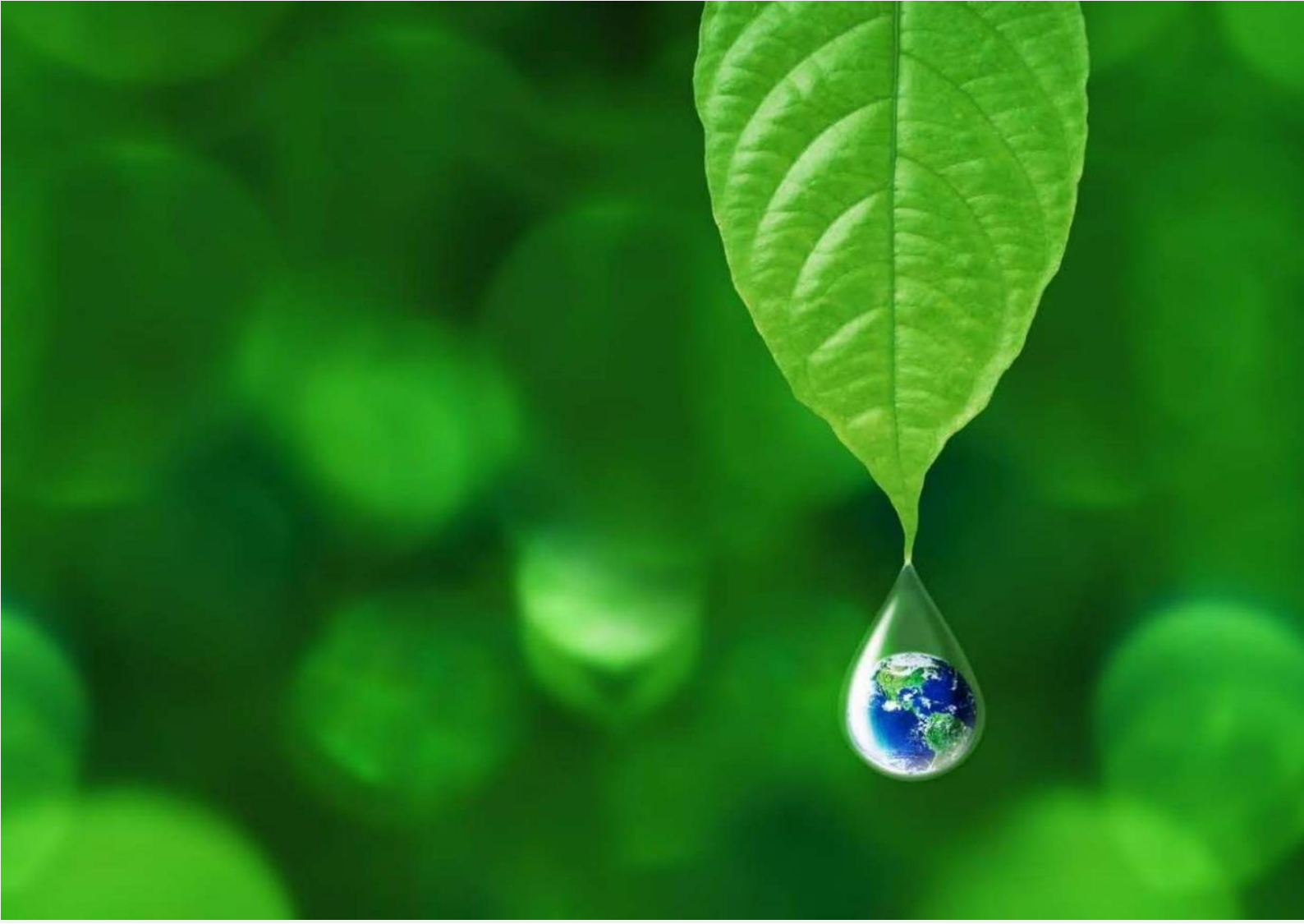
APPENDIX C BIODIVERSITY ASSESSMENT REPORT



Mt Piper Ash Placement Project – Lamberts North Ash Repository Modification 1

Biodiversity Assessment Report

14 May 2021

Project No.: 0581248

The business of sustainability

ERM

Document details	
Document title	Mt Piper Ash Placement Project – Lamberts North Ash Repository Modification 1
Document subtitle	Biodiversity Assessment Report
Project No.	0581248
Date	14 May 2021
Version	1.0
Author	Catherine Timbrell, Joanne Woodhouse
Client Name	EnergyAustralia Development Pty Ltd

Document history

				ERM approval to issue		
Version	Revision	Author	Reviewed by	Name	Date	Comments
Draft	00	Catherine Timbrell, Joanne Woodhouse	Amanda Antcliff, Murray Curtis	Murray Curtis	12 May 2021	Approved for Client issue
Draft	01	Joanne Woodhouse	Amanda Antcliff	Murray Curtis	13 May 2021	Address Client comments
Draft	02	Amanda Antcliff	Murray Curtis	Murray Curtis	14 May 2021	Minor updates
Final	00	Amanda Antcliff	Murray Curtis	Murray Curtis	14 May 2021	

Signature Page

14 May 2021

Mt Piper Ash Placement Project – Lamberts North Ash Repository Modification 1

Biodiversity Assessment Report

Joanne Woodhouse
Principal Ecologist

Amanda Antcliff
Project Manager

Murray Curtis
Partner

Environmental Resources Management Australia Pty Ltd
Level 15, 309 Kent Street
Sydney NSW 2000 Australia

CONTENTS

List of Tables

List of Figures

1. INTRODUCTION

1.1 Introduction

Environmental Resources Australia Pty Ltd (ERM) was engaged by EnergyAustralia NSW Pty Ltd (EnergyAustralia) to prepare a Modification Report and associated technical assessments to support a modification application to the Mt Piper Ash Placement Project (Project Approval (PA) 09_0186).

The Mt Piper Ash Placement Project was approved on 16 February 2012, permitting the construction and operation of the Lamberts North Ash Repository (LNAR) and Lamberts South Ash Repository (LSAR) at the Mt Piper Power Station (MPPS). EnergyAustralia is seeking to modify PA 09_0186 as it relates to the LNAR, hereafter referred to as 'the 'Modification'.

This Modification is seeking approval to install a leachate barrier system (using very low permeability liners) within LNAR to capture and subsequently reuse/treat leachate that has moved through the ash placed above the liner.

This Biodiversity Assessment outlines potential impacts of the Modification on flora and fauna listed under the NSW *Biodiversity Conservation Act 2016* (BC Act) and the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). Potential impacts have been assessed through application of the 'test of significance' (5-part test) pursuant to the BC Act and application of the EPBC Act Significant Impact Criteria. This report also identifies mitigation measures to minimise impacts on threatened species and supports the Modification Report.

1.2 Modification Description

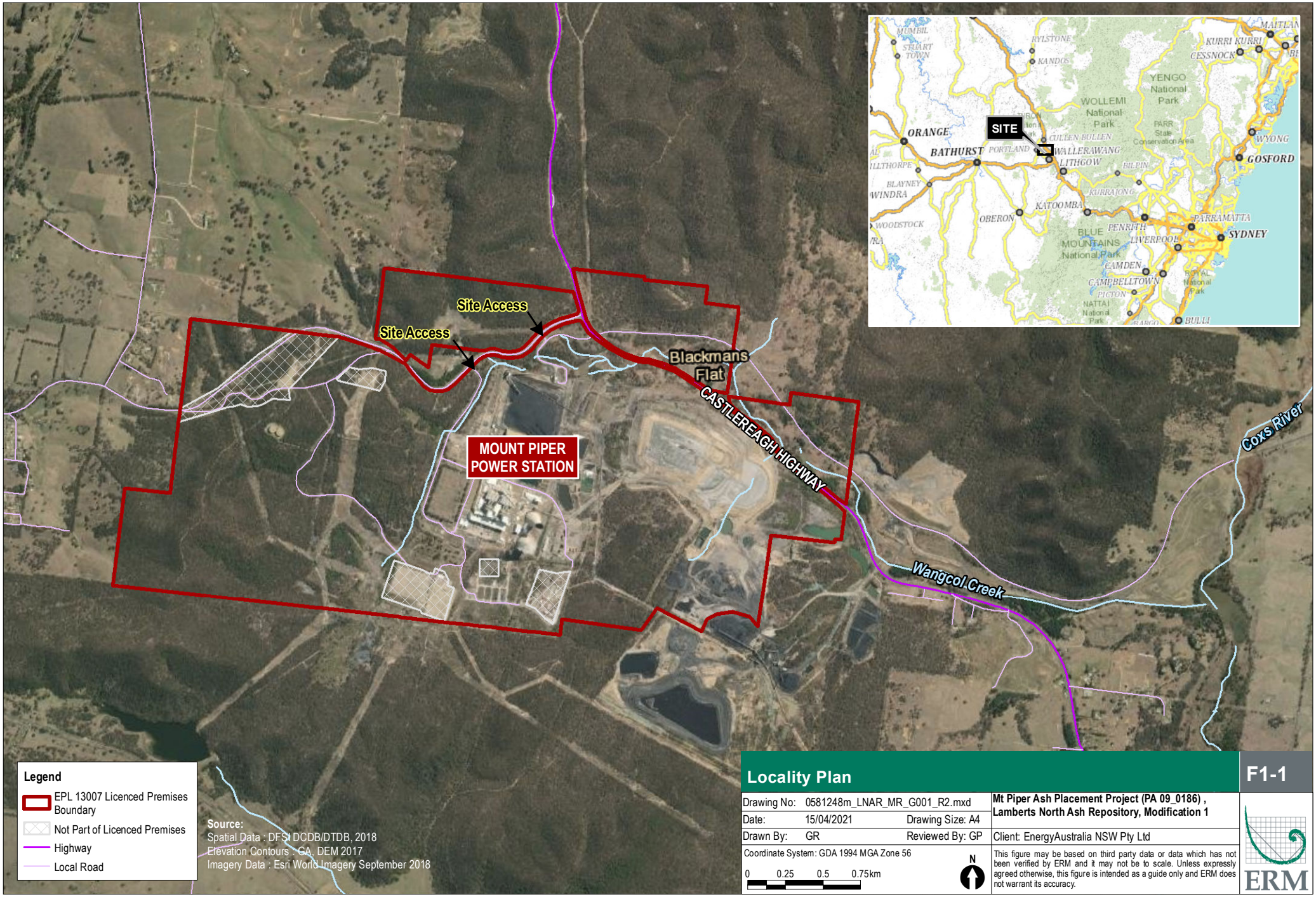
To deliver improved environmental outcomes for the LNAR, EnergyAustralia wishes to modify the LNAR PA 09_0186. The Modification consists of a leachate barrier system[1] to facilitate:

- staged installation of a single high-density polyethylene (HDPE) liner, geocomposite or equivalent (liner) to predominantly encapsulate Brine Conditioned Ash (BCA), Solid Mixed Salts and other authorised wastes (as per Environment Protection Licence (EPL) 13007) within the currently approved LNAR, including:
  - preparation of geotechnically suitable areas for liner installation utilising mine spoil that is currently available within the LNAR, including leachate barrier support systems in areas of mine subsidence risk as required;
  - placement of a geotechnical base layer using Water Conditioned Ash (WCA) (WCA is already approved for placement in LNAR);
  - installation of the liner to suitable design specifications based on NSW Environment Protection Authority (EPA) (2016) Solid Waste Landfill Guidelines; and
  - placement of drainage aggregate (sourced from mine spoil, if available, or bottom furnace ash, if suitable, within the LNAR or imported from a local supplier), followed by geotextile or other equivalent infrastructure material for leachate management.
- placement of BCA and Solid Mixed Salts and other authorised wastes (as per EPL 13007) from the surface of the liner up to the maximum approved LNAR height of RL 966-980 m AHD, including a capping liner;
- replacement of the currently approved 1 m thick WCA perimeter layer with a suitable capping liner to encapsulate the BCA and Solid Mixed Salts;

[1] The liner and leachate collection system form the leachate barrier system. "Leachate barrier system" and the term "liner" are used interchangeably throughout the report.

- staged installation of double HDPE lined multipurpose storage ponds to manage leachate from BCA placement as well as water intercepted from other areas of the LNAR. These new ponds will be adequately sized and installed so as to provide suitable storage volume for long-term management of leachate derived from the BCA and Solid Mixed Salts lined areas. Where possible, leachate will be recycled and used for dust suppression within the lined areas or transferred to MPPS for treatment and use in electricity generation; and
- minor amendments to the approved LNAR boundary in the context of the existing and proposed surrounding activities and interactions, including excising the Centennial coal washery infrastructure. Overall, the modified footprint of the LNAR is not anticipated to materially influence the operational lifespan of the LNAR.

Figure 1-1 presents the location of the MPPS and Figure 1-2 presents the location of the LNAR, including the Modification area and the associated minor adjustments to the approved boundary.



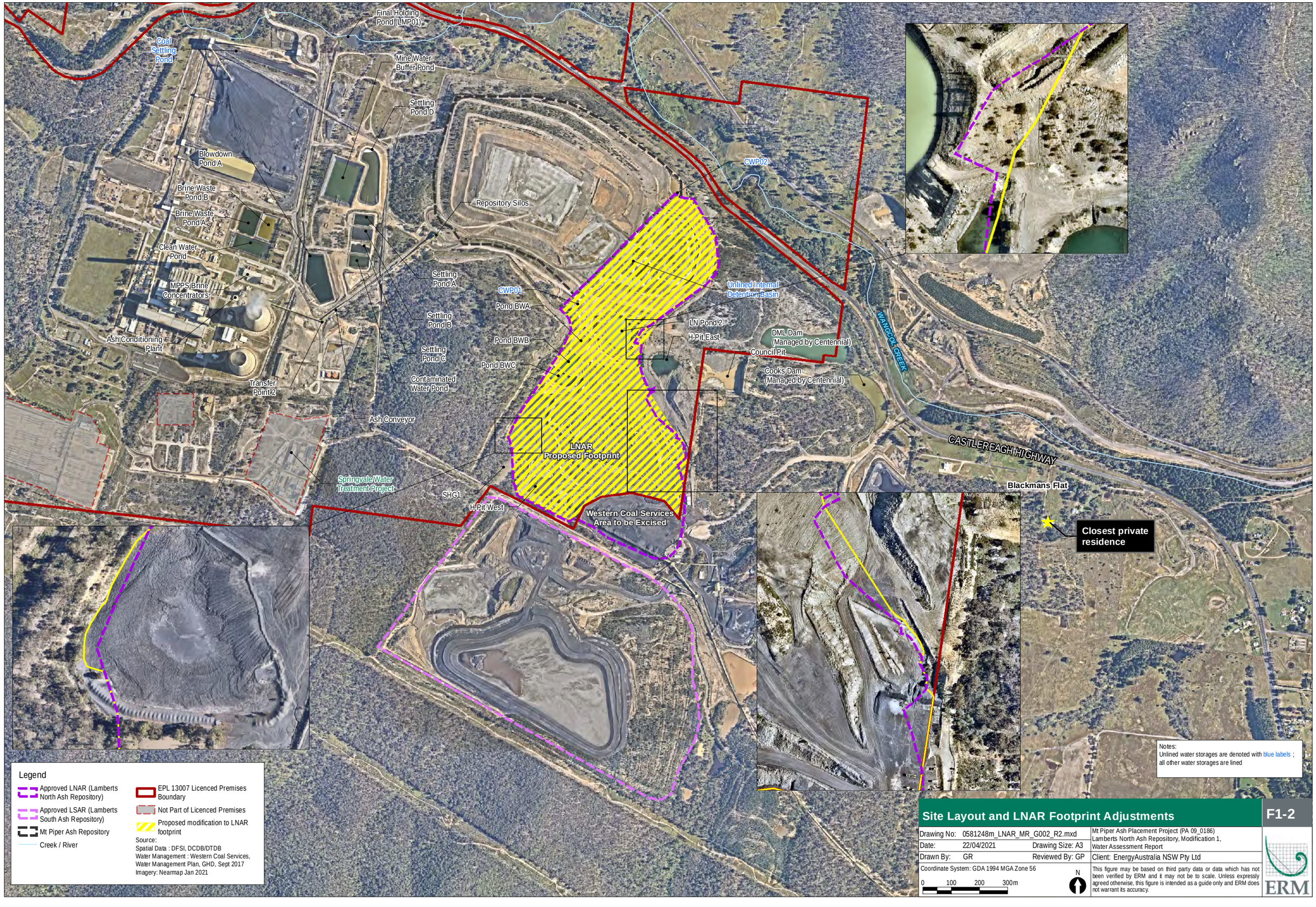
Locality Plan

F1-1

Drawing No:	0581248m_LNAR_MR_G001_R2.mxd		Mt Piper Ash Placement Project (PA 09_0186) , Lamberts North Ash Repository, Modification 1
Date:	15/04/2021	Drawing Size: A4	
Drawn By:	GR	Reviewed By: GP	Client: EnergyAustralia NSW Pty Ltd

Coordinate System: GDA 1994 MGA Zone 56

ERM



Site Layout and LNAR Footprint Adjustments

F1-2

Drawing No:	0581248m_LNAR_MR_G002_R2.mxd		Mt Piper Ash Placement Project (PA 09_0186) Lamberts North Ash Repository, Modification 1, Water Assessment Report
Date:	22/04/2021	Drawing Size: A3	
Drawn By:	GR	Reviewed By: GP	Client: EnergyAustralia NSW Pty Ltd

Coordinate System: GDA 1994 MGA Zone 56

0 100 200 300m

N

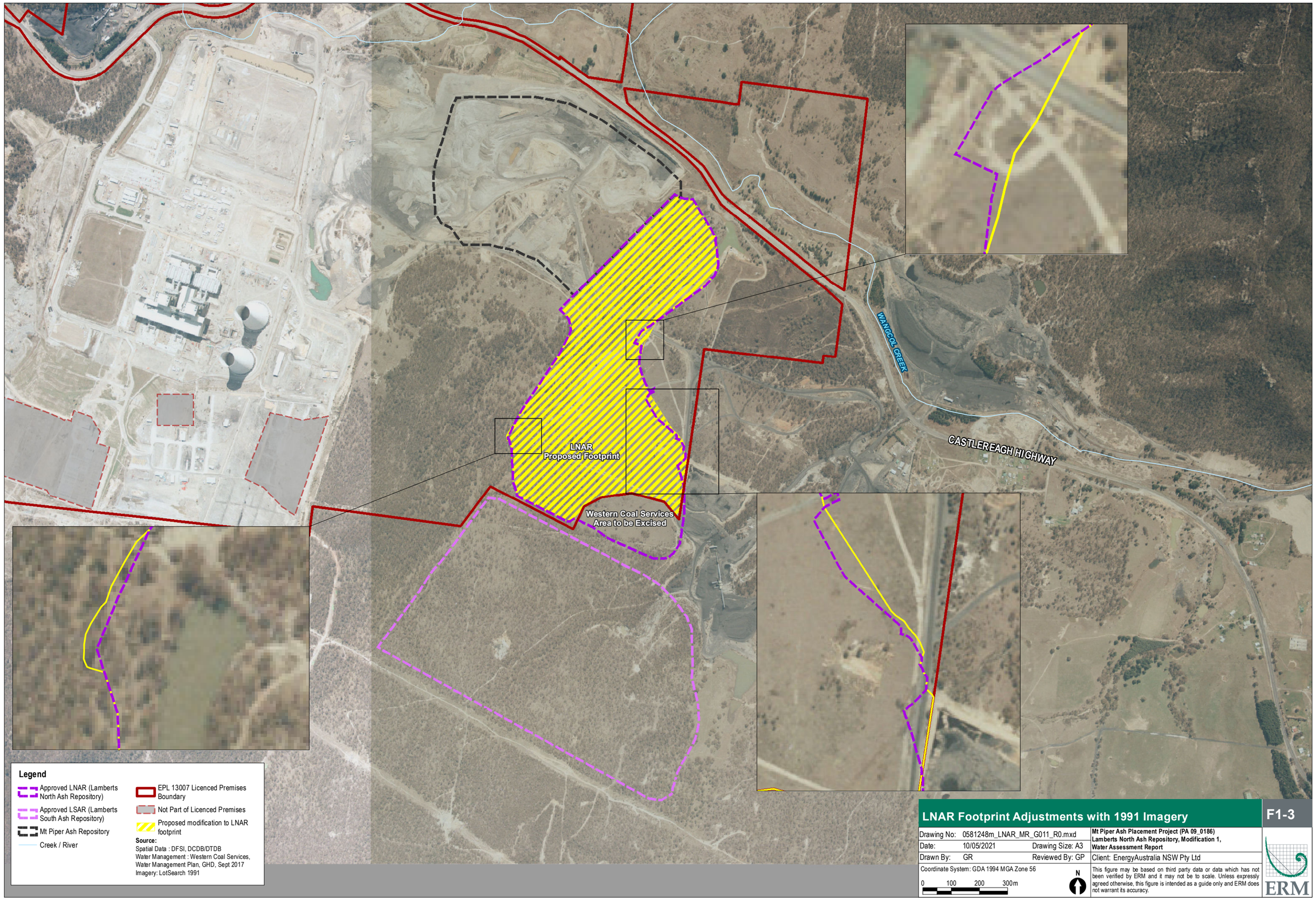
ERM

1.3 Modification Area Description

The MPPS is located in the Lithgow Local Government Area (LGA), approximately 18 km north west of Lithgow. The nearest townships are Portland, located approximately five km to the west, Blackmans Flat approximately one km to the east (although most homes have now been acquired by mining operators), Lidsdale approximately three km to the south east, and Wallerawang approximately six km to the south east.

The MPPS and the LNAR are set amongst a historically cleared landscape that has been subject to extensive open cut and underground mining activity from at least 1940. Most of this landscape has been heavily disturbed and reworked as a result of previous mining, ash placement activities and construction activity. Surrounding land uses include the Ben Bullen State Forest, existing coal mining operations and rural properties.

Whilst the Modification Area is in general accordance with the Project Approval Area for LNAR as documented in the original Environmental Assessment for the Mt Piper Ash Placement Project (SKM, 2010) and as augmented in the Consistency Report (SKM, 2012), minor boundary adjustments are sought, as detailed in Figure 1-2. There are three areas where minor boundary adjustments will extend beyond the currently Approved Area, resulting in an increase of approximately 0.8 hectares (ha). There is one area to be excised from the Approval Area in its southeast corner resulting in a reduction of approximately 5.7 ha. On balance, the boundary adjustments will result in an overall reduction of the Approval Area by approximately 4.9 ha.The three areas associated with the minor boundary adjustments have all been subject to previous mining activities and are highly disturbed, as evidenced by historic aerial imagery from 1991, 2001 and 2014, as depicted in Figure 1-3, Figure 1-4 and Figure 1-5 respectively. The areas associated with the minor boundary adjustments have not been subject to formal rehabilitation. Only one area (0.25 ha, the subject of this assessment), located on the eastern side of the Modification, contains some vegetation regrowth, the two other areas remain devoid of vegetation.



Legend

- Approved LNAR (Lamberts North Ash Repository)
- Approved LSAR (Lamberts South Ash Repository)
- Mt Piper Ash Repository
- Creek / River
- EPL 13007 Licenced Premises Boundary
- Not Part of Licenced Premises
- Proposed modification to LNAR footprint

Source:
Spatial Data : DFSI, DCDB/DTDB
Water Management : Western Coal Services, Water Management Plan, GHD, Sept 2017
Imagery: LotSearch 1991

LNAR Footprint Adjustments with 1991 Imagery

F1-3

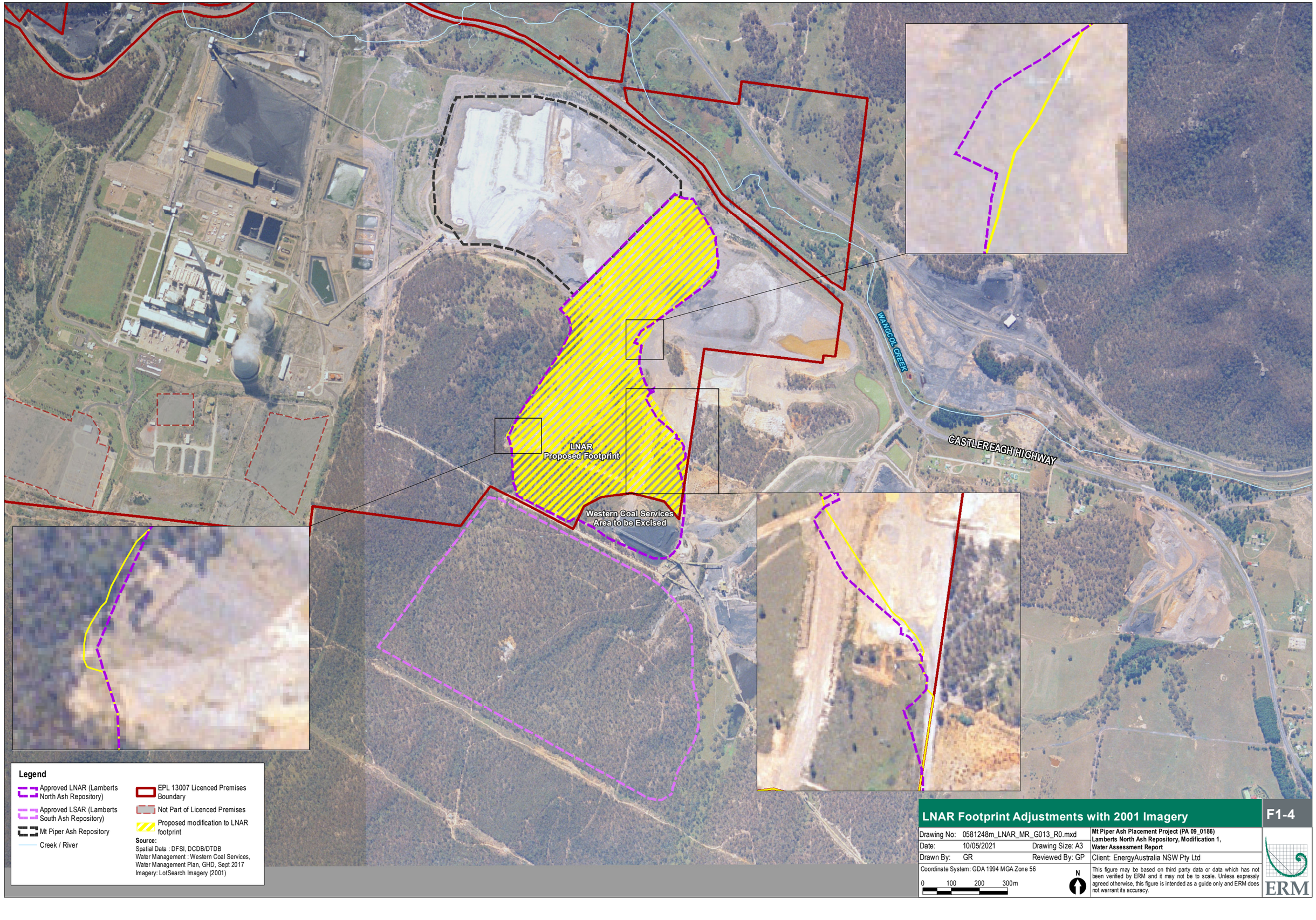
Drawing No:	0581248m_LNAR_MR_G011_R0.mxd		**Mt Piper Ash Placement Project (PA 09_0186) Lamberts North Ash Repository, Modification 1, Water Assessment Report**
Date:	10/05/2021	Drawing Size: A3	
Drawn By:	GR	Reviewed By: GP	Client: EnergyAustralia NSW Pty Ltd

Coordinate System: GDA 1994 MGA Zone 56

0 100 200 300m

N

ERM



LNAR Footprint Adjustments with 2001 Imagery

F1-4

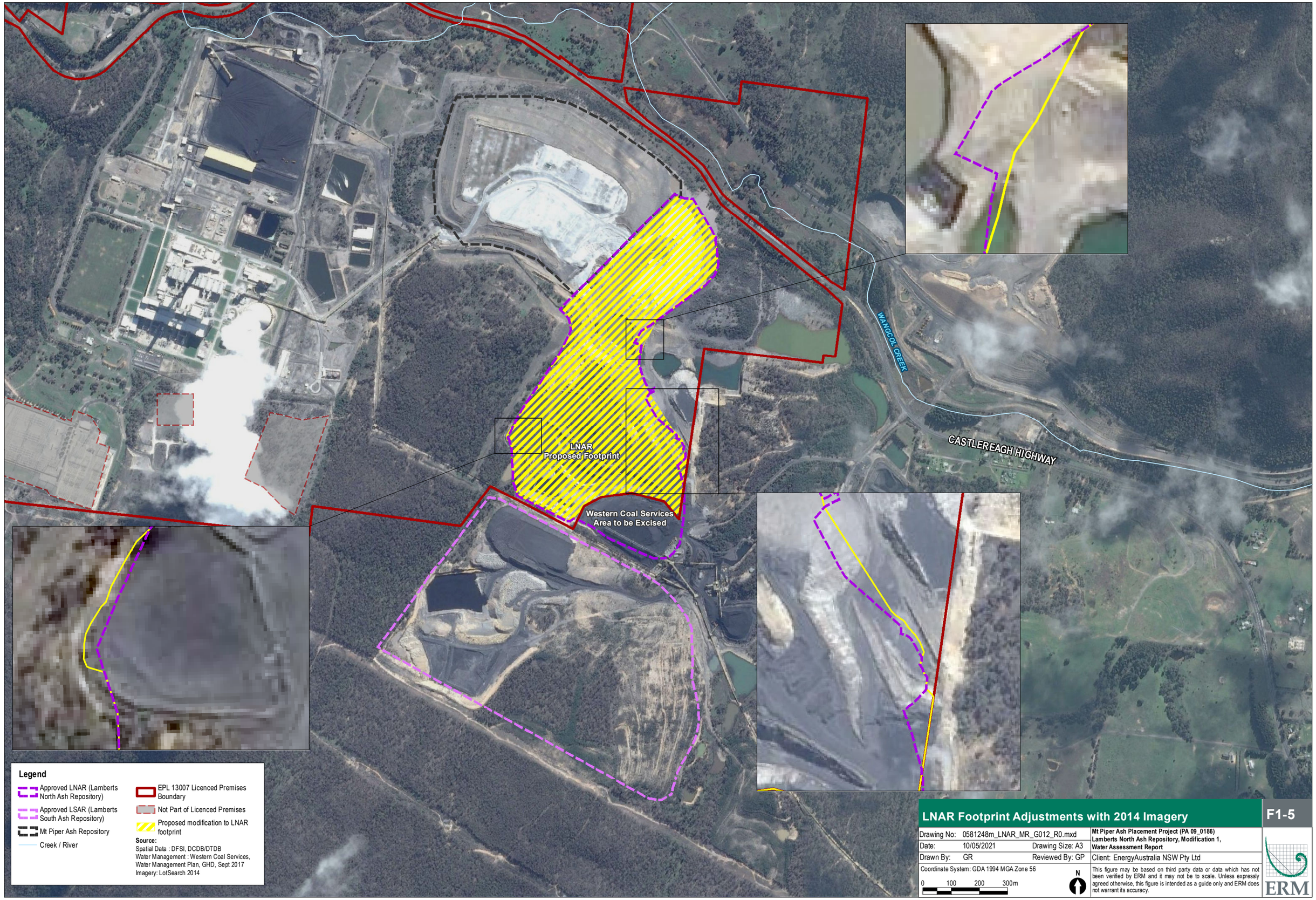
Drawing No:	0581248m_LNAR_MR_G013_R0.mxd		Mt Piper Ash Placement Project (PA 09_0186) Lamberts North Ash Repository, Modification 1, Water Assessment Report
Date:	10/05/2021	Drawing Size: A3	
Drawn By:	GR	Reviewed By: GP	Client: EnergyAustralia NSW Pty Ltd

Coordinate System: GDA 1994 MGA Zone 56

0 100 200 300m

N

ERM



LNAR Footprint Adjustments with 2014 Imagery

F1-5

Drawing No:	0581248m_LNAR_MR_G012_R0.mxd		
Date:	10/05/2021	Drawing Size: A3	
Drawn By:	GR	Reviewed By: GP	

Coordinate System: GDA 1994 MGA Zone 56

0 100 200 300m

N

Mt Piper Ash Placement Project (PA 09_0186)
Lamberts North Ash Repository, Modification 1,
Water Assessment Report

Client: EnergyAustralia NSW Pty Ltd

ERM

2. LEGISLATIVE CONTEXT

Table 2-1 below provides a description of the relevant legislative context and addresses the objectives and requirements of the legislation as it relates to biodiversity and ecological values associated with the Modification.

Table 2-1 Legislative Requirements

Commonwealth Legislation

Commonwealth *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act)

The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) requires approval of the Commonwealth Minister for Environment for actions that may have a significant impact on Matters of National Environmental Significance (MNES). The EPBC Act is administered by the Commonwealth Department of Environment and Energy (DoEE) and lists threatened species, ecological communities and other MNES. Any proposed action that is expected to have an impact on MNES must be referred to the Minister for assessment under the EPBC Act, or assessed under the accredited process between the Commonwealth and the State of NSW.

A search of the EPBC Protected Matters Search Tool (PMST) was undertaken on 22 March 2021 for the Modification. The results of the search are summarised below.

Matters of National Environmental Significance	Application to the Modification Area	Addressed
World heritage properties	Not identified within the Modification Area	Not applicable
National heritage places	Not identified within the Modification Area	Not applicable
Ramsar wetlands of international importance	Not identified within the Modification Area. The closest Ramsar wetland are over 200 km away.	Not applicable
Listed threatened species and communities	Threatened species have been recorded within the locality. No Threatened Ecological Communities (TEC) are present.	*Chapter 4.3*
Internationally protected migratory species	Migratory species identified as potentially occurring within the locality.	*Appendix C*
Commonwealth marine areas	Not identified within the Modification Area	Not applicable
The Great Barrier Reef Marine Park	Not identified within the Modification Area	Not applicable
Nuclear actions	Not applicable	Not applicable
A water resource, in relation to coal seam gas development and large coal mining development	Not applicable	Not applicable

Statutory Legislation and Guidelines

Environmental Planning and Assessment Act 1979

The *Environmental Planning and Assessment Act 1979* (EP&A Act) is the principal planning legislation for NSW. It provides a system of environmental planning and assessment administered by the NSW Department of Planning, Industry and Environment (DPIE). The EP&A Act establishes when and how a development or activity is to be assessed and who is the relevant approval or determining authority. The Modification seeks to modify an existing State Significant Development (SSD) approval, PA 09_0186.

Implications for Modification

The likely environmental impacts of the Modification will be considered and subject to conditions of consent.

Biodiversity Conservation Act 2016 (BC Act)

The NSW *Biodiversity Conservation Act 2016* came into effect on 25 August 2017. The BC Act replaced the NSW *Threatened Species Conservation Act 1995*, the NSW *Nature Conservation Trust Act 2001* and parts of the NSW *National Parks and Wildlife Act 1974*. The BC Act establishes mechanisms for:

- The management and protection of listed threatened species of native flora and fauna (excluding fish and marine vegetation) and threatened ecological communities (TECs).
- The listing of threatened species, TECs and key threatening processes.
- The development and implementation of recovery and threat abatement plans.
- The declaration of critical habitat.
- The consideration and assessment of threatened species impacts in development assessment process.
- Biodiversity Offsets Scheme, including the Biodiversity Values Map and method to identify serious and irreversible impacts (SAII).

The Biodiversity Offsets Scheme applies to all local developments, major projects or the clearing of native vegetation where the State Environmental Planning Policy (Vegetation in Non‐Rural Areas) 2017 applies. Any of these will also require entry into the Biodiversity Offsets Scheme if they occur on land mapped on the Biodiversity Values Map. ERM has reviewed and can confirm that the Modification area is not currently mapped on the Biodiversity Values Map (see BOSET report in *Appendix A*).

Implications for the Modification

The Biodiversity Offsets Scheme applies to state significant development and state significant infrastructure projects, unless the Secretary of the Department of Planning, Industry and Environment determines that the project is not likely to have a significant impact. Based on:

- the assessment of biodiversity values presented in this Biodiversity Assessment;
- the Modification area is not mapped on the Biodiversity Values map;
- the existing offset obligations for the LNAR are already being met; and
- the Modification area is located within an already highly disturbed footprint yet to be rehabilitated; and is already isolated, with no connectivity,

the Modification will not have a significant impact on biodiversity values.

National Parks and Wildlife Act 1974

Under the *National Parks and Wildlife Act 1974*, the Coordinator-General, Environment, Energy and Science is responsible for the care, control and management of all national parks, historic sites, nature reserves and Aboriginal areas. State conservation areas, karst conservation reserves and regional parks are also administered under the Act.

Implications for Modification

Marrangaroo National Park and Gardens of Stone National Park are located approximately 9 km south east and approximately 11 km north east of the Modification Area respectively. The Modification activities are not located on land reserved under the NP&W Act. No further assessment or approvals are required.

General Biosecurity Duty under the *Biosecurity Act 2015*

The NSW *Biosecurity Act 2015* came into effect on 1 July 2017, effectively replacing the Noxious Weeds Act 1993, and 13 other Acts, with a single Act. Under the Noxious Weeds Act all landowners have a responsibility to control noxious weeds on their property. Under Part 3 of the Biosecurity Act the same responsibility will apply and is known as a general biosecurity duty.

Specifically, Section 22 of the Act states that *"Any person who deals with biosecurity matter or a carrier and who knows, or ought reasonably to know, the biosecurity risk posed or likely to be posed by the biosecurity matter, carrier or dealing has a biosecurity duty to ensure that, so far as is reasonably practicable, the biosecurity risk is prevented, eliminated or minimised."* The general biosecurity duty applies to all weeds listed in Schedule 3 of the Biosecurity Act (also included as Weeds of National Significance (WoNS)).

A strategic plan for each WoNS has been developed to define responsibilities and identify strategies and actions to control the weed species. These can be downloaded from:
http://www.environment.gov.au/biodiversity/invasive/weeds/weeds/lists/wons.html

Implications for Modification

Pampass Grass (*Cortaderia* spp.) has been recorded within the Modification area and is recognised as a weed of *potential* national significance. Mechanical/manual removal of Pampas Grass is the best method of control where possible.

State Environmental Planning Policy (Koala Habitat Protection) 2021 (Koala SEPP 2021)

The Koala SEPP 2021 commenced on 17 March 2021. It reinstates the policy framework of SEPP Koala Habitat Protection 2019 to 83 local government areas (LGAs).

Koala habitat is defined in Part 1 (4) of the Koala SEPP 2021 as:

core koala habitat means—

(a) an area of land which has been assessed by a suitably qualified and experienced person as being highly suitable koala habitat and where koalas are recorded as being present at the time of assessment of the land as highly suitable koala habitat, or

(b) an area of land which has been assessed by a suitably qualified and experienced person as being highly suitable koala habitat and where koalas have been recorded as being present in the previous 18 years.

Implications for Modification

The Lithgow LGA is listed in Schedule 1 of the Koala SEPP 2021. The areas of minor extension of the LNAR boundary contain no established vegetation, as detailed in Figure 1-2. No Koala feed tree species listed in Schedule 2 of the Koala Habitat Protection SEPP 2020 have been recorded within the area associated with the Modification and the site does not constitute either Potential or Core Koala habitat.

State Environmental Planning Policy (Koala Habitat Protection) 2020 (Koala SEPP 2020)

The Koala SEPP 2020 commenced on 30 November 2020 and replaced the Koala Habitat Protection SEPP 2019. The Koala SEPP 2020 replicates the objectives and provisions of the former SEPP 44 – Koala Habitat Protection (SEPP 44) which was in force from 1995 through to 2019. The Koala SEPP 2020 applies to all RU1, RU2 and RU3 zoned land outside of the Sydney Metropolitan Area and the Central Coast.

Implications for Modification

The Modification is located on land zoned SP2. As such, the Koala SEPP 2020 is not relevant to the Modification and the provisions of the Koala SEPP 2021 apply, as discussed above.

3. METHODOLOGY

This Biodiversity Assessment has been prepared to determine if there is likely to be a significant impact on the biodiversity values as described in the BC Act and the *Biodiversity Conservation Regulation 2017*. Key definitions used in this assessment are presented in Table 3-1.

Table 3-1 Key definitions

Biodiversity Values	Description
Vegetation integrity	The degree to which the composition, structure and function of vegetation at a particular site and the surrounding landscape has been altered from a near natural state.
Habitat suitability	The degree to which the habitat needs of threatened species are present at a particular site.
Habitat connectivity	The degree to which a particular site connects different areas of habitat of threatened species to facilitate the movement of those species across their range.
**definitions as per Section 1.5 of the BC Act and Clause 1.4 of the Biodiversity Conservation Regulation 2017*	

3.1 Literature Review

Database records and relevant literature pertaining to the ecology of the Modification Area and surrounding environment were reviewed. The material reviewed included:

- NSW BioNet Atlas of threatened biodiversity database search (10 km) (accessed 25 March 2021).
- EPBC Act Protected Matters Search Tool (PMST) (5 km) (accessed 22 March 2021).
- Lithgow Local Environment Plan 2014.
- Ecotone Ecological Consultants (1996) Flora and Fauna Survey and Assessment Mount Piper Power Station Perimeter Lands and Thompsons Creek Dam.
- SKM (2009) Mt Piper Power Station Extension Environmental Assessment, August 2009.
- EnergyAustralia NSW (2015) Biodiversity Offset Management Plan – Lamberts North, July 2015.
- RPS (2016) Springvale Water Treatment Project Biodiversity Inventory and EPBC Act Assessment.
- ERM (2019) Mt Piper Energy Recovery Project Biodiversity Assessment Report, October 2019.

Aerial photography of the LNAR and surrounds were also used to investigate the extent of vegetation cover and landscape features, and to confirm previous site history in terms of historic mining activities and vegetation clearance (refer to Figure 1-3, Figure 1-4 and Figure 1-5). Based on the historic and current mining activities and ERM experience at MPPS and around the LNAR, no additional targeted site inspection was required to inform this assessment.

Likelihood of occurrences for threatened species, endangered populations and communities in the Modification Area have been made based on location of database records, the likely presence or absence of suitable habitat in the Modification Area, and knowledge of the species' ecology.

A list of potentially "affected species" was then identified using the following classification:

Known

- the ecological community/species/matter has been recorded in the Modification Area during field surveys; or
- database records demonstrate that the ecological community/species has been known to occur in the Modification Area within the last 10 year period.

Potential

- the ecological community/species' known distribution includes the Modification Area, and suitable habitat is present within it; or
- database records demonstrate that the ecological community/species has been known to occur in the Modification Area, however has not been recorded within the last 10 years; or
- the species is a wide ranging flying species which may 'fly-over' the Modification Area, regardless of the habitat types present and has been recorded within 5 km locality surrounding the Modification Area.

Unlikely

- the ecological community/species has not been recorded within 5 km locality of the Modification Area and suitable habitat does not occur within the Modification Area; or
- the Modification Area is not within the TEC/species' known distribution; or
- sufficient field surveys have been conducted to conclude that the species is likely to be absent.

3.2 Site Inspection

The Modification Area has been completely cleared of native vegetation. EnergyAustralia environment staff undertook an inspection of the boundary changes, noting regrowth vegetation and dominant weed species. Photographs of the regrowth vegetation and dominant weeds were taken and provided by EnergyAustralia for identification. .

4. BIODIVERSITY VALUES

The identification of landscape features and biodiversity values within the Modification Area are summarised in Table 4-1 below.

Table 4-1 Summary of Landscape Features and Biodiversity Values

Landscape Feature	Summary Notes
IBRA Bioregion	South Eastern Highlands
IBRA Subregion	Capertee Uplands
Vegetation	The Modification Area has been previously subject to underground and open cut coal mining, and has been completely cleared of native vegetation. This area is dominated by excavated mine material and remains unrehabilitated. Regrowth vegetation is considered to be of very low biodiversity value and includes *Acacia baileyana* (Cootamundra Wattle), *Acacia longifolia* (Sydney Golden Wattle), *Pinus* sp. and *Cortaderia selloana* (Pampas Grass).
Topography	The footprint of the Modification Area is situated at approximately 935-945 m AHD. The surrounding topography is highly modified due to the open cut mining and filling activities conducted over time.
Rivers, Streams and Estuaries	No streams, estuaries or wetlands are located within the Modification Area. At the LNAR, the surface water drainage from the former Huons Gully (an ephemeral watercourse) located along the western edge of the site has been dammed at the northern end of the undisturbed catchment area. The LNAR is located to the north and east of the dam within areas of past land disturbance.
Areas of Geological Significance	There are no karst, caves, crevices, cliffs or other areas of geological significance within the LNAR.
Areas of Outstanding Biodiversity Value (AOBV)	There are no Areas of Outstanding Biodiversity Value (AOBV) within the Modification Area.
High Biodiversity Values Map	There are no areas of high biodiversity value mapped within the Modification Area. See BOSET report in *Appendix A*.
Hollows and Hollow Bearing Trees	There are no hollow bearing trees or other important habitat features within the Modification Area.

4.1 Vegetation

The Modification Area has been subject to underground and open cut mining activities and has been completely cleared of native vegetation. This area is dominated by excavated mine material and remains unrehabilitated. Regrowth vegetation is considered to be of very low biodiversity value (refer Figure 4-1) is limited to one small area of approximately 0.25 ha and includes *Acacia baileyana* (Cootamundra Wattle), *Acacia longifolia* (Sydney Golden Wattle), *Pinus* sp. and *Cortaderia selloana* (Pampas Grass). All other areas, the subject of the minor boundary adjustments, are devoid of any vegetation.

1 2 3 4 5 6 7

Legend

- Photo Point
- Approved LNAR (Lamberts North Ash Repository)
- EPL 13007 Licenced Premises Boundary
- Proposed modification to LNAR footprint

Source:

Imagery: Nearmap Jan 2021

Amended LNAR Footprint and Regrowth Vegetation

F 4-1

Drawing No:	0581248m_LNAR_MR_G016_R1.mxd		
Date:	13/05/2021	Drawing Size: A3	
Drawn By:	GR	Reviewed By: GP	

Coordinate System: GDA 1994 MGA Zone 56

0 5 10 15m

N

Mt Piper Ash Placement Project (PA 09_0186)
Lamberts North Ash Repository, Modification 1,
Water Assessment Report

Client: EnergyAustralia NSW Pty Ltd

ERM

4.2 Threatened Ecological Communities

The installation of the liner and associated leachate management infrastructure will occur within areas previously assessed and approved under PA 09_0186 which has been previously cleared of native vegetation. Minor boundary adjustments are within areas fully disturbed by previous open cut coal mining activities, noting some patchy regrowth consisting of native (Acacia species), non-endemic and exotic species exists along the eastern boundary.

There is potential that the BC Act listed Critically Endangered Ecological Community (CEEC) Monaro Tableland Cool Temperate Grassy Woodland in the South Eastern Highlands Bioregion - South Eastern Highlands occurs within surrounding vegetated lands to the west and south of the LNAR. Mitigation measures will minimise any indirect impacts to surrounding habitats.

4.3 Threatened Flora and Fauna

A review of the NSW BioNet Atlas identifies two threatened flora species and ten threatened fauna species within one kilometre radius of the centre of the LNAR (refer to Figure 4-2). The Modification Area has been previously cleared of native vegetation by mining related activities and no habitat is currently available for any of these species.

Flora:

- *Eucalyptus cannonii* (Capertee Stringybark)
- *Eucalyptus aggregate* (Black Gum)

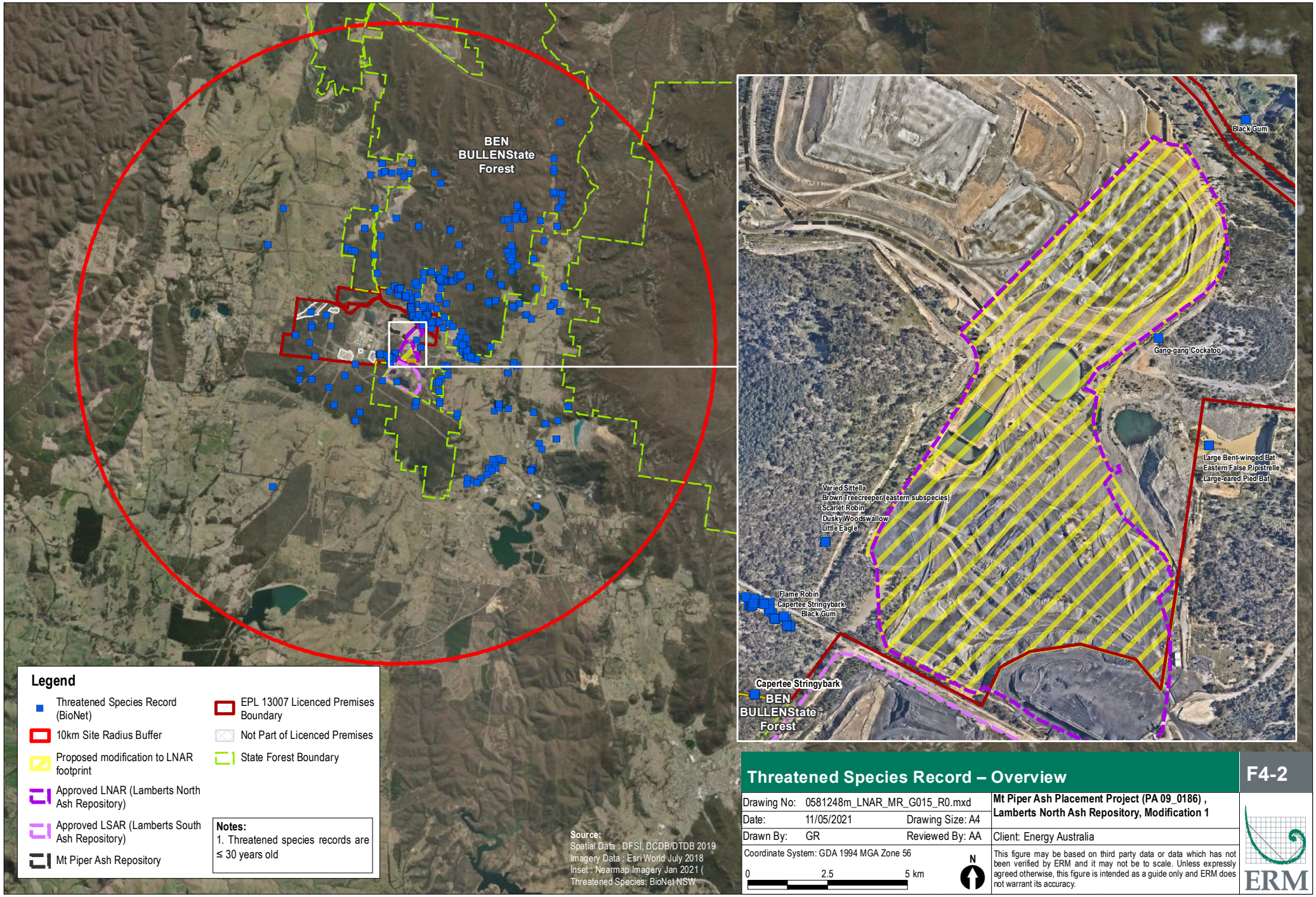
Fauna:

- *Climacteris picumnus victoriae* (Brown Treecreeper)
- *Miniopterus orianae oceanensis* (Large bent winged Bat)
- *Chalinolobus dwyeri (*Large-eared Pied Bat)
- *Falsistrellus tasmaniensis* (Eastern False Pipistrelle)
- *Hieraaetus morphnoides* (Little Eagle)
- *Callocephalon fimbriatum* (Gang-gang Cockatoo)
- *Petroica boodang* (Scarlet Robin)
- *Petroica phoenicea* (Flame Robin)
- *Artamus cyanopterus cyanopterus* (Dusky Woodswallow)
- Varied Sittella

4.4 Migratory Species

The Protected Matters Search Tool (PMST) found that potential habitat for a total of 12 migratory bird species is predicted to occur within a 5 km radius. No significant habitat features are available within the Modification Area for migratory species.

Migratory species may fly over the Modification Area as part of their generalist habitat requirements however they would not be dependent on the limited resources present within the one small area of regrowth of approximately 0.25 ha in size.



Threatened Species Record – Overview

F4-2

Drawing No:	0581248m_LNAR_MR_G015_R0.mxd		Mt Piper Ash Placement Project (PA 09_0186) , Lamberts North Ash Repository, Modification 1
Date:	11/05/2021	Drawing Size: A4	
Drawn By:	GR	Reviewed By: AA	Client: Energy Australia

Coordinate System: GDA 1994 MGA Zone 56

ERM

5. IMPACT ASSESSMENT

The potential impact of the Modification on selected threatened species and communities listed under the BC Act and the EPBC Act have been considered. Species were selected for further assessment by considering how they and their habitat might be affected by the Modification. In this instance there will be no direct clearance of any native vegetation communities or associated habitats and no threatened species or ecological communities have been recorded or likely to be dependent on the limited resources available.

It is recognised that some species which are wide-ranging, mobile and have generalist habitat requirements may still occur from time to time e.g. some highly mobile birds and microchiropteran bats may occasionally forage within or fly over the Modification Area. The Modification would not affect any habitat that is important to the survival of these species.

5.1 Direct impacts

In this instance there will be no direct clearance of any native vegetation communities or associated habitats. Siting of the Modification Area has been designed to ensure minimal impact to biodiversity values and will be restricted to areas of previous disturbance. There will be no direct impacts to any natural streams or aquatic habitats.

5.2 Indirect impacts

No threatened species are anticipated to rely on any of the habitats currently present and no sensitive receptors have been identified. Potential indirect impacts may result from any proposed development and include:

- changes to hydrology through run off, sedimentation and erosion from installation works; and
- increased edge effects (specifically spread of weeds) and any inadvertent impacts on adjacent habitat or vegetation.

Movement of vehicles has the potential to transport weeds and pathogens into the Modification Area and adjacent vegetation although it is noted that there will be minimal increase in traffic associated with the Modification.

6. CONCLUSION

The Modification has been designed to ensure minimal impact to biodiversity values. The three areas associated with the minor boundary adjustments have all been subject to previous mining activities and are highly disturbed, as evidenced by historic aerial imagery from 1991, 2001 and 2014, as depicted in Figure 1-3, Figure 1-4 and Figure 1-5 respectively. The areas associated with the minor boundary adjustments have not been subject to formal rehabilitation. Only one area (0.25 ha, the subject of this assessment), located on the eastern side of the Modification, contains some vegetation regrowth, the two other areas remain devoid of vegetation.

The Modification Area does not support any threatened species or ecological communities and no significant habitat features have been identified. Based on the long history of vegetation clearance and disturbance, it is unlikely that the Modification would result in any significant impacts on ecological values listed under the BC Act or the EPBC Act. The Modification is unlikely to impact any Matter of NES, and a referral to the Commonwealth Minister for the Environment is not required.

Based on these findings further assessment under the BC Act is also not required.

6.1 Recommendations (Mitigation Measures)

The following safeguards are designed to mitigate the potential indirect impacts of the Modification on areas of adjacent native vegetation, TECs or any potential threatened flora and fauna species in areas of adjacent habitats and include:

- review and amend the LNAR Operation Environmental Management Plan (OEMP) to ameliorate and mitigate against potential impacts to biodiversity values outside of the impact footprint, including a weed management procedure;
- installation of appropriate sediment control measures (e.g., silt fences) around the impact area to limit the spread of sediment into adjacent waterways and vegetation; and
- traffic management, as traffic is a source of mortality for some species, speed limits should be established to reduce risk of fauna strikes.

7. REFERENCES

AEP (2008) Ecological Assessment Report for Proposed Modification to Approved Western Rail Coal Unloader. August 2008

DEC (2006) The Vegetation of the Western Blue Mountains. Unpublished report funded by the Hawkesbury – Nepean Catchment Management Authority. Department of Environment and Conservation, Hurstville. Dataset revised 04/08/2011

Ecotone Ecological Consultants (1996) Flora and Fauna Survey and Assessment Mount Piper Power Station Perimeter Lands and Thompsons Creek Dam.

EnergyAustralia NSW (2015) Biodiversity Offset Management Plan – Lamberts North. July 2015

ERM (2019) Mt Piper Energy Recovery Project Biodiversity Assessment Report, October 2019.

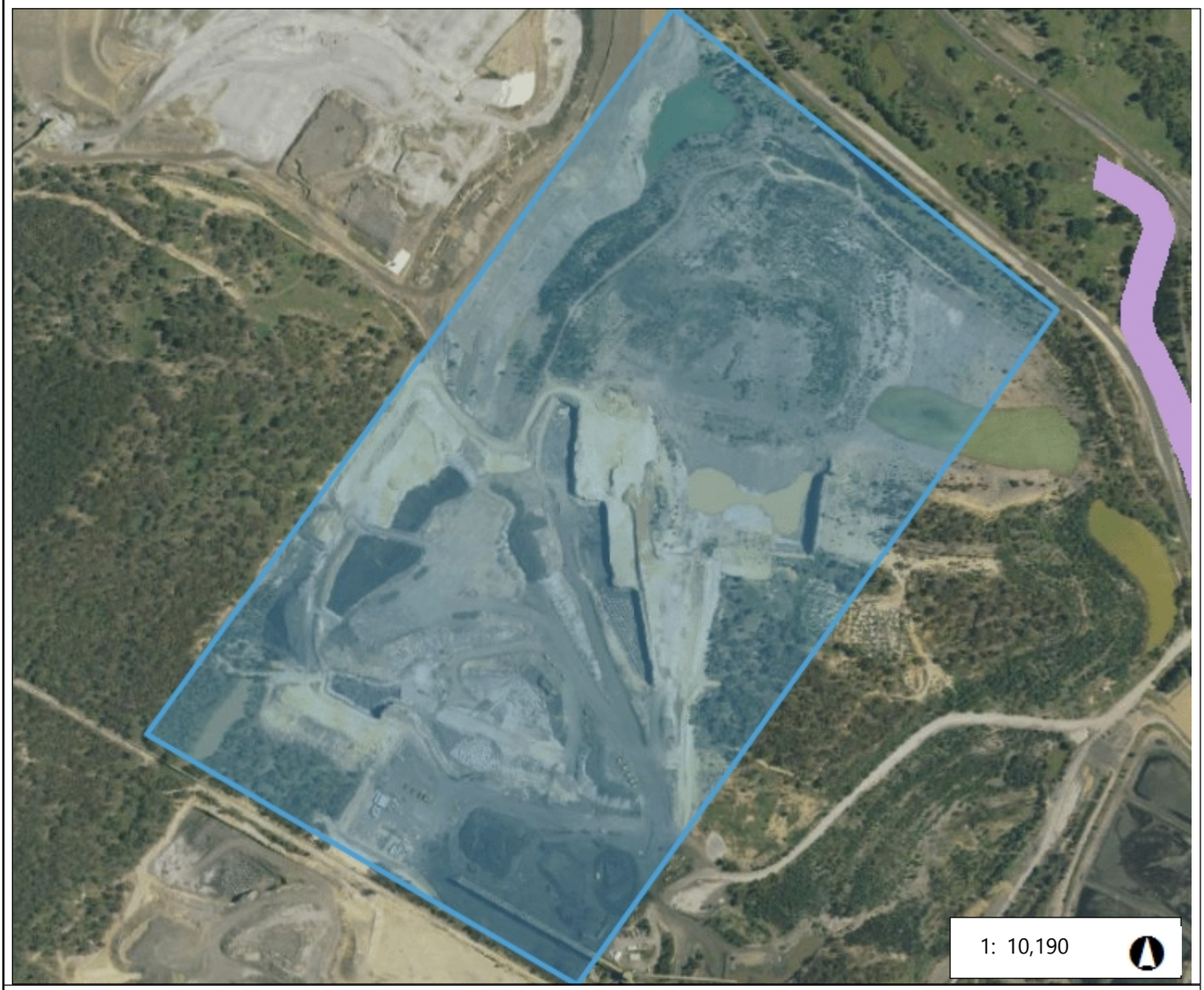
RPS (2016) Springvale Water Treatment Project Biodiversity Inventory and EPBC Act Assessment

SKM (2007) Flora and Fauna Impact Assessment for the Western Rail Coal Unloader. April 2007

SKM (2009) Mt Piper Power Station Extension Environmental Assessment, August 2009

APPENDIX A BOSET

Biodiversity Offset Scheme (BOS) Entry Threshold Map



517.6 0 258.82 517.6 Metres

WGS_1984_Web_Mercator_Auxiliary_Sphere

This map is a user generated static output from an Internet mapping site and is for reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable.

THIS MAP IS NOT TO BE USED FOR NAVIGATION

Legend

- Biodiversity Values that have been mapped for more than 90 days
- Biodiversity Values added within last 90 days

Notes

Biodiversity Values Map and Threshold Report

Results Summary

Date of Calculation	11/05/2021 1:09 PM		**BDAR Required***
Total Digitised Area	82.56	ha	
Minimum Lot Size Method	Lot size		
Minimum Lot Size	2.01	ha	
Area Clearing Threshold	0.5	ha	
Area clearing trigger Area of native vegetation cleared	Unknown #		Unknown #
Biodiversity values map trigger Impact on biodiversity values map(not including values added within the last 90 days)?	no		no
Date of the 90 day Expiry	N/A		

*If BDAR required has:

- at least one 'Yes': you have exceeded the BOS threshold. You are now required to submit a Biodiversity Development Assessment Report with your development application. Go to https://customer.lmbc.nsw.gov.au/assessment/AccreditedAssessor to access a list of assessors who are accredited to apply the Biodiversity Assessment Method and write a Biodiversity Development Assessment Report
- 'No': you have not exceeded the BOS threshold. You may still require a permit from local council. Review the development control plan and consult with council. You may still be required to assess whether the development is '"likely to significantly affect threatened species' as determined under the test in s. 7.3 of the Biodiversity Conservation Act 2016. You may still be required to review the area where no vegetation mapping is available.

Where the area of impact occurs on land with no vegetation mapping available, the tool cannot determine the area of native vegetation cleared and if this exceeds the Area Threshold. You will need to work out the area of native vegetation cleared - refer to the BOSET user guide for how to do this.

On and after the 90 day expiry date a BDAR will be required.

Disclaimer

This results summary and map can be used as guidance material only. This results summary and map is not guaranteed to be free from error or omission. The State of NSW and Office of Environment and Heritage and its employees disclaim liability for any act done on the information in the results summary or map and any consequences of such acts or omissions. It remains the responsibility of the proponent to ensure that their development application complies will all aspects of the Biodiversity Conservation Act 2016.

The mapping provided in this tool has been done with the best available mapping and knowledge of species habitat requirements. This map is valid for a period of 30 days from the date of calculation (above).

Acknowledgement

I as the applicant for this development, submit that I have correctly depicted the area that will be impacted or likely to be impacted as a result of the proposed development.

Signature_____ Date: 17 /05/2021_____

APPENDIX B PMST

Australian Government

Department of Agriculture, Water and the Environment

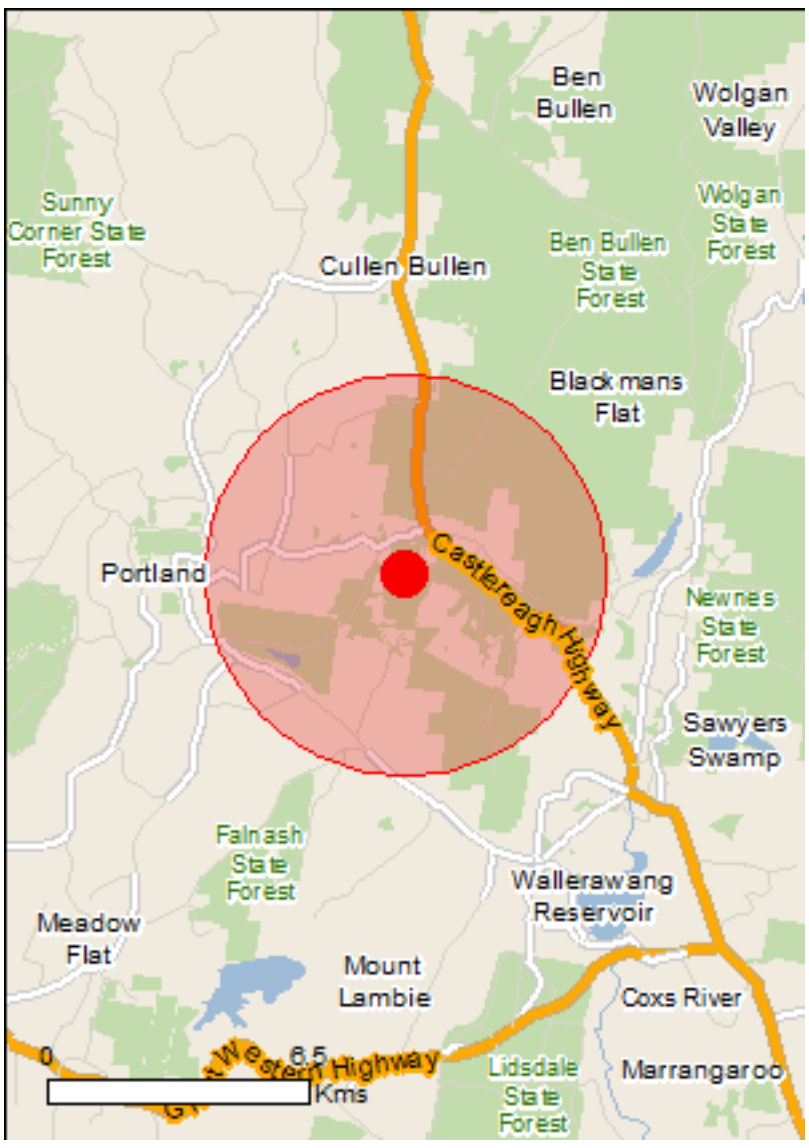
EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected.

Information on the coverage of this report and qualifications on data supporting this report are contained in the caveat at the end of the report.

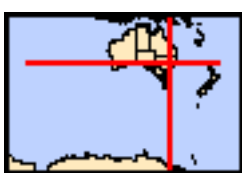
Information is available about Environment Assessments and the EPBC Act including significance guidelines, forms and application process details.

Report created: 22/03/21 13:09:00



Coordinates

Buffer: 5.0Km



Summary

Matters of National Environmental Significance

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

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance:	4
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	3
Listed Threatened Species:	40
Listed Migratory Species:	12

Other Matters Protected by the EPBC Act

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

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

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

Commonwealth Land:	1
Commonwealth Heritage Places:	None
Listed Marine Species:	19
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None

Extra Information

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

State and Territory Reserves:	None
Regional Forest Agreements:	None
Invasive Species:	33
Nationally Important Wetlands:	None
Key Ecological Features (Marine)	None

Details

Matters of National Environmental Significance

Wetlands of International Importance (Ramsar) [Resource Information]

Name	Proximity
Banrock station wetland complex	800 - 900km upstream
Riverland	800 - 900km upstream
The coorong, and lakes alexandrina and albert wetland	900 - 1000km upstream
The macquarie marshes	300 - 400km upstream

Listed Threatened Ecological Communities [Resource Information]

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

Name	Status	Type of Presence
Natural Temperate Grassland of the South Eastern Highlands	Critically Endangered	Community may occur within area
Upland Basalt Eucalypt Forests of the Sydney Basin Bioregion	Endangered	Community may occur within area
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	Critically Endangered	Community may occur within area

Listed Threatened Species [Resource Information]

Name	Status	Type of Presence
Birds		
Anthochaera phrygia Regent Honeyeater [82338]	Critically Endangered	Species or species habitat known to occur within area
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat likely to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat may occur within area
Grantiella picta Painted Honeyeater [470]	Vulnerable	Species or species habitat known to occur within area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat likely to occur within area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat likely to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area

Name	Status	Type of Presence
Polytelis swainsonii		
Superb Parrot [738]	Vulnerable	Species or species habitat may occur within area
Rostratula australis		
Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area
Fish		
Macquaria australasica		
Macquarie Perch [66632]	Endangered	Species or species habitat may occur within area
Prototroctes maraena		
Australian Grayling [26179]	Vulnerable	Species or species habitat may occur within area
Frogs		
Heleioporus australiacus		
Giant Burrowing Frog [1973]	Vulnerable	Species or species habitat may occur within area
Litoria booroolongensis		
Booroolong Frog [1844]	Endangered	Species or species habitat likely to occur within area
Insects		
Paralucia spinifera		
Bathurst Copper Butterfly, Purple Copper Butterfly, Bathurst Copper, Bathurst Copper Wing, Bathurst-Lithgow Copper, Purple Copper [26335]	Vulnerable	Species or species habitat known to occur within area
Mammals		
Chalinolobus dwyeri		
Large-eared Pied Bat, Large Pied Bat [183]	Vulnerable	Species or species habitat known to occur within area
Dasyurus maculatus maculatus (SE mainland population)		
Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population) [75184]	Endangered	Species or species habitat likely to occur within area
Nyctophilus corbeni		
Corben's Long-eared Bat, South-eastern Long-eared Bat [83395]	Vulnerable	Species or species habitat may occur within area
Petauroides volans		
Greater Glider [254]	Vulnerable	Species or species habitat known to occur within area
Petrogale penicillata		
Brush-tailed Rock-wallaby [225]	Vulnerable	Species or species habitat likely to occur within area
Phascolarctos cinereus (combined populations of Qld, NSW and the ACT)		
Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Vulnerable	Species or species habitat known to occur within area
Pseudomys novaehollandiae		
New Holland Mouse, Pookila [96]	Vulnerable	Species or species habitat may occur within area
Pteropus poliocephalus		
Grey-headed Flying-fox [186]	Vulnerable	Foraging, feeding or related behaviour may occur within area
Plants		
Acacia bynoeana		
Bynoe's Wattle, Tiny Wattle [8575]	Vulnerable	Species or species habitat may occur within area
Cryptostylis hunteriana		
Leafless Tongue-orchid [19533]	Vulnerable	Species or species habitat may occur within area

Name	Status	Type of Presence
Eucalyptus aggregata Black Gum [20890]	Vulnerable	Species or species habitat known to occur within area
Eucalyptus pulverulenta Silver-leaved Mountain Gum, Silver-leaved Gum [21537]	Vulnerable	Species or species habitat likely to occur within area
Euphrasia arguta [4325]	Critically Endangered	Species or species habitat may occur within area
Haloragodendron lucasii Hal [6480]	Endangered	Species or species habitat may occur within area
Kunzea cambagei [11420]	Vulnerable	Species or species habitat likely to occur within area
Leucochrysum albicans subsp. tricolor Hoary Sunray, Grassland Paper-daisy [89104]	Endangered	Species or species habitat may occur within area
Persoonia marginata Clandulla Geebung [10852]	Vulnerable	Species or species habitat may occur within area
Prasophyllum petilum Tarengo Leek Orchid [55144]	Endangered	Species or species habitat may occur within area
Prasophyllum sp. Wybong (C.Phelps ORG 5269) a leek-orchid [81964]	Critically Endangered	Species or species habitat may occur within area
Pultenaea glabra Smooth Bush-pea, Swamp Bush-pea [11887]	Vulnerable	Species or species habitat likely to occur within area
Rhizanthella slateri Eastern Underground Orchid [11768]	Endangered	Species or species habitat may occur within area
Thesium australe Austral Toadflax, Toadflax [15202]	Vulnerable	Species or species habitat known to occur within area
Reptiles		
Aprasia parapulchella Pink-tailed Worm-lizard, Pink-tailed Legless Lizard [1665]	Vulnerable	Species or species habitat may occur within area
Delma impar Striped Legless Lizard, Striped Snake-lizard [1649]	Vulnerable	Species or species habitat may occur within area
Hoplocephalus bungaroides Broad-headed Snake [1182]	Vulnerable	Species or species habitat likely to occur within area

Listed Migratory Species [Resource Information]

* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.

Name	Threatened	Type of Presence
Migratory Marine Birds		
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Migratory Terrestrial Species		

Name	Threatened	Type of Presence
Hirundapus caudacutus		
White-throated Needletail [682]	Vulnerable	Species or species habitat likely to occur within area
Monarcha melanopsis		
Black-faced Monarch [609]		Species or species habitat likely to occur within area
Motacilla flava		
Yellow Wagtail [644]		Species or species habitat may occur within area
Myiagra cyanoleuca		
Satin Flycatcher [612]		Species or species habitat known to occur within area
Rhipidura rufifrons		
Rufous Fantail [592]		Species or species habitat likely to occur within area
Migratory Wetlands Species		
Actitis hypoleucos		
Common Sandpiper [59309]		Species or species habitat may occur within area
Calidris acuminata		
Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area
Calidris ferruginea		
Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calidris melanotos		
Pectoral Sandpiper [858]		Species or species habitat may occur within area
Gallinago hardwickii		
Latham's Snipe, Japanese Snipe [863]		Species or species habitat may occur within area
Numenius madagascariensis		
Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area

Other Matters Protected by the EPBC Act

Commonwealth Land [Resource Information]

The Commonwealth area listed below may indicate the presence of Commonwealth land in this vicinity. Due to the unreliability of the data source, all proposals should be checked as to whether it impacts on a Commonwealth area, before making a definitive decision. Contact the State or Territory government land department for further information.

Name
Commonwealth Land - Australian Telecommunications Corporation

Listed Marine Species [Resource Information]

* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.

Name	Threatened	Type of Presence
Birds		
Actitis hypoleucos		
Common Sandpiper [59309]		Species or species habitat may occur within area
Apus pacificus		
Fork-tailed Swift [678]		Species or species habitat likely to occur within area

Name	Threatened	Type of Presence
Ardea alba Great Egret, White Egret [59541]		Species or species habitat likely to occur within area
Ardea ibis Cattle Egret [59542]		Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
Chrysococcyx osculans Black-eared Cuckoo [705]		Species or species habitat likely to occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat may occur within area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat likely to occur within area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat likely to occur within area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat likely to occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat likely to occur within area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat likely to occur within area
Rostratula benghalensis (sensu lato) Painted Snipe [889]	Endangered*	Species or species habitat likely to occur within area

Extra Information

Invasive Species [Resource Information]

Weeds reported here are the 20 species of national significance (WoNS), along with other introduced plants that are considered by the States and Territories to pose a particularly significant threat to biodiversity. The following feral animals are reported: Goat, Red Fox, Cat, Rabbit, Pig, Water Buffalo and Cane Toad. Maps from Landscape Health Project, National Land and Water Resouces Audit, 2001.

Name	Status	Type of Presence
Birds		
Acridotheres tristis Common Myna, Indian Myna [387]		Species or species habitat likely to occur within area
Alauda arvensis Skylark [656]		Species or species habitat likely to occur within area
Anas platyrhynchos Mallard [974]		Species or species habitat likely to occur within area
Carduelis carduelis European Goldfinch [403]		Species or species habitat likely to occur within area
Columba livia Rock Pigeon, Rock Dove, Domestic Pigeon [803]		Species or species habitat likely to occur within area
Passer domesticus House Sparrow [405]		Species or species habitat likely to occur within area
Passer montanus Eurasian Tree Sparrow [406]		Species or species habitat likely to occur within area
Pycnonotus jocosus Red-whiskered Bulbul [631]		Species or species habitat likely to occur within area
Streptopelia chinensis Spotted Turtle-Dove [780]		Species or species habitat likely to occur within area
Sturnus vulgaris Common Starling [389]		Species or species habitat likely to occur within area

Name	Status	Type of Presence
Turdus merula Common Blackbird, Eurasian Blackbird [596]		Species or species habitat likely to occur within area
Mammals		
Bos taurus Domestic Cattle [16]		Species or species habitat likely to occur within area
Canis lupus familiaris Domestic Dog [82654]		Species or species habitat likely to occur within area
Capra hircus Goat [2]		Species or species habitat likely to occur within area
Felis catus Cat, House Cat, Domestic Cat [19]		Species or species habitat likely to occur within area
Feral deer Feral deer species in Australia [85733]		Species or species habitat likely to occur within area
Lepus capensis Brown Hare [127]		Species or species habitat likely to occur within area
Mus musculus House Mouse [120]		Species or species habitat likely to occur within area
Oryctolagus cuniculus Rabbit, European Rabbit [128]		Species or species habitat likely to occur within area
Rattus rattus Black Rat, Ship Rat [84]		Species or species habitat likely to occur within area
Sus scrofa Pig [6]		Species or species habitat likely to occur within area
Vulpes vulpes Red Fox, Fox [18]		Species or species habitat likely to occur within area
Plants		
Cytisus scoparius Broom, English Broom, Scotch Broom, Common Broom, Scottish Broom, Spanish Broom [5934]		Species or species habitat likely to occur within area
Genista monspessulana Montpellier Broom, Cape Broom, Canary Broom, Common Broom, French Broom, Soft Broom [20126]		Species or species habitat likely to occur within area
Genista sp. X Genista monspessulana Broom [67538]		Species or species habitat may occur within area
Lycium ferocissimum African Boxthorn, Boxthorn [19235]		Species or species habitat likely to occur within area
Nassella neesiana Chilean Needle grass [67699]		Species or species habitat likely to occur within area
Nassella trichotoma Serrated Tussock, Yass River Tussock, Yass Tussock, Nassella Tussock (NZ) [18884]		Species or species habitat likely to occur

Name	Status	Type of Presence within area
Opuntia spp. Prickly Pears [82753]		Species or species habitat likely to occur within area
Pinus radiata Radiata Pine Monterey Pine, Insignis Pine, Wilding Pine [20780]		Species or species habitat may occur within area
Rubus fruticosus aggregate Blackberry, European Blackberry [68406]		Species or species habitat likely to occur within area
Salix spp. except S.babylonica, S.x calodendron & S.x reichardtii Willows except Weeping Willow, Pussy Willow and Sterile Pussy Willow [68497]		Species or species habitat likely to occur within area
Senecio madagascariensis Fireweed, Madagascar Ragwort, Madagascar Groundsel [2624]		Species or species habitat likely to occur within area

Caveat

The information presented in this report has been provided by a range of data sources as acknowledged at the end of the report.

This report is designed to assist in identifying the locations of places which may be relevant in determining obligations under the Environment Protection and Biodiversity Conservation Act 1999. It holds mapped locations of World and National Heritage properties, Wetlands of International and National Importance, Commonwealth and State/Territory reserves, listed threatened, migratory and marine species and listed threatened ecological communities. Mapping of Commonwealth land is not complete at this stage. Maps have been collated from a range of sources at various resolutions.

Not all species listed under the EPBC Act have been mapped (see below) and therefore a report is a general guide only. Where available data supports mapping, the type of presence that can be determined from the data is indicated in general terms. People using this information in making a referral may need to consider the qualifications below and may need to seek and consider other information sources.

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

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

Where very little information is available for species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc). In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More reliable distribution mapping methods are used to update these distributions as time permits.

Only selected species covered by the following provisions of the EPBC Act have been mapped:

- migratory and
- marine

The following species and ecological communities have not been mapped and do not appear in reports produced from this database:

- threatened species listed as extinct or considered as vagrants
- some species and ecological communities that have only recently been listed
- some terrestrial species that overfly the Commonwealth marine area
- migratory species that are very widespread, vagrant, or only occur in small numbers

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

- non-threatened seabirds which have only been mapped for recorded breeding sites
- seals which have only been mapped for breeding sites near the Australian continent

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

Coordinates

-33.35649 150.03364

Acknowledgements

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

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

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

Please feel free to provide feedback via the Contact Us page.

Department of Agriculture Water and the Environment
GPO Box 858
Canberra City ACT 2601 Australia
+61 2 6274 1111

APPENDIX C LIKELIHOOD OF OCCURRENCE

In order to complement identification of threatened species likely to occur within the Modification Area, the NSW BioNet and the PMST were undertaken. A likelihood of occurrence and risk assessments were undertaken for all species.

Likelihood of Occurrence

Species identified in the NSW BioNet atlas and the PMST were collated into a table where an assessment of the likelihood of occurrence of that threatened biodiversity was undertaken. In making this determination, the following factors were considered:

- habitat quality within and adjacent to the Modification Area as determined through review of regional vegetation mapping;
- breeding habitat/resources present – assists with identification of the importance of habitat to the species;
- dispersal ability - based on known ecology - whether the species have an ability to disperse to new areas of habitat following disturbance; and
- local records in similar habitat/distance/connectivity to the Modification Area.

This allows for assessment of cryptic or seasonal species that are unlikely to be readily identified during brief site inspections and/or due to seasonal constraints. The likelihood of each species occurring was categorised as known, potential or unlikely to occur based on the definitions provided in *Table C.1.*

Table C.1 Definitions of Likelihood of Occurrence

Category	Description
Known	■ the ecological community/species/matter has been recorded in the Modification Area; or ■ database records demonstrate that the ecological community/species has been known to occur in the Modification Area within the last 10 year period.
Potential	■ the ecological community/species' known distribution includes the Modification Area, and suitable habitat is present within it; or ■ database records demonstrate that the ecological community/species has been known to occur in the Modification Area, however has not been recorded within the last 10 years; or ■ the species is a wide ranging flying species which may 'fly-over' the Modification Area, regardless of the habitat types present and has been recorded within 5 km locality surrounding the Modification Area.
Unlikely	■ the ecological community/species has not been recorded within 5km locality of the Modification Area and suitable habitat does not occur within the Modification Area; or ■ the Modification Area is not within the TEC/species' known distribution; or ■ sufficient field surveys have been conducted to conclude that the species is likely to be absent.

Risk Assessment

A risk assessment was undertaken using the definitions of Species Sensitivity and Consequence to assign a relative risk ranking for each listed ecological value (Low, Medium, High or Very High, as shown in *Table C.2*). Impacts to ecological values with potential to occur that were assessed as having a Low risk was not further assessed. Results of risk assessment are presented in *Table C.3*.

Impacts to ecological values with potential to occur that were assessed as having a Medium, High or Very High risk were further assessed in accordance with the requirements of the EPBC Act and BC Act, including the preparation of detailed Assessments of Significance.

Species sensitivity rankings are based on the species conservation status under the EPBC Act, Fisheries Management Act and BC Act. Where the conservation status differs between listings, the conservation status with higher sensitivity is used.

Table C.2 Risk Assessment Matrix

		Consequence			
Sensitivity		Negligible	Minor	Moderate	Major
	Ecological value not listed as threatened	Low	Low	Medium	High
	Ecological value listed as Vulnerable or Migratory	Low	Medium	Medium	High
	Ecological value listed as Endangered	Low	Medium	High	Very High
	Ecological value listed as Critically Endangered	Medium	High	Very High	Very High

Consequence Definitions

Negligible: No impacts or removal of ecological community. Effect on species is within the likely normal range of variation. No removal of specific breeding habitat features.

Minor: Indirect impacts to listed ecological community which may affect a small proportion of the ecological community. Effects a small proportion of a population and Project-related mortality of a small number of individuals may occur, but does not substantially affect other species dependent on it, or the populations of the species itself. No removal of specific breeding habitat features.

Moderate: Direct removal of a portion of a listed ecological community. Effects a sufficient proportion of a species population that it may bring about a substantial change in abundance and/or reduction in distribution over one or more generations, but does not threaten the long term viability of that population or any population dependent on it.

Major: Direct removal of a listed ecological community. Effects an entire population or species at sufficient scale to cause a substantial decline in abundance and/or change in distribution beyond with natural recruitment (reproduction, immigration from unaffected areas) may not return that population or species, or any population or species dependent upon it, to its former level within several generations, or when there is no possibility of recovery.

Species sensitivity definitions

Species sensitivities refer to listed under either the EPBC Act or BC Act. Where listings differ, the higher sensitivity is used.

Scientific Name	Listing Status		Records within 5km radius		Habitat Requirements	Likelihood of Occurrence	Potential to be impacted?	Risk Rating
	BC Act	EPBC Act	BioNet	PMST				
Acacia bynoeana Bynoe's Wattle	E	V		x	Broadly, Bynoe's Wattle is recorded in open woodland with a heath understorey or open woodland with a sparse shrub cover and a grass/sedge ground cover. The species has been recorded in the Blue Mountains National Park (NP), Royal NP, Marramarra NP and Tarlo River NP. It is also conserved in Castlereagh, Dharawal and Agnes Banks NRs and Lake Macquarie SRA.	Unlikely No habitat available and this species has not been recorded within 5km radius of the site.	No Impact	Low
Anthochaera Phrygia Regent Honeyeater	CE	CE		x	The Regent Honeyeater inhabits eucalypt open forests and woodlands, predominantly box-ironbark types, but also Spotted Gum and Swamp Mahogany on the coast. The species also inhabits River She-oak gallery forest with *Amyema cambagei* (Needle-leaf Mistletoe). Within NSW, breeding sub-populations are fragmented and now occur mainly around the Capertee Valley in central-eastern NSW and the Bundarra-Barraba region in northern inland NSW.	Unlikely No habitat available and this species has not been recorded within 5km radius of the site.	No Impact	Low
Aprasia parapulchella Pink-tailed Worm-lizard	V	V		x	The Pink-tailed Legless Lizard is only known from the Central and Southern Tablelands, and the South Western Slopes. There is a concentration of populations in the Canberra/Queanbeyan Region. Other populations have been recorded near Cooma, Yass, Bathurst, Albury and West Wyalong. Sites where the species is found generally include rocky outcrops or scattered partly buried rocks. It occurs under rocks in grassland and woodland in south-east Australia.	Unlikely No habitat available and this species has not been recorded within 5km radius of the site.	No Impact	Low
Artamus cyanopterus cyanopterus Dusky Woodswallow	V		5		The species occurs throughout most of New South Wales, but is sparsely scattered in, or largely absent from, much of the upper western region. Most breeding activity occurs on the western slopes of the Great Dividing Range. Primarily inhabit dry, open eucalypt forests and woodlands, including mallee associations, with an open or sparse understorey of eucalypt saplings, acacias and other shrubs, and ground-cover of grasses or sedges and fallen woody debris. It has also been recorded in shrublands, heathlands and very occasionally in moist forest or rainforest. Also found in farmland, usually at the edges of forest or woodland.	Unlikely No suitable habitat is available within the site.	No Impact	Low
Calidris ferruginea Curlew Sandpiper	E	CE		x	Curlew Sandpipers mainly occur on intertidal mudflats in sheltered coastal areas, such as estuaries, bays, inlets and lagoons, and also around non-tidal swamps, lakes and lagoons near the coast, and ponds in saltworks and sewage farms. They are also recorded inland, though less often, including around ephemeral and permanent lakes, dams, waterholes and bore drains, usually with bare edges of mud or sand. They occur in both fresh and brackish waters. In NSW, they are widespread east of the Great Divide, especially in coastal regions. They are occasionally recorded in the Tablelands and are widespread in the Riverina and south-west NSW, with scattered records elsewhere.	Unlikely No habitat available and this species has not been recorded within 5km radius of the site.	No Impact	Low
Callocephalon fimbriatum Gang-gang Cockatoo	V		8		In spring and summer, generally found in tall mountain forests and woodlands, particularly in heavily timbered and mature wet sclerophyll forests. In autumn and winter, the species often moves to lower altitudes in drier more open eucalypt forests and woodlands, particularly box-gum and box-ironbark assemblages, or in dry forest in coastal areas and often found in urban areas. May also occur in sub-alpine Snow Gum (*Eucalyptus pauciflora*) woodland and occasionally in temperate rainforests. Favours old growth forest and woodland attributes for nesting and roosting. Nests are located in hollows that are 10 cm in diameter or larger and at least 9 m above the ground in eucalypts.	Unlikely No suitable habitat available due to long history of vegetation clearance and disturbance. This species has been recorded in adjacent vegetated habitats to the north east.	No direct clearance of any potential habitat. Mitigation measures will also minimise any indirect impacts to surrounding habitats.	Low
Calyptorhynchus lathami Glossy Black-Cockatoo	V		1		Inhabits open forest and woodlands of the coast and the Great Dividing Range where stands of sheoak occur. Black Sheoak (*Allocasuarina littoralis*) and Forest Sheoak (*A. torulosa*) are important foods. Feeds almost exclusively on the seeds of several species of she-oak (Casuarina and Allocasuarina species), shredding the cones with the massive bill. Dependent on large hollow-bearing eucalypts for nest sites.	Unlikely No suitable habitat available due to long history of vegetation clearance and disturbance.	No Impact	Low
Chalinolobus dwyeri Large-eared Pied Bat	V	V	7	x	It is generally rare with a very patchy distribution in NSW. Roosts in caves (near their entrances), crevices in cliffs, old mine workings and in the disused, bottle-shaped mud nests of the Fairy Martin (*Petrochelidon ariel*), frequenting low to mid-elevation dry open forest and woodland close to these features. Found in well-timbered areas containing gullies.	Unlikely No suitable habitat available due to long history of vegetation clearance and disturbance.	No Impact	Low

Scientific Name	Listing Status		Records within 5km radius		Habitat Requirements	Likelihood of Occurrence	Potential to be impacted?	Risk Rating
	BC Act	EPBC Act	BioNet	PMST				
Chthonicola sagittata Speckled Warbler	V		1		Typical habitat would include scattered native tussock grasses, a sparse shrub layer, some eucalypt regrowth and an open canopy. Large, relatively undisturbed remnants are required for the species to persist in an area.	Unlikely No suitable habitat available due to long history of vegetation clearance and disturbance.	No Impact	Low
Climacteris picumnus victoriae Brown Treecreeper (eastern subspecies)	V		10		Found in eucalypt woodlands (including Box-Gum Woodland) and dry open forest of the inland slopes and plains inland of the Great Dividing Range; mainly inhabits woodlands dominated by stringybarks or other rough-barked eucalypts, usually with an open grassy understorey, sometimes with one or more shrub species; also found in mallee and River Red Gum (*Eucalyptus camaldulensis*) Forest bordering wetlands with an open understorey of acacias, saltbush, lignum, cumbungi and grasses; usually not found in woodlands with a dense shrub layer; fallen timber is an important habitat component for foraging; also recorded, though less commonly, in similar woodland habitats on the coastal ranges and plains.	Unlikely No suitable habitat available due to long history of vegetation clearance and disturbance. This species has been recorded in adjacent habitats to the west.	No direct clearance of any native vegetation communities. Mitigation measures will also minimise any indirect impacts to surrounding habitats.	Low
Cryptostylis hunteriana Leafless Tongue-orchid	V	V		x	In NSW, the Leafless Tongue-orchid occurs between Batemans Bay and Nowra with additional records in Nelson Bay, Wyee, Washpool National Park, Nowendoc State Forest, Ku-Ring-Gai Chase National Park, Ben Boyd National Park, the Catherine Hill Bay area, Dolphin Point and Bulahdelah.	Unlikely Outside known geographic range.	No Impact	Low
Varied Sittella	V		3		Distribution in NSW is nearly continuous from the coast to the far west. The Varied Sittella's population size in NSW is uncertain but is believed to have undergone a moderate reduction over the past several decades. Inhabits eucalypt forests and woodlands, especially those containing rough-barked species and mature smooth-barked gums with dead branches, mallee and Acacia woodland.	Unlikely No suitable habitat available due to long history of vegetation clearance and disturbance.	No Impact	Low
Eucalyptus aggregate Black Gum	V	V	86	x	In NSW it occurs in the South Eastern Highlands Bioregion and on the western fringe of the Sydney Basin Bioregion. Grows on alluvial soils, on cold, poorly-drained flats and hollows adjacent to creeks and small rivers. Often grows with other cold-adapted eucalypts, such as Snow Gum or White Sallee (*Eucalyptus pauciflora*), Manna or Ribbon Gum (*E. viminalis*), Candlebark (*E. rubida*), Black Sallee (*E. stellulata*) and Swamp Gum (*E. ovata*).	Unlikely No suitable habitat available due to long history of vegetation clearance and disturbance although this species has been recorded in adjacent habitats to the south.	No Impact	Low
Eucalyptus cannonii Capertee Stringybark	V		175		The Capertee Stringybark is predominantly restricted to the central tablelands and slopes of NSW between the Golden Highway in the north, and the Mitchell Highway in the south. Within this area the species is often locally frequent.	Unlikely No habitat available within the highly disturbed site although this species has been recorded in adjacent habitats to the south.	No Impact	Low
Eucalyptus pulverulenta Silver-leaved Mountain Gum	V	V		x	The Silver-leafed Gum is found in two quite separate areas, the Lithgow to Bathurst area and the Monaro (Bredbo to Bombala). Grows in shallow soils as an understorey plant in open forest, typically dominated by Brittle Gum (*Eucalyptus mannifera*), Red Stringybark (*E. macrorhynca*), Broad-leafed Peppermint (*E. dives*), Silvertop Ash (*E. sieberi*) and Apple Box (*E. bridgesiana*).	Unlikely No habitat available within the highly disturbed site and this species has not been recorded within 5km radius of the site.	No Impact	Low
Eucalyptus robertsonii subsp. Hemisphaerica Robertson's Peppermint	V	V		x	Known only from the central tablelands of NSW, at small disjunct localities from north of Orange to Burraga. Locally frequent in grassy or dry sclerophyll woodland or forest, on lighter soils and often on granite. Usually found in closed grassy woodlands in locally sheltered sites. Habitats include quartzite ridges, upper slopes and a slight rise of shallow clay over volcanics.	Unlikely Outside known geographic range.	No Impact	Low

Scientific Name	Listing Status		Records within 5km radius		Habitat Requirements	Likelihood of Occurrence	Potential to be impacted?	Risk Rating
	BC Act	EPBC Act	BioNet	PMST				
Euphrasia arguta	CE	CE		x	*Euphrasia arguta* was rediscovered in the Nundle area of the NSW north western slopes and tablelands in 2008. Prior to this, it had not been collected for 100 years. As with other species of Euphrasia, this species is semi-parasitic and attaches to the roots of other associated plants.	Unlikely No habitat available within the highly disturbed site and this species has not been recorded within 5km radius of the site.	No Impact	Low
Falsistrellus tasmaniensis Eastern False Pipistrelle	V		3		Prefers moist habitats, with trees taller than 20 m. Generally roosts in eucalypt hollows, but has also been found under loose bark on trees or in buildings. Hunts beetles, moths, weevils and other flying insects above or just below the tree canopy.	Unlikely No habitat available within the highly disturbed sites. This species has been recorded in adjacent habitats to the north east.	No direct clearance of any native vegetation communities. Mitigation measures will also minimise any indirect impacts to surrounding habitats.	Low
Glossopsitta pusilla Little Lorikeet	V		1		Forages primarily in the canopy of open Eucalyptus forest and woodland, yet also finds food in Angophora, Melaleuca and other tree species. Riparian habitats are particularly used, due to higher soil fertility and hence greater productivity. Isolated flowering trees in open country, e.g. paddocks, roadside remnants and urban trees also help sustain viable populations of the species.	Unlikely No habitat available within the highly disturbed site.	No Impact	Low
Grantiella picta Painted Honeyeater	V	V	1	x	Inhabits Boree/ Weeping Myall (*Acacia pendula*), Brigalow (*A. harpophylla*) and Box-Gum Woodlands and Box-Ironbark Forests. A specialist feeder on the fruits of mistletoes growing on woodland eucalypts and acacias. Prefers mistletoes of the genus Amyema.	Unlikely No habitat available within the highly disturbed site.	No Impact	Low
Haliaeetus leucogaster White-bellied Sea-Eagle	V	C	2	x	Habitats are characterised by the presence of large areas of open water including larger rivers, swamps, lakes, and the sea. Breeding habitat consists of mature tall open forest, open forest, tall woodland, and swamp sclerophyll forest close to foraging habitat. Nest trees are typically large emergent eucalypts and often have emergent dead branches or large dead trees nearby which are used as ‘guard roosts’. Nests are large structures built from sticks and lined with leaves or grass.	Unlikely No habitat available within the highly disturbed site.	No Impact	Low
Heleioporus australiacus Giant Burrowing Frog	V	V		x	The Giant Burrowing Frog is distributed in south eastern NSW and Victoria, and appears to exist as two distinct populations: a northern population largely confined to the sandstone geology of the Sydney Basin and extending as far south as Ulladulla, and a southern population occurring from north of Narooma through to Walhalla, Victoria. Found in heath, woodland and open dry sclerophyll forest on a variety of soil types except those that are clay based. Breeding habitat of this species is generally soaks or pools within first or second order streams. They are also commonly recorded from 'hanging swamp' seepage lines and where small pools form from the collected water.	Unlikely No habitat available within the highly disturbed site.	No Impact	Low
Hieraaetus morphnoides Little Eagle	V		4		Occupies open eucalypt forest, woodland or open woodland. Sheoak or Acacia woodlands and riparian woodlands of interior NSW are also used. Nests in tall living trees within a remnant patch, where pairs build a large stick nest in winter.	Unlikely No habitat available within the highly disturbed sites. This species has been recorded in adjacent vegetated habitats to the west.	No direct clearance of any native vegetation communities. Mitigation measures will also minimise any indirect impacts to surrounding habitats.	Low
Hoplocephalus bungaroides Broad-headed Snake	E	V	1	x	The Broad-headed Snake is largely confined to Triassic and Permian sandstones, including the Hawkesbury, Narrabeen and Shoalhaven groups, within the coast and ranges in an area within approximately 250 km of Sydney. Nocturnal. Shelters in rock crevices and under flat sandstone rocks on exposed cliff edges during autumn, winter and spring. Moves from the sandstone rocks to shelters in crevieces or hollows in large trees within 500m of escarpments in summer.	Unlikely No habitat available within the highly disturbed site.	No Impact	Low

Scientific Name	Listing Status		Records within 5km radius		Habitat Requirements	Likelihood of Occurrence	Potential to be impacted?	Risk Rating
	BC Act	EPBC Act	BioNet	PMST				
Isotoma fluviatilis subsp. fluviatilis		X	1		Currently known from only two adjacent sites on a single private property at Erskine Park in the Penrith LGA. Previous sightings are all from western Sydney, at Homebush and at Agnes Banks. Possibly out competed when overgrown by some species such as *Cyndon dactylon.*	Unlikely No habitat available within the highly disturbed site.	No Impact	Low
Lathamus discolour Swift Parrot	E	CE		x	Breeds in Tasmania during spring and summer, migrating in the autumn and winter months to south-eastern Australia from Victoria and the eastern parts of South Australia to south-east Queensland. In NSW mostly occurs on the coast and south west slopes. On the mainland they occur in areas where eucalypts are flowering profusely or where there are abundant lerp (from sap-sucking bugs) infestations. Favoured feed trees include winter flowering species such as Swamp Mahogany *Eucalyptus robusta*, Spotted Gum *Corymbia maculata*, Red Bloodwood *C. gummifera*, Forest Red Gum *E. tereticornis*, Mugga Ironbark *E. sideroxylon*, and White Box *E. albens*.	Unlikely No habitat available within the highly disturbed site.	No Impact	Low
Leucochrysum albicans var. tricolor Hoary Sunray	-	E		x	In NSW it currently occurs on the Southern Tablelands and adjacent areas in an area roughly bounded by Albury, Bega and Goulburn, with a few scattered locatlities known from beyond this region. Occurs in a wide variety of grassland, woodland and forest habitats, generally on relatively heavy soils.	Outside known geographic range.	No Impact	Low
Litoria booroolongensis Booroolong Frog	E	E		x	The species is predominantly found along the western-flowing streams and their headwaters of the Great Dividing Range, and a small number of eastern-flowing streams in the north end of its range. The Booroolong Frog occurs along permanent streams with some fringing vegetation cover such as ferns, sedges or grasses. Adults occur on or near cobble banks and other rock structures within stream margins, or near slow-flowing connected or isolated pools that contain suitable rock habitats.	Unlikely No habitat available within the highly disturbed site.	No Impact	Low
Litoria littlejohni Littlejohn's Tree Frog	V	V		x	The majority of records are from within the Sydney Basin Bioregion with only scattered records south to the Victorian border and this species has not been recorded in southern NSW within the last decade. Records are isolated and tend to be at high altitude. This species breeds in the upper reaches of permanent streams and in perched swamps. Non-breeding habitat is heath based forests and woodlands where it shelters under leaf litter and low vegetation, and hunts for invertebrate prey either in shrubs or on the ground.	Unlikely No habitat available within the highly disturbed site.	No Impact	Low
Maccullochella peelii Murray Cod	-	V		x	Murray Cod are frequently found in the main channels of rivers and larger tributaries. The species is, therefore, considered a main-channel specialist. Preferred microhabitat consists of complex structural features in streams such as large rocks, snags (pieces of large submerged woody debris), overhanging stream banks and vegetation, tree stumps, logs, branches and other woody structures. Such structures reduce or influence stream flows and provide Murray Cod with shelter from fast-flowing water.	Unlikely No habitat available within the highly disturbed site.	No Impact	Low
Macquaria australasica Macquarie Perch	E	E		x	Within NSW they are now considered isolated to the upper reaches of the Lachlan and Murrumbidgee Rivers in southern NSW. The Macquarie Perch is a riverine, schooling species. It prefers clear water and deep, rocky holes with lots of cover. As well as aquatic vegetation, additional cover may comprise of large boulders, debris and overhanging banks.	Unlikely No habitat available within the highly disturbed site.	No Impact	Low
Miniopterus schreibersii oceanensis Eastern Bentwing-bat	V		9		Caves are the primary roosting habitat, but also use derelict mines, storm-water tunnels, buildings and other man-made structures. Form discrete populations centred on a maternity cave. Maternity caves have very specific temperature and humidity regimes. At other times of the year, populations disperse within about 300 km range of maternity caves. Hunt in forested areas, catching moths and other flying insects above the tree tops.	Unlikely No habitat available within the highly disturbed site. This species has been recorded in adjacent habitats to the south.	No direct clearance of any native vegetation communities. Mitigation measures will also minimise any indirect impacts to surrounding habitats.	Low
Ninox strenua Powerful Owl	V		3		The Powerful Owl requires large tracts of forest or woodland habitat but can occur in fragmented landscapes as well. The species breeds and hunts in open or closed sclerophyll forest or woodlands and occasionally hunts in open habitats. It roosts by day in dense vegetation comprising species such as Turpentine *Syncarpia glomulifera*, Black She-oak *Allocasuarina littoralis*, Blackwood *Acacia*	Unlikely No habitat available within the highly disturbed site.	No Impact	Low

Scientific Name	Listing Status		Records within 5km radius		Habitat Requirements	Likelihood of Occurrence	Potential to be impacted?	Risk Rating
	BC Act	EPBC Act	BioNet	PMST				
					melanoxylon, Rough-barked Apple *Angophora floribunda*, Cherry Ballart *Exocarpus cupressiformis* and a number of eucalypt species.			
Numenius madagascariensis Eastern Curlew	-	CE		x	Within Australia, the Eastern Curlew has a primarily coastal distribution. In NSW the species occurs across the entire coast but is mainly found in estuaries such as the Hunter River, Port Stephens, Clarence River, Richmond River and ICOLLs of the south coast.	Outside known geographic range.	No Impact	Low
Nyctophilus corbeni Corben's Long-eared Bat	V	V		x	Overall, the distribution of the south eastern form coincides approximately with the Murray Darling Basin with the Pilliga Scrub region being the distinct stronghold for this species. Inhabits a variety of vegetation types, including mallee, bulloke *Allocasuarina leuhmanni* and box eucalypt dominated communities, but it is distinctly more common in box/ironbark/cypress-pine vegetation that occurs in a north-south belt along the western slopes and plains of NSW and southern Queensland. Roosts in tree hollows, crevices, and under loose bark.	Unlikely No habitat available within the highly disturbed site.	No Impact	Low
Paralucia spinifera Purple Copper Butterfly,	E	V	45	x	Occurs on the Central Tablelands of NSW in an area approximately bounded by Oberon, Hartley and Bathurst. The butterfly is found at 35 locations, all within the Greater Lithgow, Bathurst Regional and Oberon local government areas. Occurs above 850 m elevation, at sites with a south-west to north-west aspect, usually where direct sunlight reaches the habitat, and with extremes of cold such as regular winter snowfalls or heavy frosts. Its lifecycle relies on a mutualistic relationship with the ant, *Anonychomyra itinerans*, and on the presence of *B. spinosa subsp. lasiophylla* which is used as the larval food plant.	Unlikely No habitat available within the highly disturbed site.	No Impact	Low
Persoonia marginate Clandulla Geebung	V	V		x	The Clandulla Geebung occurs between Kandos and Clarence in the western Blue Mountains. Populations are largely disjunct and include Clandulla, Ben Bullen and Sunny Corner State Forests; isolated populations have also been recorded from Turon and Gardens of Stone National Parks. Grows in dry sclerophyll forest and woodland communities on sandstone.	Unlikely No habitat available within the highly disturbed site.	No Impact	Low
Petauroides Volans Greater Glider	-	V	3	x	The greater glider is restricted to eastern Australia, occurring from the Windsor Tableland in north Queensland through to central Victoria (Wombat State Forest), with an elevational range from sea level to 1200 m above sea level. The greater glider is an arboreal nocturnal marsupial, largely restricted to eucalypt forests and woodlands. It is typically found in highest abundance in taller, montane, moist eucalypt forests with relatively old trees and abundant hollows.	Unlikely No habitat available within the highly disturbed site.	No Impact	Low
Petaurus norfolcensis Squirrel Glider	V		1		Inhabits mature or old growth Box, Box-Ironbark woodlands and River Red Gum forest west of the Great Dividing Range and Blackbutt-Bloodwood forest with heath understorey in coastal areas. Prefers mixed species stands with a shrub or Acacia midstorey. Live in family groups of a single adult male one or more adult females and offspring. Require abundant tree hollows for refuge and nest sites.	Unlikely No habitat available within the highly disturbed site.	No Impact	Low
Petrogale penicillata Brush-tailed Rock-wallaby	E	V		x	In NSW they occur from the Queensland border in the north to the Shoalhaven in the south, with the population in the Warrumbungle Ranges being the western limit. Occupy rocky escarpments, outcrops and cliffs with a preference for complex structures with fissures, caves and ledges, often facing north.	Unlikely No habitat available within the highly disturbed site.	No Impact	Low
Petroica boodang Scarlet Robin	V		20		This species lives in both mature and regrowth vegetation. It occasionally occurs in mallee or wet forest communities, or in wetlands and tea-tree swamps. Scarlet Robin habitat usually contains abundant logs and fallen timber: these are important components of its habitat.	Unlikely No habitat available within the highly disturbed site. This species has been recorded in adjacent vegetated habitats.	No direct clearance of any native vegetation communities. Mitigation measures will also minimise any indirect impacts to surrounding habitats.	Low
Petroica phoenicea Flame Robin	V		3		Breeds in upland tall moist eucalypt forests and woodlands, often on ridges and slopes. Prefers clearings or areas with open understoreys. The groundlayer of the breeding habitat is dominated by native grasses and the shrub layer may be	Unlikely No habitat available within the highly disturbed site.	No Impact	Low

Scientific Name	Listing Status		Records within 5km radius		Habitat Requirements	Likelihood of Occurrence	Potential to be impacted?	Risk Rating
	BC Act	EPBC Act	BioNet	PMST				
					either sparse or dense. Occasionally occurs in temperate rainforest, and also in herbfields, heathlands, shrublands and sedgelands at high altitudes. In winter, birds migrate to drier more open habitats in the lowlands (i.e. valleys below the ranges, and to the western slopes and plains).			
Phascolarctos cinereus Koala	V	V		x	In New South Wales, koala populations are found on the central and north coasts, southern highlands, southern and northern tablelands, Blue Mountains, southern coastal forests, with some smaller populations on the plains west of the Great Dividing Range. Feed on the foliage of more than 70 eucalypt species and 30 non-eucalypt species, but in any one area will select preferred browse species.	Unlikely No habitat available within the highly disturbed site.	No Impact	Low
Philotheca ericifolia	-	V		x	Known only from the upper Hunter Valley and Pilliga to Peak Hill districts of NSW. Grows chiefly in dry sclerophyll forest and heath on damp sandy flats and gullies. It has been collected from a variety of habitats including heath, open woodland, dry sandy creek beds, and rocky ridge and cliff tops. Associated species include *Melaleuca uncinata, Eucalyptus crebra, E. rossii, E. punctata, Corymbia trachyphloia, Acacia triptera, A. burrowii, Beyeria viscosa, Philotheca australis, Leucopogon muticus* and *Calytrix tetragona*.	Unlikely No habitat available	No Impact	Low
Prasophyllum petilum Tarengo Leek Orchid	E	E		x	Natural populations are known from a total of five sites in NSW. These are near Boorowa, Queanbeyan area, Ilford, Delegate and a newly recognised population c.10 km west of Muswellbrook. Grows in open sites within Natural Temperate Grassland at the Boorowa and Delegate sites. Also grows in grassy woodland in association with River Tussock *Poa labillardieri*, Black Gum *Eucalyptus aggregata* and tea-trees Leptospermum spp. near Queanbeyan and within the grassy groundlayer dominated by Kangaroo Grass under Box-Gum Woodland at Ilford.	Unlikely No habitat available within the highly disturbed site.	No Impact	Low
Prasophyllum sp. Wybong a leek-orchid	-	CE		x	Endemic to NSW, it is known from near Ilford, Premer, Muswellbrook, Wybong, Yeoval, Inverell, Tenterfield, Currabubula and the Pilliga area. Known to occur in open eucalypt woodland and grassland and is a perennial orchid, appearing as a single leaf over winter and spring.	Unlikely No habitat available within the highly disturbed site.	No Impact	Low
Prototroctes maraena Australian Grayling	-	V		x	The Australian Grayling occurs in streams and rivers on the eastern and southern flanks of the Great Dividing Range, from Sydney, southwards to the Otway Ranges of Victoria and in Tasmania. The species is found in fresh and brackish waters of coastal lagoons, from Shoalhaven River in NSW to Ewan Ponds in South Australia.	Unlikely No habitat available within the highly disturbed site.	No Impact	Low
Pseudomys novaehollandiae New Holland Mouse	-	V		x	The New Holland Mouse has a fragmented distribution across Tasmania, Victoria, New South Wales and Queensland. Known to inhabit open heathlands, woodlands and forests with a heathland understorey and vegetated sand dunes.	Unlikely No habitat available within the highly disturbed site.	No Impact	Low
Pteropus poliocephalus Grey-headed Flying-fox	V	V		x	Grey-headed Flying-foxes are generally found within 200 km of the eastern coast of Australia, from Rockhampton in Queensland to Adelaide in South Australia. Occur in subtropical and temperate rainforests, tall sclerophyll forests and woodlands, heaths and swamps as well as urban gardens and cultivated fruit crops. Roosting camps are generally located within 20 km of a regular food source and are commonly found in gullies, close to water, in vegetation with a dense canopy.	Unlikely No habitat available within the highly disturbed site.	No Impact	Low
Pultenaea glabra Smooth Bush-pea	V	V		x	This species is primarily associated with riparian or swamp habitat areas in the mid to upper altitudes of the central Blue Mountains on sandstone derived soils. Grows in swamp margins, hillslopes, gullies and creekbanks and occurs within dry sclerophyll forest and tall damp heath on sandstone. Restricted to the higher Blue Mountains and has been recorded from the Katoomba-Hazelbrook and Mount Victoria areas, with unconfirmed sightings in the Mount Wilson and Mount Irvine areas.	Unlikely No habitat available within the highly disturbed site.	No Impact	Low

Scientific Name	Listing Status		Records within 5km radius		Habitat Requirements	Likelihood of Occurrence	Potential to be impacted?	Risk Rating
	BC Act	EPBC Act	BioNet	PMST				
Rostratula australis Australian Painted-snipe	E	E		x	Prefers fringes of swamps, dams and nearby marshy areas where there is a cover of grasses, lignum, low scrub or open timber. Nests on the ground amongst tall vegetation, such as grasses, tussocks or reeds. In NSW many records are from the Murray-Darling Basin including the Paroo wetlands, Lake Cowal, Macquarie Marshes, Fivebough Swamp and more recently, swamps near Balldale and Wanganella. Other important locations with recent records include wetlands on the Hawkesbury River and the Clarence and lower Hunter Valleys.	Unlikely No habitat available within the highly disturbed site.	No Impact	Low
Saccolaimus flaviventris Yellow-bellied Sheathtail-bat	V		3		Roosts singly or in groups of up to six, in tree hollows and buildings; in treeless areas they are known to utilise mammal burrows. When foraging for insects, flies high and fast over the forest canopy, but lower in more open country. Forages in most habitats across its very wide range, with and without trees; appears to defend an aerial territory.	Unlikely No habitat available within the highly disturbed site.	No Impact.	Low
Thesium austral Austral Toadflax	V	V	4	x	Austral Toad-flax is found in very small populations scattered across eastern NSW, along the coast, and from the Northern to Southern Tablelands. Occurs in grassland on coastal headlands or grassland and grassy woodland away from the coast. Often found in association with Kangaroo Grass (*Themeda australis*).	Unlikely No habitat available within the highly disturbed site.	No Impact	Low
Veronica blakelyi	V		32		Restricted to the western Blue Mountains, near Clarence, near Mt Horrible, on Nullo Mountain and in the Coricudgy Range. Occurs in eucalypt forest, often in moist and sheltered areas. Associated canopy species include *Eucalyptus dives, E. dalrympleana, E. rossii and E. pauciflora*.	Unlikely No habitat available within the highly disturbed site.	No Impact	Low
Hirundapus caudacutus *Apus pacificus* *Monarcha melanopsis* *Motacilla flava* *Myiagra cyanoleuca* *Rhipidura rufifrons*		M		x		Unlikely No habitat available within the Modification Area. May fly over the site.	No direct clearance of any native vegetation communities or habitats. Mitigation measures will also minimise any indirect impacts to surrounding habitats.	Low
Upland Basalt Eucalypt Forests of the Sydney Basin Bioregion	-	EEC		x	Small disjunct patches are scattered across the upper Blue Mountains on residual caps of basalt (or basalt-like substrates), including Mt Wilson, Mt Tomah, Mt Bell, Mt Banks, Mt Caley, Mt Hay, Boyd Plateau, Mt Werong, Mt Irvine, Mt Cameron, Green Hill, Gospers Mountain, Buffers Mountain, Mt Budgery and Mt Coricudgy. These areas occur within or adjacent to the Greater Blue Mountains World Heritage Area.	Unlikely No suitable habitat available due to long history of vegetation clearance and disturbance.	No Impact	Low
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	EEC	CEEC		x	Occurs in an arc along the western slopes and tablelands of the Great Dividing Range from Southern Queensland through NSW to central Victoria. It occurs in the Brigalow Belt South, Nandewar, New England Tableland, South Eastern Queensland, Sydney Basin, NSW North Coast, South Eastern Highlands, South East Corner, NSW South Western Slopes, Victorian Midlands and Riverina Bioregion.	Unlikely No suitable habitat available due to long history of vegetation clearance and disturbance.	No Impact	Low
Natural Temperate Grassland of the South Eastern Highland	-	CEEC		x	Natural Temperate Grassland is confined to the Southern Tablelands, a region bounded by the ACT, Yass, Boorowa, the Abercrombie River, Goulburn, the Great Eastern Escarpment, the Victorian border and the eastern boundary of Kosciusko National Park.	Outside known geographic range.	No Impact	Low
Monaro Tableland Cool Temperate Grassy Woodland in the South Eastern Highlands Bioregion - South Eastern Highlands	CEEC				Monaro Tablelands Cool Temperate Grassy Woodland is a woodland to low open woodland community. It is characterised by a sparse to very sparse tree (woodland to open woodland) layer dominated by Eucalyptus pauciflora (snow gum) either as a single species or with any of Acacia melanoxylon (blackwood), E. rubida (candlebark), E. stellulata (black sallee) and/or E. viminalis (ribbon gum) as co-dominants. Other tree species may occur within the community, although very infrequently and always as canopy sub-dominants.	Unlikely No suitable habitat available due to long history of vegetation clearance and disturbance. There is potential that this CEEC occurs within surrounding vegetated lands to the west and south of the Modification Area.	No Impact	Low

ERM has over 160 offices across the following countries and territories worldwide

Argentina
Australia
Belgium
Brazil
Canada
China
Colombia
France
Germany
Hong Kong
Hungary
India
Indonesia
Ireland
Italy
Japan
Kazakhstan
Kenya
Malaysia
Mexico
The Netherlands
New Zealand
Panama
Peru
Poland
Portugal
Puerto Rico
Romania
Russia
Singapore
South Africa
South Korea
Spain
Sweden
Taiwan
Thailand
UAE
UK
US
Vietnam

ERM's Sydney Office
Level 15, 309 Kent Street
Sydney NSW 2000 Australia

Telephone +61 2 8584 8888
Facsimile +61 2 9299 7502

www.erm.com

The business of sustainability

ERM