP (BHP Billiton 2016 - Table 13), BHP identified two Threatened Ecological Communities (TECs) and eight Priority Ecological Communities (PECs) known from within the Strategic Proposal Boundary.

No formally recognised TECs or PECs have been recorded from within the Development Envelope.

6.3.3.3 Vegetation

The Proposal is located wholly within the Hamersley subregion of the Pilbara bioregion, as defined by the Interim Biogeographic Regionalisation for Australia (IBRA) (DSEWPaC 2012) (Figure 6-3). Homestead Creek is largely situated in the Hamersley subregion, with the eastern end of the creek line crossing into the Augustus subregion of the Gascoyne bioregion, before it flows into the Fortescue River. The Fortescue River extends from the Hamersley subregion north into the Fortescue subregion.

Of the 41 vegetation associations mapped by Beard (1975), and refined by Shepherd *et al.* (2002) that occur within the Strategic Proposal Boundary (BHP Billiton 2016 - Section 8.1.3.1), two occur within the Development Envelope (Figure 6-4):

- Association 18 - low woodland; mulga (*Acacia aneura*)
- Association 82 - hummock grassland, low tree steppe; snappy gum over *Triodia wiseana*.

BHP has consolidated vegetation mapping across its tenure (Onshore Environmental 2014), which provides a greater level of detail than the Beard (1975) vegetation mapping. This consolidated vegetation mapping was used for the assessment of vegetation in the Strategic Proposal (BHP Billiton 2016 - Section 8.1.3.1). Detailed vegetation mapping across the Development Envelope was undertaken in 2021-2022 and 2025 (Spectrum 2022; Biologic 2025). This mapping updates the consolidated vegetation mapping across the Development Envelopment.

Based on the latest vegetation mapping (Biologic 2025; Spectrum 2022) four vegetation associations classified under four broad floristic formations based on the dominant vegetation stratum occur within the Development Envelope (Table 6-2, Figure 6-5). The dominant vegetation association occurring throughout the Development Envelope is *Triodia* and **Cenchrus* grassland with *Acacia* trees. The vegetation associations mapped in the Development Envelope, while more detailed, are consistent with those discussed in the PERSP (BHP Billiton 2016).

The riparian vegetation of the main channel of Homestead Creek and the upper reaches of Fortescue River has been mapped as association MI CcCs AciAaAte ChEvEg (Biologic 2025) and MA EcrEvi Aci Mgl (Spectrum 2022) and is dominated by *Eucalyptus camaldulensis* and *Eucalyptus victrix* trees occurring with *Acacia citrinoviridis* and *Melaleuca glomerata* shrubs and mixed hummock and tussock grasslands. The lower reaches of Fortescue River were mapped as association MA Ecr AciAhe Mgl and is dominated by *Eucalyptus camaldulensis* trees occurring with *Acacia citrinoviridis* and *Melaleuca glomerata* shrubs and scattered sedges (Spectrum 2022). The adjacent banks of

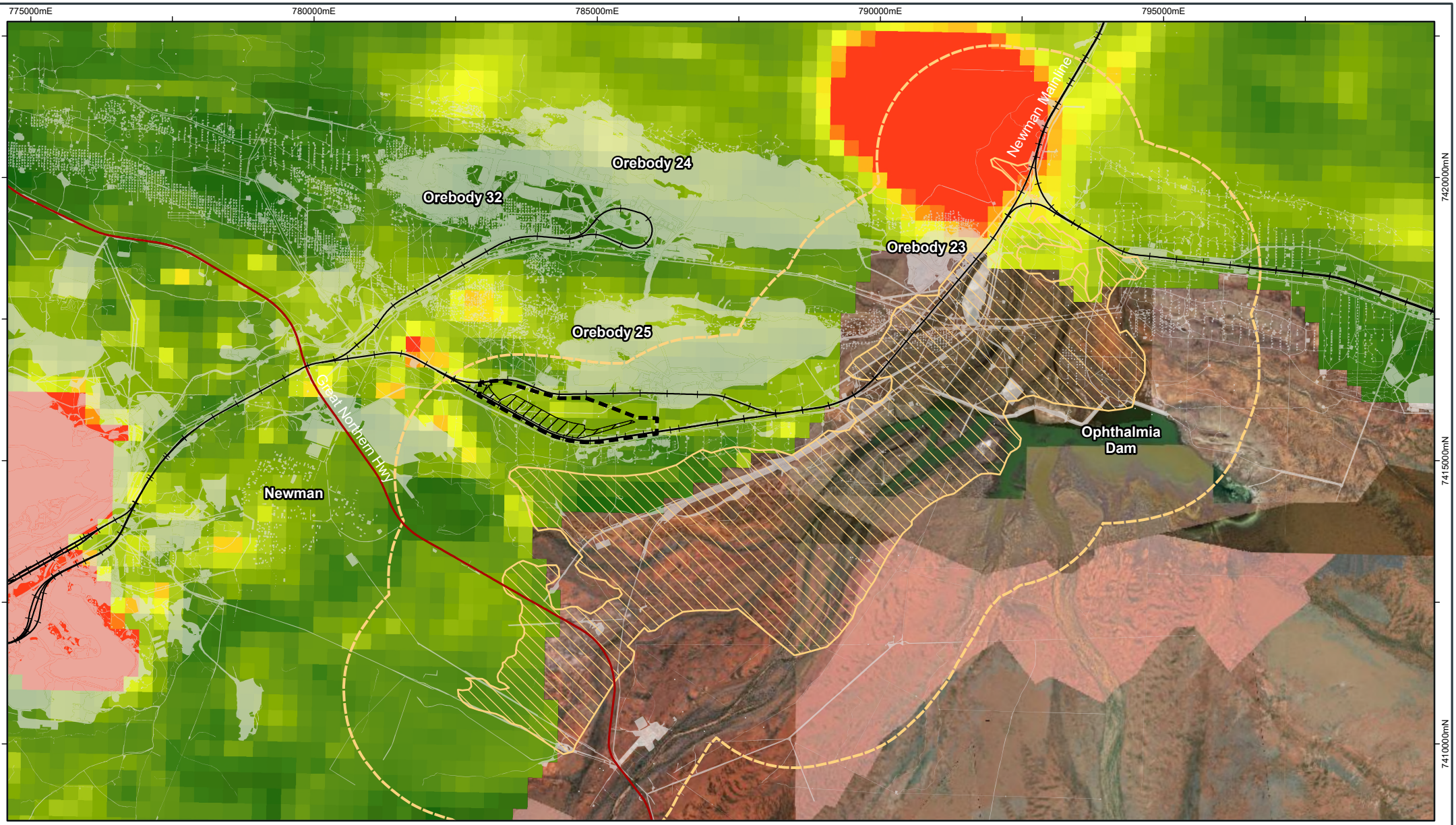
the creek lines are mapped as being dominated by tussock grassland of **Cenchrus ciliaris* and *Enneapogon* species with *Acacia* shrubs, changing to *Triodia* hummock grasslands with *Senna* and *Acacia* shrublands further downstream on Fortescue River (Spectrum 2022).

In the Hamersley subregion, all major ephemeral watercourses are listed as 'ecosystems at risk' by the DBCA due to threats from grazing and weed invasion, as described by Kendrick (2001). There is one vegetation association occurring along Homestead Creek within the Development Envelope, MI CcCs AciAaAte ChEvEg (Biologic 2025) and MA EcrEvi Aci Mgl (Spectrum 2022) (Table 6-2; Figure 6-4). These vegetation associations represent riparian vegetation and is situated directly south of the Eastern Ridge mine and close to the existing rail infrastructure; however, has also been mapped occurring more extensively along the Fortescue River (Spectrum 2022). This association was not considered to be restricted locally and was assessed as having a low level of significance locally and regionally (Biologic 2025; Spectrum 2022).

No other vegetation association within the Development Envelope is considered to represent an 'ecosystem at risk' as recognised by the DBCA, and none have been identified as being locally significant (Spectrum 2022, Biologic 2025).

Table 6-2: Vegetation associations

Broad floristic formation	Vegetation code (Biologic 2025)	Vegetation association description (Biologic 2025)	Area within Development Envelope (ha)	% of Development Envelope
**Cenchrus* mid tussock grassland	FP CcChfTt AaAci ChExCoc	**Cenchrus ciliaris*, *Chrysopogon fallax*, *Themeda triandra* tall open to closed tussock grassland with *Acacia aptaneura*, *Acacia citrinoviridis* tall open shrubland with *Corymbia hamersleyana*, *Eucalyptus xerothermica*, *Corymbia candida* low open woodland on red-brown silty clay sand of drainage areas/ floodplains Mapped as FP Cci ChaAci AbiApr by Spectrum (2022)	48.12	27.67
**Cenchrus* mid closed tussock grassland	MI CcCs AciAaAte ChEvEg	**Cenchrus ciliaris*, **Cenchrus setiger* closed tussock grassland with *Acacia citrinoviridis*, *Acacia aptaneura*, *Acacia tetragonophylla* tall shrubland with *Corymbia hamersleyana*, *Eucalyptus victrix*, *Eucalyptus gamophylla* low open woodland on red-brown clayey sand on drainage areas/ floodplains and drainage lines Mapped as MA EcrEvi Aci Mgl by Spectrum (2022)	14.44	8.30
Acacia low open forest	SS AanAprApt Tp	*Acacia aneura*, *Acacia pruinocarpa*, *Acacia pteraneura* low open forest of over *Triodia pungens* open hummock grassland on red sand clay on plains Mapped as SA AanApr Tpu by Spectrum (2022)	57.27	32.93
**Cenchrus* tussock grassland	SS CcEnpo Aci	**Cenchrus ciliaris*, *Enneapogon polyphyllus* tussock grassland with *Acacia citrinoviridis* low woodland on orange-brown sand and clay on floodplains Mapped as SC CciEpo Aci by Spectrum (2022)	13.05	7.50
Rehabilitation		Areas of previous disturbance (drill pads) that have been rehabilitated (Spectrum 2022)	0.30	0.17
Cleared		Includes areas mapped by Biologic (2025) and Spectrum (2022) as degraded and without vegetation, as well as previously cleared areas	40.75	23.43
Total			**173.93**	**100**



- BHP Rail
- Highways
- Development Envelope
- Indicative Footprint
- Ethel Gorge Threatened Ecological Community
- Ethel Gorge TEC Buffer

Biodiversity Significance (all groups) excluding richness and condition

- High
- Low

N

0 1 2 3 4 5

KILOMETRES

GDA 1994 MGA ZONE 50

BHP

PUBLIC

OB32 BWT CREEK DISCHARGE DERIVED PROPOSAL

MODELLED AREAS OF BIODIVERSITY SIGNIFICANCE

WAIO PLANNING, TECHNICAL & ENVIRONMENT

SCALE @ A4:	1:90,000	REQUESTOR:	ENV. APPROVALS	FIGURE:	6-2
DATE:	29/05/2025	PREPARED:	GEOMATICS	NO:	A1079_110_RevC

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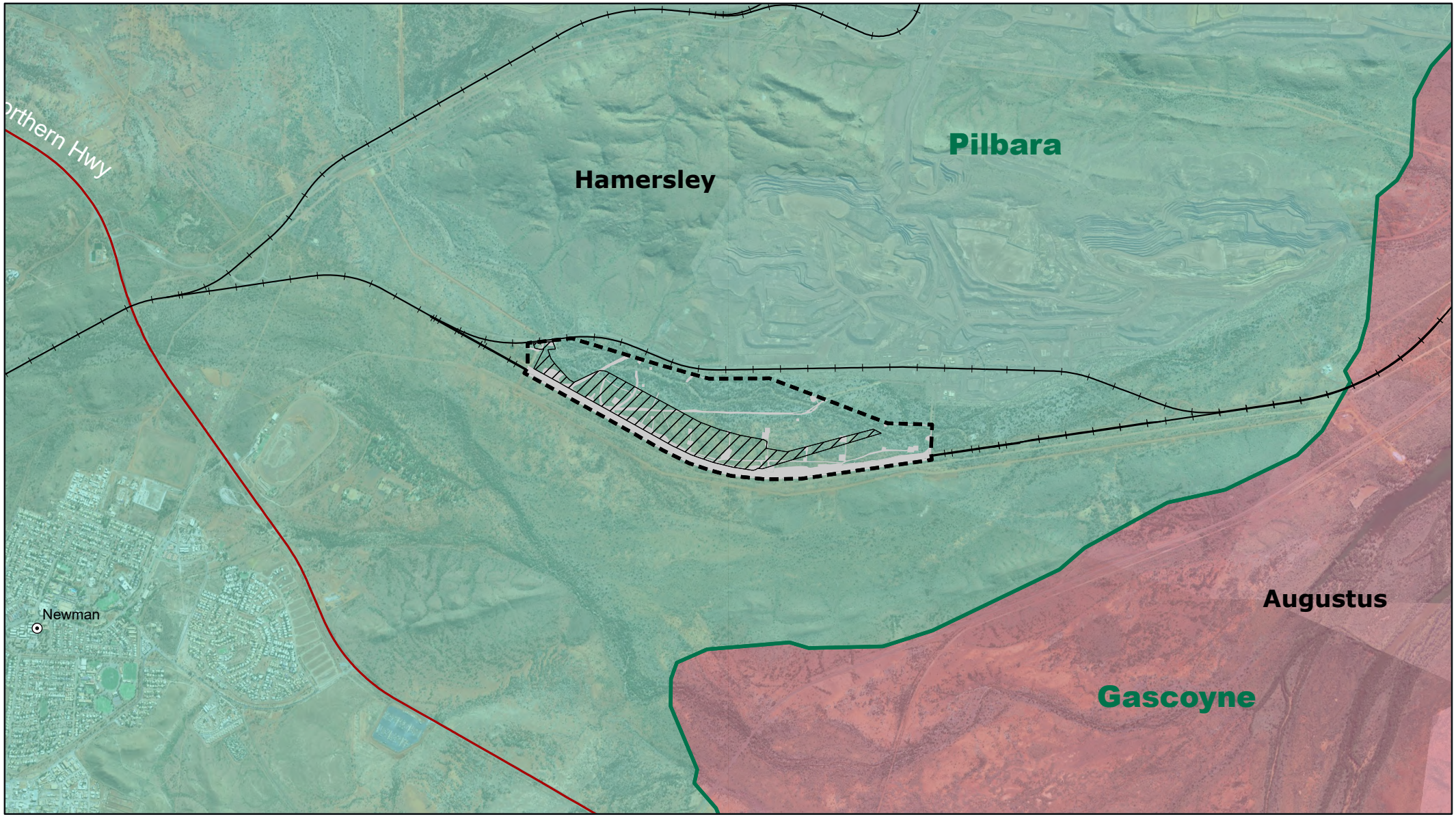

Development Envelope
Indicative Footprint
Indicative Cleared Area
Highways
BHP Rail

IBRA Bioregions

IBRA Subregion

Augustus
Hamersley

N

0 0.5 1 1.5 2 2.5
KILOMETRES

GDA 1994 MGA ZONE 50

BHP

PUBLIC

OB32 BWT CREEK DISCHARGE DERIVED PROPOSAL

IBRA BIOREGIONS AND SUBREGIONS

WAIO PLANNING, TECHNICAL & ENVIRONMENT

SCALE @ A4:	1:40,000	REQUESTOR:	ENV. APPROVALS	FIGURE:	6-3
DATE:	3/06/2025	PREPARED:	GEOMATICS	NO:	A1079_111_RevD

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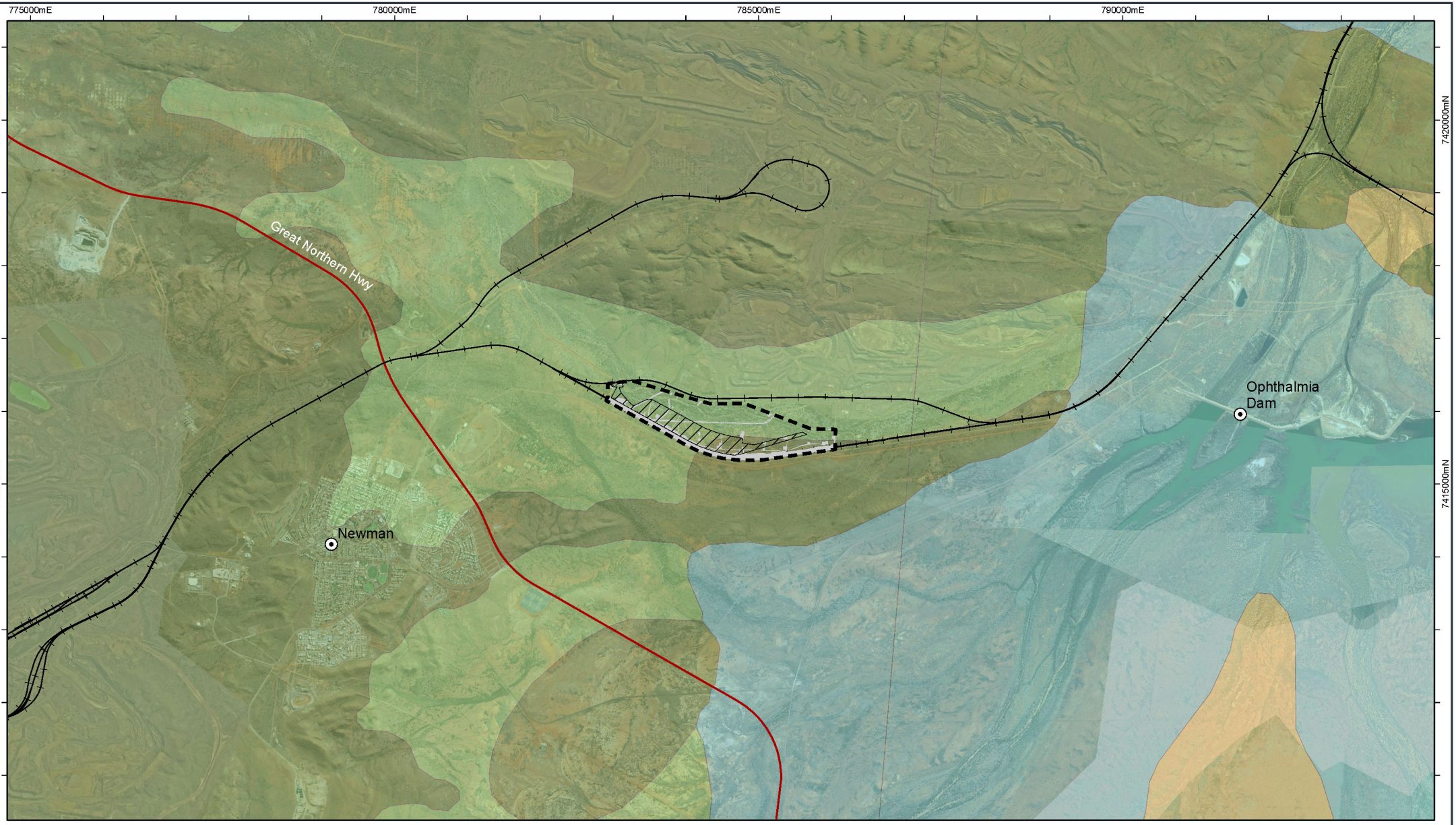

- Highways
- BHP Rail
- Indicative Footprint
- Development Envelope
- Indicative Cleared Area

Beard System Association

- Vegetation Association 18
- Vegetation Association 82
- Vegetation Association 29
- Vegetation Association 216

DRAFT

N

0 1 2 3 4 5

KILOMETRES

GDA 1994 MGA ZONE 50

BHP

PUBLIC

OB32 BWT CREEK DISCHARGE DERIVED PROPOSAL

BEARD VEGETATION ASSOCIATIONS

WAIO PLANNING, TECHNICAL & ENVIRONMENT

SCALE @ A4:	1:70,000	REQUESTOR:	ENV. APPROVALS	FIGURE:	6-4
DATE:	6/03/2025	PREPARED:	GEOMATICS	NO:	A1079_112_RevB

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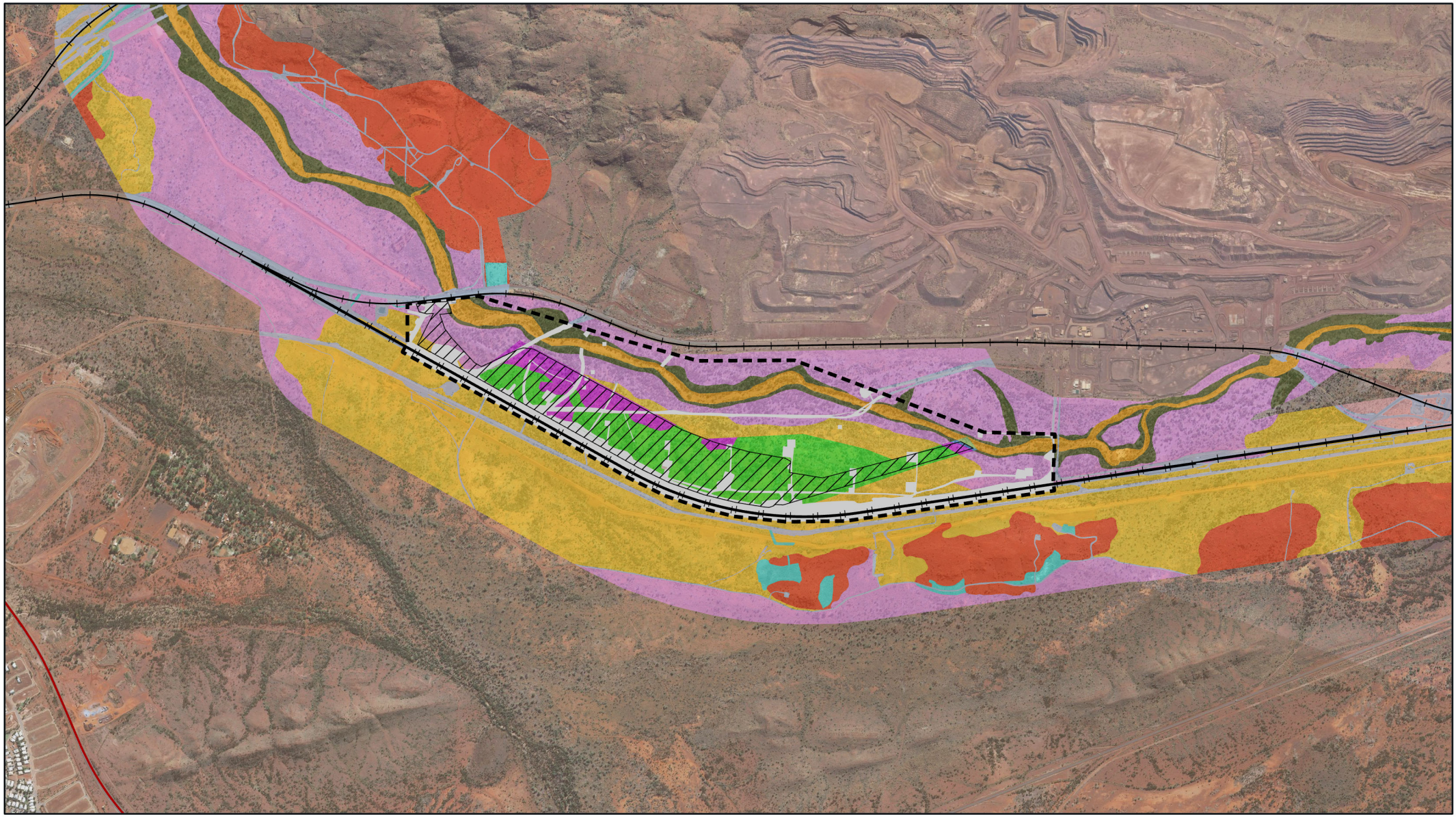

Development Envelope
Indicative Footprint
Indicative Cleared Area
Highways
BHP Rail

Vegetation Code

Cleared
Degraded
FP CcChfTt AaAci ChExCoc
FP Cci ChaAci AbiApr
MA EcrEvi Aci Mgl
MI CcCs AciAaAte ChEvEg
RP Tpu EsoExe AciAscAbi
Rehabilitation
SA AanApr Tpu
SC CciEpo Aci
SL TvuTpu EllApr SggAbi
SS AanAprApt Tp
SS CcEnpo Aci

N

0 0.25 0.5 0.75 1 1.25
KILOMETRES

GDA 1994 MGA ZONE 50

BHP

PUBLIC

OB32 BWT CREEK DISCHARGE DERIVED PROPOSAL
VEGETATION ASSOCIATION MAPPING

WAIO PLANNING, TECHNICAL & ENVIRONMENT

SCALE @ A4:	1:25,000	REQUESTOR:	ENV. APPROVALS	FIGURE:	6-5
DATE:	10/09/2025	PREPARED:	GEOMATICS	NO:	A1079_113_RevE

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6.3.3.4 Vegetation condition

Vegetation condition mapping of the Development Envelope was undertaken in 2021-2022 and 2025 (Spectrum 2022; Biologic 2025) (Figure 6-6) and updates the 2014 vegetation condition mapping used in the PERSP (BHP Billiton 2016 - Section 8.1.3.1). Of the native vegetation remaining within the Development Envelope, the majority (76.5%) has been mapped as being in Good condition, noting approximately 23% of the Development Envelope is cleared of native vegetation (Figure 6-6).

The condition of the vegetation along the main channel of Homestead Creek ranges from Good to Very Good, with the adjacent banks being in Poor condition (due to the presence of Buffel grass) (Spectrum 2022). The majority of the main channel of Fortescue River is in Very Good condition, with the banks largely mapped as in Good condition (Spectrum 2022).

6.3.3.5 Significant flora

As documented in the PERSP (BHP Billiton 2016 - Appendix 4), BHP identified two Threatened flora species and 126 Priority flora species known from within the Strategic Proposal Boundary.

No Threatened or Priority flora listed under the BC Act or EPBC Act have been recorded within the Development Envelope (Spectrum 2022; Biologic *2025*).

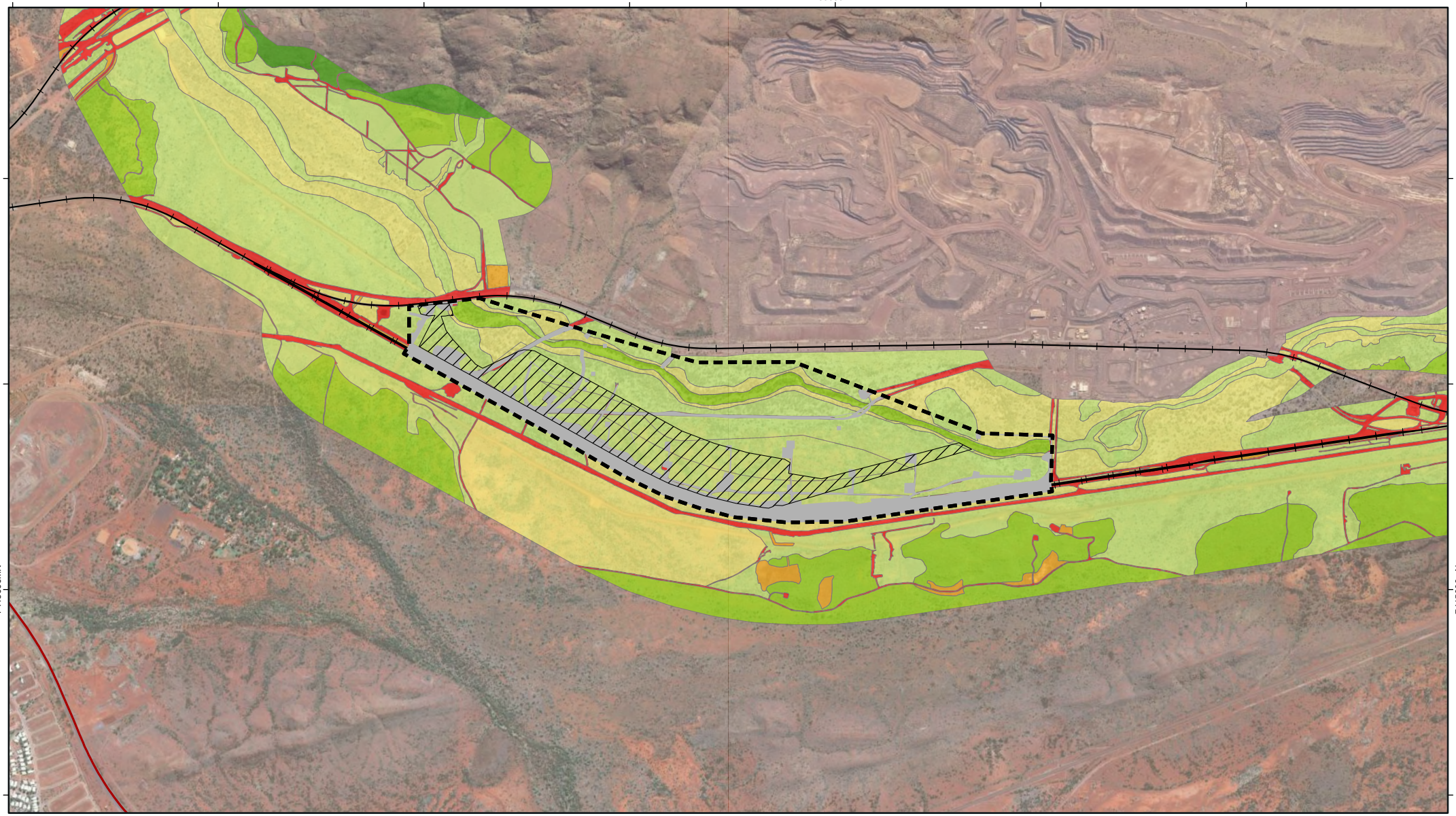
6.3.3.6 Flora of Other Significance

The EPA (2016b) advises that flora species, subspecies, varieties, hybrids and ecotypes may be considered significant for reasons other than listing as a Threatened or Priority flora taxa.

Three individuals of *Hibiscus* aff*. campanulatus* were recorded at one location within the Development Envelope (Biologic 2025, Figure 6.7) which is a known taxa with anomalous features. A species affinis (‘aff’.) indicates a potentially new and undescribed species with an affinity to, but is not identical to, the named species. *Hibiscus* aff*. campanulatus* is a known entity from the area, differing from *H. campanulatus* (Priority 1) (P1). One specimen was submitted to the Western Australian Herbarium (ACC/11,633/E) and confirmed as *Hibiscus* aff*. campanulatus* (Biologic 2025). As the specimen was confirmed to not be the P1 species, and as no Threatened or Priority flora listed under the BC Act or EPBC Act have been recorded within the Development Envelope, significant flora will not be discussed further.

6.3.3.7 Introduced flora (weeds)

Seven introduced flora (weed) species have been recorded in the Development Envelope (Figure 6-8). In the PERSP (BHP Billiton 2016 - Section 5.7.3.1), BHP noted from Keighery (2010) that eight weed species specific to the Strategic Proposal Boundary are able to grow in many habitats in the Pilbara, often becoming dominant. Of the eight weed species identified for the Strategic Proposal, four have been recorded within the Development Envelope: Kapok Bush (**Aerva javanica*), Buffel Grass (**Cenchrus ciliaris*), Birdwood Grass (**Cenchrus setiger*) and Spiked Malvastrum (**Malvastrum americanum*). Kapok Bush and Buffel Grass are the most commonly recorded species within the Development Envelope, with Kapok Bush occurring along the existing rail line in the southern portion of the Development Envelope and Buffel Grass scattered along the banks of Homestead Creek.



- Development Envelope
- Indicative Footprint
- Indicative Cleared Area
- Highways
- BHP Rail

Vegetation Condition

- Completely Degraded
- Degraded
- Poor
- Good
- Very Good
- Excellent

N

0 0.25 0.5 0.75 1 1.25

KILOMETRES

GDA 1994 MGA ZONE 50

BHP

PUBLIC

OB32 BWT CREEK DISCHARGE DERIVED PROPOSAL

VEGETATION CONDITION

WAIO PLANNING, TECHNICAL & ENVIRONMENT

SCALE @ A4:	1:25,000	REQUESTOR:	ENV. APPROVALS	FIGURE:	6-6
DATE:	18/07/2025	PREPARED:	GEOMATICS	NO:	A1079_114_RevD

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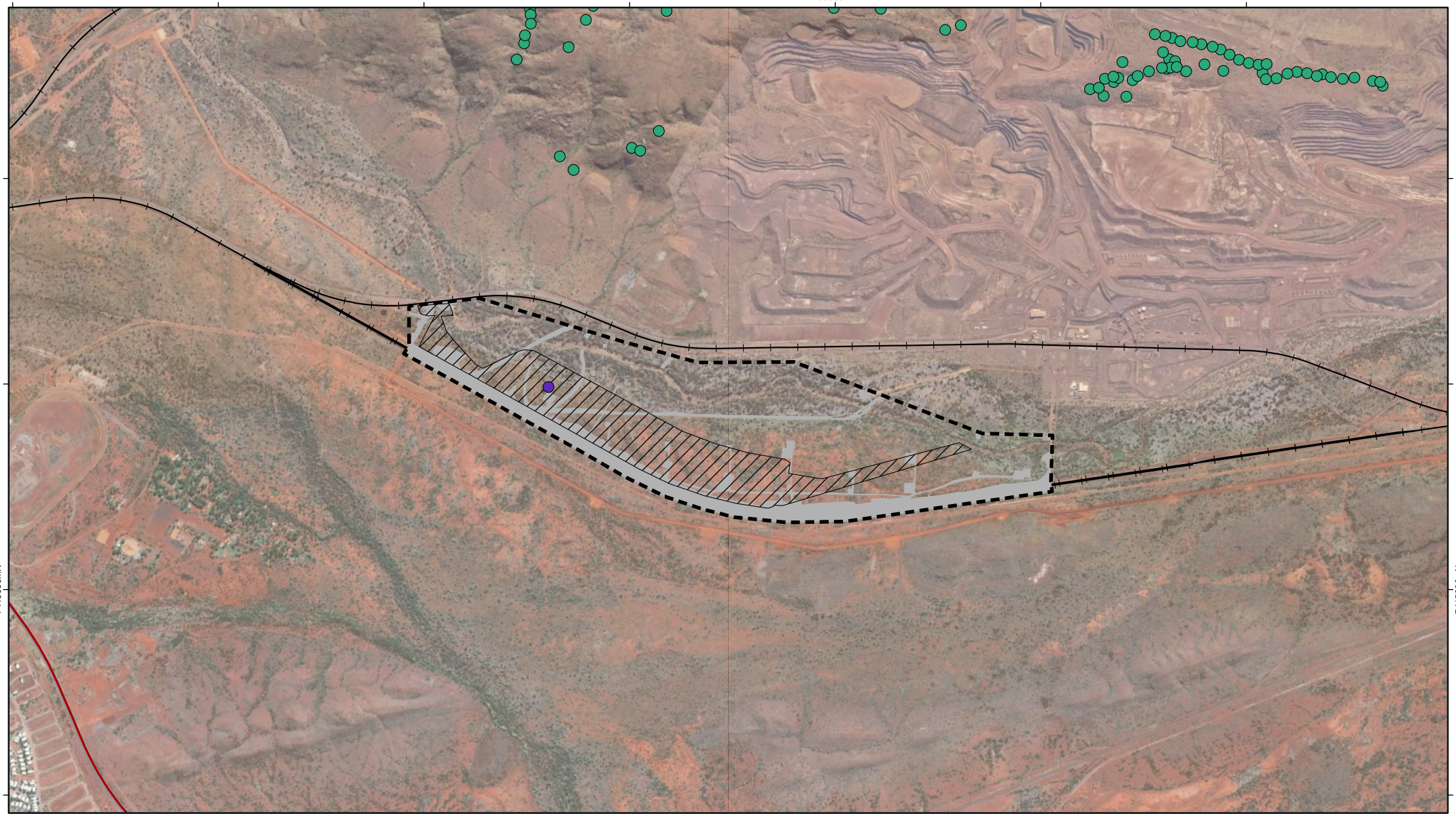

Development Envelope
Indicative Footprint
Indicative Cleared Area
Highways
BHP Rail

Significant Flora Records

- *Eremophila magnifica* subsp. *velutina*
- *Hibiscus aff. campanulatus*

N

0 0.25 0.5 0.75 1 1.25

KILOMETRES

GDA 1994 MGA ZONE 50

BHP

PUBLIC

OB32 BWT CREEK DISCHARGE DERIVED PROPOSAL

SIGNIFICANT FLORA SPECIES

WAIO PLANNING, TECHNICAL & ENVIRONMENT

SCALE @ A4:	1:25,000	REQUESTOR:	ENV. APPROVALS	FIGURE:	6-7
DATE:	18/07/2025	PREPARED:	GEOMATICS	NO:	A1079_128_RevB

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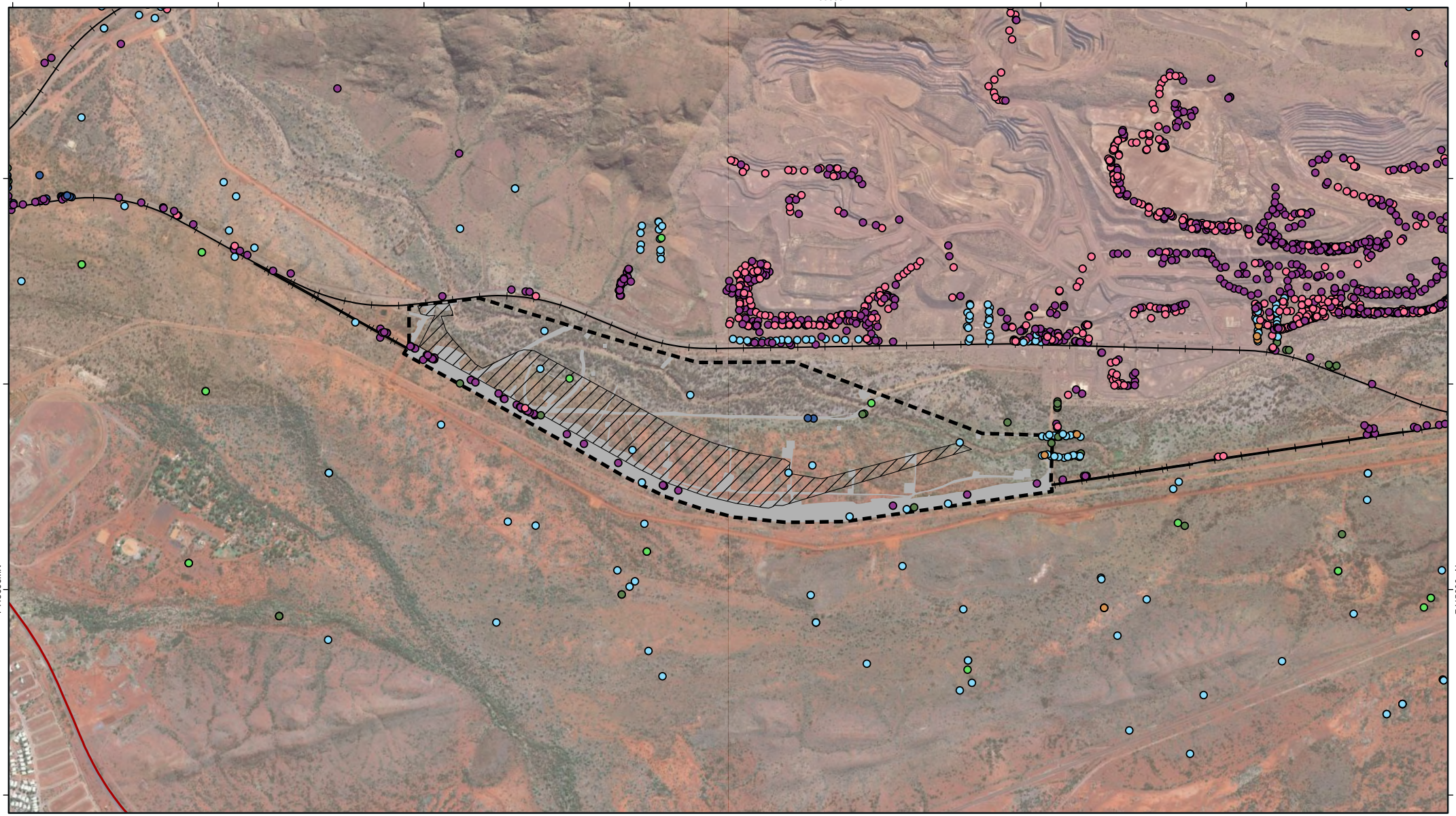

Development Envelope
Indicative Footprint
Indicative Cleared Area
Highways
BHP Rail

Introduced Flora Species

- *Aerva javanica*
- *Bidens bipinnata*
- *Cenchrus ciliaris*
- *Cenchrus setiger*
- *Malvastrum americanum*
- *Rumex vesicarius*
- *Vachellia farnesiana*

N

0 0.25 0.5 0.75 1 1.25
KILOMETRES

GDA 1994 MGA ZONE 50

BHP

PUBLIC

OB32 BWT CREEK DISCHARGE DERIVED PROPOSAL
INTRODUCED FLORA SPECIES

WAIO PLANNING, TECHNICAL & ENVIRONMENT

SCALE @ A4:	1:25,000	REQUESTOR:	ENV. APPROVALS	FIGURE:	6-8
DATE:	18/07/2025	PREPARED:	GEOMATICS	NO:	A1079_115_RevD

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6.4 Potential environmental impacts

In the PERSP (BHP Billiton 2016 - Table 15), BHP identified and described potential impacts from the Strategic Proposal on Flora and Vegetation. Table 6-3 identifies whether the Strategic Proposal potential impacts are relevant to the Proposal. The additional threats that have been identified since the Strategic Proposal EPA Report 1619 are also listed in Table 6.3.

Table 6-3: Flora and Vegetation - relevant impacts identified in the Strategic Proposal

Strategic Proposal Potential impact	Strategic Proposal impact relevant to the Proposal	Potential impacts from the Proposal
Removal of vegetation (direct)	Yes	Clearing of up to 40 ha of native vegetation will be required in the Development Envelope for the surplus water infrastructure (Section 6.4.1)
Altered water regimes (indirect)	Yes (surface water regimes) No (groundwater regimes) There is no abstraction or reinjection of groundwater included in the Proposal	The surface water regime of Homestead Creek and Fortescue River will be altered due to the proposed discharge of surplus water, and this has the potential to impact on the riparian vegetation of the creek lines (Section 6.4.2)
Fire (indirect)	No The Proposal is not expected to alter the fire regime of the area, as it is an extension of mining within an existing operational mine	N/A
Weeds (indirect)	No The Proposal is located adjacent to an existing operational mine and existing rail and roads and is not expected to introduce new weeds or spread existing weeds into new areas; Buffel grass (**Cenchrus ciliaris*) is already a dominant component of Homestead Creek	N/A

BHP has considered the potential impacts outlined in the EPA's *Environmental Factor Guideline - Flora and Vegetation Factor* (EPA 2016a) and the PERSP (BHP Billiton 2016), and considers that those relevant to the Proposal are:

- loss of vegetation from clearing of vegetation (direct)
- changes to vegetation from changes to surface water regimes (indirect).

As discussed in Section 5.5.1, surplus water from OB32 BWT will be preferentially discharged to Ophthalmia Dam. The intermittent discharge regime and cessation of the creek discharge for a minimum of three consecutive months a year during the Pilbara dry season will likely prevent the deposition of calcium carbonate precipitation in Homestead Creek. Homestead Creek will be monitored for signs of calcium carbonate precipitation. If visual inspections detect the persistent formation of calcium carbonate precipitate in Homestead Creek following rainfall and natural flow events in Homestead Creek, the creek discharge will cease temporarily, and the operation of the Homestead Creek discharge will be reviewed. Surplus water from OB32 BWT will be directed to Ophthalmia Dam while the review is underway, if capacity of the dam permits. If required, mitigation will be implemented. Refer to Section 6.5.

6.4.1.1 Vegetation

The Proposal will result in the loss of vegetation and flora through the direct clearing of up to 40 ha of native vegetation within the Development Envelope.

Two vegetation associations (as described by Beard) are located within the Development Envelope (Figure 6-4). Table 6-4 shows the area of each association within the Development Envelope and Indicative Footprint. The potential impact of the Proposal on any vegetation association (as a percentage of the current extent) is less than 0.1%, and therefore each association will have more than 99% of their pre-European extent remaining.

Table 6-4 Flora and Vegetation – potential impacts to Beard vegetation associations

Beard Vegetation Association	Pre-European Extent (ha)[1]	Current Extent (ha)[1]	Current % of Association Remaining	Area within Development Envelope[2] (ha)	Area within Indicative Footprint (ha)	% of Association Remaining[2]
18	676,556.72	671,843.35	99.30	108.51	28.19	99.30
82	2,563,583.23	2,550,888.14	99.50	25.16	11.53	99.50
Cleared	-	-	-	40.26	9.99	-
Total	**-**	**-**	**-**	**173.93**	**49.71**	**-**

1. Pre-European Extent and Current Extent based on current DBCA data for the Pilbara bioregion (Government of Western Australia 2019).
2. Current Extent minus area within the Indicative Footprint as percentage of Pre-European Extent.

Detailed vegetation association mapping identified four vegetation associations in the Development Envelope, all of which occur in the Indicative Footprint (Figure 6-5). Table 6-5 shows the area of each vegetation association within the Development Envelope and Indicative Footprint.

As discussed in Section 6.3.3.3, vegetation association MI CcCs AciAaAte ChEvEg (Biologic 2025) and MA EcrEvi Aci Mgl (Spectrum 2022) represents riparian vegetation and has been mapped as occurring within Homestead Creek and the lower reaches of the Fortescue River. This vegetation association occurs across 14.44 ha of the Development Envelope and less than 0.1 ha in the Indicative Footprint (Figure 6-5, Table 6-5). The predicted impact of less than 0.1 ha to this association, based on the Indicative Footprint, is considered negligible, with more than 455 ha of this association occurring along Homestead Creek and extending into Fortescue River (based on Spectrum 2022 mapping). The boundary of Homestead Creek is not well defined. The Development Envelope of the Proposal extends across (north) Homestead Creek to provide a buffer to the Indicative Footprint. It is worth noting however that the creek discharge and aeration ponds will be constructed on the southern side of Homestead Creek. Riparian vegetation north of Homestead Creek will not be cleared as part of the Proposal.

Table 6-5: Potential impacts to vegetation associations

Vegetation Association (Biologic 2025)	Area within Development Envelope (ha)	% of Development Envelope	Area within Indicative Footprint (ha)	% of Indicative Footprint
FP CcChfTt AaAci ChExCoc	48.12	27.67	10.80	21.72
MI CcCs AciAaAte ChEvEg	14.44	8.30	0.01	0.02
SS AanAprApt Tp	57.27	32.93	28.24	56.80
SS CcEnpo Aci	13.05	7.50	0.14	0.28
Rehabilitation	0.30	0.17	0.23	0.46
Cleared	40.75	23.43	10.30	20.72
Total	**173.93**	**100**	**49.72**	**100**

6.4.1.2 Vegetation condition

Most (76.5%) of the native vegetation in the Development Envelope has been mapped as being in Good condition. No areas of Excellent condition vegetation are present within the Development Envelope. Based on the Indicative Footprint, the total extent of clearing required is 40 ha, of which up to 39 ha (rounded up from 38.86 ha) of native vegetation is in Good or Very Good condition (Table 6-7). The remainder of the vegetation proposed to be cleared is mapped as being in Poor or Completely Degraded condition (Table 6-7).

Table 6-6: Potential impacts to vegetation condition (unmitigated)

Vegetation Condition	Area within Development Envelope (ha)	% of Development Envelope	Area within Indicative Footprint (ha)	% of Indicative Footprint
Very Good	13.61	7.83	<0.01	<0.01
Good	101.91	58.59	38.85	78.14
Poor	17.65	10.15	0.56	1.13
Completely Degraded/ Cleared[1]	40.76	23.43	10.30	20.72
Total	**173.93**	**100**	**49.72**	**100**

1. As per the vegetation condition scale in the EPA technical guidance (EPA 2016a), Completely Degraded (0.30 ha) includes existing cleared areas (10.00 ha).

6.4.2 Changes to vegetation from altered water regimes

The Proposal includes the discharge of surplus water to Homestead Creek, which will flow into the Fortescue River. Proposed surplus water discharge has the potential to impact on the health of the riparian vegetation due to increased inundation, and it may create a dependency on increased surface water flow that has the potential to alter the composition of the vegetation community.

The riparian vegetation along the main channel of Homestead Creek and Fortescue River is dominated by *Eucalyptus camaldulensis* and/or *Eucalyptus victrix* trees occurring with *Acacia citrinoviridis* and *Melaleuca glomerata* shrubs with mixed hummock and tussock grasslands or scattered sedges further downstream Fortescue River (Spectrum 2022) (Section 6.3.3).

The vegetation of the creek lines is at risk of decline from waterlogging due to the occurrence of *Acacia citrinoviridis* and large riparian *Eucalyptus* trees. *Acacia citrinoviridis* has an extensive shallow root system that utilises ephemeral flow of surface water, and is susceptible to waterlogging, while riparian *Eucalyptus* trees have been found to decline in health when they are permanently inundated (Delton 1990). BHP modelled the predicted wetting front associated with the proposed surface water discharge (as detailed in Section 5.4.1). The modelling indicated there is the potential for inundation from surface water discharge to extend up to 75 km downstream from the discharge point after approximately 5 years of continuous operation. This wetting front extent will remain within the low flow channel of Homestead Creek and Fortescue River where minimal vegetation exists. The health of the minimal vegetation within this area of inundation may be impacted due to water logging in low-lying areas and water levels rising to the extent that the entire vadose zone becomes saturated for long periods of time. Given the creek discharge will cease for 3 consecutive months during the dry season, the wetting front will remain within the low flow channel of the creek lines where minimal vegetation occurs and the depth of the wetting front is anticipated to be less than 0.5 m, there are no predicted impacts to riparian vegetation from the increased water supply.

6.5 Mitigation

6.5.1 Avoid

As noted in EPA Report 1619 (EPA 2018a), undertaking site-specific surveys that inform the planning process is the main method that BHP proposes to use to avoid Flora and Vegetation impacts. As there are no TECs and PECs (relevant to flora and vegetation values), Threatened or Priority flora species known from within the Development Envelope, there are no specific avoidance measures proposed for the Proposal.

If visual inspections detect the persistent presence of armouring of sediment across more than 10% of the low flow channel in Homestead Creek, BHP will review the creek discharge and aeration ponds will be constructed. The surplus water will be piped to the ponds and then gravity fed into Homestead Creek. The ponds will provide adequate residence time and aeration to allow calcium precipitate to settle out prior to the water entering Homestead Creek, avoiding the armouring of sediment in Homestead Creek. In addition, surplus water from OB32 BWT will be directed to Ophthalmia Dam until the aeration ponds have been constructed and commissioned.

6.5.2 Minimise

As noted in EPA Report 1619 (EPA 2018a), the Strategic Proposal allows for a 'hub' approach with the sharing of infrastructure between mines to reduce the disturbance footprint required for each future proposal. There is only minimal clearing (40 ha) required for the Proposal, for activities and infrastructure associated with construction and operation of the surplus water discharge and aeration ponds (if required), with existing pipeline infrastructure and access roads and tracks for the OB32 BWT, or Eastern Ridge mine being used.

Consistent with MS1105 Guidelines for submitting a Derived Proposal (1(b)), the results from the surveying (Spectrum 2022; Biologic 2025) were used to design the proposed pipeline and settlement ponds to:

- minimise clearing of native vegetation by locating it in degraded areas, where possible
- minimise disturbance to riparian vegetation.

The discharge of surplus water to Homestead Creek is proposed as a contingency option, with surplus water discharged to Ophthalmia Dam from the OB32 mine the preferred method of surplus water management (Section 6.5.2). Controlled surface water discharge to creek lines is a management measure provided within the PERSP water management (BHP Billiton 2016 - Section 8.2.1.3).

To minimise the potential impacts to riparian vegetation from the discharge of surplus water, the discharge will be managed to maintain a drying pattern in Homestead Creek and Fortescue River. As discussed in Section 6.5.2, a maximum of nine-months of discharge per year to Homestead Creek is proposed, with the three consecutive months of no discharge aligned to the dry season. Management of the discharge to Homestead Creek, as well as the controlled releases of water from Ophthalmia Dam to the Fortescue River, are outlined in the Eastern Pilbara Water Resource Management Plan (EPWRMP) (BHP 2024). Where discharge and controlled releases are required, BHP will maintain the current release approach (i.e. up to three months during natural no-flow events), to ensure the ephemeral nature of Fortescue River is maintained.

In recognition of the significance of riparian vegetation in the Pilbara, BHP proposes to implement the *OB32 BWT Flora and Vegetation Environmental Management Plan* (FVEMP) (BHP 2025c). The FVEMP proposes monitoring of riparian vegetation health (with triggers and threshold) along Homestead Creek and Fortescue River within the predicted area of inundation.

6.5.3 Rehabilitate

BHP will implement the ERMCP (BHP 2025b) to meet the MS1105 Condition 15 environmental objective that the Proposal is decommissioned, and the site of the Proposal rehabilitated to be safe, stable and non-polluting and in an ecologically appropriate and sustainable manner.

Clearing of native vegetation for the Proposal will occur in the Development Envelope for activities and infrastructure associated with construction and operation of the surplus water discharge and aeration ponds (if required). The ERMCP addresses the rehabilitation of infrastructure. Management approaches relating to Flora and Vegetation include:

- undertake progressive rehabilitation (including revegetation) and ongoing performance assessment in areas where work is complete and further disturbance is unlikely
- at closure, following the removal of surplus water infrastructure, implement re-profiling of the land surface, surface treatments and revegetation works in accordance with BHP standard rehabilitation procedures.

For the Strategic Proposal, BHP considered that disturbance for linear infrastructure can be successfully rehabilitated to a vegetation condition rating of at least Good (BHP Billiton 2016 - Section 8.5.2.2).

Since the PERSP was developed, BHP's approach to mine closure planning and rehabilitation success has evolved. BHP has developed quantitative criteria for revegetation success, including vegetation completion criteria, based on a scientific analysis of BHP's rehabilitation monitoring data. BHP has used this work on the criteria for rehabilitation success to refine the high-level rehabilitation estimates presented in the PERSP and to further develop criteria at the hub level.

Rehabilitation success at current BHP mine operations is discussed in the BHP Derived Proposal Rehabilitation Report (BHP 2022a, Appendix 12). The MCP has incorporated learnings from the analysis of rehabilitation success.

6.5.4 Other statutory decision-making processes

BHP's view is that there is no other statutory decision-making process to mitigate the potential environmental impacts of the Proposal on Environmental Factor.

6.6 Validation of impacts and environmental outcome

BHP has validated the impacts to Flora and Vegetation from the Proposal against the Strategic Proposal, assuming relevant mitigation measures identified in Section 6.5 have been applied, to demonstrate that the environmental objective identified in MS1105 Condition 7, can be met.

The clearing of vegetation in Good to Excellent condition for the Proposal is a significant residual impact due to the cumulative impacts of clearing in the Pilbara. BHP proposes to contribute funds to the Pilbara Environmental Offsets Fund (PEOF) for the clearing of up to 38.86 ha of Good to Excellent condition vegetation in the Pilbara IBRA region

Table 6-7 summarises the residual impacts and environmental outcomes for Flora and Vegetation and demonstrates consistency with MS1105 condition objectives.

Table 6-7: Flora and Vegetation residual impacts, environmental outcomes and consistency with MS1105 condition objectives

Derived Proposal residual impact	Derived Proposal environmental outcome	Consistency with Strategic Proposal MS1105 condition objectives
		Condition objective/s:
Clearing of up to 40 ha of native vegetation, of which up to 39 ha is in Good or Very Good condition	Increase to the cumulative clearing of Good to Excellent native vegetation in the Pilbara bioregion	The significant residual impact of the contribution of the proposed clearing to cumulative clearing in the Pilbara bioregion can be counterbalanced by offsets, so that the environmental outcome is consistent with the relevant Strategic Proposal outcome (Section 7.6.1) and the EPA's objective for Flora and Vegetation (Section 6.1)
Clearing of less than 0.1% of each Beard vegetation association 18 and 82	Each Beard vegetation association will have more than 99% of their pre-European extent remaining	The representation of regional vegetation and locally significant vegetation will not be significantly impacted, which is consistent with the relevant Strategic Proposal outcomes (Section 7.6.1), the EPA's objective for Flora and Vegetation (Section 6.1) and the environmental objectives in MS1105 Condition 7-1(1) (d)
Clearing of less than 0.1 ha of locally significant vegetation (Homestead Creek riparian vegetation)	No impacts to regional significant vegetation (TECs or PECs) Locally significant (riparian) vegetation will be maintained to an extent that ecological integrity is not threatened	The representation of regional vegetation and locally significant vegetation will not be significantly impacted, which is consistent with the relevant Strategic Proposal outcomes (Section 7.6.1), the EPA's objective for Flora and Vegetation (Section 6.1) and the environmental objectives in MS1105 Condition 7-1(1) (d)
Changes to vegetation health from altered water regimes	Health and representation of riparian vegetation will be maintained (within natural variation) to an extent that ecological integrity is not threatened	The extent and ecological integrity of locally significant vegetation will be maintained, which is consistent with the relevant Strategic Proposal outcomes (Section 7.6.1), the EPA's objective for Flora and Vegetation (Section 6.1) and the environmental objectives in MS1105 Condition 7-1(1)

6.7 Implementation conditions

BHP considers that the Strategic Proposal MS1105 conditions should apply to the Proposal:

- 6 Condition Environmental Management Plans
- 7 Flora and Vegetation Environmental Management Plan (FVEMP)
- 15 Rehabilitation and decommissioning (ERMCP)
- 16 Offsets.

As there is a residual impact from the cumulative impact of clearing native vegetation in the Pilbara (Section 6.4.1), BHP has proposed offsets in accordance with the Strategic Proposal MS1105 Condition 16 (Section 9).

BHP's view is that none of the above MS1105 implementation conditions relating to Flora and Vegetation should be changed.

7 Social Surroundings

7.1 EPA environmental factor and objective

The EPA's objective for Social Surroundings is:

> *To protect social surroundings from significant harm.*

The EPA's objective for Social Surroundings is the same as when the EPA assessed the Strategic Proposal. The PERSP however, assessed Social Surroundings in accordance with the former Heritage factor and objective approved at that time. The EPA's objective for this now superseded factor was:

> *To ensure that historical and cultural associations, and natural heritage, are not adversely affected.*

7.2 Relevant legislation, policy and guidance

BHP validated this environmental factor considering the following relevant EPA policies and guidance:

- Environmental factor guideline – Social Surroundings (EPA 2023).

The recognition, preservation and management of activities that may impact Aboriginal cultural heritage is currently provided for under the *Aboriginal Heritage Act 1972* (AH Act). Section 18 of the AH Act allows for the provision of Ministerial consent for certain activities, including disturbance to heritage sites.

7.3 Traditional Owners, engagement and values

7.3.1 Nyiyaparli Traditional Owner determination area

The Nyiyaparli People are the Traditional Owners of the land that underlies the Proposal. The proposed Development Envelope sits wholly within the external boundaries of the Nyiyaparli Traditional Owner determination area (WCD2018/008) (Figure 1-1)

BHP has a positive ongoing relationship with the Nyiyaparli People which is formalised through a Comprehensive Agreement and associated registered Indigenous Land Use Agreement (ILUA). The scope of the Comprehensive Agreement applies to BHP's operations located within the Nyiyaparli Traditional Owner determination area includes a heritage protocol supporting the identification and management of heritage sites within the determination area. As part of this agreement, representatives from both BHP and the Nyiyaparli meet through the formal committees on a regular basis. This enables sharing of information, identification and discussion of concerns and decision making in relation to matters including heritage and environment.

KNAC represents the Nyiyaparli People, and BHP maintains an ongoing relationship with KNAC through regular communication.

7.3.2 Engagement with Nyiyaparli Traditional Owners and KNAC

BHP consulted with the Nyiyaparli People through KNAC and their consultants, in relation to the Proposal through a Social Surroundings consultation from the 2 to 6 September 2024. The consultation included workshops and on country visits to explain the scope and siting of the Proposal, to share information on their values, to provide an opportunity to identify and discuss any concerns and questions in relation to the potential impacts of the Proposal, and for BHP to better understand the broader Aboriginal social, cultural and heritage values of their lands. Opportunities to work together and collaborate on future BHP activities such as undertaking biological surveys and monitoring programs were also identified. A summary of engagement undertaken to date is provided in Table 3-2.

7.3.3 Surveys, values and interests

Ethnographical and archaeological surveys have been undertaken across the Development Envelope and Homestead Creek. No sites of cultural significance were identified. An Ethnographic consultation of the Fortescue River wetting front was undertaken in July 2024 which identified a new site and values of cultural heritage significance within proximity to the Fortescue River. The Heritage sites along the Fortescue River do not interact with the wetting front. The project design including the location of proposed water monitoring locations have avoided impacts to Heritage sites and areas of cultural significance, and all water monitoring and stream gauge locations have been placed outside all Aboriginal Cultural Heritage locations.

BHP understands that water is of high importance to Nyiyaparli Traditional Owners and the management of water is a matter of interest. This includes the proposed discharge of surplus water to Homestead Creek and potential downstream impacts on the Fortescue River.

During the development of the Proposal, impacts to known heritage locations and the environment were avoided in the first instance including the siting of infrastructure and proposed water monitoring locations, and the setting of the wetting front threshold location. During the Social Surroundings engagement, Nyiyaparli representatives through KNAC did not request BHP to action any Proposal design changes. The Nyiyaparli representatives were satisfied with the location of the proposed creek discharge, aerations ponds and the extent of the wetting front not going beyond the Jigalong Road crossing on the Fortescue River andwould not go within 55 km of Fortescue Marsh.during natural no flow conditions (excluding during the release of water from Ophthalmia Dam).

KNAC representatives raised concerns regarding access over the Jigalong Road crossing over the Fortescue River being restricted due to increased water in the Fortescue River from the creek discharge. KNAC representatives noted that there are communities located east of the Jigalong Road crossing. BHP advised that the creek discharge is very minor in relation to the natural events which occur in both waterways (as demonstrated by Table 5.3). It is important to note that the Jigalong Road crossing follows the profile of the Fortescue River and the road traverses through the low flow channel of the river (the road crossing is not constructed as a bridge crossing over the Fortescue River). For this reason, the crossing can be impacted by relatively minor rainfall events. BHP has committed to ensuring that the creek discharge will not increase the risk of flooding in Homestead Creek or Fortescue River and will not increase the number of days that access is restricted across Jigalong Road.

During the Social Surroundings engagement, KNAC representatives asked if the surplus water was fresh and safe for drinking and swimming. The surplus water quality is discussed in Section 5.3.3, water monitoring results demonstrates the water is fresh and safe for swimming and drinking. PFAS modelling undertaken for OB32 BWT concluded that there are no sources of PFAS within OB32 BWT, and groundwater modelling predicts that PFAS levels in the OB32 BWT production bores will be well below the PFAS NEMP (2000 and 2025) and human health drinking water guideline values. There is no specific health guideline value for Total dissolved solids (TDS), as there are no health effects directly attributable to TDS. For good palatability however, the Australian Drinking Water Guidelines suggests the ideal TDS in drinking water should not exceed 600 mg/L. Groundwater with a TDS of 600 – 900 mg/L has fair palatability (NHMRC 2011). Water quality monitoring indicates the TDS of the surplus water will be in the range of 660 – 840 mg/L which has a fair palatability.

KNAC representatives queried whether monitoring would be completed at areas they believed to be permanent pools along the Fortescue River. Two pools known as Mingana yinda located at the Mingana crossing and Sandy Creek, located approximately 51 km, and 50 km respectively downstream of Ophthalmia Dam were known to regularly contain water. Water monitoring of the Fortescue River will be undertaken, however additional monitoring at these pools is not proposed, principally because the water quality of the surplus water is fresh and not expected to impact upon these areas. These pools are likely to contain water for extended periods during the dry season due to the release of water from Ophthalmia Dam after the wet season. The Proposal will not alter the dam releases or remove water from the Fortescue River.

Nyiyaparli representatives through KNAC requested that opportunities for BHP and the Nyiyaparli people to collaborate on future BHP activities. Where both BHP and KNAC resources are available to support the Nyiyaparli people, opportunities for BHP and Nyiyaparli people to collaborate such as on biodiversity surveys or rehabilitation activities will continue to be considered.

Nyiyaparli representatives did not request any modifications to the Proposal design. The Social Surroundings engagement report (Stevens Heritage Services 2024) identified a number of recommendations, to which BHP has responses. All recommendations detailed in this report, along with BHPs response is provided in Appendix 18.

7.4 Potential impacts

In the PERSP (BHP Billiton 2016 – Table 48), BHP identified and described potential impacts from the Strategic Proposal on Aboriginal heritage. Table 7-1 identifies whether the Strategic Proposal potential impacts are relevant to the Proposal.

Table 7-1: Social Surroundings – relevant impacts identified in the Strategic Proposal

Strategic Proposal potential impact	Strategic Proposal impact relevant to the Proposal?	Potential impacts from the Proposal
Activities or processes impacting social, cultural, heritage values (direct)	Yes Clearing and disturbance for the Proposal, will be limited to within the Development Envelope which avoids all known heritage sites	No known heritage sites impacted within the Development Envelope or by the wetting front
Activities or processes disturbing social, cultural, heritage values (indirect)	Yes Indirect impacts associated with noise, dust and vibration may occur during the construction phase	Indirect impacts associated with noise, dust and vibration will occur for a short duration and be intermittent during the construction phase which is expected to be short given the small Indicative Footprint of the Proposal

BHP has considered the potential impacts outlined in the EPA's *Environmental factor guideline – Social Surroundings* (2016j) and the PERSP (BHP Billiton 2016), and considers that those relevant to the Proposal are:

- changes to surface water values from discharge of surplus water (direct)
- degradation of social, cultural and heritage values (indirect).

The Proposal is located wholly within the Nyiyaparli Traditional Owner Determination Area. BHP has focused the discussion of potential impacts of the Proposal, as distinct from existing impacts associated with current approved Eastern Ridge operations (which includes the OB32 BWT mining operation).

7.4.1 Disturbance of social, cultural, heritage values (direct)

The Proposal involves the discharge of surplus water to Homestead Creek. BHP understands that the Nyiyaparli interests include the potential impacts of the Proposal on water values including water quality and condition of vegetation from the discharge of surplus water.

BHP discusses the potential impacts of the Strategic Proposal on water resources from surplus water management in the PERSP (BHP Billiton 2016 - Table 43), which includes that the discharge of water to ephemeral streams for extended periods can alter the downstream ecology.

As discussed in Section 5.6.3, the surface water regime of Fortescue River has been altered by the construction and operation of Ophthalmia Dam in the early 1980s and BHP will continue to manage releases from the dam in accordance with the Eastern Pilbara Water Resource Management Plan (BHP 2024). The creek discharge will cease

for three consecutive months during the dry season so that there is no increase in the timing of water being released to the Fortescue River during the dry season.

The wetting front is anticipated to remain in the low flow channel of Homestead Creek and Fortescue River, and the creek discharge will cease for three consecutive months during the Pilbara dry season to allow both waterways to dry. Table 5.3 in Section 5.3.3 demonstrates that the proposed maximum discharge of 60 ML/day is insignificant when compared to the natural flow events which occur in both Homestead Creek and Fortescue River. The flow rate of 60 ML/day is equivalent to just 2.24% of a 1 in 2 year ARI rainfall event in Homestead Creek. The Fortescue River is a much larger waterway than Homestead Creek and the proposed flow rate of 60 ML/day in the Fortescue River is anticipated to be negligible, especially given some losses will occur through infiltration in Homestead Creek and the full 60 ML/day will not reach Fortescue River. The creek discharge will not increase the risk of flooding in Homestead Creek or Fortescue River, and the number of days that access is restricted across the Jigalong Road over the Fortescue River will not be increased.

BHP will continue to manage releases from Ophthalmia Dam and the discharge of surplus water to Homestead Creek to ensure that the existing (altered) surface water regime within Fortescue River and associated cultural values of the river are maintained. Ophthalmia Dam will continue to be the preferential pathway to manage surplus water from OB32 BWT. The creek discharge will be utilised when the dam is nearing capacity or the surplus water pipeline from OB32 BWT mine to Ophthalmia Dan is undergoing maintenance.

As a result, the current (altered) surface water regime, vegetation condition and associated cultural values of Homestead Creek and Fortescue River will not be significantly altered. The Proposal is not predicted to result in significant impacts to Social Surroundings values from the discharge of surplus water.

The amount of water proposed to be discharged to Homestead Creek is a fraction of the amount which flows during natural rainfall events. The wetting front will remain in the low flow channel and will operate for a maximum of 9 months per year.

In addition to altered water regimes, clearing for the Proposal may result in the removal of some ethnobotanically significant flora and the removal of some habitat which supports native fauna of cultural value. A desktop review of the detailed flora and vegetation survey (Spectrum 2022) identified a number of species understood to be of cultural importance, as present in the survey area. These include:

- Mulga (*Acacia aptaneura*)
- *Acacia bivenosa*
- Gigjee (*Acacia pruinocarpa*)
- Bloodwood (*Corymbia hamersleyana*)
- Emu Bush (*Eremophila cuneifolia*)
- Giddi (*Triodia pungens*).

Given the extent of clearing is minimal and these species are common and widespread, the impact to Social Surroundings from this clearing is not predicted to be significant.

7.4.2 Disturbance of social, cultural, heritage values (indirect)

Construction activities required for the Proposal will be minimal given the limited infrastructure and Development Envelope; however, will include vehicle and machinery movements and clearing of native vegetation. The construction activities are associated with the construction of the creek discharge outlet and aeration ponds (which will be constructed only if required to manage calcium carbonate precipitate in Homestead Creek). These activities have the potential to generate noise and dust which may deposit on adjacent vegetation and/or degrade cultural values within or near to the proposed Development Envelope.

The generation of noise and dust will be limited to the construction phase and will therefore be temporary. The construction activities and are not expected to result in long term alterations to the existing amenity within or near the Development Envelope.

BHP considered potential indirect impacts of the Strategic Proposal on Aboriginal cultural values including as a result of increased public access, indirect impacts to vegetation or fauna and impact to landscape.

The Proposal has the potential to indirectly impact cultural values from dust, noise and access. The potential release of dust and noise from ground disturbance and installation of the surplus water discharge outlet and aeration ponds (if required) will be temporary and limited to the construction phase only, ceasing once construction is complete. The potential impacts of this are not predicted to be significant.

These activities are not predicted to result in significant impacts to social, cultural or heritage values.

BHP commits to ongoing engagement with the Nyiyaparli Traditional Owners on social surroundings matters relevant to the Proposal throughout the life of the operation. This validation demonstrates that the potential indirect impacts to cultural heritage values from the Proposal are consistent with the Strategic Proposal outcomes.

7.5 Mitigation

KNAC representatives, KNAC and their consultants have not requested any design changes to the Proposal.

The PERSP provides examples of the Heritage and Amenity management measures that BHP may apply to mitigate the potential impacts on Social Surroundings (BHP Billiton 2016 - Section 8.3.1.3). More specifically, the Comprehensive Agreement between BHP and the Nyiyaparli defines the management requirements for Nyiyaparli land within the determination area, including heritage sites. BHP has undertaken avoidance measures during the design phase of the Proposal and commits to the following additional measures to complement these existing requirements, which apply to cultural heritage values more broadly.

7.5.1 Avoid

The Proposal has avoided impacts to all known Heritage sites and areas of cultural significance. The Proposal will also avoid clearing, if possible, and BHP will only construct the aeration ponds, if required to prevent the formation of calcium carbonate precipitate in Homestead Creek.

7.5.2 Minimise

As above in Section 7.5.1, the Proposal has avoided impacts to all known Heritage sites and areas of cultural significance. KNAC representatives did not request any Proposal design changes.

Efforts to minimise impacts to Homestead Creek including the construction of the aeration ponds, if required to prevent the persistent formation of calcium carbonate precipitate and ceasing the creek discharge for three consecutive months to allow the waterways to dry have been included in the Proposal.

BHP is aiming to minimise vegetation clearing, by only constructing aeration ponds if there is evidence of persistent calcium carbonate formation in Homestead Creek. This will therefore minimise potential impacts to plants of cultural importance.

7.5.3 Rehabilitate

BHP is committed to rehabilitation of land no longer required for operational purposes and understands that mine closure is of interest for Traditional Owners. BHP commits to consulting with the Nyiyaparli Traditional Owners, through KNAC, to identify opportunities for rehabilitation both during and post-mining land uses. BHP is committed to ensuring that final landforms are designed to allow for safe, ongoing access to places of Traditional Owner significance post-closure, where practicable.

BHP is also committed to ongoing engagement with the Nyiyaparli Traditional Owners in relation to closure outcomes of the Proposal, through ongoing consultation on the ERMCP.

7.5.4 Other statutory decision-making processes

The Proposal will not result in harm to any Aboriginal heritage sites and a s18 approval is not required.

The Part V Works Approval and Licence will place limits on the creek discharge flow rate, wetting front threshold, timing of discharge, and water monitoring requirements (including PFAS) which will contribute towards mitigating impacts to the social and cultural values of Homestaed Creek and Fortescue River.

7.6 Validation of impacts and environmental outcome

BHP has validated the impacts to Social Surroundings from the Proposal against the Strategic Proposal environmental outcomes, assuming mitigation measures identified in Section 7.5 have been applied, to demonstrate that the environmental objective in MS1105 Condition 13 can be met.

BHP has undertaken the process summarised in Section 2.1.1 to validate the impacts to Social Surroundings from the Proposal against the Strategic Proposal outcomes, assuming mitigation measures have been applied, where relevant, as discussed in Section 7-5.

Table 7-2: Social Surroundings residual impacts, environmental outcomes and consistency with MS1105 condition objectives

Derived Proposal residual impact	Derived Proposal outcome	Consistency with Strategic Proposal environmental outcome/s and consistency with EPA objective
Changes to surface water regimes from the discharge of surplus water	The wetting front is anticipated to remain in the low flow channel of Homestead Creek and Fortescue River, and the creek discharge will cease for three consecutive months during the Pilbara dry season. The creek discharge will not increase the risk of flooding in Homestead Creek or Fortescue River, and the number of days that access is restricted across the Jigalong Road over the Fortescue River will not be increased	The Proposal is not predicted to result in significant impacts to Homestead Creek or the existing altered surface water regime of the Fortescue River and associated cultural values The Proposal is not predicted to result in significant impacts to the existing altered surface water regime of the Fortescue River and Homestead Creek and associated cultural values
Potential impacts to Aboriginal social, cultural and heritage values	The Proposal will result in loss of up to 40 ha of native vegetation which may result in clearing of some plants of cultural significance; however, given the limited clearing extent, this impact is not predicted to be significant. No cultural heritage sites are located within the Development Envelope. BHP will engage with Nyiyaparli Traditional Owners, through KNAC, throughout the life of operation, in relation to social, cultural and heritage values and interests.	Historical and cultural associations, and natural heritage will not be adversely affected. BHP will continue to engage with Nyiyaparli Traditional Owners, through KNAC, throughout the life of the Proposal in relation to the management of cultural heritage values, surplus water management, closure and other matters related to social surroundings. This is consistent with the outcomes of the Strategic Proposal and the EPA's objective for Social Surroundings (Section 7.1) will be met.

7.7 Implementation conditions

BHP considers that the application of conditions from Strategic Proposal MS1105 is not required for the Proposal. Outcomes can be assured through implementation of the Project Management Plan, agreed to by BHP and KNAC.

8 Other environmental factors

BHP's evaluation of other environmental factors is summarised in Table 8-1 to support BHP's position that an environmental factor is not a relevant environmental factor for the Proposal. BHP has also included supporting technical information as appendices, where relevant.

Table 8-1: Evaluation of other environmental factors

Relevant associated activities / operations	Potential impacts	Justification for why factor is not considered to be a relevant environmental factor
LAND		
Terrestrial Fauna EPA objective: *To protect terrestrial fauna so that biological diversity and ecological integrity are maintained*		
Ground disturbance Discharge of surplus water Rehabilitation and decommissioning activities	Removal of terrestrial fauna habitats Changes to surface water regimes (modification of aquatic fauna habitat)	The potential impacts to Terrestrial Fauna relate to the direct impact of the removal of terrestrial fauna habitats from the clearing of native vegetation within the Development Envelope, or potential impacts to aquatic fauna habitats and species from the changes to surface water regimes from the discharge of surplus water to Homestead Creek. **Significance considerations** As per the requirements of *MS1105 Guidelines for submitting a Derived Proposal 1(a)*, targeted surveys have been undertaken for the Proposal. Two targeted vertebrate fauna surveys were undertaken over all or part of the Development Envelope and surrounds, to determine the presence of significant vertebrate fauna species and their habitats in the area (Biota 2022, Biologic 2024). Targeted short-range endemic (SRE) invertebrate fauna surveys were not undertaken due to the small disturbance footprint within an area of existing disturbance, and because the habitat types within the Development Envelope are not restricted to the area and are not considered suitable to support SRE fauna. Aquatic fauna surveying of Homestead Creek and Fortescue River was undertaken to identify any aquatic fauna values of Homestead Creek and Fortescue River (Indo-Pacific 2022, 2024). BHP has reviewed the potential impacts of the Proposal on Terrestrial Fauna (including aquatic fauna), considering the assessment undertaken for the Strategic Proposal (BHP Billiton 2016), the *Environmental Factor Guideline – Terrestrial Fauna* (EPA 2016e), *Orebody 32 Surplus Water Targeted MNES Vertebrate Fauna Survey* (Biota 2022, Appendix 16), *NEBO OB25 West Targeted Vertebrate Fauna Survey* (Biologic 2024, Appendix 3), *Eastern Ridge OB25 West Additional Targeted Vertebrate Fauna Survey (Biologic 2025b, Appendix 3), OB32 Surplus Water – Homestead Creek Wetting Front Aquatic Fauna Survey 2021* (IndoPacific 2022, Appendix 6) and *Homestead Creek & Fortescue River Aquatic Fauna Survey 2022* (IndoPacific 2024, Appendix 6) with the findings summarised below: ***Fauna habitats*** • Fauna habitat mapping of the Development Envelope (Figure 8-1) (Biota 2022, Biologic 2024 and Biologic 2025), identified four fauna habitat types within the Development Envelope: Drainage Area/ Floodplain, Hillcrest/ Hillslope, Major Drainage Line and Stony Plain. • For the Strategic Proposal, BHP assessed the relative value of the fauna habitats for native vertebrate fauna. Vertebrate fauna habitats with high species richness and those with a high number of significant species were identified (BHP Billiton 2016, Section 8.1.4.1). The fauna habitat types within the Development Envelope align with those highlighted in the Strategic Proposal: Hillcrest/ Hillslope, Drainage Area/ Floodplain and Stony Plain identified as having high species richness, and Major Drainage Line identified as having high number of significant species. • No important fauna habitat features (i.e. caves or permanent waterbodies) have been recorded within the Development Envelope. Three ephemeral water features have been identified within the Development Envelope occurring within Homestead Creek (Figure 8-

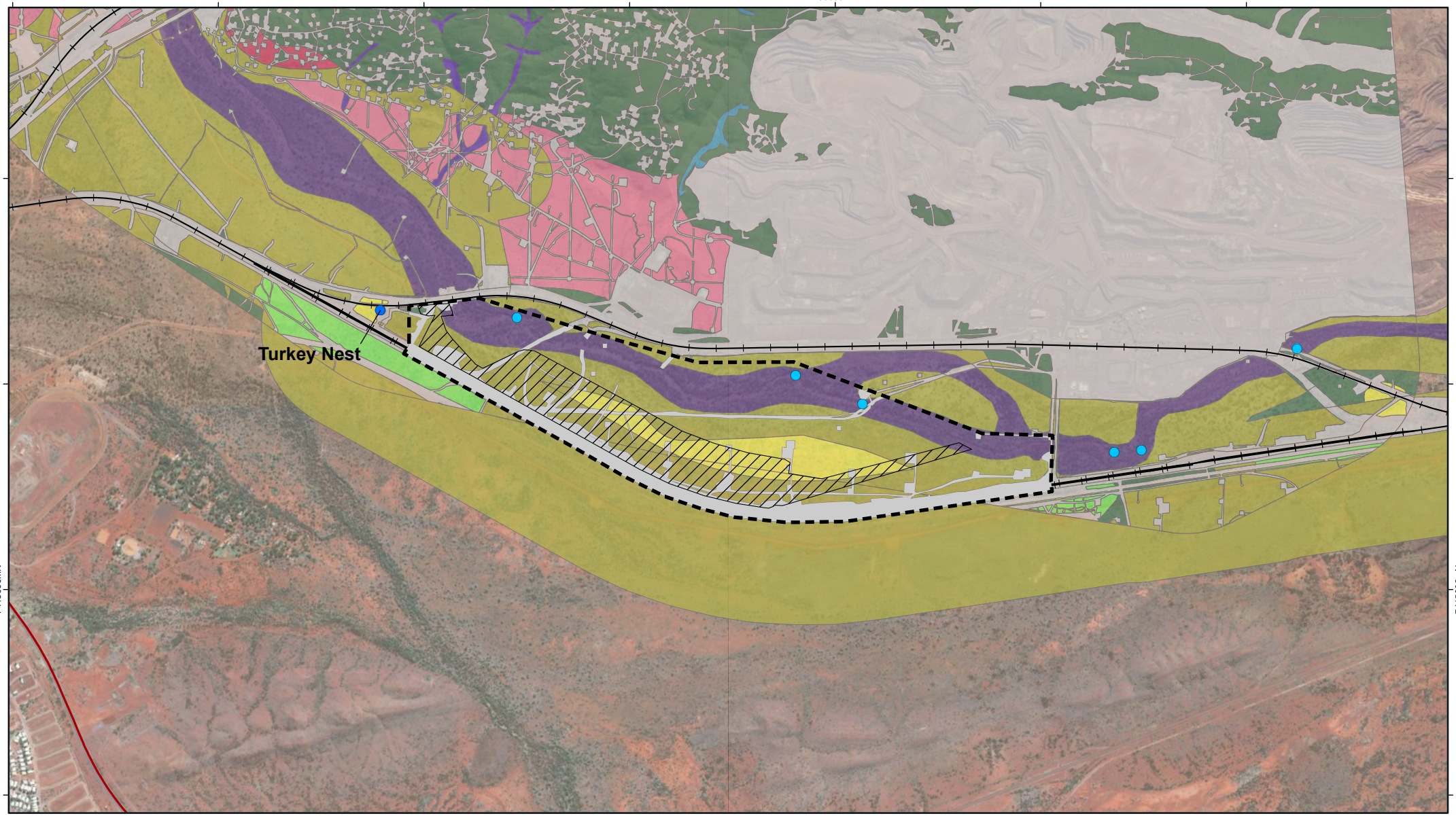
Relevant associated activities / operations	Potential impacts	Justification for why factor is not considered to be a relevant environmental factor
		1). These water features were recorded during targeted surveying of the Development Envelope and considered likely to be present due to the high rainfall received in the month prior to the survey (Biologic 2024). • For the Strategic Proposal, BHP assessed the habitats of the Newman area (that included Eastern Ridge) as being of high suitability for supporting SRE invertebrate fauna based on the land systems in which these areas occur (BHP Billiton 2016 - Appendix 5). Areas of 'Boulders, Outcrops, Ridges and Breakaways' habitat associated with the Newman Land System and dispersal habitats associated with Homestead Creek were identified in the vicinity of the Development Envelope. • Of the four fauna habitat types occurring in the Development Envelope, none are considered highly suitable to support SRE fauna. There are no habitat types in the Development Envelope that align with areas identified in the assessment of the Strategic Proposal as 'Boulders, Outcrops, Ridges and Breakaways'. The habitats of the Development Envelope are continuous through the landscape and provide little or limited protection and complexity, thus allowing easy dispersal of invertebrate taxa that occupy such habitats. • Based on fauna habitat mapping, and further analysis of the likely occurrence of habitat types beyond their known mapped extent, none of the fauna habitat types occurring within the Development Envelope are regionally under-represented. All habitat types are known to be widespread in the Pilbara bioregion and occur contiguously outside of the Development Envelope (Biota 2022, Biologic 2024). Clearing will be limited to 40 ha within the Development Envelope. The proposed extent of clearing will not impact on the ecological integrity of any terrestrial fauna habitats. ***Significant fauna*** • Based on survey information across the area, no Threatened or Priority vertebrate fauna species, and no Confirmed or Potential SRE invertebrate fauna species have been recorded within the Development Envelope. ***Aquatic fauna*** • The aquatic habitat in Homestead Creek was found to be highly ephemeral with a majority of that catchment drying rapidly after the cessation of rain (IndoPacific 2022). • The Strategic Proposal acknowledged the importance of permanent water bodies in the Pilbara as refuge for aquatic biota during the dry season (BHP Billiton 2016 - Section 8.1.4.1). There are no permanent water bodies within the Development Envelope or in Homestead Creek downstream of the proposed discharge point. • No range restricted or significant aquatic fauna species were recorded from microinvertebrate, hyporheic, sediment rehydration or macroinvertebrate samples collected from Homestead Creek or Fortescue River. The majority of species recorded were considered typical of freshwater Pilbara aquatic systems with widespread distributions (IndoPacific 2022, 2024). • An assessment of the hydrogeochemical risk of the proposed discharge to Homestead Creek indicated that the chemistry of the surplus water discharge has a higher alkalinity than surplus water from other BHP operations and therefore a greater tendency for calcification and scaling (Worley 2024). The intermittent discharge regime and cessation of the creek discharge for a minimum of three months a year will likely prevent persistent formation of calcium carbonate precipitate in Homestead Creek (Hydrobiology 2025, Worley 2024). Additionally, as Homestead Creek is ephemeral and the aquatic fauna is typically transient with strong dispersal capabilities, the overall risk to aquatic fauna and habitats is considered to be low.

Relevant associated activities / operations	Potential impacts	Justification for why factor is not considered to be a relevant environmental factor
		• As discussed in Section 0, Homestead Creek will be monitored for signs of calcium carbonate precipitation formation.If detected, surplus water will be discharged to aeriation pondsprior to discharge to Homestead Creek, which will remove the potential of further calcium carbonate precipitate to form **Mitigation** • The PERSP provides examples of the measures that BHP may apply to mitigate the potential impacts on Terrestrial Fauna (BHP Billiton 2016 - Section 8.1.1.3). • BHP considers that there are no potentially significant impacts to Terrestrial Fauna from the Proposal and therefore, no targeted management measures for Terrestrial Fauna are proposed for the Proposal. As discussed in Section 6.4.1.1 for Flora and Vegetation, BHP will apply standard management practices during operations, including internal land disturbance approval processes and reporting, to mitigate potential impacts from the clearing of native vegetation (and fauna habitats). Mitigation relevant to the proposed discharge of surplus water is discussed in Section 0 for Inland Waters; BHP will manage the discharge of surplus water in a manner that maintains the ephemeral nature of Homestead Creek and Fortescue River, and minimise the risk of calcium carbonate precipitate forming. • BHP will implement the MCP which addresses the rehabilitation of infrastructure (BHP 2022d, Appendix 11), to meet the MS1105 Condition 15 environmental objective that the Proposal is decommissioned and the site of the Proposal rehabilitated to be safe, stable and non-polluting and in an ecologically appropriate and sustainable manner. **Environmental outcomes** ***Strategic Proposal environmental outcomes*** The key environmental outcomes for Terrestrial Fauna established through the assessment of the Strategic Proposal (BHP Billiton 2016 and EPA 2018a) that are relevant to the Proposal are: • All habitat types extend beyond BHP's tenements and substantial areas of habitat available will remain within BHP tenements. • Habitat will not be impacted to an extent that ecological integrity is threatened. While impacts on individuals of significant species may occur, biological diversity within the Strategic Proposal boundary can be maintained. ***Derived Proposal environmental outcomes*** • The representation of fauna habitat types will be maintained in the local area (within and adjacent to the Development Envelope). • There will be no impact to Threatened or Priority vertebrate fauna species, Confirmed or Potential SRE invertebrate fauna species, or significant aquatic fauna species. The predicted impacts of the Proposal on Terrestrial Fauna are not predicted to be significant. The Derived Proposal environmental outcomes are consistent with the Strategic Proposal environmental outcomes and the EPA's objective for Terrestrial Fauna. As the impacts to Terrestrial Fauna are not significant, targeted management measures for Terrestrial Fauna are not required to meet the EPA's objective for Terrestrial Fauna and BHP considers that Condition 8 (Terrestrial Fauna Environmental Management Plan) is not required for the Proposal. The section 45B Notice (limit on extent of proposal elements (native vegetation clearing), and Strategic

Relevant associated activities / operations	Potential impacts	Justification for why factor is not considered to be a relevant environmental factor
		Proposal (MS1105) Condition 10 Water Environmental Management Plan and Condition 15 Rehabilitation and Decommissioning, are adequate to ensure consistency of the elements of the Derived Proposal with the EPA's objective for Terrestrial Fauna.
Subterranean Fauna	Removal of subterranean fauna habitats due to changes in water regimes	The nearest ecological community is the Ethel Gorge Aquifer Stygobiont Community (Ethel Gorge TEC). This TEC is listed as a Critically Endangered community under the BC Act. The Development Envelope occurs within the 2 km buffer of this TEC (Figure 7-2), with the mapped extent of the community occurring approximately 650 m south of the Development Envelope at its closest point. It is a subterranean community occurring in the alluvium calcrete aquifer on the Fortescue River and is listed due to the unique and diverse assemblage of stygofaunal species. The Proposal does not include activities which may impact subterranean fauna such as dewatering or mounding of groundwater, the Proposal is not anticipated to have an impact on the Ethel Gorge TEC.
AIR		
Greenhouse Gas Emissions EPA objective: *To reduce net greenhouse gas emissions in order to minimise the risk of environmental harm associated with climate change*		
Emissions to the environment Discharge of surplus water Civil and earthworks Native vegetation clearing	Contribution of proposal's GHG emissions to WA's GHG emissions	**Significance considerations** BHP has reviewed the potential impacts of GHG Emissions from the Proposal, considering the assessment undertaken for the Strategic Proposal (BHP Billiton 2016) and the *Environmental Factor Guideline – Greenhouse Gas Emissions* (EPA 2020a), with the findings summarised below: • BHP quantified potential GHG emissions for the Strategic Proposal based on fuel usage for CO_2, CH_4 and N_2O (BHP Billiton 2016 - Section 8.4.3.1). The other greenhouse gases (SF_6, HFCs and PFCs) are reportable by BHP but the contribution to BHP's overall GHG emissions is negligible (<0.1%). • BHP's assessment of GHG emissions through the Strategic Proposal predates the EPA's *Environmental Factor Guideline – Greenhouse Gas Emissions* (EPA 2024) however, the intent of the guideline (to reduce net GHG emissions) is consistent with guidance in place when the EPA assessed the Strategic Proposal. • The direct (Scope 1) GHG emissions from the Proposal will be from the use of diesel fuel in civil and earthworks and land use change emissions associated with native vegetation clearing. • No indirect (Scope 2) emissions are predicted for the Proposal. GHG emissions associated with dewatering and surplus water management were previously estimated as part of the OB32 BWT Proposal. The Homestead Creek discharge and aeration ponds will be gravity fed. There is no incremental increase to GHG emissions associated with surplus water management through the addition of the Homestead Creek discharge and aeration basins to the previous GHG assessment. • No material indirect (Scope 3) emissions are predicted for the Proposal. There is no iron ore production associated with the Proposal, sources of Scope 3 GHG emissions relevant to the Proposal are estimated to be immaterial.

Relevant associated activities / operations	Potential impacts	Justification for why factor is not considered to be a relevant environmental factor
		• BHP has estimated the Scope 1 emissions for the.Proposal The annual average Scope 1 emissions are estimated to be 5,036 tonnes of carbon dioxide equivalence (t CO_2-e), which is approximately 5% of the threshold (100,000 t CO_2-e) referred to in the EPA's GHG Guideline (EPA 2020a). • The annual average Scope 1 emissions (5,036 t CO_2-e) is equivalent to approximately 0.006% of WA's GHG inventory in 2023 (89.4 million t CO_2-e) and 0.001% of the national GHG inventory 2023 (453.45 million t CO_2-e), including LULUCF emissions (DCCEEW 2024). • The cumulative annual average emissions from MS1105, including the Proposal are 0.424% and 0.084% of the 2023 WA and 2023 national GHG inventories respectively, including LULUCF emissions (DCCEEW 2024). These percentage contributions are less than the previously assessed contribution of incremental GHG emissions associated with the FCDS, which was 4.6% of WA's GHG emissions and 0.6% on national GHG emissions, including LULUCF (BHP Billiton 2016). • The estimated Scope 1 emissions intensity of the Proposal has not been determined, in the context of MS1105 the project is not directly associated with iron ore production, and therefore emissions intensity for the Proposal is undefined (GHG emissions per unit of iron ore production). **Mitigation** • BHP considers that there are no potential significant impacts from GHG Emissions from the Proposal and therefore, no targeted management measures are proposed for the Discharge Proposal. GHG emissions associated with the civil works and land clearing are not significant (<100 kt CO_2-e Scope 1 or Scope 2 GHG emissions) and constitute a once-off activity. GHG emissions associated with diesel consumption from the Proposal are reportable through the NGER Act, these activities will be reported as Scope 1 emissions against the Newman Operations NGER facility, which is covered by the Safeguard Mechanism • BHP also undertakes mitigation and reporting according to national statutory decision-making processes under the NGER Act: - NGER Scheme: a national framework for reporting GHG emissions, greenhouse gas projects and energy consumption and production by corporations in Australia - The Safeguard Mechanism imposes limits on large GHG emitting facilities (Scope 1 emissions of more than 100,000 t CO_2-e per annum), to ensure that net emissions are kept below declining GHG emission baselines on a trajectory to net-zero GHG emissions by 2050. **Environmental outcomes** ***Strategic Proposal environmental outcomes*** The key environmental outcomes for GHG Emissions established through the assessment of the Strategic Proposal (BHP Billiton 2016 and EPA 2018a) that are relevant to the Proposal are: • The total emissions of GHG across the life of the Strategic Proposal are potentially significant; however, emissions of future proposals can be avoided and minimised through proposal design and best-practice technology for operations.

Relevant associated activities / operations	Potential impacts	Justification for why factor is not considered to be a relevant environmental factor
		• GHG emissions intensity is not expected to increase, as mining methods are consistent with those currently used for iron ore operations. ***Derived Proposal environmental outcomes*** • Annual average Scope 1 GHG emissions from the Proposal are estimated to be 5,036 CO_2-e. The predicted impacts of GHG emissions from the Proposal are not significant and are consistent with the Strategic Proposal environmental outcomes and the Derived Proposal environmental outcomes meet the EPA's objective for GHG Emissions. BHP considers that the GHG emission outcomes can be met without an implementation of a GHG Management Plan as Scope 1 GHG emissions are minimal and well below the EPA's Scope 1 threshold of 100,000 t CO_2-e. As such BHP is not proposing to develop a GHG Management Plan (Condition 12) for the Proposal.



Development Envelope
Indicative Footprint
Highways
BHP Rail

Water Feature
Turkey Nest
Ephemeral Water Feature

Habitat Type
Cleared/ Disturbed
Drainage Area/ Floodplain
Gorge/ Gully
Hillcrest/ Hillslope
Major Drainage Line
Minor Drainage Line
Mulga Woodland
Sand Plain
Stony Plain
Undulating Low Hills

N

0 0.25 0.5 0.75 1 1.25
KILOMETRES

GDA 1994 MGA ZONE 50

BHP

PUBLIC

OB32 BWT CREEK DISCHARGE DERIVED PROPOSAL
FAUNA HABITATS

WAIO PLANNING, TECHNICAL & ENVIRONMENT

SCALE @ A4:	1:25,000	REQUESTOR:	ENV. APPROVALS	FIGURE:	8-1
DATE:	18/07/2025	PREPARED:	GEOMATICS	NO:	A1079_116_RevE

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9 Offsets

This section addresses offsets relating to potentially significant residual impacts to environmental values from the Proposal. The process of identifying significant residual impacts and determining appropriate offsets follows the framework provided by the *Environmental Offsets Policy (Government of Western Australia 2011)* and the *Environmental Offsets Guidelines (Government of Western Australia 2014).*

As discussed in Section 6.60, the EPA considers the clearing of native vegetation in Good to Excellent condition a significant residual impact due to the cumulative impacts of clearing in the Pilbara IBRA region.

Figure 6-6 illustrates the condition of vegetation within the Development Envelope. Based on the Indicative Footprint, up to 40 ha of native vegetation proposed to be cleared is in Good or Very Good condition, all of which occurs within the Hamersley subregion of the Pilbara bioregion (Section 7.4.1.2) and will require offsetting.

As stated in EPA Report 1619 (EPA 2018a), the EPA considers that when a Derived Proposal is referred and an offset is required, the current rates and approach of the PEOF will be applied. The EPA also states in EPA Report 1619 (EPA 2018a) that should it be determined that a significant residual impact exists at the time a Derived Proposal is declared, the proponent will make a contribution to the PEOF. BHP proposes to contribute to the PEOF, based on the PEOF 2023/24 financial year contribution rates (Table 9-1).

Table 9-1: Significant residual impacts and proposed offsets

Significant residual impact	Values	Extent of impact	Offset payment rate $/ha	Proposed offset $
Clearing of native vegetation in the Pilbara Hamersley IBRA region	Native vegetation in Good to Excellent condition	Up to 39 ha	$1016	$39,624
Total extent to be offset		**39 ha**		**$39,624**

As discussed in Section 6.7, BHP's view is that MS1105 Condition 16 Offsets should apply to the Proposal, and that the condition should not be changed. The following significant residual impact in Condition 16-2 applies to the Proposal:

- 16-2(1) clearing of Good to Excellent condition native vegetation, including habitat for threatened fauna species, within the Hamersley and/or Chichester IBRA subregion.

BHP has prepared the draft *OB32 BWT Creek Discharge Impact Reconciliation Procedure* (IRP) (Appendix 16) (BHP 2025e) to satisfy MS1105 Condition 16-6.

10 Holistic impact assessment

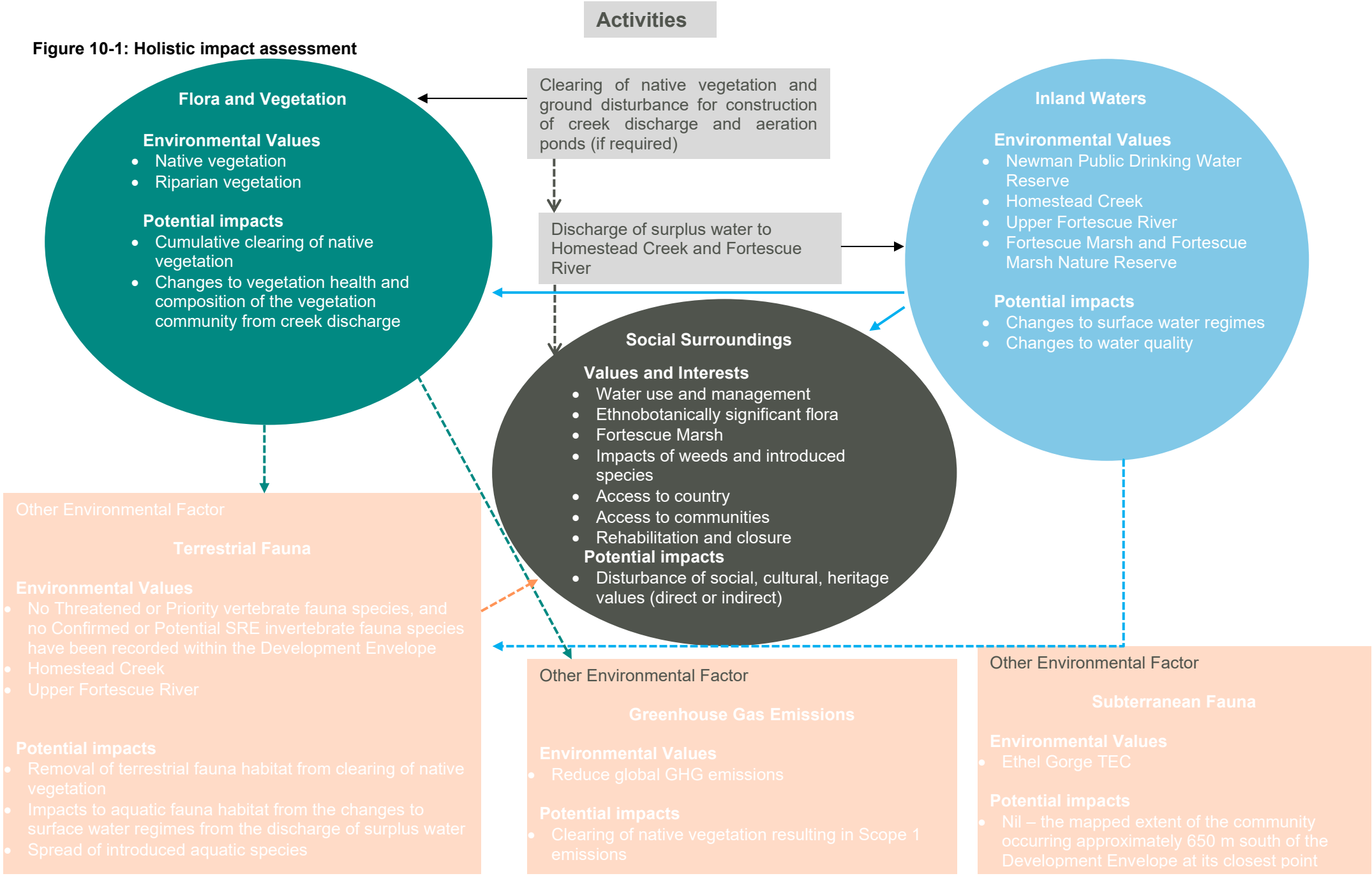
BHP has validated the potential impacts of the Proposal for the relevant environmental factors, including 'other environmental factors', and environmental values individually (Sections 5 to 8). However, given the link between Inland Waters, Flora and Vegetation and Social Surroundings, consistent with the EPA's *How to prepare an Environmental Review Document Instructions* (EPA 2021j), BHP has also considered connections and interactions between all relevant environmental factors (Figure 10-1) to inform a holistic view of impacts to the whole environment.

The environmental effects of the Proposal will be due to the discharge of surplus water to Homestead Creek and the clearing of native vegetation and ground disturbance for the construction of the creek discharge and aeration ponds (if required). These activities have the potential to change the hydrological regime of the receiving waterways and impact on the health of the riparian vegetation due to increased inundation, and potential to alter the composition of the vegetation community.

BHP considers that the proposed mitigation and regulation (Part IV MS1105 environmental management plans and other statutory decision-making processes) for Inland Waters and Flora and Vegetation will maintain the inter-related key environmental values of the waterways, as well as other potential environmental values including Social Surroundings. The Development Envelope does not contain any Aboriginal Cultural Heritage sites, and while the implementation of the Proposal will avoid direct disturbance to known heritage sites, BHP is committed to ongoing engagement in relation to surplus water management, access, rehabilitation and closure of the Proposal and other matters relevant to Social Surroundings.

Therefore, BHP considers that when the relevant environmental factors are considered together, for the holistic validation, the Proposal is consistent with the Strategic Proposal environmental outcomes and achieves the EPA's objectives and the relevant environmental objectives in Strategic Proposal MS1105.

Figure 10-1: Holistic impact assessment



11 Cumulative environmental impact assessment

11.1.1 OB32 BWT Creek Discharge

Inland Waters

A cumulative impact assessment has been undertaken for the Proposal. The wetting front modelling and assessment (Advisian 2023, BHP 2025a, Appendix 1), included Rio Tinto's existing approval to continuously discharge surplus water to Kalgan Creek, a tributary of the Fortescue River located approximately 15 km downstream of the confluence of Homestead Creek and Fortescue River. This creek discharge was included to assess the cumulative flow and extent of the wetting front which may occur from the Proposal, which includes continuous discharge of 60 ML/day to Homestead Creek 9for up to 9 months per year) plus Rio Tinto's discharge of 27 ML/day to Kalgan Creek, and BHP's three months of controlled releases from Ophthalmia Dam at 120 ML/day.

The hydraulic modelling indicated that the higher flow rate associated with the cumulative wetting front from all three discharges would arrive at the Jigalong Road crossing within two years (during natural no flow conditions) compared to 5 years when assessing the wetting front from the Proposal (discharge of 60 ML/day to Homestead Creek) in isolation. The width of the wetting front during the cumulative discharge of water to Homestead Creek, Kalgan Creek and from Ophthalmia Dam to the Fortescue River did not result in a drastically wider wetting front (Worley 2024, Appendix 1), likely due to the significant width and depth of the Fortescue River and relatively minor combined flow in comparison to the natural flows that occur in the Fortescue River.

The width of the wetting front in the Fortescue River when continuously discharging 60 ML/day to Homestead Creek for the Proposal is predicted to range from 21 m to 37 m, and the width of the wetting front in the Fortescue River during the cumulative discharge of water to Homestead Creek, Kalgan Creek and from Ophthalmia Dam is predicted to range from 23 m to 43 m (Worley 2024, Appendix 1). The wetting front in Homestead Creek will not be altered in the cumulative scenario as releases from Ophthalmia Dam and discharges to Kalgans Creek enter the Fortescue River.

The Proposal threshold of the Homestead Creek wetting front not going beyond Jigalong Road during natural no flow conditions and outside the release of water from Ophthalmia Dam, will also apply when Rio Tinto's Kalgan Creek discharge is operational. BHP monitors the release of water from Ophthalmia Dam. An additional water monitoring location (flow meter) is proposed to be installed in the Fortescue River, downstream of the confluence with Kalgan Creek to detect when flow from Kalgan Creek is occurring. There is not anticipated to be any cumulative impacts downstream of Jigalong Road.

Social Surroundings

Surplus water from other BHP Newman and Wheelarra Hill (Jimblebar) operations is primarily released to Ophthalmia Dam. Jimblebar is located approximately 40 km east of Newman and the Proposal and has approval (either through Part IV or Part V) to discharge surplus water to Caramulla Creek, Jimblebar Creek and Copper Creek (a tributary of Jimblebar Creek) when required. The creek discharges are included in the Wheelarra Hill (Jimblebar) Iron Ore Mine Part V licence (L5415/1988/9) and require monitoring of flow and water quality parameters, and annual reporting to DWER in BHP's Annual Environmental Report. BHP is also considering the discharge of surplus water to 13 Creek, a waterway located east of Jimblebar, this is however subject to further Heritage surveys and a Social Surrounding engagement.

The release of surplus water to waterways has the potential to impact values of cultural heritage significance including changes to water movement, creek ecology and access across country. Efforts to minimise these impacts including the three month non discharge period and improved weed management commitments have been included in the Proposal to minimise the cumulative impacts of creek discharge across BHP operations.

11.1.2 BHP Derived Proposals under MS1105

BHP undertook a cumulative environmental impact assessment for the Strategic Proposals based on the proposal extent at that time. BHP considered the successive, incremental and interactive impacts on the environment of the Strategic Proposal with past, present and reasonably foreseeable future activities including third party activities. These are detailed in the PERSP (BHP Billiton 2016 - Section 7).

In assessing the Pilbara Expansion as a Strategic Proposal, the EPA considered the cumulative impacts of future proposals by the proponent, rather than assessing impacts on a case-by-case basis as individual iron ore mines are proposed (EPA 2018a).

To date, BHP has submitted and subsequently had approved, two Derived Proposals, totalling 4,505 ha of new land disturbance; equating to approximately 4.6 % of the total 98,500 ha disturbance approved for the Strategic Proposal. In addition, BHP has submitted the Ministers North Derived Proposal to the EPA in September 2025, which is currently under assessment and will result in an increase (1,848 ha) of the progressive extent of disturbance approved under BHPs Strategic Proposal from 4,505 ha to 6,353 ha. The total disturbance footprint remains within the 98,500 ha of disturbance authorised for the Strategic Proposal under MS1105. Figure 11-1 considers the cumulative impacts of the Derived Proposal with other BHP Derived Proposals under MS1105. Figure 11-1 illustrates the location of the other BHP Derived Proposals which includes OB32 BWT, Western Ridge and Minsters North.

Table 11-2 and Figure 11-2 consider the cumulative impacts of the Proposal in the context of other nearby BHP and third party operations.

The Proposal consists of a small Development Envelope and Disturbance Footprint and does not significantly increase the cumulative environmental impacts. Following mitigation, the Proposal is anticipated to have no residual impacts to Homestead Creek or the Fortescue River. The Proposal will have no impact to significant flora, or threatened or Priority vertebrate fauna species, confirmed or potential SRE invertebrate fauna species, or significant aquatic fauna species. Direct and indirect impacts to Aboriginal cultural heritage sites will be avoided. The validation demonstrates that the potential impacts of the Proposal, when considered cumulatively with the impacts of other BHP Derived Proposals and other third-party mining operations, remains consistent with the cumulative impacts assessed for BHP’s Strategic Proposal., no Priority flora species or Matters of National Environmental Significance have been recorded in the Development Envelope. The Proposal has a minor impact on the cumulative impact.

Table 11-1 Cumulative impacts of BHP's Derived Proposals subject to MS1105

Environmental value	Approved disturbance from previous BHP Derived Proposals			Extent to be disturbed by the Proposal	Extent at the State/regional level	Potential cumulative impact to the environmental value
	Orebody 32 Below Water Table (EPA 2023)	Western Ridge (EPA 2023b)	Ministers North (BHP 2025d)	OB32 Below Water Table Creek Discharge		
Vegetation						
Total clearing (ha)	224	4,281	1,848	40	98,500 ha authorised via MS1105	Cumulative total 6,393 ha
Beard Vegetation Association 18 (ha)	152.88	1,411	0	28.19	671,843 ha[1]	Cumulative total 1,592 ha
Beard Vegetation Association 82 (ha)	56.97	2,870	2,360	11.53	2,550,888 ha[1]	Cumulative total 5,298.5 ha (>99% remaining)
Beard Vegetation Association 29	14.06				3,802,460	Cumulative total 14.06 ha (>99% remaining)
Good to Excellent condition veg (ha)	156	3,863	1,827	39		Cumulative total 5,885 ha
Riparian Vegetation (ha)	12	4.8	33.7	<0.1		Cumulative total 50.6 ha

Environmental value	Approved disturbance from previous BHP Derived Proposals			Extent to be disturbed by the Proposal	Extent at the State/regional level	Potential cumulative impact to the environmental value
	Orebody 32 Below Water Table (EPA 2023)	Western Ridge (EPA 2023b)	Ministers North (BHP 2025d)	OB32 Below Water Table Creek Discharge		
Surplus water discharge to waterways	0	0	0	1		Impacts to Social Surroundings through impacts to cultural heritage values
Aristida lazaridis (P3)	No impact	No impact	3 individuals	No impact	14,232 (93 populations)[1]	Cumulative total of 3 individuals (<0.1% of regional records) No further cumulative impact from the Proposal
Ipomoea racemigera (P3)	No impact	No impact	20 individuals	No impact	3,290 (77 populations)	Cumulative total of 20 individuals (0.6% of regional records) No further cumulative impact from the Proposal
Eremophila naaykensii (P3)	No impact	97 records	No impact	No impact	13,077 (31 populations)	Cumulative total of 97 records. No further cumulative impact from the Proposal
Indigofera gilesii (P3)	No impact	43 records	No impact	No impact		Cumulative total of 43 records. No further cumulative impact from the Proposal

[1] Source from internal BHP Datasets: noting other sources indicate higher regional records (e.g. > 23,000 individuals Source: EPA (2024d))

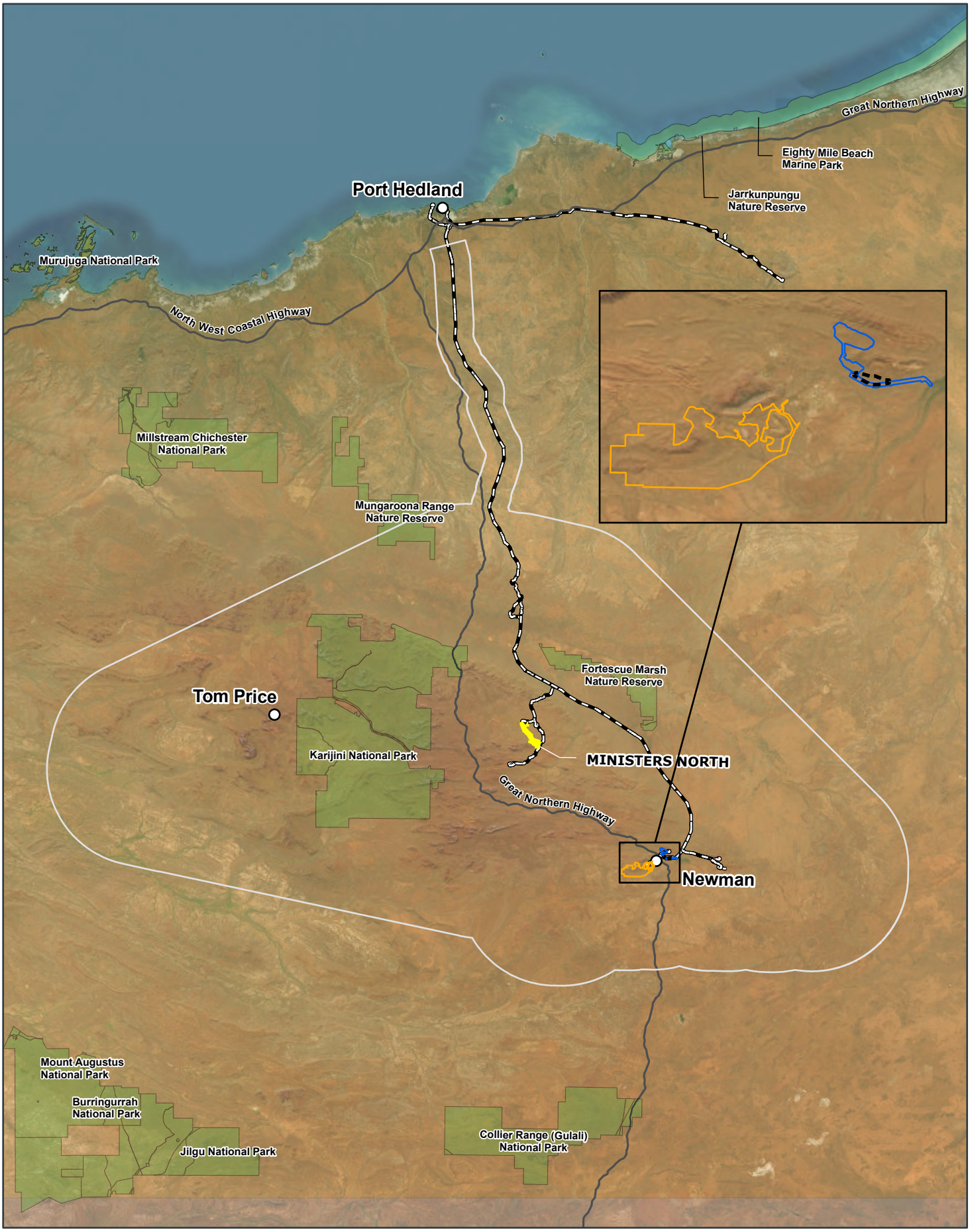
Environmental value	Approved disturbance from previous BHP Derived Proposals			Extent to be disturbed by the Proposal	Extent at the State/regional level	Potential cumulative impact to the environmental value
	Orebody 32 Below Water Table (EPA 2023)	Western Ridge (EPA 2023b)	Ministers North (BHP 2025d)	OB32 Below Water Table Creek Discharge		
Rostellularia adscendens var. *latifolia* (P3)	No impact	No impact	40 individuals	No impact	7,807 (138 populations)	Cumulative total of 40 individuals (0.5% of regional records) No further cumulative impact from the Proposal
Acacia bromilowiana (P4)	No impact	No impact	144 individuals	No impact	4,165[2] (34 populations)	Cumulative total of 144 individuals (3.5% of regional records) No further cumulative impact from the Proposal
Sida sp. Barlee Range (P4)	No impact	No impact	1,137 individuals	No impact	11,579[3] (98 populations)	Cumulative total of 1,137 individuals (9.8% of regional records) No further cumulative impact from the Proposal
Fauna habitats						
Ghost Bat Caves	No impact	Five Category 4 caves impacted	Three Category 4 caves impacted. An additional four caves with potential to be impacted (three Category 4 caves and one unsuitable).	No impact		Eight Category 4 caves impacted. Three Category 4 caves and one unsuitable for Ghost Bats will potentially to be impacted.

[2] Source EPA 2024e: Regional records of 4,551 (minus 452 individuals approved for impact), plus 66 recorded from current Derived Proposal targeted survey (Spectrum 2023)

[3] Source EPA 2024e: Regional records of 12,212 individuals from Brockman Syncline Proposal (minus 2,054 approved for impact), plus 1,421 from the current Derived Proposal targeted survey (Spectrum 2023)

Environmental value	Approved disturbance from previous BHP Derived Proposals			Extent to be disturbed by the Proposal	Extent at the State/regional level	Potential cumulative impact to the environmental value
	Orebody 32 Below Water Table (EPA 2023)	Western Ridge (EPA 2023b)	Ministers North (BHP 2025d)	OB32 Below Water Table Creek Discharge		
						No further cumulative impact from the Proposal
Western Pebble-mound Mouse mounds	No impact	72 mounds impacted	35 mounds impacted	No impact	3,536	Cumulative 107 mounds impacted (approx. 3% of regional mounds). No further cumulative impact from the Proposal
Waterbodies / surface water pools in and or near Development Envelope	No impact	Three temporary surface water pools impacted	No impact	Three ephemeral pools in Development Envelope, 3 downstream of Development Envelope in Homestead Creek.		Three temporary and six ephemeral pools potentially impacted
Critical habitat for Ghost Bat	No significant residual impact	2,534 ha	256.8 ha	No significant residual impact		Cumulative total of 2,790.8 ha No further cumulative impact from the Proposal
Supporting habitat for Ghost Bat	No significant residual impact	No significant residual impact	19.7 ha	No significant residual impact		Cumulative total of 19.7 ha No further cumulative impact from the Proposal
Critical habitat for Pilbara Olive Python	No significant residual impact	147 ha	99.6 ha	No significant residual impact		Cumulative total of 246.6 ha No further cumulative impact from the Proposal

Environmental value	Approved disturbance from previous BHP Derived Proposals			Extent to be disturbed by the Proposal	Extent at the State/regional level	Potential cumulative impact to the environmental value
	Orebody 32 Below Water Table (EPA 2023)	Western Ridge (EPA 2023b)	Ministers North (BHP 2025d)	OB32 Below Water Table Creek Discharge		
Supporting habitat for Pilbara Olive Python	No significant residual impact	No significant residual impact	78.7 ha	No significant residual impact		Cumulative total of 78.7 ha No further cumulative impact from the Proposal
Critical habitat for Northern Quoll	No significant residual impact	No significant residual impact	115.5 ha	No significant residual impact		Cumulative total of 115.5 ha No further cumulative impact from the Proposal
Supporting habitat for Northern Quoll	No significant residual impact	No significant residual impact	1,518 ha	No significant residual impact		Cumulative total of 1,518 ha No further cumulative impact from the Proposal



Legend

- OB32 BWT Creek Discharge Development Envelope
- Ministers North Derived Proposal
- Strategic Proposal Boundary
- Orebody 32 Below Water Table Derived Proposal
- Western Ridge Derived Proposal
- Conservation Area
- Townsite
- Major Roads
- Rail (BHP)

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KILOMETRES

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BHP

PUBLIC

OB32 BWT CREEK DISCHARGE DERIVED PROPOSAL

CUMULATIVE IMPACTS OF DERIVED PROPOSALS

WAIO PLANNING, TECHNICAL & ENVIRONMENT

SCALE @ A4:	1:2,600,000	REQUESTOR:	PROJECTS	FIGURE:	11-1
DATE:	5/09/2025	PREPARED:	GEOMATICS	NO:	A1079-130 RevA
		REVIEWED:			

Document Path: Y:\Jobs\A1001_A1500\A1079\3Project\A1079_130_OB32_DP_CumulativeImpacts_RevA.aprx

Table 11-2 Cumulative impacts by third parties within the vicinity of the Derived Proposal

Environmental value	Extent to be potentially disturbed			Extent to be disturbed by the Proposal	Current extent at the State/regional level	Potential cumulative impact to the environmental value
	Rio Tinto Hope Downs 2	BHP OB29/30/35 Significant Amendment	BHP Jimblebar Hub Significant Amendment			
Total Clearing (ha)	4,900	116	12,262	40		Cumulative total of 17,318 ha
Beard Vegetation Association 18 (ha)	3,067	0.16	0	28.19	671,843 ha	Cumulative total of 3095 ha
Beard Vegetation Association 82 (ha)	1,792				2,550,888 ha	Cumulative total of 1,792 ha
Beard Vegetation Association 29 (ha)	0	47	306.3	0	3,802,460 ha	Cumulative total of 353 ha No further cumulative impact from the Proposal
Beard Vegetation Association 216 (ha)	0	0	220.9	0		Cumulative total of 221 ha No further cumulative impact from the Proposal
Good to Excellent condition vegetation (ha)	4,205	104	1,864	39	-	Cumulative total of 6,212 ha
Riparian vegetation (ha)	54	1.23	52.6	<0.1	-	108 ha

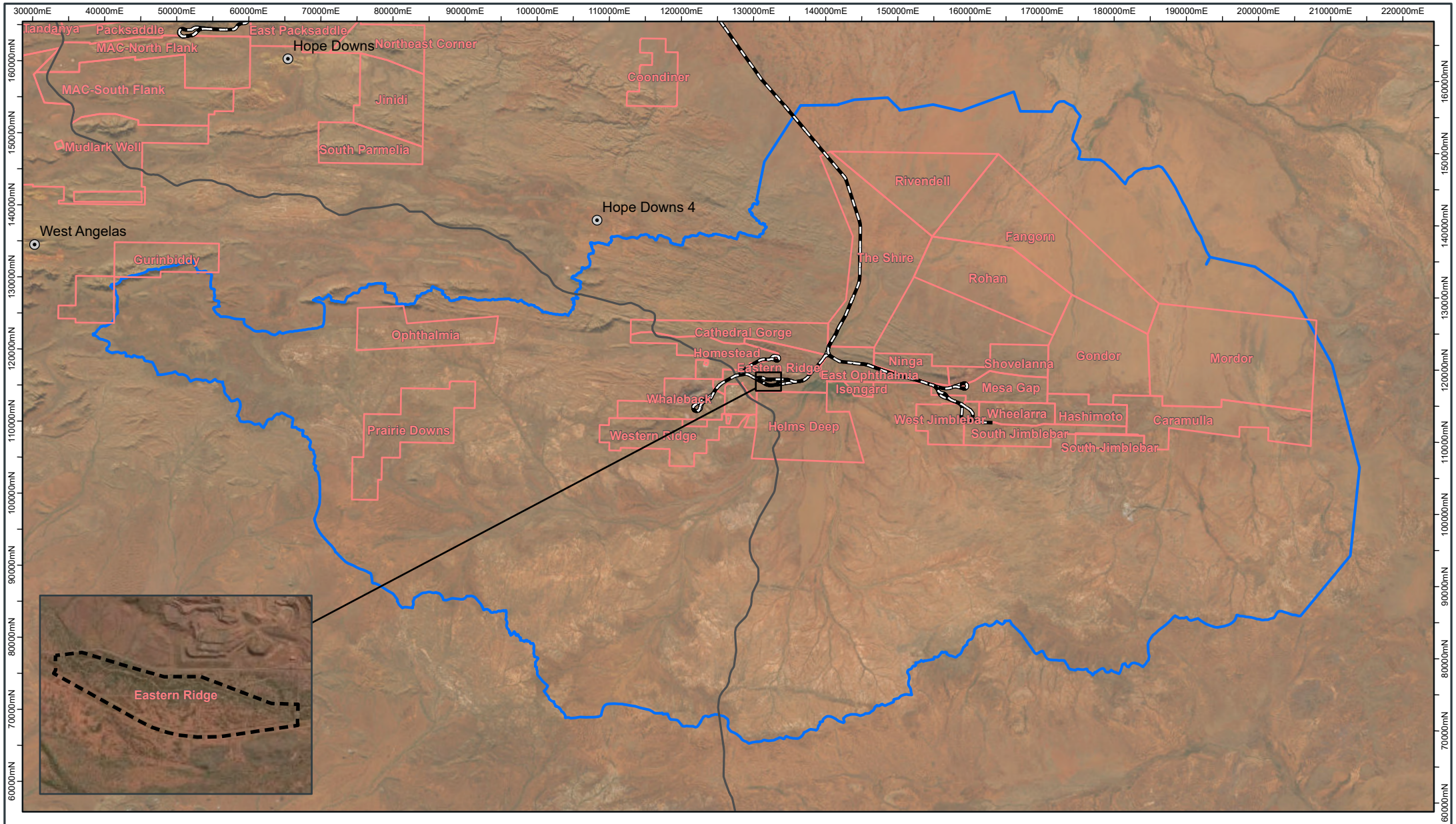
Environmental value	Extent to be potentially disturbed			Extent to be disturbed by the Proposal	Current extent at the State/regional level	Potential cumulative impact to the environmental value
	Rio Tinto Hope Downs 2	BHP OB29/30/35 Significant Amendment	BHP Jimblebar Hub Significant Amendment			
Significant flora in Development Envelope	Six Priority flora species	No records	Seven Priority flora species	No records		No further cumulative impact from the Proposal
Acacia bromilowiana (P4)	202 individuals	No impact	No impact	No impact	4,099 (34 populations)	Cumulative total of 202 individuals No further cumulative impact from the Proposal
Acacia corusca (P1)	No impact	No impact	95 individuals	No impact	No impact	Cumulative total of 95 individuals No further cumulative impact from the Proposal
Aristida jerichoensis var. subspinulifera (P3)	No impact	No impact	4 individuals	No impact	No impact	Cumulative total of 4 individuals No further cumulative impact from the Proposal
Aristida lazaridis (P3)	2,304 individuals	No impact	No impact	No impact	14,232 (93 populations)[5]	Cumulative total of 2,304 individuals No further cumulative impact from the Proposal
Eremophila capricornica (P1)	No impact	No impact	141 records	No impact	No impact	Cumulative total of 141 individuals No further cumulative impact from the Proposal

Environmental value	Extent to be potentially disturbed			Extent to be disturbed by the Proposal	Current extent at the State/regional level	Potential cumulative impact to the environmental value
	Rio Tinto Hope Downs 2	BHP OB29/30/35 Significant Amendment	BHP Jimblebar Hub Significant Amendment			
Euphorbia inappendiculate var. inappendiculate (P2)	No impact	No impact	1 record	No impact	No impact	Cumulative total of 1 individuals No further cumulative impact from the Proposal
Eremophila naaykensii (P3)	1,860	No impact	No impact	No impact	No impact	Cumulative total of 1,860 individuals No further cumulative impact from the Proposal
Eremophila sp. Werst Angelas	656	No impact	No impact	No impact	No impact	Cumulative total of 656 individuals No further cumulative impact from the Proposal
Grevillea saxicola	140	No impact	No impact	No impact	No impact	Cumulative total of 140 individuals No further cumulative impact from the Proposal
Hibiscus sp. Gurinbiddy Range	473	No impact	No impact	No impact	No impact	Cumulative total of 473 individuals No further cumulative impact from the Proposal
Rhagodia sp. Hamerlsey (P3)	93	No impact	145 records	No impact	No impact	Cumulative total of 238 individuals

Environmental value	Extent to be potentially disturbed			Extent to be disturbed by the Proposal	Current extent at the State/regional level	Potential cumulative impact to the environmental value
	Rio Tinto Hope Downs 2	BHP OB29/30/35 Significant Amendment	BHP Jimblebar Hub Significant Amendment			
						No further cumulative impact from the Proposal
Acacia bromilowiana (P4)	202 individuals	No impact	No impact	No impact	4,099[7] (34 populations)	Cumulative total of 202 individuals No further cumulative impact from the Proposal
Triodia sp Mt Ella (P3)	No impact	No impact	82 records	No impact		Cumulative total of 82 individuals No further cumulative impact from the Proposal
Vittadinja sp. Coondewanna	No impact	No impact	1 record	No impact		Cumulative total of 1 individual No further cumulative impact from the Proposal
Significant Terrestrial Fauna in Development Envelope	Ghost Bat Northern Quoll Pilbara leaf nosed bat	Ghost bat Western Pebble Mound Mouse	Ghost Bat Northern Quoll Western Pebble Mound Mouse (P4) Brush tailed Mulgara (P4) Spotted Ctenotus (P2)	No records		No further cumulative impact from the Proposal

Environmental value	Extent to be potentially disturbed			Extent to be disturbed by the Proposal	Current extent at the State/regional level	Potential cumulative impact to the environmental value
	Rio Tinto Hope Downs 2	BHP OB29/30/35 Significant Amendment	BHP Jimblebar Hub Significant Amendment			
Significant Fauna Habitat in Development Envelope						
Ghost Bat Caves	One Category 2, One Category 3 and Two Category 4 cave	Two Category 4 caves	Three Category 3, Nine Category 4 caves	No impact		Cumulative four Category 4 caves and one Category 3 cave impacted. A further four caves with potential to be impacted
Western Pebble-mound mouse mounds	1 mound	1 mound	57 mounds	No impact	3,536	Cumulative 59 mounds impacted No further cumulative impact from the Proposal
Waterbodies/surface water pools in and or near Development Envelope	No impact	No records	Innawally Pool 9 ephemeral pools in Development Envelope,	Three ephemeral pools in Development Envelope, 3 downstream of Development Envelope in Homestead Creek.		1 permanent pool, 15 ephemeral pools
Critical habitat	105 ha for Northern Quoll, Ghost Bat and Pilbara Olive Python (Hamersley HMS 2023)	14 ha of critical foraging habitat for Ghost Bat	814 ha of critical foraging habitat for Ghost Bat	No impact		No further cumulative impact from the Proposal
Supporting habitat	2,659 ha for Northern Quoll, Ghost Bat and			No impact	-	No further cumulative impact from the Proposal

Environmental value	Extent to be potentially disturbed			Extent to be disturbed by the Proposal	Current extent at the State/regional level	Potential cumulative impact to the environmental value
	Rio Tinto Hope Downs 2	BHP OB29/30/35 Significant Amendment	BHP Jimblebar Hub Significant Amendment			
	Pilbara Olive Python (Hamersley HMS 2023)					



Legend

- Other Mining Operations
- Rail (BHP)
- Major Roads
- Projects
- WAIO Eastern Catchment
- OB32 BWT Creek Discharge Development Envelope

BHP

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OB32 BWT CREEK DISCHARGE
CUMULATIVE IMPACTS WITH NEARBY OPERATIONS

WAIO PLANNING, TECHNICAL AND ENVIRONMENT

SCALE @ A3:	1:699,403	REQUESTOR:	ENVIRONMENT	FIGURE:	11-2
DATE:	8/09/2025	PREPARED:	GEOMATICS	NO:	A1079_131A
		REVIEWED:			

Document Path: Y:\Jobs\A1001_A1500\A1079\3Project\A1079_131_OB32_DP_CumulativeImpactsNearbyOperations_RevA.aprx\A1079_131_OB32_DP_CumulativeImpactsNearbyOperations_RevA

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Appendices

Appendix 1 Proposal Content Document

Appendix 2 BHP Derived Proposals and Clearing Extents

Declared Derived Proposal title	Derived Proposal number	Derived Proposal declaration Date	Derived Proposal clearing extent (ha)	Cumulative clearing extent (ha)	Remaining clearing extent ha (against BHP approved clearing extent under MS1105 of 98,500 ha)
Orebody 32 Below Water Table	1	27 September 2023	224	224	98,276
Western Ridge	2	27 September 2023	4,281	4,505	93,995
Ministers North	3	TBC	1,848	6,353	92,147
Orebody 32 Below Water Table Creek Discharge	4	TBC	40	6,393	92,107

Appendix 3 Orebody 25 Pit 3 Homestead Creek Management at Closure (Homestead Creek flood study)

Appendix 4 Wetting Front Studies

Appendix 5 NEBO OB25 West Targeted Vertebrate Fauna Survey and Eastern Ridge OB25 West Additional Targeted Vertebrate Fauna Survey

Appendix 6 Homestead Creek and Fortescue River Aquatic Fauna Surveys

Appendix 7 Orebody 32 Below Water Table Groundwater EIA

Appendix 8 Orebody 32 Below Water Table Groundwater Monitoring Data

Appendix 9 Orebody 32 Surplus Water Study: DPS Infiltration Study

Appendix 10 Orebody 32 Aeration Ponds Preliminary Design Summary

Appendix 11 Orebody 32 BWT Creek Discharge Water Environmental Management Plan

Appendix 12 Eastern Ridge Mine Closure Plan

Appendix 13 Orebody 32 Surplus Water and Homestead Creek Wetting Front Detailed Flora and Vegetation Assessment

Appendix 14 Orebody 32 Settlement Ponds Flora and Vegetation Survey

Appendix 15 Orebody 32 BWT Creek Discharge Flora and Vegetation Environmental Management Plan

Appendix 16 Orebody 32 Surplus Water Targeted MNES Vertebrate Fauna Survey

Appendix 17 Impact Reconciliation Procedure

Appendix 18 KNAC Social Surrounding Recommendations

Appendix 19 IBSA Data Package

Appendix 20 Proposed content for Section 38E(6) and Section 45B notices

NOTICE OF SECTION 38E DECLARATION
THAT PROPOSAL IS A DERIVED PROPOSAL
(Section 38E(6) of the Environmental Protection Act 1986)

Schedule 1 - Description of Derived Proposal

Derived Proposal: Orebody 32 Below Water Table Creek Discharge

Proponent: BHP Iron Ore Pty Ltd (ACN) 008 700 981

Proponent Address: 125 St Georges Tce PERTH WA 6000

Description of the Derived Proposal: As detailed in Tables 1 and 2 and Figures 1 and 2

Table 1: General proposal description

Proposal title	Orebody 32 Below Water Table Creek Discharge
Proponent name	BHP Iron Ore Pty Ltd
Short description	The Proposal is a Derived Proposal for the expansion of existing mining operations at Newman (Figure 1), authorised by the Pilbara Expansion Strategic Proposal, Ministerial Statement 1105. The Proposal includes the construction of a creek discharge at Homestead Creek to manage up to 60 ML/d of surplus water from the OB32 Below water table iron ore mine (OB32 BWT) (authorised by the OB32 BWT Proposal, Ministerial Statement 1105) in BHP's Newman Hub (Eastern Ridge). The Proposal is located approximately 3.6 kilometres (km) northeast of Newman (Figure 2). The proposed management of surplus water and creek discharge is consistent with the associated activity and operations described in activity (xix) of Table 3 of Schedule 1 in Ministerial Statement 1105 which includes. • Activity (xix): Water Supply, water disturbance, water use, water storage, water treatment, drainage and stormwater management and water discharge and water reinjection.

Table 2: Authorised extent of proposal elements

Proposal element	Location and description	Maximum extent, capacity or range
Physical elements		
Infrastructure elements: Homestead Creek discharge infrastructure and aeration ponds	Appendix 1 - Figure 1-3	Disturbance footprint of up to 40 ha within an Indicative Footprint of 50 ha, and Development Envelope of 174 ha. A short offtake from the existing OB32 BWT surplus water pipeline, and a discharge outlet to Homestead Creek. Aeration ponds to be constructed, if required, to prevent persistent calcium carbonate precipitation forming in Homestead Creek.
Operational elements		

Proposal element	Location and description	Maximum extent, capacity or range
Management of surplus water to Homestead Creek	Appendix 3 - Figure 5-2	Continuous discharge of up to 60 ML/day to Homestead Creek for a maximum of 9 months per year (270 days). The creek discharge will cease for 3 consecutive months per year during the dry season. This will result in a maximum of 16.2 GL/a being discharged to Homestead Creek.
Aeration pond capacity	Appendix 10 - Figure 5-2	Aeration pond capacity of 240 ML Two parallel pond systems each rated at 30 ML/day to provide a residence time of 4 days (4 days x 60 ML/day = 240 ML)
Greenhouse Gas Emissions		
Peak annual average		
Scope 1	Diesel consumption during civil works, earthworks and clearing of vegetation	5,036 tCO_2-e per annum (2028)
Scope 2	N/A	N/A
Total (based on average Scope 1)		5,036 tCO_2-e per annum (2028)
Commissioning		
Commissioning of the Homestead Creek discharge is to be undertaken subject to operational limits of Ophthalmia Dam and dewatering activities at BHP Newman Operations including OB32 BWT.		
Rehabilitation and closure		
Undertake progressive rehabilitation following BHP's closure principles. Following the closure of OB32 BWT, the creek discharge infrastructure will be decommissioned and removed, closure earthworks completed, and a natural and stable surface for creek health will be reinstated. BHP aims to restore land with native vegetation that is naturally self-sustaining. The aeration ponds will be dewatered and remaining sediment will be removed and encapsulated within an overburden storage area (OSA) or interim storage area (ISA). The ponds will be backfilled using embankment material and / or material from the flood bund. The flood bund will be pushed down to reinstate natural surface water drainage lines and the remaining footprint will be profiled and rehabilitated using standard surface treatments The Eastern Ridge Mine Closure Plan has been revised to include the Proposal and is included with the referral.		
Other elements which affect the extent of the environment		
Proposal time Financial Year 2027	Maximum project life 50 years	While OB32 BWT mining occurs – estimated project life of 50 years

Figure 1: Proposal location in relation to the Strategic Proposal

Figure 2: Proposal Development Envelope

NOTICE OF TAKING EFFECT OF STRATEGIC PROPOSAL STATEMENT IN RELATION TO DERIVED PROPOSAL (Section 45B(2) of the *Environmental Protection Act 1986*)

Strategic Proposal: Pilbara Expansion Strategic Proposal

Strategic Proposal Statement No: Ministerial Statement 1105 published on 11 July 2019

Derived Proposal: Orebody 32 Below Water Table Creek Discharge

Proponent: BHP Iron Ore Pty Ltd (ACN) 008 700 981

Having received written notice on XX MMM YYYY under section 38E(6)(b) of the Act that the Environmental Protection Authority has declared the above proposal a Derived Proposal, I hereby give notice pursuant to section 45B(2) of the Act, that:

1. The implementation agreement previously made in relation to the Derived Proposal has taken effect on XX MMM YYYY.

2. The following implementation conditions in Statement No. 1105 dated 11 July 2019 apply to this Derived Proposal subject to any changes made pursuant to section 45C or 46 of the *Environmental Protection Act 1986*:

    - 1 Derived Proposals
    - 2 Contact Details
    - 3 Time Limit for Substantial Commencement
    - 4 Compliance Reporting
    - 5 Public Availability of Data
    - 6 Condition Environmental Management Plans
    - 7 Condition Flora and Vegetation Environmental Management Plan
    - 10 Water Environmental Management Plan
    - 15 Mine Closure Plan
    - 16 Offsets

Schedule 1 - Description of Derived Proposal

Content as for s38E Notice