APPENDIX Q - AQUATIC ECOLOGY ASSESSMENT

Freshwater Ecology Pty Ltd

Isaac Downs Extension Project
Aquatic Ecology Assessment

Prepared for
Stanmore ID Extension Pty Ltd
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Document Control Summary

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Executive summary

Freshwater Ecology Consulting was engaged by Stanmore ID Extension Pty Ltd (ID Extension), a wholly owned subsidiary of Stanmore Resources Limited (Stanmore), to undertake an aquatic ecology assessment for the proposed Isaac Downs Extension (IDE) Project, a greenfield site. The purpose of this report is to provide the results of sampling, identify aquatic ecological values present within and adjacent to the Project area, assess potential impacts from the Project and identify management measures to protect aquatic ecology values.

The Project is located within the headwaters of the Isaac River catchment in the greater Fitzroy River Basin. The Isaac River (order 6) and Cherwell Creek (order 5) flow parallel to the Project area. The sampling sites within the Project area were located on first or second order streams, palustrine wetlands, gilgais or shallow depressions. All waterways were found to be ephemeral. There are no wetlands of International or National Importance identified within the Study Area, with one wetland of High Ecological Significance (HES) located within the Study Area but outside the Project area.

Sampling was conducted across waterways and drainage features within and adjacent to the Project area between March and July 2025. Rainfall across the area in the twelve months preceding sampling largely followed the longer term trends but with noticeably higher than mean rainfall from February through to April 2025. At the time of sampling there was little flow in the Isaac River and no flow in any of the other watercourses. Twelve of the 23 sites sampled were dry.

In situ water quality was recorded at all sites with standing water to assist in ecological interpretation of field data. All sites had moderately low electrical conductivity (an indirect measure of salinity), elevated turbidity levels and were mostly mildly to moderately alkaline.

Aquatic macrophyte diversity was variable across all sites but was typically higher in the palustrine wetlands and gilgais. All macrophyte species recorded were species capable of persisting in the absence of permanent standing water. The macrophyte species that could be identified to species level were native, widespread and abundant along eastern Australia, with none listed as threatened under state or federal legislation.

Macroinvertebrate communities were typical for ephemeral waterways in central Queensland, composed primarily of early colonising species and those that can sustain long periods of desiccation. Four macrocrustacean families recorded were across the Study Area, with no macrocrustaceans recorded from three sites that held water. One species was a translocated native species, while the other species were native, widespread and abundant along eastern Australia.

A total of twelve fish species were recorded across all sites, with no fish recorded in two sites holding water. Two of the species are exotic pest species, while all other species were native. All fish species recorded are capable of rapid colonisation of recently inundated watercourses and are widespread and common across their distributional ranges.

A desktop review was undertaken on the available existing information for aquatic Endangered, Vulnerable and Near Threatened (EVNT) species with potential to be present in proximity to, or in the adjacent reaches of, the Project area. The EPBC Protected Matters search identified two species, and the Wildnet search detected none. Following the desktop assessment and field surveys an assessment of the likelihood of occurrence for aquatic EVNT species was made. Both of the EVNT species identified in the desktop review were determined to be unlikely to be present within the Study Area. This was largely due to a lack of permanent flows and lack of suitable habitat present.

The Project requires the diversion on Conrock Gully (a low stream order ephemeral waterway with low aquatic ecosystem value) around the proposed mining area and the removal of one wetland which is not a HES wetland, for which significant impacts have been identified in the terrestrial ecology study and will therefore be offset. Although there are several proposed crossings of waterways adjacent to the Project, these will be constructed to no to not create a barrier for fish passage, in accordance with the principles in the Accepted Development Requirements for Operational Work that is Constructing or Raising Waterway Barrier Works. Therefore, it was concluded that the Project was unlikely to result in a significant impact on fish passage.

Indirect impacts that have been considered in this assessment include potential impacts associated with changes in water quality, hydrological changes, impacts to groundwater dependant ecosystems and potential cumulative impacts. It is concluded that the Project is unlikely to have a significant impact on aquatic ecology as a result of these potential indirect impacts. This is largely attributable to the design of Project infrastructure and activities in a manner to reduce or eliminate potential impacts to aquatic ecology. The Project will not result in significant impacts to aquatic ecological values that are matters of national environmental significance (MNES) or matters of state environmental significance MSES.

Acronym	Definition
AEP	Annual Exceedance Probability
ALA	Atlas of Living Australia
AS/NZS	Australian Standards and Australian/New Zealand Standards
AusRivAS	Australian River Assessment System (a methodology for assessing aquatic ecosystem health using macroinvertebrates)
Bed habitat	Stream bed area more than 0.5 meters from the bank edge.
Composite habitat	Composite habitat is a mixture of all bed habitats within a site (e.g. sandy pool, rocky pool, riffle, run, cascade).
CHPP	Coal Handling and Preparation Plant
DES	Department of Environment and Science (now DETSI)
DETSI	Department of the Environment, Tourism, Science and Innovation
DNRM	Department of Natural Resources and Mines (now DNRMMRRD)
DSEWPC	Department of Sustainability, Environment, Water, Population and Community
DO	Dissolved Oxygen
DotE	Department of Environment
DPI	Department of Primary Industries
EA	Environmental Authority
EC	Electrical Conductivity
Edge habitat	Edges (or banks and underbank areas) are along the bank where there is little or no current and extend to approximately 0.5 m from the bank. There may be some terrestrial vegetation (e.g. paragrass, sedges), tree roots or the area may be bare (e.g. waterholes in drier areas).
EIS	Environmental Impact Statement
EP Act	Environmental Protection Act 1994
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999
EVNT species	Endangered, Vulnerable and Near threatened species as legislated under state or federal laws.
FRREMP	Fitzroy Regional Receiving Environment Monitoring Program
GDE	Groundwater Dependent Ecosystems
Gilgai	A gilgai is a small, palustrine wetland formed from a surface depression in expanding clay soils.
HES	High Ecological Significance
IDE	Isaac Downs Extension
IDM	Isaac Downs Mine
IPC	Isaac Plains Complex
ML	Mining Lease
MLA	Mining Lease Application
MNES	Matters of National Environmental Significance
MSES	Matters of State Environmental Significance
NC Act	Nature Conservation Act 1992
PET	Plecoptera (stoneflies), Ephemeroptera (mayflies) and Trichoptera (caddisflies)
PET taxa Richness	PET Taxa Richness (or EPT) is the number of families from the three orders of aquatic insects: Ephemeroptera (mayflies), Plecoptera (stoneflies) and

Acronym	Definition
	Trichoptera (caddisflies). Macroinvertebrates belonging to these three orders are considered to be pollution intolerant and sensitive to changes in their environment. PET taxa richness is an index that measures waterway health and can be used to assess improvement or degradation of habitat over time.
PRCP	Progressive Rehabilitation and Closure Plan
RE	Regional Ecosystem
REMP	Receiving Environment Monitoring Program
ROM	Run Of Mine
SIGNAL	Stream Invertebrate Grade Number – Average Level
SIGNAL 2 score	The SIGNAL index (stream invertebrate grade number – average level), was developed for the bio-assessment of water quality in Australia. A SIGNAL score gives an indication of water quality in the river from which the sample was collected. Rivers with high SIGNAL scores are likely to have low levels of salinity, turbidity and nutrients such as nitrogen and phosphorus, and are also likely to be high in dissolved oxygen.
Taxa Richness	Taxa richness is the number of macroinvertebrate taxa collected in a sample. This index is commonly used by most monitoring programs. Its use is generally based on the premise that the better the condition of a site, the more taxa will be found; however, inflated numbers may also result at sites with higher than normal levels of flow and nutrients.
TEC	Threatened Ecological Community
ToR	Terms of Reference
WoNS	Weeds of National Significance

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1. Introduction and Scope

1.1. Background

Stanmore ID Extension Pty Ltd, a wholly owned subsidiary of Stanmore Resources Ltd, proposes to develop the Isaac Downs Extension (IDE) Project (the Project). The Project will extend the life of mining operations at Isaac Plains Complex (IPC) (comprising Isaac Downs Mine (IDM) and Isaac Plains Mine (IPM)) through the development of an open cut coal mine pit and associated infrastructure, primarily mining metallurgical (steel making) coal. Approximately 46 million tonnes of run of mine coal will be mined over 15 years, with approximately 2 – 4.5 million tonnes per annum.

The Project requires approvals from the:

- State under the Environmental Protection Act 1994 (EP Act), for a new environmental authority (EA) and progressive rehabilitation and closure plan (PRCP) schedule.
- Commonwealth through referral under the Environment Protection and Biodiversity Conservation Act 1999 (EPC Act).

The proponent has applied for four mining leases (MLs) for the Project (ML application [MLA] 700081, MLA 700082, MLA 700083 and MLA 700084), together forming the Project area. The proponent is preparing a voluntary environmental impact statement (EIS) under the EP Act which will support the EA, PRCP schedule and Referral for the Project.

Freshwater Ecology Pty Ltd (Freshwater Ecology) was commissioned by Stanmore to undertake an aquatic ecology baseline assessment for the Project to inform an Environmental Impact Statement (EIS). This report forms part of the EIS submission for the Project.

Specifically, the scope for this assessment included:

- Undertake desktop assessments, recent studies at nearby mines and relevant publicly available databases and imagery, to identify potential aquatic ecosystems upstream and downstream of potential Project impacts.
- Undertake aquatic ecology field surveys;
    - in accordance with State and Commonwealth relevant standards, guidelines and procedures
    - to ground truth aquatic ecosystems (including any potential wetlands) and determine habitat quality and condition
    - upstream and downstream of potential impacts that assess the following matters: habitat, water quality, aquatic plants, macroinvertebrates, amphibians, fish and turtles.
- Determine if the survey area provides habitat for State or Commonwealth listed threatened aquatic species (including all potential aquatic MSES and MNES) and assess their likelihood of occurrence.
- An impact assessment that addresses direct and indirect impacts of the Project on the aquatic ecosystems, propose management and mitigation measures to avoid and/or reduce

impacts to relevant aquatic MNES and MSES, and assess the significance of the residual impacts.

- An assessment of matters relating to Biosecurity relevant to aquatic ecosystems, and high-level cumulative impacts, monitoring indicators, and input into the rehabilitation plan.
- Recommendations for a receiving environment monitoring program (REMP) monitoring in line with typical EA conditions, including joining the Fitzroy Regional Receiving Environment Monitoring Program.

1.2. Project overview

The Project is located in the Bowen Basin of central Queensland approximately 15 km southeast of Moranbah and 150 km southwest of Mackay.

The proponent intends to commence construction activities in late 2027 / early 2028, subject to obtaining all required approvals, with construction commencing in 2028 and run of mine (ROM) coal extraction in 2029.

The open cut mining methods for the Project will be similar to those at IDM, including:

- clearing of vegetation, stripping and stockpiling of topsoil
- drilling and blasting of pre-strip overburden
- removing the pre-strip overburden using mining equipment at IDM being a dragline and / or truck and shovel fleets and / or dozers
- drilling and blasting of overburden
- drilling and blasting of pit floor for geotechnical stability to allow for in-pit dumping
- overburden removal using the existing dragline at IDM and / or truck and shovel fleets
- coal mining using excavators
- formation of out of pit and in-pit overburden dumps as mining progresses
- progressive rehabilitation of overburden dump areas.

ROM coal will be transported from the Project's ROM coal pad to the coal handling and preparation plant (CHPP) at IPM for washing, utilising existing haul roads at IPC and new haul roads, including a bridge across the Isaac River, constructed in the Project area. The dragline will be walked from IDM to the Project via a temporary crossing of the Isaac River.

The primary access to the Project for workers and deliveries will be via IDM's existing access road and new internal roads connecting with the Project, utilising the bridge to be constructed across the Isaac River. There is potential for a secondary access route to the Project between the Project and Stanmore's Eagle Downs project, utilising new and existing roads to connect with the Peak Downs Mine Road.

During operations, levees will be constructed to protect the open cut pit area from flooding of the Isaac River, Cherwell Creek and Conrock Gully up to a 0.1% annual exceedance probability (AEP) (1:1,000 year) flood event. Conrock Gully will be diverted around the active mining areas into the

Isaac River, with the diversion remaining post mining. Any residual void remaining post mine life will not be located within the 0.1% AEP flood event.

A mine affected water dam will store water from the pit, ROM pad, go line and crib area, with the ability to transfer mine affected water to and from IDM and IPM within IPC's integrated water management system, thereby enabling the balancing of water supply and demand. Sediment water drains and dams will be constructed to capture runoff from overburden dumps. Clean water drains and dams will be constructed to separate clean water from mine affected water and sediment water.

IPC has access to external raw water supplied from SunWater and has excess storage capacity for water within existing mined voids and dams. As the Project's water management systems will be integrated with IPC, it is anticipated that water supply will be available during dry periods, and storage capacity will be able to receive any excess water during wet periods. Therefore, no new sources of water supply will be required.

Topsoil stockpile areas will be used for storage of topsoil that has been stripped from mining and infrastructure areas, for future use in rehabilitation.

Power for the dragline will be supplied via connections to IDM's existing power supply.

The proposed Project layout, MLA areas (2,707 ha) and proposed disturbance area (2,080 ha) is shown in **Figure 1**. The proposed disturbance allows for working and construction areas within and around proposed Project activities and infrastructure. The disturbance area has been refined to minimise and / or avoid sensitive ecological features (e.g. habitat for listed threatened species and riparian areas). The disturbance area may be subject to further refinement for environmental or operational reasons.

The Project area is largely located on Winchester Downs station (Lot 8 SP277834) but also has overlaps with a State Reserve (Lot 9 GV33) which has grazing rights for the owners of Winchester Downs, a local road used to access Winchester Downs, the Isaac River and Cherwell Creek.

The Project operational workforce will be similar to, but lower than that for current operations at IPC, with around 300 - 400 workers, compared to around 400 - 450 workers. Approximately 100 – 150 workers will be engaged at the Project for infrastructure construction. Through the Project, Stanmore will continue to support local and regional suppliers and contractors, providing additional economic benefits and employment in the region.

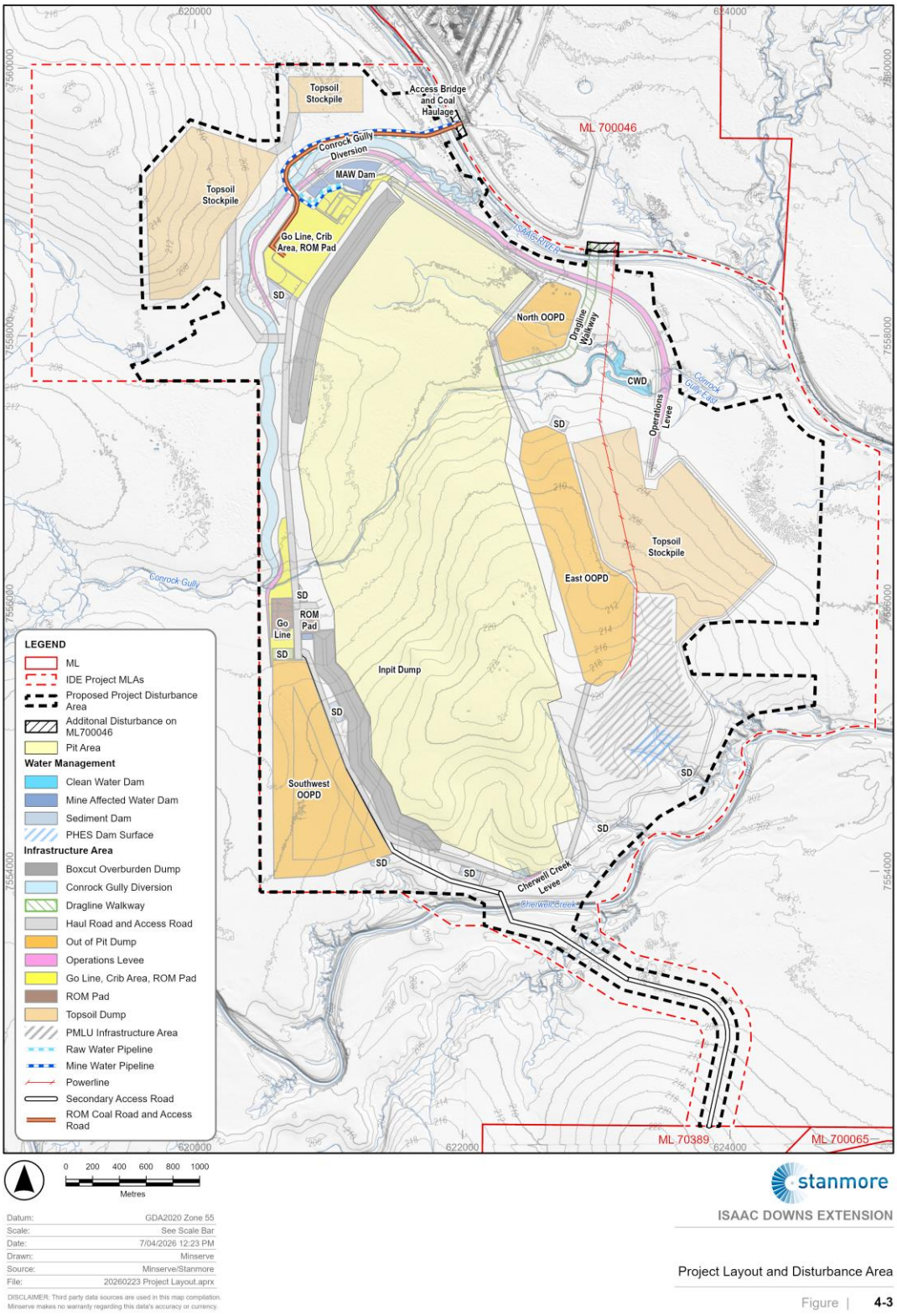

Figure 1: Proposed Project layout

1.3. Terms of Reference

This aquatic ecology impact assessment forms part of the EIS for the Project. This assessment has been prepared to satisfy the requirements of the Terms of reference (ToR) for the Project's EIS issued by the Department of Environment, Tourism, Science and Innovation (DETSI) on 11 December 2025.

This impact assessment addresses the ToR relevant to aquatic ecology. **Table 1** lists the elements of the ToR relevant to this assessment and the sections of this report where those ToR requirements are addressed.

Table 1: Terms of Reference for EIS relevant to aquatic ecology

Project specific matters	Requirement	Report Section
Flora and fauna		
9.67	Conduct the impact assessment in accordance with relevant guidelines, including the latest version of the department's EIS information guidelines that cover terrestrial ecology (ESR/2020/5309) (DETSI 2024), aquatic ecology (ESR/2020/5295) (DETSI 2024), groundwater dependent ecosystems (ESR/2020/5301) (DETSI 2024), water (ESR/2020/5312) (DETSI 2024), matters of national environmental significance (ESR/2020/5304) (DETSI 2024), and biosecurity (ESR/2020/5297) (DETSI 2024).	Sections 4, 5 and 6
Biodiversity - Existing environment		
9.69	Identify, describe and map all terrestrial, and/ or aquatic (including groundwater dependent ecosystems) and/ or marine ecological values present or likely to be present within an area potentially affected either directly or indirectly by the project. Base the description on the desktop assessment, vegetation surveys, plant and animal species surveys, and the assessment of the condition of the vegetation communities and species habitats.	Section 5.1 -5.11
9.70	Describe all significant species and ecological communities, prescribed environmental matters listed as MNES and MSES, and all listed flora and fauna species, and regional ecosystems, on the project site and in its vicinity.	Sections 5.12 and 5.13
9.71	Describe the potential for significant species (e.g. listed threatened, near threatened or special least-concern species) to occur, or potentially occur, within the area potentially affected either directly or indirectly by the project. Show the location of significant species found during field surveys on suitable maps and figures and describe their habitat.	Sections 5.12 and 5.13
9.72	Include any other environmental value(s) that the desktop studies identified as occurring or potentially occurring in, and adjacent to, the project area (e.g. wildlife corridors, environmentally sensitive areas) and display them on maps and figures.	Section 6.3
9.73	Describe the connectivity of habitats and the integrity of ecosystems.	Section 5.1
9.74	Describe, with photographs and detailed mapping at suitable scales, the current extent of regional ecosystems, species habitat, threatened	Section 3.2, Appendix A and B

	ecological communities, groundwater dependent ecosystems, wetlands, waterways and springs at the project area(s).	
Biodiversity – Impact Assessment		
9.75	Assess, describe, quantify and illustrate all potential direct and indirect significant impacts on terrestrial/ aquatic and/or marine ecological values. Assess the impacts on all potentially affected areas, whether on or off the project site. Include all stages of the project from initial development through to rehabilitation.	Section 6
9.76	Address in the assessment:	
	(a) all significant species and ecological communities (MNES, MSES, MLES, listed threatened flora and fauna species and regional ecosystems)	Sections 6.9, 6.10
	(b) the conservation status of each identified ecological value under the Nature Conservation Act 1992, Vegetation Management Act 1999 and the EP Act	Sections 6.9, 6.10
	(c) the integrity of ecological processes, including habitats of listed threatened, near threatened or special least-concern species	Sections 6.9, 6.10
	(d) interactions between terrestrial and aquatic ecosystems (including groundwater dependent ecosystems and stygofauna)	No surface aquatic GDEs detected (Section 5.10), terrestrial GDEs addressed in GDE Assessment (Watermark Ecohydrology 2026), stygofauna addressed in Stygofauna Assessment (Freshwater Ecology 2026)
	(e) connectivity of habitats and ecosystems	Sections 6.2, 6.3, 6.4
	(f) the integrity of landscapes and places, including wilderness and similar natural places	Addressed in Terrestrial Ecology Assessment (Trend 2026)
	(g) biological diversity	Section 6.8
	(h) chronic, low-level exposure to contaminants or the bio-accumulation of contaminants	Section 6.7
	(i) direct and indirect impacts on terrestrial, aquatic or marine species and ecosystems whether acting individually or in combination. Relevant matters include vegetation clearing, hydrological changes, discharges of contaminants to water, air or land, noise, and the influence of climate change	Sections 6.1, 6.2, 6.4, 6.5, 6.6, 6.7
	(j) impacts of waterway barriers on fish passage in all waterways mapped on the Queensland Waterways for Waterway Barrier Works spatial data layer including the length and width (area) of Conrock Gully and its floodplain that will be impacted by the proposed diversion	Sections 6.1, 6.4
	(k) propose measures that would avoid the need for waterway barriers or propose measures to mitigate the impacts of their construction and operation.	Section 6.4
9.77	Describe any actions of the project that require an authority under the Nature Conservation Act 1992, and/or would be assessable	Wetland management addressed in

	development for the purposes of the Vegetation Management Act 1999, the Regional Planning Interests Act 2014, the Fisheries Act 1994 and the Planning Act 2016. Features to consider include regional ecosystems, environmentally sensitive areas, wetlands, nature refuges, protected areas and strategic environmental areas.	Terrestrial Ecology Assessment (Trend 2026)
9.78	Specifically address any obligations imposed by State or Commonwealth legislation or policy or international treaty obligations.	Sections 6.9, 6.10. Addressed in Terrestrial Ecology Assessment (Trend 2026)
Biodiversity – Mitigation measures		
9.80	Propose effective and proven measures to avoid, minimise, mitigate and/or offset direct or indirect impacts on environmental values. In particular, address measures to protect or preserve any listed threatened, near-threatened or special least concern species or other MSES. Demonstrate that clearing and the adverse impacts of clearing have been reasonably avoided, or reasonably minimised consistent with Performance Outcome 1 of State Code 16 (Queensland Government 2025a).	Sections 6.1, 6.2, 6.3, 6.4, 6.5, 6.7
9.81	Describe the practicality, effectiveness and risks for each avoidance and mitigation measure. Include the timeframes in which the results would be delivered.	Sections 6.1, 6.2, 6.3, 6.4, 6.5, 6.7
9.82	Justify how applying all proposed avoidance and management measures would result in acceptable outcomes for terrestrial, aquatic and/or marine ecology. Describe how achieving the measures successfully will be monitored, measured and audited. Include provisions to regularly evaluate all the mitigation measures so that improvements may be made as new technologies and best practices evolve.	Sections 6.1, 6.2, 6.3, 6.4, 6.5, 6.7
9.83	Assess the need for buffer zones and the retention, rehabilitation or planting of movement corridors. The assessment must consider the role of buffer zones in maintaining and enhancing riparian vegetation and wetlands to enhance water quality, promote habitat connectivity and provide habitat.	Riparian vegetation and wetland management addressed in Terrestrial Ecology Assessment (Trend 2026)
Biosecurity		
9.89	Describe the impact the project's construction and operation will have on the introduction and spread of pest animals, weed species, diseases and pathogens.	Section 6.6
Appendix 3 Terms of reference for matters of national environmental significance (MNES) under the Environment Protection and Biodiversity Conservation Act 1999 requirements		
All points	Note: As no aquatic ecology MNES where detected and a likelihood of assessment determined they were highly unlikely to be present within, or for a significant distance from the project area, it was not considered necessary to address specific points in Appendix 3 for the aquatic ecology impact assessment.	Not applicable

2. Relevant legislation

Environment Protection and Biodiversity Conservation Act 1999

The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) provides for the protection and management of nine matters of national environmental significance (MNES). The MNES relevant for this assessment are the potential for listed threatened aquatic species to occur, and water resources (including GDEs) in relation to coal seam gas development and large coal mining development.

Environmental Protection Act 1994

The *Environmental Protection Act 1994* (EP Act) and the subordinate *Environmental Protection (Water and Wetland Biodiversity) Policy 2019* (EPP (WWB)) seek to protect the quality of natural waters in Queensland. There is one HES wetland in proximity to the Project area (approximately 1.5 km to the east of the Project area), and no high ecological value (HEV) waterways or wetlands within the Project area or the broader Study Area.

Nature Conservation Act 1992

The Nature Conservation Act 1992 (NC Act) provides the framework for the declaration and management of protected areas, and the protection of wildlife listed as endangered, vulnerable and near threatened under the Nature Conservation Regulation (Plants) 2020 and Nature Conservation Regulation (Animals) 2020.

Biosecurity Act 2014

The *Biosecurity Act 2014* (Biosecurity Act) provides a framework for minimising and managing biosecurity risks in Queensland, ensure the safety of agricultural inputs, align responses to biosecurity events to national and international obligations, and manage risks. Potential aquatic pest plants (also recognised nationally as Weeds of National Significance (WoNS)) and pest animals could have an adverse economic, environmental or social impact.

Fisheries Act 1994

The *Fisheries Act 1994* (Fisheries Act) provides for the management and protection of fisheries resources, including regulating development that might impact declared fish habitat areas and fish passage. It regulates the taking and possession of specific fishes, removal of marine vegetation, the control of development in areas of fish habitat and listed noxious fish species. Waterway barrier works approval may be required if new waterway crossings are constructed or existing crossings are modified outside of the Mining Lease (ML) but as part of the Project. The Project does not propose activities outside the ML areas and hence approval under the Fisheries Act is not required.

3. Project Location and Site Selection

3.1. Project area

The Project area is located in the upper Isaac River catchment in the Fitzroy River Basin of central Queensland, approximately 15 km southeast of Moranbah and 150 km southwest of Mackay. The Project area is located on mining lease application (MLA) 700084, MLA 700081, MLA 700082 and MLA 700083 (**Figure 1**). Surveys were also undertaken adjacent to the Project MLAs in a wider Study Area The waterways present are highly ephemeral although several retain waterholes for some time following the cessation of rain. The largest waterway that passes through the Project area is the Isaac River which drains into the Mackenzie River approximately 230 kilometres to the south-east. There are three named tributaries, Cherwell Creek, JB Gully (a tributary of Cherwell Creek), and Conrock Gully that pass through the Project area and flow directly into the Isaac River.

The Isaac River is a seasonal waterway, alternatively wet and dry most years according to season. Surface flows in the Isaac River typically occur intermittently, but persist for about half of the year, enough for some plants and animals to complete the aquatic stages of their life cycles, as well as allowing for the passage of aquatic fauna upstream and downstream of the Study Area. Cherwell Creek is the second largest waterway that passes through the Project area, although retains surface water for less time than other waterways. All the smaller tributaries of the Isaac River that pass through the Project area (Conrock Gully and JB Gully being the only two named waterways) are highly ephemeral with a few pools which may persist for some time following the cessation of flows (most notably in the lower section of Conrock Gully and upper section of JB Gully).

Several wetlands have been mapped within, and adjacent to, the Study Area. One of the wetlands has been mapped as both a HES and a MSES wetland, while the remaining wetlands are mapped as wetlands under the *Vegetation Management Act* 1999.

3.2. Site selection

Sites for aquatic ecology surveys were selected to represent the key waterways and wetlands across the Study Area (see **Table 2** and **Figure 2**). This included three sites along both the Isaac River (AQ10, AQ9, AQ1) and Cherwell Creek (AQ5, AQ4, AQ3) (one upstream, one adjacent and one downstream of the Project area). Four sites were selected along Conrock Gully (AQ8, A7, AQ6 AQ11), and another on a small unnamed tributary of Conrock Gully (AH3). One site was located on JB Gully (AH5). One on a small unnamed tributary of the Isaac River (AH1), and another site on a small tributary of JB Gully (AH6).

Site AQ2 was the HES mapped wetland located in proximity to the confluence of Cherwell Creek with the Isaac River. Sites AH2, AH12, AH11, AH8, AH10 and AH9 were selected for sampling due to being mapped as wetlands under the *Vegetation Management Act* 1999. Two other potential wetland sites were identified following examination of aerial imagery (AH4 and AH7).

Table 2: Sampling site details

Site code	Waterway	Wetland type	Stream order	Waterway barrier determination	Elevation	Coordinates (UTM 55K)	
						Easting	Northing
AH1	Unnamed creek	Riverine	1	Low	211	618950	7561392
AH2	Unnamed depression	Riverine	1	Low	207	620627	7560799
AH3	Unnamed	Riverine	1	Low	209	619408	7557911
AH4	Unnamed gilgai	Palustrine	-	-	201	627237	7555503
AH5	JB Gully	Riverine	2	Moderate	214	621079	7551949
AH6	Unnamed creek	Riverine	1	Low	208	622658	7552833
AH7	Unnamed gilgai	Palustrine	-	-	203	625932	7553596
AH8	Unnamed depression	-	-	-	223	618673	7554144
AH9	Unnamed depression	-	-	-	219	619585	7554560
AH10	Unnamed wetland	-	-	-	220	619262	7554795
AH11	Unnamed wetland	Palustrine	-	-	207	621696	7559439
AH12	Unnamed wetland	Palustrine	-	-	206	621300	7560140
AQ1	Isaac River	Riverine	6	Major	199	627664	7556522
AQ2	Unnamed wetland	Palustrine	-	-	201	626715	7556401
AQ3	Cherwell Creek	Riverine	5	Major	205	626626	7555802
AQ4	Cherwell Creek	Riverine	5	Major	205	624103	7554857
AQ5	Cherwell Creek	Riverine	5	Major	210	621049	7553251
AQ6	Conrock Gully	Riverine	2	Moderate	201	623588	7557746
AQ7	Conrock Gully	Riverine	2	Moderate	203	622587	7557664
AQ8	Conrock Gully	Riverine	2	Moderate	207	620889	7556282
AQ9	Isaac River	Riverine	6	Major	205	622711	7558630
AQ10	Isaac River	Riverine	6	Major	207	619807	7562136
AQ11	Conrock Gully	Riverine	2	Moderate	200	624064	7557839

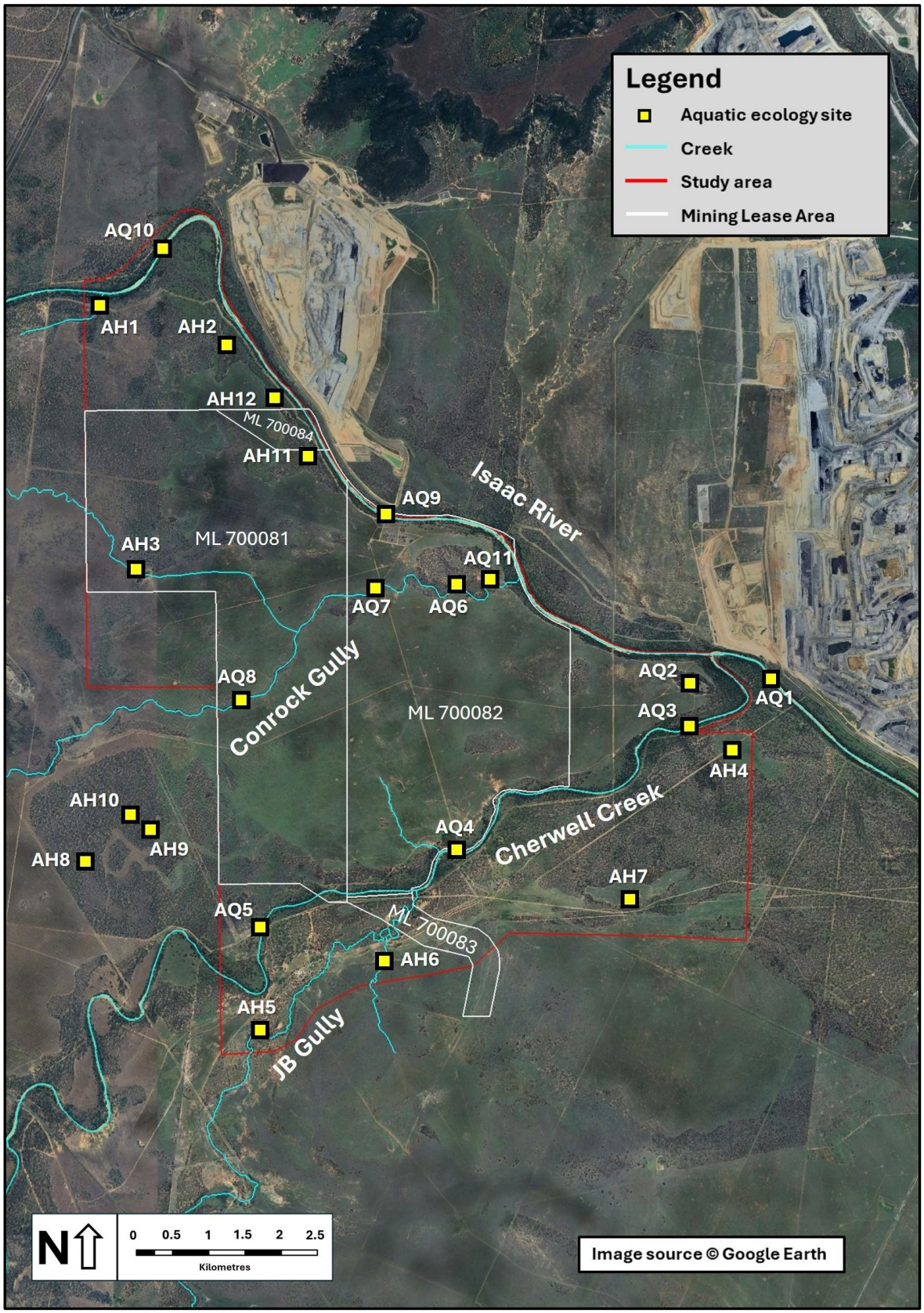

Figure 2: Location of sites sampled within and adjacent the Project area

4. Methods

4.1. Desktop assessment

A desktop review of available mapping resources and previous aquatic ecology assessments was undertaken to assess the environmental values and aquatic fauna species that could occur in and adjacent to the Project area. The following sources were reviewed as part of the desktop assessment;

- The EPBC *Protected Matters Search Tool* for MNES aquatic species (**Appendix E**) and the Queensland *Wildnet Search Tool* (DETSI 2026) for MSES aquatic species (**Appendices F**) that may or are likely to occur within a radius of 20 km of the Project area.
- An Atlas of Living Australia search for records of EVNT species (ALA 2026) identified in the Protected Matters and Wildnet Search searches.
- Existing mapping layers provided in Queensland Globe, including but not limited to, Watercourse Identification Map, Queensland Waterways for Waterway Barrier Works, Aquatic conservation assessments - non-riverine, and MSES and HES wetlands.
- Aquatic Conservation Assessments (ACAs) for the riverine (Inglis and Howell 2009) and non-riverine (Rollason and Howell 2012) wetlands of the Great Barrier Reef catchment.
- Recent aquatic ecology assessments undertaken for other projects in vicinity to the IDE Project including Olive Downs Coking Coal Project: Aquatic Ecology Assessment (DPM Environsciences 2018), Isaac Downs Mine (2019), Winchester South Project: Aquatic Ecology and Stygofauna Assessment (ESP 2021a), Caval Ridge Mine: Horse Pit Extension Project Aquatic Ecology Assessment (ESP 2021b) and Saraji East Mining Lease Expansion Project (Hydrobiology 2023).
- Flow data from the Water Monitoring Portal and rainfall data from Moranbah Airport.

4.2. EVNT species likelihood of occurrence

Threatened and significant species identified from the desktop assessment (and subsequent field surveys) were assigned a likelihood of occurrence based on the criteria identified in **Table 3**. The assessment was based on the knowledge of ecologists, habitat suitability, previous surveys/records near the Study Area and available scientific literature.

Table 3: Likelihood of occurrence determination criteria

Likelihood of occurrence	Criteria
Unlikely	• species or species habitat may occur, is likely to occur or is known to occur from the broader search area (based on database searches); but preferred habitat has not been identified within the Study Area; and • there are no confirmed species records within 20 km of the Study Area or within the catchment. • preferred habitat occurs within the Study Area, but there are no confirmed species records within 20 km of the Study Area or within the catchment.
Potential	• species or species habitat may occur, is likely to occur or is known to occur from the broader search area (based on database searches); and • preferred habitat occurs within the Study Area; OR • species indicated as likely during desktop assessment, but field surveys revealed no evidence of occurrence in the Study Area.
Likely	• preferred habitat occurs within the Study Area; and • confirmed species records within 20 km of the Study Area; however, species not yet confirmed as occurring within the Study Area.
Known	• Confirmed species records within the Study Area.

4.3. Survey timing

An initial site inspection was undertaken in November 2024 during the early wet season. At this time the area was relatively dry despite approximately 50 mm rainfall (recorded at the Moranbah Airport gauge 34035A) in the month preceding the inspection. Twenty-one sites were inspected and site photographs taken, several were determined not to be capable of sustaining water at any time and thirteen were identified as potential aquatic habitat.

The late wet aquatic ecology sampling was undertaken from the 17th to the 19th of March 2025 until localised rainfall closed site access on the 19th of March and then heavy rainfall occurred across the region from the 27th of March until the 5th of April. Sampling was resumed between the 1st and 3rd of April and was completed between the 19th and the 22nd of July 2025.

In the late wet season sampling a total of 23 sites were inspected across and immediately upstream and downstream of the Project area (**Table 2, Figure 2**). Thirteen of these sites were the same as those inspected in November 2024. This included stream orders ranging from 1-6 as well as palustrine wetlands and depressions thought to potentially hold water for some time after rain.

4.4. Field sampling methods

The sampling techniques used in the late wet sampling were in line with the Monitoring and Sampling Manual: Environmental Protection (Water) Policy (DES 2018) and are summarised in **Table 4** for each site. Sampling was conducted under General Fisheries Permit No. 266846, research permit WA0044388 and Animal Ethics Approval No. CA 2023/01/1682 held by Freshwater Ecology Pty Ltd.

Table 4: Sampling methods used for each site

Site	Habitat description	Habitat Bioassessment	*In situ* water quality	Macrophytes	Macroinvertebrate	Fish and turtles			
						Backpack electrofishing	Fyke netting	Unbaited box trapping	Dip netting
AH1	✓	✓		✓					
AH2	✓	✓		✓					
AH3	✓	✓		✓					
AH4	✓			✓					
AH5	✓	✓	✓	✓	✓	✓			
AH6	✓	✓		✓					
AH7	✓		✓	✓	✓	✓			
AH8	✓			✓					
AH9	✓			✓					
AH10	✓			✓					
AH11	✓		✓	✓	✓	✓			
AH12	✓		✓	✓	✓	✓			
AQ1	✓	✓	✓	✓	✓	✓	✓		
AQ2	✓		✓	✓	✓	✓	✓		
AQ3	✓	✓	✓	✓	✓				✓
AQ4	✓	✓	✓	✓	✓	✓			
AQ5	✓	✓		✓					
AQ6	✓	✓		✓					
AQ7	✓	✓		✓					
AQ8	✓	✓		✓					
AQ9	✓	✓	✓	✓	✓	✓			
AQ10	✓	✓	✓	✓	✓		✓		
AQ11	✓	✓	✓	✓	✓			✓	✓

4.5. Aquatic habitat

An aquatic habitat assessment was undertaken following the Australian River Assessment System (AusRivAS) protocols (DNRM 2001). The assessment was undertaken by Dr Timothy Howell from Freshwater Ecology Consulting who is an AusRivAS accredited ecologist. The habitat assessment included:

- substrate composition;
- flow, water depth and wetted width, noting if surface water was connected or comprised of one or more disconnected pools in the channel;
- channel morphology;
- physical habitat features, such as large woody debris, undercut banks and aquatic plants;
- riparian vegetation cover and condition;
- any notable disturbances including bank erosion, cattle access to waterway and barriers associated with nearby road crossings or dams; and
- other on-site observations, such as presence of filamentous or benthic algae, surface scums, unusual sediment deposits, or fish kills.

An aquatic habitat inventory was undertaken at each monitoring location to assist in the interpretation of ecological data. This inventory included a general description of the environment within, and immediately surrounding each site, including:

- Channel characteristics
    - reach length, bankfull bank height, bankfull stream width, mean water depth, mean wetted width.
- Riparian vegetation characteristics
    - riparian vegetation height (max.), riparian zone width (both banks), bare ground, grass, shrubs, trees (< 10 m and > 10 m), canopy cover.
- Mesohabitat composition (%)
    - riffle, run, rocky pool, sandy pool, dry.
- Substrate composition (%)
    - bedrock, boulder (>256 mm), cobble (64-256 mm), pebble (4-64 mm), gravel (2-4 mm), sand (2-4 mm), silt/clay (<0.05 mm).
- Macrophytes (None, Little 1-10%, Some 10-50%, Moderate 50-75%, Extensive >75%)
    - free floating, attached floating, submerged, emergent.
- In-stream wood (None, Little 1-10%, Some 10-50%, Moderate 50-75%, Extensive >75%)
    - detritus (leaves etc), sticks (<2 cm diameter), branches (<15 cm diameter), logs (>15 cm diameter).
- Microhabitat (None, Little 1-10%, Some 10-50%, Moderate 50-75%, Extensive >75%)
    - periphyton, filamentous algae, submerged macrophytes, bank overhang vegetation, trailing bank vegetation, blanketing silt, substrate anoxia, bank undercuts.

An aquatic habitat bioassessment was undertaken at all watercourses (this assessment is not relevant for wetlands) in accordance with Queensland Australian River Assessment System (AusRivAS) Sampling and Processing Manual (DNRM 2001). Habitat bioassessment score datasheets (DNRM 2001) were used to numerically score nine criteria, which were then allocated to

one of four categories (excellent, good, moderate and poor). The sum of the numerical rating from each category produced an overall habitat condition assessment score (**Table 5**).

According to this system sites with scores:

- >110 were considered to be in excellent condition
- Between 75 and 110 were considered to be in good condition
- Between 39 and 74 were considered to be in fair condition
- ≤38 were considered to be in poor condition.

Whilst the AusRivAS method is an accepted standard for undertaking aquatic habitat assessments, it is less appropriate for ephemeral systems in Queensland than for more permanent waterways; using this method, even pristine ephemeral systems are rarely classed as being in excellent condition, due to the nature of the ephemeral waterways. Nevertheless, it is a useful system for comparing sites within and adjacent the Project area.

Table 5: Habitat bioassessment scores

Habitat Category	Category Score Range			
	Excellent	Good	Fair	Poor
Bottom substrate/available cover	16–20	11–15	6–10	0–5
Embeddedness	16–20	11–15	6–10	0–5
Velocity/depth category	16–20	11–15	6–10	0–5
Channel alteration	12–15	8–11	4–7	0–3
Bottom scouring & deposition	12–15	8–11	4–7	0–3
Pool/riffle, run/bend ratio	12–15	8–11	4–7	0–3
Bank stability	9–10	6–8	3–5	0–2
Bank vegetative stability	9–10	6–8	3–5	0–2
Streamside cover	9–10	6–8	3–5	0–2
TOTAL Score for the Site	**111–135**	**75–110**	**39–74**	**0–38**

4.6. Surface water quality

In situ water quality data was recorded using portable multiparameter water quality meters that had been calibrated in accordance with the manufacturer's specifications. Calibrations were regularly checked in the field. Parameters tested *in situ* were: temperature, electrical conductivity (EC), pH, turbidity and dissolved oxygen (DO). *In situ* water quality testing was undertaken in conjunction with macroinvertebrate sampling to assist with the interpretation of results.

All sample collection was completed in accordance with the *Monitoring and Sampling Manual: Environmental Protection (Water) Policy* (DES 2018) and *AS/NZ 5667.6:1998 Guidance on sampling of rivers and streams* (AS/NZS 1998).

A summary of the *in situ* parameters measured and their associated measurement precision are presented in **Table 6**.

Table 6: *In situ* water quality measurement parameters

Parameter	Units	Measurement precision
Water temperature	ºC	± 0.1
pH	pH units	± 0.1
Dissolved oxygen	% saturation	± 1
Electrical conductivity	µS/cm	± 1
Turbidity	NTU	± 0.1

4.7. Aquatic flora

Macrophyte surveys were undertaken following completion of the fish and macroinvertebrate surveys to increase the chance of observing macrophytes that were not abundant throughout the reach. All native and exotic macrophyte species at the site were recorded. Species were identified using Stephens & Dowling (2002), Sainty & Jacobs (2003) and MacDonald & Haslam (2016). The approximate area covered by each macrophyte species was recorded. Free-floating, floating, attached and submerged macrophyte percentage coverage was based on stream wetted area across the reach, whereas emergent macrophyte coverage was recorded as a percentage of the riparian zone (note that non-macrophyte species also contributed to riparian vegetation but were not assessed within the scope of this survey).

Macrophyte species were categorised by growth form in accordance with definitions provided in Sainty and Jacobs (2003), as follows:

- **Free floating** – Species that are normally unattached and float on the surface but may become attached and rooted in drying mud when water levels drop.
- **Floating attached** – Species that are rooted in the substrate but normally have at least the mature leaves floating on the water surface.
- **Submerged**– Species rooted in the substrate or free-floating submerged.
- **Emergent** – Species rooted in the bank substrate with stems, flowers and most of the mature leaves projecting above the water surface.

4.8. Aquatic macroinvertebrates

Freshwater macroinvertebrates were sampled in accordance with the *Monitoring and Sampling Manual: Environmental Protection (Water) Policy* (DES 2018) which defaults to those methods adopted by the Queensland Australian River Assessment System (AusRivAS) *Sampling and Processing Manual* (DNRM 2001). Where sufficient aquatic habitat was present a bed and edge sampled were collected, at site AQ3 (where there was little water present) and at palustrine sites composite samples were collected.

A 250 micron (µm) mesh dip net fitted to a triangular frame (250 mm x 250 mm x 250 mm) was used to collect samples. Samples were collected by disturbing the benthos using a kicking or shuffling technique and sweeping the net through the water above the disturbed benthos. The sample was rinsed clean from the net into a bucket and then evenly distributed into sorting trays. Field (live) picking was completed for each sample for a minimum of 30 minutes and a maximum of one hour. Picked macroinvertebrates were placed into a single vial and preserved in a 70% methylated spirits (ethanol) solution. Each vial was labelled with the monitoring site code, replicate number, sampler, habitat, date and time of sampling.

In the laboratory, macroinvertebrates were sorted, identified to the family taxonomic level and relative abundance enumerated. Organisms were identified to family level with the exception of lower phyla (e.g. porifera, nematoda), oligochaetes (freshwater worms), acarina (freshwater mites) and microcrustacea (ostracoda, copeopoda and cladocera). Chironomids were identified to sub-family level in accordance with standard AusRivAS protocols (DNRM 2001).

Enumeration and identification of macroinvertebrate samples was conducted by Susan Jones, an experienced AusRivAS accredited taxonomist. Sorting, enumeration and data entry was cross-checked by a second ecologist for 10% of the samples.

4.9. Fish

Fish was conducted at each monitoring location in line with the approach outlined in the *Monitoring and Sampling Manual: Environmental Protection (Water) Policy* (DES 2018).

Backpack electrofishing was undertaken in all sites that held sufficient water. A Smith-Root backpack unit (LR20B model) was utilised by a Senior Electrofishing Operator while an appropriately trained assistant aided in the collection of fish for identification and measurement. Sampling was carried out over a site reach spanning at least 100 m (where sufficient water was available), with care being taken to sample all macro and microhabitat types. Settings for the backpack electrofisher varied between sites, depending on water conductivity, depth, fish size and species. All electrofishing was undertaken in compliance with the Australian Code of Electrofishing Practice (NSW Fisheries 1997) with the minimum power setting used to effectively attract and stun the fish.

Unbaited box trapping is a passive fish sampling technique that targets small bodied pelagic and benthic species. Five unbaited box traps were strategically placed at all sites with sufficient habitat for between 30 minutes and 2 hours. Extensive field survey experience has shown that most fish enter the traps within the first 30 minutes and removing them after 2 hours minimises the chance of predation within the traps (by both predatory fish and larger macroinvertebrates). Between sampling sites all box nets were cleared of any plant matter and dried to ensure aquatic plants were not inadvertently transferred between sites.

A second passive fish sampling method, fyke netting, was used at sites with larger water bodies. Baited fyke nets were set overnight at sites at AQ1, AQ2 and AQ10. Nets were baited with tinned sardines. In all other sites there was insufficient water present to set the fyke nets, or electrofishing was considered optimal so setting fyke nets was not considered to add further value to the sampling.

Two double wing fyke nets were set parallel to the shoreline with the cod end suspended or buoyed to prevent drowning of air breathing animals.

The settings used for backpack electrofishing and effort for all methods at each site sampled for fish and turtles are detailed in **Appendix D**.

4.10. Turtles

Turtle sampling was conducted in conjunction with fish sampling using the baited fyke nets. Turtle sampling was completed in accordance with the *Australian Survey Guidelines for Australia's Threatened Reptiles* (DSEWPC 2011), *Terrestrial Vertebrate Fauna Survey Guidelines for Queensland* (Eyre *et al*. 2022). Captured turtles were quickly identified, photographed and released back to the location of capture.

There was insufficient depth to deploy cathedral traps at any sites and the water shallow to observe any turtles that may be present. Baited fyke nets were set overnight at sites at AQ1, AQ2 and AQ10. Nets were baited with tinned sardines. Two double wing fyke nets were set parallel to the shoreline with the cod end suspended or buoyed to prevent drowning of air breathing animals.

While there was habitat available for turtles in some areas, there was no suitable habitat for listed threatened turtle species identified in the Study Area. As such, no further targeted surveys for these species (such as snorkelling, evening spotlighting or seine netting) were undertaken.

4.11. Frogs

Detection of frogs was restricted to opportunistic visual encounter surveys and call identification. These were undertaken during general aquatic ecology surveys. At each site suitable habitat was searched for any frogs present.

4.12. Aquatic ecosystem values

The overall aquatic ecosystem values of the waterways and wetlands were identified in accordance with the *Guidelines for Identifying High Ecological Values Aquatic Ecosystems* (Aquatic Ecosystems Task Group 2012). These guidelines identify five core criteria that can be used to determine aquatic ecosystems of high value. These criteria are:

- **Diversity**: The aquatic ecosystem exhibits exceptional diversity of species (native/migratory), habitats, and/or geomorphological features/processes. Diversity includes diversity of ecosystem types (rivers, wetlands, subterranean systems etc.), biotic diversity (within and between species) and/or abiotic (e.g. geomorphic) features and processes.
- **Distinctness**: The aquatic ecosystem is rare/threatened or unusual; and/or supports rare/threatened/ endemic species/communities/genetically unique populations; and/or the aquatic ecosystem exhibits rare or unusual geomorphological features/processes and/or

environmental conditions, and is likely to support unusual assemblages of species adapted to these conditions, and/or are important in demonstrating key features of the evolution of Australia's landscape, riverscape or biota.

- **Vital Habitat**: An aquatic ecosystem provides vital habitat for flora and fauna species if it supports:
    - unusually large numbers of a particular native or migratory species; and/or
    - maintenance of populations of specific species at critical life cycle stages; and/or
    - key/significant refugia for aquatic species that are dependent on the habitat, particularly at times of stress
- **Naturalness**: The ecological character of the aquatic ecosystem is not adversely affected by modern human activity.
- **Representativeness**: The aquatic ecosystem is an outstanding example of an aquatic ecosystem class to which it has been assigned, within a drainage division.

Combining the results of the desktop assessment and field surveys, each of these criteria are assessed collectively for larger waterways, smaller waterways and palustrine wetlands (**Section 5.11**).

5. Existing Environment

5.1. Aquatic habitat

Full descriptions of physical parameters and habitat for each site in early wet 2024 and late wet 2025 are provided in **Appendices A and B** respectively. The availability and quality of aquatic habitat is strongly influenced by water permanency. Eleven of the 13 sites were dry during the site inspection in the early wet period (November 2024) and 12 of the 23 sites were dry in the late wet 2025 period (March, April, July 2025). The two sites that retained water in the early wet period held small receding pools only.

5.1.1. Waterways

The Isaac River is the largest waterway (order 6) within the Study Area and is ephemeral. It has a large defined channel with a substrate strongly dominated by sand. As flow recedes much of it becomes subsurface with intermittent pools along the reach, several of which persist for extended periods of time following heavy rainfall events. The riparian vegetation along the Isaac River was more developed than most of the Study Area. Site AQ1 was the only location water was recorded along the Isaac River in the early wet season, with a single small pool remaining. At the time of the late wet sampling there was water present in all three sites sampled, with large sections between those sites lacking surface flow.

Cherwell Creek is similar in characteristic (in channel form, substrate and riparian vegetation) to the Isaac River but of a lower stream order (order 5) and has smaller channel dimensions. It was completely dry for much of its length, including site AQ5, with a few small receding pools at sites AQ4 and AQ3. Cherwell Creek was completely dry during the early wet period.

Conrock Gully and JB Gully are two 2nd order streams that pass through the Study Area. Both are highly ephemeral, and each had only a single pool found during the late wet sampling, both of which appeared ephemeral. Only a small pool was remaining at site AH5 in the early dry season. Site AH5 on JB Gully had a large pool that was sustained by a low gradient and clay substrates and is likely to hold water for some time following heavy rainfall. Site AQ11 on Conrock Gully was the only location which supported a clay base and the pool sampled in the late wet season was likely the last remaining pool to dry up along the length of the waterway. Both waterways had a riparian zone which was dominated by dry woodland.

Sites AH1, AH3 and AH6 were all located on first order streams. All were dry in the early wet season and dry except for some pooling of water at site AH3 in the late wet. The pooling of water in small areas of site AH3 was likely to due to rainfall prior to sampling as it was shallow (typically less than 5 cm) and inundated terrestrial grasses. The vegetation in the riparian zone of all three sites was sparse dry woodland.

5.1.2. Wetlands

Wetland sites (nine sites in total) were selected from examination of wetland mapping layers in Queensland Globe and from examination of aerial imagery. One of these sites was a listed MSES and HES wetland, while the remaining sites were either not identified in mapping or mapped as wetlands under the *Vegetation Management Act* 1999. These sites were then inspected during field surveys to determine whether they met the definition of a wetland under the *Queensland Wetland Definition Guideline* (DES 2023).

Freshwater wetlands are defined as areas of permanent or periodic/intermittent inundation, with water that is static or flowing, fresh, brackish or salt. To be a wetland, the area must have one or more of the following attributes:

1. **Biotic**: The land supports, at least periodically, plants or animals that are adapted to and dependent on living in wet conditions for at least part of their life cycle.
2. **Soil**: The substratum is predominantly undrained soils that are saturated, flooded or ponded long enough to develop anaerobic conditions in the upper layers.
3. **Non-soil, non-biotic**: The substratum is not soil and is saturated with water, or covered by water, at some time. This is assessed by the presence of beds and banks of creeks, rivers, and other drainage lines.

These criteria were assessed in the field to determine whether a wetland, mapped or identified by state mapping or aerial imagery examination, was indeed a wetland or would be more accurately described as a depression (**Table 7**).

Table 7: Determination of wetland status

Site	Biotic	Soil	Non-soil / non-biotic	Designation
AH2	No evidence of aquatic flora or fauna detected.	No evidence of organic matter accumulation.	No defined banks.	depression
AH4	Aquatic macrophytes of three growth forms detected.	Evidence of accumulated organic matter.	No defined banks.	wetland
AH7	Aquatic macrophytes of three growth forms detected. Developed aquatic macroinvertebrate communities present.	Evidence of accumulated organic matter.	Defined banks.	wetland
AH8	No evidence of aquatic flora or fauna detected.	No evidence of organic matter accumulation.	No defined banks.	depression
AH9	No evidence of aquatic flora or fauna detected.	No evidence of organic matter accumulation.	No defined banks.	depression
AH10	Small amounts of aquatic macrophyte present.	Limited evidence of organic matter accumulation.	No defined banks.	wetland
AH11	Aquatic macrophytes of two growth forms detected. Developed aquatic macroinvertebrate communities present.	Evidence of accumulated organic matter.	Defined banks and riparian vegetation.	wetland
AH12	Macrophytes and bugs	Evidence of accumulated organic matter.	Defined banks and riparian vegetation.	wetland
AQ2	Aquatic macrophytes of three growth forms detected. Developed aquatic macroinvertebrate communities present.	Evidence of accumulated organic matter.	Defined banks and riparian vegetation.	wetland

Site AQ2 is located in a palustrine wetland and is mapped as a HES wetland. When full, this is a relatively large wetland (approximately 6.2 hectares). There was extensive emergent macrophyte growth at this site and there were some floating and floating attached macrophytes present. The vegetation surrounding the wetland is similar to that along the Isaac River and Cherwell Creek but slightly sparser.

Two smaller palustrine wetlands were identified at sites AH11 and AH12. These were located along the same drainage line as site AH2, although between these sites there was no defined channel. Sites AH11 and AH12 were surrounded by sparse woodland.

Two gilgais (AH4 and AH7) were sampled in the south-east of the Study Area. These sites held water for longer than smaller depressions and supported a moderately high diversity of aquatic macrophytes. These were relatively shallow, not connected to other waterways by overland flow and surrounded by open grassland with the occasional tree.

Sites AH2, AH8, AH9 and AH10 were located at sites where depressions were considered to potentially hold water but not sufficient to be considered gilgais. Site examination determined that none were likely to hold water for long, although water was still present at site AH10 where a small number of aquatic macrophytes were noted in low abundance. The vegetation around all these sites was sparse woodland.

No Wetlands of International Importance were identified in the desktop assessment.

5.2. Rainfall conditions preceding sampling

Monthly rainfall at the Bureau of Meteorology's Moranbah Airport rain gauge (station 034035) located approximately 10 kilometres north-west of the Project area for the 12 months preceding sampling is presented in **Figure 3** along with mean monthly totals between 2012 and 2025.

More generally, the monthly rainfall totals followed the same seasonal patterns as the mean values. However, from February through until April 2025 the rainfall values were notably higher than the mean values. As a result, the sampling was taken within and following a period of above average rainfall.

The flow in the Isaac River at Deverill (flow gauge 130410A) (approximately 20kms to the south-east) 12 months prior to the commencement of sampling and during the sampling period is shown in **Figure 4**. There was low flow detected on the gauge in early March which ceased on the 8th of March 2024 and no further flows were detected until late June when another low flow event persisted for two weeks. Two low events occurred in late December 2024 and early January 2025. From the commencement of flows on the 6th of February 2025 there were continual low flows until the 15th of May. During this period there were extremely high rainfall events that occurred in late February and early April 2025.

All sampling was undertaken four or more weeks following heavy rainfall and notable flow events.

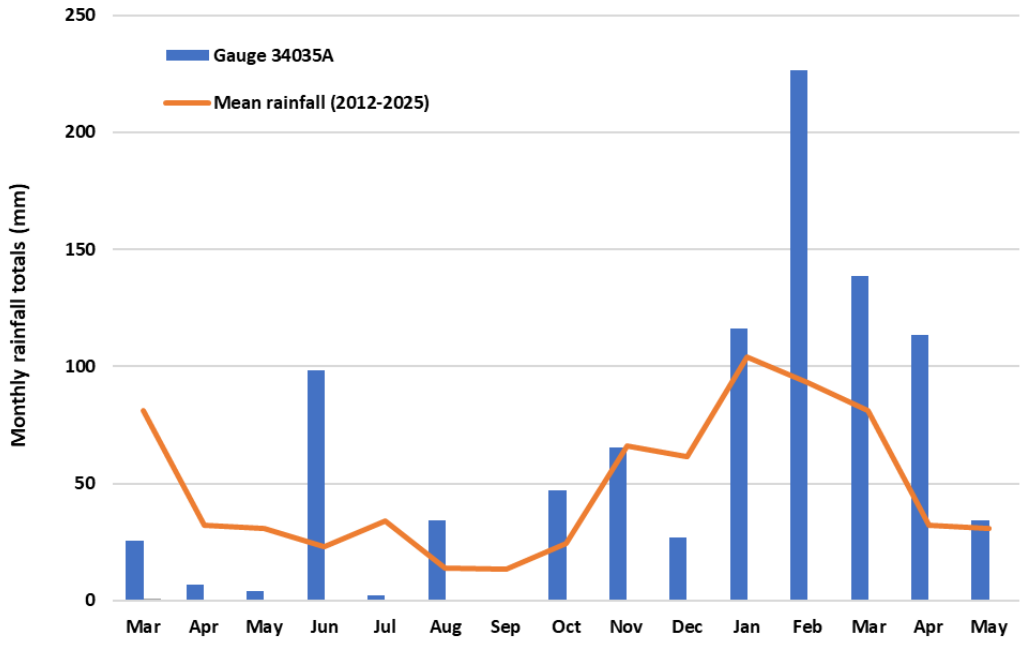

Figure 3: Total monthly rainfall collected at Moranbah Airport weather station in the 14 months preceding and during sampling.

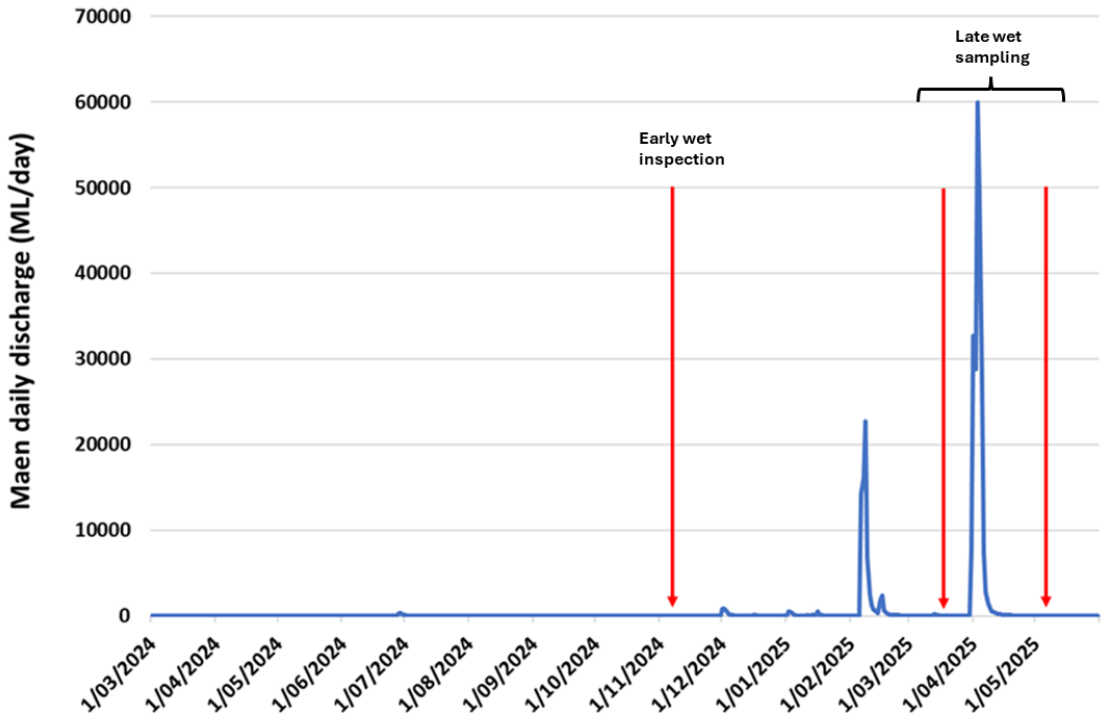

Figure 4: **Stream flow in the Isaac River at Deverill (Flow gauge 130410A) in the 14 months preceding and during sampling. Red lines indicate inspection / sampling dates.**

5.3. *In situ* water quality

Standing water was present at only 11 of the 23 sites sampled. The *in situ* water quality parameters recorded for sites containing surface water are presented in **Table 8**. Water temperatures ranged from 20.1 to 30.0°C and were largely influenced by the time of year and day that they were recorded. Dissolved oxygen (DO) levels were highly variable ranging from low (28%) to relatively high to very high (101-180% saturation). The electrical conductivity levels were moderately low and ranged from 112-424 µs/cm. All but one site (which was slightly acidic) were slightly to moderately alkaline. Turbidity was highly variable between sites but generally low. The highest turbidity levels were recorded in the lower Cherwell Creek site and in the some of the palustrine wetlands.

Table 8: ***In situ*** **water quality**

Site	Date	Time	Temperature (ºC)	Dissolved oxygen (%)	Conductivity (µs/cm@25ºC)	pH	Turbidity (NTU)
AH5	1/05/2025	0830	21.0	47	298	8.3	44
AH7	1/05/2025	1135	28.5	180	187	8.6	5
AH11	18/03/2025	1110	27.1	28	168	7.4	93
AH12	18/03/2025	1045	26.8	176	164	7.2	64
AQ1	1/05/2025	1315	25.9	112	112	8.4	15
AQ2	17/03/2025	945	26.7	57	193	6.8	21
AQ3	17/03/2025	1230	28.4	101	303	7.5	143
AQ4	17/03/2025	1530	30.0	87	371	7.9	29
AQ9	18/03/2025	1215	28.9	111	281	7.5	14
AQ10	18/03/2025	1530	28.8	123	424	8.0	24
AQ11	22/07/2025	1240	20.1	101	354	8.9	141

5.4. Aquatic habitat bioassessment

The habitat bioassessment results are presented in **Figure 5**, this assessment is only relevant for riverine sites. As the habitat bioassessment was undertaken during the late wet sampling and sampling was undertaken with several weeks of heavy rainfall, these values are likely to represent the upper limit (i.e. highest habitat bioassessment score) of the values for the sites. No sites were considered to be in ‘excellent’ or ‘good’ condition from a habitat bioassessment perspective. six sites were considered to be in ‘fair’ condition, although this rating would only be applicable while water persisted. All other sites were considered to be in ‘poor’ condition.

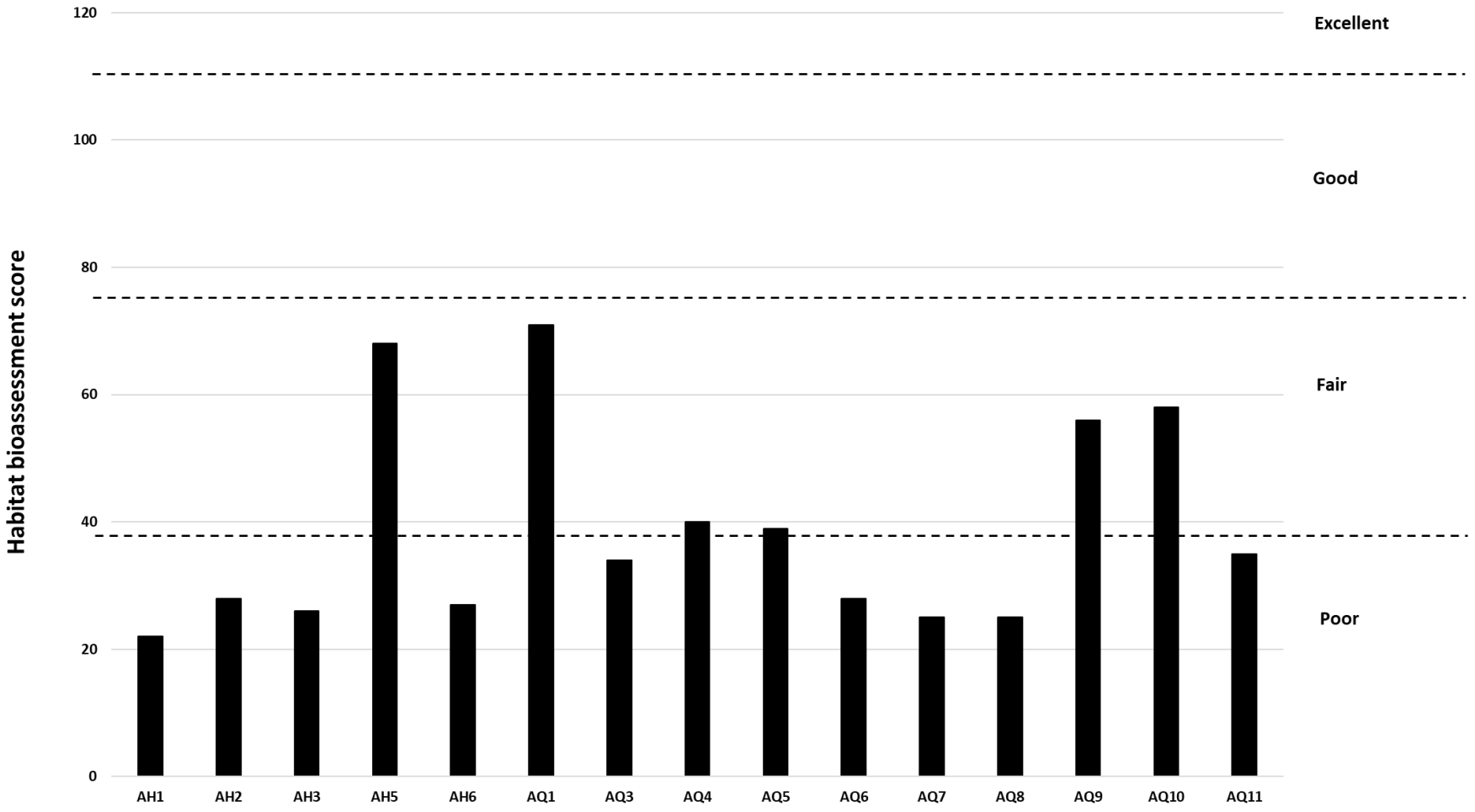

Figure 5: Habitat bioassessment scores for riverine sites in the late wet 2025

5.5. Aquatic flora

Across all sites, aquatic macrophyte diversity was variable but generally low with none being recorded at eleven sites and between one to four species recorded at six sites, and between five to nine species at six sites (**Table 9**). The highest diversity was recorded at gilgai and palustrine wetland sites, which is not surprising as these sites have no flow, clay bases and typically hold water for longer after heavy rainfall than riverine sites.

A single species of macrophyte with a floating form was recorded in relatively low coverage at two sites (AH11 and AQ2), both palustrine wetlands. Five species with floating attached forms were recorded across all sites, being largely restricted to gilgai and palustrine wetland habitats.

Two species of submerged macrophyte (one more correctly a form of complex algae yet functionally included as a macrophyte) were recorded but only at three sites.

Nine emergent macrophyte species were recorded across all sites, with between one and five recorded at sites that macrophytes were recorded at. Emergent macrophytes diversity was generally highest at gilgai and palustrine wetland sites, which is unsurprising as these sitea are exposed to less hydrological energy and longer water permanency than other sites across the Study Area.

All macrophyte species recorded are species capable of persisting in the absence of permanent standing water. The macrophyte species that could be identified to species level recorded are native, widespread and abundant along eastern Australia and none are listed under state or federal legislation as threatened. No aquatic weeds of national significance (WoNS) were recorded.

No Weeds of National Significance (WoNS) or restricted/invasive plants under the *Biosecurity Act* 2014 were recorded at any site.

Table 9: Aquatic macrophytes present and relative coverage

Growth form	Floating	Floating attached					Submerged		Emergent								
Common name	Duckweed	Water primrose	Monochoria	Caldesia	Nardoo	Swamp lily	Charophyte	Bladderwort	Sedge species	Sedge species	Downs Nutgrass	Dirty dora	Water chestnut	Common rush	Awnless barngrass	Umbrella canegrass	White smartweed
Scientific name	*Spirodela sp.*	*Ludwigia peploides*	*Pontederia cyanea*	*Albidella oligococca*	*Marsilea drummondii*	*Ottelia ovalifolia*	*Chara sp.*	*Utricularia sp.*	*Cyperus sp.*	*Cyperus c.f. betchei*	*Cyperus bifax*	*Cyperus difformis*	*Eleocharis dulcis*	*Juncus c.f. usitatus*	*Echinochloa colona*	*Leptochloa digitata*	*Persicaria attentuata*
AH1																	
AH2																	
AH3			2		1				2			1		1		5	
AH4			10		5		5		5			5				2	
AH5		2	0.1							1		0.1				5	
AH6																	
AH7			5	60	20		80		5			2		2	5	10	
AH8																	
AH9																	
AH10			20		2							5					
AH11	0.1		1	15		5											
AH12			1	40		60			15		2	2		5	2		
AQ1																	
AQ2	5				2	0.1		1					70		1		5
AQ3																	
AQ4																	
AQ5																	
AQ6											0.1			0.1			
AQ7											1			2			
AQ8																	
AQ9																	
AQ10											0.1						
AQ11					3						2			1		30	

5.6. Aquatic macroinvertebrates

A total of 2,635 aquatic macroinvertebrate individuals from 53 taxa (mainly family level) were collected from the sites that held water across the Project area (**Appendix C**). In addition to the macroinvertebrates recorded, three groups of microcrustacea (Cladocera, Copepoda, Ostracoda) were recorded.

Macroinvertebrate relative abundance and taxonomic richness for sites sampled for macroinvertebrates is presented in **Figure 6**. Abundance values were not absolute but in line with the live picking procedures of the AusRivAS methodology (DNRM 2001). Abundance varied across all sites and samples, ranging from 39 to 272 individuals. Abundances were higher for edge samples than bed samples, which is typical for ephemeral waterways. In nine samples (half of the total) abundances were less than 150 individuals in all samples. AusRivAS methods aim to collect approximately 200 individuals (without over collection of abundant taxa). This illustrates the overall low abundance of aquatic macroinvertebrates in many sites across the Study Area. The low abundances are likely to be due to the largely ephemeral nature of the waterways. Taxa diversity across all samples ranged from 10 to 33 (with a mean of 19.7 taxa across all samples) and was higher in edge samples than bed samples. These results are typical for ephemeral streams in central Queensland.

No exotic or threatened macroinvertebrate species were recorded.

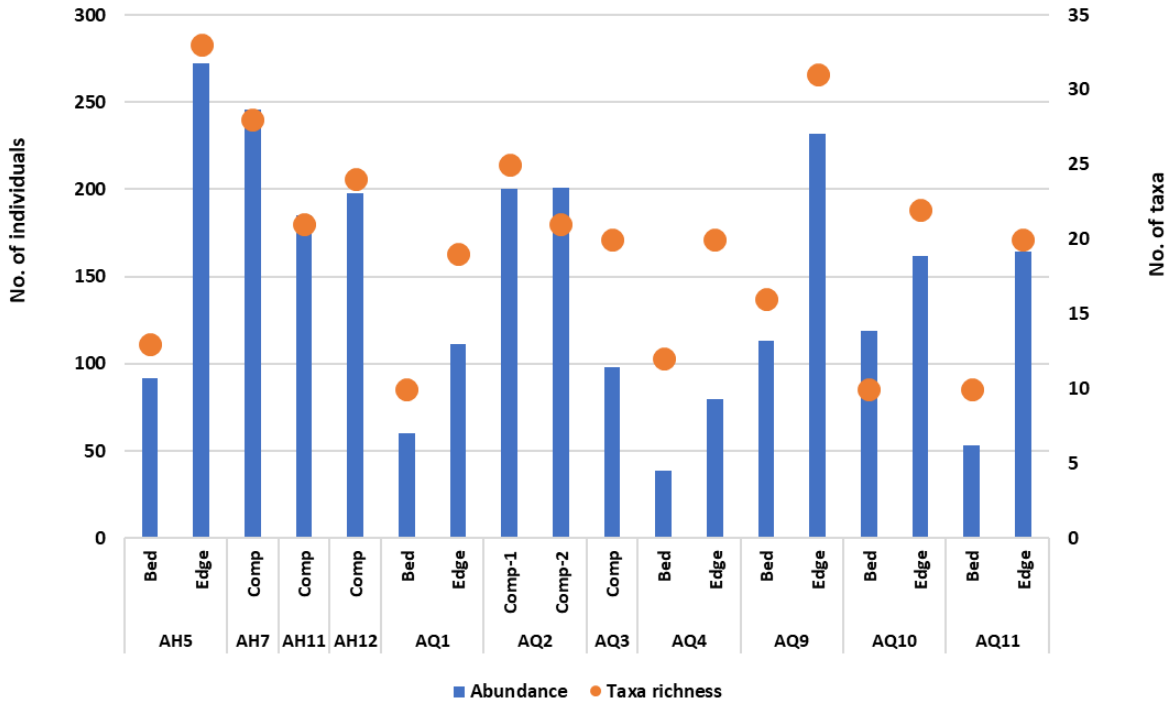

Figure 6: Macroinvertebrate abundance and taxa richness

Macroinvertebrate PET richness and Signal2 scores for all samples are presented in **Figure 7**. Two families of ephemeroptera – mayfly (Baetidae, Caenidae and Leptophlebiidae) and two families of tricoptera – caddisfly (Ecnomidae and Leptoceridae) were recorded across all sites. PET richness ranged from one to four taxa across all samples, with a mean of 2.4 taxa. Signal2 scores ranged from 2.74 to 4.08 across all samples with a mean of 3.40. This represents a typical PET taxa diversity and Signal2 scores for central inland Queensland.

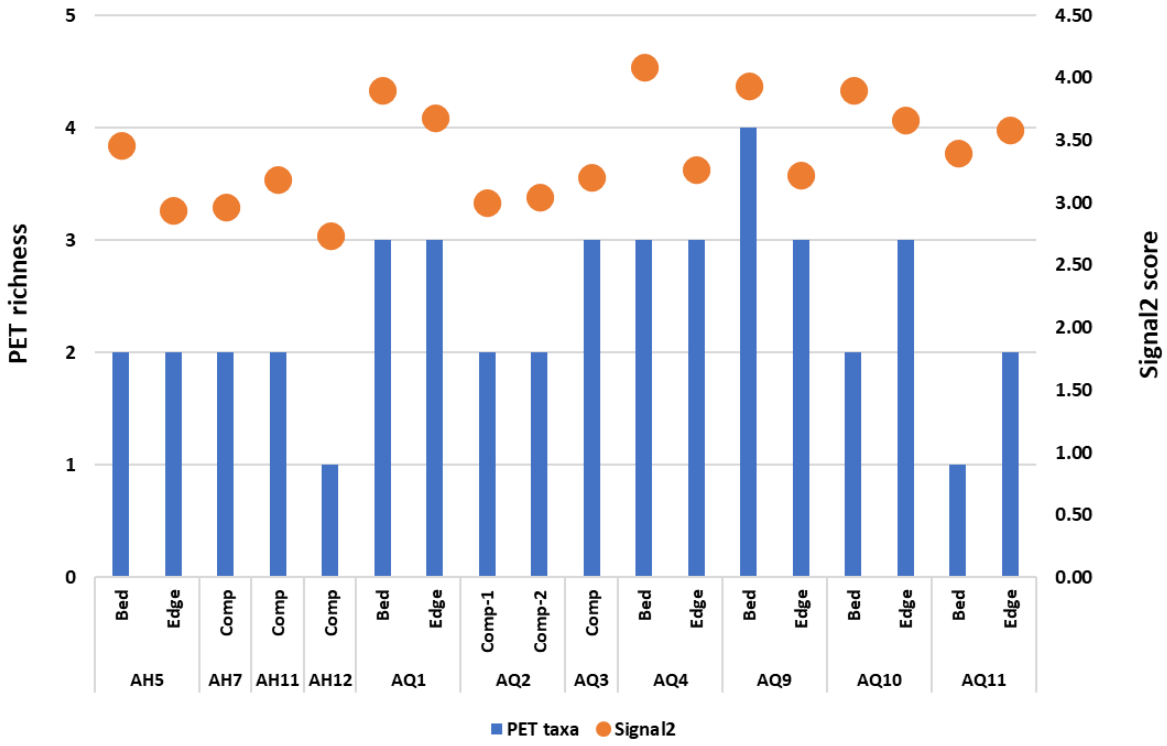

Figure 7: Macroinvertebrate PET richness and Signal2 scores

5.7. Macrocrustaceans

Macrocrustaceans were collected during both macroinvertebrate and fish sampling. Images of four of the species recorded are presented in **Table 12**. Four families recorded were across the Study Area; Atyidae (glass shrimps), Palaemonidae (longarm shrimps), Paratascidae (crayfish) and Gecarcinucidae (freshwater crabs) (**Table 10**). No macrocrustaceans were recorded from three sites. The most abundant groups across all sites were Atyidae and Palaemonidae which were both recorded from seven sites, although relative abundance varied between sites. The Palaemonidae species was *Macrobrachium australiense*, a common and widespread species across eastern Australia.

Specimens from the family Gecarcinucidae were *Austrothelphusa transversa*, an ephemeral specialist that has a widespread distribution from north-east Western Australia across to central New South Wales and across vast regions of Queensland. Single specimens were recorded in two sites.

Two species from the family Parastacidae were recorded; the orange fingered crayfish (*Cherax depressus*) and the red claw crayfish (*Cherax quadricarinatus*). *Cherax depressus* was recorded in low abundance at two sites (AH5 on JB Gully and AQ11 on Conrock Gully). *Cherax depressus* is an ephemeral waterway specialist and is currently known as a species complex with a widespread distribution across coastal waterways in central and south-east Queensland. *Cherax quadricarinatus* was recorded in low abundance at two sites on the Isaac River. *Cherax quadricarinatus* is native to permanent freshwater streams, billabongs and lakes on the north coast of the Northern Territory, northeastern Queensland, and Papua New Guinea. Through translocation by humans, the range has spread down to southern Queensland.

Table 10: Macrocrustacean family relative abundance recorded

Site	Atyidae	Palaemonidae	Paratascidae		Gecarcinucidae
		Macrobrachium australiense	***Cherax depressus***	***Cherax quadricarinatus***	***Austrothelphusa transversa***
AH5	< 10	10's	3	-	-
AH7	-	-	-	-	-
AH11	-	-	-	-	-
AH12	-	-	-	-	1
AQ1	10's	10's	-	3	-
AQ2	-	-	-	-	-
AQ3	< 10	< 10	-	-	-
AQ4	10's	100's	-	-	-
AQ9	1,000's	100's	-	-	-
AQ10	100's	10's	-	3	-
AQ11	< 10	10's	2	-	1

5.8. Fish

A total of 1,948 fish from twelve species were collected from the 11 sites that had water across the Study Area (**Table 11**). Images of all fish species recorded during sampling are presented in **Table 12**. At two sites that held water (AH7 and AQ2) no fish were recorded, reflecting the lack of connectivity to other waterways and the ephemeral nature of these two sites. Ten of the species of fish recorded were native species and are relatively common and widespread across their distributions. Two exotic species were also recorded (shown in red in **Table 11**), with one represented by a single specimen (platy – *Xiphophorus maculatus*) which is not restricted or prohibited under Queensland legislation. The second exotic species was tilapia (*Oreochromis mossambica*) which is listed as a restricted species under the *Biosecurity Act* 2014.

The highest diversity was recorded in the two sites on the Isaac River, AQ10 (12 species) and AQ1 (11 species), followed by ten species at AH5. At the remaining sites between one and seven species were recorded.

The most abundant species was eastern rainbowfish (*Melanotaenia splendida splendida*) which accounted for 36% of all fish recorded, with just over two thirds of those individuals recorded from just two sites (AQ1 and AQ10). Other abundant species, in descending order of abundance, were; spangled perch (*Leiopotherapon unicolor*), Midgley's carp gudgeon (*Hypseleotris bucephalus*), Agassiz's glassfish (*Ambassis agassizii*), sleepy cod (*Oxyeleotris lineolatus*) and tilapia (*Oreochromis mossambica*). The most widespread fish species were eastern rainbowfish and spangled perch (recorded at eight of the eleven sites sampled), followed by Midgley's carp gudgeon (recorded at seven of the eleven sites sampled).

Table 11: Fish species and abundance recorded

Scientific name	*Ambassis agassizii*	*Craterocephalus stercusmuscarum*	*Hypseleotris bucephalus*	*Leiopotherapon unicolor*	*Melanotaenia splendida splendida*	*Mogurnda adspersa*	*Nematalosa erebi*	*Neosilurus hyrtlii*	*Oxyeleotris lineolatus*	*Porochilus rendahli*	*Oreochromis mossambica*	*Xiphophorus maculatus*	
Common name	**Agassiz's glassfish**	**Fly-specked hardyhead**	**Midgley's carp gudgeon**	**Spangled perch**	**Eastern rainbowfish**	**Southern purplespotted gudgeon**	**Bony bream**	**Hyrtl's catfish**	**Sleepy cod**	**Rendahl's catfish**	**Tilapia**	**Platy**	**Totals**
AH5	16	3	46	53	123	1	10	-	1	2	70	-	325
AH7	-	-	-	-	-	-	-	-	-	-	-	-	0
AH11	-	-	-	10	3	-	-	-	-	-	-	-	13
AH12	9	-	-	-	-	-	-	-	-	-	-	-	9
AQ1	72	3	25	140	284	9	58	11	16	7	47	-	672
AQ2	-	-	-	-	-	-	-	-	-	-	-	-	0
AQ3	-	-	1	1	1	-	-	-	-	-	-	-	3
AQ4	-	-	4	14	10	2	6	-	-	-	7	-	43
AQ9	5	-	63	57	61	-	1	-	58	-	4	-	249
AQ10	59	3	116	72	205	11	7	4	82	4	10	1	574
AQ11	21	-	29	1	9	-	-	-	-	-	-	-	60
Totals	**182**	**9**	**284**	**348**	**696**	**23**	**82**	**15**	**157**	**13**	**138**	**1**	**1,948**

Table 12: Images of fish and larger crustacean species recorded

Agassiz's glassfish (*Ambassis agassizii*)	**Fly-specked hardyhead (*Craterocephalus stercusmuscarum*)**
	
Midgley's carp gudgeon (*Hypseleotris bucephalus*)	**Spangled perch (*Leiopotherapon unicolor*)**
	
Eastern rainbowfish (female) (*Melanotaenia splendida splendida*)	**Southern purplespotted gudgeon (*Mogurnda adspersa*)**
	
Bony bream (*Nematalosa erebi*)	**Hyrtl's Catfish (*Neosilurus hyrtlii*)**
	

Table 12 (continued): Images of fish and larger crustacean species recorded

Sleepy cod (*Oxyeleotris lineolata*)	**Rendahls catfish (*Porochilus rendahli*)**
	
Tilapia (*Oreochromis mossambica*)	**Platy (*Xiphophorus maculatus*)**
	
Redclaw (*Cherax quadricarinatus*)	**Inland freshwater crab (*Austrothelphusa transversa*)**
	
Orange-fingered yabby (*Cherax depressus*)	**Eastern longarm prawn (*Macrobrachium australiense*)**
	

5.9. Frogs and turtles

Images of the frogs and turtles recorded during sampling are shown in **Table 13**. Frogs were scarce at the time of sampling, with only three species observed and none noted as calling during the aquatic ecology surveys. Single specimens of green-striped burrowing frog (*Ranoidea alboguttata*) were observed at sites AH7 and AH12. Several specimens of Ornate burrowing frog (*Platyplectrum ornatum*) were observed at AQ1 on the Isaac River. A single specimen of short-footed frog (*Ranoidea brevipes*) was unearthed by earthworks on the track between sites AH7 and AQ3 in an area where several small gilgais were present.

Four specimens of eastern long-necked turtle (*Chelodina longicollis*) were captured in fyke netting in AQ2, a palustrine wetland.

No observations or signs of frogs, turtles or other aquatic vertebrates were noted at any other sites sampled. All frog and turtle species recorded are capable of surviving extended dry periods by aestivating underground.

Table 13: Images of frog and turtle species observed

Green-striped burrowing frog (*Ranoidea alboguttata*)	**Ornate burrowing frog (*Platyplectrum ornatum*)**
	
Short-footed frog (*Ranoidea brevipes*)	**Eastern long-necked turtle (*Chelodina longicollis*)**
	

5.10. Surface expression aquatic groundwater-dependent ecosystems

There was no evidence to suggest that any waterway within the Study Area was sustained by surface expressions of groundwater. Therefore, the aquatic ecosystems associated with the waterways and wetlands are not reliant on the surface-expression of groundwater.

5.11. Aquatic ecosystem values

Based on the criteria identified in the *Guidelines for Identifying High Ecological Values Aquatic Ecosystems* (Aquatic Ecosystems Task Group 2012) the following section summarises each site sampled across the Study Area. The five points for each site represent the five criteria described in **Section 4.12** and are shown for each site in **Table 14**.

One site, the HES wetland was rated as having high aquatic values, based on its relative distinctness, and aquatic macrophyte diversity. All three sites along the Isaac River were considered to be of moderate value based on extended periods of holding water and supporting moderately diverse fish assemblages, as well as providing passage for fish to habitat further upstream. Sites AH7, AH11 and AH12 was also rated as having moderate aquatic values, due to semi-permanence of wetted habitat and relatively diverse aquatic macrophyte assemblages. All other sites were considered to have low aquatic values due to the lack of water permanency and, in the case of the watercourses, little to no permanent water upstream.

Table 14: Aquatic ecosystems value ratings for the Study Area

Site code	Waterway	Stream order	Criteria for value rating	Overall value rating
AH1	Unnamed creek	1	• No standing water, dries quickly, incised channel • No distinctness • No habitat likely to extend beyond days following heavy rainfall • Heavily impacted by land clearing and grazing • Poor example of a lower stream order	Low
AH2	Unnamed depression	1	• Poor diversity with one pool that may persist for a few weeks after heavy rainfall • No distinctness • Short water retention times and poor habitat • Heavily impacted by grazing • Poor example of a wetland	Low
AH3	Unnamed creek	1	• Several small temporary pools, supporting a low diversity of aquatic macrophytes • No distinctness • Not vital habitat • Impacted by land clearing and grazing • Fair example of a lower stream order	Low
AH4	Unnamed gilgai	-	• Poor diversity with one pool that may persist for a several weeks after heavy rainfall • No distinctness • No habitat likely to extend beyond weeks following heavy rainfall • Heavily impacted by land clearing, grazing and feral pigs	Low

			• Poor example of a wetland	
AH5	JB Gully	2	• Moderate diversity of fish and crustacean species • No distinctness • Habitat likely to extend for several months following heavy rainfall • Moderate naturalness, impacted by grazing • Moderate example of semi-permanent refugial pool	Moderate
AH6	Unnamed creek	1	• No standing water, dries quickly, incised channel • No distinctness • No habitat likely to extend beyond days following heavy rainfall • Heavily impacted by land clearing and grazing • Poor example of a lower stream order	Low
AH7	Unnamed gilgai	-	• Moderate diversity of aquatic macrophytes • No distinctness • Aquatic habitat likely to persist for weeks following heavy rainfall • Heavily impacted by grazing and feral pigs once drying out • Good example of a gilgai	Moderate
AH8	Unnamed depression	-	•Poor diversity with one pool that may persist for a few hours after heavy rainfall • No distinctness • Short water retention times and poor habitat • Impacted by grazing • Poor example of a wetland	Low
AH9	Unnamed depression	-	•Poor diversity with one pool that may persist for a few hours after heavy rainfall • No distinctness • Short water retention times and poor habitat • Impacted by grazing • Poor example of a wetland	Low
AH10	Unnamed wetland	-	• Poor diversity with one pool that may persist for a few weeks after heavy rainfall • No distinctness • Short water retention times and poor habitat • Heavily impacted by grazing • Poor example of a wetland	Low
AH11	Unnamed wetland	-	• Moderate diversity of aquatic macrophytes • No distinctness • Aquatic habitat likely to persist for weeks following heavy rainfall • Heavily impacted by grazing and feral pigs once drying out • Moderate example of a wetland	Moderate
AH12	Unnamed wetland	-	• Moderate diversity of aquatic macrophytes • No distinctness • Aquatic habitat likely to persist for weeks following heavy rainfall • Heavily impacted by grazing and feral pigs once drying out • Moderate example of a wetland	Moderate
AQ1	Isaac River	6	• Moderate diversity of fish species only • No distinctness • Habitat likely to persist for months following heavily rainfall. Conduit for fish passage	Moderate

			• Ecological character moderately natural • Moderate example of a higher stream order	
AQ2	Unnamed wetland	-	• Moderate diversity of aquatic macrophytes and riparian vegetation. High wetland values • Moderate distinctness • High value temporary habitat for terrestrial species • Impacted by grazing and feral pigs when drying • Good example of an ephemeral wetland	High
AQ3	Cherwell Creek	5	• Large channel that drains within days following heavy rainfall • No distinctness • No habitat likely to extend beyond weeks following heavy rainfall • Ecological character moderately natural • Moderate example of a highly ephemeral higher stream order	Low
AQ4	Cherwell Creek	5	• Large channel that drains within days following heavy rainfall • No distinctness • No habitat likely to extend beyond weeks following heavy rainfall • Ecological character moderately natural • Moderate example of a highly ephemeral higher stream order	Low
AQ5	Cherwell Creek	5	• Large channel that drains within days following heavy rainfall • No distinctness • No habitat likely to extend beyond weeks following heavy rainfall • Ecological character moderately natural • Moderate example of a highly ephemeral higher stream order	Low
AQ6	Conrock Gully	2	• Poor channel diversity and dries quickly with a few intermittent pools. • No distinctness • No habitat likely to extend beyond weeks following heavy rainfall • Impacted by grazing • Poor example of a lower stream order	Low
AQ7	Conrock Gully	2	• Poor channel diversity and dries quickly with a few intermittent pools. • No distinctness • No habitat likely to extend beyond weeks following heavy rainfall • Impacted by grazing • Poor example of a lower stream order	Low
AQ8	Conrock Gully	2	• Poor channel diversity and dries quickly with a few intermittent pools. • No distinctness • No habitat likely to extend beyond weeks following heavy rainfall • Impacted by grazing • Poor example of a lower stream order	Low
AQ9	Isaac River	6	• Moderate diversity of fish species only • No distinctness • Habitat likely to persist for months following heavily rainfall. Conduit for fish passage • Ecological character moderately natural	Moderate

			• Moderate example of a higher stream order	
AQ10	Isaac River	6	•Moderate diversity of fish species only • No distinctness • Habitat likely to persist for months following heavily rainfall. Conduit for fish passage • Ecological character moderately natural • Moderate example of a higher stream order	Moderate
AQ11	Conrock Gully	2	• Little standing water present, dries quickly through most reaches • No distinctness • Habitat in one pool likely to persist for weeks following heavily rainfall. • Impacted by grazing • Moderate example of a lower stream order	Low

5.12. Matters of National Environmental Significance

Matters of National Environmental Significance (MNES) are regulated under the federal *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). The literature review identified two fauna species with the potential to occur in and adjacent to the Project area. No MNES aquatic flora were identified.

MNES - EPBC Protected Matters

- White-throated snapping turtle (*Elseya albagula*) (Critically Endangered)
- Fitzroy River turtle (*Rheodytes leukops*) (Endangered)

A combination of literature reviews and field surveys was used to make an assessment of the likelihood of occurrence for the aquatic MNES identified in the desktop assessment. While no aquatic MSES species were identified in the Wildnet search, the two aquatic MNES species (both turtles) identified in the EPBC Protected Matters Search are also listed as MSES species. The likelihood assessment for these species is presented in **Table 15**. Both of the MNES and MSES turtle species identified in the desktop review were determined to be unlikely to be present within the Study Area. This was largely due to a lack of permanent flows and lack of suitable habitat present, and no records for more than 150 kms of stream length from the Project area.

Table 15: Likelihood of occurrence for EVNT aquatic species

Species	Status		Preferred habitat	Likelihood of occurrence
	EPBC	NC Act		
White-throated snapping turtle (*Elseya albagula*)	CE	CR	The white-throated snapping turtle is recognised as a habitat specialist. Within the river system the white-throated snapping turtle prefers clear, flowing, well-oxygenated waters. The species prefers waterways with permanent flowing water, with undercut banks, large woody debris, deep pools (6 m deep) and shallow riffle zones.	**Unlikely** the closest records are more than 150 kms by stream length from the Project area and there is no suitable habitat present within or in proximity of the Project area.
Fitzroy River turtle (*Rheodytes leukops*)	E	E	The Fitzroy River Turtle is found in rivers with large deep pools with rocky, gravelly or sandy substrates, connected by shallow riffles. Preferred areas have high water clarity and are often associated with Ribbonweed (*Vallisneria* sp.) beds.	**Unlikely** the closest records are more than 150 kms by stream length from the Project area and there is no suitable habitat present within or in proximity of the Project area.

EPBC designations; CE – Critically Endangered, E – Endangered.

NC Act designations; CR – Critically Endangered, E – Endangered

5.13. Matters of State Environmental Significance

There are several Matters of State Environmental Significance (MSES) relevant to aquatic ecology that occur, or have the potential to occur, in the vicinity of the Project area. These are:

- Listed threatened species.
- Waterways providing for fish passage.
- HES wetlands.

MSES species are regulated under the *Nature Conservation Act* 1992 (NC Act). The Wildnet search review did not identify any listed threatened aquatic flora or fauna species with the potential to occur in and adjacent to the Project area, however, the EPBC Protected Matters identified two MSES species - white-throated snapping turtle (*Elseya albagula*) (Critically Endangered) and Fitzroy River turtle (*Rheodytes leukops*) (Endangered). These are discussed in **section 5.12** and the likelihood assessment for these species is presented in **Table 15**.

The DAF (2020) Queensland Waterways for Waterway Barrier Works mapping indicates the level of 'risk' associated with undertaking waterway barrier works within Queensland waterways with regards to fish passage.

Where the works associated with the Project are undertaken on the mining lease under the conditions of an EA (and not a development approval), a waterway barrier works approval under the Fisheries Act 1994 will not be required; however, fish passage requirements in the Project area need to be considered. There are several designations of waterways across the Study Area (**Figure 8**):

- The Isaac River and Cherwell Creek are mapped as major risk (purple) of adverse impact to fish movement.
- All other waterways are mapped as moderate risk (amber) or low risk (green) of adverse impact to fish movement.

There are two wetlands of high ecological significance (HES) within 20 kilometres of the Project Area. One is located approximately 1.5 km east of the Project MLAs and within the Study Area (site AQ2). The other is located approximately 15 kms to the south-east adjacent to the Isaac River with no potential to be impacted by the Project.

5.14. Matters of Local Environmental Significance

There are eleven fish species, two freshwater crayfish and six Priority species recorded by the ACA Expert Panel Reports for the Fitzroy section of the GBR catchment (Inglis & Howell 2009, Rollason & Howell 2012). Only two of the fish species (golden perch – *Macquaria ambigua oriens* and leathery grunter – *Scortum hillii*), three plant species (tall flatsedge - *Cyperus exaltatus*, water chestnut - *Eleocharis dulcis* and native hyacinth - *Monochoria cyanea*) occur, or have the potential to occur, in the vicinity of the Project. None are listed as MNES or MSES.

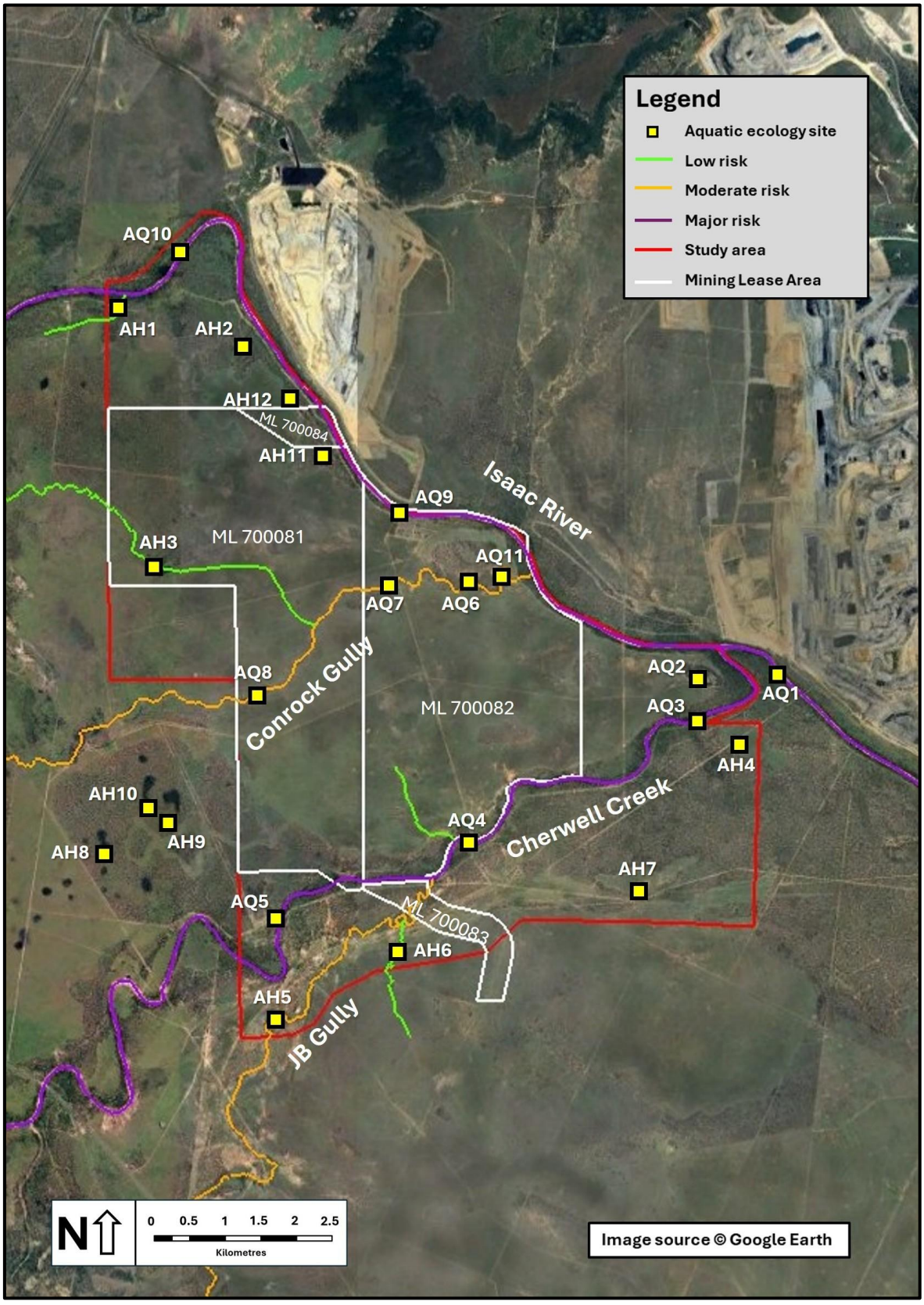

Figure 8: Waterway barrier works designations under the Fisheries Act 1994

6. Potential Impacts and Mitigation

The Project layout has been designed to minimise environmental impacts, including to aquatic ecosystems. This section summarises the potential impacts of the Project on aquatic ecology and identifies the avoidance and mitigation measures proposed in accordance the EIS Information Guideline – Aquatic Ecology (DETSI 2026).

6.1. Aquatic habitat modification

Conrock Gully will be diverted around the proposed mining area. The diversion construction will commence at the start of the on-ground activities. The majority of Conrock Gully upstream and including the beginning of the proposed diversion is defined as a drainage feature under the Water Act. The 3.2 km downstream reach of Conrock Gully to its confluence with Isaac River is defined as a watercourse under the Water Act. The proposed diversion channel will mimic the existing gully channel geomorphic characteristics, with the design hydraulic conditions similar, and generally improved, to those in the existing Conrock Gully channel (Hydrobalance 2026b). Following construction, the diversion will be revegetated to maintain bank stability and reduce erosion and achieve a native vegetation (riparian) post mining land use in accordance with the proposed PRCP schedule. The diversion will remain in the post mining landform as a revegetated, rehabilitated, stable landform. This will be essential for bank stability over time. Where possible the diversion will be constructed 'offline' until the works have stabilised, and the vegetation has become established. Monitoring of the diversion establishment and rehabilitation will occur in order to achieve the design outcomes and rehabilitation milestones. A culvert crossing is proposed in the northern end of the diversion, which is discussed further in **Section 6.4.3**.

The Project's functional design report for the Conrock Gully diversion is provided in (Hydrobalance 2026b). The following provides an overview of the key design characteristics:

- The hydraulic assessment was used to assess the potential hydraulic impacts and demonstrate the suitability of Conrock Gully diversion's functional design, in accordance with the objectives and design criteria of the '*Guideline: Works that interfere with water in a watercourse for a resource activity—watercourse diversions authorised under the Water Act 2000* (DNRME 2019).
- The proposed diversion channel has similar dimensions to the existing channel and thus has similar design capacity.
- The existing channel includes a large meander which contributes significantly to the length of channel being diverted. A number of meanders have been introduced at the upstream end of the diversion which results in a length of channel and bed slope similar to the existing channel. The meanders have similar amplitude, wavelength, sinuosity, and bend radius to bends found in the existing creek channel.
- The main channel has a similar geometry to the existing channel, but with slightly steeper side slopes to reduce the extent of disturbance required. The hydraulic conditions within the existing Conrock Gully channel and proposed diversion channel have been compared for conditions before and after the proposed development, and to the guideline conditions within the DNRME guideline. Within the Conrock Gully diversion, the design hydraulic conditions

are similar, and generally improved, to those in the existing Conrock Gully channel, and are consistent with the DNRME guideline values for channel-averaged shear stress, stream power and velocity

The downstream remainder of the existing Conrock Gully channel will be excised by the Project. However, this section of Conrock Gully channel is subject to backwater flood flows from the Isaac River as it sits within the Isaac River floodplain and would regularly be inundated by Isaac River backwater during flood flows. Hydrobalance 2026b shows that this downstream reach of Conrock Gully would be inundated by Isaac River backwater flows for flood events greater than the 50% Annual Exceedance Probability (AEP) (1 in 2 year). This means that the loss of catchment from catchment excision from the Conrock Gully Diversion is largely mitigated by Isaac River backwater flows for flow events greater than 50% AEP.

No aquatic species of conservation significance listed under the NC Act (MSES) or EPBC Act (MNES) were recorded in Conrock Gully and given the lack of suitable habitat features none are expected to be present. All aquatic ecology survey sites on Conrock Gully were determined to have low aquatic ecology value (see **Section 5.11**). With the proposed diversion design, including rehabilitation, and the low aquatic ecosystem values, the Project will have minor impacts on aquatic ecology values of Conrock Gully.

The Project will result in disturbance to riparian vegetation associated with the crossings of the Isaac River and Cherwell Creek. The proposed bridges and dragline walk route have a nominated 200 m to 250 m construction corridor width, which allows for some flexibility in detailed design. However, it is likely that the disturbance widths in these areas will be reduced. All disturbance within these areas is within the nominated 'disturbance area' for the Project and hence has been assessed as a direct impact in the terrestrial ecology impact assessment (Trend 2026), including identification of significant residual impacts to these areas that require biodiversity offsets. Further, the nominated post mining land use for these locations is riparian vegetation which would ultimately aim to achieve a similar ecosystem to that which existed pre-mining.

6.2. Changes to flow and surface water hydrology

During operations, levees will be constructed to protect the open cut pit area from flooding of the Isaac River, Cherwell Creek and Conrock Gully diversion up to a 0.1% annual exceedance probability (AEP) (1:1,000 year) flood event.

Three levees have been proposed to protect the mine from local and regional flooding:

- Isaac River levee.
- Cherwell Creek levee plug.
- Conrock Gully levee plug.

Detailed hydraulic and hydrology modelling for a range of AEP events has been completed for the Project for the operational and closure periods, inclusive of all Project structures and landforms with the potential to alter hydrology and geomorphology (Hydrobalance, 2026b). The design of infrastructure with the potential to alter hydrology and geomorphology has been undertaken to

minimise impacts (e.g. locating the Isaac River levee approximately 100–400 m from the high bank; bridge designs with minimal interference with flows; and a temporary dragline crossing). In addition, hydraulic and hydrology modelling has been completed for five cross sections through the Isaac River and adjoining floodplain upstream, adjacent and downstream of the Project, with the five cross sections representing areas of potential ecological value, containing Regional Ecosystems (REs), Threatened Ecological Communities (TECs) and Groundwater Dependent Ecosystems (GDEs). This modelling has identified:

- The Project will have negligible impact on hydrology and geomorphology (e.g. flood levels, velocity, bed shear stress and stream power) for more frequent flood events (e.g. 10% AEP or 1:10 year flood event)
- The Project will have negligible to minor impact on hydrology and geomorphology for less frequent flood events (e.g. 1% AEP or 1:100 year flood event) during operations.
- Post mining, with the decommissioning and rehabilitation of the crossing infrastructure and the Isaac River levee, and restoration of the associated floodplain, the Project will have negligible impact on hydrology and geomorphology.
- The Project will result in almost no change in the duration for which flood events will occur (less than 1 hour change in duration for all AEP events), as measured at the nominated cross section locations.
- The proposed design of Conrock Gully diversion will be hydraulically and geomorphically stable, with revegetation to a native ecosystem, and will be similar to the existing Gully.
- The final void is located outside the 0.1% AEP (1:1,000) year flood event.

Based on the findings from the flooding assessment (Hydrobalance, 2026b) impacts to vegetation in floodplains, riparian habitat and vegetation condition from changes to hydrology, hydraulics and geomorphology are expected to be negligible (Trend 2026).

Hydrobalance (2026b) includes modelling of hydrological and geomorphological changes at the HES wetland, including a cross sectional analysis located close to the HES wetland. The modelling demonstrates that the Project will not result in changes to hydrology or geomorphology at the HES wetland.

The Project layout has been designed to avoid waterways as far as practical and minimise impacts where avoidance is not possible. The hydrological and geomorphological modelling suggest negligible impacts resulting from the development of the Project on major waterways. The proposed Conrock Gully diversion has been designed to provide similar habitat characteristics to the existing Gully conditions. Therefore, any impacts on aquatic ecosystems due to changes in flooding and surface water hydrology resulting from the Project are considered to be negligible.

6.3. Wetlands

The location of the state mapped wetlands in the vicinity of the Project is shown in **Figure 9**. These are analogous to the aquatic ecology survey sites:

- AQ2, being the HES wetland approximately 1.5 km east of the Project area

- AH8 (depression), AH9 (depression) and AH10 to the west of the Project area
- AH11, AH12 and AH2 (depression) in or to the north of the Project area
- AH6 to the south of Cherwell Creek.

In addition, surveys of other more distant potential wetlands from Project area were undertaken, with results presented in **Section 5.1.2**.

The Project will result in the removal of one wetland in the north of the Project area (AH11), with this site to be included in the Project's assessment of direct impacts to terrestrial ecology values for which there is a significant impact requiring offsets (Trend 2026). The remaining wetlands and depressions will remain in place.

The direction of surface water flows across the Project area following rehabilitation is illustrated in **Figure 9** and demonstrates that the remaining wetlands and depressions will not receive surface water runoff from the ML areas. During operations mine affected water and sediment water will be managed within their respective water managements systems (see **Section 6.5** and Hydrobalance 2026a). The mine water system will not result in uncontrolled releases and any releases from sediment water system, in accordance with the proposed design criteria, would be even further constrained than the flows paths shown on **Figure 9**. Therefore, these wetlands are not at risk of changes to surface flows or water quality as a result of the Project, during operations or closure.

An assessment of the likelihood of the HES wetland (AQ2) being a groundwater dependent concluded that this wetland relies on a perched groundwater unit that is disconnected from the deeper alluvial aquifer and hence not subject to drawdown (Watermark Ecohydrology 2026). The flood / hydrology assessment modelled no changes at this wetland (Hydrobalance 2026b). Considering the lack of groundwater dependence of this wetland and no changes to the surface water hydrology the Project will not impact the HES wetland.

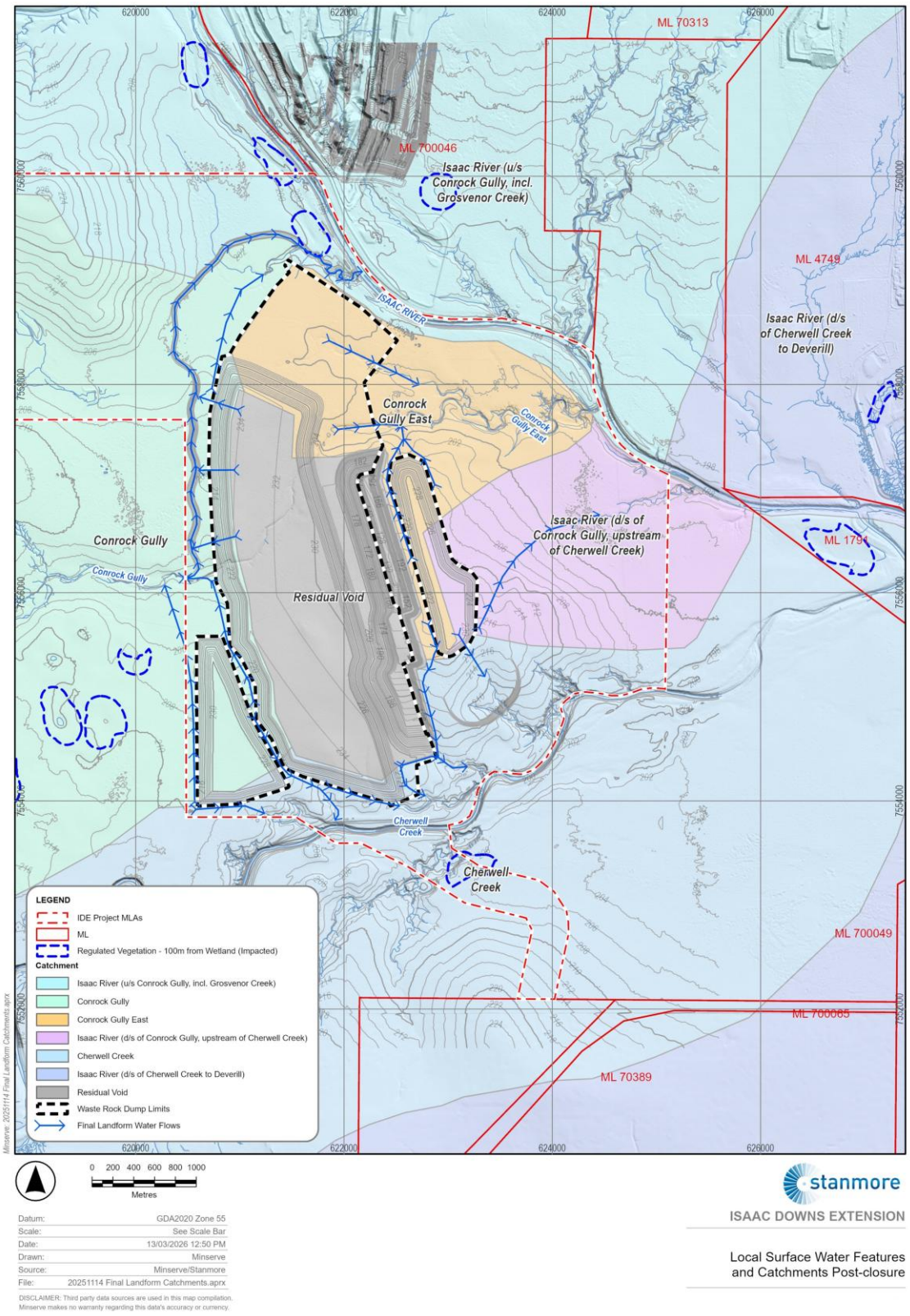

Figure 9: Wetland protection areas and surface flow direction across the Project area

6.4. Fish passage

There are two bridges, a dragline walk route, a low level crossing and a culvert crossing proposed for the Project that intersect waterways. Each is described separately below. These activities and infrastructure occur within the proposed Project disturbance area and are included in the Project's assessment of direct impacts to terrestrial ecology values for which there is a significant impact requiring offsets (Trend 2026).

6.4.1. Bridges

The Isaac River and Cherwell Creek bridges will be approximately 110 m and 70 m long, respectively. The bridge designs are subject to detailed design; however, conceptual design of the bridges includes:

- approximate 15 m bridge width
- dual lanes
- between 2 and 4 concrete and / or steel spans supported by concrete piers, piled into the banks and beds, nominally to a depth a 10 m
- less than 1:10 year flood event immunity
- rip rap rock scour protection for bank abutments to minimise risk of scour, which will be inspected following major flood events and, if required, reinstated to reduce the risk of future scour
- waterway crossings perpendicular to the waterway direction.

The proposed Project Isaac River bridge is expected to be similar to the existing Peak Downs Highway Isaac River bridge located approximately 8 km upstream, while the Cherwell Creek bridge will have a similar design but will be approximately half the length.

Construction of bridges will involve methodologies similar to the following:

- preferentially constructed in the dry season
- geotechnical investigations to determine the stable depth
- temporary (i.e. less than 180 days) sheet piles around each pier location to create a dry work area
- installation of pier piles driven done to a suitable depth
- installation of a reinforced concrete pile cap to tie piles together construction of piers
- construction of abutments adjacent the river banks, with riprap rock protection placed adjacent abutments
- lifting of the of the girders (bridge superstructure) span by span between the abutments and piers
- casting of the bridge deck slab.
- bed scour protection, if required, with any bed scour protection to be at, or below the natural bed level of the waterway, such that it does not alter the profile of the low-flow channel, and no more than 20 m upstream or downstream.

The construction and operation of the bridges will not create a barrier for fish passage. Whilst there will be sites of construction activity within the watercourse (e.g. at each pile location), these will be temporary at each location and not create an impediment to fish passage elsewhere in the river channel.

Following the construction there will be no ongoing impediment to fish movement in the Isaac River or Cherwell Creek, as the bridges will function in the same manner as the existing Peaks Down Highway bridge.

At the end of the closure period, when the bridges are no longer required, the bridges will be decommissioned, with affected lands rehabilitated in accordance with the PRCP schedule to a restore riparian habitat post mining land use. Bridges would be retained if there is an agreement with a third party for their retention.

6.4.2. Dragline walk route

The dragline currently operating at IDM will be walked to the Project. This will result in a temporary barrier to fish passage in the Isaac River. The proposed walk route is different to the haul road and access road but will exist for only a short time (e.g. a few weeks to a few months), with a temporary crossing of the Isaac River. The walk route may also be utilised by other heavy vehicles to cross the Isaac River prior to bridge construction, in which case the walk route construction, use and removal of material on the bed of the river would occur for less than 180 days (6 months) The dragline walk route will preferentially be constructed and utilised in the dry season when flows in the Isaac River are unlikely.

At the conclusion of mining operations, and once the dragline is no longer required for use in rehabilitation (i.e. approximately 20 years after operations commenced), the temporary crossing will be reestablished for a short duration (e.g. a few weeks). The temporary crossing will not be required for the movement of other equipment at closure as the Isaac River bridge will be available. All walk route crossing construction, use and removal of material on the bed of the river would occur within weeks to a few months (i.e. less than 180 days).

The proposed location for the dragline walk route crossing of the Isaac River has been selected based on relatively shallow and low river banks and minimising areas of remnant vegetation clearing. The dragline crossing construction will involve:

- gravel, road base or similar overlain on the bed of the river to a height of around 100 – 250 mm above the bed (noting that there will be flexibility in the height of the base as part of detailed design)
- bank cuttings on either side of the river to create a suitable gradient to facilitate the dragline's movements
- stabilisation of the banks of the river with rock protection.

Following utilisation of the crossing, and within 180 days of construction commencement, the temporary gravel base will be removed, and any sand that has been removed will be replaced to

restore the natural bed of the Isaac River. Bank cuttings and the walk route itself will be stabilised and rehabilitated through topsoiling, seeding and vegetation establishment. Rock protection installed during construction will remain in place. This will create a stable landform during the operational period and prior to the dragline being walked from the Project back to IDM at closure.

At closure those parts of the walk route required for the movement of the dragline will be re-opened during the dry season, with gravel, road base or similar overlain on the bed of the river. Once the dragline has returned to IDM, the crossing will be fully rehabilitated with the gravel base removed, sandy bed reestablished, bank cuttings filled to resemble pre-mining topography and landforms rehabilitated through topsoiling, seeding and revegetation in accordance with the PRCP schedule requirements to restore riparian habitat.

As the dragline crossing will be temporary for the pre and post operational crossings, it will not result in a permanent waterway barrier that will impede fish passage.

The design, construction, operation and rehabilitation of the dragline walk route demonstrates that activities will be temporary in accordance with the *Accepted development requirements for operational work that is constructing or raising waterway barrier works* for a purple (high risk) waterway (DPI 2025). Hence any design requirements for waterway barriers will be in accordance with those for temporary structures.

6.4.3. Low level and culvert crossings

The secondary access route crossing of JB Gully will be constructed as a bed level crossing based on the principles described in the Department of Primary Industry's (DPI's) '*Accepted development requirements for operational work that is constructing or raising waterway barrier works: September 2025* (DPI, 2025)' (the Waterway Barrier Works Guideline). At the end of the closure period, when the crossing is no longer required, the crossing will be decommissioned, with affected lands rehabilitated in accordance with the PRCP schedule requirements to restore the pre-mining land use (i.e. grazing).

The crossing of Conrock Gully diversion will be constructed as a culvert crossing based on the principles described in the Waterway Barrier Works Guideline. Following operations this crossing will be decommissioned and rehabilitated, with the diversion continuing to function as a geomorphically stable waterway.

As the crossings of JB Gully and Conrock Gully diversion will be constructed based on the principles in the Waterway Barrier Works Guideline, they will allow for low flows and will not act as waterway barriers to fish passage.

6.5. Water management

6.5.1. Water management systems

A water management plan has been developed for the Project. The mine site water management system will be integrated with the rest of IPC and is described in detail in Hydrobalance 2026a. The water management strategy is for separation of mine affected water, sediment affected water and clean water, with appropriate management of each of these water types.

A mine affected water dam will store water from the pit, ROM pads, go line and crib area, with the ability to transfer mine affected water to and from IDM and IPM within IPC's integrated water management system, thereby enabling the balancing of water supply and demand. Sediment water drains and dams will be constructed to capture runoff from overburden dumps. Sediment dams will be constructed in stages in accordance with mine progression. An erosion and sediment control plan (ESCP) has been developed for the Project. Clean water drains and dams will be constructed to separate clean water from mine affected water and sediment water.

The water management system assessment (Hydrobalance 2026a) demonstrates the following:

- There will be no uncontrolled releases of mine affected water
- Controlled releases of mine affected water will occur in accordance with receiving environment flow and quality limits that are designed to protect downstream environmental values and water quality objectives.
- Sediment dams will release water in accordance with their engineered design criteria and the ESCP. Modelling demonstrates that releases of water from sediment dams would have a negligible effect on salinity in the receiving environment.
- The Project would not result in a net decline in water quality in the receiving environment in accordance with the "*Reef discharge standards for industrial activities*" guideline (DESI 2021).
- Clean water from upgradient of the mining activities will be diverted around the mining activities into the Isaac River or Cherwell Creek, including the diversion of Conrock Gully.

6.5.2. Receiving Environment Monitoring Program

A Receiving Environment Monitoring Program (REMP) is typically required by the conditions of an EA for a Project, with the EA specifying the design criteria for the REMP. However, a proponent for a Project can elect to be a participant in the Fitzroy Regional Receiving Environment Monitoring Program (FRREMP) (Fitzroy Basin Association 2025). The FRREMP is supported by DETSI, which has prepared the Fitzroy Basin regional receiving environment monitoring program guideline (ESR/2023/6463) (DETSI 2025). The FRREMP provides a single basin-wide REMP that meets the regulatory requirements for each participant, focuses on the freshwater component of the basin and replaces the individual REMPs for each participant. The FRREMP allows for assessment of cumulative changes from multiple projects within the Fitzroy Basin as well as avoiding duplication of monitoring effort between different projects.

The proponent for the Project (ID Extension) is a wholly owned subsidiary of Stanmore. Stanmore, through a number of its subsidiary entities for various mines in the Bowen Basin, is a participant in the FRREMP. The Project proponent intends to join the FRREMP consistent with other Stanmore sites including; IPM, IDM, Poitrel Mine, Red Mountain CHPP, Millenium Mine and South Walker Creek Mine. Compliance with the FRREMP is expected to become a condition of Project's EA. Project related aquatic ecosystem monitoring and reporting will be done as per FRREMP.

The FRREMP Technical Design Manual (Fitzroy Basin Association, 2025) identifies the locations of existing monitoring sites. There are several existing FRREMP monitoring sites in proximity to the Project that would be applicable for monitoring potential impacts from the Project. However, to distinguish between potential impacts from Project and adjacent mines it is recommended that two additional monitoring sites are included in the FRREMP Technical Design Manual;

- on Cherwell Creek above the confluence with the Isaac River but downstream of the Project's MLs and any potential overland flows, and
- on the Isaac River upstream of the confluence with Cherwell Creek but downstream of the Project's MLs and any potential overland flows.

The Project will work with Fitzroy Basin Association, as a participant in the scheme, to modify the FRREMP to include any additional locations.

6.6. Aquatic pests

One species of invasive fish (tilapia) listed as a restricted species under the *Biosecurity Act 2014* was recorded as part of the field surveys. This species is known to occur in the broader region of the Isaac River sub-basin. No invasive aquatic plants were recorded during the field surveys. The Project would not result in beneficial change or additional habitat for invasive fish, and hence abundance.

6.7. Leaks and spills

Leaks and spills of hydrocarbons and other chemicals and contaminants can directly impact water quality. This can have both direct (e.g. toxicity) and indirect (e.g. changes to habitat characteristics and condition) influences on aquatic flora and fauna.

Leaks and spills would be managed through the following procedures:

- Facilities at the go line for the storage of fuels and minor maintenance requirements will be constructed and bunded in accordance with the relevant Australian Standard specifications, including but not limited to the provisions of AS 3780:2008 – The storage and handling of corrosive substances, AS 1940:2004 – The storage and handling of flammable and combustible liquids (AS 1940), AS 3833:2007 – Storage and handling of mixed classes of dangerous goods in packaged and intermediate bulk containers.

- Fuel storage areas will be inspected regularly, with repair and maintenance work completed as required. Bunds filled with stormwater will be drained or pumped out by a licensed contractor as soon as practicable to maintain the bund volume.
- A waste oil system will collect all waste oils for transfer offsite or recycling onsite, so that waste oils are not released to the environment. Lubricants will be stored in a bunded concrete area with a sump to collect any spills.
- All runoff from areas with potential contaminants will pass through water management controls such as an oily water separator or sediment trap before entering the mine affected water management system.
- Incident reporting and the management of spills will be undertaken in accordance with the site operational incident reporting forms and procedures. A spill response protocol will be developed and implemented. Spills management procedures will be designed to contain and remediate any spills of fuels or chemicals to prevent impacts on surface waters.
- Specific waste bins and bunding will be used to isolate waste liquids, chemicals and hazardous wastes.
- Spill kits will be available close to areas where chemicals are being used or kept.
- Hazardous liquid wastes awaiting disposal, such as hydrocarbons and oils, will be stored appropriately in accordance with AS1940:2004 'The storage and handling of flammable and combustible liquids'.
- All areas containing potential contaminants or hazardous wastes will be protected from flooding by levees with flood protection for a 0.1% AEP (1:1,000 year) flood event. Hence, they will have a negligible risk of releasing contaminants during flood events.

With the implementation of the proposed mitigation and management measures for the Project, the risk to the aquatic ecological values of the receiving environment is very low.

6.8. Aquatic biological diversity

Aquatic habitats in waterways and wetlands in the Study area were typical of ephemeral systems across the broader region, with seasonal patterns in habitat availability and quality. Biological communities (including aquatic plants, macroinvertebrates, macrocrustaceans, fish and turtles) recorded at sites in the Study Area and receiving environment were typical of ephemeral systems in central Queensland. The Project will not impact on the aquatic biological diversity within or adjacent to the Project area.

6.9. Matters of National Environmental Significance

As discussed in **Section 5.12**, no aquatic threatened species listed under the EPBC Act were recorded during field surveys, and they are considered unlikely to occur due to a lack of suitable habitat and extensive distances from the closest location from which they have been recorded. Therefore, no significant impacts to MNES listed species are expected as a result of the development of the Project's mining activities and associated infrastructure.

6.10. Matters of State Environmental Significance

As discussed in **Section 5.13**, no aquatic threatened species listed under the NC Act were recorded during field surveys, and they are considered unlikely to occur due to a lack of suitable habitat and extensive distances from the closest location from which they have been recorded. Therefore, no significant impacts to MSES listed species are expected resulting from the development of the Project's mining activities and associated infrastructure.

The potential impacts on waterways for fish passage and mitigation measures are discussed for the Cherwell Creek and Isaac River bridges in **Section 6.4.1**, the dragline walk route across the Isaac River in **Section 6.4.2**, and for the low level crossing of JB Gully and for the culvert crossing of the Conrock Gully diversion in **Section 6.4.3.** While approvals for waterway barrier works are only required off MLs under the Fisheries Act 1994, all waterway crossings will be constructed to not create a barrier for fish passage, in accordance with the principles in the Department of Primary Industry's (DPI's) '*Accepted development requirements for operational work that is constructing or raising waterway barrier works: September 2025* (DPI 2025)'. Therefore, no significant residual impacts on fish passage are expected resulting from the development of the Project's mining activities and associated infrastructure.

The MSES listed HES wetland (site AQ02) is approximately 1.5 km east of the Project area and there is no risk of changes to surface water flows or quality, or groundwater, that could impact this wetland (Trend 2026, Watermark Ecohydrology 2026).

The MSES "Fish Habitat Areas and Highly Protected Zones of State Marine Parks" is not relevant due to the distance of the site from the coast, with Project infrastructure designed to achieve the "*Reef discharge standards for industrial activities*" guideline (DESI 2021).

7. Cumulative impacts

Cumulative impacts on surface water resources are assessed in Hydrobalance 2026a and Hydrobalance 2026b. In summary, these identify that the Project would result in a negligible contribution to cumulative impacts in the region, with existing controls in place across the resource industry to manage impacts to surface waters. Therefore, the Project is expected to result in a negligible contribution to cumulative impacts on aquatic ecology in the region.

8. Offsets

The Project is not expected to have any significant residual impacts on aquatic MNES species, MSES species, or other MSES including HES wetlands or fish passage. Therefore, no offsets are required for aquatic ecology under the Matters of National Environmental Significance: Significant Impact Guidelines 1.1 (DotE 2013) and the Queensland Environmental Offsets Policy – Significant Residual Impact Guideline (EHP 2014).

9. Conclusions

9.1. Aquatic Ecology

Aquatic habitat assessed within the vicinity of the Project area was typical of ephemeral systems across the broader region. The largest waterways were the Isaac River and Cherwell Creek which are sixth and fifth order waterways respectively. Both are highly ephemeral, with large areas drying out for much of the year. Cherwell Creek ceases to flow and support water faster than the Isaac River, which holds semi-permanent pools for extended periods following the wet season flows. All other streams were either first or second waterways. Accordingly, the Isaac River and Cherwell Creek are mapped as major risk waterways providing for fish passage in the *Waterway Barrier Works* spatial layer, a MSES, with other waterways mapped as low to moderate risk of adverse impacts to fish passage as a result of waterway barrier works. There were several palustrine wetlands, gilgais and shallow depressions that were ground-truthed during the field assessments, including one HSES wetland that is a MSES. None of the waterways or wetlands were determined to be aquatic GDEs, sustained only by surface water flows for limited periods of time.

An assessment of the aquatic ecosystem values determined that one site (the HSES wetland) was of high value, three wetlands, one waterway site and all sites along the Isaac River were of moderate value and all remaining sites were of low value.

In situ water quality measurements during the late season sampling had relatively low conductivity (an indirect measure of salinity), elevated turbidity levels and were mostly mildly to moderately alkaline. This data was collected to assist in the interpretation of the biological data.

Overall, the biological communities (including aquatic plants, macroinvertebrates, macrocrustaceans, fish and turtles) recorded at sites in the vicinity of the Project were typical of ephemeral systems in central Queensland. All taxa recorded were common in the broader region, and no State or Commonwealth listed threatened species known from the catchment (or potential habitat for these species) were identified.

Aquatic macrophyte diversity was variable across all sites but was typically higher in the palustrine wetlands and gilgais. Sites along the watercourses supported low macrophyte diversity and were dominated by emergent growth forms. All macrophyte species recorded were species capable of persisting in the absence of permanent standing water.

Macroinvertebrate communities were typical for ephemeral waterways in central Queensland, composed primarily of early colonising species and those that can sustain long periods of desiccation. Four macrocrustacean families recorded were across the Study Area, with no macrocrustaceans recorded from three sites that held water. One species was a translocated native species, while the other species were native, widespread and abundant along eastern Australia.

A total of twelve fish species were recorded across all sites, with no fish recorded in two sites holding water. Two of the species are exotic pest species, while all other species were native. One of the

exotic species of fish was tilapia which is listed as a noxious species under the *Biosecurity Act 2014*. All native fish species recorded are capable of rapid colonisation of recently inundated watercourses and are widespread and common across their distributional ranges.

Turtles were not particularly abundant or widespread in the vicinity of the Project and were only caught in the mapped HSES palustrine wetland. The species captured (eastern snake neck turtle) is considered widespread and common throughout waterways in Queensland.

No threatened aquatic species were recorded and based on the current survey, lack of historical records (nearest record located more than 150 km by waterway connectivity from the Study area) and the habitat suitability assessments, the critically endangered white-throated snapping turtle and Fitzroy River turtle do not occur in the Study Area or surrounds.

9.2. Potential Impacts and Proposed Mitigation Measures

The Project layout has been designed to minimise environmental impacts, including to aquatic ecosystems. This includes the avoidance, where possible, of waterways and diversion of surface flows from the Project away from natural watercourses and wetlands.

The Project requires the diversion on Conrock Gully (a low stream order ephemeral waterway with low aquatic ecosystem value) around the proposed mining area and the removal of one wetland which is not a HES wetland, for which significant impacts have been identified in the terrestrial ecology study and will therefore be offset. Although there are several proposed crossings of waterways as part of the Project, these will be constructed to no to not create a barrier for fish passage, in accordance with the principles in the Accepted Development Requirements for Operational Work that is Constructing or Raising Waterway Barrier Works. Therefore, it was concluded that the Project was unlikely to result in a significant impact on fish passage.

Indirect impacts that have been considered in this assessment include potential impacts associated with changes in water quality, hydrological changes, impacts to groundwater dependant ecosystems and potential cumulative impacts. It is concluded that the Project is unlikely to have a significant impact on aquatic ecology as a result of these potential indirect impacts. This is largely attributable to the design of Project infrastructure and activities in a manner to reduce or eliminate potential impacts to aquatic ecology. The Project will not result in significant impacts to aquatic ecological values that are matters of national environmental significance (MNES) or matters of state environmental significance MSES.

10. References

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Appendix A – Site Photographs November 2024

AH2 **Unnamed wetland** **9/11/2024**	**Co-ordinates (UTM 55K)** **E 620627** **S 7560799**
 **Upstream**	 **Downstream**
AH3 **Unnamed wetland** **8/11/2024**	**Co-ordinates (UTM 55K)** **E 619408** **S 7557911**
 **Upstream**	 **Downstream**
AH5 **JB Gully** **11/11/2024**	**Co-ordinates (UTM 55K)** **E 621079** **S 7551949**
 **Upstream**	 **Downstream**

<table>
<tr><td>AQ1
Isaac River
10/11/2024</td><td><u>Co-ordinates (UTM 55K)</u>
E 627664
S 7556522</td></tr>
<tr><td> 
Upstream</td><td> 
Downstream</td></tr>
<tr><td>AQ2
Unnamed wetland
9/11/2024</td><td><u>Co-ordinates (UTM 55K)</u>
E 626715
S 7556401</td></tr>
<tr><td> 
Facing north</td><td> 
Facing south</td></tr>
<tr><td>AQ3
Cherwell Creek
10/11/2024</td><td><u>Co-ordinates (UTM 55K)</u>
E 626626
S 7555802</td></tr>
<tr><td> 
Upstream</td><td> 
Downstream</td></tr>
</table>

AQ4 **Cherwell Creek** **9/11/2024**	**Co-ordinates (UTM 55K)** **E 624103** **S 7554857**
 **Upstream**	 **Downstream**
AQ5 **Cherwell Creek** **10/11/2024**	**Co-ordinates (UTM 55K)** **E 621049** **S 7553251**
 **Upstream**	 **Downstream**
AQ6 **Conrock Gully** **8/11/2024**	**Co-ordinates (UTM 55K)** **E 623588** **S 7557746**
 **Upstream**	 **Downstream**

AQ7 **Conrock Gully** **8/11/2024**	**Co-ordinates (UTM 55K)** **E 622587** **S 7557664**
 **Upstream**	 **Downstream**
AQ8 **Conrock Gully** **10/11/2024**	**Co-ordinates (UTM 55K)** **E 620889** **S 7556282**
 **Upstream**	 **Downstream**
AQ9 **Isaac River** **9/11/2024**	**Co-ordinates (UTM 55K)** **E 622711** **S 7558630**
 **Upstream**	 **Downstream**

<table>
<tr><td>AQ10
Isaac River
9/11/2024</td><td><u>Co-ordinates (UTM 55K)</u>
E 619807
S 7562136</td></tr>
<tr><td> 
Upstream</td><td> 
Downstream</td></tr>
</table>

Appendix B – Site Profiles March/May/July 2025

AH1 Unnamed creek 18/3/2025		**Co-ordinates (UTM 55K) E 618950 S 7561392**	
			
Upstream		**Downstream**	
Channel characteristics		**Mesohabitat composition**	
Reach length	100 m	Riffle	-
Bankfull bank height	4.5 m	Run	-
Bankfull stream width	5 m	Shallow pool (<1m)	-
Mean water depth	-	Deep pool (>1m)	-
Maximum water depth	-	Dry	100 %
Mean wetted width	-		
Riparian characteristics		**Microhabitat present**	
Riparian veg height (max)	11 m	Periphyton	-
Riparian width (left bank)	5 m	Filamentous algae	-
Riparian width (right bank)	10 m	Submerged macrophytes	-
Bare ground	10 %	Bank overhang veg	-
Grass	90 %	Trailing bank veg	-
Shrubs	5 %	Blanketing silt	-
Trees < 10 m	10 %	Substrate anoxia	-
Trees > 10 m	20 %	Bank undercuts	-
Canopy cover	5 %		
Instream wood		**Macrophyte coverage**	
Detritus (leaves etc)	little	Emergent	-
Sticks (<2cm diam)	little	Floating	-
Branches (<15cm diam)	little	Floating attached	-
Logs (>15cm diam)	some	Submerged	-
***In situ* water quality**		**Substrate composition**	
Temperature	-	Bedrock	-
Conductivity	-	Boulder (>256 mm)	-
Dissolved oxygen	-	Cobble (64-256 mm)	-
pH	-	Pebble (4-64 mm)	-
Turbidity	-	Gravel (2-4 mm)	-
		Sand (0.05-2 mm)	-
		Silt/clay (<0.05 mm)	100 %
Comments: Dry site, unlikely to hold water for extended periods immediately following heavy rainfall.			

AH2 Unnamed depression 18/3/2025		**Co-ordinates (UTM 55K) E 620627 S 7560799**	
 **Upstream**		 **Downstream**	
Channel characteristics		**Mesohabitat composition**	
Reach length	100 m	Riffle	-
Bankfull bank height	0.5 m	Run	-
Bankfull stream width	4 m	Shallow pool (<1m)	-
Mean water depth	-	Deep pool (>1m)	-
Maximum water depth	-	Dry	100 %
Mean wetted width	-		
Riparian characteristics		**Microhabitat present**	
Riparian veg height (max)	10 m	Periphyton	-
Riparian width (left bank)	5 m	Filamentous algae	-
Riparian width (right bank)	5 m	Submerged macrophytes	-
Bare ground	40 %	Bank overhang veg	-
Grass	60 %	Trailing bank veg	-
Shrubs	5 %	Blanketing silt	-
Trees < 10 m	60 %	Substrate anoxia	-
Trees > 10 m	-	Bank undercuts	-
Canopy cover	20 %		
Instream wood		**Macrophyte coverage**	
Detritus (leaves etc)	little	Emergent	-
Sticks (<2cm diam)	little	Floating	-
Branches (<15cm diam)	some	Floating attached	-
Logs (>15cm diam)	some	Submerged	-
***In situ* water quality**		**Substrate composition**	
Temperature	-	Bedrock	-
Conductivity	-	Boulder (>256 mm)	-
Dissolved oxygen	-	Cobble (64-256 mm)	-
pH	-	Pebble (4-64 mm)	-
Turbidity	-	Gravel (2-4 mm)	-
		Sand (0.05-2 mm)	-
		Silt/clay (<0.05 mm)	100 %
Comments: Drainage feature depression. Dry site, some pools appear to hold a small amount of water after heavy rainfall.			

AH3 Unnamed creek 3/5/2025		**Co-ordinates (UTM 55K) E 619408 S 7557911**	
 **Upstream**		 **Downstream**	
Channel characteristics		**Mesohabitat composition**	
Reach length	100 m	Riffle	-
Bankfull bank height	0.2 m	Run	-
Bankfull stream width	10 m	Shallow pool (<1m)	10 %
Mean water depth	0.02 m	Deep pool (>1m)	-
Maximum water depth	0.05 m	Dry	90 %
Mean wetted width	1.0 m		
Riparian characteristics		**Microhabitat present**	
Riparian veg height (max)	9 m	Periphyton	-
Riparian width (left bank)	2 m	Filamentous algae	-
Riparian width (right bank)	3 m	Submerged macrophytes	-
Bare ground	-	Bank overhang veg	-
Grass	100 %	Trailing bank veg	moderate
Shrubs	1 %	Blanketing silt	moderate
Trees < 10 m	10 %	Substrate anoxia	-
Trees > 10 m	20 %	Bank undercuts	-
Canopy cover	-		
Instream wood		**Macrophyte coverage**	
Detritus (leaves etc)	some	Emergent	some
Sticks (<2cm diam)	little	Floating	-
Branches (<15cm diam)	little	Floating attached	little
Logs (>15cm diam)	little	Submerged	-
***In situ* water quality**		**Substrate composition**	
Temperature	-	Bedrock	-
Conductivity	-	Boulder (>256 mm)	-
Dissolved oxygen	-	Cobble (64-256 mm)	-
pH	-	Pebble (4-64 mm)	-
Turbidity	-	Gravel (2-4 mm)	-
		Sand (0.05-2 mm)	-
		Silt/clay (<0.05 mm)	100 %
Comments: Small pools likely the result from recent rainfall prior to sampling, vegetation in wet areas dominated by terrestrial grasses.			

AH4 Unnamed gilgai 1/5/2025		Co-ordinates (UTM 55K) E 627237 S 7555503	
			
Facing north		Facing south	
Channel characteristics		**Mesohabitat composition**	
Reach length	16 x 25 m	Riffle	-
Bankfull bank height	N/A	Run	-
Bankfull stream width	N/A	Shallow pool (<1m)	20 %
Mean water depth	0.03 m	Deep pool (>1m)	-
Maximum water depth	0.08 m	Dry	80 %
Mean wetted width	4.0 m		
Riparian characteristics		**Microhabitat present**	
Riparian veg height (max)	-	Periphyton	little
Riparian width (left bank)	-	Filamentous algae	some
Riparian width (right bank)	-	Submerged macrophytes	some
Bare ground	-	Bank overhang veg	-
Grass	100 %	Trailing bank veg	-
Shrubs	1 %	Blanketing silt	-
Trees < 10 m	5 %	Substrate anoxia	-
Trees > 10 m	-	Bank undercuts	-
Canopy cover	1 %		
Instream wood		**Macrophyte coverage**	
Detritus (leaves etc)	-	Emergent	moderate
Sticks (<2cm diam)	-	Floating	-
Branches (<15cm diam)	some	Floating attached	some
Logs (>15cm diam)	-	Submerged	moderate
***In situ* water quality**		**Substrate composition**	
Temperature	-	Bedrock	-
Conductivity	-	Boulder (>256 mm)	-
Dissolved oxygen	-	Cobble (64-256 mm)	-
pH	-	Pebble (4-64 mm)	-
Turbidity	-	Gravel (2-4 mm)	-
		Sand (0.05-2 mm)	-
		Silt/clay (<0.05 mm)	100 %
Comments:			

AH5 JB Gully 1/5/2025		**Co-ordinates (UTM 55K) E 621079 S 7551949**	
			
Upstream		**Downstream**	
Channel characteristics		**Mesohabitat composition**	
Reach length	100 m	Riffle	-
Bankfull bank height	0.8 m	Run	-
Bankfull stream width	25 m	Shallow pool (<1m)	100 %
Mean water depth	0.3 m	Deep pool (>1m)	-
Maximum water depth	0.8 m	Dry	-
Mean wetted width	8.0 m		
Riparian characteristics		**Microhabitat present**	
Riparian veg height (max)	12 m	Periphyton	little
Riparian width (left bank)	15 m	Filamentous algae	little
Riparian width (right bank)	15 m	Submerged macrophytes	-
Bare ground	20 %	Bank overhang veg	little
Grass	80 %	Trailing bank veg	little
Shrubs	5 %	Blanketing silt	extensive
Trees < 10 m	40 %	Substrate anoxia	-
Trees > 10 m	20 %	Bank undercuts	-
Canopy cover	10 %		
Instream wood		**Macrophyte coverage**	
Detritus (leaves etc)	some	Emergent	some
Sticks (<2cm diam)	some	Floating	-
Branches (<15cm diam)	some	Floating attached	some
Logs (>15cm diam)	little	Submerged	-
***In situ* water quality (0830)**		**Substrate composition**	
Temperature	21.0 °C	Bedrock	-
Conductivity	298 µS/cm	Boulder (>256 mm)	-
Dissolved oxygen	47 %	Cobble (64-256 mm)	-
pH	8.3	Pebble (4-64 mm)	-
Turbidity	44 NTU	Gravel (2-4 mm)	-
		Sand (0.05-2 mm)	10 %
		Silt/clay (<0.05 mm)	90 %
Comments: Likely to be one of the last pools in the area to dry up.			

AH6 Unnamed creek 1/5/2025		**Co-ordinates (UTM 55K) E 622658 S 7552833**	
			
Upstream		**Downstream**	
Channel characteristics		**Mesohabitat composition**	
Reach length	100 m	Riffle	-
Bankfull bank height	2.2 m	Run	-
Bankfull stream width	4.0 m	Shallow pool (<1m)	-
Mean water depth	-	Deep pool (>1m)	-
Maximum water depth	-	Dry	100 %
Mean wetted width	-		
Riparian characteristics		**Microhabitat present**	
Riparian veg height (max)	4 m	Periphyton	-
Riparian width (left bank)	0 m	Filamentous algae	-
Riparian width (right bank)	2 m	Submerged macrophytes	-
Bare ground	5 %	Bank overhang veg	-
Grass	95 %	Trailing bank veg	-
Shrubs	5 %	Blanketing silt	-
Trees < 10 m	2 %	Substrate anoxia	-
Trees > 10 m	-	Bank undercuts	-
Canopy cover	-		
Instream wood		**Macrophyte coverage**	
Detritus (leaves etc)	little	Emergent	-
Sticks (<2cm diam)	little	Floating	-
Branches (<15cm diam)	-	Floating attached	-
Logs (>15cm diam)	-	Submerged	-
***In situ* water quality**		**Substrate composition**	
Temperature	-	Bedrock	-
Conductivity	-	Boulder (>256 mm)	-
Dissolved oxygen	-	Cobble (64-256 mm)	-
pH	-	Pebble (4-64 mm)	-
Turbidity	-	Gravel (2-4 mm)	-
		Sand (0.05-2 mm)	10 %
		Silt/clay (<0.05 mm)	90 %
Comments:			

AH7 Unnamed gilgai 1/5/2025		**Co-ordinates (UTM 55K) E 625932 S 7553596**	
 **Facing north**		 **Facing south**	
Channel characteristics		**Mesohabitat composition**	
Reach length	30 x 6 m	Riffle	-
Bankfull bank height	N/A	Run	-
Bankfull stream width	N/A	Shallow pool (<1m)	90 %
Mean water depth	0.3 m	Deep pool (>1m)	-
Maximum water depth	0.5 m	Dry	10 %
Mean wetted width	-		
Riparian characteristics		**Microhabitat present**	
Riparian veg height (max)	-	Periphyton	moderate
Riparian width (left bank)	-	Filamentous algae	little
Riparian width (right bank)	-	Submerged macrophytes	extensive
Bare ground	-	Bank overhang veg	-
Grass	100 %	Trailing bank veg	little
Shrubs	-	Blanketing silt	extensive
Trees < 10 m	-	Substrate anoxia	some
Trees > 10 m	-	Bank undercuts	-
Canopy cover	-		
Instream wood		**Macrophyte coverage**	
Detritus (leaves etc)	little	Emergent	moderate
Sticks (<2cm diam)	little	Floating	-
Branches (<15cm diam)	little	Floating attached	extensive
Logs (>15cm diam)	little	Submerged	extensive
***In situ* water quality (1135)**		**Substrate composition**	
Temperature	28.5 °C	Bedrock	-
Conductivity	187 µS/cm	Boulder (>256 mm)	-
Dissolved oxygen	180 %	Cobble (64-256 mm)	-
pH	9.6	Pebble (4-64 mm)	-
Turbidity	5 NTU	Gravel (2-4 mm)	-
		Sand (0.05-2 mm)	-
		Silt/clay (<0.05 mm)	100 %
Comments: Inspected as possible aquatic habitat. The pool sampled was the largest but part of a much wider network of gilgais.			

AH8 Unnamed depression 2/5/2025		**Co-ordinates (UTM 55K) E 618673 S 7554144**	
			
Facing north		**Facing south**	
Channel characteristics		**Mesohabitat composition**	
Reach length	-	Riffle	-
Bankfull bank height	-	Run	-
Bankfull stream width	-	Shallow pool (<1m)	-
Mean water depth	-	Deep pool (>1m)	-
Maximum water depth	-	Dry	100 %
Mean wetted width	-		
Riparian characteristics		**Microhabitat present**	
Riparian veg height (max)	-	Periphyton	-
Riparian width (left bank)	-	Filamentous algae	-
Riparian width (right bank)	-	Submerged macrophytes	-
Bare ground	-	Bank overhang veg	-
Grass	-	Trailing bank veg	-
Shrubs	-	Blanketing silt	-
Trees < 10 m	-	Substrate anoxia	-
Trees > 10 m	-	Bank undercuts	-
Canopy cover	-		
Instream wood		**Macrophyte coverage**	
Detritus (leaves etc)	little	Emergent	-
Sticks (<2cm diam)	little	Floating	-
Branches (<15cm diam)	-	Floating attached	-
Logs (>15cm diam)	-	Submerged	-
***In situ* water quality**		**Substrate composition**	
Temperature	-	Bedrock	-
Conductivity	-	Boulder (>256 mm)	-
Dissolved oxygen	-	Cobble (64-256 mm)	-
pH	-	Pebble (4-64 mm)	-
Turbidity	-	Gravel (2-4 mm)	-
		Sand (0.05-2 mm)	-
		Silt/clay (<0.05 mm)	100 %
Comments: Inspected as possible aquatic habitat. Unlikely to hold water. Not a waterbody.			

AH9 Unnamed depression 2/5/2025		**Co-ordinates (UTM 55K) E 619585 S 7554560**	
 **Upstream**		 **Downstream**	
Channel characteristics		**Mesohabitat composition**	
Reach length	-	Riffle	-
Bankfull bank height	-	Run	-
Bankfull stream width	-	Shallow pool (<1m)	-
Mean water depth	-	Deep pool (>1m)	-
Maximum water depth	-	Dry	100 %
Mean wetted width	-		
Riparian characteristics		**Microhabitat present**	
Riparian veg height (max)	-	Periphyton	-
Riparian width (left bank)	-	Filamentous algae	-
Riparian width (right bank)	-	Submerged macrophytes	-
Bare ground	-	Bank overhang veg	little
Grass	-	Trailing bank veg	-
Shrubs	-	Blanketing silt	extensive
Trees < 10 m	-	Substrate anoxia	-
Trees > 10 m	-	Bank undercuts	little
Canopy cover	-		
Instream wood		**Macrophyte coverage**	
Detritus (leaves etc)	little	Emergent	-
Sticks (<2cm diam)	little	Floating	-
Branches (<15cm diam)	little	Floating attached	-
Logs (>15cm diam)	little	Submerged	-
***In situ* water quality**		**Substrate composition**	
Temperature	-	Bedrock	-
Conductivity	-	Boulder (>256 mm)	-
Dissolved oxygen	-	Cobble (64-256 mm)	-
pH	-	Pebble (4-64 mm)	-
Turbidity	-	Gravel (2-4 mm)	-
		Sand (0.05-2 mm)	-
		Silt/clay (<0.05 mm)	100 %
Comments: Inspected as possible aquatic habitat. Unlikely to hold water. Not a waterbody.			

AH10 Unnamed wetland 2/5/2025		**Co-ordinates (UTM 55K) E 619262 S 7554795**	
 **Facing north**		 **Facing south**	
Channel characteristics		**Mesohabitat composition**	
Reach length	30 x 50 m	Riffle	-
Bankfull bank height	N/A	Run	-
Bankfull stream width	N/A	Shallow pool (<1m)	-
Mean water depth	0.15 m	Deep pool (>1m)	5 %
Maximum water depth	0.3 m	Dry	95 %
Mean wetted width			
Riparian characteristics		**Microhabitat present**	
Riparian veg height (max)	12 m	Periphyton	little
Riparian width (left bank)	20 m	Filamentous algae	little
Riparian width (right bank)	20 m	Submerged macrophytes	-
Bare ground	10 %	Bank overhang veg	-
Grass	90 %	Trailing bank veg	some
Shrubs	5 %	Blanketing silt	extensive
Trees < 10 m	20 %	Substrate anoxia	-
Trees > 10 m	5 %	Bank undercuts	-
Canopy cover	5 %		
Instream wood		**Macrophyte coverage**	
Detritus (leaves etc)	little	Emergent	little
Sticks (<2cm diam)	little	Floating	-
Branches (<15cm diam)	little	Floating attached	some
Logs (>15cm diam)	-	Submerged	-
***In situ* water quality**		**Substrate composition**	
Temperature	-	Bedrock	-
Conductivity	-	Boulder (>256 mm)	-
Dissolved oxygen	-	Cobble (64-256 mm)	-
pH	-	Pebble (4-64 mm)	-
Turbidity	-	Gravel (2-4 mm)	-
		Sand (0.05-2 mm)	-
		Silt/clay (<0.05 mm)	100 %
Comments: Inspected as possible aquatic habitat. There is a shallow wetland present but in late stages of desiccation following a wet year suggests it is highly ephemeral.			

AH11 Unnamed wetland 18/3/2025 & 3/5/2025		**Co-ordinates (UTM 55K) E 621696 S 7559439**	
			
Upstream		**Downstream**	
Channel characteristics		**Mesohabitat composition**	
Reach length	100 m	Riffle	-
Bankfull bank height	1.0 m	Run	-
Bankfull stream width	50 m	Shallow pool (<1m)	90 %
Mean water depth	0.4 m	Deep pool (>1m)	-
Maximum water depth	0.8 m	Dry	10 %
Mean wetted width	20 m		
Riparian characteristics		**Microhabitat present**	
Riparian veg height (max)	12 m	Periphyton	little
Riparian width (left bank)	10 m	Filamentous algae	little
Riparian width (right bank)	5 m	Submerged macrophytes	-
Bare ground	30 %	Bank overhang veg	little
Grass	70 %	Trailing bank veg	-
Shrubs	5 %	Blanketing silt	extensive
Trees < 10 m	10 %	Substrate anoxia	little
Trees > 10 m	20 %	Bank undercuts	-
Canopy cover	5 %		
Instream wood		**Macrophyte coverage**	
Detritus (leaves etc)	little	Emergent	-
Sticks (<2cm diam)	little	Floating	little
Branches (<15cm diam)	little	Floating attached	little
Logs (>15cm diam)	some	Submerged	-
***In situ* water quality (1110)**		**Substrate composition**	
Temperature	27.1 ^{o}C	Bedrock	-
Conductivity	168 µS/cm	Boulder (>256 mm)	-
Dissolved oxygen	28 %	Cobble (64-256 mm)	-
pH	7.4	Pebble (4-64 mm)	-
Turbidity	93 NTU	Gravel (2-4 mm)	-
		Sand (0.05-2 mm)	-
		Silt/clay (<0.05 mm)	100 %
Comments: Appears to be a relatively recent inundation with young developing floating attached macrophytes. Heavy cattle access. First inspected on 18/3/2025 sampled for fish and macroinvertebrates on the 3/5/2025.			

AH12 Unnamed wetland 18/3/2025		**Co-ordinates (UTM 55K) E 621300 S 7560140**	
 **Upstream**		 **Downstream**	
Channel characteristics		**Mesohabitat composition**	
Reach length	120 x 200 m	Riffle	-
Bankfull bank height	1.5 m	Run	-
Bankfull stream width	N/A	Shallow pool (<1m)	80 %
Mean water depth	.04	Deep pool (>1m)	-
Maximum water depth	0.9	Dry	20 %
Mean wetted width	N/A		
Riparian characteristics		**Microhabitat present**	
Riparian veg height (max)	9 m	Periphyton	some
Riparian width (left bank)	5 m	Filamentous algae	moderate
Riparian width (right bank)	5 m	Submerged macrophytes	-
Bare ground	20 %	Bank overhang veg	little
Grass	70 %	Trailing bank veg	some
Shrubs	10 %	Blanketing silt	extensive
Trees < 10 m	30 %	Substrate anoxia	some
Trees > 10 m	-	Bank undercuts	-
Canopy cover	5 %		
Instream wood		**Macrophyte coverage**	
Detritus (leaves etc)	little	Emergent	some
Sticks (<2cm diam)	little	Floating	-
Branches (<15cm diam)	little	Floating attached	extensive
Logs (>15cm diam)	little	Submerged	-
***In situ* water quality (1045)**		**Substrate composition**	
Temperature	26.8 ^{o}C	Bedrock	-
Conductivity	164 µS/cm	Boulder (>256 mm)	-
Dissolved oxygen	176 %	Cobble (64-256 mm)	-
pH	7.2	Pebble (4-64 mm)	-
Turbidity	64 NTU	Gravel (2-4 mm)	-
		Sand (0.05-2 mm)	-
		Silt/clay (<0.05 mm)	100 %
Comments: A small wetland was present with well established macrophytes. No other wetlands were present immediately upstream or downstream of this point			

AQ1 Isaac River 1/5/2025		**Co-ordinates (UTM 55K) E 627664 S 7556522**	
 **Upstream**		 **Downstream**	
Channel characteristics		**Mesohabitat composition**	
Reach length	100 m	Riffle	-
Bankfull bank height	8 m	Run	-
Bankfull stream width	40 m	Shallow pool (<1m)	40 %
Mean water depth	0.8 m	Deep pool (>1m)	60 %
Maximum water depth	> 1.5 m	Dry	-
Mean wetted width	12 m		
Riparian characteristics		**Microhabitat present**	
Riparian veg height (max)	28 m	Periphyton	-
Riparian width (left bank)	20 m	Filamentous algae	-
Riparian width (right bank)	50m	Submerged macrophytes	-
Bare ground	20 %	Bank overhang veg	some
Grass	80 %	Trailing bank veg	little
Shrubs	10 %	Blanketing silt	-
Trees < 10 m	40 %	Substrate anoxia	-
Trees > 10 m	40 %	Bank undercuts	little
Canopy cover	5 %		
Instream wood		**Macrophyte coverage**	
Detritus (leaves etc)	little	Emergent	little
Sticks (<2cm diam)	little	Floating	-
Branches (<15cm diam)	little	Floating attached	-
Logs (>15cm diam)	little	Submerged	-
***In situ* water quality (1315)**		**Substrate composition**	
Temperature	25.9 °C	Bedrock	5 %
Conductivity	425 µS/cm	Boulder (>256 mm)	20 %
Dissolved oxygen	112 %	Cobble (64-256 mm)	5 %
pH	8.4	Pebble (4-64 mm)	-
Turbidity	15 NTU	Gravel (2-4 mm)	-
		Sand (0.05-2 mm)	-
		Silt/clay (<0.05 mm)	50 %
Comments:			

AQ2 Unnamed wetland 17/3/2025	**Co-ordinates (UTM 55K) E 626715 S 7556401**
 **Facing north**	 **Facing south**

Channel characteristics		**Mesohabitat composition**	
Reach length	120 x 200 m	Riffle	-
Bankfull bank height	1 m	Run	-
Bankfull stream width	N/A	Shallow pool (<1m)	90 %
Mean water depth	0.5 m	Deep pool (>1m)	10 %
Maximum water depth	1.0 m	Dry	-
Mean wetted width	N/A		
Riparian characteristics		**Microhabitat present**	
Riparian veg height (max)	21 m	Periphyton	some
Riparian width (left bank)	50 m	Filamentous algae	little
Riparian width (right bank)	10 m	Submerged macrophytes	-
Bare ground	20 %	Bank overhang veg	little
Grass	80 %	Trailing bank veg	little
Shrubs	5 %	Blanketing silt	little
Trees < 10 m	5 %	Substrate anoxia	-
Trees > 10 m	30 %	Bank undercuts	-
Canopy cover	20 %		
Instream wood		**Macrophyte coverage**	
Detritus (leaves etc)	moderate	Emergent	moderate
Sticks (<2cm diam)	moderate	Floating	some
Branches (<15cm diam)	some	Floating attached	little
Logs (>15cm diam)	some	Submerged	-
***In situ* water quality (0930)**		**Substrate composition**	
Temperature	26.7 ^{o}C	Bedrock	-
Conductivity	193 µS/cm	Boulder (>256 mm)	-
Dissolved oxygen	57 %	Cobble (64-256 mm)	-
pH	6.8	Pebble (4-64 mm)	-
Turbidity	21 NTU	Gravel (2-4 mm)	-
		Sand (0.05-2 mm)	-
		Silt/clay (<0.05 mm)	100 %

Comments:

AQ3 Cherwell Creek 17/3/2025		**Co-ordinates (UTM 55K) E 626010 S 7555615**	
			
Upstream		**Downstream**	
Channel characteristics		**Mesohabitat composition**	
Reach length	100 m	Riffle	-
Bankfull bank height	7 m	Run	-
Bankfull stream width	30 m	Shallow pool (<1m)	2 %
Mean water depth	0.3 m	Deep pool (>1m)	-
Maximum water depth	0.6 m	Dry	98 %
Mean wetted width	1.5 m		
Riparian characteristics		**Microhabitat present**	
Riparian veg height (max)	22 m	Periphyton	-
Riparian width (left bank)	20 m	Filamentous algae	-
Riparian width (right bank)	50 m	Submerged macrophytes	-
Bare ground	-	Bank overhang veg	-
Grass	95 %	Trailing bank veg	-
Shrubs	5 %	Blanketing silt	little
Trees < 10 m	10 %	Substrate anoxia	-
Trees > 10 m	30 %	Bank undercuts	-
Canopy cover	10 %		
Instream wood		**Macrophyte coverage**	
Detritus (leaves etc)	little	Emergent	-
Sticks (<2cm diam)	-	Floating	-
Branches (<15cm diam)	little	Floating attached	-
Logs (>15cm diam)	-	Submerged	-
***In situ* water quality (1220)**		**Substrate composition**	
Temperature	28.4 ^{o}C	Bedrock	-
Conductivity	303 µS/cm	Boulder (>256 mm)	-
Dissolved oxygen	101 %	Cobble (64-256 mm)	-
pH	7.5	Pebble (4-64 mm)	-
Turbidity	143 NTU	Gravel (2-4 mm)	-
		Sand (0.05-2 mm)	100 %
		Silt/clay (<0.05 mm)	-
Comments: Site moved approximately 600 metres upstream from photographs taken in November 2024 due to access constraints.			

AQ4 Cherwell Creek 17/3/2025		**Co-ordinates (UTM 55K) E 623573 S 7554232**	
 **Upstream**		 **Downstream**	
Channel characteristics		**Mesohabitat composition**	
Reach length	100 m	Riffle	-
Bankfull bank height	7 m	Run	-
Bankfull stream width	25 m	Shallow pool (<1m)	80 %
Mean water depth	0.4 m	Deep pool (>1m)	-
Maximum water depth	1.0 m	Dry	20 %
Mean wetted width	2.5 m		
Riparian characteristics		**Microhabitat present**	
Riparian veg height (max)	18 m	Periphyton	-
Riparian width (left bank)	20 m	Filamentous algae	-
Riparian width (right bank)	10 m	Submerged macrophytes	-
Bare ground	5 %	Bank overhang veg	-
Grass	90 %	Trailing bank veg	little
Shrubs	10 %	Blanketing silt	little
Trees < 10 m	10 %	Substrate anoxia	-
Trees > 10 m	20 %	Bank undercuts	little
Canopy cover	10 %		
Instream wood		**Macrophyte coverage**	
Detritus (leaves etc)	some	Emergent	-
Sticks (<2cm diam)	little	Floating	-
Branches (<15cm diam)	little	Floating attached	-
Logs (>15cm diam)	little	Submerged	-
***In situ* water quality (1420)**		**Substrate composition**	
Temperature	30.0 °C	Bedrock	5 %
Conductivity	371 µS/cm	Boulder (>256 mm)	5 %
Dissolved oxygen	87 %	Cobble (64-256 mm)	-
pH	7.9	Pebble (4-64 mm)	-
Turbidity	29 NTU	Gravel (2-4 mm)	-
		Sand (0.05-2 mm)	-
		Silt/clay (<0.05 mm)	90 %
Comments:			

AQ5 Cherwell Creek 1/5/2025		**Co-ordinates (UTM 55K) E 621049 S 7553251**	
			
Upstream		**Downstream**	
Channel characteristics		**Mesohabitat composition**	
Reach length	100 m	Riffle	-
Bankfull bank height	9.0 m	Run	-
Bankfull stream width	60 m	Shallow pool (<1m)	-
Mean water depth	-	Deep pool (>1m)	-
Maximum water depth	-	Dry	100 %
Mean wetted width	-		
Riparian characteristics		**Microhabitat present**	
Riparian veg height (max)	28 m	Periphyton	-
Riparian width (left bank)	20 m	Filamentous algae	-
Riparian width (right bank)	30 m	Submerged macrophytes	-
Bare ground	5 %	Bank overhang veg	-
Grass	90 %	Trailing bank veg	-
Shrubs	10 %	Blanketing silt	-
Trees < 10 m	20 %	Substrate anoxia	-
Trees > 10 m	30 %	Bank undercuts	-
Canopy cover	10 %		
Instream wood		**Macrophyte coverage**	
Detritus (leaves etc)	little	Emergent	little
Sticks (<2cm diam)	little	Floating	-
Branches (<15cm diam)	-	Floating attached	-
Logs (>15cm diam)	-	Submerged	-
***In situ* water quality**		**Substrate composition**	
Temperature	-	Bedrock	-
Conductivity	-	Boulder (>256 mm)	-
Dissolved oxygen	-	Cobble (64-256 mm)	-
pH	-	Pebble (4-64 mm)	-
Turbidity	-	Gravel (2-4 mm)	5 %
		Sand (0.05-2 mm)	95 %
		Silt/clay (<0.05 mm)	-
Comments: Dry site, no signs of water persistence.			

AQ6 Conrock Gully 19/7/2025		Co-ordinates (UTM 55K) E 623588 S 7557746	
 Upstream		 Downstream	
Channel characteristics		**Mesohabitat composition**	
Reach length	100 m	Riffle	-
Bankfull bank height	2.5 m	Run	-
Bankfull stream width	12 m	Shallow pool (<1m)	-
Mean water depth	-	Deep pool (>1m)	-
Maximum water depth	-	Dry	100 %
Mean wetted width	-		
Riparian characteristics		**Microhabitat present**	
Riparian veg height (max)	12 m	Periphyton	-
Riparian width (left bank)	15 m	Filamentous algae	-
Riparian width (right bank)	20 m	Submerged macrophytes	-
Bare ground	10 %	Bank overhang veg	-
Grass	90 %	Trailing bank veg	-
Shrubs	5 %	Blanketing silt	-
Trees < 10 m	20 %	Substrate anoxia	-
Trees > 10 m	20 %	Bank undercuts	-
Canopy cover	20 %		
Instream wood		**Macrophyte coverage**	
Detritus (leaves etc)	little	Emergent	little
Sticks (<2cm diam)	little	Floating	-
Branches (<15cm diam)	little	Floating attached	-
Logs (>15cm diam)	some	Submerged	-
***In situ* water quality**		**Substrate composition**	
Temperature	-	Bedrock	-
Conductivity	-	Boulder (>256 mm)	-
Dissolved oxygen	-	Cobble (64-256 mm)	-
pH	-	Pebble (4-64 mm)	1 %
Turbidity	-	Gravel (2-4 mm)	2 %
		Sand (0.05-2 mm)	92 %
		Silt/clay (<0.05 mm)	5 %
Comments:			

AQ7 Conrock Gully 20/7/2025		Co-ordinates (UTM 55K) E 622587 S 7557664	
 Upstream		 Downstream	
Channel characteristics		**Mesohabitat composition**	
Reach length	100 m	Riffle	-
Bankfull bank height	1.8 m	Run	-
Bankfull stream width	7 m	Shallow pool (<1m)	-
Mean water depth	-	Deep pool (>1m)	-
Maximum water depth	-	Dry	100 %
Mean wetted width	-		
Riparian characteristics		**Microhabitat present**	
Riparian veg height (max)	15 m	Periphyton	-
Riparian width (left bank)	5 m	Filamentous algae	-
Riparian width (right bank)	5 m	Submerged macrophytes	-
Bare ground	10 %	Bank overhang veg	-
Grass	90 %	Trailing bank veg	-
Shrubs	5 %	Blanketing silt	-
Trees < 10 m	10 %	Substrate anoxia	-
Trees > 10 m	30 %	Bank undercuts	-
Canopy cover	20 %		
Instream wood		**Macrophyte coverage**	
Detritus (leaves etc)	little	Emergent	little
Sticks (<2cm diam)	little	Floating	-
Branches (<15cm diam)	some	Floating attached	-
Logs (>15cm diam)	little	Submerged	-
***In situ* water quality**		**Substrate composition**	
Temperature	-	Bedrock	5 %
Conductivity	-	Boulder (>256 mm)	-
Dissolved oxygen	-	Cobble (64-256 mm)	-
pH	-	Pebble (4-64 mm)	5 %
Turbidity	-	Gravel (2-4 mm)	5 %
		Sand (0.05-2 mm)	70 %
		Silt/clay (<0.05 mm)	15 %
Comments:			

AQ8 Conrock Gully 20/7/2025		**Co-ordinates (UTM 55K) E 620889 S 7556282**	
			
Upstream		**Downstream**	
Channel characteristics		**Mesohabitat composition**	
Reach length	10 m	Riffle	-
Bankfull bank height	1.5 m	Run	-
Bankfull stream width	5 m	Shallow pool (<1m)	-
Mean water depth	-	Deep pool (>1m)	-
Maximum water depth	-	Dry	100 %
Mean wetted width	-		
Riparian characteristics		**Microhabitat present**	
Riparian veg height (max)	10 m	Periphyton	-
Riparian width (left bank)	5 m	Filamentous algae	-
Riparian width (right bank)	5 m	Submerged macrophytes	-
Bare ground	10 %	Bank overhang veg	-
Grass	90 %	Trailing bank veg	-
Shrubs	5 %	Blanketing silt	-
Trees < 10 m	10 %	Substrate anoxia	-
Trees > 10 m	30 %	Bank undercuts	-
Canopy cover	20 %		
Instream wood		**Macrophyte coverage**	
Detritus (leaves etc)	little	Emergent	-
Sticks (<2cm diam)	little	Floating	-
Branches (<15cm diam)	some	Floating attached	-
Logs (>15cm diam)	moderate	Submerged	-
***In situ* water quality**		**Substrate composition**	
Temperature	-	Bedrock	-
Conductivity	-	Boulder (>256 mm)	-
Dissolved oxygen	-	Cobble (64-256 mm)	-
pH	-	Pebble (4-64 mm)	2 %
Turbidity	-	Gravel (2-4 mm)	8 %
		Sand (0.05-2 mm)	50 %
		Silt/clay (<0.05 mm)	40 %
Comments:			

AQ9 Isaac River 18/3/2025		**Co-ordinates (UTM 55K) E 622711 S 7558630**	
			
Upstream		**Downstream**	
Channel characteristics		**Mesohabitat composition**	
Reach length	100 m	Riffle	-
Bankfull bank height	6 m	Run	-
Bankfull stream width	90 m	Shallow pool (<1m)	30 %
Mean water depth	0.3 m	Deep pool (>1m)	-
Maximum water depth	0.8 m	Dry	70 %
Mean wetted width	2.0 m		
Riparian characteristics		**Microhabitat present**	
Riparian veg height (max)	27 m	Periphyton	little
Riparian width (left bank)	50 m	Filamentous algae	little
Riparian width (right bank)	10 m	Submerged macrophytes	-
Bare ground	10 %	Bank overhang veg	little
Grass	80 %	Trailing bank veg	little
Shrubs	30 %	Blanketing silt	little
Trees < 10 m	40 %	Substrate anoxia	-
Trees > 10 m	20 %	Bank undercuts	little
Canopy cover	5 %		
Instream wood		**Macrophyte coverage**	
Detritus	little	Emergent	-
Sticks (<2cm diam)	little	Floating	-
Branches (<15cm diam)	little	Floating attached	-
Logs (>15cm diam)	little	Submerged	-
***In situ* water quality (1215)**		**Substrate composition**	
Temperature	28.9 °C	Bedrock	-
Conductivity	281 µS/cm	Boulder (>256 mm)	-
Dissolved oxygen	111 %	Cobble (64-256 mm)	-
pH	7.5	Pebble (4-64 mm)	-
Turbidity	14 NTU	Gravel (2-4 mm)	-
		Sand (0.05-2 mm)	100 %
		Silt/clay (<0.05 mm)	-
Comments: Small shallow isolated pools present.			

AQ10 Isaac River 18/3/2025		Co-ordinates (UTM 55K) E 619807 S 7562136	
			
Upstream		Downstream	
Channel characteristics		**Mesohabitat composition**	
Reach length	100 m	Riffle	-
Bankfull bank height	7 m	Run	-
Bankfull stream width	90 m	Shallow pool (<1m)	90 %
Mean water depth	0.7 m	Deep pool (>1m)	10 %
Maximum water depth	> 1.5 m	Dry	-
Mean wetted width	18 m		
Riparian characteristics		**Microhabitat present**	
Riparian veg height (max)	26 m	Periphyton	little
Riparian width (left bank)	20 m	Filamentous algae	little
Riparian width (right bank)	50 m	Submerged macrophytes	-
Bare ground	5 %	Bank overhang veg	little
Grass	90 %	Trailing bank veg	little
Shrubs	40 %	Blanketing silt	little
Trees < 10 m	20 %	Substrate anoxia	-
Trees > 10 m	50 %	Bank undercuts	little
Canopy cover	5 %		
Instream wood		**Macrophyte coverage**	
Detritus (leaves etc)	little	Emergent	little
Sticks (<2cm diam)	little	Floating	-
Branches (<15cm diam)	little	Floating attached	-
Logs (>15cm diam)	little	Submerged	-
***In situ* water quality (1530)**		**Substrate composition**	
Temperature	28.8 °C	Bedrock	-
Conductivity	424 µS/cm	Boulder (>256 mm)	-
Dissolved oxygen	123 %	Cobble (64-256 mm)	-
pH	8.0	Pebble (4-64 mm)	-
Turbidity	24 NTU	Gravel (2-4 mm)	2 %
		Sand (0.05-2 mm)	98 %
		Silt/clay (<0.05 mm)	-
Comments: A large pool upstream extends for several hundred metres. Some low flow in sections becoming hyporheic in other sections.			

AQ11 Conrock Gully 22/7/2025		**Co-ordinates (UTM 55K) E 624064 S 7557839**	
			
Upstream		**Downstream**	
Channel characteristics		**Mesohabitat composition**	
Reach length	100 m	Riffle	-
Bankfull bank height	1.8 m	Run	-
Bankfull stream width	5.5 m	Shallow pool (<1m)	20 %
Mean water depth	0.2 m	Deep pool (>1m)	-
Maximum water depth	0.4 m	Dry	80 %
Mean wetted width	3.5 m		
Riparian characteristics		**Microhabitat present**	
Riparian veg height (max)	12 m	Periphyton	little
Riparian width (left bank)	3 m	Filamentous algae	little
Riparian width (right bank)	30 m	Submerged macrophytes	-
Bare ground	10 %	Bank overhang veg	little
Grass	90 %	Trailing bank veg	little
Shrubs	30 %	Blanketing silt	moderate
Trees < 10 m	20 %	Substrate anoxia	-
Trees > 10 m	20 %	Bank undercuts	-
Canopy cover	5 %		
Instream wood		**Macrophyte coverage**	
Detritus (leaves etc)	little	Emergent	some
Sticks (<2cm diam)	little	Floating	-
Branches (<15cm diam)	some	Floating attached	-
Logs (>15cm diam)	little	Submerged	-
***In situ* water quality (1240)**		**Substrate composition**	
Temperature	20.1°C	Bedrock	-
Conductivity	354 µS/cm	Boulder (>256 mm)	-
Dissolved oxygen	101 %	Cobble (64-256 mm)	-
pH	8.9	Pebble (4-64 mm)	-
Turbidity	141 NTU	Gravel (2-4 mm)	10 %
		Sand (0.05-2 mm)	60 %
		Silt/clay (<0.05 mm)	30 %
Comments: Channel set within a larger macrochannel (approx..bankfull height 5 m, approx. channel width 50 m).			

Appendix C – Macroinvertebrate data March/May/July 2025

		Site	AH5	AH5	AH7	AH11	AH12	AQ1	AQ1	AQ2	AQ2
		Habitat	Bed	Edge	Comp	Comp	Comp	Bed	Edge	Comp1	Comp2
SIGNAL2	Microcrustacea	Cladocera	P	P	P	P	P		P		P
		Copepoda	P	P	P	P	P	P		P	P
		Ostracoda	P	P	P		P	P	P	P	P
2	Hydrozoa	Hydridae									
	Turbellaria	Dalyelliidae		2							
5		Temnocephalidae									
3	Nemertea	Nemertea								1	
3	Nematoda	Nematoda		3	10	1	1			1	5
4	Gastropoda	Ancylidae		6							
3		Bithyniidae		1	2	2					
1		Lymnaeidae		11	6		3				
1		Physidae									
2		Planorbidae		3	9		3			1	1
2	Oligochaeta	Oligochaeta	8	4		6	1	1		29	20
	Araneae	Araneae		5	2		4				
6	Acari	Acari	3		2	2	8	3	3	18	36
3	Decapoda	Atyidae						1	2		
4		Palaemonidae		2					1		
2	Coleoptera	Dytiscidae	9	11	12	2	7			7	6
4		Gyrinidae								1	1
2		Haliplidae								1	
3		Hydraenidae	1	13	9		4		5	7	
4		Hydrochidae	1	18	5	16	12		1	1	
2		Hydrophilidae		2	1	3			3	11	15
4		Noteridae									
6		Scirtidae								1	
2		Spercheidae		6	1					5	5
4	Diptera	Ceratopogonidae	1	3	1	10	3	7	1	1	2
3		s-f Chironominae	23	27	30	30	9	9	17	30	30
4		s-f Orthocladiinae				1					
4		s-f Tanypodinae	10	14	3	30	1		10		1
1		Culicidae		5		24	2			2	
2		Stratiomyidae			1						
3		Tabanidae								3	5
5		Tipulidae		1							
5	Ephemeroptera	Baetidae	2	15	30	30	30	4	3	15	19
4		Caenidae						22	15		
8		Leptophlebiidae									
1	Hemiptera	Belostomatidae		2	2	3	3				
2		Corixidae					1			2	
4		Gerridae		7	2	2			22		
3		Hydrometridae		2					2		
2		Mesoveliidae		8	5		9				1
2		Micronectidae	30	30	4		20	3	2	9	2
3		Nepidae		1	1				3		
1		Notonectidae		1	26	1	23			11	13
2		Pleidae	1	10	8	1	4			23	5
3		Veliidae		7	13		3		5		1
2	Odonata	Coenagrionidae	1	25	26	12	37		1	13	13
4		Aeshnidae		3	16	1	8				
5		Corduliidae							2		
5		Gomphidae									
4		Libellulidae		1	4	2	2	1		4	2
3		Lindeniidae									
4	Trichoptera	Ecnomidae									
6		Leptoceridae	2	23	15	6		9	13	3	18
		Abundance	92	272	246	185	198	60	111	200	201
		Taxonomic Richness	13	33	28	21	24	10	19	25	21
		PET Richness	2	2	2	2	1	3	3	2	2
		SIGNAL	3.46	2.94	2.96	3.19	2.74	3.90	3.68	3.00	3.05

		Site	AQ3	AQ4	AQ4	AQ9	AQ9	AQ10	AQ10	AQ11	AQ11
		Habitat	Comp	Bed	Edge	Bed	Edge	Bed	Edge	Bed	Edge
SIGNAL2	Microcrustacea	Cladocera		P		P	P		P	P	P
		Copepoda	P	P		P	P		P	P	P
		Ostracoda	P			P	P	P	P	P	P
2	Hydrozoa	Hydridae				1	1				
	Turbellaria	Dalyelliidae									
5		Temnocephalidae							4		
3	Nemertea	Nemertea									
3	Nematoda	Nematoda									
4	Gastropoda	Ancylidae					4		1		
3		Bithyniidae									
1		Lymnaeidae									
1		Physidae				3	13				
2		Planorbidae					2	1	1		
2	Oligochaeta	Oligochaeta							2		
	Araneae	Araneae			2				2		2
6	Acari	Acari		3		3	5		3	1	14
3	Decapoda	Atyidae	1		13		26		18		4
4		Palaemonidae	1						4		
2	Coleoptera	Dytiscidae	5		1	3	12			12	22
4		Gyrinidae			1					5	1
2		Haliplidae									
3		Hydraenidae	8		1		12			3	16
4		Hydrochidae	4	1	1		20			2	6
2		Hydrophilidae	5		1		1		1		2
4		Noteridae					2				7
6		Scirtidae									
2		Spercheidae	1				7				
4	Diptera	Ceratopogonidae		2	2	2	1	7	6		1
3		s-f Chironominae	1	6	3	21	12	23	30	8	9
4		s-f Orthocladiinae							1		
4		s-f Tanypodinae	2	4	1	16	7	30	30	18	11
1		Culicidae	2		3		3			1	
2		Stratiomyidae									
3		Tabanidae						1			
5		Tipulidae		1							
5	Ephemeroptera	Baetidae	6	1	6	3	13		8		
4		Caenidae	9	9	2	23	12	47	30	2	5
8		Leptophlebiidae				1					
1	Hemiptera	Belostomatidae									
2		Corixidae		1							
4		Gerridae	4	1	8	6	16	5	1		7
3		Hydrometridae					1				1
2		Mesoveliidae					1				
2		Micronectidae	7	1	3	6	5				11
3		Nepidae					3				1
1		Notonectidae	13						2		
2		Pleidae			2		4				
3		Veliidae	8		7		6			1	22
2	Odonata	Coenagrionidae	1		1		4		3		
4		Aeshnidae									
5		Corduliidae	1				3		4		
5		Gomphidae				4	2	2	1		
4		Libellulidae	10		6	8	3	1	9		1
3		Lindeniidae				2	1				
4	Trichoptera	Ecnomidae							1		
6		Leptoceridae	9	9	16	11	30	2			21
		Abundance	98	39	80	113	232	119	162	53	164
		Taxonomic Richness	20	12	20	16	31	10	22	10	20
		PET Richness	3	3	3	4	3	2	3	1	2
		SIGNAL	3.20	4.08	3.26	3.94	3.23	3.90	3.67	3.40	3.58

Appendix D – Fish sampling effort

Site	Method	Conductivity (µS/cm)	Time start	Time end	Effort time (minutes)	Electrofishing on-time	Volts	% duty cycle	Frequency (Hz)
AH5	BPE	298	850	915	25	490	400	20	100
AH7	BPE	187	940	955	15	161	500	20	100
AH11	BPE	168	1130	1146	16	238	400	20	100
AH12	BPE	164	1036	1045	11	86	400	20	100
AQ1	BPE	425	1335	1410	35	686	250	20	100
	FN		1505	730	985				
AQ2	BPE	193	1015	1040	25	383	400	20	80
	FN		1430	0830	960				
AQ3	DN	303	1255	1305	10				
AQ4	BPE	371	1420	1445	25	366	400	20	80
AQ9	BPE	281	1230	1255	25	652	400	20	80
AQ10	BPE	424	1545	1610	25	683	400	20	80
	FN		1625	1630	2,885				
AQ11	UBT	354	1235	1310	35				
	DN		1315	1325	10				

BPE – backpack electrofisher, UBT – unbaited box trap, FN – fyke net, DN – dip netting

Appendix E – EPBC Protected Matters Search

EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected. Please see the caveat for interpretation of information provided here.

Report created: 31-Oct-2025

Summary
Details
- Matters of NES
- Other Matters Protected by the EPBC Act
- Extra Information

Caveat
Acknowledgements

Summary

Matters of National Environment Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the Administrative Guidelines on Significance.

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance (Ramsar	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	4
Listed Threatened Species:	27
Listed Migratory Species:	10

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at https://www.dcceew.gov.au/parks-heritage/heritage

A permit may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Lands:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	15
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have

State and Territory Reserves:	None
Regional Forest Agreements:	None
Nationally Important Wetlands:	None
EPBC Act Referrals:	40
Key Ecological Features (Marine):	None
Biologically Important Areas:	None
Bioregional Assessments:	None
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

Listed Threatened Ecological Communities [Resource Information]

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.
Status of Vulnerable, Disallowed and Ineligible are not MNES under the EPBC Act.

Community Name	Threatened Category	Presence Text	Buffer Status
Brigalow (Acacia harpophylla dominant and co-dominant)	Endangered	Community known to occur within area	In feature area
Natural Grasslands of the Queensland Central Highlands and northern Fitzroy Basin	Endangered	Community likely to occur within area	In feature area
Poplar Box Grassy Woodland on Alluvial Plains	Endangered	Community likely to occur within area	In feature area
Semi-evergreen vine thickets of the Brigalow Belt (North and South) and Nandewar Bioregions	Endangered	Community likely to occur within area	In buffer area only

Listed Threatened Species [Resource Information]

Status of Conservation Dependent and Extinct are not MNES under the EPBC Act.
Number is the current name ID.

Scientific Name	Threatened Category	Presence Text	Buffer Status
BIRD			
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area	In feature area
Erythrotriorchis radiatus Red Goshawk [942]	Endangered	Species or species habitat may occur within area	In feature area
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Gallinago hardwickii			
Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat may occur within area	In feature area
Geophaps scripta scripta			
Squatter Pigeon (southern) [64440]	Vulnerable	Species or species habitat known to occur within area	In feature area
Grantiella picta			
Painted Honeyeater [470]	Vulnerable	Species or species habitat may occur within area	In feature area
Neochmia ruficauda ruficauda			
Star Finch (eastern), Star Finch (southern) [26027]	Endangered	Species or species habitat likely to occur within area	In feature area
Poephila cincta cincta			
Southern Black-throated Finch [64447]	Endangered	Species or species habitat may occur within area	In feature area
Rostratula australis			
Australian Painted Snipe [77037]	Endangered	Species or species habitat may occur within area	In feature area
Stagonopleura guttata			
Diamond Firetail [59398]	Vulnerable	Species or species habitat may occur within area	In feature area
Tringa nebularia			
Common Greenshank, Greenshank [832]	Endangered	Species or species habitat may occur within area	In feature area
MAMMAL			
Dasyurus hallucatus			
Northern Quoll, Digul [Gogo-Yimidir], Wijingadda [Dambimangari], Wiminji [Martu] [331]	Endangered	Species or species habitat likely to occur within area	In feature area
Petauroides volans			
Greater Glider (southern and central) [254]	Endangered	Species or species habitat known to occur within area	In feature area
Phascolarctos cinereus (combined populations of Qld, NSW and the ACT)			
Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Endangered	Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
PLANT			
Denhamia megacarpa Large-fruited Denhamia [91342]	Endangered	Species or species habitat may occur within area	In feature area
Dichanthium queenslandicum King Blue-grass [5481]	Endangered	Species or species habitat known to occur within area	In feature area
Eucalyptus raveretiana Black Ironbox [16344]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Polianthion minutiflorum [82772]	Vulnerable	Species or species habitat may occur within area	In feature area
Samadera bidwillii Quassia [29708]	Vulnerable	Species or species habitat likely to occur within area	In feature area
REPTILE			
Denisonia maculata Ornamental Snake [1193]	Vulnerable	Species or species habitat known to occur within area	In feature area
Egernia rugosa Yakka Skink [1420]	Vulnerable	Species or species habitat may occur within area	In feature area
Elseya albagula Southern Snapping Turtle, White-throated Snapping Turtle [81648]	Critically Endangered	Species or species habitat may occur within area	In feature area
Furina dunmalli Dunmall's Snake [59254]	Vulnerable	Species or species habitat may occur within area	In feature area
Hemiaspis damelii Grey Snake [1179]	Endangered	Species or species habitat may occur within area	In feature area
Lerista allanae Allan's Lerista, Retro Slider [1378]	Endangered	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Rheodytes leukops Fitzroy River Turtle, Fitzroy Tortoise, Fitzroy Turtle, White-eyed River Diver [1761]	Endangered	Species or species habitat likely to occur within area	In feature area

Listed Migratory Species [Resource Information]

Scientific Name	Threatened Category	Presence Text	Buffer Status
Migratory Marine Birds			
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area	In feature area
Migratory Terrestrial Species			
Cuculus optatus Oriental Cuckoo, Horsfield's Cuckoo [86651]		Species or species habitat may occur within area	In feature area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area	In feature area
Migratory Wetlands Species			
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area	In feature area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area	In feature area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat may occur within area	In feature area
Pandion haliaetus Osprey [952]		Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Tringa nebularia](#) Common Greenshank, Greenshank [832]	Endangered	Species or species habitat may occur within area	In feature area

Other Matters Protected by the EPBC Act

Listed Marine Species			[Resource Information]
Scientific Name	Threatened Category	Presence Text	Buffer Status
Bird			
[Actitis hypoleucos](#) Common Sandpiper [59309]		Species or species habitat may occur within area	In feature area
[Anseranas semipalmata](#) Magpie Goose [978]		Species or species habitat may occur within area overfly marine area	In feature area
[Apus pacificus](#) Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area	In feature area
[Bubulcus ibis as Ardea ibis](#) Cattle Egret [66521]		Species or species habitat may occur within area overfly marine area	In feature area
[Calidris acuminata](#) Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area	In feature area
[Calidris ferruginea](#) Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Calidris melanotos](#) Pectoral Sandpiper [858]		Species or species habitat may occur within area overfly marine area	In feature area
[Chalcites osculans as Chrysococcyx osculans](#) Black-eared Cuckoo [83425]		Species or species habitat may occur within area overfly marine area	In feature area
[Gallinago hardwickii](#) Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat may occur within area overfly marine area	In feature area
[Haliaeetus leucogaster](#) White-bellied Sea-Eagle [943]		Species or species habitat known to occur within area	In feature area
[Merops ornatus](#) Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area	In feature area
[Motacilla flava](#) Yellow Wagtail [644]		Species or species habitat may occur within area overfly marine area	In feature area
[Pandion haliaetus](#) Osprey [952]		Species or species habitat likely to occur within area	In feature area
[Rostratula australis as Rostratula benghalensis (sensu lato)](#) Australian Painted Snipe [77037]	Endangered	Species or species habitat may occur within area overfly marine area	In feature area
[Tringa nebularia](#) Common Greenshank, Greenshank [832]	Endangered	Species or species habitat may occur within area overfly marine area	In feature area

Extra Information

EPBC Act Referrals				[Resource Information]
Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Caval Ridge Mine Horse Pit Extension, Bowen Basin	2021/9031		Post-Approval	In buffer area only
Isaac Downs coal mine project, near Moranbah, Qld	2019/8413		Post-Approval	In feature area
Isaac River Coal Mine Project	2021/8980		Post-Approval	In buffer area only
Moorvale South Extension Project	2024/09960		Referral Decision	In buffer area only
Moranbah South Project 2013 Seismic Exploration Program, Qld	2013/6814		Completed	In buffer area only
Olive Downs Project	2005/2377		Post-Approval	In feature area
Olive Downs Project Mine Site and Access Road	2017/7867		Post-Approval	In buffer area only
Peak Downs Mine Continuation Project	2022/09350		Assessment	In buffer area only
Peak Downs Mine Power Line Realignment Project	2024/09983		Assessment	In buffer area only
Winchester South Project Electricity Transmission Line, near Moranbah, Qld	2019/8458		Approval	In feature area
Winchester South Project Mine Site and Access Road, near Moranbah, Qld	2019/8460		Approval	In feature area
Winchester South Project Water Pipeline, near Moranbah, Qld	2019/8459		Approval	In feature area
Controlled action				
7 North Dam Extension Project - Peak Downs Mine	2012/6260	Controlled Action	Completed	In buffer area only
Alpha Coal Project - Mine and Rail Development	2008/4648	Controlled Action	Post-Approval	In buffer area only
Bowen Gas Project	2012/6377	Controlled Action	Post-Approval	In feature area
Caval Ridge Open Cut Coal Mine Project	2008/4417	Controlled Action	Post-Approval	In buffer area only

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Controlled action				
Construct and Operate the Connors River Dam and Pipelines	2008/4429	Controlled Action	Post-Approval	In buffer area only
Develop an Open Cut Coal Mine at Daunia	2008/4418	Controlled Action	Post-Approval	In buffer area only
Eagle Downs Coal Mine Central Queensland	2008/3945	Controlled Action	Post-Approval	In feature area
Establishment of Galilee Coal Mine and Associated Infrastructure	2009/4737	Controlled Action	Post-Approval	In buffer area only
Extension to the exisiting Isaac Plains Mine, near Moranbah, Qld	2016/7827	Controlled Action	Post-Approval	In buffer area only
install & operate gas pipeline	2005/2059	Controlled Action	Post-Approval	In feature area
Millenium Open Cut Coal Mine Expansion Project, QLD	2009/4821	Controlled Action	Post-Approval	In feature area
Moranbah South Project Coal Mine, QLD	2012/6337	Controlled Action	Post-Approval	In feature area
Olive Downs Project Electricity Transmission Line	2017/7869	Controlled Action	Post-Approval	In buffer area only
Olive Downs Project Rail Spur	2017/7870	Controlled Action	Post-Approval	In buffer area only
Olive Downs Project Water Pipeline	2017/7868	Controlled Action	Post-Approval	In buffer area only
Open Cut Coal Mining	2004/1770	Controlled Action	Post-Approval	In feature area
Relocation of approximately 16km of Dysart Road and associated service infrastructure	2013/6868	Controlled Action	Post-Approval	In feature area
The Grosvenor Coal Mine Project	2007/3785	Controlled Action	Post-Approval	In buffer area only
Not controlled action				
Broadlea North Coal Project open cut mine and associated infrastructure	2005/2179	Not Controlled Action	Completed	In buffer area only
Broadlea to Mallawa and Mallawa to Wotonga Rail Duplication	2006/3046	Not Controlled Action	Completed	In buffer area only
Carborough Downs mine extension	2006/3085	Not Controlled Action	Completed	In buffer area only
construction and operation of Carborough Downs Mine	2005/2064	Not Controlled Action	Completed	In feature area

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Not controlled action				
Eagle-1 Exploration Drilling, North West Shelf, WA	2019/8578	Not Controlled Action	Completed	In buffer area only
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed	In feature area
Integrated Isaac Plains Project	2006/3043	Not Controlled Action	Completed	In feature area
Open cut coal mine 7km NE of Moranbah (Isaac Plains)	2005/2070	Not Controlled Action	Completed	In feature area
Not controlled action (particular manner)				
Moranbah South Feasibility Seismic Survey	2010/5497	Not Controlled Action (Particular Manner)	Post-Approval	In feature area
Referral decision				
Expansion of open cut coal mine and diversion of creeks in existing mine operati	2006/2845	Referral Decision	Completed	In feature area

Caveat

1 PURPOSE

This report is designed to assist in identifying the location of matters of national environmental significance (MNES) and other matters protected by the Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act) which may be relevant in determining obligations and requirements under the EPBC Act.

The report contains the mapped locations of:

- World and National Heritage properties;
- Wetlands of International and National Importance;
- Commonwealth and State/Territory reserves;
- distribution of listed threatened, migratory and marine species;
- listed threatened ecological communities; and
- other information that may be useful as an indicator of potential habitat value.

2 DISCLAIMER

This report is not intended to be exhaustive and should only be relied upon as a general guide as mapped data is not available for all species or ecological communities listed under the EPBC Act (see below). Persons seeking to use the information contained in this report to inform the referral of a proposed action under the EPBC Act should consider the limitations noted below and whether additional information is required to determine the existence and location of MNES and other protected matters.

Where data is available to inform the mapping of protected species, the presence type (e.g. known, likely or may occur) that can be determined from the data is indicated in general terms. It is the responsibility of any person using or relying on the information in this report to ensure that it is suitable for the circumstances of any proposed use. The Commonwealth cannot accept responsibility for the consequences of any use of the report or any part thereof. To the maximum extent allowed under governing law, the Commonwealth will not be liable for any loss or damage that may be occasioned directly or indirectly through the use of, or reliance on the contents of this report.

3 DATA SOURCES

Threatened ecological communities

For threatened ecological communities where the distribution is well known, maps are generated based on information contained in recovery plans, State vegetation maps and remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species

Threatened, migratory and marine species distributions have been discerned through a variety of methods. Where distributions are well known and if time permits, distributions are inferred from either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc.) together with point locations and described habitat; or modelled (MAXENT or BIOCLIM habitat modelling) using point locations and environmental data layers.

Where little information is available for a species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc.).

In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More detailed distribution mapping methods are used to update these distributions when time permits.

4 LIMITATIONS

The following species and ecological communities have not been mapped and do not appear in this report:

- threatened species listed as extinct or considered vagrants;
- some recently listed species and ecological communities;
- some listed migratory and listed marine species, which are not listed as threatened species; and
- migratory species that are very widespread, vagrant, or only occur in Australia in small numbers.

The following groups have been mapped, but may not cover the complete distribution of the species:

- listed migratory and/or listed marine seabirds, which are not listed as threatened, have only been mapped for recorded breeding sites; and
- seals which have only been mapped for breeding sites near the Australian continent

The breeding sites may be important for the protection of the Commonwealth Marine environment.

Refer to the metadata for the feature group (using the Resource Information link) for the currency of the information.

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

-Office of Environment and Heritage, New South Wales
-Department of Environment and Primary Industries, Victoria
-Department of Primary Industries, Parks, Water and Environment, Tasmania
-Department of Environment, Water and Natural Resources, South Australia
-Department of Land and Resource Management, Northern Territory
-Department of Environmental and Heritage Protection, Queensland
-Department of Parks and Wildlife, Western Australia
-Environment and Planning Directorate, ACT
-Birdlife Australia
-Australian Bird and Bat Banding Scheme
-Australian National Wildlife Collection
-Natural history museums of Australia
-Museum Victoria
-Australian Museum
-South Australian Museum
-Queensland Museum
-Online Zoological Collections of Australian Museums
-Queensland Herbarium
-National Herbarium of NSW
-Royal Botanic Gardens and National Herbarium of Victoria
-Tasmanian Herbarium
-State Herbarium of South Australia
-Northern Territory Herbarium
-Western Australian Herbarium
-Australian National Herbarium, Canberra
-University of New England
-Ocean Biogeographic Information System
-Australian Government, Department of Defence
Forestry Corporation, NSW
-Geoscience Australia
-CSIRO
-Australian Tropical Herbarium, Cairns
-eBird Australia
-Australian Government – Australian Antarctic Data Centre
-Museum and Art Gallery of the Northern Territory
-Australian Government National Environmental Science Program
-Australian Institute of Marine Science
-Reef Life Survey Australia
-American Museum of Natural History
-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania
-Tasmanian Museum and Art Gallery, Hobart, Tasmania
-Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Appendix F – Wildnet Search

WN Taxon ID	Kingdom	Class	Family	Scientific name	Common name	NCA status	EPBC status	Conservation significant	Sensitive species	Sighting records	Specimen records	Sighting summary
26896	Animalia	Actinopterygii	Ambassidae	Ambassis agassizii	Agassiz's glassfish			No	No	23	0	23
26920	Animalia	Actinopterygii	Atherinidae	Craterocephalus stercusmuscarum	flyspecked hardyhead			No	No	4	0	4
26938	Animalia	Actinopterygii	Cichlidae	Oreochromis mossambicus	Mozambique mouthbrooder			No	No	10	0	10
26941	Animalia	Actinopterygii	Clupeidae	Nematalosa erebi	bony bream			No	No	15	0	15
26955	Animalia	Actinopterygii	Eleotridae	Hypseleotris galii	firetail gudgeon			No	No	1	0	1
26956	Animalia	Actinopterygii	Eleotridae	Hypseleotris klunzingeri	western carp gudgeon			No	No	4	0	4
33897	Animalia	Actinopterygii	Eleotridae	Hypseleotris sp.				No	No	19	0	19
26957	Animalia	Actinopterygii	Eleotridae	Hypseleotris species 1	Midgley's carp gudgeon			No	No	1	0	1
18168	Animalia	Actinopterygii	Eleotridae	Mogurnda adspersa	southern purplespotted gudgeon			No	No	5	0	5
26965	Animalia	Actinopterygii	Eleotridae	Oxyeleotris lineolata	sleepy cod			No	No	3	0	3
27029	Animalia	Actinopterygii	Melanotaeniidae	Melanotaenia splendida splendida	eastern rainbowfish			No	No	22	0	22
27042	Animalia	Actinopterygii	Percichthyidae	Macquaria ambigua	golden perch			No	No	2	0	2
27048	Animalia	Actinopterygii	Plotosidae	Neosilurus hyrtlii	Hyrtl's catfish			No	No	9	0	9
27053	Animalia	Actinopterygii	Plotosidae	Porochilus rendahli	Rendahl's catfish			No	No	2	0	2
27054	Animalia	Actinopterygii	Plotosidae	Tandanus tandanus	freshwater catfish			No	No	2	0	2
19501	Animalia	Actinopterygii	Poeciliidae	Xiphophorus maculatus	platy			No	No	2	0	2
27083	Animalia	Actinopterygii	Terapontidae	Amniataba percoides	barred grunter			No	No	1	0	1
27089	Animalia	Actinopterygii	Terapontidae	Leiopotherapon unicolor	spangled perch			No	No	13	0	13
27094	Animalia	Actinopterygii	Terapontidae	Scortum hillii	leathery grunter			No	No	1	0	1
716	Animalia	Amphibia	Bufonidae	Rhinella marina	cane toad			No	No	27	0	27
624	Animalia	Amphibia	Hylidae	Cyclorana alboguttata	greenstripe frog	C		No	No	10	0	10
643	Animalia	Amphibia	Hylidae	Cyclorana brevipes	superb collared frog	C		No	No	3	0	3
620	Animalia	Amphibia	Hylidae	Cyclorana novaehollandiae	eastern snapping frog	C		No	No	6	0	6
623	Animalia	Amphibia	Hylidae	Cyclorana verrucosa	rough collared frog	C		No	No	2	1	2
627	Animalia	Amphibia	Hylidae	Litoria caerulea	common green treefrog	C		No	No	9	0	9
608	Animalia	Amphibia	Hylidae	Litoria fallax	eastern sedgefrog	C		No	No	1	0	1
612	Animalia	Amphibia	Hylidae	Litoria inermis	bumpy rocketfrog	C		No	No	6	0	6
614	Animalia	Amphibia	Hylidae	Litoria latopalmata	broad palmed rocketfrog	C		No	No	8	0	8
599	Animalia	Amphibia	Hylidae	Litoria rothii	eastern laughing treefrog	C		No	No	3	0	3
600	Animalia	Amphibia	Hylidae	Litoria rubella	ruddy treefrog	C		No	No	12	0	12
29174	Animalia	Amphibia	Hylidae	Litoria wilcoxii	eastern stony creek frog	C		No	No	1	0	1
681	Animalia	Amphibia	Limnodynastidae	Limnodynastes peronii	striped marshfrog	C		No	No	2	0	2
682	Animalia	Amphibia	Limnodynastidae	Limnodynastes salmini	salmon striped frog	C		No	No	5	0	5
684	Animalia	Amphibia	Limnodynastidae	Limnodynastes tasmaniensis	spotted grassfrog	C		No	No	14	0	14
673	Animalia	Amphibia	Limnodynastidae	Limnodynastes terraereginae	scarlet sided pobblebonk	C		No	No	2	0	2
680	Animalia	Amphibia	Limnodynastidae	Platyplectrum ornatum	ornate burrowing frog	C		No	No	30	0	30
63	Animalia	Reptilia	Chelidae	Chelodina longicollis	eastern snake-necked turtle	C		No	No	3	0	3
58	Animalia	Reptilia	Chelidae	Emydura macquarii krefftii	Krefft's river turtle	C		No	No	2	0	2
11061	Plantae	Equisetopsida	Cyperaceae	Cyperus alterniflorus		C		No	No	1	1	1
10326	Plantae	Equisetopsida	Cyperaceae	Cyperus betchei		C		No	No	2	0	2
14659	Plantae	Equisetopsida	Cyperaceae	Cyperus compressus				No	No	1	1	1
11060	Plantae	Equisetopsida	Cyperaceae	Cyperus concinnus		C		No	No	2	0	2
17513	Plantae	Equisetopsida	Cyperaceae	Cyperus conicus var. conicus		C		No	No	1	1	1
13966	Plantae	Equisetopsida	Cyperaceae	Cyperus flaccidus		C		No	No	1	1	1
17520	Plantae	Equisetopsida	Cyperaceae	Cyperus gilesii		C		No	No	41	0	41
17521	Plantae	Equisetopsida	Cyperaceae	Cyperus gracilis		C		No	No	2	1	2
17524	Plantae	Equisetopsida	Cyperaceae	Cyperus iria		C		No	No	1	1	1
17525	Plantae	Equisetopsida	Cyperaceae	Cyperus javanicus		C		No	No	1	1	1
17475	Plantae	Equisetopsida	Cyperaceae	Cyperus polystachyos var. polystachyos		C		No	No	1	1	1
10208	Plantae	Equisetopsida	Cyperaceae	Cyperus pulchellus		C		No	No	1	1	1
17106	Plantae	Equisetopsida	Cyperaceae	Fimbristylis depauperata		C		No	No	1	1	1
17107	Plantae	Equisetopsida	Cyperaceae	Fimbristylis dichotoma	common fringe-rush	C		No	No	1	0	1