



Matters of National Environmental Significance Assessment Report

Newlands Closure Project - Cerito Creek Permanent Diversion System

NC Coal Company Pty Limited

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Executive summary

This report is subject to, and must be read in conjunction with, the limitations and assumptions set out in Sections 1 and 3.8, and the qualifications contained throughout the report.

This MNES Assessment Report has been prepared to identify and assess any potential impacts to matters of national environmental significance (MNES) under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) (Cth) from activities associated with construction of the Newlands Closure Project – Cerito Creek permanent diversion system (the Project). This report includes the findings of desktop and field-based ecological assessments for all relevant MNES, including threatened ecological communities (TECs), threatened flora, threatened fauna, migratory species (birds) and an assessment of potential impacts on water resources (that relate to large coal mining development).

The assessment against the EPBC Act Significant Impact Guidelines 1.1 – Matters of National Environmental Significance (Significant Impact Guidelines 1.1) (DoE 2013a), determined that the Project would potentially have significant impacts to the following matters:

- Brigalow Threatened Ecological Community (TEC) (13.42 ha)
- Greater glider (southern and central) (16.90 ha of denning and foraging habitat)
- Koala (37.37 ha of foraging and sheltering habitat).

The assessment against the EPBC Act Significant Impact Guidelines 1.3: Coal seam gas and large coal mining developments – impacts on water resources (Significant Impact Guidelines 1.3) (DCCEEW 2022d), determined that the Project is unlikely to have a significant impact on the hydrological characteristics or the water quality of a water resource.

Further details pertaining to the Project and MNES assessment are summarised below.

Project description

Mining at Newlands Coal Mine ceased in February 2023, and the mine is undergoing site-wide rehabilitation and closure activities. As part of the Newlands Closure Project, NC Coal Company Pty Limited (NCC) is progressively rehabilitating the existing mine complex to comply with the closure requirements of the State Environmental Authority (EA) Permit number EPML00817713, and in accordance with the Progressive Rehabilitation and Closure Plan (PRCP) currently under assessment by the Queensland Department of the Environment, Tourism, Science and Innovation (DETSI).

The following terminology is used to describe the proposed action:

- **Project Area** – The area encompassing the proposed Cerito Creek permanent diversion system that may be directly or indirectly impacted by the Project activities, comprising (1) the Project disturbance footprint, and (2) the Impact area for the water resources trigger.
- **Project disturbance footprint** – Areas of TECs, threatened species habitat, and migratory species habitat that may be directly or indirectly impacted by the Project activities. This consists of discrete areas for in-channel earthworks inclusive of a 50 m buffer (to allow for ancillary activities such as remediation of existing bank erosion and revegetation of riparian areas) as well as Project access tracks (existing and new) inclusive of a 25 m buffer (resulting in a 50 m wide access corridor).
- **Impact area for the water resources trigger** – The post-mine alignment of Cerito Creek with the potential to directly or indirectly affect water resources (that relate to a large coal mining development) as a result of the Project activities, including an additional 1 km reach upstream and downstream of the main Cerito Creek channel for the permanent diversion system.

The Project is located at Newlands Coal Mine in Queensland's Bowen Basin, approximately 30 km north-west of Glenden and 135 km west of Mackay. The existing Cerito Creek diversion system (comprising of a southern and northern diversion drain, Cerito Dam and several water storage ponds) is an approximately 30 km long clean water diversion, channelling upstream ephemeral watercourse flows, and overland stormwater flows around the Newlands Coal Mine. The existing diversions are temporary and are authorised by the Queensland Government through temporary Water Licences issued under the *Water Act 2000* (Qld).

The Newlands Coal Mine site consists of three major mining areas – Main Deposit, Eastern Creek and Suttor Creek. The proposed Cerito Creek permanent diversion system and ancillary activities is located within the Main Deposit area on Lands Lease within Mining Lease (ML) 4748, 4771, 4774, 10176 and 10316.

The Project Area is 631.67 ha and the Project disturbance footprint is 325.06 ha.

The major components of the Project are:

- Modification and rehabilitation of the existing temporary diversions.
- A proposed channel connecting the Ramp 1 Pond with the Cerito Creek system.
- A proposed channel connecting Lake Austin to the Cerito Creek system, which will collect runoff from the final landforms.
- Removal of Cerito Dam within upstream reaches of Cerito Creek, and an engineered drop structure within the existing southern diversion.

The Project is not a standard mine diversion for temporarily diverting a section of a watercourse. Cerito Creek was originally diverted in 1988 (with subsequent repairs and modifications occurring between 1988 and 2016). The Project involves refinement and adjustment of existing diversions, as well as creation of new channels to manage runoff from the final landform and link to the natural channel system.

Recent geomorphological and geotechnical assessments have indicated that the existing two diversions are, on the whole, performing better than might be anticipated for older constructed channels. However, there is evidence of erosion within the existing constructed channels and sediment throughput has been disrupted by Cerito Dam, subsidence from historical mining activities, and the low bed slope of the existing southern diversion. Vegetation that was cleared for the existing two diversions was slow to re-establish during the first 15–20 years, with mature riparian vegetation only becoming more widespread and established within the last decade or so (based on site photographs and aerial imagery).

Therefore, the Project aims to:

- Improve throughput of flow and sediment to match the local seasonal and ephemeral watercourses
- Provide a permanent diversion that is safe, stable and environmentally sustainable
- Retain existing water storages, where possible, for stock watering by the post-mining landholder.

The Project will involve linking of channels, removal of engineered structures, creation of low-flow channels, remediation of erosion, and rehabilitation of an area of past subsidence, amongst other activities, where necessary to reinstate natural flow and sediment transport in Cerito Creek and its tributaries. Project activities will be undertaken in previously mined and disturbed areas, rehabilitated areas, and to a lesser extent, undisturbed areas (resulting from linking into and integrating with natural ephemeral flow paths).

The Project design prioritises the re-establishment of natural ephemeral watercourse characteristics and the retention of mature, stabilising vegetation. It seeks to avoid and minimise disturbance in areas that comprise or contain habitat for conservation significant species. The Project will not impact the biodiversity offset areas for the Newlands Coal Extension Project (EPBC No. 2011/5968) and Wollombi Open Cut Coal Mine – Suttor Creek ML4761 Extension (EPBC No. 2005/2015) located within Newlands Nature Refuge area. Disturbance in the Newlands Nature Refuge (outside of the two biodiversity offset areas) is authorised under the Newlands Open Cut (Glencore): PLN Biodiversity Management Plan, however additional disturbance by the Project will be minimised.

To achieve the above, the following Project activities are proposed:

- Vegetation clearing for:
 - Diversion earthworks (consisting largely of in-channel works and disturbance of riparian vegetation and will therefore have more of a direct and indirect impact to aquatic species, habitats and functions); and
 - Construction and maintenance access (establishment of new temporary access tracks to gain entry at key locations where in-channel earthworks are proposed to occur and for widening of existing narrow access tracks).
- In-channel earthworks, including blasting of areas of strong competent basalt and sandstone layers within the diversion system although a design objective is to minimise blasting through avoidance of strong, competent rock, typically Rewan Group sandstone layers and Tertiary basalt flows. Areas envisaged to require blasting are as follows:
 - At the drop structure due to challenging access and some medium to high strength sandstone and rock layers within the target excavation depth.
 - Along Lake Austin channel due to strong basalt layers in the upstream reaches of the proposed new channel and deep gravely fill expected to be encountered adjacent to Pub Hill cutting.
- Permanent access track construction for post-construction monitoring and to accommodate post-mine landholder access, including replacing existing culvert crossings with bed level causeways.
- Temporary and permanent erosion and sedimentation controls both during and post-construction.
- Temporary and permanent spoil stockpiles during and post-construction (which will be located in previously mined and/or disturbed areas).
- Temporary and permanent fences to prevent livestock from accessing rehabilitated areas until such time that adequate ground cover and riparian vegetation has established around areas that require additional protection from grazing pressures.
- Temporary laydown areas (which will be located in previously mined and/or disturbed areas).
- Revegetation of riparian areas and rehabilitation of temporary construction areas.

The following activities are excluded from the Project:

- Rehabilitation and closure activities currently authorised as part of the existing Newlands Coal Mine (including under the EA EPML00817713) and approvals under the EPBC Act (Cth) for the Newlands Coal Extension Project (EPBC No. 2011/5968) and Wollombi Open Cut Coal Mine - Suttor Creek ML4761 Extension (EPBC No. 2005/2015) are excluded from the Project.
- Ongoing use of existing access roads, and monitoring and maintenance of existing infrastructure (including repairs to existing culvert and bed level crossings), related to the current land uses, operations and closure activities are excluded from the Project.
- On-ground assessments are excluded from the Project, such as topographical surveys, ecological surveys, geotechnical assessments and works pertaining to the management or salvage of Aboriginal cultural heritage items.

Construction is anticipated to take approximately three years with the Project to commence in December 2026 and be completed in December 2029. An operation and maintenance program of approximately 10 years from 2030 to 2040 is proposed. Therefore, the total duration of the proposed action is 14 years from December 2026 to December 2040.

Likelihood of occurrence assessment for species

An assessment was conducted to attribute a 'likelihood of occurrence' rating to threatened species, migratory species and threatened ecological communities listed under the EPBC Act (Cth) that were identified in desktop assessments. The likelihood of occurrence assessment was based on a review of species distributions and habitat requirements, vegetation mapping, field survey results and historical records.

The following matters were assessed as known to occur, likely to occur or with potential to occur within the Project disturbance footprint:

- TECs:
 - Brigalow (*Acacia harpophylla* dominant and co-dominant) (Brigalow TEC) – endangered
 - Semi-Evergreen Vine Thickets of the Brigalow Belt (North and South) and Nandewar Bioregions (Semi-Evergreen Vine Thickets TEC) – endangered.
- Threatened flora:
 - King blue-grass (*Dichanthium queenslandicum*) – endangered.
- Threatened fauna:
 - Greater glider (southern and central) (*Petauroides volans*) – endangered
 - Koala (*Phascolarctos cinereus*) – endangered
 - Ornamental snake (*Denisonia maculata*) – vulnerable
 - Squatter pigeon (southern) (*Geophaps scripta scripta*) – vulnerable
 - White-throated needletail (*Hirundapus caudacutus*) – vulnerable.
- Migratory birds:
 - Caspian tern (*Hydroprogne caspia*)
 - Fork-tailed swift (*Apus pacificus*)
 - Oriental cuckoo (*Cuculus optatus*)
 - White-throated needletail (also assessed as a threatened species).

Potential impacts and mitigation measures

The assessment determined that the Project's construction phase activities are expected to result in the loss and disturbance of vegetation and habitat for conservation significant species. Impacts most likely to adversely affect conservation significant species or communities that were confirmed present or likely or have potential to occur in the Project disturbance footprint, include:

- Loss of habitat
- Injury and mortality
- Temporary disturbance to wildlife due to noise, light and vibration
- Habitat fragmentation or barrier effects
- Habitat degradation by increased dust, erosion and sedimentation
- Introduction and spread of weeds and pest fauna species
- Modification of hydrological regimes
- Alteration of aquatic habitats.

Substantial design refinements have been undertaken as part of design progression to reduce the Project disturbance footprint and avoid areas of ecological MNES. However, vegetation clearing associated with the Project is an unavoidable impact. The following measures will be undertaken to further minimise and mitigate the impacts of vegetation and habitat loss:

- Restrict clearing to the smallest area required for construction of the Project and all ancillary activities
- Locate spoil and borrow areas in previously mined and/or disturbed areas wherever possible
- Schedule construction to minimise the active works area required at any time
- Locate and mark no-go areas of environmental sensitivity on site and in construction plans, including all vegetation not to be cleared
- Hollow logs and large debris will be salvaged for the use of habitat creation/enhancement outside of the extent of works
- Rehabilitate temporary construction areas as soon as possible after the completion of local construction works.

The post-construction phase of the Project will consist of Cerito Creek flowing in a self-sustaining manner. This will include permanent modification of hydrological regimes and alteration of aquatic habitats from the current temporary diversions.

Management measures will include post-construction monitoring to confirm the Cerito Creek permanent diversion system is functioning as intended. A Monitoring Plan will be developed and implemented, to demonstrate that the Cerito Creek permanent diversion system is developing and functioning as designed and any issues can be identified before major instabilities occur that require significant rehabilitation. The post-mine land use has also been considered with overgrazing the key threat to riparian areas. Management measures include temporary and permanent fencing, reviewing stock levels and implementing rotational grazing, where practicable.

Significant impact assessment

Significant impact assessments (SIAs) have been conducted for conservation significant species, including threatened ecological communities, threatened flora, threatened fauna, and migratory species (birds) that are assessed as known to occur, likely to occur or with potential to occur within the Project disturbance footprint.

The SIAs were undertaken against the Significant Impact Guidelines 1.1 (DoE 2013a). Significant impacts are those that remain after all efforts to avoid, minimise and mitigate impacts to MNES have been applied. It was determined that the Project would potentially have residual significant impacts to the following matters:

- Brigalow TEC (13.42 ha)
- Greater glider (southern and central) (16.90 ha of denning and foraging habitat)
- Koala (37.37 ha of foraging and sheltering habitat).

An assessment has also been conducted under the Significant Impact Guidelines 1.3 (DCCEEW 2022d), to determine if the proposed action is likely to have a significant impact on the hydrology or the water quality of a water resource. The outcome of this assessment was:

- A significant impact to hydrological characteristics is unlikely to result from the Project. The Project is unlikely to cause a change in the water quantity, including the timing of variations in water quantity and is unlikely to change the area or extent of a water resource (for both surface and groundwater).
- A significant impact to water quality is unlikely to result from the Project. There is unlikely to be a risk that the ability to achieve relevant local or regional water quality objectives would be materially compromised. The Project is unlikely to significantly worsen local water quality (for both surface and groundwater).

Offsets

There is the potential that significant impacts to Brigalow TEC, greater glider (southern and central) and koala may require a land-based offset to be secured and managed. It is envisaged that part of the Newlands Nature Refuge, that is not currently part of existing offset areas for the Newlands Coal Extension Project (EPBC No. 2011/5968) and Wollombi Open Cut Coal Mine - Suttor Creek ML4761 Extension (EPBC No. 2005/2015), would be used to offset any significant impacts from this Project. There is similar habitat in the Newlands Nature Refuge to the Project Area, therefore this has the potential to provide offset areas for species and ecological communities (subject to further survey).

The Project disturbance footprint and the proposed offset area will be surveyed in accordance with DCCEEW requirements and scored in terms of habitat quality in the *Modified Habitat Quality Assessment template* and the *Offsets Assessment Guide*. Where a land-based offset is required, an Offset Proposal and Offset Management Plan will be developed for demonstrating compliance with the principles and requirements of the *EPBC Act Environmental Offsets Policy (October 2012)* (Cth).

Abbreviations and acronyms

Term	Description
ACARP	Australian Coal Association Research Programme
AEP	Annual exceedance probability
AHO	Aquatic habitat only sites
AHT	Ancillary habitat trees
ALA	Atlas of Living Australia
ANZG	Australian & New Zealand Guidelines for Fresh & Marine Water Quality
BoM	Bureau of Meteorology
CAS	Comprehensive assessment sites
DAWE	Department of Agriculture, Water and the Environment
DBH	Diameter at breast height
DCCEEW	Department of Climate Change, Energy, the Environment and Water
DEHP	Department of Environment and Heritage Protection
DES	Department of Environment and Science
DLGWV	Department of Local Government, Water and Volunteers
DETSI	Department of Environment, Tourism, Science and Innovation
DNRME	Department of Natural Resources, Mines and Energy
DoE	Department of the Environment
DoEE	Department of the Environment and Energy
DoR	Department of Resources
DRDMW	Department of Regional Development, Manufacturing, and Water
DSEWPC	Department of Sustainability, Environment, Water, Population and Communities
EA	Environmental Authority
EC	Electrical conductivity
EDL	Ecologically dominant layer
EP Act	<i>Environmental Protection Act 1994</i>
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i>
EPP guidelines	<i>Environment Protection (Water and Wetland Biodiversity) Policy 2019</i>
GDEs	Groundwater Dependent Ecosystems
LIKT	Locally important koala trees
MNES	Matters of national environmental significance
NC Act	<i>Nature Conservation Act 1992</i>
NCEP	Newlands Coal Extension Project
PMST	Protected Matters Search Tool
REs	Regional ecosystems
SAT	Spot Assessment Technique
SIA	Significant impact assessment
SPRAT	Species Profile and Threats Database

Term	Description
TECs	Threatened ecological communities
VM Act	<i>Vegetation Management Act 1999</i>
WQO	Water Quality Objectives
WWBW	Queensland waterways for waterway barrier works

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1. Introduction

1.1 Proposed action

NC Coal Company Pty Limited (NCC) proposes to undertake the Newlands Closure Project – Cerito Creek permanent diversion system (the Project).

Mining at Newlands Coal Mine ceased in February 2023, and the mine is undergoing site-wide rehabilitation and closure activities. As part of the Newlands Closure Project, NCC is progressively rehabilitating the existing mine complex to comply with the closure requirements of the State Environmental Authority (EA) Permit number EPML00817713, and in accordance with the Progressive Rehabilitation and Closure Plan (PRCP) currently under assessment by the Queensland Department of the Environment, Tourism, Science and Innovation (DETSI).

The following terminology is used to describe the proposed action:

- **Project Area** – The area encompassing the proposed Cerito Creek permanent diversion system that may be directly or indirectly impacted by the Project activities, comprising (1) the Project disturbance footprint, and (2) the Impact area for the water resources trigger.
- **Project disturbance footprint** – Areas of threatened ecological communities (TECs), threatened species habitat, and migratory species habitat that may be directly or indirectly impacted by the Project activities. This consists of discrete areas for in-channel earthworks inclusive of a 50 m buffer (to allow for ancillary activities such as remediation of existing bank erosion and revegetation of riparian areas) as well as Project access tracks (existing and new) inclusive of a 25 m buffer (resulting in a 50 m wide access corridor).
- **Impact area for the water resources trigger** – The post-mine alignment of Cerito Creek with the potential to directly or indirectly affect water resources (that relate to a large coal mining development) as a result of the Project activities, including an additional 1 km reach upstream and downstream of the main Cerito Creek channel for the permanent diversion system.

The Project is located at Newlands Coal Mine in Queensland's Bowen Basin, approximately 30 km north-west of Glenden and 135 km west of Mackay. The existing Cerito Creek diversion system (comprising of a southern and northern diversion drain, Cerito Dam and several water storage ponds) is an approximately 30 km long clean water diversion, channelling upstream ephemeral watercourse flows, and overland stormwater flows around the Newlands Coal Mine. The existing diversions are temporary and are authorised by the Queensland Government through temporary Water Licences issued under the *Water Act 2000* (Qld).

The Newlands Coal Mine site consists of three major mining areas - Main Deposit, Eastern Creek and Suttor Creek. The proposed Cerito Creek permanent diversion system and ancillary activities is located within the Main Deposit area on Lands Lease within Mining Lease (ML) 4748, 4771, 4774, 10176 and 10316.

The Project location and existing mining leases for Newlands Coal Mine are shown in Figure 1.1. The proposed action is shown in Figure 1.2. The Project Area is 631.67 ha and the Project disturbance footprint is 325.06 ha.

The Project disturbance footprint for impacts to threatened species and ecological communities is shown in Figure 1.3. The proposed Cerito Creek permanent diversion system for impacts to water resources is shown in Figure 1.4

The major components of the Project are:

- Modification and rehabilitation of the existing temporary diversions.
- A proposed channel connecting the Ramp 1 Pond with the Cerito Creek system.
- A proposed channel connecting Lake Austin to the Cerito Creek system, which will collect runoff from the final landforms.
- Removal of Cerito Dam within upstream reaches of Cerito Creek, and an engineered drop structure within the existing southern diversion.

The Project is not a standard mine diversion for temporarily diverting a section of a watercourse. Cerito Creek was originally diverted in 1988 (with subsequent repairs and modifications occurring between 1988 and 2016). The Project involves refinement and adjustment of existing diversions, as well as creation of new channels to manage runoff from the final landform and link to the natural channel system.

Recent geomorphological and geotechnical assessments have indicated that the existing two diversions are, on the whole, performing better than might be anticipated for older constructed channels. However, there is evidence of erosion within the existing constructed channels. Sediment throughput has been disrupted by Cerito Dam, subsidence from historical mining activities and the low bed slope of the existing southern diversion. Vegetation that was cleared for the existing two diversions was slow to re-establish during the first 15–20 years, with mature riparian vegetation only becoming more widespread and established within the last decade or so (based on site photographs and aerial imagery).

Therefore, the Project aims to:

- Improve throughput of flow and sediment to match the local seasonal and ephemeral watercourses
- Provide a permanent diversion that is safe, stable and environmentally sustainable
- Retain existing water storages, where possible, for stock watering by the post mining land holder.

1.2 Purpose of this report

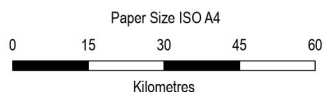
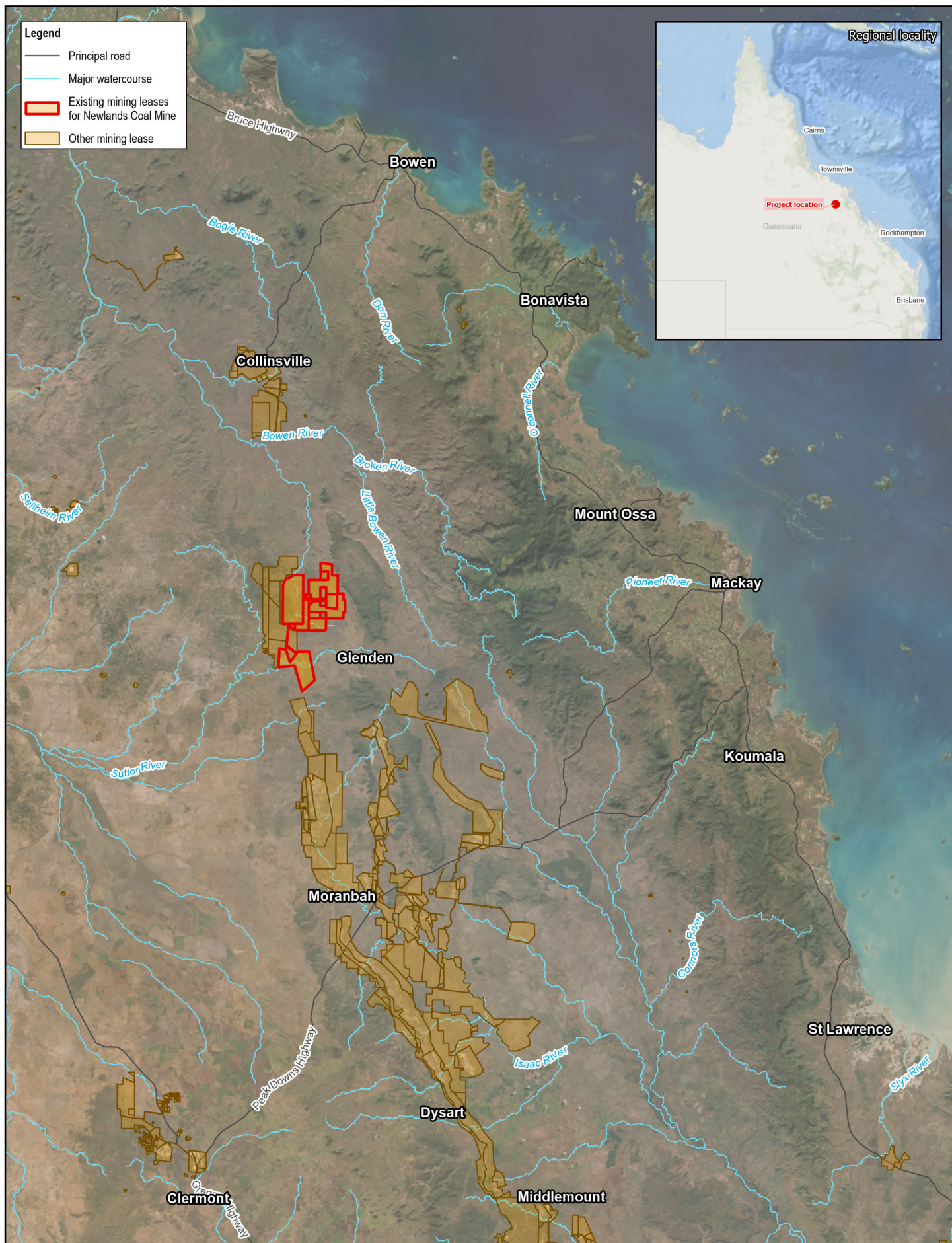
This report has been prepared as supporting documentation for a referral made under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) (Cth). Referrals are made under the EPBC Act (Cth) where there is potential that a proposed action will have a significant impact on a matter of national environmental significance (MNES). The purpose of a referral is to determine whether a proposed action will need formal assessment and approval under the EPBC Act (Cth).

This MNES Assessment Report has been prepared to identify and assess any potential impacts to MNES under the EPBC Act (Cth) from activities associated with construction of the Project. The report includes the findings of desktop and field-based ecological assessments for all relevant MNES, including threatened ecological communities, threatened flora, threatened fauna, migratory species (birds), and an assessment of potential impacts on water resources (that relate to large coal mining development).

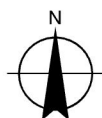
1.3 Terminology

The following terminology is used in this report:

Terminology	Definition
The Project	Newlands Closure Project – Cerito Creek permanent diversion system
Project Area	The area encompassing the proposed Cerito Creek permanent diversion system that may be directly or indirectly impacted by the Project activities, comprising (1) the Project disturbance footprint, and (2) the Impact area for the water resources trigger.
Project disturbance footprint	Areas of TECs, threatened species habitat, and migratory species habitat that may be directly or indirectly impacted by the Project activities. This consists of discrete areas for in-channel earthworks inclusive of a 50 m buffer (to allow for ancillary activities such as remediation of existing bank erosion and revegetation of riparian areas) as well as Project access tracks (existing and new) inclusive of a 25 m buffer (resulting in a 50 m wide access corridor).
Impact area for the water resources trigger	The post-mine alignment of Cerito Creek with the potential to directly or indirectly affect water resources (that relate to a large coal mining development) as a result of the Project activities, including an additional 1 km reach upstream and downstream of the main Cerito Creek channel for the permanent diversion system.
Study area	The study area represents the extent of the desktop assessment (generally using a 10 km buffer around the Project Area).
Survey area	The survey area includes the area of field survey assessment undertaken within the Project Area and adjacent areas.



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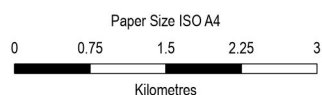
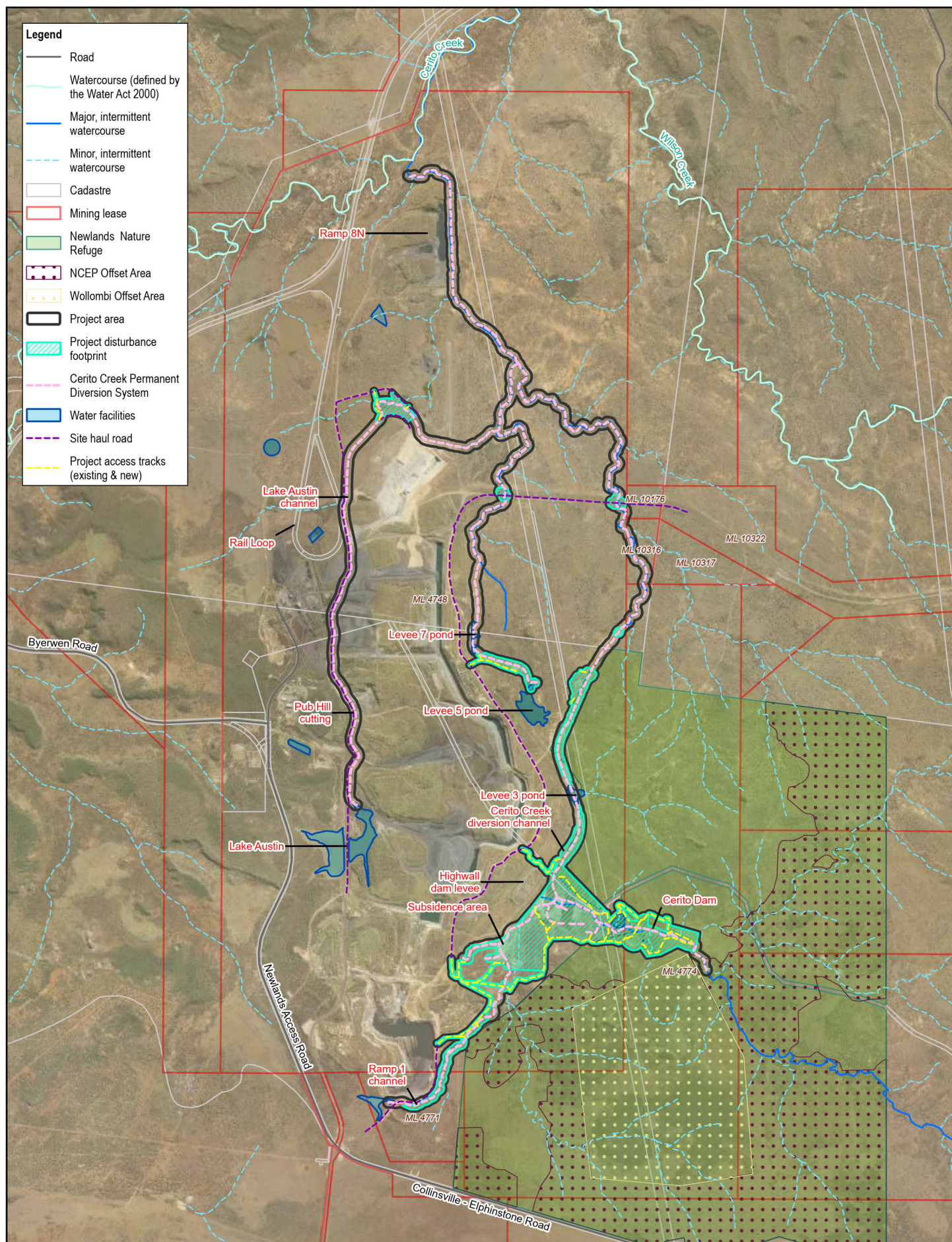


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Newlands Closure Project – Cerito Creek Permanent
Diversion System

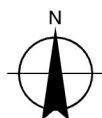
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Date 12/09/2025

Project location

FIGURE 1.1



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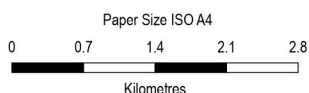
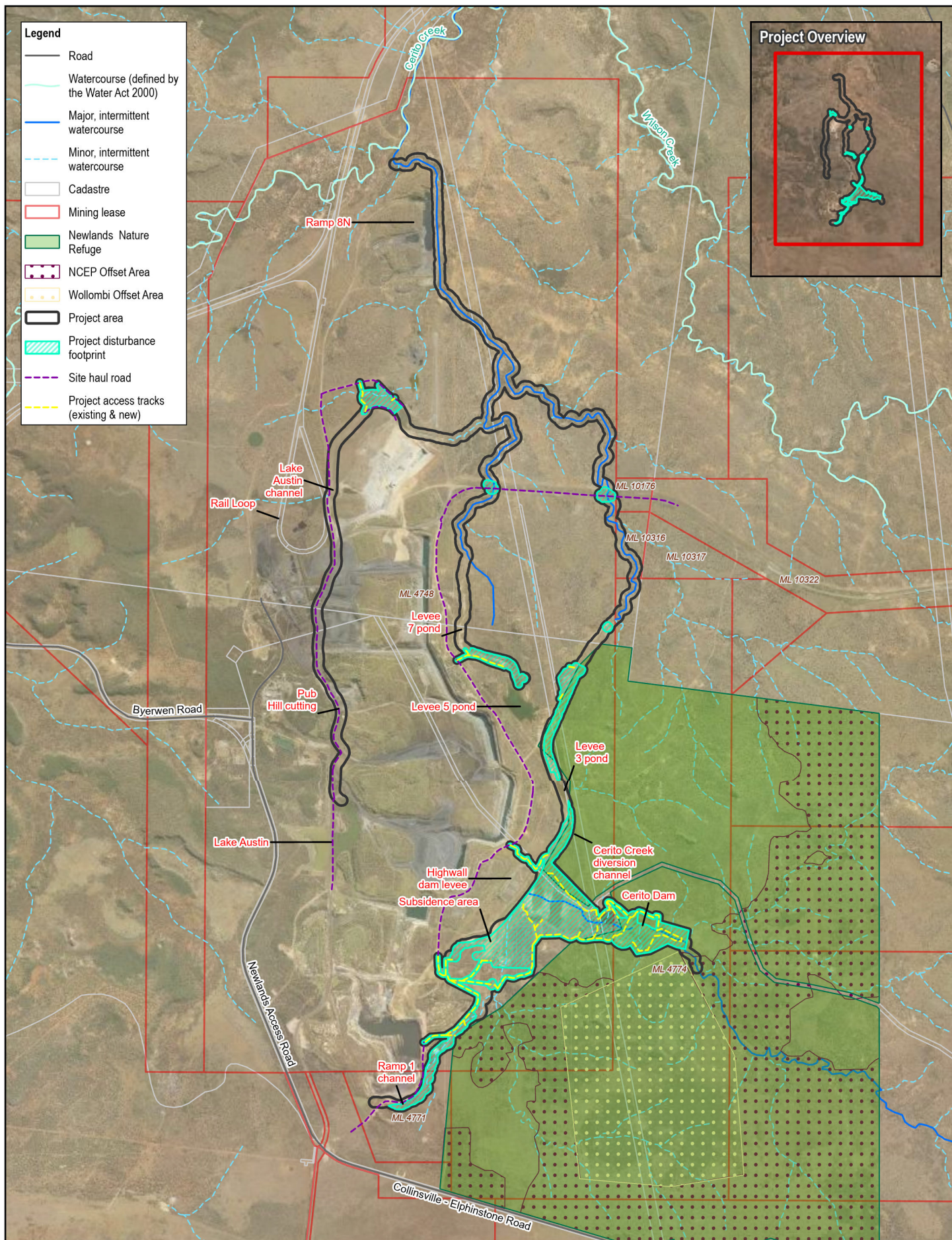


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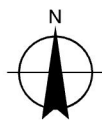
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Proposed action

FIGURE 1.2



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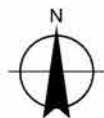
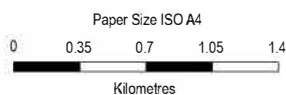
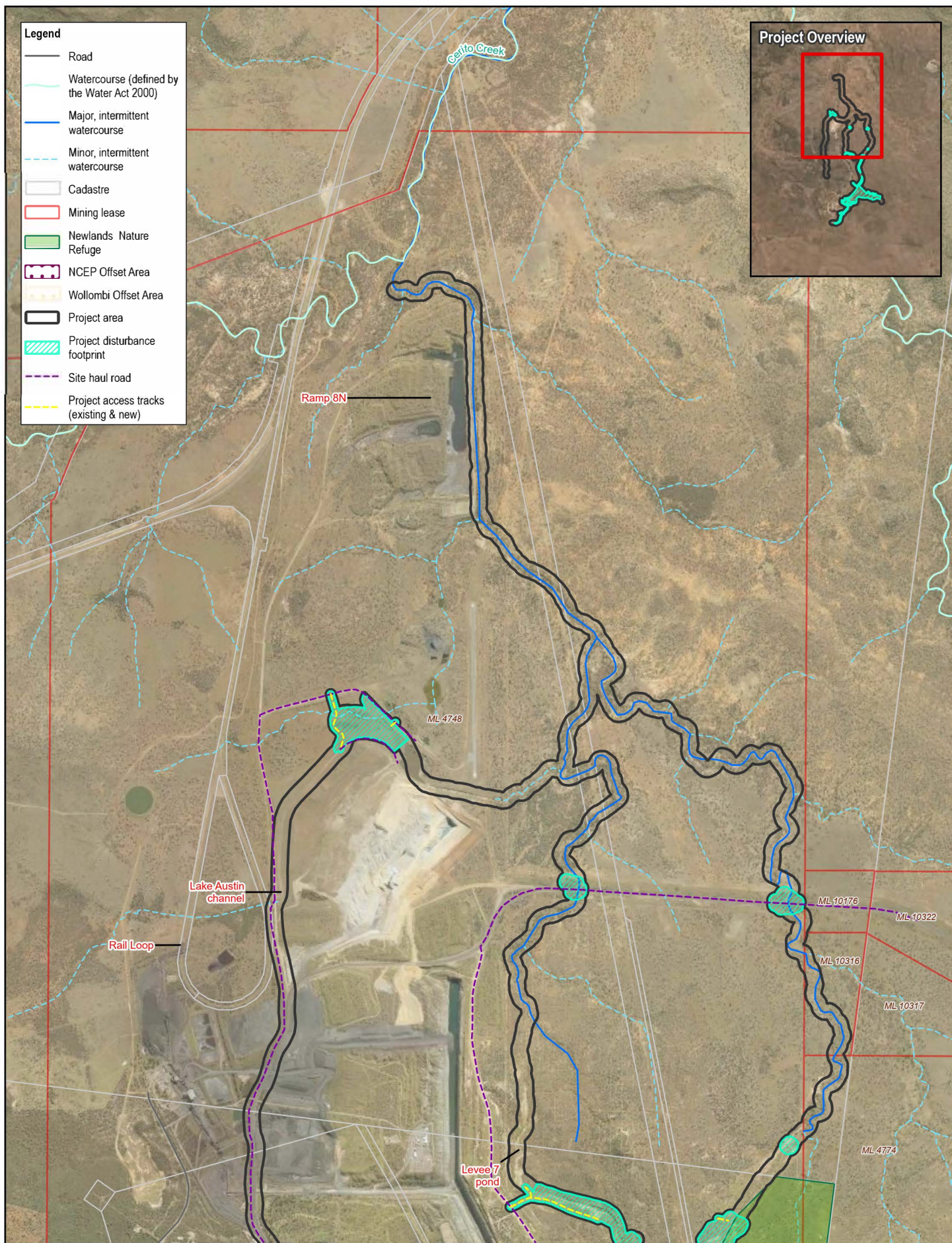


NC Coal Company Pty Limited
Newlands Closure Project – Cerito Creek Permanent
Diversion System

Impact area for threatened species
and ecological communities

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FIGURE 1.3

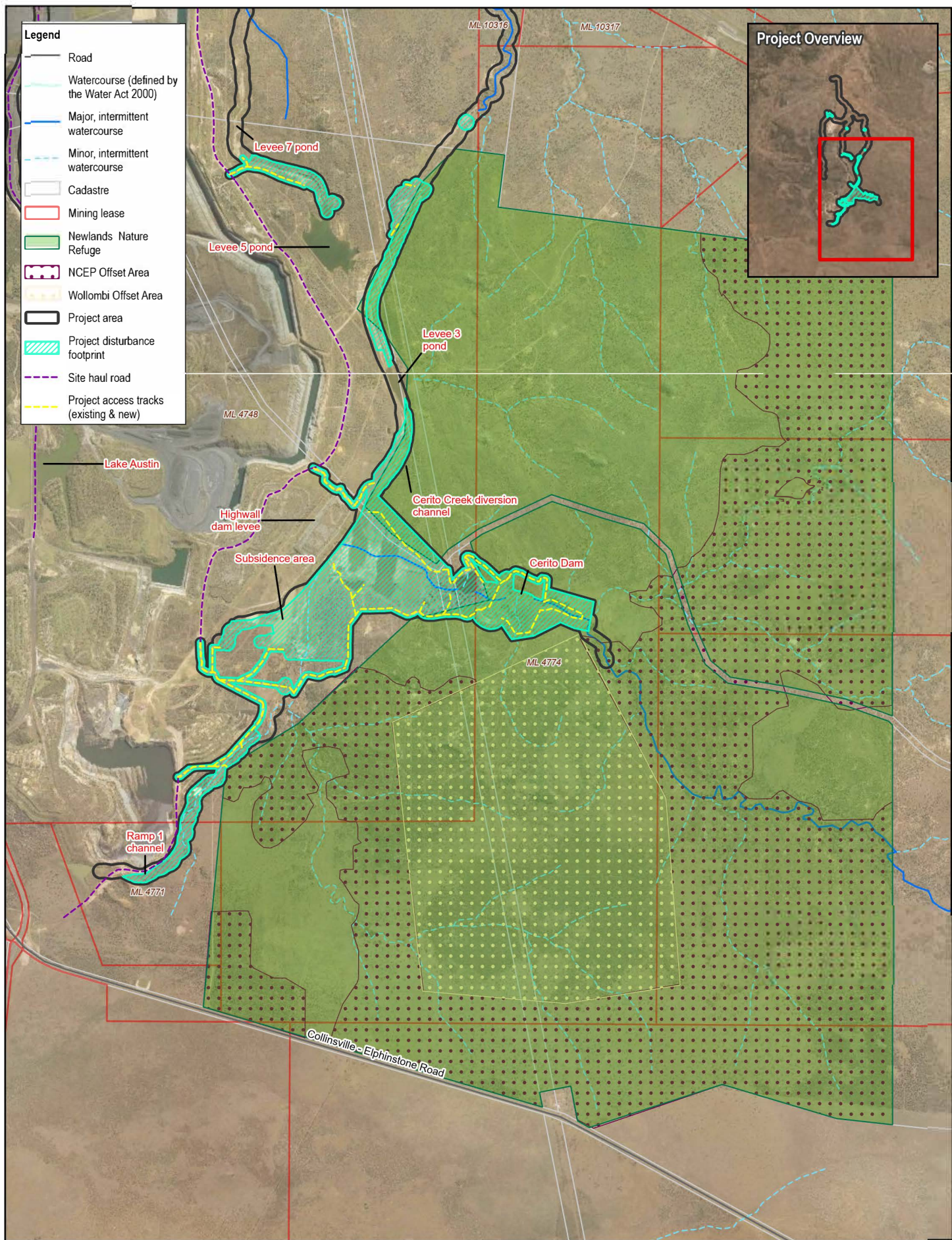


NC Coal Company Pty Limited
Newlands Closure Project – Cerito Creek Permanent
Diversion System

Project No. 12611481
Revision No. 0
Date 12/09/2025

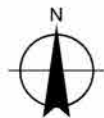
Impact area for threatened species
and ecological communities

FIGURE 1.3a



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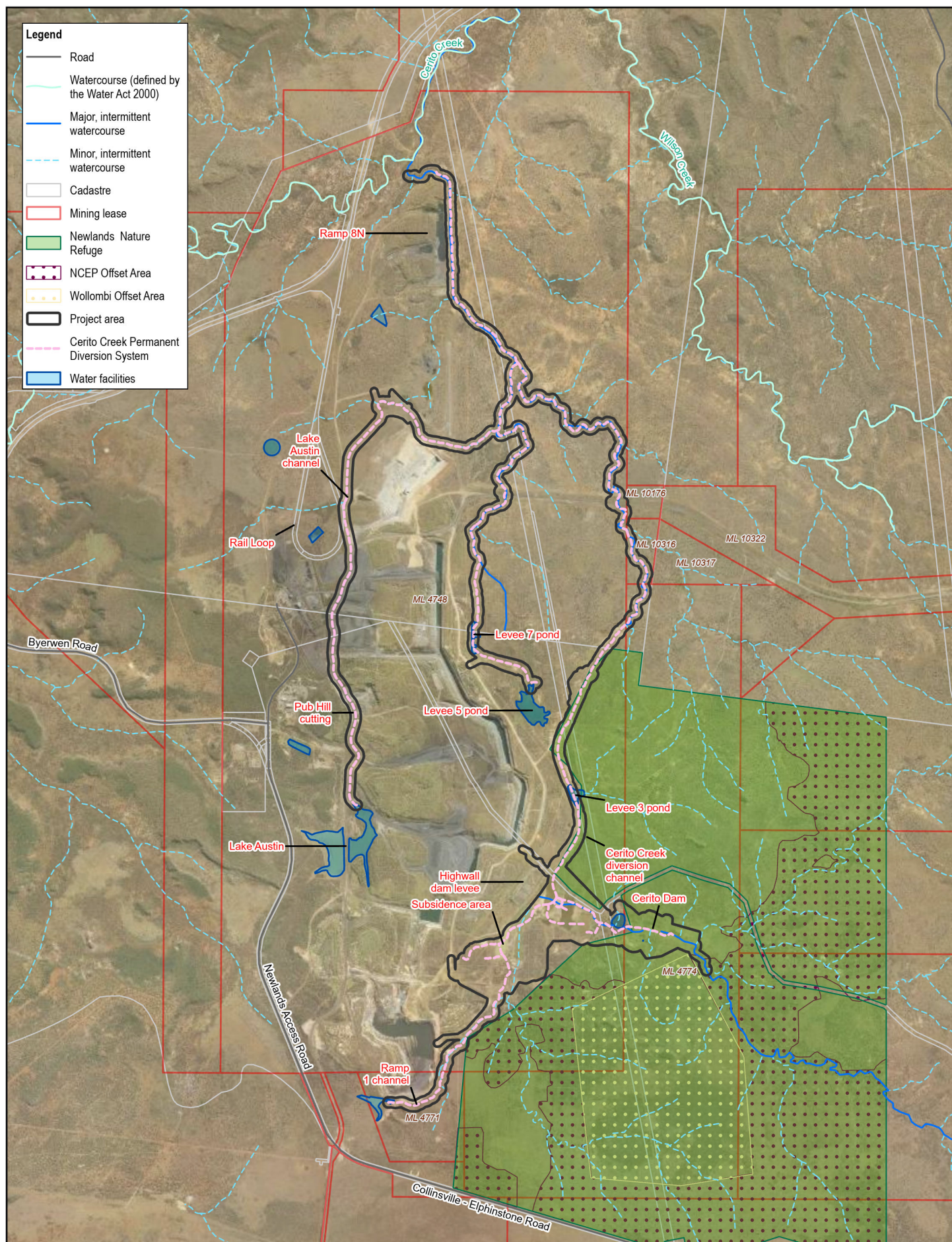


NC Coal Company Pty Limited
Newlands Closure Project – Cerito Creek Permanent
Diversion System

Impact area for threatened species
and ecological communities

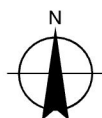
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FIGURE 1.3b



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Kilometres

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Horizontal Datum: GDA2020
Grid: GDA2020 MGA Zone 55



NC Coal Company Pty Limited
Newlands Closure Project – Cerito Creek Permanent
Diversion System

Impact area for water
resources trigger

Project No. 12611481
Revision No. 0
Date 12/09/2025

FIGURE 1.4

2. Project description

2.1 Cerito Creek characteristics

Cerito Creek is a dynamically evolving, incised, ephemeral watercourse, i.e., the deep channel is frequently dry and can change rapidly in response to flood events. The natural channel has adapted to the wide range of flows in the region, developing a distinct low-flow channel enclosed within a much larger flood channel. Six natural and nine diversion reaches occur within the system (including reaches of Cerito Creek upstream and Kangaroo Creek downstream of the mine disturbance), each with a distinctive set of geomorphological characteristics, such as channel shape and sediment dynamics.

Descriptions of each of the design reaches are provided in Appendix A, Section A-1 of this report. The design reaches are shown on Figure 2.1.

A comparison of diversion reaches, and natural reaches (including adjacent tributaries) found that:

- The natural and existing diversion channels of the Cerito Creek system are strongly bedrock-controlled. Bedrock-controlled reaches are narrower, deeper and straighter than those incised into weaker material. Aerial imagery from 1959 indicated that the diverted pre-mine alignment of Cerito Creek had extensive straight, bedrock-controlled reaches with elongated pools.
- Fourteen rock steps, ranging from 1 m to 6 m in height, were identified within the natural reaches, natural tributaries and southern diversion (Appendix A, Section A-2). These had formed in outcropping sandstone and basalt.
- Longwall-related mine subsidence has created topographic lows that are up to 1.7 m below the downstream channel invert within Reach 3, creating a backwater upstream of the southern diversion, which is frequently inundated during the wet season. Prior to mine development and construction of the current existing diversion, this area was a broad floodplain, which was periodically inundated during extreme flood events.
- The existing southern diversion has a significantly larger cross-section and shallower slope than the natural channels and existing northern diversion. The existing southern diversion has two broad reaches, where the constructed channel crosses former tributaries (Reach 5 and Reach 7).
- Much of the existing southern diversion has no defined low-flow channel. Where a low-flow channel is present, the dimensions are similar to those in the natural reaches, with an average width of about 8 m (varying between 3 m and 12 m) and depth of about 1 m (varying between 0.2 m and 2.6 m). The active channel is larger where bedrock-controlled.
- Soils in the local region are highly erodible, being dispersive (sodic), soluble (due to the high calcium content) and erodible due to high fine sand / silt content. Rilling, piping, gully, sheetwash and rain splash are common, both along the existing diversions and within the natural channels.
- The natural channels typically have a sediment bed of deep, mobile, coarse sand, which is episodically mobilised during flood events. Sediment throughput has been disrupted by Cerito Dam and the southern diversion, due to the low bed slope, but is consistent with the natural system through the existing northern diversion.
- The steep benched existing northern diversion has similar geomorphological features and dimensions to the natural channel and is performing better than the shallow, deep existing southern diversion. However, the existing southern diversion has developed some geomorphological features, including sediment benches (typically where material has been trapped by vegetation) and pool / riffle sequences.

2.2 Design objectives

The Project design was based on the findings of site-specific condition assessments in order to align with key hydraulic, geomorphological, environmental and construction objectives, with the aim of developing a relinquished landform and permanent diversion that is safe, stable and environmentally sustainable.

The key objectives of the design of the Project are:

- Provide a stable landform condition, in accordance with s111A of the *Environmental Protection Act 1994* (EP Act) (Qld), including that:
 - The land should be safe and structurally stable
 - There should be no environmental harm caused by anything on or in the land
 - The land should be able to sustain a post-mining land use.
- Avoid and minimise impacts on MNES and minimise disturbance within the Newlands Nature Refuge, an area established in 2007 containing biodiversity offset areas for significant impacts of the Newlands Coal Extension Project (EPBC No. 2011/5968) and Wollombi Open Cut Coal Mine - Suttor Creek ML4761 Extension (EPBC No. 2005/2015). The Newlands Nature Refuge is located directly east of Main Deposit and contains upstream reaches of Cerito Creek.
- Remove engineered structures constructed in 1988, appropriate to hydraulic outcomes, including Cerito Dam and the drop structure.
- Comply with the functional design requirements in the Queensland Guideline: *Works that interfere with water in a watercourse for a resource activity – watercourse diversions authorised under the Water Act 2000* (OSW/2019/4599) (Department of Natural Resources, Mines and Energy (DNRME), 2019).
- Align with Australian Coal Association Research Programme (ACARP) best practice engineering principles and guidelines, including ACARP / DNRME hydraulic guidelines for the 50% Annual Exceedance Probability (AEP) and 2% AEP flood events.
- Accommodate the 0.1% AEP (approx. 1 in 1000 AEP) flood event without adverse impacts or floodwater inputs to final voids.
- Restore throughput of flow and sediment within the Cerito Creek system retaining existing water storage ponds.
- Incorporate geomorphological features, such as a defined low-flow channel, benches, sediment bars and pool / riffle sequences.
- Retain existing mature, stabilising vegetation, where practicable.
- Accommodate post-mining landholder access.

The Cerito Creek permanent diversion system will be authorised by the Queensland Government through the grant of a Water Licence under the *Water Act 2000* (Qld).

2.3 Project activities

The Project will involve linking of channels, removal of engineered structures, creation of low-flow channels, remediation of erosion, and rehabilitation of an area of past subsidence, amongst other activities, where necessary to reinstate natural flow and sediment transport in Cerito Creek and its tributaries. Project activities will be undertaken in previously mined and disturbed areas, rehabilitated areas, and to a lesser extent, undisturbed areas (resulting from linking into and integrating with natural ephemeral flow paths).

The Project design prioritises the re-establishment of natural ephemeral watercourse characteristics and the retention of mature, stabilising vegetation. It seeks to avoid and minimise disturbance in areas that comprise or contain habitat for conservation significant species. The Project will not impact the biodiversity offset areas for the Newlands Coal Extension Project (EPBC No. 2011/5968) and Wollombi Open Cut Coal Mine – Suttor Creek ML4761 Extension (EPBC No. 2005/2015) located within Newlands Nature Refuge area. Disturbance in the Newlands Nature Refuge (outside of the two biodiversity offset areas) is authorised under the Newlands Open Cut (Glencore): PLN Biodiversity Management Plan, however additional disturbance by the Project will be minimised.

To achieve the above, the following Project activities are proposed:

- Vegetation clearing for:
 - Diversion earthworks (consisting largely of in-channel works and disturbance of riparian vegetation and will therefore have more of a direct and indirect impact to aquatic species, habitats and functions); and
 - Construction and maintenance access (establishment of new Project access tracks to gain entry at key locations where in-channel earthworks are proposed to occur and for widening of existing Project access tracks).
- In-channel earthworks, including blasting of areas of strong competent basalt and sandstone layers within the diversion system although a design objective is to minimise blasting through avoidance of strong, competent rock, typically Rewan Group sandstone layers and Tertiary basalt flows. Areas envisaged to require blasting are as follows:
 - At the drop structure due to challenging access and some medium to high strength sandstone and rock layers within the target excavation depth.
 - Along Lake Austin channel due to strong basalt layers in the upstream reaches of the proposed new channel and deep gravely fill expected to be encountered adjacent to Pub Hill cutting.
- Permanent access track construction for post-construction monitoring and to accommodate post-mine landholder access, including replacing existing culvert crossings with bed level causeways.
- Temporary and permanent erosion and sedimentation controls both during and post-construction.
- Temporary and permanent spoil stockpiles during and post-construction (which will be located in previously mined and/or disturbed areas).
- Temporary and permanent fences to prevent livestock from accessing rehabilitated areas until such time that adequate ground cover and riparian vegetation has established around areas that require additional protection from grazing pressures.
- Temporary laydown areas (which will be located in previously mined and/or disturbed areas).
- Revegetation of riparian areas and rehabilitation of temporary construction areas.

2.3.1 Project components and design rationale

Geomorphological research has identified that, in general, historical diversion channels do not perform well hydraulically and functionally, in terms of ecosystems and habitat, for the following reasons (Hardie and White, 2000; Flatley and Markham, 2021):

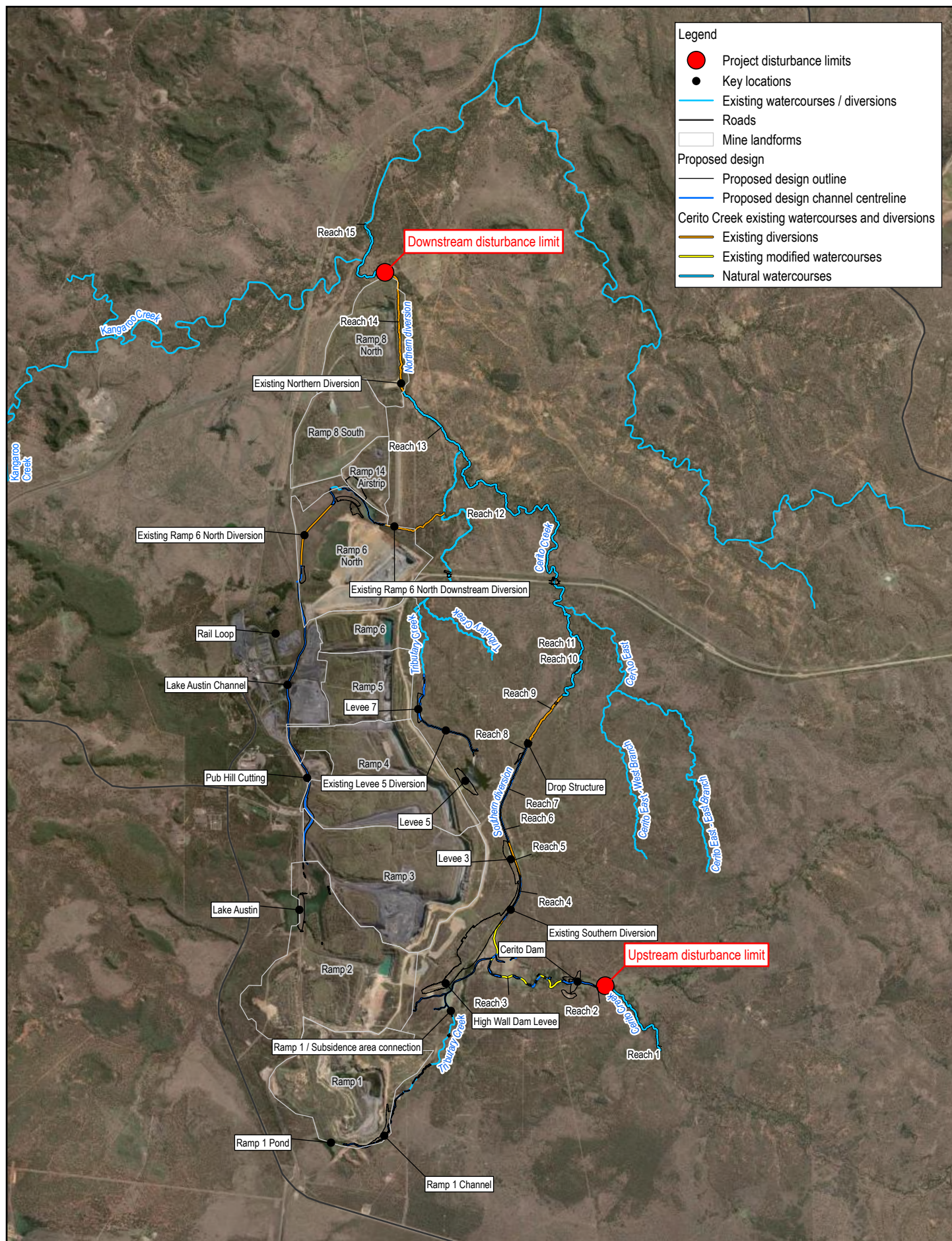
- Inappropriate channel dimensions, typically larger than natural, due to conservative flood modelling and a requirement to accommodate high magnitude / low frequency floods (e.g., 1% AEP or 0.1% AEP floods), with associated disruption in sediment dynamics (erosion and / or deposition).
- Lack of vegetation establishment.
- Higher erosion rates than in natural channels, frequently due to increased bed slope (due to a reduction in channel length) and consequent increased velocity. Diversions in the 1980s, such as Cerito Creek, used drop structures to compensate for the reduced channel length / potential increase in bed slope.
- The predominance of dispersive soils exposed along diversion channels also increased vulnerability to adverse erosion.
- Poor replication or disturbance of in-channel habitat.
- Adverse impacts upstream and downstream of the diversion channel.

The design rationale for the major Project components are described in Table 2.1. The design reaches are shown on Figure 2.1. Typical sections for the Cerito Creek permanent diversion system are provided in Appendix B.

Table 2.1 *Project components and design rationale*

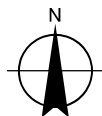
Project component	Proposed design description	Design rationale
General	– Enhancement or incorporation of geomorphological features. – Long-term monitoring / maintenance (during relinquishment) and landholder access.	– Enhancement of existing geomorphological features, or introduction of constructed features, including • Pool / riffle sequences, particularly within steeper constructed reaches • Rock steps analogous to natural features • Benches, berms and sediment bars • Riparian corridor and / or vegetated buffer. – Construction and upkeep of Project access tracks for the monitoring and maintenance programme post-construction, and longer-term access for landholders.
Ramp 1 Channel	– Channels linking the Ramp 1 Pond to the existing Cerito Creek tributary.	– Geomorphologically-sensitive landform, which redirects existing creek away from the final void. – Spoil material short haul for Ramp 1 final void flood protection up to 0.1% AEP events. – Reduced impact on landscape / existing vegetation through creation of a free-draining watercourse without enlarging the existing water storage or creating an over-sized channel.
Reach 2 Cerito Dam	– Removal of Cerito Dam – Link channel to original channel downstream.	– Refinements to reduce or avoid rock protection. – Creation of constructed channel through sediments deposited upstream of dam to reduce likelihood of uncontrolled erosion. – Spoil material short haul from dam decommissioning to rehab spillway and deeply incised dam discharge channel.
Reach 3 Subsidence area	– Link channels through subsidence area. – Flood expansion area upstream of existing southern diversion.	– Cuts through remnant pillars to improve flow and sediment throughput. – Final void flood immunity up to 0.1% AEP event. – Flood expansion area adjacent Highwall Dam levee to improve performance and capacity, reducing backwater effects upstream of narrow Reach 4 during large flood events. – Retain existing diversion to capture hillside runoff.
Existing southern diversion, Reach 4 - 9	– Creation of low-flow channel. – Removal of drop structure. – Severe erosion remediation.	– Low-flow channel through existing diversion to improve throughput of flow and sediment and minimise water retention within Reach 3 and Levee 3 Pond. – Removal of drop structure and creation of rock steps analogous with natural features in the area. – Remediation of longwall-impacted area and severely eroding areas.
Levee 5 and 7	– Creation of low-flow channel.	– Final void flood immunity up to 0.1% AEP event. – Low-flow channel through diversion to improve throughput of flow and sediment. – Rock steps incorporated through steep section upstream of Levee 7.
Existing northern diversion Reach 14	– Preservation and enhancement of existing diversion.	– Preservation of: • Mature geomorphological features and vegetation • Good flood / sediment throughput • Accommodates 0.1% AEP flood with excess capacity.

Project component	Proposed design description	Design rationale
Lake Austin channel	– Link channel from Lake Austin and runoff final landform through the existing diversions at Ramp 6 to Cerito Creek. – Flood expansion area in downstream reaches. – Remediation of severely eroding areas.	– Channel accommodating 0.1% AEP flood – Modification of existing Ramp 6 North diversion, where perched on hillside. – Rerouting of flow and runoff from final landform into existing tributary through the existing diversions at Ramp 6 to Cerito Creek. Velocity control management is anticipated to be required, using basalt from Lake Austin channel excavation. – Creation of new and retention of existing flood expansion areas to improve performance and capacity, reducing backwater effects upstream of existing narrow Ramp 6 North downstream diversion during large flood events. – Remediation of severely eroding gully system above right bank of existing Ramp 6 North downstream diversion.
Project access tracks	– Widening of existing Project access tracks for construction. – Construction of new Project access tracks.	– New temporary access tracks branching off from existing access tracks will be required to provide construction access to the in-channel works. – Project access tracks will need to accommodate the use of both light vehicles and heavy vehicles. Heavy vehicles to be utilised on-site during construction includes graders, bulldozers and excavators. – Project access tracks, branching off from the Eastern Creek haul road that runs west to east across the central area of the Project, may be required to provide ongoing access for post-construction monitoring. They may also be retained permanently on-site for use by the post-mining landowner where agreed in writing (including as stock mustering corridors and fire breaks).
Causeways	– Replace existing culvert crossings along the Cerito Creek permanent diversion system with bed level causeways.	– Existing culvert crossings will be replaced with bed level causeways to: • Improve flow and sediment throughput • Reduce barriers to fauna movement • Provide ongoing access for type 2 road trains and four-wheel drive vehicles for rehabilitation monitoring and maintenance, and post-mining land use.



Paper Size ISO A4
0 0.5 1 1.5 2
Kilometres

Map Projection: Transverse Mercator
Horizontal Datum: GDA2020
Grid: GDA2020 MGA Zone 55



NC Coal Company Pty Limited
Newlands Closure Project
Cerito Creek Permanent Diversion System

Design Reaches

Project No. 12611481
Revision No. Rev 0
Date 15/07/25

FIGURE 2.1

2.3.2 Revegetation

The Project aims to retain and enhance existing floodplain and in-channel native vegetation, while infilling those reaches where vegetation density or diversity is lacking. Revegetation plans will be developed in accordance with the Water Licence conditions and revegetation requirements in the EA EPML00817713, with consideration of guidelines for establishment of riparian corridors (e.g., Queensland soil conservation guidelines: Carey *et al.*, 2015) and recognition of the importance of successful revegetation in runoff and erosion control.

Revegetation will be prioritised at the following locations:

- All constructed or modified diversions and channels.
- Along the existing southern diversion margins. Establishment of a vegetated buffer in this area, particularly within areas adjacent to severe erosion, will improve the ecological value and functioning of this area, as well as reducing overland flow erosion of the diversion wall.
- Within rehabilitated erosion areas, e.g., the currently eroding gully systems identified for rehabilitation along the existing southern diversion right (eastern) wall and existing Ramp 6 North downstream diversion, and severely eroding areas on the eastern spoil pile at Ramp 8.

Vegetation selection will be compliant with revegetation requirements in the EA EPML00817713 and consider existing habitat values, as well as field-verified vegetation communities within the proposed works area. Hollows and fallen branches will be left *in situ* where practicable. Hydroseeding, hydromulching or direct seeding may be undertaken as shown in Table 2.2.

Table 2.2 *Revegetation*

Landform / area	Revegetation methods
Bulk earthworks, including: – Cerito Dam / spillway removal – High wall dam levee / flood expansion area – Levee 3, 5 and 7 reprofiling / removal areas – Existing Ramp 6 North diversion upstream reshaping area – Existing Ramp 6 North downstream diversion removal area / flood expansion area.	– Broad scale soil improvement, hydroseeding, hydromulching and broad scale revegetation techniques. – It is anticipated that revegetation in these areas would comprise native grasses appropriate for the area. – Use of mulch and / or topsoil, where required / available.
Major cuts into soil, including: – Lake Austin to Pub Hill Cutting, above rock cut, and deeper sections of Lake Austin channel above the rock head (intermediate domain of the Pub Hill cutting to existing Ramp 6 North diversion) – Reach 8 earthworks, longwall remediation area and upper walls of drop structure remediation area. Minor earthworks, including: – Culvert removal areas.	– Direct seeding / hydroseeding or hydromulching, depending on access. – Vegetation variability is anticipated following flow events bringing other species from upstream / overbank, as per the existing diversions. – Use of mulch and / or topsoil, where available and where appropriate (i.e., where unlikely to be washed off steep slopes into the diversion / channel). – Use of soil improvement to treat dispersive soils, e.g., Reach 8 spoil and existing southern diversion works. Lake Austin channel soils within upstream and downstream reaches are unlikely to be dispersive due to their basaltic parent material.
Minor / low-flow channels, including: – Ramp 1 Channel – Reach 2 / 3 minor channels upstream of Cerito Dam and joining subsidence troughs – Low-flow channel along Reaches 4-8 – Levee 5 diversion low-flow channel and Levee 7 link channel – Smaller dimension reaches of Lake Austin channel.	– Complete revegetation to establish grassy swale, except low-flow channel, where bed would be left bare to encourage sediment throughput. – Vegetation variability is anticipated following flow events bringing other species from upstream / overbank, as per the existing diversions. – Placement of large woody debris at selected locations to improve geomorphological / habitat functioning and encourage species diversity.
– Riparian corridor and vegetated buffers – Inner floodplains (within incised channels / diversion trenches).	– Trees and other woody vegetation will be introduced with appropriate species and planting density, i.e., in keeping with adjacent remnant or regrowth fully-structured vegetation.

2.4 Excluded activities

The following activities are excluded from the Project:

- Rehabilitation and closure activities currently authorised as part of the existing Newlands Coal Mine (including under the EA EPML00817713) and approvals under the EPBC Act (Cth) for the Newlands Coal Extension Project (EPBC No. 2011/5968) and Wollombi Open Cut Coal Mine - Suttor Creek ML4761 Extension (EPBC No. 2005/2015) are excluded from the Project.
- Ongoing use of existing access roads, and monitoring and maintenance of existing infrastructure (including repairs to existing culvert and bed level crossings), related to the current land uses, operations and closure activities are excluded from the Project.
- On-ground assessments are excluded from the Project, such as topographical surveys, ecological surveys, geotechnical assessments and works pertaining to the management or salvage of Aboriginal cultural heritage items.

2.5 Project timing

Construction is anticipated to take approximately three years with the Project to commence in December 2026 and be completed in December 2029.

Post-construction monitoring at 1, 2, 5 and 10 years is considered a fundamental part of confirming that the Cerito Creek permanent diversion system functions as intended until trends indicate no change and the rehabilitation has been certified. Therefore, an operation and maintenance program of approximately 10 years from 2030 to 2040 is proposed.

The total duration of the proposed action is 14 years from December 2026 to December 2040.

2.6 Alternatives

Cerito Creek was originally diverted in 1988 (with subsequent repairs and modifications occurring between 1988 and 2016), authorised by the Queensland Government through temporary Water Licences. The option of doing nothing is not considered to be a feasible option and would not comply with the relinquishment requirements of the existing Water Licences. The removal of Cerito Dam, as a regulated structure, along with the removal of other engineered structures (such as the drop structure and culvert crossings) and repairs to the subsidence area must also occur to comply with the Rehabilitation Goals and Criteria (Table H1 – Rehabilitation Requirements) set out in the EA EPML00817713 to achieve mine closure.

The design of the Cerito Creek permanent diversion system incorporates the findings of site-specific condition assessments in order to align with key hydraulic, geomorphological, environmental and construction objectives, with the aim of developing a relinquished landform that is safe, stable and environmentally sustainable.

Investigations were undertaken to identify opportunities and constraints related to achieving the relinquishment of the Water Licences and Newlands Coal Mine EA requirements. Conceptual options were developed for elements within the Cerito Creek diversion system.

The preferred option from the investigations identified the opportunity to upgrade and/or introduce a variety of channels to rehabilitate the site, from which the Cerito Creek permanent diversion system design has been developed.

2.7 Legislative context

2.7.1 Commonwealth

2.7.1.1 EPBC Act

The EPBC Act (Cth) is the principal environmental law administered by the Commonwealth Department of Climate Change, Energy, the Environment and Water (DCCEEW). The EPBC Act (Cth) provides for the protection of MNES, which are categorised within the following nine controlling provisions:

- World heritage properties
- National heritage places
- Wetlands of international importance
- Threatened species and ecological communities
- Migratory species
- Commonwealth marine areas
- Great Barrier Reef Marine Park
- Nuclear actions (including uranium mines)
- Water resources, in relation to all unconventional gas and large coal mining development.

Any action that is likely to have a significant impact on MNES is required to be referred to DCCEEW for determination under the EPBC Act (Cth). The proposed action is to be assessed against the relevant guidelines, including:

- Significant Impact Guidelines 1.1 – Matters of National Environmental Significance (Significant Impact Guidelines 1.1) (DoE 2013a)
- Significant Impact Guidelines 1.3: Coal seam gas and large coal mining developments – impacts on water resources (Significant Impact Guidelines 1.3) (DCCEEW 2022d).

Development at Newlands Coal Mine began in 1981, with the mine opening in December 1981 and operating up until February 2023. As part of the Newlands Closure Project, NCC is progressively rehabilitating the existing mine complex to comply with the closure requirements of the EA EPML00817713, and in accordance with the PRCP currently under assessment by the Queensland DETSI.

The EPBC Act (Cth) (under Division 6, Part 4) recognises the prior authorisation of the existing Newlands Coal Mine including previous mining operations and the current closure activities, other than where expansion projects have been the subject of additional referrals and subsequent approvals by the Minister, namely for the Newlands Coal Extension Project (EPBC No. 2011/5968) and the Wollombi Open Cut Coal Mine - Suttor Creek ML4761 Extension (EPBC No. 2005/2015).

Residual significant impacts, which may be remaining after avoidance and minimisation measures are assessed for a proposed action, may be offset in accordance with the *EPBC Act Environmental Offsets Policy (October 2012)* (Cth).

2.7.1.1.1 Application of the water resources trigger

Water resources in relation to all unconventional gas and large coal mining developments are considered MNES under the EPBC Act (Cth) (referred to as the 'water trigger' under the EPBC Act).

The water trigger and activities covered by the water trigger, exemptions, and significant impact criteria are described in the Significant Impact Guidelines 1.3 (DCCEEW 2022d).

A 'large coal mining development' is defined under the EPBC Act (Cth) (section 528) as any coal mining activity that has, or is likely to have, a significant impact on water resources (including any impacts of associated salt production and/or salinity):

- In its own right; or

- When considered with other developments, whether past, present or reasonably foreseeable developments.

The Significant Impact Guidelines 1.3 (DCCEEW 2022d) state that an action will involve a large coal mining development if the action is so closely associated with the extraction of coal as to be integral to it. Section 2.4 of the Significant Impact Guidelines 1.3 (DCCEEW 2022d) states that infrastructure that is an integral part of the extraction of coal is likely to be included in the definitions, as are whole-of-life activities, including mine closure and completion activities.

While proposals will be considered by DCCEEW on a case-by-case basis, examples of activities that are likely to be considered an integral part of the extractive process include:

- The decommissioning of coal mines
- Decommissioning of infrastructure to provide water supply for use in coal extraction (or dust suppression)
- The management of water through holding dams
- The disposal of water produced from coal mining into watercourses.

Therefore, for the purposes of this assessment, the Cerito Creek permanent diversion system is considered to be a 'large coal mining development with the potential to impact a water resource', due to being for the purpose of mine closure and rehabilitation integral to the formerly operating Newlands Coal Mine.

2.7.1.2 Native Title Act 1993

The recognition of rights and interests in land by Aboriginal and Torres Strait Islander peoples is administered through the *Native Title Act 1993* (Cth) for activities or works with the potential to affect native title by extinguishing native title rights or creating interests which are inconsistent with the existence of native title.

There are two native title determinations in favour of the Birriah People (QCD2016/001) and the Jangga People (QCD2012/009) for the region.

No changes to the mining tenements or additional restrictions with respect to site access for native title holders are currently proposed as part of the Project.

2.7.2 Queensland

2.7.2.1 Environmental Protection Act 1994 (EP Act)

The EP Act (Qld) provides for the granting of EAs for resource activities – mining activities. In giving approval under the EP Act (Qld), the Queensland DETSI must address the regulatory requirements set out in the *Environmental Protection Regulation 2008* (Qld) and impose conditions to reduce or avoid potential environmental impacts.

NCC holds an existing EA EPML00817713 for mining activities at Newlands Coal Mine, covering the Project MLs 4748, 4771, 4774, 10176 and 10316. Mining at Newlands Coal Mine ceased in February 2023, and the mine is undergoing site-wide rehabilitation and closure activities. As part of the Newlands Closure Project, NCC is progressively rehabilitating the existing mine complex to comply with the closure requirements in EA EPML00817713, and in accordance with the PRCP currently under assessment by the Queensland DETSI.

In addition to the closure requirements in EA PML00817713, NCC must also meet other obligations under the EP Act (Qld), and the regulations made under the EP Act (Qld), including the general environmental duty under section 319 of the EP Act (Qld). Appropriate construction management measures and monitoring will be implemented for the Project to meet these obligations.

2.7.2.2 Environmental Offsets Act 2014

When deciding an EA application that proposes to impact Matters of State Environmental Significance, the Queensland DETSI must also consider whether to impose a condition requiring the delivery of an environmental offset under the *Environmental Offsets Act 2014* (Qld), as provided for under section 207(1)(c) of the EP Act (Qld). Environmental offset requirements for the site-wide rehabilitation and closure activities as part of the Newlands

Closure Project has formed part of the assessment for the existing EA EPML00817713 (last issued on 11 June 2025).

2.7.2.3 Water Act 2000

A Water Licence under the *Water Act 2000* (Qld) is required to divert the flow of water or to impound water. Temporary Water Licences currently authorise the existing Cerito Creek diversion system and engineered structures (i.e. Cerito Dam and the drop structure). The Department of Local Government, Water and Volunteers (DLGWV) has advised that a new Water Licence will be required to authorise the Cerito Creek permanent diversion system and relinquish the existing temporary Water Licences.

A Riverine Protection Permit is required when undertaking work that requires the excavation, placement of fill or destruction of vegetation within a watercourse, lake or spring. The holder of an EA (for a resource activity) under the EP Act (Qld) can use the Riverine protection permit exemption requirements WSS/2013/726 (Version 2.03 2/06/2023); however, construction works and activities associated with the Project are unlikely to be able to achieve the minimum requirements with respect to clearing limits and material limits outlined in the Riverine protection permit exemption requirements WSS/2013/726. Therefore, a Riverine Protection Permit will likely be required for the Project, including the causeways.

2.7.2.4 Aboriginal Cultural Heritage Act 2003

The *Aboriginal Cultural Heritage Act 2003* (Qld) directs Cultural Heritage Risk Assessments to identify high-risk areas for significant cultural items or places. Consultation with Aboriginal parties and a Cultural Heritage Management Agreement are key parts of the process.

A number of cultural heritage sites within a 10 km radius of the Project have been recorded from previous clearance surveys undertaken in 1978, 2002, 2003, 2005, 2010, 2014, 2018, 2019 and 2021.

The two Traditional Owners for the area are the Birriah People and Jangga People. NCC has executed separate Cultural Heritage Management Plans with the Birriah People (in 2010) and Jangga People (in 2004), which provides guidelines and processes that must be strictly followed when engaging with the Traditional Owners.

NCC has commenced engagement activities with the Birriah People and Jangga People to confirm survey requirements and start to schedule cultural heritage surveys and salvage of Aboriginal Cultural Heritage, where necessary, within the Project Area prior to commencement of construction.

2.7.2.5 Biosecurity Act 2014

The *Biosecurity Act 2014* (Qld) provides a framework for an effective biosecurity system for Queensland. This Act is relevant when a project is located within a designated Biosecurity Zone, or where restricted matters are present.

A General Biosecurity Obligation applies to all persons. Compliance with this Act will be required during the construction phase to prevent spread of existing pest species and the introduction of new prohibited or restricted pest species. Measures will include active weed management during and after construction.

2.7.2.6 Nature Conservation Act 1992 (NC Act)

The NC Act (Qld) is concerned with the protection of protected plants and animals, including animal breeding places, and protected areas. If an action is proposed that will tamper with animal breeding places, it must comply with the *Nature Conservation (Animals) Regulation 2020* and potentially requires a Species Management Program to be approved by DETSI. A high-risk Species Management Program will be implemented for the Project prior to removal of any denning trees for greater glider.

The *Nature Conservation (Koala) Conservation Plan 2017* includes independent clearing requirements for overall districts within Queensland and for types of koala habitat, in order to protect koalas from being injured or killed during clearing. Provisions include sequential clearing methods and the use of a qualified fauna spotter. Suitably qualified and experienced fauna spotter-catchers will be engaged to undertake pre-clearance surveys prior to clearing and to supervise the clearing process.

Clearing of vegetation within 100 m of a known occurrence of a threatened plant listed under the NC Act (Qld) requires a Protected Plant Clearing Permit to be obtained from DETSI. This will be required for the Project prior to clearing within 100 m of the king blue-grass individuals.

3. Methods

A desktop assessment was undertaken to identify and collate existing information on the potential MNES values within the Project disturbance footprint including location-specific information on threatened flora and fauna species, migratory bird species, and ecological communities. Desktop searches are detailed in Section 3.1.

Field surveys have been undertaken within the Project Area, targeting the Project disturbance footprint and surrounding areas, which are described further in Section 3.2.

3.1 Desktop searches

The desktop search extent generally encompassed areas within a 10 km buffer of the Project Area and included searches of the databases and mapping layers up to 20 km from the Project Area. Databases and desktop mapping utilised during the desktop assessments is summarised in Table 3.1 and provided in Appendix C.

Table 3.1 Desktop assessment information sources

Desktop search	Purpose
Commonwealth	
Protected Matters Search Tool (PMST)	The Commonwealth DCCEEW PMST search was conducted to identify MNES protected under the EPBC Act (Cth) that have the potential to occur within the study area (Project Area plus 10 km buffer was searched, dated September 2025).
Species Profile and Threats Database (SPRAT)	The DCCEEW SPRAT profiles were assessed to determine habitat requirements and ecology of potentially occurring conservation significant species.
Commonwealth Conservation Advice	The Commonwealth Conservation Advice for individual species and TECs were reviewed to identify the field survey and patch requirements, community characteristics, diagnostic criteria and conditions thresholds applicable for accurate field identification.
State (Queensland)	
Atlas of Living Australia	The Atlas of Living Australia database was searched to retrieve historical records of conservation significant flora and fauna species previously observed within the Project Area.
WildNet database	The DETSI WildNet database was searched to retrieve historical records of conservation significant flora and fauna species within the lot and plans encompassing the Project Area.
Wildlife online	The wildlife online database was searched to retrieve a species list of conservation significant flora and fauna. Central coordinates were chosen (-21.20622,147.90844) with a 10 km buffer.
Biomaps Portal	The Biomaps mapping tool was used to review historical records of conservation significant flora and fauna species.
Essential habitat mapping	The DETSI Essential Habitat Map spatial layer was viewed to determine if regional ecosystems (REs) within the Project Area have been identified as essential habitat for a conservation significant species of wildlife listed under provisions of the NC Act (Qld).
Protected Plants Flora Survey Trigger Map	The DETSI Protected Plants Flora Survey Trigger Map spatial layer was viewed to identify the location of any high-risk trigger areas occurring within the Project Area, indicating previous records of modelled habitat of conservation significant flora species listed under the NC Act (Qld).
Species Profile Search	The DETSI Species Profile Search was used to obtain spatial records and accompanying data for native flora and fauna species previously recorded in proximity to the Project Area.
Birddata database	BirdLife Australia's Birddata database was reviewed for existing available migratory bird observations.

Desktop search	Purpose
Vegetation Management Report	The Department of Natural Resources and Mines, Manufacturing and Regional and Rural Development Vegetation Management Report was retrieved to identify the occurrence and distribution of regulated remnant and regrowth vegetation, RE types and protected plant trigger areas within the Project Area. REs are protected and regulated under the <i>Vegetation Management Act 1999</i> (VM Act) (Qld) and EP Act (Qld) and are used to provide information on habitats and the presence of TECs. Corresponding REs are generally listed in the conservation advice for TECs.
Groundwater Dependent Ecosystems Atlas	Bureau of Meteorology (BoM) online mapping developed as a national dataset of Australian Groundwater Dependent Ecosystems (GDEs) to inform groundwater planning and management.
Queensland Globe	Queensland Globe was used to identify a range of environmental constraints mapped over the Project Area. Layers searched on Queensland Globe include: – RE mapping – Watercourse mapping – Drainage basins and sub-basins – Queensland wetlands mapping – Water and wetland biodiversity for environmental values and management intent – Queensland waterways for waterway barrier works (WWBWs) mapping – Registered bores.

3.2 Previous studies

Previous studies and monitoring programs have been conducted within or near to the Project Area, these studies were reviewed, and relevant information summarised in Table 3.2.

Table 3.2 Previous studies within the Project Area

Survey outline	Year, month	Listed threatened or migratory species detected	Other species detected
NCC was required to undertake baseline seasonal flora and fauna surveys of the Newlands Nature Refuge and offset area that would form the basis of an on-going ecological monitoring program for the area.	2008	Squatter pigeon (19) Greater glider (1)	Little pied bat, rainbow bee-eater*, short-beaked echidna
Seasonal monitoring of birds, in particular identifying the extent and distribution of the squatter pigeon population and monitoring use of the Newlands Coal Mine by migratory species.	2008	Squatter pigeon (82)	White-bellied sea-eagle*, fan-tailed cuckoo*, shining bronze cuckoo*, black-eared cuckoo*, pallid cuckoo*, common koel*, channel-billed cuckoo*, dollarbird*, spangled drongo*, cicadabird*
Outline the management activities being undertaken for the Newlands Nature Refuge and the Wollombi Remnant Brigalow Area at the NCP.	2011-2012		Brigalow scaly-foot**
Update of the Biodiversity Offsets Strategy to include an additional offset area to meet the requirements of the <i>EPBC Act Environmental Offsets Policy (October 2012)</i> (Cth).	2015	Squatter pigeon	
Biodiversity monitoring measures undertaken within the Newlands Coal Extension Project (NCEP) Offset Area between August 2015 and May 2016. This monitoring was undertaken in accordance with the monitoring requirements of the NCEP Biodiversity Offsets Management Plan.	2015-2016	Greater glider	Little pied bat
MNES monitoring that has occurred within the vicinity of the NCEP mining leases during the previous 12 month reporting period (1 July 2016 to 30 June 2017).	2016-2017	King blue-grass (~127) Squatter pigeon (1)	Little pied bat, satin flycatcher*, rainbow bee-eater*
MNES monitoring that has occurred within the vicinity of the NCEP mining leases during the previous 12 month reporting period (1 July 2017 to 30 June 2018).	2017-2018	King blue-grass (~545) Squatter pigeon (21) Greater glider (3)	Rainbow bee-eater*, satin flycatcher*
MNES monitoring that has occurred within the vicinity of the NCEP mining leases during the previous 12 month reporting period (1 July 2018 to 30 June 2019).	2018-2019	King blue-grass (17) Squatter pigeon (36)	Rainbow bee-eater*, satin flycatcher*
The MNES survey for the NCEP monitors several MNES identified during the NCEP approval process, including threatened ecological communities, threatened species and migratory species.	2019, December	Squatter pigeon (17)	Rainbow bee-eater*, satin flycatcher*
MNES monitoring survey within the NCEP ML; as well as a biodiversity monitoring survey within the NCEP Offset Area, the Newlands Nature Refuge, the Wollombi No. 2 Offset Area and the Wollombi Remnant Brigalow Area.	2020, March	King blue-grass (135)	

Survey outline	Year, month	Listed threatened or migratory species detected	Other species detected
MNES monitoring survey within the NCEP ML; as well as a biodiversity monitoring survey within the NCEP Offset Area, the Newlands Nature Refuge, the Wollombi No. 2 Offset Area and the Wollombi Remnant Brigalow Area.	2020, May	Northern quoll	Short-beaked echidna
MNES monitoring survey within the NCEP ML; as well as a biodiversity monitoring survey within the NCEP Offset Area, the Newlands Nature Refuge, the Wollombi No. 2 Offset Area and the Wollombi Remnant Brigalow Area.	2020, September	Squatter pigeon (14)	Rainbow bee-eater*, satin flycatcher*
MNES monitoring survey within the NCEP ML; as well as a biodiversity monitoring survey within the NCEP Offset Area, the Newlands Nature Refuge, the Wollombi No. 2 Offset Area and the Wollombi Remnant Brigalow Area.	2020, December	Squatter pigeon (30)	Rainbow bee-eater*
To complete the monitoring activities in accordance with the monitoring methods and procedures outlined within the Newlands Open Cut (Glencore): PLN Biodiversity Management Plan. The monitoring activities undertaken as part of the recent monitoring event include vegetation and fauna monitoring.	2021, February	Squatter pigeon (20) Ornamental snake (2) Greater glider	Short-beaked echidna
Fauna monitoring was conducted as part of the design of ongoing monitoring of fauna species in relevant areas of management.	2021, September	Ornamental snake (1) Squatter pigeon (4)	Short-beaked echidna
Monitoring activities in accordance with the methods and procedures outlined within the Newlands Open Cut (Glencore): PLN Biodiversity Management Plan.	2022, March	King blue-grass (122)	
Monitoring activities in accordance with the monitoring methods and procedures outlined within the Newlands Open Cut (Glencore): PLN Biodiversity Management Plan.	2024, March	Squatter pigeon (10) Ornamental snake (1)	
To complete monitoring activities following the methods and procedures outlined within the Newlands Open Cut (Glencore): PLN Biodiversity Management Plan.	2024, May	Squatter pigeon (2) Greater glider (5)	
Surveys which targeted two MNES species (squatter pigeon and satin flycatcher), as well as surveys for biodiversity monitoring.	2024 August	Squatter pigeon (19)	
* Denotes species that were listed under the EPBC Act (Cth) at the time of survey, however are no longer listed threatened or migratory			
** Denotes species that were listed under the EPBC Act (Cth) at the time of survey, however are no longer listed			

3.3 Field assessment

3.3.1 Survey effort and conditions

Two rounds of ecology field surveys have been conducted by AARC and GHD ecologists within the Project Area. A summary of the field survey effort is presented in Table 3.3.

Table 3.3 Summary of survey effort (to date)

Date	Team	Flora survey effort	Fauna survey effort
22–25 March 2024	Two ecologists from AARC	– 25 quaternary assessments – 100 rapid observations – Traverse (meanders) for targeted flora survey – Field-verified vegetation mapping	– 35 rapid habitat observations – Targeted fauna surveys – Four water bird surveys at two waterbody locations (three person hours duration total) – Four spotlighting surveys at three sites (60 person minutes per survey site) – Four call playbacks at three sites (two-minute duration) – Two Spot Assessment Technique (SAT) survey sites
14–26 May 2024	Two ecologists from AARC	– 49 quaternary assessments – 12 BioCondition assessments – Observation points – Field-verified vegetation mapping – Traverse (meanders) for targeted flora survey	– 28 rapid habitat observations – 44 habitat characterisation points – Seven bird surveys at four locations – 12 spotlighting surveys at five sites (60–150 person minutes per survey site), including two spotlighting transects – One call playback (two-minute duration) – Three camera traps over five nights at two sites – Incidental sightings – One SAT survey sites
18–25 June 2024	Two ecologists from AARC	– 65 quaternary assessments – Two BioCondition assessments – Observation points – Field-verified vegetation mapping – Traverse (meanders) for targeted flora survey – Four secondary transects	– 53 rapid habitat observations – Two camera traps over five nights at two sites – Incidental sightings
26 February – 2 March 2025	Two ecologists from GHD	– Seven aquatic habitat only sites – A walking transect of approximately 100 m was conducted along the banks of the watercourse to identify aquatic plants growing in-stream or on the wetted banks	– 10 comprehensive assessment sites – ≥600 seconds of backpack electrofishing at seven sites – 355.5 hours of netting, in the form of fyke nets and box traps – Water quality in situ measuring

Date	Team	Flora survey effort	Fauna survey effort
10–14 March and 19–25 March 2025	Two ecologists from AARC	– 28 quaternary assessments – 2 grassland transects – 4 secondary transects – Observation points – Field-verified vegetation mapping – Traverse (meanders) for targeted flora survey	– 19 water bird surveys at 10 waterbody locations (20–120 person minutes duration) – 11 spotlighting surveys at six locations (30–120 person minutes duration) – Nine camera traps in seven locations (4–9 nights each) – Five bird surveys in three locations (30–60 person minutes duration) – Five diurnal searches (30–60 person minutes duration) – One SAT survey site – Incidental survey sites – 35 rapid habitat observations

The first ecological field survey was completed from 22 to 25 March 2024 to identify and describe the existing terrestrial ecological values within the Project Area. For the duration of the surveys, the weather was hot, sunny and calm with a slight south-east breeze, with temperatures ranging from 20.3°C to 33.1°C (Figure 3.1). A total of 0.7 mm of rain was recorded during the field surveys from the BoM weather station at Collinsville (Station number 033013), located 75 km from the Project Area (Figure 3.2). During the two weeks leading up to the survey, 6.2 mm of rain was recorded.

The second ecological field survey was completed from 14 to 26 May 2024 to identify and describe the existing terrestrial ecological values within the Project Area. For the duration of the surveys, the weather was warm, sunny and calm with a slight, alternating breeze from east, south, to south-southeast with temperatures ranging from 6.9°C to 30.2°C (Figure 3.1). A total of 0.2 mm of rain was recorded during the field surveys from the Collinsville weather station (Figure 3.2). During the two weeks leading up to the survey, 2.5 mm of rain was recorded.

Further additional flora surveys were carried out from 18 to 25 June 2024, with most of the work occurring after 22 June including areas which had not been previously visited. This period experienced generally drier, and notably cooler conditions, compared to those in March and May.

A post-wet aquatic ecology survey was completed between the dates of 26 February and 2 March 2025. For the duration of the survey, temperatures ranged from 17.9°C to 36.1°C, with no rain recorded over the period.

A post-wet terrestrial ecological field survey was undertaken from 10 to 14 March and 19 to 25 March 2025. A total of 88.4 mm of rain was recorded over the duration of the survey, with temperatures ranging from 20.3°C to 33.9°C.

Across the entire duration of the surveys, temperatures ranged from a minimum of 5.6°C to a maximum of 36.1°C (Figure 3.1). Little to no rain was recorded over most of the survey periods; with the exception of the March 2025 surveys, during which 88.4 mm of rain was recorded (Figure 3.2).

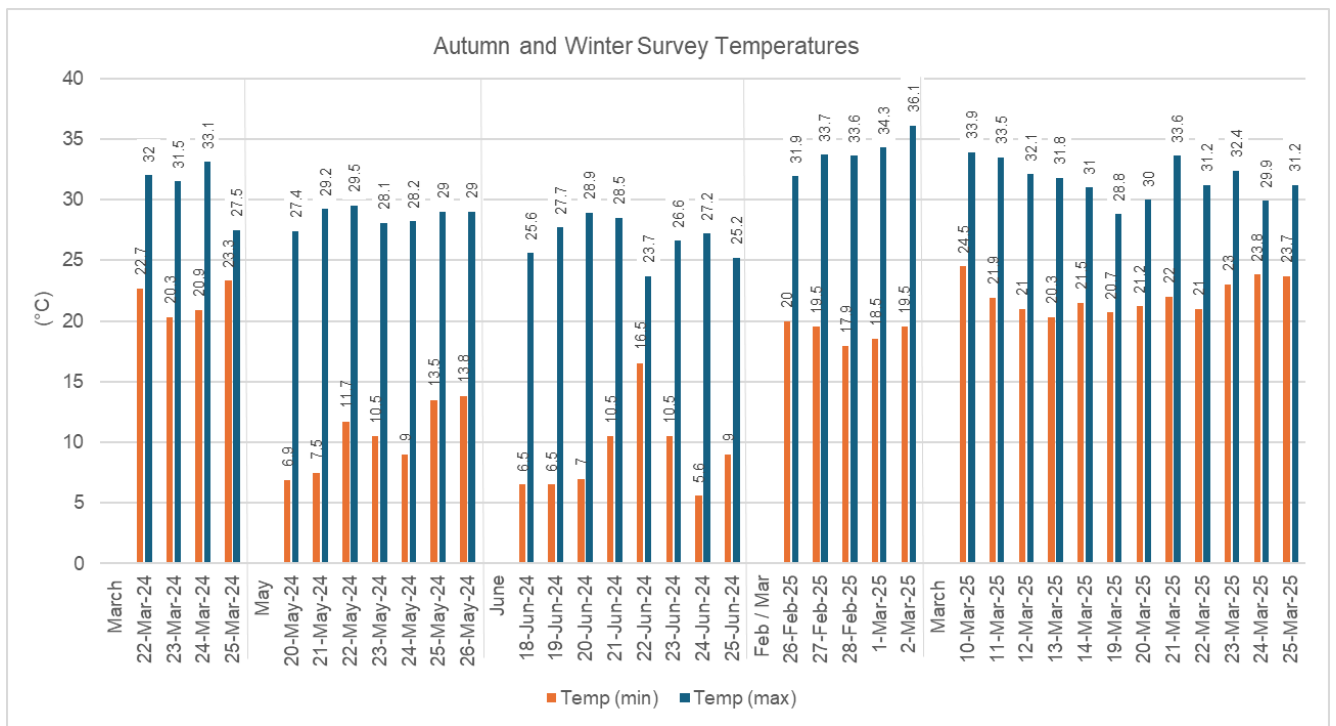


Figure 3.1 Survey temperatures

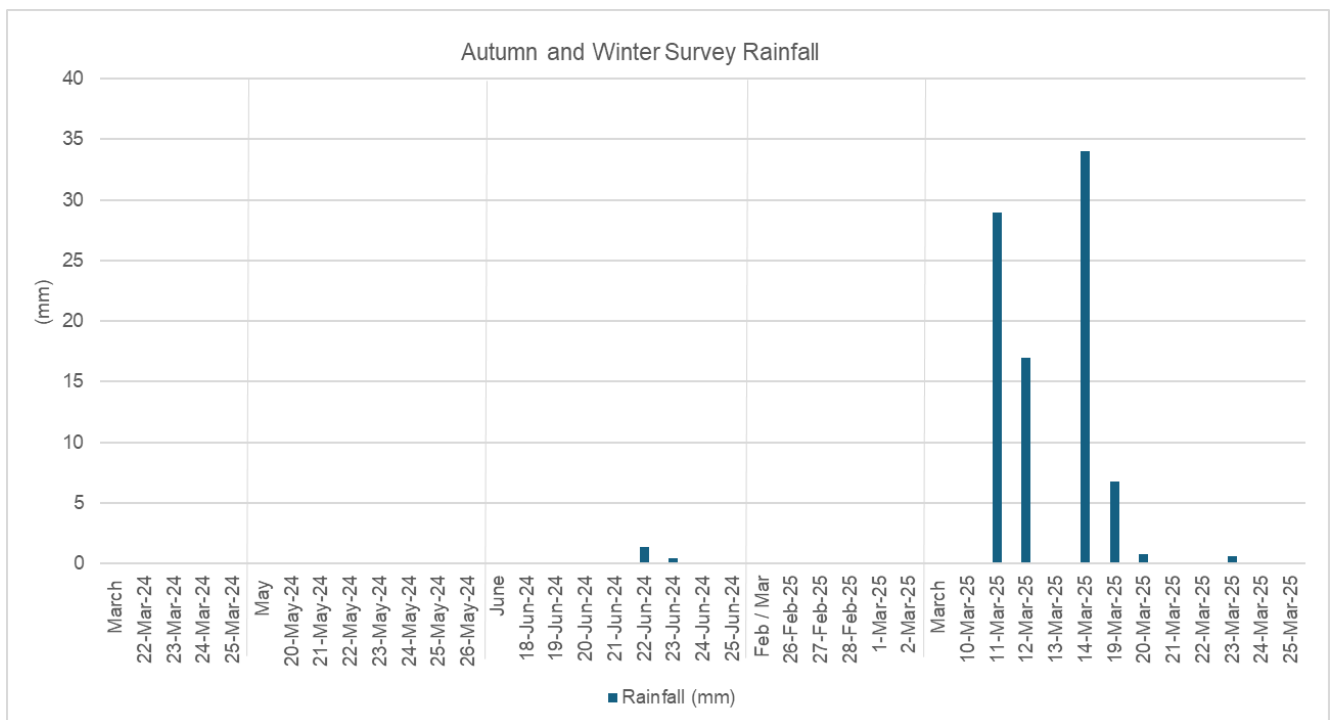


Figure 3.2 Survey rainfall

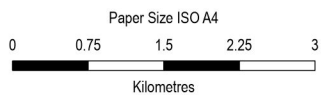
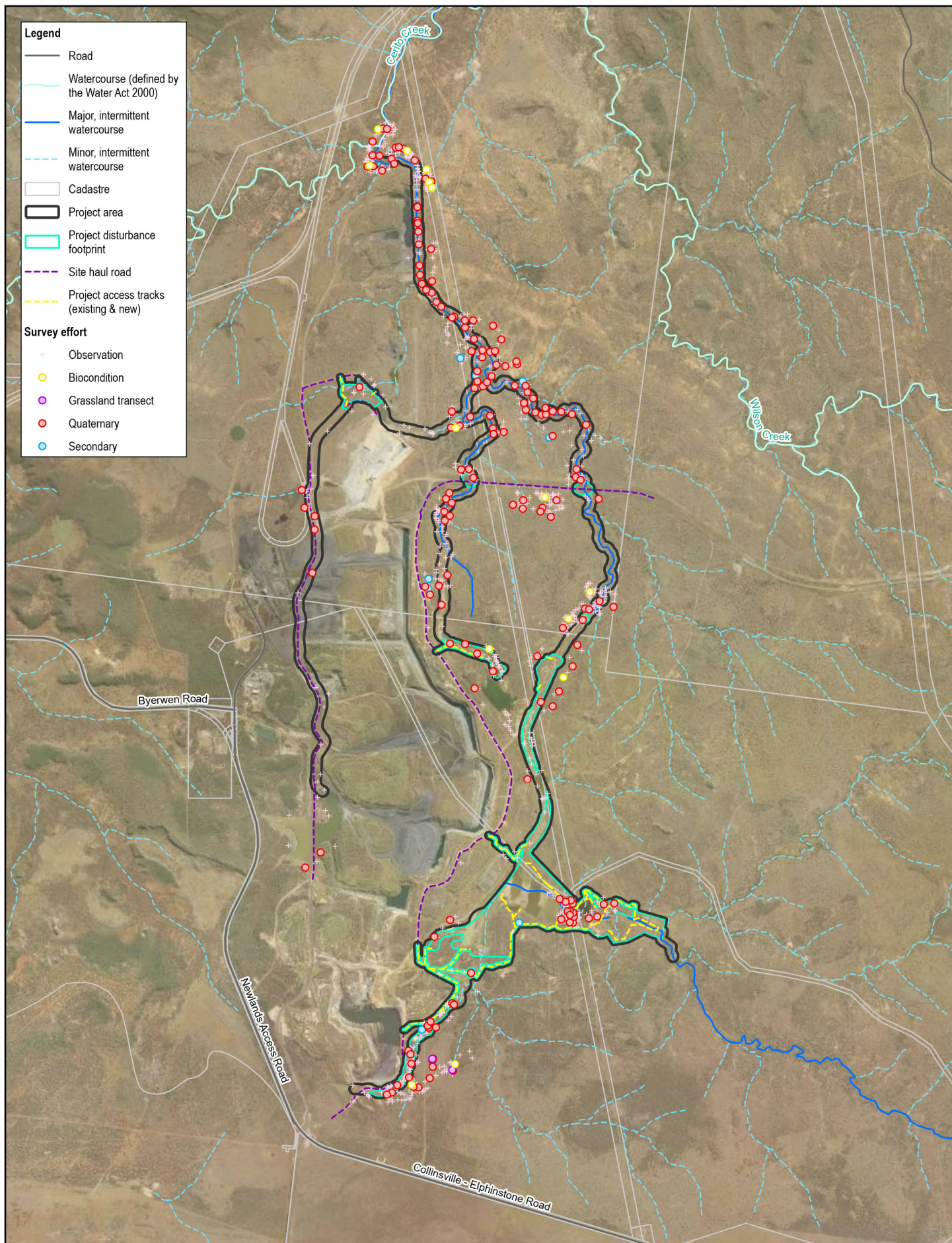
3.3.2 Flora field survey methods

Terrestrial flora surveys involved a combination of vegetation transects and other assessments, as described in Table 3.4. Quaternary assessments were undertaken at 167 sites across the Project Area and surrounding locations, as shown on Figure 3.3a.

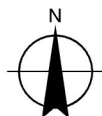
Table 3.4 *Flora field survey methods*

Assessment type	Detailed survey methodology
Quaternary assessment	A total of 167 quaternary flora assessments were assessed for the survey area, involving measuring canopy height and estimating vegetation canopy cover. Information recorded included: – Site identifier information – Site photographs – Vegetation structural formation – Vegetation stratum details – Identification of ecologically dominant layer – Disturbance notes.
Secondary assessment	A total of eight secondary transects were undertaken to classify and provide detailed descriptions of the vegetation communities (and associated REs) present within the survey area. The assessment comprises a detailed assessment within an area of 50 x 10 m, and the information collected includes: – Site identifier information – Site photographs – Field-verified REs – Vegetation structural formation – Vegetation stratum details – Identification of ecologically dominant layer – Land zone descriptions – Disturbance notes.
BioCondition assessment	14 transects were conducted in accordance with the BioCondition Assessment Manual (Eyre et al. 2015). The BioCondition score was determined using landscape attributes recorded in the field: – Large trees – Tree canopy height – Recruitment of canopy species – Tree canopy cover – Shrub layer cover – Coarse woody debris – Native plant species richness – Non-native plant cover – Native perennial grass cover – Litter cover.
TEC assessments	Where the field surveys identified vegetation communities containing vegetation that could represent a TEC, the vegetation was assessed against the key diagnostic characteristics and condition thresholds described in the relevant Commonwealth listing advice to determine whether the vegetation community meets the TEC status. BioCondition transects were conducted in vegetation patches with the potential to qualify as Brigalow TEC, based on the criteria that each patch must be at least 0.5 hectares in size and contain less than 50% exotic perennial plant cover within the sampled area. The BioCondition assessments confirmed that the patches met the required criteria for Brigalow TEC, including: – Dominant canopy species – Tree canopy height – Tree canopy cover. One BioCondition transect was also undertaken in the northern Semi-Evergreen Vine Thicket TEC patch; however, for this ecological community to meet TEC status, the only criteria is the presence of the relevant RE. Additionally, a secondary transect was completed in the Semi-Evergreen Vine

Assessment type	Detailed survey methodology
	Thicket patch within the central survey area (north of Levee 7 Pond) to assess whether the vegetation met TEC classification. Grassland transects were undertaken in areas that had the possibility of being a patch of Natural grasslands of the Queensland Central Highlands and northern Fitzroy Basin (Natural Grasslands) TEC. Two transects in the southern extent of the survey area were established and conducted under this methodology. The transects consisted of ten 10 m x 10 m quadrats resulting in an area of 50 m x 20 m (0.1 ha), as specified in the Natural Grasslands TEC listing advice (TSSC 2009). The information collected allows the assessment against the key diagnostic characteristics and the condition thresholds for the TEC: – Native grass species identification (native perennial grass species from the list of perennial native grass indicator species) – Total projected canopy cover of shrubs – Percentage of perennial non-woody introduced species – Native grass tussock counting when the other key diagnostic characteristics for the TEC are met.
Targeted threatened species surveys	Targeted surveys for threatened flora species were undertaken in suitable habitat in accordance with seasonal requirements and recommended survey guidelines, where applicable.
Aquatic flora assessments	At each aquatic survey site, a walking transect of approximately 100 m was conducted along the banks of the watercourse to identify aquatic plants growing in-stream or on the wetted banks. Aquatic plants were identified to the lowest taxonomic level possible and relative condition (e.g. healthy, moderate, or poor) was assessed visually.



Map Projection: Transverse Mercator
Horizontal Datum: GDA2020
Grid: GDA2020 MGA Zone 55

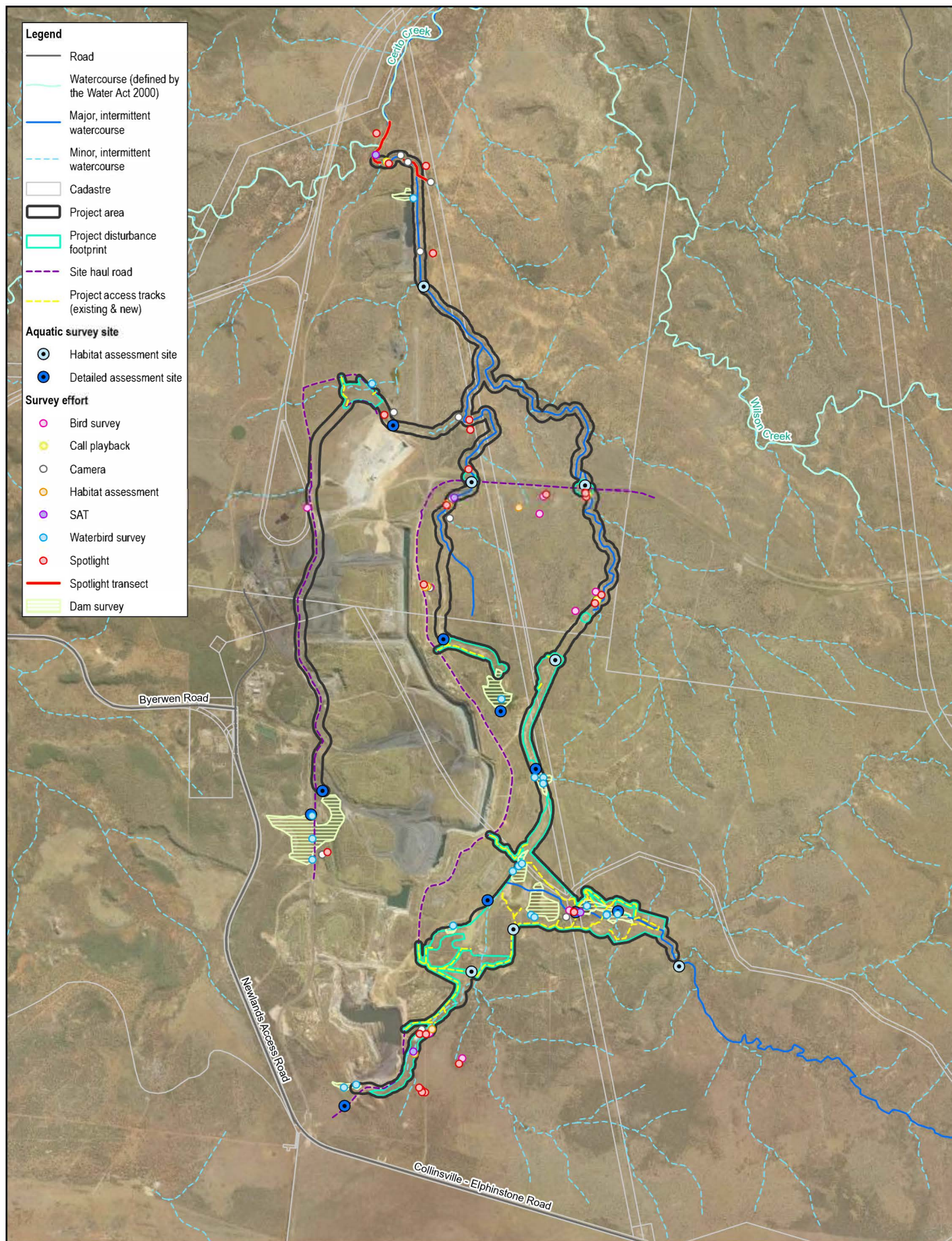


NC Coal Company Pty Limited
Newlands Closure Project – Cerito Creek Permanent
Diversion System

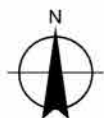
Project No. 12611481
Revision No. 0
Date 12/09/2025

Field survey locations - Flora

FIGURE 3.3a



Paper Size ISO A4
0 0.75 1.5 2.25 3
Kilometres



Map Projection: Transverse Mercator
Horizontal Datum: GDA2020
Grid: GDA2020 MGA Zone 55

NC Coal Company Pty Limited
Newlands Closure Project – Cerito Creek Permanent
Diversion System

Project No. 12611481
Revision No. 0
Date 12/09/2025

Field survey locations - Fauna

FIGURE 3.3b

3.3.3 Fauna field survey methods

The fauna field surveys included predominantly rapid habitat assessments and active searches throughout the Project Area. Survey effort was targeted towards areas deemed to be of ecological significance based on a review of desktop sources and previous studies, with a high-level assessment being conducted in disturbed areas.

Field survey methods are detailed in Table 3.5 whilst the location of field survey sites is presented on Figure 3.3b.

Table 3.5 Fauna field survey methods

Assessment type	Detailed survey methodology
Habitat assessments	Habitat assessments were undertaken in representative vegetation communities and non-remnant areas. At each of the habitat assessment sites, the value of habitats for terrestrial fauna was assessed based on the presence of key resources and microhabitats – as determined by the structural complexity of vegetation and the presence of features such as tree hollows, burrows, rocky outcrops, caves, leaf litter and woody debris. Key habitat features important for conservation significant species were recorded.
Bird surveys	Bird surveys were undertaken to identify a range of species present within the Project Area. Surveys at dams were undertaken during cooler and warm parts of the day and were not restricted to early mornings and evenings. All other surveys occurred in the early morning and evening, during conditions identified by surveyors as high-activity periods for birds, whenever possible. Bird surveys included observations of all bird taxa visible or audible from the survey site, including aerial hunters, feeders and scavengers such as raptors, wood swallows and bee-eaters. Where possible, sites were visited multiple times. Bird surveys were undertaken for a minimum of 15-20 person minutes per survey site visit. Waterbird surveys were primarily undertaken around the Cerito Dam area, and opportunistically at other identified water bodies within the mine leases. Waterbird surveys at Cerito Dam were undertaken for a minimum of 120 person minutes over several surveys. Opportunistic waterbodies were monitored for a minimum of 20 person minutes targeting waterbirds and migratory species.
SAT	Searches for Koala faecal pellets were undertaken at two sites during the March 2024 survey, one site during the May 2024 survey, and one site during the March 2025 survey using the SAT (Phillips and Callaghan, 2011). The SAT utilises a point-based, tree sampling methodology that utilises the presence/absence of koala faecal pellets within a prescribed search area around the base of trees to derive a measure of koala activity. The focus or 'centre' tree was recorded using GPS. The 29 nearest koala habitat trees were visually identified. A search for koala faecal pellets within 100 cm of the trunk for each of the 30 koala habitat trees was undertaken for two person minutes or until a scat was found (whichever occurred first).
Incidental and opportunistic observations / searches for wildlife and traces	All incidental observations of fauna during surveys were recorded. All secondary fauna traces were recorded including bones, feathers, skulls, sloughed skins, faecal pellets, tracks, burrows and scratches.
Active habitat searches	Active searches were conducted at locations which supported coarse woody debris, fallen logs and/or an abundance of ground layer microhabitats. These searches involved searching in leaf litter, under fallen logs and rocks to target reptile species, such as the ornamental snake. The methodology involved raking organic litter (DCCEEW, 2023).
Spotlighting area searches and transects	Spotlight area searches were conducted over three nights at four sites in March 2024 and over 12 nights at 14 sites in May 2024 and over three nights at six sites in March 2025. Spotlighting area searches were conducted by two ecologists with flashlights. The Spotlighting surveys were conducted to target nocturnal and arboreal mammals (e.g. koala, greater gliders).
Camera traps	Remote surveillance cameras were deployed along creek lines, gilgai's and at Cerito Dam, and baited with chicken necks. Remote cameras were deployed in representative habitat types to target conservation significant species. Each camera was left in situ for at least four nights.
Call playback	Call playback methods were conducted by broadcasting pre-recorded calls for two minutes prior to conducting the spotlight searches. Call playback targeted nocturnal and arboreal mammals (e.g. koala, greater gliders etc.)
Aquatic habitat assessments	Habitat assessments were undertaken to describe the presence and condition of key aquatic habitat features and overall condition of each survey site. The assessments were conducted in accordance with the Queensland AusRivAS Sampling and Processing Manual (DNRM 2001) and the Monitoring and Sampling Manual (DES 2018).

Assessment type	Detailed survey methodology
	Habitats were characterised in terms of key features, such as channel type, diversity, bed and bank composition, riparian condition, instream habitat features, disturbances and breeding habitat. Photographs of each survey site were taken as an additional record of habitat conditions at the time of the survey. An overall condition score was calculated by scoring each habitat variable against condition criteria detailed in the bioassessment condition score criteria in the AusRivAS Sampling and Processing Manual (DNRM 2001). These scores were then compared between survey sites to identify patterns within the data and provide an ecologically relevant interpretation of the results.
Electrofishing	Backpack electrofishing was conducted at each survey site where suitable water depth was present (i.e. no deeper than 1.5 m). Electrofishing was conducted by two operators using a Smith-Root LR-20 backpack unit. The methodology at each survey site was conducted in accordance with the Australian Rivers Institute methods and the Australian Code of Electrofishing Practice.
Box traps	At survey sites with adequate water depth (>0.5 m deep) five standard square box traps (400 mm x 250 mm x 250 mm) with 50 mm openings at each end were placed in stream and set for a minimum of one hour.
Fyke nets	At survey sites with adequate water depth, one fyke net comprising two wings 10 m wide, with a 0.6 m drop and 25 mm mesh was set in-stream for a minimum of one hour.

3.3.4 Aquatic ecology field survey methods

Aquatic ecology field assessments were conducted from 26 February to 2 March 2025 at 17 survey sites within the Project Area. Survey sites comprised 10 comprehensive assessment sites (CAS) and seven aquatic habitat only sites (AHO). Nine survey sites were located along Cerito Creek, which were spaced at intervals up to 2 km apart. An additional eight survey sites were analysed within the Project Area, nearby to Cerito Creek that have connectivity to the aquatic ecology of Cerito Creek.

At each survey site, surface water quality was measured in situ using a YSI ProDSS multi-parameter probe. Measurements were collected approximately 0.1-0.3 m below the surface water level. The following physio-chemical parameters were measured:

- Dissolved oxygen (percent (%) saturation and mg/L)
- Electrical conductivity (µS/cm)
- pH (pH units)
- Turbidity (NTU)
- Water temperature (°C).

The probes were calibrated prior to the field survey in accordance with the manufacturer's manual.

Water quality results were compared to the *Environment Protection (Water and Wetland Biodiversity) Policy 2019* (EPP guidelines) environmental values and water quality objectives for the Burdekin River (lower) and Bowen River Sub-basins (DEHP 2019). Water quality objectives (WQO) used were those for low-flow, moderately disturbed Bogie River, Glenmore Creek, Little Bowen R, Pelican Creek, Rosella Creek sub-catchment fresh waters and for lakes / reservoirs (Table 3.6).

Table 3.6 Water quality objectives relevant to the Project Area

Analyte	Units	Water quality objectives – lakes/reservoirs	Water quality objective – low flow freshwaters
Electrical conductivity	µS/cm	270	340
pH	pH units	6.5-8.0	6.5-8.5
Dissolved oxygen	% sat	90-110	85-110
Turbidity	NTU	1-20	8

3.3.5 Survey guidelines

Targeted surveys for threatened fauna species were undertaken in suitable habitat in accordance with recommended survey guidelines, where applicable. Targeted species surveys and their relevance to recommended survey methods and effort are provided in Table 3.7.

Table 3.7 *Relevant Commonwealth and Queensland survey guidelines and survey effort completed for threatened species*

Species	Survey recommendations		Survey effort undertaken
	Commonwealth ¹	Queensland ²	
Greater glider (southern and central)	– Searches for faecal pellets – Daytime searches on foot (transects spaced 50 m–100 m intervals) – Spotlighting (2 x 200 m transects, 100 m apart, walking speed 10 m/minute, for 2 nights) – Call playback (2 sessions at each site) – Stag watch surveys at potential den locations (30 minutes before dusk for 60 minutes)	– 3 replicate generic survey sites per assessment unit – Call playback (2 x 30-minute within 100 x 100 m survey site) – Spotlighting (2 30-minute searches within 100 x 100 m plot) – Scat and sign searches (within 2 50 x 50 m plots by 3 people for 30 minutes) – Incidental detection of species unintentionally	– Surveys undertaken March, May, and June 2024 and March 2025 – Spotlighting (total 1050 person minutes in potential habitat) • Total of 18 nights x 23 sites across March and May 2024 and March 2025 • Conducted for minimum 30 person minutes per site • 2 x 700 m spotlighting transects – Call playback (30 person minutes) – Habitat assessments
Koala	– Daytime searches on foot (transects spaced 50 – 100 m) – Spotlighting surveys (2 x 200 m transects 100 m apart per 5 ha site, walking speed 10 m/minute) – Call playback (2 sessions per relevant species per site) – Other direct observation methods to be undertaken between August – January: • Remote sensor activated cameras • Mark resight, mark recapture • Detection dogs – Indirect observation methods: • Scratching and scat searches • Spot Assessment Techniques (SAT) • Regularised Grid Based Spot Assessment Technique • Koala optimised Rapid Assessment Methodology – Faecal standing crop assessment	– 3 replicate generic survey sites per assessment unit – Call playback (2 sessions of playback per relevant species at centre point of survey site) – Spotlighting (30-minute searches within 100 x 100 m survey site) – Scat and sign searches (2 50 x 50 m plots for 2 30-minute / person)	– Surveys undertaken March, May, and June 2024 and March 2025 – SAT searches (2 areas in March 2024, 1 area in May 2024, 1 area in March 2025) (Phillips and Callaghan, 2011) – Incidental observations – Spotlighting (total 1810 person minutes in potential habitat) • Total of 18 nights x 23 sites across March and May 2024 and March 2025 • Conducted for minimum 30 person minutes per site • 2 x 700 m spotlighting transects – Call playback (30 person minutes) – Habitat assessments

Species	Survey recommendations		Survey effort undertaken
	Commonwealth ¹	Queensland ²	
Northern quoll	– Cage/Elliott trapping (April to September) (minimum 3 nights) – Daytime habitat searches – Remote cameras (baited for 4 nights) – Hair tubes – Spotlighting (2 x 200 m transects per 5 ha, over 2 nights) (DSEWPC 2011; DoE 2016) – Reconnaissance surveys with motion sensing cameras with lures / baits – Active scat searches	– 3 replicate generic survey sites per assessment unit – Spotlighting (2 x 30 minute within 100 x 100 m plot) – Scat and sign searches within 2 x 50 x 50 m plot – Camera trapping (1 camera per site, minimum 4 nights) – Hair tubes alongside trapping sites	– Surveys undertaken March, May, and June 2024 and March 2025 – 14 remote cameras deployed for 4–9 nights each (77 trap nights) – Spotlighting (total 1050 person minutes in potential habitat) • Total of 18 nights x 23 sites across March and May 2024 and March 2025 • Conducted for minimum 30 person minutes per site • 2 x 700 m spotlighting transects – 3-yearly monitoring surveys using baited camera traps at Newlands Coal Mine since 2016
Ornamental snake	– Survey when frogs are active – Spotlighting (1.5 hrs per 1 ha, minimum 3 nights) – Daytime habitat searches (1.5 hrs per 1 ha, minimum 3 days) – Pitfall and funnel trapping, consisting of 6 x 20 L buckets, evenly distributed under a 30 m drift fence, buried 500 mm deep) with 2 replicate sites per habitat type. Traps to be checked over 4 days, during the morning and early evening (After optimal foraging)	– Survey during spring to early summer (September to mid-November), or autumn (March to mid-May) – 3 replicate generic survey sites established per assessment site – Pitfall trapping with 4 buckets, spaced 7.5 m in a 'T' shape, along 45 m drift fence, for 4 nights – Funnel trapping with 6 buckets, placed 3 m from the distal ends of the 'T' shape drift fence, for 4 nights total. – Daytime surveys, 2 x 30 minute searches within 2 different 50 x 50 m plots within survey site – Spotlighting surveys, 2 x 30 minute searches within 100 x 100 m survey site – Camera trapping, 1 camera per site, minimum four nights	– Surveys undertaken March, May, and June 2024 and March 2025 – Spotlighting (total 760 person minutes in potential habitat) – Total of 5 nights across 7 sites in May 2024 and March 2025 – Two searches (total of 110 person minutes) of active habitat searches in brigalow

Species	Survey recommendations		Survey effort undertaken
	Commonwealth ¹	Queensland ²	
Red goshawk	– Survey in breeding season (August to November) – Ground searches for nesting undertaken early or late in the day – Point counts at locations where observers can see over the canopy – Area searches of potential suitable habitat, walking or driving slowly (80 hrs over 10 days for areas over 50 ha, 50 hrs over 8 days for areas less than 50 ha)	– Diurnal bird surveys (6 x 5–10 minute area searches in 100 x 100 m survey site)	– Surveys undertaken March, May, and June 2024 and March 2025 – Bird surveys (11 sites) for total 600 person minutes (includes 270 person minutes within riparian vegetation)
Squatter pigeon (southern)	– Area searches (15 hours over 3 days for areas <50 ha) (DEWHA 2010) – Flushing surveys (10 hrs over 3 days for areas <50 ha) – Slow driving surveys, 2 along the same road from sunrise to 9 am and 3.30 pm to sunset	– 2 replicate generic survey sites established per assessment site – Diurnal survey (6 x 5–10 minute area searches within 100 x 100 m survey site)	– Surveys undertaken March, May, and June 2024 and March 2025 – Bird surveys (11 sites) for total 600 person minutes – 21 waterbody bird surveys (total 920 person minutes)
White-throated needletail	– Survey between October and April (northern and eastern Australia), and December and March (south-eastern Australia) – Daytime incidental detection of species – Evening observations when birds come into roost	– Diurnal survey (6 x 5–10 minute area searches within 100 x 100 m survey site)	– Surveys undertaken March, May, and June 2024 and March 2025 – Bird surveys (11 sites) for total 600 person minutes – 21 waterbody bird surveys (total 920 person minutes)
Fork-tailed swift	– Species should be counted by an experienced person from an elevated viewpoint during summer (DoE 2015)	– Diurnal survey (6 x 5–10 minute area searches within 100 x 100 m survey site)	– Surveys undertaken March, May, and June 2024 and March 2025 – Bird surveys (11 sites) for total 600 person minutes – 21 waterbody bird surveys (total 920 person minutes)
Caspian tern	– No species-specific guidelines	– Diurnal survey (6 x 5–10 minute area searches within 100 x 100 m survey site)	– Surveys undertaken March, May, and June 2024 and March 2025 – Bird surveys (11 sites) for total 600 person minutes – 21 waterbody bird surveys (total 920 person minutes)

Species	Survey recommendations		Survey effort undertaken
	Commonwealth ¹	Queensland ²	
Oriental cuckoo	Area survey in non-breeding areas (2 ha survey in 20 minutes in spring or summer) (DoE 2015)	Diurnal survey (6 x 5–10 minute area searches within 100 x 100 m survey site)	- Surveys undertaken March, May, and June 2024 and March 2025 - Bird surveys (11 sites) for total 600 person minutes 21 waterbody bird surveys (total 920 person minutes)

¹Commonwealth guidelines include: Draft referral guidelines for the nationally listed Brigalow Belt reptiles (DCCEEW 2023), Survey guidelines for Australia's threatened birds (DEWHA 2010), Survey guidelines for Australia's threatened mammals (DSEWPC 2011) Survey guidelines for Australia's threatened reptiles (DSEWPC 2011a), Draft referral guideline for 14 migratory birds listed under the EPBC Act (DoE 2015), EPBC Act referral guideline for the endangered northern quoll *Dasyurus hallucatus* (DoE 2016).

²Queensland guidelines include: Terrestrial vertebrate fauna survey assessment guidelines for Queensland (Eyre et al. 2022a), Guide to greater glider habitat in Queensland (Eyre et al. 2022).

3.4 Likelihood of occurrence assessment

An assessment was conducted to attribute a 'likelihood of occurrence' rating to threatened species, migratory species and TECs listed under the EPBC Act (Cth) that were identified in the desktop assessments. The likelihood of occurrence assessment was based on a review of species distributions and habitat requirements, vegetation mapping, field survey results and historical records. The likelihood of occurrence ranking was based on the framework outlined in Table 3.8 The post-survey likelihood of occurrence assessment for TECs, threatened and migratory species is included in Appendix E.

Table 3.8 *Likelihood of occurrence assessment criteria*

Rating	Criteria	Assessment
Known	There are confirmed species records within the Project Area.	Species with these ratings are all included in the MNES significant impact assessment.
Likely	Preferred habitat occurs within the Project Area. There are confirmed species records in the nearby surrounds; however, the species is not yet confirmed as occurring within the Project Area.	
Potential	Potential habitat may occur within the study area, and the species is known to occur in the wider surrounds.	
Unlikely	Due to a lack of suitable habitat within the Project Area and/or the absence of records from the wider surrounds, the species is considered to have a low likelihood of occurring within the study area.	Species with this rating are not included in the MNES significant impact assessment.

3.5 Habitat for MNES species

For all species assessed as known to occur, likely to occur or with potential to occur from the likelihood of occurrence assessment, the distribution of predicted habitat was mapped based on criteria detailed in Appendix D. Areas of predicted habitat were differentiated into functional types (such as potential breeding, foraging and dispersal habitat), or general habitat, and then into habitat critical to the survival of the species, where relevant. The criteria used for each species is aimed to be consistent with the species profiles and habitat requirements specified in the relevant species Commonwealth listing advice, conservation advice, referral guidelines and/or SPRAT databases provided by DCCEEW.

Given these descriptions are often necessarily broad to apply at a national scale and use definitions that are generally not spatially defined, further definition of the habitat criteria was required to explain how they have been mapped at a local scale. For most species, predicted habitat mapping was based on several factors, including landform, geology and soil type, field verified vegetation communities, field verified habitat features, presence of waterbodies.

3.6 Water resources assessments

3.6.1 Surface water

The hydrology and hydraulics of the Cerito Creek system were modelled using a two-dimensional hydrograph inflow model with Australian-standard software. The catchment, covering approximately 375 km², was discretised into 72 sub-catchments and modelled using three separate models to capture its complexity.

Data from a Newlands Coal Mine gauge at Kangaroo Creek was used for calibration, as public data was unavailable. Significant localised variability in rainfall and streamflow was noted, with design rainfall information adjusted based on local gauge data for high-intensity events. Model validation and calibration involved flood frequency analysis, testing various input parameters, and revising initial and continuing loss values to ensure accurate representation of the system's hydrologic and hydraulic behaviour.

The flood model was used to develop a TUFLOW hydraulic model using three models (east and west tributaries of Cerito Creek, and Kangaroo Creek). The model outputs were used to assess hydraulic conditions within the existing and design systems during various flood events (50% AEP, 2% AEP, 1% AEP and 0.1% AEP).

A hydrograph inflow model was used to assess the hydraulic performance of the 60% design throughout the site, using Manning's n roughness values throughout the channel based on the 60% design and site visit observations. It should be noted that conditions within diversions and natural channels are variable, even within designated geomorphological reaches. Therefore, the Mannings n values adopted are best estimates of average roughness conditions within the specified reaches at the time of the site visit in October 2024. High and low flow scenarios to assess the flood behaviour under variable conditions:

- Low flow / high return period (63.2% AEP / 1 in 1.58 AEP event)
- High flow / low return period (0.1% AEP / 1 in 1000 AEP event).

The design was then refined based on the outcomes of these models. Subsequently, additional scenarios were undertaken:

- 50% AEP / 1 in 2 AEP and 2% AEP / 1 in 50 AEP events, in accordance with ACARP / DNRME guidelines
- 1% AEP / 100 AEP event design flood.

Model runs were based on events that resulted in critical flood conditions at the downstream control points of each of the models. Hydraulic outputs (i.e., maximum velocity, stream power and boundary shear stress) for the 50% AEP and 2% AEP events have been classified according to ACARP / DNRME guidelines. In areas of high hydraulic model outputs, average hydraulic parameters were calculated for a 1 km reach containing the exceedance area in order to provide a better comparison with the ACARP guidelines. The modelled reach-averaged hydraulic parameters were then compared with relevant published ACARP reach-averaged parameters, and modelled parameters within natural channels adjacent to Cerito Creek.

It is noted that hydraulic modelling that utilises source area inflows (hydrograph inflows) possess inherent limitations, such as:

- Overland flows from hillsides are not captured, particularly at locations such as the diversion north of the subsidence area / Reach 3
- Dispersed inflows are artificially concentrated through source area inflow points, artificially elevating depth and hydraulics through some areas. This is a factor throughout specific sections of the model such as the Lake Austin Channel and Rail Loop areas
- Artificial concentration of flows can result in elevated simulated depth and velocity.

3.6.2 Groundwater

The groundwater assessment was undertaken with consideration of the Significant Impact Guidelines 1.3 (DCCEEW 2022d), with reference to Information guidelines for proponents preparing coal seam gas and large coal mining development proposals (IESC 2024). In line with IESC 2024, a risk-based approach to assess potential impacts of change to the existing hydrogeological conditions has been followed, i.e. evaluation of the risk of potential impacts to groundwater resources from the Cerito Creek permanent diversion system.

A desktop assessment was completed using local geological, hydrogeological and groundwater data from public databases, mapping layers and other publicly available data sources to determine the groundwater values within a 10 km radius from the existing Cerito Creek diversion system. This desktop investigation report includes information from data sources summarised in Table 3.9.

Table 3.9 Groundwater publicly available data sources

Database name / report	Owner / source	Purpose of desktop search
Groundwater Database – Queensland	Queensland Government, Department of Regional Development, Manufacturing and Water (DRDMW, 2024) ⁽¹⁾	Review and assess existing groundwater supply facilities
Detailed 1:100 k surface geology	Queensland Government, Department of Resources (DoR)	Review descriptions and characteristics of local geology to assess groundwater occurrence and quality
Groundwater dependant ecosystems (GDE) mapping	Queensland Government, Department of Environment and Science (2018a)	Identify Queensland mapped GDEs

Database name / report	Owner / source	Purpose of desktop search
Queensland active springs database	Queensland Government, 2019	Identify Queensland mapped groundwater springs
GDE Atlas	BoM, 2019	Identify 'potential of ecosystem to be a GDE'

¹Known as DRDMW at time of data download date (September 2024) and as DLGWV from 1 November 2024.

A conceptual hydrogeological model was created to demonstrate the geological properties of bedrock and superficial deposits, groundwater flow characteristics, and groundwater-surface water interactions.

A risk-based approach was adopted, where an evaluation of the risk from the Cerito Creek permanent diversion system was undertaken using the criteria in the Information guidelines for proponents preparing coal seam gas and large coal mining development proposals (IESC 2024) to determine the scale, likelihood and consequences of potential impacts, divided into environmental, economic and social/cultural values applicable to groundwater resources under the EPBC Act (Cth) water trigger. A risk rating was applied based on the combination of the likelihood of impact and consequence of the impact. The risk assessment steps implemented are aligned with AS/NZS ISO 31000:2018 Risk Management—Principles and Guidelines.

3.6.3 Geomorphology

A desktop assessment of geomorphological features of Cerito Creek was conducted to establish the baseline geomorphological condition and assess the trajectory of change since the original southern diversion was constructed in 1988. Publicly available historic aerial imagery from 1959, 1983 and 2000 were reviewed for the assessment.

A site assessment was conducted in October 2024 to verify the findings in the desktop assessment. This included:

- Identifying and mapping key geomorphological features within the Cerito Creek system and reaches or areas of proposed rehabilitation
- Assessing the character and behaviour of in situ and temporarily stored channel and floodplain materials
- Assessing the contemporary geomorphology of analogous natural creeks in the vicinity
- Mapping and characterising tuffaceous clay bedding within the exposed coal seam on the Pub Hill cutting (in the western Project Area along the Lake Austin channel, separated from Cerito Creek by the Newlands Coal Mine Main Deposit).

3.6.4 Water quality

An assessment of water quality in regard to water quality objectives (WQO) from the EPP guidelines (DEHP 2019) and the Significant Impact Guidelines 1.3 (DCCEEW 2022d) was conducted.

Long term water quality monitoring data from within, upstream and downstream of the mine disturbance area and default WQOs from the EPP guidelines (DEHP 2019) were used to establish whether changes in water quality were significant for the disturbed systems within the Project Area. In-situ water quality measurements were also undertaken during aquatic habitat field assessments, described in Section 3.3.4.

3.7 Significant Impact assessments

A significant impact assessment (SIA) was undertaken for species and communities assessed as known to occur, likely to occur or with potential to occur within the Project disturbance footprint.

A significant impact is an impact which is important, notable, or of consequence, having regard to its context or intensity. For a significant impact to be 'likely', it is not necessary for there to be a greater than 50 percent chance of a significant impact; it is sufficient if there is a real or not remote chance or possibility of a significant impact.

The SIAs were undertaken against the Significant Impact Guidelines 1.1 (DoE 2013a) for the following species and communities:

- TECs:
 - Brigalow (*Acacia harpophylla* dominant and co-dominant) – endangered
 - Semi-Evergreen Vine Thickets of the Brigalow Belt (North and South) and Nandewar Bioregions – endangered.
- Threatened flora:
 - King blue-grass (*Dichanthium queenslandicum*) – endangered.
- Threatened fauna:
 - Greater glider (southern and central) (*Petauroides volans*) – endangered
 - Koala (*Phascolarctos cinereus*) – endangered
 - Ornamental snake (*Denisonia maculata*) – vulnerable
 - Squatter pigeon (southern) (*Geophaps scripta scripta*) – vulnerable
 - White-throated needletail (*Hirundapus caudacutus*) – vulnerable.
- Migratory birds:
 - Caspian tern (*Hydroprogne caspia*)
 - Fork-tailed swift (*Apus pacificus*)
 - Oriental cuckoo (*Cuculus optatus*)
 - White-throated needletail (*Hirundapus caudacutus*) (also assessed as a threatened species).

A SIA was undertaken against the Significant Impact Guidelines 1.3 (DCCEE 2022d) to assess the potential for significant impacts to a water resource from the Project.

3.8 Assessment limitations and assumptions

Desktop and field assessment limitations and assumptions include:

- Survey effort focussed on potential areas of impact as a priority, with downstream and adjacent habitat areas surveyed in some parts of the Project Area, however not all of the Project Area has been assessed.
- Winter survey conditions were in the dry season, with generally lower floral diversity able to be identified than wet season conditions. Assessments were undertaken in the post-wet season to account for this.
- Some species or ecological communities have conservation advice documents that are more than 10 years old and therefore may not have included the most recent records of those species or ecological communities in their descriptions of potential habitats or populations.
- Some species are less studied and documented in terms of distributions, populations, habitats, ecology (behaviour such as breeding, shelter, dispersal), and threats. In such cases, reference to similar species or habitat characteristics may be relied upon, and/or the precautionary principle used when knowledge of a species is lacking.
- RE mapping in regional areas, such as around the Project Area, is prepared at a scale of 1:100,000, and therefore may be less accurate in terms of boundaries, land zone extent (based on larger scale geology and soils mapping), and vegetation community types.
- Historical species records may be less precise than more recent records (i.e., actual location is further distant from shown location on mapping websites or data files).

- Historical records may be less reliable than more recent records, particularly where species are highly mobile, where records of mobile species occur within low quality or less preferred habitat (thereby potentially representing individuals in transit between preferred habitats), or where substantial degradation of habitat has occurred since the observation.
- Some species or ecological community conservation advice or listing advice does not define habitat, important populations or habitat critical to the survival of a species or ecological community. Where adequate information was available, these have been assumed based on documented species habitat or population information.
- The desktop and field survey assessments have been undertaken based on design progression, with a 50 m buffer applied to the proposed construction areas and a 50 m wide corridor applied to Project access tracks. Further refinements of the design are likely during subsequent design stages, which will be aimed at refining the Project disturbance footprint further to avoid or reduce potential impacts to MNES species and communities.