

Jimblebar Hub Significant Amendment: Response to Submissions

Table 1: Response to EPAS Comments, dated 11 April 2025

Comment number	EPA Services Comments	Proponent Response
Flora and Vegetation		
1.	Impacts to priority flora at the state level have not been provided in Table 8-7. Actions: To ensure an adequate quantitative impact assessment on priority flora, undertake a review of all available online databases and spatial tools to provide the statewide data of priority flora which have been recorded or are likely to occur within the development envelope. Provide impacts to priority flora at the state level.	In Table 8-7 of the ERD, BHP provides known populations and records of Priority flora based on BHP data in addition to publicly available information such as the DBCA records from the Pilbara and Gascoyne regions. Data is provided from these regions as it represents the regional population and predicted impact in the regional context. No further data is provided for the following four Priority flora species given their known distributions are limited to the Pilbara and Gascoyne regions. These are: <i>Acacia corusca</i> - only occurs in the Pilbara <i>Eremophila capricornica</i> - only occurs in Pilbara and Gascoyne <i>Rhagodia</i> sp Hamersley - only occurs in Pilbara and Gascoyne regions <i>Vittadinia</i> sp. Coondewanna Flats - only occurs in the Pilbara For the remaining three Priority flora species, the distributions extend outside of the Pilbara and Gascoyne IBRA regions. These are described below. The predicted impacts of the Combined Proposal on the known records using both BHP and DBCA data (as provided in Table 8-7 of the ERD) for the Gascoyne and Pilbara regions are as follows: <i>Aristida jerichoensis</i> var. <i>Subspinulifer</i> occurs in Pilbara, Gascoyne, Murchison and Central Ranges – 2.1% <i>Euphorbia inappendiculata</i> var. <i>Inappendiculata</i> is known from the Hamersley subregion of the Pilbara and west of Halls Creek in the Kimberley in the Central Kimberley – 0% <i>Triodia</i> sp Mt Ella occurs in Gascoyne, Pilbara and Little Sandy Desert – 1.5%

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		No further information is provided as the predicted impacts are low and representative of regional impact. Note for additional information, Attachment 4 Figure 3 provides historical survey coverage.
2.	Rehabilitation and closure for MS1126, MS439 (as amended by MS1012) and MS1021. Actions: - Discuss commitments relating to undertaking rehabilitation and closure for MS1126, MS 439 (as amended by MS 1012) and MS 1021, such as annual rehabilitation rates, contouring/profiling of waste dump landforms to mimic the surrounding landscape, backfilling of pits, completion criteria any other outcomes. - Detail and describe the rehabilitation process and outcomes to date relating to the current operations, including but not limited to: date of commencement, anticipated closure date, hectares cleared, hectares rehabilitated and success of rehabilitation.	Annual rehabilitation rates are determined each year and vary depending on the mine plan and areas available. In Financial Year (FY) 2024, rehabilitation monitoring across WAIO was compared against the ecological completion criteria for the first time. Remote sensing and on-ground flora surveys will be used to assess rehabilitation performance against the progressive and completion ecological criteria each year. Section 7.3.8 in the FY2024 Annual Environment Report (AER) details the rehabilitation results for Jimblebar hub. The next round of rehabilitation monitoring at the Jimblebar Hub will be in FY2026. The total number of Jimblebar Hub hectares cleared and hectares rehabilitated can be located in the FY2024 AER under each Ministerial Statement number in Section 3. BHP is currently looking at geomorphic concept designs at Eastern Ridge OB23 Overburden Storage Area (OSA) and at Mining Area C (MAC). BHP is currently assessing suitable OSAs at Jimblebar for geomorphic landform design.
3.	Cumulative impacts of the proposal with known and reasonably foreseeable activities for priority flora and significant vegetation associations has not been quantified. Actions: Provide a quantification of the cumulative impacts (i.e. of the proposal with known and reasonably foreseeable activities within nominal 100 km) for priority flora and significant vegetation associations.	Only three of the Priority flora species recorded within the Jimblebar Indicative Footprint and which are proposed to be impacted, also occur within the Indicative Footprints across other known/recently approved BHP proposals and foreseeable BHP activities in the Eastern Pilbara. The following Table identifies these species and the combined predicted extent of impact from Orebody 29/30/35 Significant Amendment (under assessment), Orebody 32 Below Water Table and Western Ridge. Note that the known records identified below are the same as the known records provided in Table 8-7 of the ERD and includes both BHP records and records from DBCA databases in the Pilbara and Gascoyne.

Comment number	EPA Services Comments	Proponent Response				
		Species	Known records within Pilbara and Gascoyne based on BHP and DBCA databases	Predicted impact from Jimblebar Significant Amendment (records)	Predicted cumulative impact (records)	Predicted impact from Proposal as % of cumulative impact
		<i>Eremophila carpriconica</i>	1,185	93	245	37%
		<i>Rhagodia</i> sp. Hamersley 9M. Trudgen 17794)	1,670	22	72	30%
		<i>Triodia</i> sp. Mt Ella (M. E. Trudgen 12739)	472	14	14	100%
Terrestrial Fauna						
4.	The proponent states ‘While unlikely, it should be noted that there is the potential for direct impacts to the caves within the proposed Development Envelope’. Table 9-4 of the ERD shows that 10 caves were previously assessed for MS1126, however the proponent states ‘Twelve cave structures have been mapped within the proposed Development Envelope, 10 of which are located within the Additional Areas.’ Action: - Provide a worst-case scenario for any ghost bat caves which may be directly or indirectly impacted by the proposal, taking into consideration combined effects. - Confirm which caves were assessed under MS1126, MS439 (as amended by MS1012) and MS1021, and which caves have not been previously assessed.	BHP has applied buffers to 11 Ghost Bat caves. One further cave (Category 4, CJIM-04) is outside of the Indicative Footprint and unlikely to be directly impacted. In the event that the Indicative Footprint changes, this Category 4 Ghost Bat cave with no evidence of use, has the potential to be impacted. Table 9-4 of the ERD identifies the distance of Ghost Bat caves from previously assessed areas or footprint. It does not state that caves were previously assessed. For the Jimblebar Optimisation Project approved under MS1126, BHP assessed potential impacts to two potential day roosts within the Development Envelope. One of these is an adit located with an opening considered too small to allow Ghost Bats to enter (and has since been cleared); and the other was a CJIM-20, a shallow cave located on the upper slopes of a Hillside. Neither had evidence of use at the time of the assessment. In addition, BHP identified five Category 4 caves north of the former Development Envelope including CJIM-04, CJIM-05, CJIM-06, CJIM-07 and CJIM-08. The two caves south of the former Development Envelope were then known as SC1 and SC2 and are now identified as CJIM-01 and CJIM-03, respectively. CJIM-01 is a Category 4 cave and CJIM-03 is a Category 2 cave.				

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		All of these caves are labelled on Figure 9-4 of the ERD. Cave categories are provided in Attachment 1, Table 1. A map showing updated buffers is provided in Attachment 1, Figure 1.
5.	The ERD refers to records of the Spotted Ctenotus (<i>Ctenotus uber</i> subsp. <i>johnstonei</i>) P2 which all occur within the approved proposal areas, with no records known from within the significant amendment of the proposed development envelope. Although not recorded in the proposed development envelope, clearing of the species habitat (including stone, sand and hard plain habitat types) will occur as part of the significant amendment. Action: Atlas of Living Australia shows this species as occurring approximately 800 km northwest of Newman, indicating a possibly new (undescribed) species. Confirm if the Spotted Ctenotus (<i>Ctenotus uber</i> subsp. <i>johnstonei</i>) P2 occurs within the development envelope or is a new (undescribed) species. If the species is a new species, quantify the direct and indirect impacts to the species and its habitat, taking into consideration combined effects and cumulative impacts	Note that all records of the Spotted Ctenotus occur within the existing approved Development Envelope and do not occur within proposed additional areas relevant to the Jimblebar Significant Amendment. The records are presumed to be the Priority 2 Ctenotus <i>uber</i> subsp. <i>Johnstonei</i> as a precautionary measure (Biologic 2019). Biologic (2025a) noted that recent communication with the WA Museum stated that the taxonomic status of the disjunct Pilbara population of the Spotted Ctenotus is unknown and may represent an undescribed taxon (P. Doughty, Western Australian Museum, pers. comm.).
6.	Cumulative impacts of the proposal with known and reasonably foreseeable activities for significant fauna species has not been quantified. Action: Quantify the cumulative impacts (i.e. of the proposal with known and reasonably foreseeable activities within nominal 100 km) for critical and supporting habitats for BC Act listed species, and significant features such as pools and caves.	The following table provides the cumulative mapped extent of fauna habitat types and habitat features within Indicative Footprints across recently approved BHP projects and foreseeable BHP projects in the Eastern Pilbara, including Mt Whaleback (commenced in 1968 and subsequently approved under NVCP; habitats provided here reflect extents within the NVCP 5617), Eastern Ridge (first commenced in 1988, most recently revised in 2016), Western Ridge and Orebody 32 Below Water Table (both approved in 2023), Orebody 29/30/35 Significant Amendment (under assessment), and Orebody 32 Creek discharge (future). Note that for caves and surface water pools, the numbers below reflect the numbers within Indicative Footprints. This number is an estimate only, given the age of the Mt Whaleback mine (commenced in 1968) and limited available information about historical impact. Not all caves and surface water pools within Indicative Footprints will be impacted as BHP has committed to applying buffers to multiple caves and pools across its operational areas.

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		Fauna habitat	Predicted cumulative impact	Predicted impact from the Proposal (ha)	Predicted impact from the Proposal as % of predicted cumulative impact
		Breakaway/Cliff	53	2.5	4%
		Claypan	0.02	0	0%
		Drainage Area/Floodplain	1,375	269.1	19%
		Gorge/Gully	136.3	7.6	5%
		Hardpan Plain	4.1	0.8	19%
		Hillcrest/Hillslope	5,551.8	1,067.1	19%
		Major Drainage Line	174.8	15.9	9%
		Medium Drainage Line	0.14	0	0%
		Minor Drainage Line	161.06	24.7	15%
		Mulga Woodland	1,359.7	492.9	36%
		Sand Plain	537.2	24.4	4%
		Sandy/Stony Plain	4.07	0	0%
		Stony Plain	1,702.5	16.9	0.9%
		Undulating Low Hills	372.7	0	0%
		Degraded/Cleared	4,024	145.1	3%
		Caves	21	0	0%
		Surface water pools	4	0	0%

Comment number	EPA Services Comments	Proponent Response
Inland Waters		
7.	The ERD and Jimblebar Hub In-pit TSF impact assessment (Version 0 date 17/01/2025) discusses the short-term In-pit TSF options as Orebody (OB) 18 De Grey and OB17 Swan pits. The detailed studies undertaken indicate that the OB17 Swan and OB18 De Grey pits will provide sufficient storage for approximately 4 years of initial (continuous) tailings deposition followed by eight short term “top ups” for an additional 16 years (WSP 2024a). The scope of the modelling and assessment appears limited to short-term options only. Action: Discuss the process and timeframes for undertaking the relevant hydrogeological investigations (including how the results and outcomes from the initial (short-term) options investigations and modelling will be used), to assess the potential impacts of the long-term in-pit tailings storage facility (TSF) options on water-related environmental values.	Similar detailed investigations and studies to those undertaken to support the initial (short-term) tailings strategy will be undertaken prior to implementation of any of the long term tailings storage options. For a discussion of the long term strategy and potential risks (including how the results of the initial studies have been considered), see Section 8.2 of the <i>Jimblebar Hub In-pit TSF impact assessment</i> (BHP 2025) provided in Appendix 4 of the ERD (Version 2). Investigations and studies for the long-term options will be consistent with secondary approval requirements, including <i>Environmental Protection Act 1986</i> (EP Act) Part V, and will be submitted to the Department of Water and Environmental Regulation (DWER) as part of the works approval application/s and licence amendment/s. Since the <i>Jimblebar Hub In-pit TSF impact assessment</i> was provided to DWER in January 2025, the <i>In-Pit Tailings Storage Facility – Design Report</i> (Design Report) (WSP 2025) has been compiled which summarises the in-pit TSF studies undertaken and includes the technical studies as appendices. See the Design Report, Section 5 and Appendix E Deposition Modelling Outputs for deposition modelling, in Attachment 2.
8.	A waste characterisation report, which outlines the geochemical and geophysical properties of the waste rock to be intersected during operations has not been provided. Previous Department of Energy, Mines, Industry Regulation and Safety (DEMIRS) advice has stated that without the waste characterisation report, the proposed management measures to mitigate erosion, exposure of acid sulfate soils and contamination cannot be determined sufficient to achieve the environmental objectives relating to inland waters, and closure and rehabilitation and minimise impacts to sensitive environmental receptors. Furthermore, DEMIRS noted that adequate baseline waste characterisation data has not been provided, nor a waste rock dump design.	Waste characterisation <i>Jimblebar VD12 Variation: Results of geotechnical and geochemical test work on tailings composite samples</i> (Golder 2022b) is referenced in the MCP and was provided as a technical reference included with referral document. This document summarises the outcomes of test work undertaken on Jimblebar metallurgical tailings samples and supernatant, with a focus on determining geotechnical properties, mineralogy, AMD potential and elemental enrichment and release under various leaching conditions. The <i>Jimblebar AMD Risk Assessment</i> (BHP 2022i) is summarised in the MCP and was provided as a technical reference included with the referral document; this document summarises the outcomes of the geochemical assessment of mined materials for the Jimblebar and OB31 deposits, coupled with local/regional hydrological/hydrogeological and environmental receptors to derive a Source-Pathway-Receptor risk profile.

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	Action: - Provide a waste characterisation report, outlining the geochemical and geophysical properties of the waste rock to be intersected during operations. - Waste Rock Dump (WRD) designs need to be presented, which consider and address the risks associated with potentially acid forming (PAF) and dispersive material exposure. - Inclusion of perimeter bunding and sediment traps around these overburden storage areas (OSAs) need to be considered and discussed.	Waste Rock Dump (Overburden Storage Area) designs BHP refers to waste rock landforms as Overburden Storage Areas (OSAs), rather than Waste Rock Dumps. The <i>Reactive Ground and AMD Potential: Mining Design and Dumping Technical Process Instruction</i> (WAIO 2021) is referenced in the MCP and provides OSA designs which consider and address the risks associated with PAF materials. The <i>Mines Closure Design Guidance Technical Process Instruction</i> (WAIO 2022f) is referenced in the MCP and provides guidance for managing dispersive material in OSAs (WRDs). Mine planning conceptual (final) OSA designs are presented in the MCP, which consider bunding and measures to minimise erosion and sedimentation (see Section 9.2.2 OSAs and ISAs).
9.	The proponent has presented a position that the OB17 Swan and OB18 De Grey in-pit TSFs pose a low risk to groundwater quality at key water sources, including the Warrawandu potable borefield and Newman Water Reserve. Action: Noting the comments above on waste characterisation and identified knowledge gaps in short-term and long-term in-pit TSF options, provide additional information and rationale including: - Detail and describe the rationale and justification informing the determination of this level of risk to regional water supply sources. - Discuss measures to manage the risk of overtopping at Ophthalmia Dam to protect surface water regimes.	Rational and justification for risk assessment Further detail on the risk assessment (including the risk to water resources) is provided in <i>Conceptual Exposure Model: Definition Phase Study, Jimblebar Beneficiation Project</i> (WSP 2025c), referenced in the <i>Jimblebar Hub In-pit TSF impact assessment</i> (BHP 2025). BHP has provided this report in Attachment 2 of this Response to Submissions document (WSP (2025), Appendix O Conceptual Exposure Model). A summary of the rationale and justification is also provided below: Groundwater quality (affected by in-pit TSF seepage) was estimated at the OB31 dewatering bores. These estimates had significant conservatism built into them to ensure that worst-case water qualities were assessed. These included: - No solute transport modelling simulating the flow path between the in-pit TSF and OB31 (i.e. no advection, diffusion or dispersion). - High case seepage (quantity) was included as an uncertainty case. 100% of seepage from De Grey was assumed to enter the regional groundwater system in the modelling. This was then able to flow towards OB31. This is very unlikely. - Further dilution in surface water / groundwater in the vicinity of the receptors was not considered (i.e. in the case of discharge to the dam, the OB31 water would be mixed with significant amounts of other surplus water discharges and rainfall runoff, before then infiltrating into the groundwater system and being diluted again) Even with these conservatisms, based on the relevant guideline values, the estimated water quality in the groundwater at OB31 presents very little risk to the receptors.

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		Risk of overtopping at Ophthalmia Dam The risk of overtopping at Ophthalmia Dam is related to surplus water discharge, not in-pit TSFs – see response to Comment 20 in Table 2: Response to Public Submissions.
10.	The proponent has outlined studies used to inform the design of post-mining landforms, but not the erosion controls that would be applied. Action Specific erosion controls should be committed to as previously recommended to provide confidence that sediment loading is appropriately managed.	BHP has presented erosional studies and materials characterisation studies in section 5.3 of the MCP which has been used to determine OSA design criteria, including erosion controls. These are also discussed in Completion Criteria 3.4 in Table 8-1 of the MCP. Mine planning conceptual (final) OSA designs are presented in the MCP, which consider bunding and measures to minimise erosion and sedimentation (see Section 9.2.2 OSAs and ISAs). See also response to Table 1: EPA Services Comment 8.
11.	The significant amendment proposal includes the implementation of a new beneficiation plant at Jimblebar to remove alumina and silica from the fines and construction of in-pit storage of tailings generated by the Jimblebar beneficiation plant in the OB17/18 Swan and De Grey Pits. Noting these new proposed activities, the project's water quality risk profile has changed with the potential to exceed a number of water quality screening guideline values. Previous project related Environmental Management Plans (EMP's) and secondary approvals (Part V of the EP Act and Rights in Water and Irrigation Act 1914 (RiWI Act) have focused on risk pathways and associated management provisions (i.e. monitoring of salinity and site-specific trigger values (SSTVs) relevant to approved activities) which may now be inadequate and require amendments and/or updates to ensure changes in water quality are monitored and appropriate trigger/threshold values are applied for all relevant water quality parameters. Action Detail and describe the process and rationale for selecting appropriate SSTVs that are	As discussed in Section 7.4.4 of the <i>Jimblebar Hub In-pit TSF impact assessment</i> (BHP 2025), BHP recently revised the Jimblebar and Shovelanna (representative of the OB17/OB18/OB31 Brockman orebody aquifer) SSTVs. The revised SSTVs are included in the updated RiWI Act <i>GWL Operating Strategy for Jimblebar</i> (GWOS) (Version 5.0) for GWL158795(11) submitted to DWER in February 2025. The revised SSTVs are based on reviews undertaken in 2022 and 2023 respectively (Hydro Geochem Group 2022, Hydro Geochem Group 2023), which are included in Appendix G of the GWOS and contain the detail regarding the development of the Jimblebar and Shovelanna SSTVs. A 95th percentile (P₉₅) background threshold value (BTV) was developed for the Shovelanna SSTVs. Note that with a BTV based on the 95th percentile one could expect 1/20 (i.e. 5%) random samples that are representative of background conditions to exceed an SSTV, whilst use of an 80th percentile would lead to 1/5 (i.e.20%) samples of a background population exceeding the SSTV. Therefore, the 95th percentile provides a more realistic upper limit on the chemistry of the groundwater at OB31, to ensure environmental outcomes can be met. The Shovelanna SSTVs were deemed suitable for the TSF assessment to screen against modelled in-pit TSF seepage quality relative to background chemistry as the SSTVs represent the P₉₅ (95th percentile) background value in the Brockman orebody aquifer at OB31. SSTVs are intended to protect relevant environmental values and beneficial use of groundwater, while considering background concentrations. Reported concentrations below SSTVs indicate hydrochemistry is within acceptable site specific groundwater quality while exceedances trigger further investigation. Exceedances of SSTVs, identified trends and any investigations are reported by BHP in RiWI Act Annual Aquifer Reviews and EP Act Annual Environmental Reports.

Comment number	EPA Services Comments	Proponent Response
	scientifically robust and appropriate to ensure environmental outcomes can be met.	
Subterranean Fauna		
12.	Studies indicate that the beneficiation process may result in elevated concentrations of some analytes (Total Dissolved Solutions (TDS), barium and alkalinity) in groundwater beneath the OB17 Swan and OB18 De Grey in-pit TSFs and migrate along the pathway to OB31 and subsequently captured in the OB31 dewatering wells. The predictions indicate that with dilution, the concentrations of three analytes (TDS, barium and alkalinity) in the OB31 dewatering water may exceed guideline values (BHP 2025). Furthermore, based on a preliminary review of the most recent monitoring report for the Ethel Gorge Stygobiont Threatened Ecological Community (TEC) (Appendix 14.6), there may be parameters that should be monitored and have trigger and threshold criteria e.g. metals such as barium and boron (p. iv), and that could be suitable for inclusion in the project's EMPs. The scope of the Eastern Pilbara Water Resource Management Plan (EPWRMP) focuses on the management of water-related activities that have the potential to impact the Ethel Gorge TEC) and the Fortescue River. The EPWRMP includes a trigger and threshold for groundwater salinity (TDS) in the Ethel Gorge aquifer, however does not consider the full suite of water quality parameters that have been determined to potentially exceed guideline values. In addition to salinity, the full suite of water quality parameters and relevant trigger/threshold criteria that need to be included into the monitoring provisions of the EPWRMP to ensure impact pathways (i.e. Inpit-TSF seepage and mine dewater discharge to Ophthalmia Dam) are identified and addressed. Action	The EPWRMP contains criteria related to groundwater salinity (as TDS) as water balance modelling predicted that groundwater salinity in the Ethel Gorge aquifer may increase as a result evapo-concentration of surplus water discharged into Ophthalmia Dam and investigations. As discussed in 7.4.6 of the <i>Jimblebar Hub In-pit TSF impact assessment</i> (BHP 2025 – provided with responses to comments and the revised ERD (version 2) submitted in January 2025), the predicted concentrations of TDS, barium and alkalinity exceeded one of the guideline values (Shovelanna SSTV or ADWG value) but not both, and the exceedances were minor. As discussed in Section 7.5, the background concentrations of all three analytes in the natural groundwater at OB31 are either close to exceeding one of the guidelines (Barium in the case of the SSTVs) or already exceeding (TDS and Alkalinity in the case of the ADWGs). Therefore, there is no justification to add criteria for alkalinity or barium to the EPWRMP. As requested however, BHP has provided further justification relating to the parameters referred to in the comment. <i>Alkalinity</i> Predicted alkalinity from the OB17 Swan and OB18 De Grey modelling was elevated against the Drinking Water Guidelines: Health (ADWG, 2011). There are no SSTVs for this analyte. The guideline alkalinity value is 200 mg/L as CaCO₃ (Figure 1-1). The maximum predicted value at the OB31 dewatering wells, from all model runs, is 210 mg/L (Figure 1-1). This is generally at the start of the simulation (before significant amounts of seepage reach the wells). The measured alkalinity data for relevant groundwaters is also shown in Figure 1-1 of this response document (following Table 1), including groundwater at the Ethel Gorge TEC, Jimblebar and OB31. This shows that the predicted alkalinity is elevated slightly in respect to the guideline value, but much lower than the background value in the TEC (as well as Jimblebar and OB31). <i>Barium</i> The historical Barium concentrations for relevant groundwaters are shown in Figure 1-2 of this response document. This shows that both the best estimate (0.035 mg/L) and highest (0.054 mg/L) predictions for Barium concentrations at the OB31 dewatering wells are within historical variability at the Ethel Gorge TEC. Given the predicted values, and the lower concentrations of Barium at Jimblebar, the mixing of these waters at

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	Discuss the additional parameters listed above and provide clarification as to whether the EPWRMP will be amended to provide for monitoring and management protocols to ensure the Ethel Gorge Stygobiont TEC ecological function is maintained.	Ophthalmia Dam is very unlikely to result in concentrations of Barium in the TEC outside these historical observations. The same is true even without this mixing. <i>Other analytes</i> All other analytes (other than TDS), including Boron, are predicted to remain within background groundwater concentrations. While there is currently no justification for adding criteria to the EPWRMP for other parameters, BHP will continue to monitor and report on these (and other parameters). As outlined in the EPWRMP (Table 5), the parameters in the Laboratory Standard hydrochemistry suite (which include alkalinity, barium and boron) are monitored biannually in groundwater in the Ethel Gorge TEC and reported on annually as part of Ethel Gorge TEC stygofauna monitoring program. Consistent with the results of previous monitoring rounds, the preliminary results from the 2023/2024 stygofauna monitoring indicate that salinity, alkalinity, barium and boron measurements are generally within the historical range of values. Where there are exceedances against internal groundwater trigger values (developed for the stygofauna monitoring program) they are at bores that have recorded consistently elevated values historically. There is no perceived metal toxicity risk to the Ethel Gorge Aquifer Stygobiont TEC. These parameters are also monitored in groundwater at the Jimblebar Hub under the RiWI Act Jimblebar GWL158795(11) GWOS and under the EP Act Part V Jimblebar licence L5415/1988/9 (at the points where surplus dewater is discharged to the environment). Exceedances of SSTVs, identified trends and any investigations are reported by BHP in RiWI Act Annual Aquifer Reviews and EP Act Annual Environmental Reports.
13.	The draft ERD outlines that offsets will be utilised (via contributions to the Pilbara Environment Offsets Fund (PEOF)) to counterbalance 783 ha of clearing of critical foraging habitat for the ghost bat. WA Environmental Offsets Guidelines (August 2014) refer to significant residual impacts that would require an offset as 'the removal of habitat necessary to maintain species declared under the BC Act or listed as threatened species under the EPBC Act'. Quantification of significant residual impacts (SRI) for BC Act listed fauna species are not based on a species home range around a known record. SRI's comprise the entire habitat necessary to maintain	BHP has revised the offset commitment to include offsets for the loss of 41.3 ha of Ghost Bat supporting habitat, which comprises 24.4 ha Sand Plain and 16.9 ha Stony Plain. BHP has not proposed offsets for Northern Quoll given a single scat was recorded in 2021, with no further evidence of presence since, despite targeted survey effort. Biologic (2022) indicated that the scat likely derived from a transient individual and the species is considered unlikely to occur in the Development Envelope, given lack of suitable rocky habitats. Furthermore, there are few records of Northern Quoll from within 100 km and therefore it is unlikely that a population of Northern Quoll exists within or near to the Development Envelope at anything other than very low densities and / or intermittently, and therefore it is unlikely the Northern Quoll, if present at all, represents an important population. On this basis, BHP considers that the Proposal will not result in significant residual impacts to this species and offsets are not required. BHP does not propose offsets for priority fauna species.

Comment number	EPA Services Comments	Proponent Response
	species declared under the BC Act (refer to the WA Environmental Offsets Guidelines (August 2014)). Action • Expand the quantification of significant residual impacts for all critical and supporting habitat (foraging and dispersal) for ghost bat and provide proposed offset rates. • Expand the quantification of significant residual impacts for critical and supporting habitat for all fauna listed under the BC Act from Table 9-6 and provide proposed offsets.	

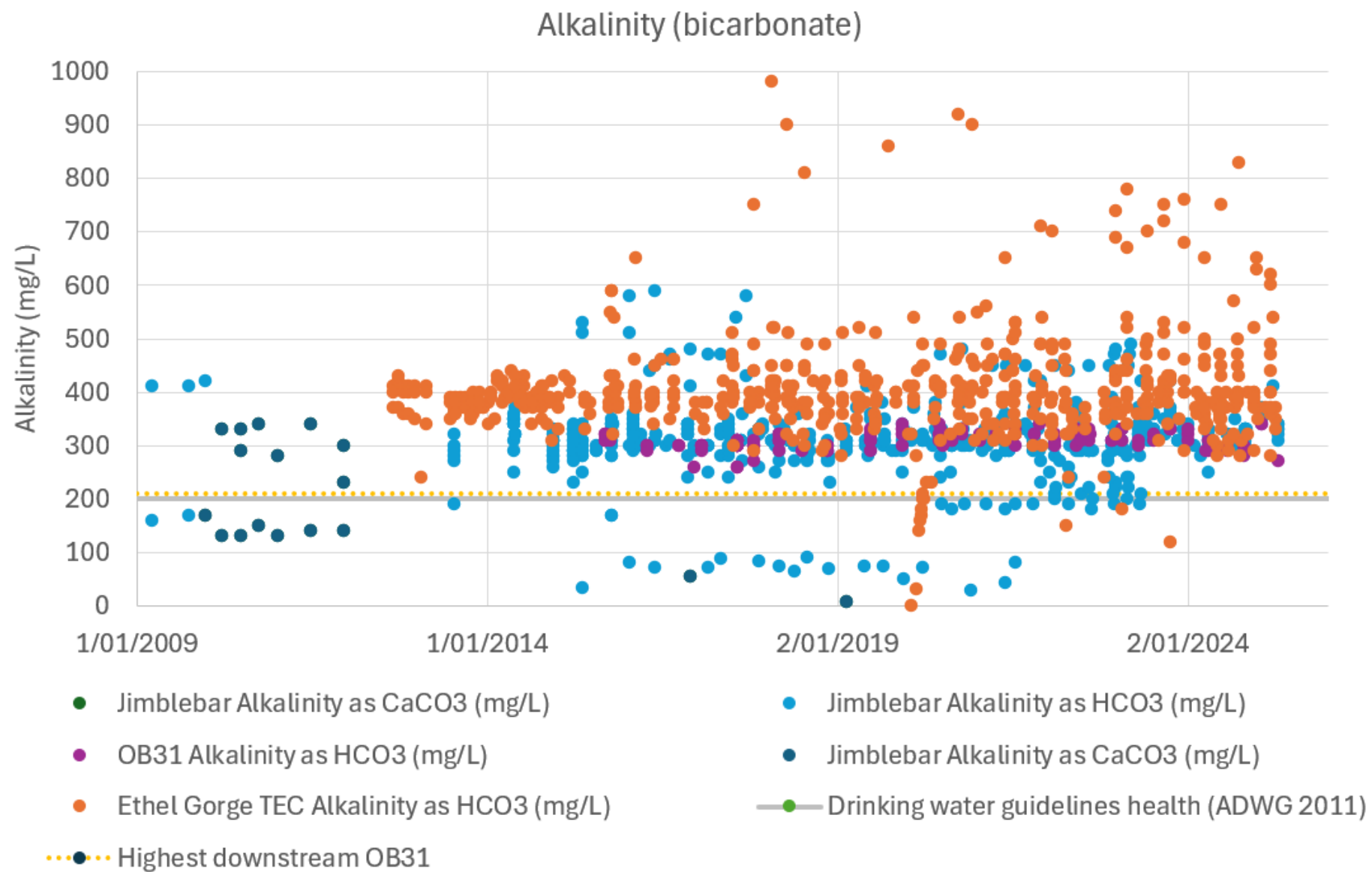


Figure 1-1: Measured and predicted alkalinity concentrations in groundwater

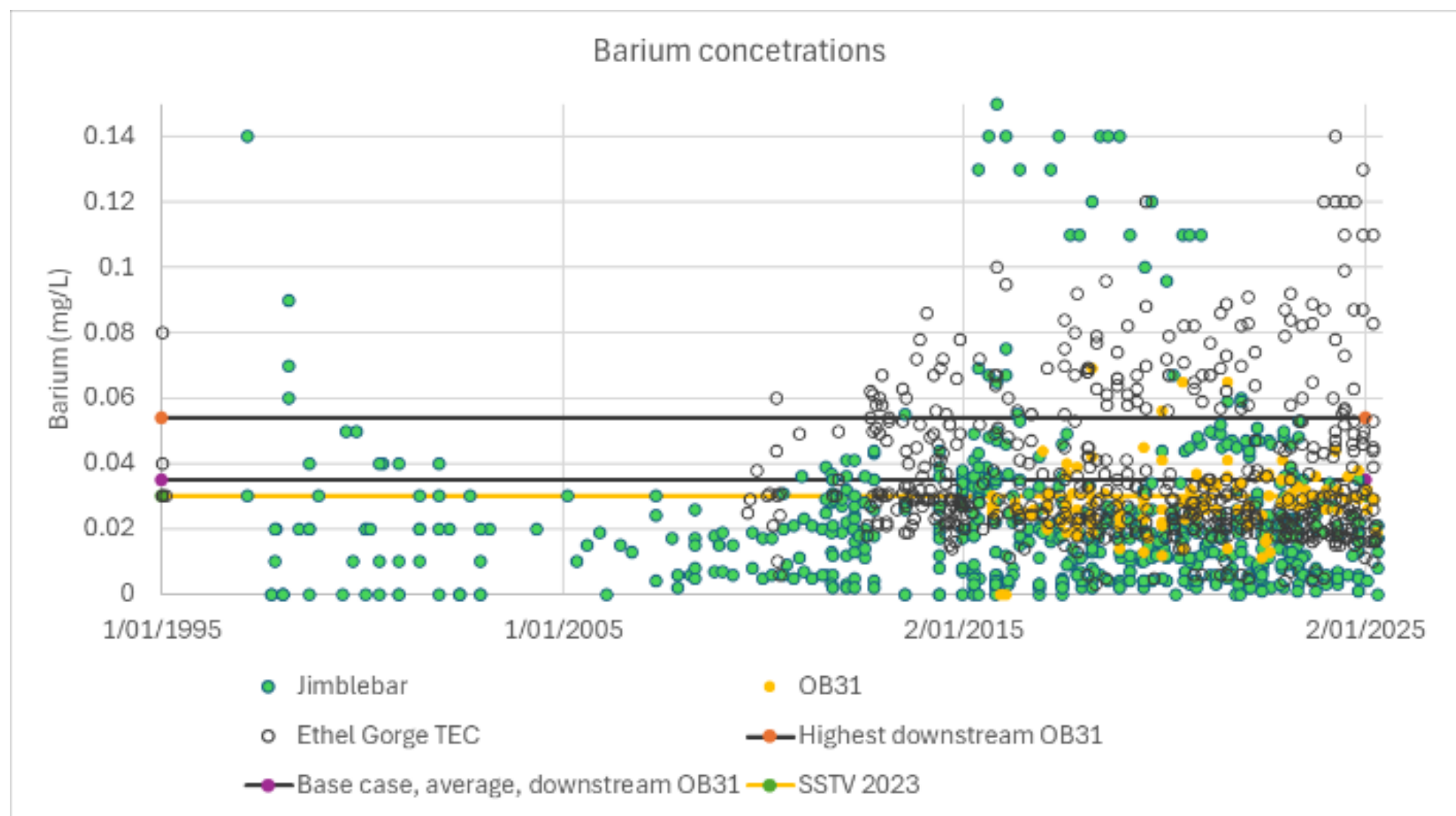


Figure 1-2: Measured and predicted barium concentrations in groundwater

Table 2: Response to Public Submissions

Comment Number	Submitter	Submission and/or issue	Response to comment
General comments			
1.	DWER	The EPA requires biodiversity survey reports and their underlying data to be submitted to the Index of Biodiversity Surveys for Assessments (IBSA). The Proponent should submit biodiversity survey reports and data to IBSA via IBSA Submissions. The resulting 'IBSA number' should be provided to EPA Services Directorate as evidence. Please note that any survey reports or data that are revised after their initial acceptance into IBSA – e.g. as a result of the assessment process – should be updated in IBSA. The proponent should contact ibsa@dwer.wa.gov.au for assistance in such cases.	Noted.
2.	DWER	Previous requested items remain outstanding. Actions: Requested data consolidation has not been provided by the proponent. For example, data from historical surveys for terrestrial fauna were not included as these surveys were considered as not relevant to the assessment. As above, all information should be presented and consolidated so an appropriate cumulative impact assessment can be undertaken.	All relevant data is provided in survey reports and/or in the relevant ERD chapter, to inform the assessment. A consolidated report is not provided as this would duplicate information already provided in the ERD and supporting appendices.
Flora and Vegetation			
3.	DWER	Jimblebar Hub Flora and Vegetation EMP (Appendix 10) (p. 7) states the 10th and 5th percentile as trigger and thresholds for decline in	A small quantity of <i>Acacia corusca</i> seed has been picked on three occasions over the last five years. Seed is stored in controlled conditions in BHP's seed stores in preparation for rehabilitation trials which have not begun.

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		mean leaf chlorophyll fluorescence and crown density of <i>Acacia corusca</i> (Priority 1), however one component of proposed management to be implemented, if these points are reached, appears to be “accelerate progressive rehabilitation of the northern side of the OSA adjacent to the ‘impact’ populations” (p. 17). Action: To have confidence in this proposed management measure for achieving the outcome for Condition B2 (1), provide the detail of the success of rehabilitation trials/licensing/ propagation and seed collection etc. for <i>Acacia corusca</i>.	A rehabilitation design of the OSA is in progress and the OSA is planned to be regraded and rehabilitated in FY26. Planting <i>Acacia corusca</i> tube stock on or near the OSA will be investigated as part of the design process. The plants are observed to only flower sporadically and do not always set seed following flowering. Ongoing monitoring is conducted quarterly by Astron Environmental. No seed set has been observed in the last two years.
4.	DWER	Jimblebar Hub Flora and Vegetation EMP (FVEMP) It is unclear how it will be determined that exceedance of trigger and threshold parameters (for crown condition score and foliage cover measures) for Caramulla Creek and Jimblebar Creek riparian vegetation monitoring is attributable to “BHP water surplus”, and not to other factors. It appears that management including “potential modification to surplus water discharge rate” or “ceasing discharge temporarily” will only occur if it is determined the relevant changes detected are attributable to the proposal. Mitigation measures to reduce impacts to <i>Eremophila capricornica</i> (Priority 1) are noted, however management for any significant flora should still be included in the FVEMP given the uncertainty about the footprint location. Action:	As discussed in Section 2.2.2 of the ERD, the Proposal (Significant Amendment) does not include any changes to the existing approved Caramulla Creek discharge authorised under MS1126 and associated riparian vegetation monitoring. The Jimblebar Flora and Vegetation Management Plan is approved for implementation under MS1126 (current version 0.1). Therefore, no further information is provided here.

Comment Number	Submitter	Submission and/or issue	Response to comment														
		- Provide a risk assessment to allow consideration of factors outside of project impacts. Without these, it is unclear if the proposed outcome for Condition B2 (2) and (3) will be achieved. - Provide mitigation measures for any significant flora which may potentially be impacted from the proposal within the development envelope, noting the indicative footprint may change.															
5.	DWER	Hibiscus aff. campanulatus is potentially significant flora and assessment of impacts is warranted. The EPA's Technical Guidance Flora and Vegetation Surveys for Environmental Impact Assessment EPA Guidance (states that, "If a new flora species is confirmed or suspected, targeted surveys should be undertaken to quantify numbers of individuals and populations." Additional detailed information for other significant flora provides some of the context previously lacking in the ERD, but uncertainty remains regarding the cumulative impacts to significant flora species, including those other than listed flora as per EPA's criteria for significance (EPA 2016a, p. 29). Action: Provide an impact assessment for Hibiscus aff. Campanulatus. including quantification of the direct impacts on other significant flora recorded within the development envelope.	The following table provides total count of <i>Hibiscus</i> aff. Campanulatus from BHP records and the DBCA database for the Pilbara and Gascoyne. <table><tr><th>Species</th><th>Total records from Pilbara and Gascoyne regions</th><th>Number of records within the Proposal Indicative Footprint</th><th>Predicted cumulative impact</th><th>Predicted impact of Proposal as % of cumulative impact</th></tr><tr><td><i>Hibiscus</i> aff. Campanulatus</td><td>1334</td><td>15</td><td>189</td><td>7%</td></tr></table>					Species	Total records from Pilbara and Gascoyne regions	Number of records within the Proposal Indicative Footprint	Predicted cumulative impact	Predicted impact of Proposal as % of cumulative impact	<i>Hibiscus</i> aff. Campanulatus	1334	15	189	7%
Species	Total records from Pilbara and Gascoyne regions	Number of records within the Proposal Indicative Footprint	Predicted cumulative impact	Predicted impact of Proposal as % of cumulative impact													
<i>Hibiscus</i> aff. Campanulatus	1334	15	189	7%													

Comment Number	Submitter	Submission and/or issue	Response to comment
Subterranean Fauna			
6.	DWER	The ERD states that five stygofauna species have only been collected from the impact footprint, including: • Atopobathynella sp. 'BSY241', • Enchytraeus sp. 'Ench3', • Phreodrilidae sp. 'BOL084', • Schizopera sp. 'BHA285' and • Tubificidae sp. 'BOL074' (ERD, Figure 10-2). However, it is not possible to verify that these are the only potentially restricted species, due to inadequate data consolidation and missing information. Action: • To increase confidence in the assessment, and particularly for cumulative impact assessment, provide a table summarising the following information: ○ all stygofauna taxa assessed (including historical and recent species) ○ whether they were collected inside and/or outside impact areas ○ whether they will be impacted from the significant amendment, the proposal (combined effect) and the cumulative impacts from the proposal and nearby proposals	A total of four stygofauna species are currently only recorded from the predicted impact area as reported by Bennelongia (2023) and referenced in the ERD and these are: • Atopobathynella sp. 'BSY241', • Phreodrilidae sp. 'BOL084', • Schizopera sp. 'BHA285' and • Tubificidae sp. 'BOL074' (ERD, Figure 10-2). Bennelongia has recently confirmed (pers. comm, Huon Clark) that Enchytraeus sp. 'Ench3' is currently called Enchytraeidae sp. E06-B05 (see Appendix 2 of Bennelongia (2023)), which has been matched to other specimens, with a linear range of approximately 50 km. Bennelongia (2023) referenced in the ERD supports this information and provides a figure depicting these restricted species. Similarly Figure 10-2 depicts these species in addition to the Enchytraeus sp. 'Ench 3' that is not restricted. Additional species have been recorded historically but are not restricted to the predicted impact area. All of these are identified in Appendix 5 of Bennelongia (2023) as described in Section 4.4.4 of this report. This information has not been duplicated in the ERD. IBSA data for relevant surveys was provided with the ERD.

Comment Number	Submitter	Submission and/or issue	Response to comment
		○ which ministerial statement area they were considered in. • Provide maps of examples of related widespread species, in relation to suitable habitat and the impact footprint, to demonstrate habitat connectivity outside the impact footprint.	
7.	DWER	It is acknowledged that significant additional sequencing work has been undertaken to determine if potentially restricted stygofauna species occur outside the impact footprint. It is noted that some sequencing results (Bennelongia and Biologic) and additional survey results (Bennelongia) are pending, as well as additional sampling rounds planned for the next six months. Additional genetic sequencing and planned survey work are appropriate measures to resolve the distributions of restricted species. Action: • Provide updated genetic sequencing results for previously pending samples to inform the impact assessment.	Results of the Biologic sequencing program were included in the previous responses, but to recap, no matches were found to the restricted species, although the sequencing of 92 Phreodrilidae specimens resulted in 82 successful sequences which were resolved into 16 operational taxonomic units (OTUs) uploaded to GenBank (Biologic 2024). Bennelongia has conducted a database review and is currently conducting sequencing of additional indeterminate subterranean fauna specimens. During 2023-24, Bennelongia (in prep) also conducted an additional four rounds of subterranean fauna sampling in the East Caramulla and Thirteen Creek area. A total of 87 stygofauna samples were collected, with 290 stygofauna specimens recovered from 22 of the 42 drillholes sampled. Preliminary results indicate that none of the target stygofauna taxa were recorded within the 18 species collected, and that the stygofauna community remains moderate and not abundant (likely due to the depth to groundwater which regularly reaches approximately 50 metres below ground level (mbgl). It is well understood that the abundance of stygofauna decreases with depth to groundwater greater than 30 mbgl.
8.	DWER	The Stantec 2022-Stygofauna Monitoring 2021-2022 (Appendix 14.6) notes that “diversity rarefaction curves indicate that not all the species in the Ethel Gorge Stygobiont TEC have been detected to date” and that more species are likely to be detected with additional sampling (p. iv). The monitoring report also notes that diversity and abundance of stygofauna was lower than in historical surveys, but comparable with results in	In 2023 BHP commissioned Stantec (Attachment 3) to conduct a review of the long-term data set for the Ethel Gorge Stygobiont TEC, to further understand the temporal and spatial trends in the fauna to environmental factors. Stantec (2023) noted that the level of variability in species richness and abundance within each survey round is greater than the mean, effectively obscuring any statistically measurable trends throughout the time series. Since BHP prepared the ERD (Version 1), Ethel Gorge Stygobiont TEC monitoring reports have now been finalised for 2022/23 (Stantec 2024, Attachment 3) and drafted for the 2023/24 monitoring (Stantec, in prep (2025)). Stantec (2025) states that overall, the Ethel Gorge Stygobiont TEC stygofauna assemblage was largely consistent with that

Comment Number	Submitter	Submission and/or issue	Response to comment
		the previous five years (Section 4.2) and suggests that “longer term decreasing trends in diversity (taxa per bore) are likely to reflect climate variability on those same timescales” (Section 4.3). However, adequate justification supporting this conclusion has not been provided. Action: Provide evidence such as regional data of climatic variability supporting the above conclusion. In addition, it is recommended that ongoing stygofauna sampling and potentially use of eDNA monitoring is used to test the accuracy of the conclusion and ensure that the rate of decline is not increasing or permanent.	observed in previous programs with comparable species composition and diversity. Overall, diversity was equivalent to previous survey rounds but abundance was lower. The lower abundance can likely be attributed to the absence of samples containing a high abundance of copepods. This may reflect the timing of the wet season survey in 2024, which was later than previous wet season surveys as a result of the flooding earlier in 2024. eDNA monitoring methods were implemented during the 2022/23 and 2023/24 Ethel Gorge Stygobiont TEC monitoring programs, with 20 samples collected and analysed each year. Stantec (in prep (2025)) noted that results of the 2023/24 program were similar to the 2022/23 program, with consistent differences noted between the performance of the CO1 and 18S assays, and the comparison of both molecular assays with morphological methods.
9.	DWER	The ERD states that “The combined effect of the Proposal and Approved Proposals will result in the reduction of stygofauna habitat (both the lateral extent and vertical extent) to the east of Jimblebar (when compared to the previously assessed Part IV drawdowns)” (p. 179). Action: Provide a quantification of the reduction in stygofauna habitat for the significant amendment, the proposal (combined effect) and cumulative impacts (i.e. of the proposal with known and reasonably foreseeable activities within nominal 100 km).	Figure 7-6 in the ERD shows a comparison of the assessed (lateral) drawdown extents for the approved proposals and combined proposal. As shown in Figure 7-6, the predicted lateral additional drawdown (Jimblebar Hub Additional Drawdown yellow shaded area) is to the north and mainly to the east (beyond BHP’s tenement) and BHP has not identified any major activities that would contribute to cumulative impacts in this area (see Figure 2-3 in the ERD). The increase in the predicted lateral drawdown extent for the Significant Amendment (Jimblebar Hub Additional Drawdown area) is 13,700 ha, which represents a 44% increase compared to the assessed drawdown area (30,849 ha for the approved proposals (2010 Jimblebar and 2015 Orebody 31), noting that this is an over-estimation as the only a 5 m drawdown was provided for the 2010 Jimblebar assessment, not a 1 m contour. As shown in Figure 7-5b, the predicted additional vertical drawdown in the area north of the 2010 Jimblebar 5m Drawdown Contour ranges from 1 m towards the northern boundary of the model domain to a maximum of approximately 50 m. The predicted additional vertical drawdown in the area east of the 2010 Jimblebar 5m Drawdown Contour ranges from approximately 25 m towards the eastern boundary of the model domain to 50 m.

Comment Number	Submitter	Submission and/or issue	Response to comment
			BHP is currently progressing the development of a subterranean fauna habitat model for the Jimblebar area; however this is still in the early stages and is currently unable to quantify the reduction in potential stygofauna habitat. The <i>East Jimblebar Baseline Subterranean Fauna Survey</i> (Bennelongia 2023), provided as Appendix 14 of the ERD, stated that the diversity of the stygofauna community (that extends across the Jimblebar Hub Additional Drawdown area (shown in the ERD Figure 7-6 and 10-2)) is moderately low, especially when compared with the highly diverse community hosted in the Ethel Gorge threatened ecological community to the west. The most likely reasons are that the depth to water table is too great to be conducive to stygofauna occurrence and that palaeovalleys and calcretes, which are particularly prospective for stygofauna, are largely absent. This was presented in the ERD, Section 10. Since submission of the ERD, Bennelongia (in prep) has conducted a comprehensive subterranean fauna survey over a large portion of the Jimblebar Hub Additional Drawdown area, with significant survey effort extending further east of the Bennelongia (2023) survey area to Thirteen and Davidson Creeks to the east of the Jimblebar Hub Additional Drawdown area. Bennelongia (D. White, pers. comm) found again that stygofauna abundance is moderate at best, considering survey effort (87 samples taken over 4 rounds of survey), with 290 specimens from 51 records), and significantly less than similar surveys conducted recently in other parts of the eastern Pilbara. Additionally, the stygofauna species present are quite widespread, suggesting they are more opportunists than locally restricted, and there is a high contingent of amphibious worms suggesting habitat is less ideal for true stygofauna. These stygofauna observations are likely due to depth to groundwater, which is often deeper than 30 m (a threshold depth beyond which habitat becomes less prospective), and abundant clay geology layers which occur throughout the area which lack the required spaces for stygofauna to live. The most prospective stygofauna habitat in this area is likely associated with the Caramulla Creek and Thirteen Creek drainage lines, with habitat likely extending north and south out of the Jimblebar Hub Additional Drawdown area.
10.	DWER	The Jimblebar Significant Amendment - Additional Information (supplement to ERD, 6 September 2024) (RFI) states that groundwater mounding is not part of this proposal and has already been approved. However, it is possible that mounding from this proposal could have significant cumulative impacts on troglodfauna,	The information stated in the RFI response is correct. The activities associated with the Proposal are summarised in Section 2.2.1 of the ERD. While the Proposal includes a predicted increase in surplus water, as discussed in Section 2.2.2 of the ERD (and defined in the Proposal Content Document), the Proposal (Significant Amendment) does not include any changes to existing approved MAR activities authorised under MS1126. There is no mounding associated with the Proposal and no impacts to troglodfauna from mounding from the Proposal. Therefore, no further information is provided here.

Comment Number	Submitter	Submission and/or issue	Response to comment
		particularly for species that have only been recorded from the impact footprint. Action: Provide sufficient information to determine whether there may be significant cumulative impacts to troglofauna.	
Terrestrial Fauna			
11.	DWER	Given the footprint is indicative and may change, all areas within the DE are required to be surveyed and a consolidation of survey effort should be undertaken. Inadequate presentation of survey effort prevents adequate impact assessment to be undertaken as the indicative footprint may change. Action: - Demonstrate adequate fauna surveys were undertaken, including mapping survey effort, including sampling types (sites and methods) in relation to fauna habitat and the indicative footprint. For example, it is unclear how extensive cave searches were undertaken in the eastern portion of the DE where Overburden Storage Areas (OSAs) are proposed (Appendix 12.8, Figure 2). - Provide a consolidation of fauna surveys. Figure 1 in the Additional Information provided demonstrates historical vertebrate fauna survey effort across the DE, however, this figure provides limited information i.e. it does not demonstrate survey names, dates or methodology type and is not mapped in relation to fauna habitat.	BHP has provided all relevant information in the ERD and supporting appendices. A consolidated survey report is not provided as this would duplicate information already provided. Areas north of the proposed OSAs is off tenure and has therefore not been surveyed. Aerial imagery indicates that the same fauna habitats extend north and outside of the Development Envelope boundary. BHP has provided the additional Astron Greater Bilby survey in Attachment 3. Attachment 4 Figure 1 provides historical fauna survey coverage.

Comment Number	Submitter	Submission and/or issue	Response to comment
		- Fauna habitat located north of the OSAs proposed on the north-eastern boundary of the DE may be indirectly impacted. Clarify whether hillcrests/hillslopes habitat continues outside of the DE adjacent to the proposed OSA and whether this area may be within the area of indirect impacts. - Provide all relevant surveys for the assessment. For example, when discussing Greater Bilby impact assessment, the Additional Information provided refers to Astron Environmental Services (2024) East Caramulla Targeted Bilby Fauna Assessment. May 2024 but this report has not been provided with the ERD.	
12.	DWER	The ERD states, “The Proposal is located within existing operational areas, and is not expected to result in an increase in airborne dust”; however, additional dust may be generated from the proposed OSAs in the eastern portion of the DE. The proponent’s assessment that caves within the DE will not be impacted by dust emissions from the proposed OSAs based upon their current distance, and cave entrance direction relative to proposed OSAs, is appropriate. However, dust from OSAs may impact ghost bat foraging habitat and potential roosting and foraging habitat outside the DE. Action: Amend the Terrestrial Fauna Environmental Management Plan (Appendix 13) to address the following comments: The Terrestrial Fauna Environmental Management Plan remains unchanged and	The Significant Amendment is within existing operational areas and is not predicted to substantially alter noise, light and dust emissions. BHP has therefore not proposed targeted management measures for these. Note that the assessment of potential impacts is provided in the ERD, while the EMP is intended to provide management measures for potential significant impacts. BHP will continue to manage dust in operational areas in accordance with its standard management measures. No further measures are proposed. Monitoring of Ghost Bat caves within the Jimblebar and surrounding areas (including Ninga, Cathedral Gorge, Homestead, Western Ridge and Eastern Ridge) has been conducted extensively since 2021. As an example, during the 2022-23 program, Biologic (2024) monitored 41 caves with over 145 separate visitations to those caves. Refer to the monitoring reports already provided (2021-2022 (Biologic 2023)), and those completed since submission of the ERD (2022-2023 (Biologic 2025b – Attachment 3)). These reports are building a solid understanding of the Ghost Bat population and roost usage (and classification) in the eastern Pilbara, with Biologic (2025b) stating that even though the individuals in the study area are inherently low numbers and sparse in distribution, they currently appear to be stable.

Comment Number	Submitter	Submission and/or issue	Response to comment
		there is no discussion on the indirect impacts of noise, light and dust emissions. Provide clarification for not considering these impact pathways in the management approach. - Objective-based management to address indirect impacts, particularly for dust emissions generated by the proposed OSAs, should be included in the revision to the Terrestrial Fauna Environmental Management Plan. - In relation to whether monitoring and management targets proposed within Appendix 13 are adequate to maintain ghost bat populations within the DE, it does not appear a sufficient sample size of abundance or bat activity has been recorded across category 3 and 4 caves to establish trigger and threshold criteria (Appendix 12.6). Update the Terrestrial Fauna Environmental Management Plan to include ongoing monitoring and collection of additional data to provide a sufficient understanding of the population dynamics or population size/occurrence of ghost bat at Jimblebar Hub. Take into consideration that caves occurring within the existing Jimblebar proposal are already subjected to disturbance by existing mining activities, and an appropriate baseline may not have been established prior to disturbance.	
13.	DWER	The full methodology for cave categorisation of caves within the proposal has not been provided. The internal memorandum, 'Eastern Pilbara Ghost Bat Cave Categorisation' (ERD, Table 9-2), is referred to in the ERD (p. 122),	Biologic has classified caves (and continues to reassess cave classifications) at Jimblebar and across our Eastern Pilbara operations in line with Bat Call (2021), through the threatened bat monitoring program being conducted across BHP's eastern Pilbara operations. See Section 2 of the <i>Western Ridge and Jimblebar Ghost Bat Monitoring Program: 2021-2022</i> (Biologic 2023b; provided as Appendix 12 to the ERD), and

Comment Number	Submitter	Submission and/or issue	Response to comment
		and the additional information when describing categorisation of bat caves, however, the report has not been provided with the ERD. In general, categorisation of caves reported within Appendix 12.11 do not align with Bat Call WA (2021) guidance and therefore terms used to describe their significance do not align with what is presented in Appendix 12.6 (which are the cave categorisations used in the ERD). Appendix 12.11 has categorised several caves as 'diurnal roosts' within the proposal (Table 11), however, these have been categorised as category 4s (nocturnal refuges) in Appendix 12.6 (Table 3.2). As above, rationale has not been provided on how these caves have been re-categorised in alignment with Bat Call WA (2021). Actions: • Provide the internal memorandum, 'Eastern Pilbara Ghost Bat Cave Categorisation'. • Provide rationale on how caves were categorised in alignment with Bat Call WA (2021). • Revised cave exclusion zones or noise and vibration limit thresholds may need to be considered where targeted or pre-clearance surveys identify bat roosts, or if the footprint changes.	Appendix A of the <i>Eastern Pilbara Ghost Bat Monitoring Program: 2022-2023</i> (Biologic 2025b; Attachment 3). The classification of caves considers the size and structure of the cave (i.e. depth and internal chambers) as well as usage by Ghost Bat (in line with Bat Call 2021). See also Attachment 1 Table 1.
14.	DWER	The terrestrial fauna impact assessment and mitigation measures in the ERD focus on the impacts to ghost bat because the species is known to have 'populations' in the DE.	Only one Northern Quoll scat has been recorded in the Development Envelope with no further evidence found, despite targeted survey effort. This is likely due to lack of suitable rocky habitats which are required for this species. No avoidance measures have been applied for Northern Quoll.

Comment Number	Submitter	Submission and/or issue	Response to comment
		BHP has previously described other species as 'confirmed' or 'possible' and new information about the greater bilby is also given in Additional Information provided. Previous comments regarding surveys and survey effort of fauna and fauna habitat are relevant to Table 2, because inadequate surveys or survey effort could underestimate confirmation or likelihood of fauna in the DE. The ERD was not updated to include further discussion of mitigation measures to reduce impacts to species noted as 'confirmed' or 'possible' or 'likely' in the Additional Information provided. Actions: Provide mitigation measures to reduce impacts to the species below: - Confirmed: brush-tailed mulgara, ghost bat, northern quoll, western pebble-mound mouse and spotted ctenotus. - Possible: greater bilby, Pilbara leaf-nosed bat, Pilbara olive python, Gane's blind snake and grey falcon. - Likely: peregrine falcon.	Brush-tailed Mulgara is known from tracks and both active and inactive burrows in Sand Plain and Drainage area/Floodplain habitat, which is not proposed to be impacted by the Significant Amendment. Therefore, no avoidance measures have been applied for this species. Multiple records of Western Pebble-Mound Mouse are known from the Development Envelope including both active and inactive mounds in Hillcrest/hillslope habitat type throughout the Development Envelope. Records in previously assessed areas have not been avoided. Records within proposed pit and OSA cannot be avoided. Records of Spotted Ctenotus occur in previously assessed areas and are outside of the Indicative Footprint and will therefore be avoided. BHP has not applied avoidance measures for species not recorded in the Development Envelope.
15.	DWER	The ERD describes engagement with Nyiyaparli Traditional Owners and Karlka Nyiyaparli Aboriginal Corporation (KNAC) noting their concern for loss of habitat for native fauna, and their interest in "more ethnoecological species being included in biological surveys." (p. 193); however, the ERD does not demonstrate consideration of the Recovery Plan for the Greater Bilby (<i>Macrotis lagotis</i>) Recovery Objective 4: Indigenous organisations,	Greater Bilby has not been recorded in the Development Envelope and BHP has therefore not proposed monitoring or management commitments for this species. The nearest Greater Bilby record is more than 3 km east of the Development Envelope. Targeted Greater Bilby surveys within the Development Envelope have not found any evidence of species presence.

Comment Number	Submitter	Submission and/or issue	Response to comment
		communities, and individuals have a greater role in bilby conservation (DCCEEW 2023). Action: Provide clarification for not considering Objective 4 of the Recovery Plan for the Greater Bilby (<i>Macrotis lagotis</i>).	
16.	DWER	Current information continues to be insufficient for assessing cumulative impacts of the proposal on terrestrial fauna. Figure 2 (attached to the previous Additional Information provided) has been provided to demonstrate historical short-range endemics (SRE) survey effort across the DE, however, this figure provides limited information. Current figures within the ERD (Figure 9-2) demonstrating SRE survey effort have not been revised, and sites and sampling methods have not been specified. In addition, there is no figure demonstrating SRE records previously recorded within the DE. Action: Clarify whether surveys have been undertaken across “previously assessed areas”, and present this information in relation to fauna habitat and the proposed footprint so that adequate impact assessment can be undertaken.	Figure 2 supporting the Request for Further Information demonstrates that nearly all of the Development Envelope has been subject to SRE surveys. In addition, Figure 9-2 of the ERD demonstrates recent SRE surveys within additional areas of the Development Envelope. Combined, these surveys cover the majority of previously assessed areas and proposed additional areas. Gaps in survey effort occur over Orebody 17/18 approved by MS439 in 1997 (as amended in 2008, 2013, 2015); and two areas in the western portion of the Development Envelope that coincide with the Jimblebar rail loop and underly proposed tailings pipeline and are already largely disturbed. See Attachment 4 Figure 2 SRE Fauna Survey Coverage.
17.	DWER	Appropriate justification has been provided in the Additional Information provided as to why some surveys were undertaken outside of the recommended season. However, the Additional Information provided also states that “SRE surveys and further resolution of taxa are ongoing and have continued after the finalisation of the East Jimblebar and Caramulla Short-	The comment “SRE surveys and further resolution of taxa are ongoing and have continued after the finalisation of the East Jimblebar and Caramulla Short-Range Endemic Invertebrate Fauna Survey.....”, was a general comment referring to SRE surveys conducted for WAIO in the Eastern Pilbara adjacent and / or outside of the Development Envelope, such as the Ninga and East Ophthalmia SRE Survey (Biologic, 2022) approximately 2.5 km west of the Development Envelope. These surveys will often conduct sequencing on specimens outside of their Survey Area to obtain matches.

Comment Number	Submitter	Submission and/or issue	Response to comment
		Range Endemic Invertebrate Fauna Survey (Biologic 2020b) [Appendix 2.2] and Jimblebar North (Crowe's Nest) Short-Range Endemic Invertebrate Fauna Survey (Biologic 2020b) [Appendix 2.4].". No new survey reports have been provided and Appendices 2.2 and 2.4 have not been revised to reflect sequencing results and taxa resolution, as sequencing results are yet to be finalised. It is unclear what additional SRE survey is being undertaken. Action: Provide updated reports including sequencing results and taxa resolution and details of any additional surveys that have been undertaken.	However, in 2020 BHP commissioned Biologic (Attachment 3 – Biologic 2021) to conduct a molecular systematics analysis (DNA barcoding) of 31 specimens collected from Jimblebar North and nine comparative regional isopod specimens. Successful sequences were derived for 32 of these specimens, with seven OTUs designated. This led to the pseudoscorpion <i>Austrohorus</i> sp. JIM 02 being split into three OTUs (<i>Austrohorus</i> sp. 'Biologic-PSEU023', <i>Austrohorus</i> sp. 'Biologic-PSEU024', and <i>Austrohorus</i> sp. 'Biologic-PSEU025').
18.	DWER	The Cumulative Impacts section of the ERD (Section 16) remains unchanged. Action: All SRE survey across the DE should be provided to aid cumulative impact analysis of the proposal. A consolidation list of SRE surveys and records across the DE should be provided and information should include: - Figures illustrating survey effort (sites and sampling methods), with appropriate citation to the survey, and mapped in relation to fauna habitats and the indicative footprint areas. - Figures illustrating SRE records (including historical and recent species) across the DE from all historical surveys in relation to the existing and proposed footprints and fauna habitats. This should include:	SRE surveys completed in the Development Envelope include: - East Jimblebar and Caramulla SRE Survey (Biologic 2020) SurveyID 10227 - Jimblebar North SRE Fauna Survey (Biologic 2020) Survey ID 10225 - Shearer's West Targeted Vertebrate and SRE Invertebrate Fauna Assessment (Biologic 2019) SurveyID 10168 - Orebody 19 and Orebody 31 level 2 SRE Invertebrate Fauna Survey (Biologic 2014) SurveyID 1221 - South-West Jimblebar SRE Invertebrate Survey (Biologic 2013) SurveyID 1057 - Jimblebar Iron Ore Project Terrestrial Invertebrate SRE Assessment (Outback Ecology 2009) SurveyID 472 SRE survey effort is depicted in Attachment 4 Figure 2. SRE records are provided in Attachment 4 Figure 4. Attachment 5 provides the cumulative impacts to Confirmed (Table 1) and Potential (Table 2) SRE from the Proposal and nearby approved projects and foreseeable proposals, noting no cumulative impacts are predicted from the Proposal.

Comment Number	Submitter	Submission and/or issue	Response to comment
		○ whether they were recorded inside and/or outside impact areas ○ whether they will be impacted by the proposal, significant amendment and/or cumulative impacts from the proposal and nearby proposals ○ which ministerial statement area they were considered in. • Where surveys have been undertaken by different consultants, provide a comparison and alignment of SRE records across surveys including a finalisation of sequencing results. • Provide the cumulative impacts from the proposal and nearby proposals on SREs (i.e. of the proposal with known and reasonably foreseeable activities within nominal 100 km).	
19.	DBCA	DBCA notes that the ERD proposes buffers around ghost bat caves to ensure the caves are retained. From the available information, ghost bat caves within the DE appear to provide the only known link between two important maternity roosts in the local area. Given none of the caves proposed to be retained within the DE are within 250 metres of the indicative footprint, cave buffers should be expanded, without impacting on proposed activities, which would give further certainty that the local ghost bat population is not adversely impacted by the proposal. Cave buffers should be developed on a case-by-case basis, informed by geotechnical assessment of caves and predicted noise and in-ground vibration impacts.	The Jimblebar Terrestrial Fauna EMP already includes a commitment to inspect Category 4 roosts CJIM-04, 08, 17 and 18. Note that as identified in Table 9-4 of the ERD, these caves have no evidence of use. BHP has reviewed the Ghost Bat cave buffers and for the following caves, has increased the buffers from 50m to 100m: • CJIM-05 • CJIM-06 • CJIM-07 • CJIM-15 • CJIM-20. BHP has also applied a 50m buffer to: • CJIM-08

Comment Number	Submitter	Submission and/or issue	Response to comment
		Buffers should also consider the management and mitigation of indirect impacts, including artificial light, and other habitat features important to the local persistence of ghost bat (i.e. water sources). Action: • Include management actions in the ERD and Terrestrial Fauna Management Plan to inspect category 4 ghost bat roosts prior to disturbance and displacement of ghost bats, should they be present. • To give further certainty that the local ghost bat population is not adversely impacted by the proposal, it is recommended that cave buffers are expanded without impacting on the proposal. • Management actions in the Terrestrial Fauna Management Plan to inform cave buffers are required should the indicative footprint change. Buffers should be informed by geotechnical assessment of caves and predicted noise and in-ground vibration impacts. • The removal of threatened fauna from their habitat through displacement and/or exclusion requires Ministerial authorisation under section 40 of the Biodiversity Conservation Act 2016 (BC Act). Consultation with DBCA in relation to an authorisation is required, and further information, in addition to what has been provided in the ERD and the Terrestrial Fauna Management Plan, will be required	• CJIM-17 • CJIM-18. BHP has updated the TFEMP (Version 1.2) to include the revised buffers and provides updated spatial data to this effect. This is provided as Attachment 6. BHP notes the requirement for approval under Section 40 of the BC Act.

Comment Number	Submitter	Submission and/or issue	Response to comment
		to inform an assessment for issuing an authorisation.	
Inland Waters			
20.	DWER	Based on current hydrogeological conceptualisation, the Wheelarra Fault constrains drawdown to the west of Jimblebar and is supported by groundwater level data. Drawdown from other BHP mines west of the Wheelarra Fault are not predicted to overlap the predicted drawdown extent for Jimblebar. The hydrogeological assessment (BHP 2023a) identified potential drawdown interference with other groundwater users (Figure 10.1) which included an Atlas Iron Ore bore. The monitoring strategy proposed by BHP has not been provided and will need to be considered further as part of the licence application under the Rights in Water and Irrigation Act 1914. Section 2.2.2 of the ERD states that discharge to Ophthalmia Dam is excluded from the proposal, and there is no proposed change to the approved volumes and management of surplus water management including discharge to Ophthalmia Dam. The predicted peak forecast discharge to Ophthalmia Dam is expected to be 28.5 GL/a (BHP 2023b), which is less than the current approved limits for Jimblebar and OB31 mines. However the peak total discharge rate from all BHP mines discharging to Ophthalmia Dam is predicted to be very close to reaching the maximum holding capacity and potentially result in overtopping.	As discussed in Section 2.2.2 (and defined in the Proposal Content Document), discharge to Ophthalmia Dam is excluded from the Proposal (Significant Amendment) as the Proposal does not include an increase to the total discharge rate from the Jimblebar Hub authorised under MS1021 (Orebody 31) and MS1126 (Jimblebar) and the Part V licence L5415/1988/9. Also as discussed in Section 7.4.1.2 of the ERD and shown on Figure 7-7, the 2023 forecast discharge to Ophthalmia Dam from the Jimblebar Hub (including the Proposal) is less than the authorised limit (as the increase in the predicted dewatering rate for the Jimblebar mine is partially offset by the increased water demand due to the proposed Jimblebar beneficiation plant). BHP has assessed the cumulative impacts of discharge to Ophthalmia Dam (ERD Section 16) as part of the proposal because the 2023 cumulative forecast discharge from all BHP Eastern Pilbara mines has increased for some years compared to the 2021 cumulative forecast discharge (assessed for the Western Ridge Proposal), as shown in Figure 16-1. Potential for overtopping The 2023 forecast surplus discharge from all BHP Eastern Pilbara mines (Figure 16-1 in the ERD) indicates that the theoretical dam capacity will not be exceeded, compared to the 2021 forecast which indicated a potential exceedance. As discussed in the <i>Jimblebar Hub: Ophthalmia Dam surplus water impact assessment update</i> provided in Appendix 4 with the ERD, the 2023 forecast discharge and dates were indicative for assessment purposes only, based on the mine plans available at the time of the assessment. Actual discharge to the dam will depend on the mine plans and variability in dewatering rates. Management provisions to mitigate overtopping risk However, if future detailed surplus water forecasts indicate that the capacity of Ophthalmia Dam could be reached, BHP will continue to manage the surplus discharge volumes from its operations and the operation of the dam according to the EPWRMP to avoid overtopping of the dam spillway and uncontrolled surface flows to the Fortescue River in the dry season (i.e. when there are typically no natural flows). As discussed in Section 8 Surplus Water Management of the <i>Jimblebar Hub: Ophthalmia Dam surplus water impact assessment update</i> (See Appendix 4 of the original ERD submitted in

Comment Number	Submitter	Submission and/or issue	Response to comment
		The proponent needs to manage the risk of overtopping early to ensure that surface water regimes are not significantly impacted. Action: - Discuss the potential for overtopping and consequences to downstream environmental values. - Detail and describe the management provisions to mitigate this potential risk.	December 2023), management options to limit releases to the Fortescue River in the dry season include the management measures and controls outlined in the EPWRMP, e.g. release water from the dam during wet season flow events or alter/temporarily cease surplus water discharge from its eastern mines to the Ophthalmia Dam system. As communicated to the DWER-EPA Services, BHP is also implementing and investigating alternative surplus water management options for its Eastern Pilbara mines, including MAR and creek discharge in the Eastern Pilbara region, to minimise risk to operations and alleviate dependency on the dam. This includes implementation of the Caramulla surplus water scheme (MAR and creek discharge) in 2022 and investigations into alternative surplus water options as part of its Eastern Pilbara Regional Surplus Water study. The components tables (Tables 8-10) in the EPWRMP (Version 8.0) specify a threshold limiting releases to the Fortescue River to 3 months total controlled release per year during natural no-flow conditions and BHP has maintained this control, despite the forecast increase in the cumulative discharge from BHP's mines in some years. BHP has not undertaken an assessment of the potential ecological impacts from an increase in controlled releases to Fortescue River, because the 3 month limit specified in the EPWRMP is a threshold.
21.	DWER	The information provided about Innawally Pool has not been consistent in the ERD and hydrogeological assessment (BHP 2023a) regarding its characterisation (semipermanent and ephemeral) and depth to water. The Jimblebar Hub Water Management Plan (Version 1, December 2023) states that 'Innawally Pool appears to be a perched semi-permanent water feature, but BHP has not drilled the area to confirm the hydrogeology of the pool'. However, Appendix 4 Jimblebar hydrogeological assessment states, "Monitoring bores have been installed adjacent to the Pool to assess seasonal water table (perched and permanent) fluctuations and to confirm hydraulic	The monitoring bores referred to in Appendix A of the <i>Jimblebar Hydrogeological Assessment</i> (HHH0009M and HSJ0133M) are adjacent to Jimblebar Creek and Innawally Pool but they reflect the regional groundwater level not the perched pool water level. However, they do show that the regional water level is continuous under the pool and deep beneath it (approximately 435 mAHD at HHH0009M in June 2024 and HSJ0133M in October 2024) compared to the ground elevation at the bores of 511.5 mAHD at HHH0009M and 509 mAHD at HSJ0133M and the ground elevation at the upstream extent of Innawally Pool of 505 mAHD), i.e. great than 60 mbgl. Therefore, there is no way that dewatering drawdown could impact water levels in a perched system above it. BHP will continue to monitor the regional aquifer bores adjacent to Innawally Pool (HHH0009M and HSJ0133M), which are included in the RiWI GWL158795(11) GWOS and Annual Aquifer Reviews. BHP is planning drilling in the next 18 months to improve understanding of the shallow perched groundwater system and to undertake further studies to inform the hydrogeological understanding of the pool; however, given this is a heritage site, this requires engagement with Traditional Owners prior to implementing. Therefore, no changes are proposed to the Water Management Plan at this stage. Once

Comment Number	Submitter	Submission and/or issue	Response to comment
		disconnection between the pool and deeper groundwater system.” Current hydrogeological understanding based on the depth to water (greater than 40 m premining) suggests Innawally Pool is hydrogeologically separated from the deeper aquifer. However, as there is limited hydrogeological understanding about the perched aquifer, continuous monitoring (data loggers) from the two monitoring bores adjacent to Innawally Pool should continue to occur. Action: • Due to the uncertainty around the hydrogeological understanding, and the heritage significance of the Innawally Pool, include the two monitoring bores adjacent to Pool in the monitoring approach detailed in the Jimblebar Hub Water Management Plan.	engagement is complete and all relevant approvals are in place, the Water Management Plan can be updated, if required.
22.	DEMIRS	The proposal will result in an increased dewatering requirement. The use of a beneficiation plant and associated in-pit TSF allows (based on modelling) for the proposed increase in dewatering to stay below or equal to the approved Part IV and Part V limit of 16.425 GL/a for Ophthalmia Dam discharges (ERD Section 7.4.1.2, p. 52). The formation of a safe and stable in-pit TSF surface requires excess water to be removed, preferably via a decant pond to allow for the consolidation of the material (especially at the start of deposition in the bottom of a pit shell with less surface area and greater rate of rise).	Decant water will be reused by the beneficiation plant and was considered in the water balance for BHP’s Eastern Pilbara mines as it would reduce raw water demand. The modelled decant water return was subtracted from the beneficiation water demand to develop the 2023 forecast surplus discharge to Ophthalmia Dam, that BHP used for the assessment. See responses to Comments 30 and 31 for discussion on consolidation studies in operations and closure.

Comment Number	Submitter	Submission and/or issue	Response to comment
		Appendix 4 seems to indicate losses via evaporation only with no decant of tailings supernatant returning to the beneficiation plant. Studies undertaken for in-pit TSF impact assessment looked at consolidation rate, rate of rise / size of decant management system (based on Figure 7-1 in Appendix 4: Jimblebar Hub: In-pit TSF Impact assessment) but there is no detail provided on the IPTSF water balance and whether this impacts the Jimblebar site wide water balance and discharge to Ophthalmia Dam. Action: - BHP should detail and describe how they have considered water return to the process plant from the in-pit TSF decants, optimizing tailings consolidation during deposition and implications for Part IV / Part V discharge to Ophthalmia Dam - Further assessment of options to improve the rate of settlement and consolidation of tailings are needed to inform operational management of tailings, discussed further below in relation to mine closure. This may affect inputs from the processing stream into the Jimblebar hub water balance, which should be considered in this EPA assessment.	
23.	DWER	Eastern Pilbara Water Resource Management Plan The ERD is supported by the East Pilbara Water Resource Management Plan (Rev8, December 2023) (EPWRMP) as Appendix 5. The intention of the EPWRMP is management of water-	BHP revised the groundwater level criteria in 2023 in Version 8.0 of the EPWRMP submitted with the Jimblebar Hub Mining Operations Significant Amendment referral. As discussed in Table 3 in the EPWRMP (Version 8.1), the revised criteria are based on monitoring of groundwater levels in the Ethel Gorge Primary Habitat Monitoring Zone, which shows that groundwater levels have historically usually been above 494 mRL.

Comment Number	Submitter	Submission and/or issue	Response to comment												
		related activities that have the potential to impact the Ethel Gorge TEC from BHP proposals. The ERD identifies that additional drawdown as part of the significant amendment is not predicted to migrate west of the Wheelarra Fault and will not reach the Ethel Gorge TEC. However the surplus water management operations across the Newman area and Jimblebar Hub are based on the use of Ophthalmia Dam. The EPWRMP (Rev8) has revised groundwater level criteria that relate to groundwater decline based on observed groundwater levels, with the early response indicator set at 494 mRL (Table 6), and trigger criteria and threshold criteria of 494 and 490 mRL respectively. Time series of Ethel Gorge monitoring bores provided in Figure 12 of the Western Ridge and OB29/30/35 Detailed Hydrogeological Assessment (BHP 2022, refer figure below) indicate that groundwater levels in Ethel Gorge aquifer have only been recorded below 494 mRL following sustained regional drawdown associated with Ophthalmia Borefield operation, and prior to Ophthalmia Dam. Groundwater levels in the Ethel Gorge aquifer were reported above 500 mRL prior to abstraction from the bore field or mine dewatering. Action: Update the EPWRMP to include time series Ethel Gorge aquifer groundwater levels and rationale to support the revised groundwater level criteria.	Figure 2-1 attached with this response (following Table 2) shows the location of monitoring bores adjacent and in the Ethel Gorge Primary Habitat Monitoring Zone with long term records. Figure 2-2 shows the time series of groundwater levels at the monitoring bores shown in Figure 2-1, which BHP used to revise the EPWRMP groundwater criteria (early warning criteria of 494 mAHD, trigger of 492 mAHD, and threshold of 490 mAHD). and which BHP uses to assess groundwater levels against criteria in the EPWRMP. The revised groundwater level criteria represent an appropriate range which allows for the variation in anthropogenic activities in the Ethel Gorge area (including groundwater abstraction for Newman water supply from the Ophthalmia Borefield, commissioning of the Ophthalmia Dam MAR System, mine dewatering and surplus discharge to the Ophthalmia Dam system). As shown in Figures 2-1 and 2-2, while groundwater level measurements in some bores during the period of record have been greater than 497 mRL, groundwater levels in most bores have been lower than 494 m during the period of record. The following table provides a comparison of the endorsed (EPWRMP v6.0) and revised (EPWRMP v8.0) groundwater level criteria. The revised groundwater level criteria are more appropriate than the endorsed criteria because they provide easier to interpret, defined water level elevations (rather than the current criteria of changes in groundwater level against an undefined reference level), while remaining within the range of the previous criteria. EPWRMP endorsed and revised groundwater level criteria <table> <tr> <th>Groundwater level criteria (and action)</th><th>Endorsed value (EPWRMP v6.0)</th><th>Endorsed value as groundwater elevation*</th><th>Revised value (EPWRMP v8.0 onwards)</th></tr> <tr> <td>Early warning indicator (investigate)</td><td>Aquifer groundwater levels change 5 m or a rate of >4 m/year</td><td>495 mRL</td><td>494 mRL</td></tr> <tr> <td>Trigger (act)</td><td>Aquifer groundwater levels change 6 m or a rate of >4 m/year</td><td>494 mRL</td><td>492 mRL</td></tr> </table>	Groundwater level criteria (and action)	Endorsed value (EPWRMP v6.0)	Endorsed value as groundwater elevation*	Revised value (EPWRMP v8.0 onwards)	Early warning indicator (investigate)	Aquifer groundwater levels change 5 m or a rate of >4 m/year	495 mRL	494 mRL	Trigger (act)	Aquifer groundwater levels change 6 m or a rate of >4 m/year	494 mRL	492 mRL
Groundwater level criteria (and action)	Endorsed value (EPWRMP v6.0)	Endorsed value as groundwater elevation*	Revised value (EPWRMP v8.0 onwards)												
Early warning indicator (investigate)	Aquifer groundwater levels change 5 m or a rate of >4 m/year	495 mRL	494 mRL												
Trigger (act)	Aquifer groundwater levels change 6 m or a rate of >4 m/year	494 mRL	492 mRL												

Comment Number	Submitter	Submission and/or issue	Response to comment			
			Threshold (mitigate)	Aquifer groundwater levels change 12 m or a rate of >8 m/year	488 mRL	490 mRL
			* based on a typical groundwater elevation of 500 mRL since 2005 The revised groundwater level criteria are also outcomes-based and represent the lower range of groundwater levels to maintain the habitat of, and minimise impacts to, the Ethel Gorge Aquifer TEC. As discussed in Table 3 in the EPWRMP (v8.1): - BHP has undertaken annual stygofauna monitoring in the Ethel Gorge TEC since 2009 - the area has experienced substantial changes in groundwater levels, due to groundwater abstraction, dewatering activities, recharge through Ophthalmia Dam, and climatic variation. However, to date, no measurable impacts on the stygofauna community have been observed - thirty-nine 'core endemic' species have been recognised from the Ethel Gorge area from monitoring programs conducted annually since 2009. Species accumulation modelling estimates that between 75.5 to 94.6 percent of the assemblage predicted to exist within the Ethel Gorge area has been recorded - the findings of the [2022/2023] Program along with previous surveys indicate that current groundwater management practices have been appropriate to prevent potential impacts to the Ethel Gorge stygofauna TEC from BHP operations. It is also considered that adequate saturation of the core habitat has been maintained, enabling the persistence of stygofauna. The draft findings of the 2023/2024 monitoring program (Stantec 2025 in prep) are consistent with the finding of previous monitoring rounds. Therefore, based on the information above, BHP considers that the revised groundwater level criteria are appropriate as a surrogate measure to maintain the habitat of the Ethel Gorge TEC, and are more appropriate than the endorsed criteria. BHP will add a summary of the justification provided in this response, in the next version of the EPWRMP submitted to DWER (as at May 2025 the EPA is also reviewing the EPWRMP V8.1 as part of the assessment of the Orebody 29/30/35 Significant Amendment Proposal).			

Comment Number	Submitter	Submission and/or issue	Response to comment
24.	DPIIRD	The option of managed aquifer recharge is mentioned in the proposal and the management structures described should prevent any negative impact on pastoral activities relying on water from the same aquifer. Similarly, the discharge of surface water into Caramulla Creek appears to be managed by proposed structures located to reduce erosion of the creek. Action: • Provide surface water management measures to avoid soil erosion in the mine closure plan.	Similar to the responses provided to Comments 4 and 10 in Table 2, the Proposal (Significant Amendment) does not include any changes to existing approved MAR and/or creek discharge activities authorised under MS1126. Surplus water management activities (including MAR and/or creek discharge) are undertaken during operations (when there is dewatering), not closure. Therefore, these activities are not included in the Jimblebar Hub Mine Closure Plan.
25.	DWER	The response provided by the proponent including the additional document “Jimblebar Hub: In-pit tailings storage facility impact assessment”, addresses only part of the comments previously provided. While seepage modelling of two pits selected for short-term initial in-pit TSFs has been discussed in the afore mentioned report (discussion of this below), a generic discussion of potential contamination pathways or closure options for tailings, including the long-term disposal of tailings, or disposal options for waste rock has not been included. The proponent has undertaken considerable acid-base accounting assessment-work to identify specific pits within the Jimblebar hub area where acid and metalliferous drainage (AMD) could be a problem. However, during the life of the mining operation within the Jimblebar Hub, it would be important that the proponent undertakes additional long-term kinetic testing to	In-pit TSF closure risks Jimblebar Hub MCP, Section 5.11.2 discusses the current knowledge base for groundwater behaviour in the Shovelanna (Orebody 17/18/31) area based on recent and historical groundwater monitoring and groundwater modelling of aquifer behaviour. In summary: • De Grey pit (OB18) aquifer is a localised aquifer that is not directly or indirectly hydraulically connected to regional aquifers of adjacent orebodies • Swan (OB17) is hydraulically disconnected from the regional aquifer to the south, but is connected to the OB31 aquifer. The closure risks and associated impacts are identified in the MCP in Table 7.3 Risk IDs R5 to R8 (AMD from OSAs and in pit storage areas (ISAs)); R9 (Impact from in pit tailings storage facilities (in-pit TSFs)). Note that Table 7.3 is presented as Risk Event (Source and Pathway) and Impact to Receptors with inherent risk and residual risk scored for each risk ID. Further geochemical characterisation test work (which considers kinetic tests such as free-draining and saturated columns to address the behaviour of mined materials under variable environmental, including anaerobic, conditions) are in the forward work program as referenced in Section 7.6 of the MCP. Routine/ongoing geochemical testing of tailings material will be undertaken during operations to confirm the geochemical

Comment Number	Submitter	Submission and/or issue	Response to comment
		determine how quickly AMD will be generated, and to determine how the quality of leachate from the mine wastes would vary over time. The assessment of closure risks associated with in-pit TFS focusses on acid and metalliferous drainage (AMD) release from potentially acid-forming (PAF) materials. However, the risk of contaminant release from non-acid forming (NAF) mine waste (waste rock or tailings) under non-acidic, anaerobic conditions which are likely to establish in-pit when groundwater rebounds has not been considered. Furthermore, the seepage modelling for the two initial in-pit TSFs does not include a sensitivity analysis to cover the full range of expected parameters which would provide a more solid basis for the risk assessment as recommended in the Australian Groundwater Modelling Guideline (2012). In particular for the geochemical part of the model, reasoning and discussion for the selection process of the input parameters is lacking. The seepage rates and groundwater flow seem plausible, however, this component of the modelling was not properly documented in the manner outlined in Chapter 8 of the Australian Groundwater Modelling Guideline (2012) so that a full review could not be undertaken. Another information gap in the work submitted by the proponent is the assessment of potential impacts to waterways when dewatering effluent cannot be managed under the managed aquifer recharge (MAR) but is discharged to waterways instead. Even in the absence of acidity or metals, increased concentrations of sulfate that might occur from sulfide oxidation within the cone of depression caused by the dewatering	characterisation of these materials, where results (including the assessment of nitrate) would support reviews and updates to the in-pit tailings storage facilities water quality models and downstream seepage water quality assessment. Updates to geochemical characterisation of mined materials and tailings, associated modelling and potential risks and management strategies (if required) will be presented in future iterations of the MCP. Section 7.5 of the MCP outlines Management of Identified Issues including sections on Overburden management (7.5.1.1), Groundwater at OB17/18/31 (7.5.2.1), Landforms – inclusive of OSAs, ISAs and in-pit TSFs (7.5.4) and Tailings Storage Facilities (7.5.5). Each section outlines Management Actions, Tools (eg. procedures, guidelines) to inform Management Actions and Improvement Activities to further closure knowledge gaps. Seepage modelling The seepage modelling (FEFLOW) included a robust sensitivity analysis. This can be found in Section 4.4 of Appendix H of the Design Report in Attachment 2. The section begins: “A sensitivity analysis was conducted to identify the key parameters that influence seepage rates, encompassing both in-pit factors, like the conductance of tailings material, and external hydrogeological factors, such as the hydraulic conductivity and storage of the surrounding rock and groundwater levels” For the seepage and groundwater flow modelling, documentation in line with the <i>Australian Groundwater Modelling Guideline</i> (AGMG) (2012) can be found in Section 4.4 of Appendix H Hydrogeological Assessment of the Design Report. For the geochemical modelling, documentation roughly in-line with the AGMG (2012) can be found in the following appendices of the Design Report: • Pond water quality modelling: Appendix K IPTSF Pond Water Quality Assessment • Downstream water quality modelling: Appendix A, of Appendix H Hydrogeological Assessment

Comment Number	Submitter	Submission and/or issue	Response to comment
		can cause adverse changes in the receiving water bodies (Zak et al., 2021). Action: • Provide further discussion of potential contamination pathways or closure options for tailings, including the long-term disposal of tailings, or disposal options for waste rock has not been included. • During the life of the mining operation within the Jimblebar Hub, it would be important to undertake additional long-term kinetic testing to determine how quickly AMD will be generated, and to determine how the quality of leachate from the mine wastes would vary over time. • Discuss the risk of contaminant release from non-acid forming (NAF) mine waste (waste rock or tailings) under non-acidic, anaerobic conditions which are likely to establish in-pit when groundwater rebounds. • The risk of contaminant seepage including nitrate and associated seepage modelling of waste rock in in-pit TSFs should be included. • The seepage modelling for the two initial in-pit TSFs does not include a sensitivity analysis to cover the full range of expected parameters which would provide a more solid basis for the risk assessment as recommended in the Australian Groundwater Modelling Guideline (2012). The seepage rates and groundwater flow component of the modelling is required to be documented in	

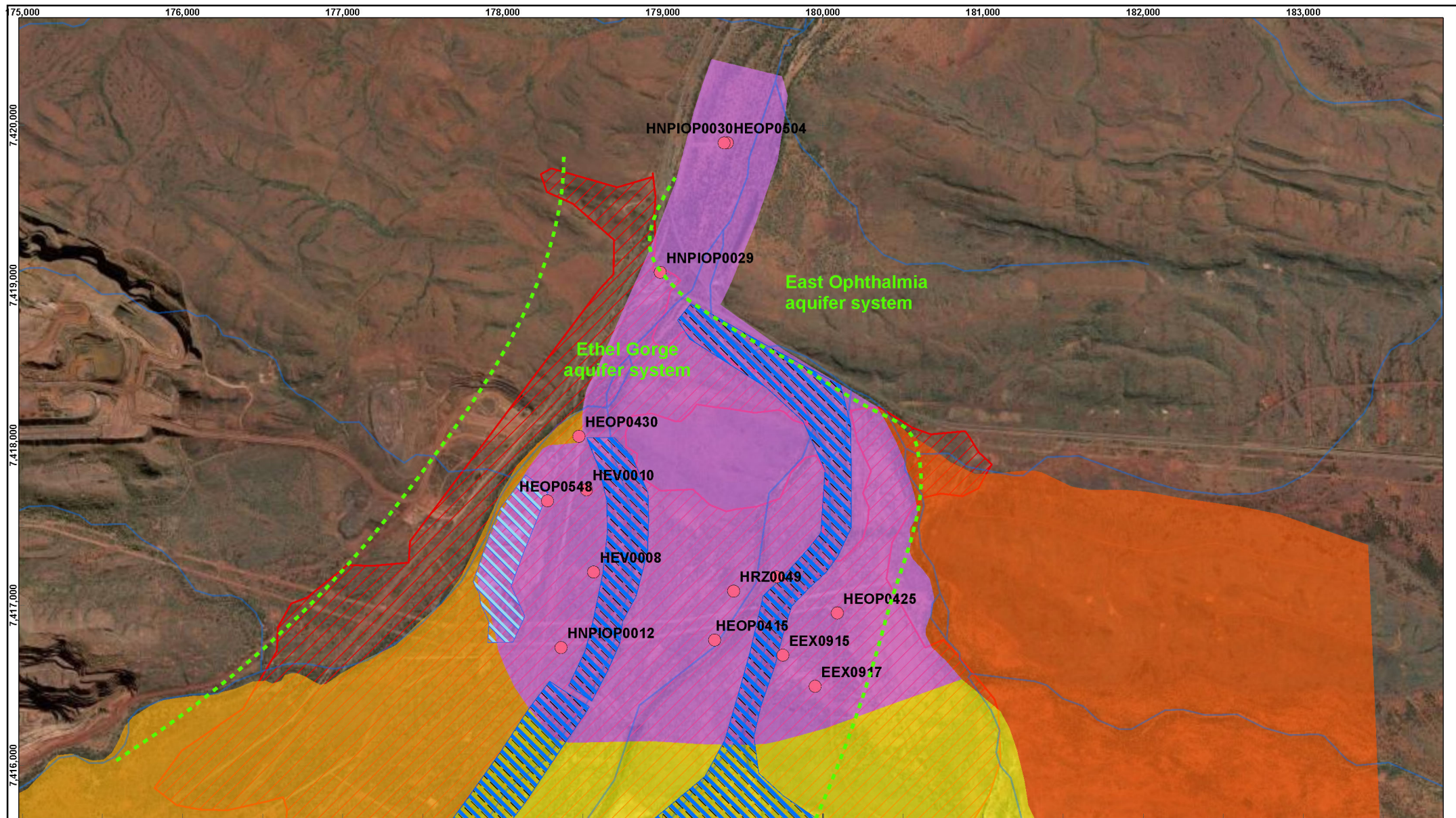
Comment Number	Submitter	Submission and/or issue	Response to comment
		the manner outlined in Chapter 8 of the Australian Groundwater Modelling Guideline (2012) so that a full review of the model can be undertaken. In particular for the geochemical part of the model, reasoning and discussion for the selection process of the input parameters is required.	
26.	DWER	The origin of the tailings samples which have been assessed is not provided. If tailings samples were sourced from an existing mine pit within the Jimblebar hub, the information that was provided by the proponent suggests that dewatering effluent will have low nitrate concentrations. This might suggest that the risk of sub-surface pyrite oxidation due to elevated nitrate concentrations is considered to be low at in-pit TSFs within the Jimblebar Hub. If the tailings samples were sourced from drill core then this data gap has not been closed out. Action: • Provide an assessment of the risk of nitrate from waste rock in ISAs. • Undertake ongoing monitoring of nitrate concentrations in dewatering effluent to ensure the risk remains low.	<i>Jimblebar VD12 Variation: Results of geotechnical and geochemical test work on tailings composite samples</i> (Golder 2022b) is referenced in the MCP and was provided as a confidential technical appendix to the MCP included with the referral document. This document summarises the outcomes of test work undertaken on Jimblebar metallurgical tailings samples (which were composited from blasted material) and supernatant, with a focus on determining geotechnical properties, mineralogy, AMD potential and elemental enrichment and release under various leaching conditions. The assessment of nitrate concentrations within the tailings solids, supernatant and leachate are addressed in this document. Nitrate concentrations are monitored and reported as part of the following water quality programs: • RiWI GWL158795(11): Jimblebar GWOS groundwater licence monitoring - including biannual water quality monitoring of selected dewatering bores; reporting of groundwater quality at dewatering bores in Annual Aquifer Reviews • EP Act Part V licence L5415/1988/9: quarterly water quality monitoring at emission point of surplus dewatering water, when discharging or reinjecting. BHP will continue monitoring of nitrate concentrations in the surplus dewatering water, to ensure the risk remains low.
27.	DWER	It is understood that no waste rock will be co-disposed of with tailings in the initial two short-term TSFs. However, the updated assessment for the tailings as described in the new In-pit TSF Impact Assessment (BHP 2025) does not include the previously recommended assessment of tailings under long-term anaerobic conditions where tailings will be	See response to related Comment 25.

Comment Number	Submitter	Submission and/or issue	Response to comment
		stored below the water table once groundwater rebounds. Saturated column investigations of iron-ore tailings in the region (see Watson et al, 2016) have indicated that significant concentrations of arsenic and manganese can be released when disposed of below the water table in in-pit TSFs. Action: Assess the risk of contaminant release from a typical mixture of the tailings material under long-term anaerobic conditions (saturated kinetic leach columns) which is further described in Søndergaard et al. (2018) and Watson et al. (2016).	
Social Surroundings			
28.	DWER	Gilgai claypan BHP state that the traditional owners have been engaged in the review of the proposal however it remains unclear if they are aware of the presence of the Gilgai claypan. Action: BHP to address previous comments on the claypan and the potential impacts from alterations to surface water catchment.	The draft approval documents were reviewed by KNAC on behalf of Nyiyaparli Traditional Owners. No specific queries or concerns were raised in relation to Gilgai claypan. Therefore, no further information is provided here.
Mine Closure Plan			
29.	DEMIRS	It is understood that the Overburden Storage Areas (OSA) locations were selected to “avoid Ghost Bat roosts, remain on tenure and	E52/1776 is currently being converted and is with the Minister for Mines for approval. Once approved, E52/1776 will be surrendered, and the tenure area will become part of

Comment Number	Submitter	Submission and/or issue	Response to comment
		minimise the haulage distance from the pit" (ERD Section 2.4). DEMIRS note the following: 1. The OSA within E52/1776-I will require tenure that is suitable for proposed OSAs to be constructed (as noted in Table 3-1) (i.e. an E can only be used for exploration). 2. OSA boundaries where adjoining tenure boundaries and corners may impact the proponent's ability to implement rehabilitation, manage environmental impacts, and ensure the OSA is blended into the natural landscape. Alternative options need to be considered in closure planning (e.g. additional tenure, pit backfill). BHP note pit backfill is prioritised (Section 7.4.1.1, p. 52) "taking into account ...the potential to reduce footprint for out of pit rock dumps". Action: • Tenure constraints should not result in OSAs and mine pits having inadvertent environmental and safety risks. • DEMIRS request the risk associated with tenure constraints on OSA placement and design be explained and discussed in the future revision of the Mine Closure Plan.	Mining Lease M266SA, which is appropriate tenure for the Jimblebar Significant Amendment requirements.
30.	DEMIRS	The Mine Closure Plan provided has been revised to include the proposed additional activities. DEMIRS is concerned about the length of time estimated for consolidation of the tailings in the in-pit tailings storage facilities (IPTSFs), which is noted to be 10-20 years (Appendix 7, Mine Closure Plan – Executive Summary Table 1).	As part of ongoing pre-planning for the disposal of tailings to the in-pit TSFs, further consolidation modelling and cover implementation timing was undertaken in 2024 (Attachment 2 Design Report, Appendix F Consolidation Modelling) as it was agreed that the time between final tailings deposition and emplacement of an engineered cover should be minimised. Figure 2-3 of this response (following Table 2) illustrates the latest tailings consolidation modelling for De Grey and Swan pits. The change in settlement rates is due to an optimisation in the spigot locations for tailings discharge. It is now forecast that deformation rates of less than 1 m per year will occur within 2 years of final tailings deposition. Emplacement of the final engineered surface could

Comment Number	Submitter	Submission and/or issue	Response to comment
		Action: Further assessment of options to improve the rate of settlement and consolidation of tailings are needed to inform operational management of tailings to ensure timely rehabilitation of the IPTSF.	occur at this time, and likely earlier for areas of the pit void where the thickness of tailings is less than 10 m. The first layer of the cover will be a “pioneer” layer designed to create a safe construction base for cover emplacement. Options to further enhance dewatering and settlement including wick drains have also been identified. During operations, settlement rates will be confirmed through lab testing of the tailings properties. This will provide a dataset that will allow detailed 3D consolidation modelling. The above information will be updated into the next version of the Jimblebar Hub MCP (planned for 2026).
31.	DEMIRS	The consolidation of the top surface of the IPTSFs aspect is missing in the IPTSF Domain Key outcomes, closure risks and controls listed in Executive Summary Table 1 of the Jimblebar 2023 MCP. Action: This omission should be modified so that the outcomes/risks/controls in the MCP align with the Key Knowledge Gap section that states: “Opportunities for enhancing tailings settlement and drainage to reduce the timeframe over which closure works can be safely operated (currently tailings will take 10 to 20 years to consolidate enough to allow earthmoving machinery to place the cover).”	Closure risks associated with consolidation of the top surface of in-pit TSFs will be reassessed based on updated information from studies undertaken in 2024 (see response to Comment 30 above) where consolidation profile is now predicted to result in more favourable conditions to reduce timeframes for closure execution.
32.	DEMIRS	Table 7-3 of the MCP: Risk ID R3 (Dust emissions from tailings surface...) notes the inherent risk likelihood that undisturbed tailings will be mobilized by wind is rated as “possible”. This likelihood rating is not supported by DEMIRS’ observations of TSFs in the East Pilbara (EP) context. In most instances TSFs inspected have significant dusting issues within 1 to 2 years post-cessation of deposition	Closure risks associated with dust emissions from tailings surface will be reassessed in the updated closure risk assessment as part of future updates to the Jimblebar Hub MCP. The closure risk for dust will change due to the expected short timeframe between final tailings deposition and commencement of closure execution, which is now expected to be less than 2 years (see responses to Comments 30 and 31).

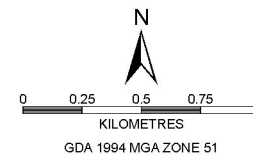
Comment Number	Submitter	Submission and/or issue	Response to comment
		(process water tend to be fresh in the EP and as a result no salt crust forms to mitigate dusting). Action: Review the risk of undisturbed tailings being mobilized by wind, which is rated as "possible".	
33.	DEMIRS	As noted above for the ERD - OSA considerations, tenure constraints should not result in OSAs and pits having inadvertent environmental and safety risks. Action: DEMIRS recommend the risk associated with tenure constraints on OSA placement and design are discussed in the future revision mine closure plan.	Closure risks associated with final OSA footprint constraints (tenure, heritage, will be included in the updated closure risk assessment as part of future updates to the Jimblebar Hub MCP.



- Groundwater monitoring bores
- ▨ Ethel Gorge TEC
- ▨ Infiltration basins
- ▨ Recharge ponds
- Watercourse
- - - Indicative aquifer system boundary

Management and Monitoring Zones

- Monitoring Zone 1 - Ethel Gorge primary habitat monitoring zone
- Monitoring Zone 2 - Shovelanna Creek monitoring zone
- Monitoring Zone 3 - Homestead Creek monitoring zone
- Early Warning monitoring zone



BHP

PUBLIC

JIMBLEBAR HUB SIGNIFICANT AMENDMENT EPWRMP ETHEL GORGE PRIMARY HABITAT ZONE GROUNDWATER LEVEL MONITORING

WAIO PLANNING, TECHNICAL & ENVIRONMENT

SCALE @A4: 1:32,000
DATE: 29/05/2025

PREPARED: GEOMATICS
REQUESTOR: ENV. APPROVALS

FIGURE: 2-1
NO: A1021/178B

Ethel Gorge Primary Habitat Zone Groundwater Levels

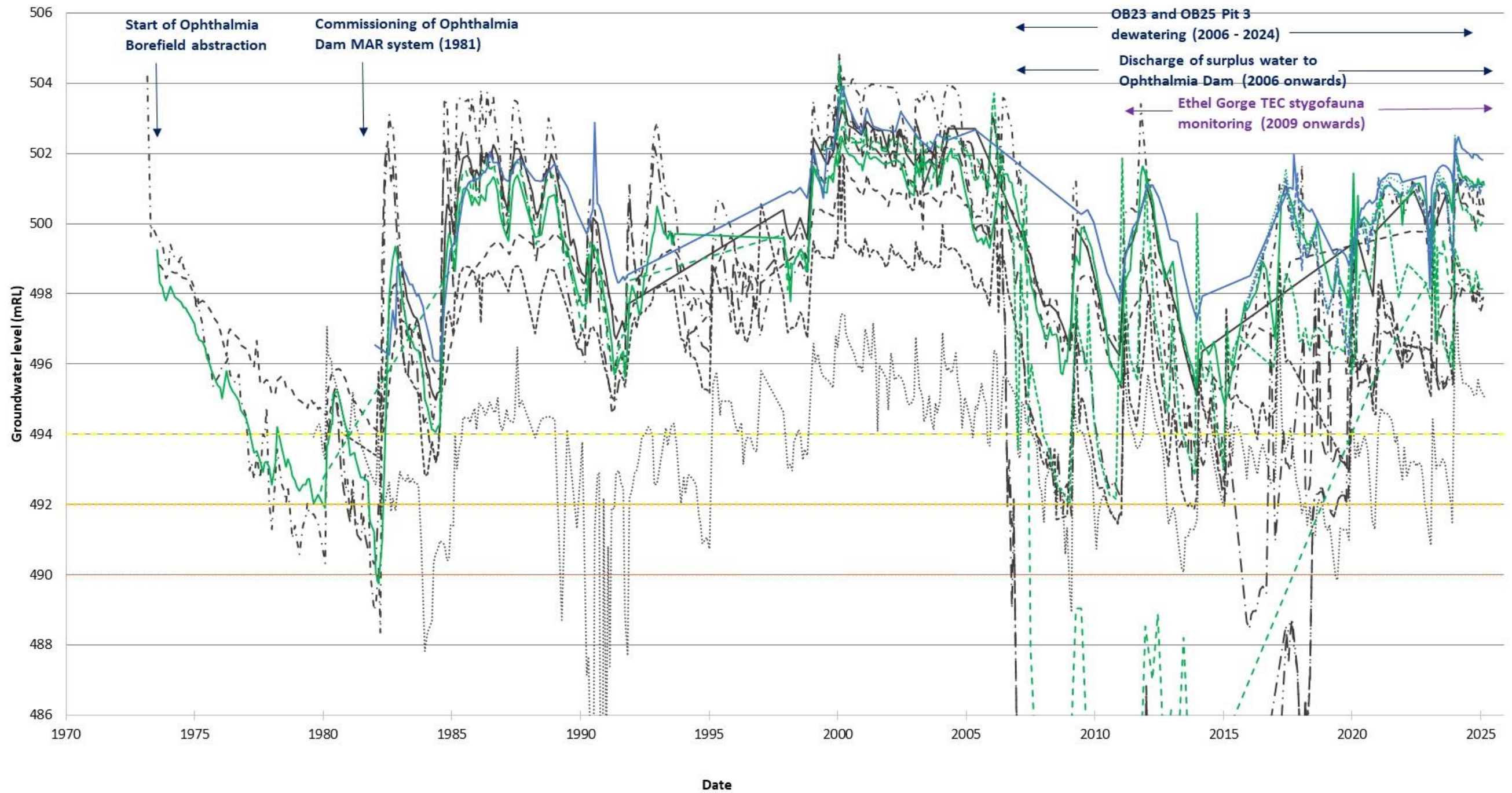


Figure 2-2 - Ethel Gorge Primary Habitat Monitoring Zone groundwater levels and EPWRMP criteria

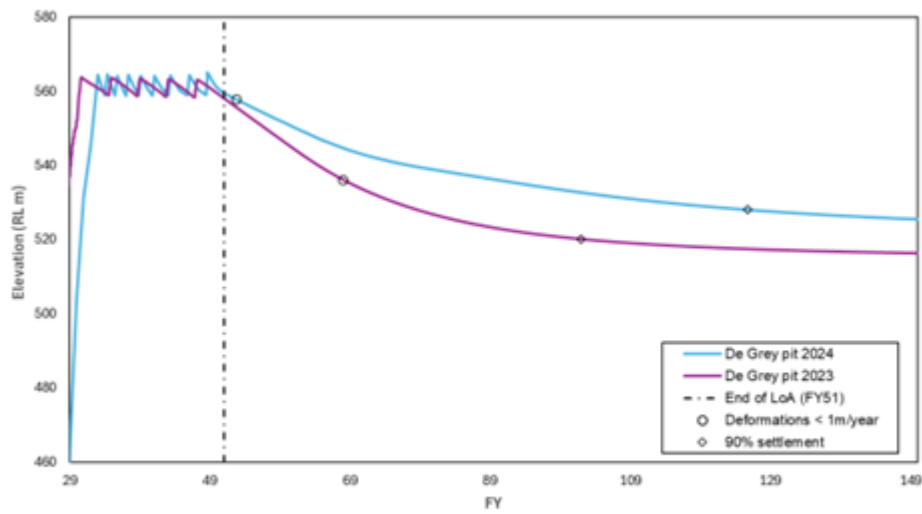


Figure 11.3 Comparison settlement in De Grey IPTSF following the multiple deposition phases

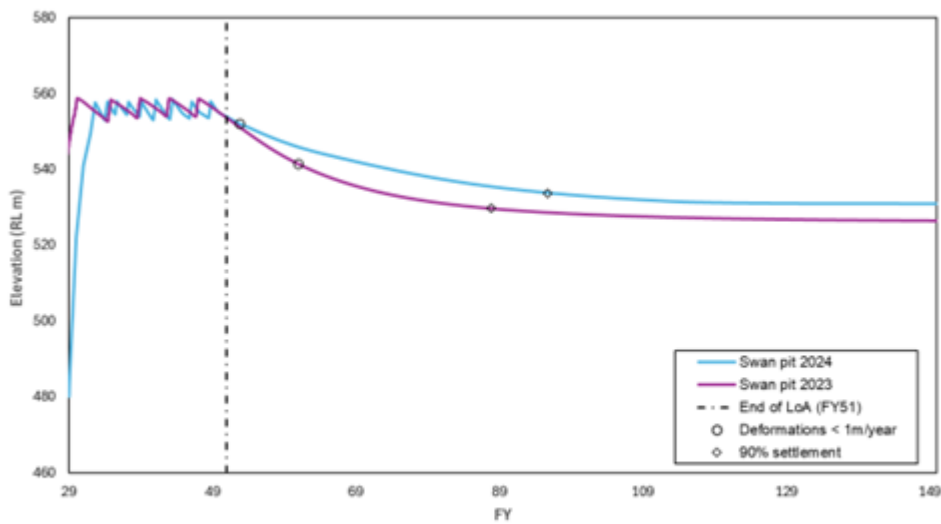


Figure 11.4 Comparison settlement in Swan IPTSF following the multiple deposition phases

Figure 2-3: Comparison of settlement in De Grey and Swan in-pit TSFs

ATTACHMENT 1 Table 1 Ghost Bat cave categorisations

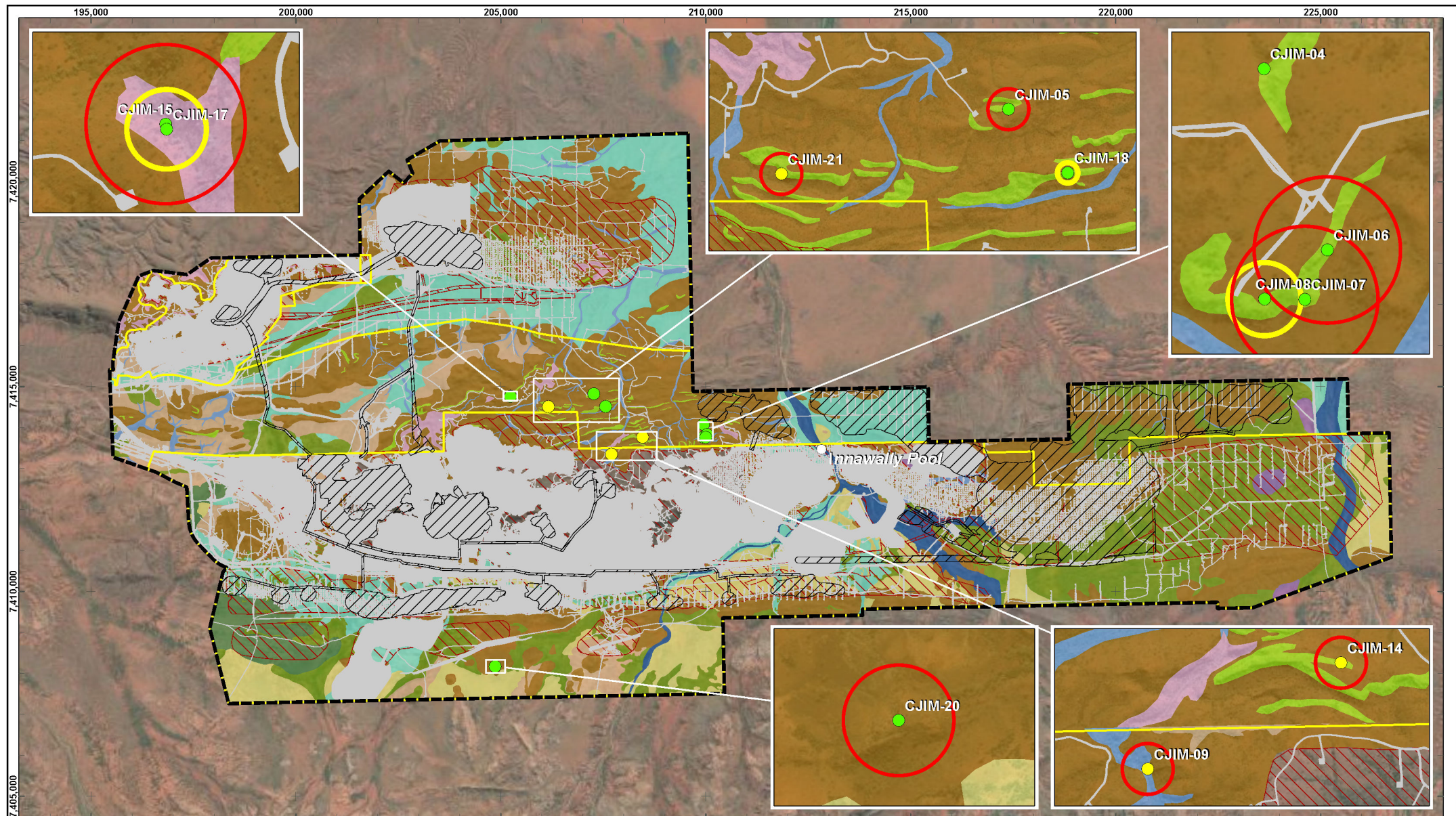
Cave ID (previous name)	Roost classification (Biologic 2023b)	Fauna habitat cave is located within	Distance to nearest footprint	Evidence of use by Ghost Bats
CJIM-04 (CAV-04 GHD 2021)	Category 4	Breakaway/ Cliff	182 m to Indicative Footprint (proposed OSA)	None
CJIM-05 (CAV-05 GHD 2021)	Category 4	Hillcrest/ Hillslope	1.1 km to Previously Assessed Area for MS1126	10 records - old scats in 2019 (GHD 2019a) - fresh scats in 2022 (Biologic 2023a) - multiple days (5) of ultrasonic recordings of individual(s) in June 2023 (Biologic 2025b) - multiple days (3) of motion activated camera recordings of individual(s) in June 2023 (Biologic 2025b)
CJIM-06 (CAV-06 GHD 2021)	Category 4	Breakaway/ Cliff	354 m to Indicative Footprint (proposed OSA)	1 record few old unconfirmed degraded scats in 2019 (GHD 2019a)
CJIM-07 (CAV-07 GHD 2021)	Category 4	Breakaway/ Cliff	317 m to Previously Assessed Area for MS1126	1 record old unconfirmed degraded scats in 2019 (GHD 2019a)
CJIM-08 (CAV-08 GHD 2021)	Category 4	Hillcrest/ Hillslope	320 m to Previously Assessed Area for MS1126	None
CJIM-09 (CAV-09 GHD 2021)	Category 3	Minor Drainage Line (extending from Gorge/ Gully habitat)	277 m to Previously Assessed Area for MS1126	3 records - fresh scats in 2020 (GHD 2021b) - ultrasonic recordings of individual(s) in May 2020 (GHD 2021b) - fresh scats in 2021 (Biologic 2023a)
CJIM-14 (CAV-14 GHD 2021)	Category 3	Breakaway/ Cliff	344 m to Previously Assessed Area for MS1126	None
CJIM-15 (CAV-15 GHD 2021)	Category 4	Gorge/ Gully	445 m to Previously Assessed Area for MS1126	1 record few fresh scats in 2022 (Biologic 2023a)

Cave ID (previous name)	Roost classification (Biologic 2023b)	Fauna habitat cave is located within	Distance to nearest footprint	Evidence of use by Ghost Bats
CJIM-17 (CAV-17 GHD 2021)	Category 4	Gorge/ Gully	445 m to Previously Assessed Area for MS1126	None
CJIM-18 (CAV-18 GHD 2021)	Category 4	Breakaway/ Cliff	1 km to Previously Assessed Area for MS1126	None
CJIM-20 (SW-01 Biologic 2019; CAV-20 GHD 2021)	Category 4	Hillcrest/ Hillslope	502 m to Previously Assessed Area for MS1126	1 record fresh scats in 2022 (Biologic 2023a)
CJIM-21 (CAV-21 GHD 2021)	Category 3	Breakaway/ Cliff	302 m to Previously Assessed Area for MS1126	1 record - foraging evidence (few scattered feathers) in 2020 (GHD 2021b)
CJIM-01 (SC-01 GHD 2019)	Category 4 Mine adit	N/A	N/A	None
CJIM-02 (CAV-02 GHD 2021)	Category 3	N/A	N/A	None
CJIM-03 (SC-02 GHD 2019; SC-01 GHD 2021)	Category 2	N/A	N/A	4 records - scat in 2019 (GHD 2019b) - large number of scats in 2020 (GHD 2021b) - large number of scats in 2021 (Biologic 2023a) - 1 individual (direct observation) in 2021 (Biologic 2023a)
CJIM-11	Category 3	N/A	N/A	1 record - old scat in 2020 (GHD 2021b)
CJIM-12	Category 3	N/A	N/A	1 record - old scat in 2020 (GHD 2021b)
CJIM-13	Category 3	N/A	N/A	None

Cave ID (previous name)	Roost classification (Biologic 2023b)	Fauna habitat cave is located within	Distance to nearest footprint	Evidence of use by Ghost Bats
CJIM-16	Category 3	N/A	N/A	2 records - old scat in 2020 (GHD 2021b) - fresh scats in 2022 (Biologic 2023a)
CJIM-19	Category 4	N/A	N/A	None
CNIN-01	Category 3	N/A	N/A	8 records - multiple (four) ultrasonic recordings of individual(s) September to December 2021 (Biologic 2023a) - scats in June 2022 (Biologic 2023a) - scats in April, July and September 2023 (Biologic 2025b)
CNIN-02	Category 3	N/A	N/A	None
CNIN-03 (obcave3 Biologic 2014; CAV-5 GHD)	Category 2	N/A	N/A	71 records - scat recorded in 2013 (Biologic 2014b) - large number of scats recorded in September 2021 (Biologic 2023a) - fresh scat recorded in June 2022 (Biologic 2023a) - multiple (12) ultrasonic recordings of individuals September 2021 to August 2022 (Biologic 2023a) - large number of scats recorded in September 2022 (Biologic 2023a) - multiple (45) ultrasonic recordings of individuals September 2022 to August 2023 (Biologic 2025b) - multiple days (8) of motion activated camera recordings of individual(s) in April, May and July 2023 (Biologic 2025b) - scat recorded in February and September 2023 (Biologic 2025b)
CNIN-04 (obcave4 Biologic 2014)	Category 4	N/A	N/A	None
CNIN-05	Category 4	N/A	N/A	None

Cave ID (previous name)	Roost classification (Biologic 2023b)	Fauna habitat cave is located within	Distance to nearest footprint	Evidence of use by Ghost Bats
(obcave5 Biologic 2014; CAV-5 GHD; OB19_r2 Biologic 2014; Cav-3 GHD)				
CNIN-06	Category 4	N/A	N/A	None
CNIN-07	Category 3	N/A	N/A	None
CNIN-09	Category 3	N/A	N/A	55 records - multiple (five) ultrasonic recordings of individual(s) October 2021 to February 2022 (Biologic 2023a) - direct observation of individuals in February 2022 (Biologic 2023a) - multiple (two) ultrasonic recordings of individual(s) May to June 2022 (Biologic 2023a) - direct observation of individuals in May 2022 (Biologic 2023a) - ultrasonic recordings of individual(s) in August 2022 (Biologic 2023a) - multiple (39) days of ultrasonic recordings of individuals September 2022 to August 2023 (Biologic 2025b) - multiple days (6) of motion activated camera recordings of individual(s) in April, May and July 2023 (Biologic 2025b)
CNIN-10	Category 3	N/A	N/A	None
CNIN-11	Category 3	N/A	N/A	None
CNIN-12	Category 3	N/A	N/A	None
CNIN-13	Category 3	N/A	N/A	4 records - scat in 2022 (Biologic 2023a) - scat recorded in July and September 2023 (Biologic (2025b) - Direct observation of a mature individual (Biologic 2025b)

Cave ID (previous name)	Roost classification (Biologic 2023b)	Fauna habitat cave is located within	Distance to nearest footprint	Evidence of use by Ghost Bats
CNIN-14	Category 4	N/A	N/A	None
CNIN-16	Category 4	N/A	N/A	1 record - potential feeding evidence in 2020 (GHD 2021c)
CNIN-17	Category 4	N/A	N/A	None



- Proposed Development Envelope
- Indicative Footprint
- Approved Proposal Ministerial Statement boundaries
- Indicative Cleared Area as at FY2022
- Previously Assessed Areas

Ghost Bat roosts

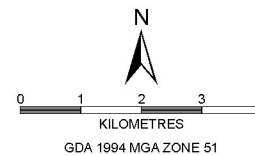
- Category 3 Roost
- Category 4 Roost

- 50m mining exclusion
- 100m mining exclusion

Habitat type

- Breakaway/ Cliff
- Claypan
- Drainage Area/ Floodplain
- Gorge/ Gully
- Hardpan Plain

- Hillcrest/ Hillslope
- Major Drainage Line
- Minor Drainage Line
- Mulga Woodland
- Sand Plain
- Stony Plain



BHP

PUBLIC

JIMBLEBAR HUB IRON ORE MINING OPERATIONS Terrestrial fauna mitigation

WAIO PLANNING, TECHNICAL & ENVIRONMENT

SCALE @A4: 1:125,000

PREPARED: GEOAMTICS

FIGURE: 9-11

DATE: 8/05/2025

REQUESTOR: ENV. APPROVALS

NO: 1021/062D

ATTACHMENT 2 In-pit Tailings Storage Facility Studies

WSP (2025) *In-Pit Tailings Storage Facility – Design Report: Jimblebar Definition Phase Study*. Rev 1, 7 February 2025. Report prepared for BHP.

ATTACHMENT 3 - Additional terrestrial and subterranean fauna studies

Astron 2024, East Caramulla Targeted Bilby Fauna Assessment

Biologic 2021, Jimblebar North SRE Sequencing Report

Biologic 2025a, Jimblebar Wind Power 2030 Targeted Vertebrate Fauna Survey

Biologic 2025b, Eastern Pilbara Ghost Bat Monitoring Program 2022-2023

Biologic 2024, Jimblebar Project Stygofauna DNA investigation

Stantec 2023, Review of the long term trends in Ethel Gorge TEC

Stantec 2024, Ethel Gorge TEC Stygofauna Monitoring 2022/2023

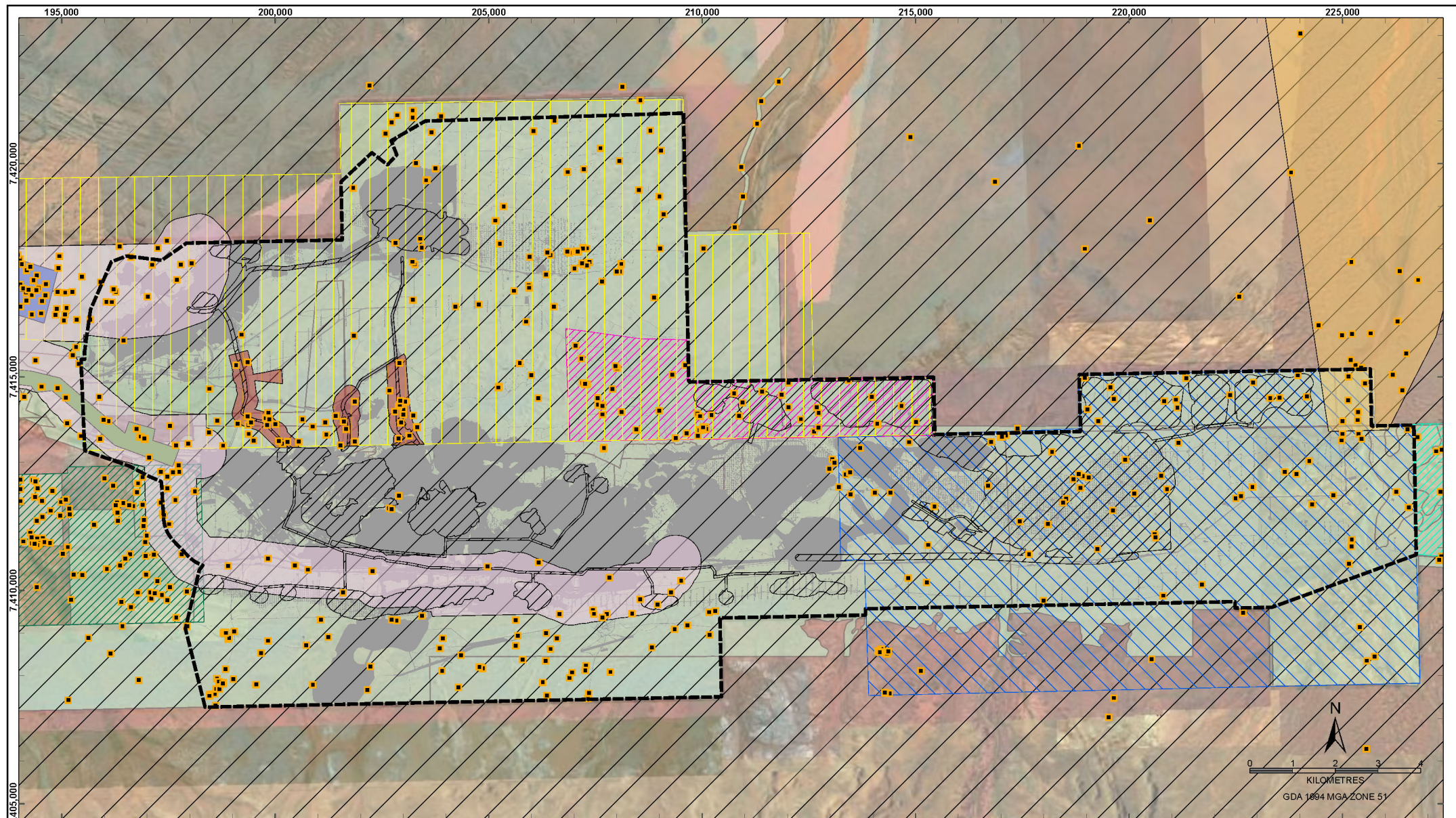
ATTACHMENT 4 – Figures of survey effort and species records

Figure 1 – Vertebrate Fauna Survey Coverage

Figure 2 – SRE Fauna Survey Coverage

Figure 3 – Flora and Vegetation Survey Coverage

Figure 4 – SRE records



Development Envelope

Indicative Footprint

Indicative Cleared Area as at FY2022

Vertebrate Fauna Sample Sites

Contemporary Vertebrate Fauna Surveys

Jimblebar Wind Power 2030 Targeted Vertebrate Fauna Survey (Biologic 2024)

Caramulla Targeted Bilby Assessment (Astron 2024)

BHP WAIO Warrawandu Targeted Fauna Survey Report (Biologic 2023)

Jimblebar Meteorological Mast: Targeted Vertebrate MNES Fauna Survey (Biologic 2023)

Mesa Gap Targeted Flora, Vegetation and Fauna Survey (Astron 2023)

North Jimblebar: Targeted Northern Quoll Assessment (Biologic 2022)

Caramulla Miscellaneous Licence Level 1 and Targeted Vertebrate Fauna Survey (Biota 2020)

East Jimblebar and Caramulla Targeted Bilby Survey (GHD 2020)

Jimblebar Greenhouse Gas Abatement Study Level 1 Vertebrate Fauna Survey (Biologic 2020)

Jimblebar targeted ghost bat survey (GHD 2020)

North Jimblebar Vertebrate Fauna Survey (GHD 2019)

Historical Vertebrate Fauna Surveys

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JIMBLEBAR SIGNIFICANT AMENDMENT REQUEST FOR INFORMATION RESPONSE Vertebrate Fauna Survey Coverage

WAIO PLANNING, TECHNICAL & ENVIRONMENT

SCALE @A4: 1:120,000

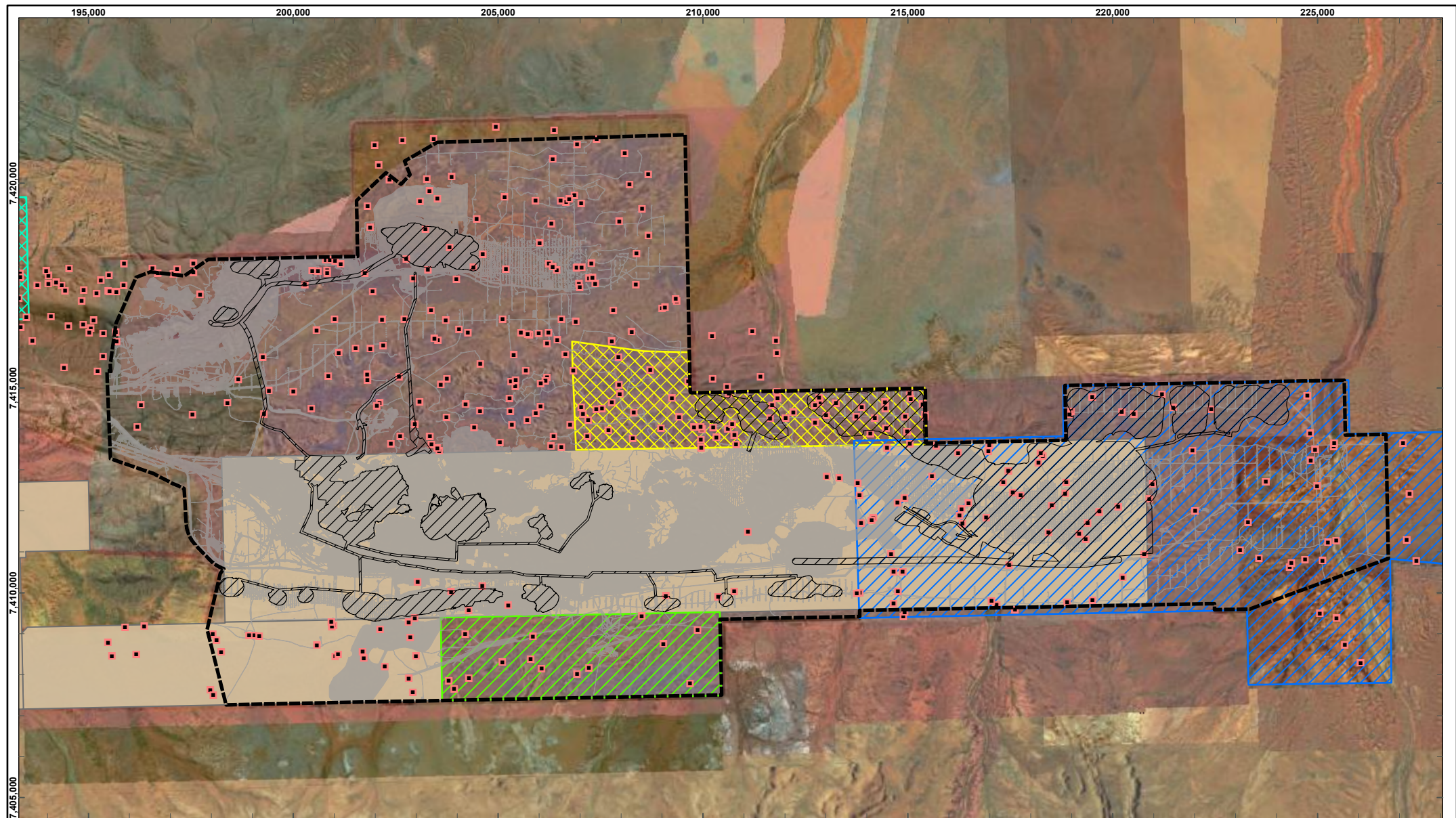
PREPARED: GEOMATICS

FIGURE: 1

DATE: 8/05/2025

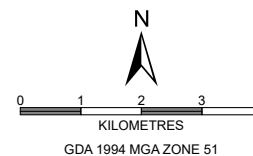
REQUESTOR: ENV. APPROVALS

NO: 1021/168D



- Development Envelope
- Indicative Footprint
- Indicative Cleared Area as at FY2022
- SRE Fauna Sample Sites
- Contemporary SRE Survey**
- East Ophthalmia and Ninga Detailed SRE Assessment (Biologic 2023)
- East Jimblebar and Caramulla Short-Range Endemic Invertebrate Fauna Survey (Biologic 2019)

- Jimblebar North (Crowe's Nest) Short-Range Endemic Invertebrate Fauna Survey (Biologic 2019)
- Shearer's West Targeted Vertebrate and Short-range Endemic Invertebrate Fauna Assessment (Biologic 2019)
- Historical SRE Survey



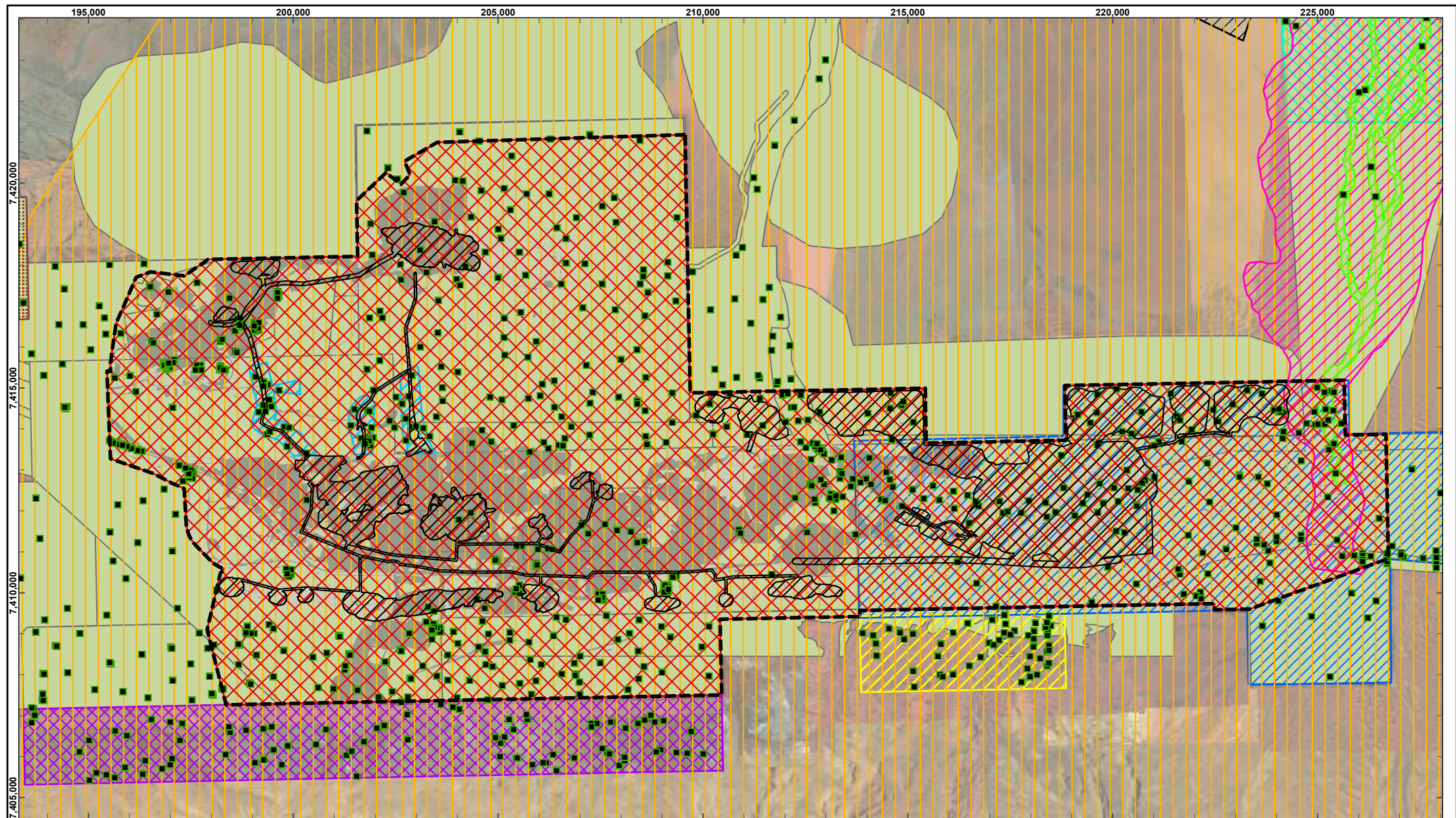
BHP

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JIMBLEBAR SIGNIFICANT AMENDMENT REQUEST FOR INFORMATION RESPONSE SRE Invertebrate Fauna Survey Coverage

WAIO PLANNING, TECHNICAL & ENVIRONMENT

SCALE @ A4: 1:125,000	PREPARED: GEOMATICS	FIGURE: 2
DATE: 12/05/2025	REQUESTOR: ENV. APPROVALS	NO: 1021/169C



Development Envelope

Indicative Footprint

Indicative Cleared Area as at FY2022

Flora and Vegetation Sample Sites

Contemporary Flora and Vegetation Survey

Desktop Consolidation of Jimblebar

Development Envelope Vegetation

Association Mapping (no report).

(Onshore 2023)

Mesa Gap Corridors - Reconnaissance

Vegetation and Flora, and Basic Fauna

Survey (Astron 2023)

V3_2118_Caramulla Creek Riparian
Vegetation Condition Monitoring_BHP
(Spectrum 2023)

Caramulla Creek Riparian Monitoring
(Spectrum 2022)

East Ophthalmia & Ninga Detailed Flora
& Vegetation Survey (Spectrum 2022)

BHP WAIO Jimblebar *Eremophila*
capricornica Targeted Flora Survey
(Biologic 2021)

BHP Poonda MAR reconnaissance flora
and level 1 fauna survey (GHD 2020)

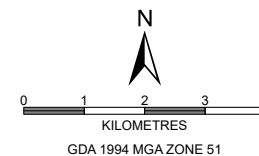
Caramulla Creek Flora and Vegetation
Survey (Astron 2019)

East Jimblebar and Caramulla Detailed
Flora and Vegetation Assessment
(Biologic 2019)

Jumbuck Reconnaissance Flora and
Vegetation Assessment (Biologic 2019)

Shearers East (Jimblebar South)
Reconnaissance Flora and Vegetation
Survey (Biologic 2019)

Historical Flora and Vegetation Survey



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JIMBLEBAR SIGNIFICANT AMENDMENT REQUEST FOR INFORMATION RESPONSE Flora and Vegetation Survey Coverage

WAIO PLANNING, TECHNICAL & ENVIRONMENT

SCALE @ A4: 1:125,000

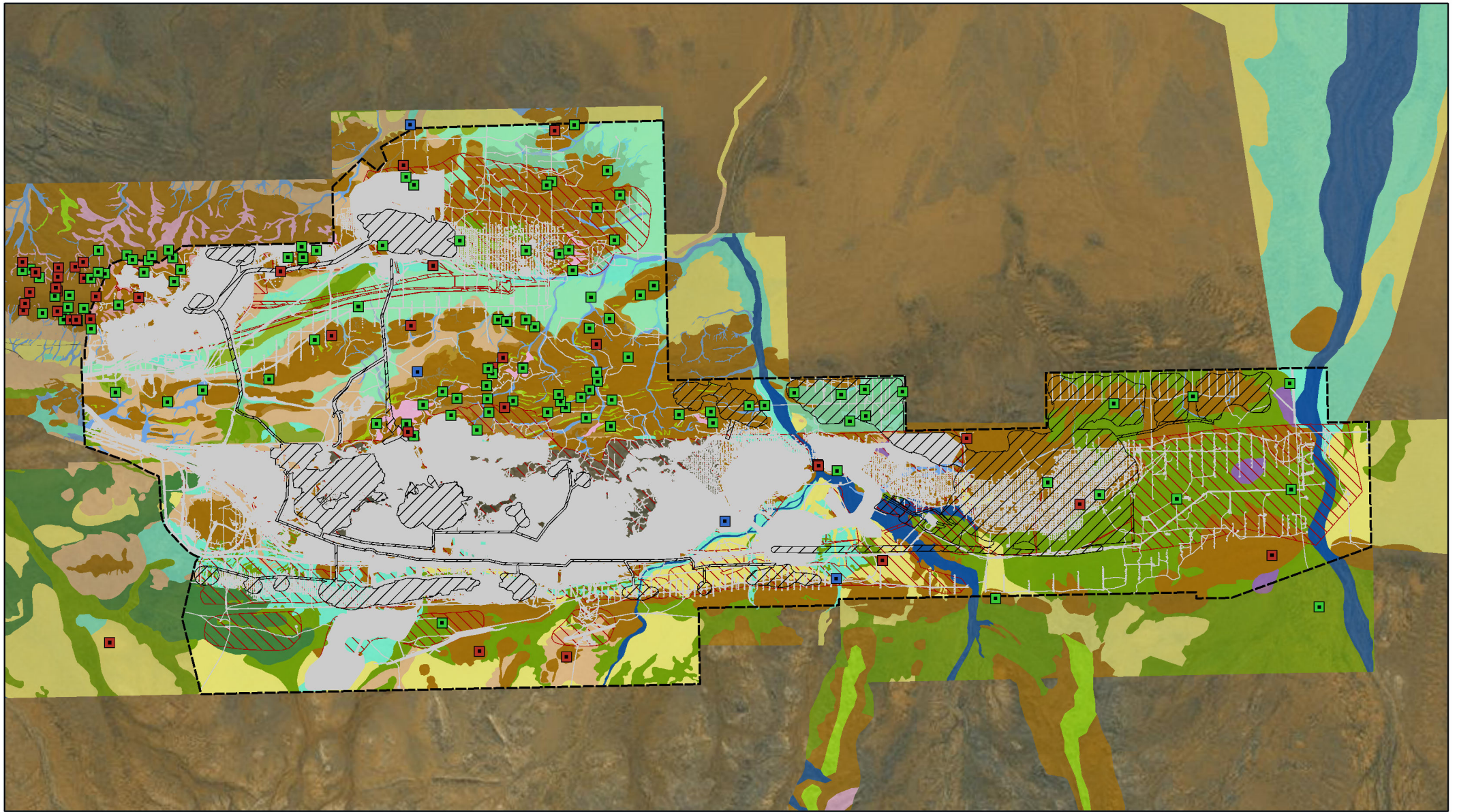
PREPARED: GEOMATICS

FIGURE: 3

DATE: 12/05/2025

REQUESTOR: ENV. APPROVALS

NO: 1021/170D



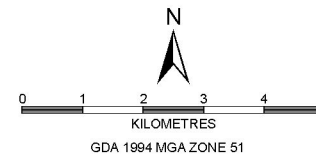
- Proposed Development Envelope
- Indicative Footprint
- Indicative Cleared Area as at FY2022
- Previously Assessed Areas

SRE Status

- Confirmed SRE
- Potential SRE
- Uncertain SRE

Habitat type

- Breakaway/ Cliff
- Claypan
- Drainage Area/ Floodplain
- Gorge/ Gully
- Hardpan Plain
- Hillcrest/ Hillslope
- Major Drainage Line
- Mulga Woodland
- Sand Plain
- Stony Plain
- Minor Drainage Line



BHP PUBLIC

JIMBLEBAR SIGNIFICANT AMENDMENT REQUEST FOR INFORMATION RESPONSE SRE RECORDS

WAIO- PLANNING, TECHNICAL & ENVIRONMENT

SCALE @ A4: 1:125,000	REQUESTOR: ENV. APPROVALS	FIGURE: 4
DATE: 27/05/2025	PREPARED: GEOMATICS	
REVIEWED: Name		NO: A1021-185B

ATTACHMENT 5 Table 1 - Predicted cumulative impacts to confirmed SRE

Confirmed SRE	Total records within 100km*	Records within 100km and within cumulative Development Envelopes	Records within 100km and within cumulative Indicative Footprints	Predicted impact from the Proposal
Aganippe MYG083	1			
Aganippe MYG086	1			
Aganippe MYG126	4			0
Aganippe MYG384	2			
Aname watsoni	1	1	1	0
Anidiops MYG286	3	1		
Antichiropus cristatus	1	1		
Antichiropus verutus	27	27		
Aureococrypta MYG315	1	1		
Beierolpium sp. `7/2`	1			
Conothele MYG002	2			
Conothele MYG279	1	1		
Conothele MYG280	2			
Kwonkan MYG337	8			
Kwonkan MYG338	2			
Missulena faulderi	3			
Yilgarnia MYG033	15			

* Records are from Western Ridge, Eastern Ridge, Whaleback, Orebody 32 BWT, Jimblebar, Orebody 29/30/35 Significant Amendment and Orebody 32 Creek discharge

ATTACHMENT 5 Table 2 Predicted cumulative impacts to potential SRE

Potential SRE	Total records within 100km*	Records within 100km and within Development Envelopes	Records within 100km and within Indicative Footprints	Predicted impact from the Proposal
Acanthodillo `BIS379`	1	1		
Afrosterophorus `BPS265`	2	2		
Afrosterophorus `BPS268`	8	7		
Amblyolpium `BPS273`	1	1		
Antichiropus sp. Biologic-POLD003	1			
Antichiropus sp. indet.	13	7		
Antichiropus? sp. indet.	1			
Atemnidae sp. `BPS270`	25	23	3	0
Austrochthonius `BPS264`	3	3		
Austrohorus sp. Biologic-PSEU023	1	1		
Austrohorus sp. Biologic-PSEU024	4	4		
Austrohorus sp. Biologic-PSEU025	4	4		
Austrohorus sp. Biologic-PSEU060	2			
Austrohorus sp. Biologic-PSEU262	1	1		
Beierolpium 8/3 `BPS259`	5	4		
Beierolpium sp. Biologic-PSEU061	2			
Beierolpium sp. Biologic-PSEU062	1			
Bothriembryon sp. indet.	8			
Bothriembryon sp. nov.	3			
Buddelundia `BIS374`	29	29	1	
Buddelundia `BIS376`	12	12	1	
Buddelundia `BIS377`	17	17	1	
Buddelundia `BIS380`	2	2		
Buddelundia `BIS381`	1	1		
Buddelundia `OBE001`	2	2		
Buddelundia `OBE002`	2	2		
Buddelundia sp. `10NM`	53	34	5	
Buddelundia sp. `14CR`	125	55	3	
Buddelundia sp. `16NM`	100	24	3	
Buddelundia sp. `36NM`	3	3		
Buddelundia sp. `49`	72	40	1	
Buddelundia sp. `78`	53	17		
Buddelundia sp. `79`	3			
Buddelundia sp. `80`	1			
Buddelundia sp. Biologic-ISOP014	2	1		
Buddelundia sp. Biologic-ISOP058 (SJ_15)	1			
Buddelundia sp. Biologic-ISOP059 (SJ_78)	3			
Buddelundia sp. Biologic-ISOP111	2			
Buddelundia sp. Biologic-ISOP112	2			
Buddelundia sp. Biologic-ISOP138	2	2		
Buddelundia sp. Biologic-ISOP139	2	2		
Buddelundia sp. SJ_10NM_DNA	2			
Buddelundia sp. SJ_10TS_DNA	1	1		
Buddelundia sp. SJ_14CR_DNA	7	2		
Buddelundia sp. SJ_49_DNA	3			
Buddelundia sp. SJ_WN_DNA	2			
Buddelundiinae sp. `OB24`	5	2		
Buddelundiinae sp. `WN`	2	2		
Buddelundiinae sp. Biologic-ISOP060	1			
Cethegus MYG299	10	4	4	
Cheliferidae sp. `BPS279`	1	1		

Potential SRE	Total records within 100km*	Records within 100km and within Development Envelopes	Records within 100km and within Indicative Footprints	Predicted impact from the Proposal
Chthoniidae sp. Biologic-PSEU120	1			
Conothele MYG385	4	1		
Conothele MYG558	1			
Conothele sp. Biologic-ARAN056	1			
Cryptops `BSCOL067`	4	4		
Cryptops sp. Biologic-CHIL028	1			
Cryptops sp. Biologic-CHIL029	1			
Cryptops sp. Biologic-CHIL063	1	1		
Cthoniidae sp. Biologic-PSEU120	1			
Euryolpium sp. Biologic-PSEU063	4			
Euryolpium sp. Biologic-PSEU064	2			
Euryolpium sp. Biologic-PSEU065	1			
Feaella PSE080	5			
Garypinidae sp. `BPS262`	2	2	1	
Garypinidae sp. `BPS263`	1	1		
Geomerinus sp. Biologic-CHIL027	2			
Geomerinus sp. Biologic-CHIL030	2			
Geophilidae sp. Biologic-CHIL064	1	1		
Hanseniella `BSYM099`	4	3		
Idiosoma sp. Biologic-ARAN039	1			
Idiosoma sp. Biologic-ARAN040	1			
Idiosoma sp. Biologic-ARAN044	2	1		
Indolpium `BPS260`	2			
Indolpium sp. Biologic-PSEU026	4	4		
Indolpium sp. Biologic-PSEU027	7	7	1	
Indolpium sp. Biologic-PSEU066	1			
Indolpium sp. Jim 04	3			
Karaops ARA003-DNA	17	5	3	
Karaops ARA004-DNA	11	11		
Karaops ARA005-DNA	31	9		
Karaops sp. Biologic-ARAN042	8	4		
Kwonkan sp. Biologic-ARAN055	2			
Kwonkan sp. nr Biologic-ARAN055	1	1		
Lychas `BSCO057`	15	15	1	
Lychas sp. `annulatus complex`	3			
Lychas sp. `jonesii`	1			
Lychas sp. Biologic-SCOR012	1			
Mecistocephalus sp. Biologic-CHIL026	4			
Mecistocephalus sp. Biologic-CHIL037	1			
Mecistocephalus sp. Biologic-CHIL091	2	1		
Mecistocephalus sp. nr Biologic-CHIL037	1			
Missulena MYG003	5			
Missulena sp. Biologic-ARAN038	1			
Missulena sp. Biologic-ARAN054	1			
Olpiidae sp. Biologic-PSEU164	1	1		
Olpiidae sp. Biologic-PSEU165	3	3		
Olpiidae sp. Biologic-PSEU263	1			
Olpiidae sp. Biologic-PSEU264	5	1		
Projapygidae sp. Biologic-DIPL065	3			
Synsphyronus `BPS258`	2	2		
Synsphyronus `PSE129`	3			

Potential SRE	Total records within 100km*	Records within 100km and within Development Envelopes	Records within 100km and within Indicative Footprints	Predicted impact from the Proposal
Troglarmadillo `BIS383`	1	1		
Troglarmadillo `ISO005`	2	2		
Tyrannochthonius sp. Biologic-PSEU059	1			
Urodacus `BSCO046`	1	1		
Urodacus sp. `megamastigus complex`	2	2	2	
Urodacus sp. Biologic-SCOR007	3	1		
Urodacus sp. Biologic-SCOR016	1			
Urodacus sp. Biologic-SCOR017	1			
Xenolpium `PSE079`	1	1	1	

* Records are from Western Ridge, Eastern Ridge, Whaleback, Orebody 32 BWT, Jimblebar, Orebody 29/30/35 Significant Amendment and Orebody 32 Creek discharge

