



Appendix M. Biodiversity Development Assessment Report (Pinion Advisory, 2021)



Buronga Landfill Expansion

BIODIVERSITY DEVELOPMENT ASSESSMENT REPORT

DECEMBER 2021

I certify that this report has been prepared on the basis of the requirements of, and information provided under, the Biodiversity Assessment Method and s6.15 of the BC Act.

In preparing this assessment, I have acted in accordance with the **Accredited BAM ASSESSOR Code of Conduct**.

I declare that I have considered the circumstances, and there is no actual, perceived or potential conflict of interest.

A handwritten signature in black ink, appearing to read 'Troy Muster', with a stylized, cursive script.

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Acronyms and abbreviations

BAM	Biodiversity Assessment Methodology
BAM-C	Biodiversity Assessment Method Calculator
BC Act	Biodiversity Conservation Act 2016 (NSW)
BCAR	Biodiversity Certification Assessment Report
BCT	Biodiversity Conservation Trust
BDAR	Biodiversity Development Assessment Report
BLE	Buronga Landfill Expansion
BOM	Australian Bureau of Meteorology
BOS	Biodiversity Offsets Scheme (NSW)
CEEC	Critically Endangered Ecological Community
CEMP	Construction Environment Management Plan
cm	centimetre
CWTH	Commonwealth
DBH	Diameter at Breast Height
DPE	Department of Planning and Environment (NSW)
DPI	Department of Primary Industry (NSW)
EEC	Endangered Ecological Community
EIS	Environmental Impact Statement
EP&A Act	Environmental Planning and Assessment Act 1979 (NSW)
EPBC Act	Environmental Protection and Biodiversity Conservation Act 1999 (CWTH)
FM Act	Fisheries Management Act 1994 (NSW)
GIS	Geographic Information System
ha	hectare
HBT	Hollow Bearing Trees
HTW	High-Threat Weeds
IBRA	Interim Biogeographic Regionalisation for Australia
KTP	Key Threatened Species
LEP	Local Environmental Plan
LGA	Local Government Area
LLS Act	Local Land Services Act 2013 (NSW)
m	metre
MNES	Matters of National Environmental Significance
NSW	New South Wales
OEH	Office of Environment and Heritage (NSW)
PCT	Plant Community Type
REAP	Regional Environmental Action Plan (NSW)
SAII	Serious and Irreversible Impact
SEARS	Secretary's Environmental Assessment Requirements
SEPP	State Environmental Planning Policy (NSW)
Sp.	Species
Spp.	Multiple Species
SSD	State Significant Development
TEC	Threatened Ecological Community
VEC	Vulnerable Ecological Community

1 Introduction

Wentworth Shire Council in the far west of NSW is seeking project approval to expand a waste and resource management facility in Buronga under section 4.55 of the *Environmental Planning and Assessment act 1979* (EP&A Act). A map of the location is below (Figure 1). The Buronga landfill expansion proposal (BLE) is classified as a State Significant Development (SSD) (SSD 10096818) under the *State Environmental Planning Policy (State and Regional Development) 2011* and is considered a 'major project'. The BLE will cater for projected waste management requirements for the region.

It is important to note that an existing development consent for establishing borrow pits was issued in January 2017 (DA15/154 – Appendix B). The development consent covers part of the BLE, including the progressive removal of native vegetation to establish borrow pit sites until 2053.

The Department of Planning, Industry and Environment (DPIE) has requested that the impacts and offset requirements within the area covered by the existing development consent be accounted for separately from the area outside of the existing development consent.

This Biodiversity Development Assessment Report (BDAR) assesses the impacts of the BLE in accordance with the NSW Biodiversity Assessment Method (BAM) as required by the Secretary's Environmental Assessment Requirements (SEARs) for the proposal. Pinion Advisory has prepared this BDAR on behalf of the proponent (Case 24826). The team was led by Troy Muster (Senior Environmental Consultant), who is accredited under Section 6.10 of the NSW *Biodiversity Conservation Act 2016* (BC Act), reference BAAS18175. Troy was assisted by Stephen Erlandsen, Dylan Butcher and Mina Ivanov. Stephen Erlandsen (B. Ag. Sc.) has almost 40 years professional experience in Botany and soil management in the semi-arid environment of south-west NSW and north-west Victoria. Dylan Butcher (B. Env. & Cons. Sc.) has eight years' experience as an environmental consultant and specialises in flora and fauna assessment. Mina Ivanov (B. Sc. (Hons)) has three years' experience as an environmental consultant and specialises in native vegetation assessments and GIS. Pinion Advisory commenced fieldwork on 29 March 2021; further site assessments occurred on: 31 March, 6, 7 and 8 April, 4 and 6 May, and 20 July 2021. Targeted threatened species surveys were undertaken in October 2021.

The following terms have been used in this document.

Subject land	The land which is directly impacted by the proposed development incorporating the landfill footprint, stormwater management area, and waste resource recovery areas.
Development site	All landholdings which are directly involved in the development proposal, including the existing waste and resource management facility. Lots 1 DP 1037845, 197 DP 756946, and 212 DP 756946.
Buffer area	Land within 1,500 m of the Subject land.
Extended landscape	Landscape features beyond the buffer area are notable for understanding fauna, flora, geological, and assessment decisions.
Vegetation Zone	A subset of a Plant Community Type (PCT) is based on a broad condition scale.

1.1 The Proposal

The Subject land covers an area of 67.8 ha within Lot 1 DP 1037845 (Figure 1). Approximately 45.75 ha is native vegetation, and approximately 22.05 ha is not native vegetation.

The Subject land (Figure 1) outlines the proposed development of a waste and resource management facility. The proposed development would delineate 11 substages which are then divided into three cells within the operational footprint; only one cell would be operating at any one time until its completion, then a transitioned rehabilitation program would be undertaken for that cell. This development is expected to operate cell by cell for approximately 119.8 years, with each cell operating for approximately three years. It is noted that each substage will likely be designed and cleared (worst case) as one with each cell constructed and rehabilitated in turn.

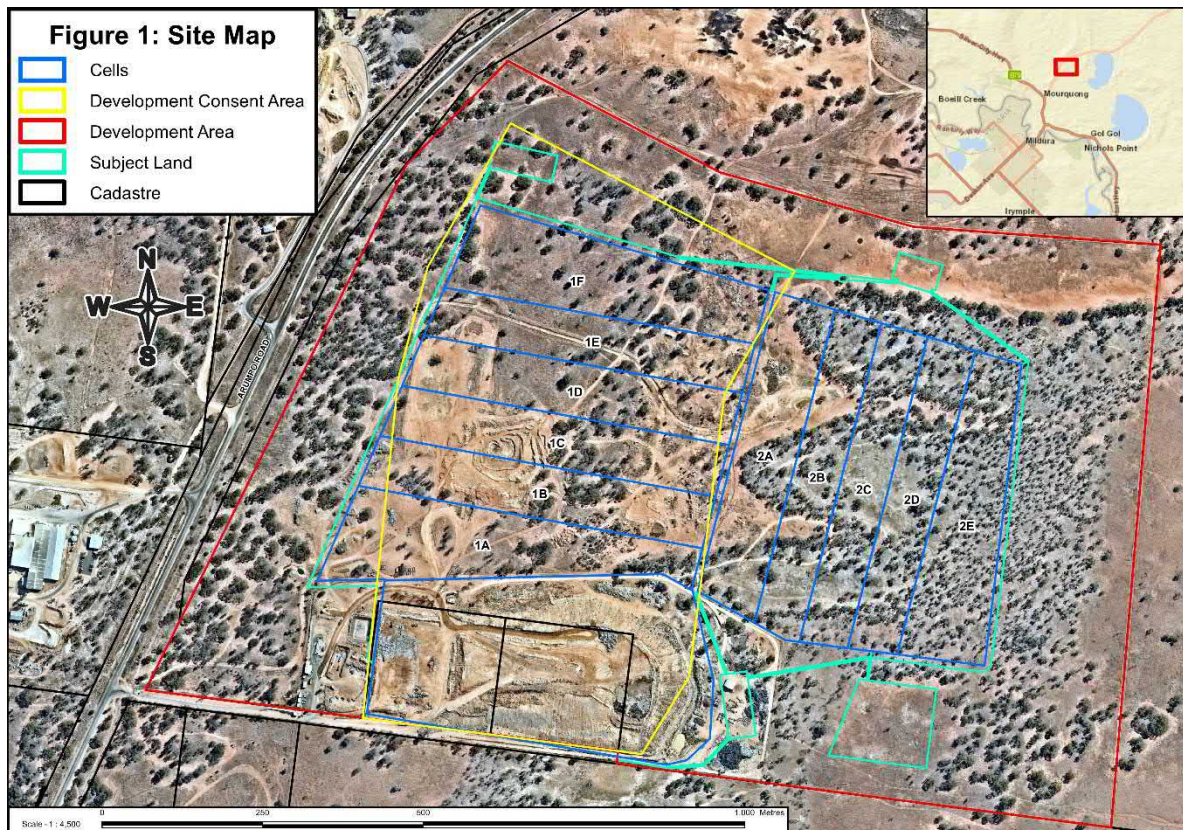


Figure 1. Site Map

1.2 General description

The Subject land is located within the Wentworth Shire Council (WSC) Local Government Area (LGA) on the east side of Arumpo Road, approximately 6 km north of Buronga, NSW. The Subject land and development site are zoned SP2 (Infrastructure) under the Wentworth Local Environmental Plan (LEP). The Subject land is within Lot 1 DP 1037845, while the development site includes Lots 197 DP 756946 and 212 DP 756946.

Four Plant Community Types (PCT) have been mapped within the Subject land, divided into five vegetation zones (Figure 2):

- PCT 15 - Black Box open woodland wetland with Chenopod understorey mainly on the outer floodplains in south-western NSW (Mainly Riverina Bioregion and Murray Darling Depression Bioregion) - (Vegetation Zone 1 – Good condition)

- PCT 58 - Black Oak – Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion – (Vegetation Zone 2 – Good condition; Vegetation Zone 3 – Moderate condition; Vegetation Zone 4 – Poor condition)
- PCT 170 - Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones – (Vegetation Zone 5 – Good condition)
- PCT 252 - Sugarwood open woodland of the inland plains mainly Murray Darling Depression Bioregion - (Vegetation Zone 6 – Good condition)

There has been historic clearing of native vegetation and preliminary development of a waste and resource management facility within the development site as prescribed by a previous development consent (DA15/154) issued by Wentworth Shire Council. In addition, a zone directly north of the preliminary development (within the Subject land) has been assessed as historic clearing and regrowth that is Category 1 exempt land as per Part 60H (1) of the *Local Land Services Act 2013*.

During the field work, the assessment team noted that there had been widespread dumping of small volumes of waste throughout the property. There are also randomly scattered areas where minor earthworks have been conducted, such as digging a borrow pit or dumping overburden.

Some of the rubbish dumping and earthworks appear to be historic; however, most appears to be more recent. A high proportion of the plastic materials is windblown.

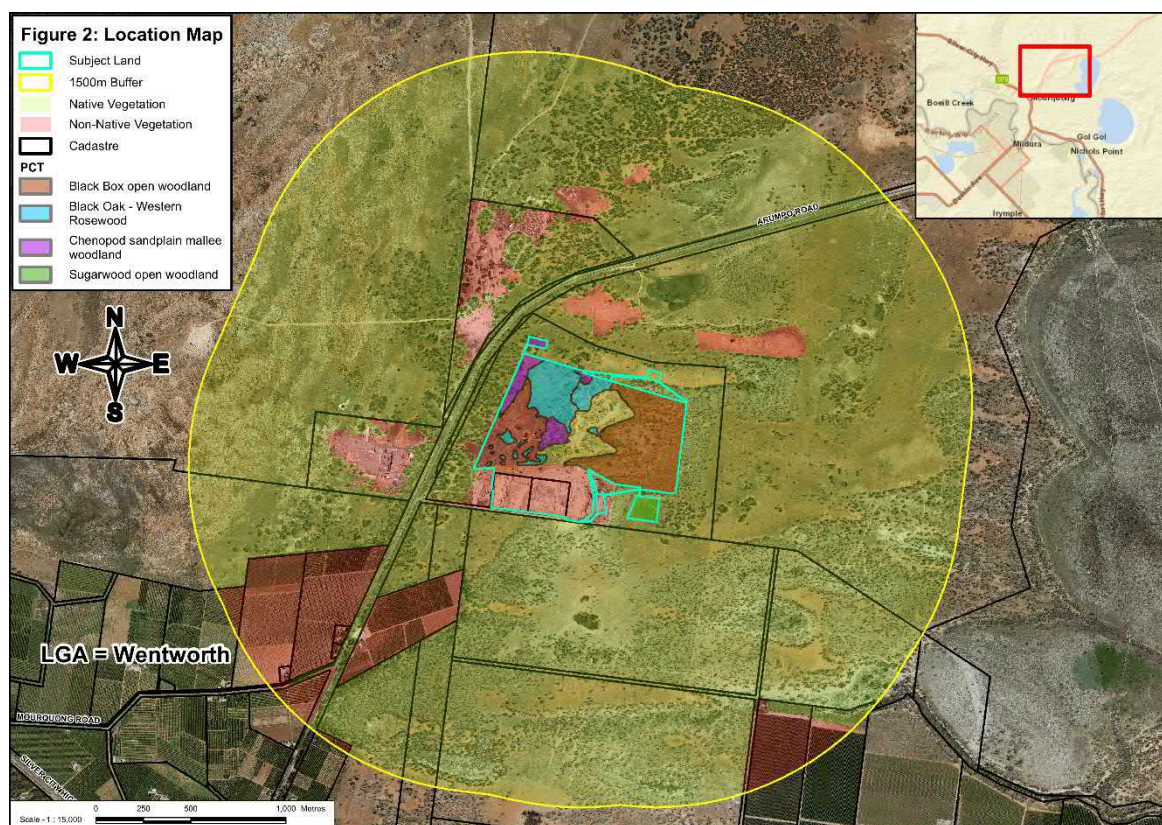


Figure 2. Location Map

1.3 Information sources

Data sources researched include:

- NSW OEH's Biodiversity Assessment Method (BAM) calculator
www.lmbc.nsw.gov.au/bamcalc
- NSW OEH's BioNet threatened biodiversity database
www.bionet.nsw.gov.au/
- OEH Threatened Species Profiles
www.environment.nsw.gov.au/threatenedSpeciesApp/
- OEH BioNet Vegetation Classification Database (OEH 2017)
www.environment.nsw.gov.au/NSWVCA20PRapp/default.aspx
- OEH BioNet VIS Mapping
www.environment.nsw.gov.au/research/VISmap.html
- Office of Environment and Heritage (OEH) (2021).
Biodiversity Assessment Method
- NSW Government SEED Mapping
geo.seed.nsw.gov.au/Public_View/index.html?viewer=Public_View&locale=en-AU
- SW Biodiversity Values Map
www.lmbc.nsw.gov.au/Maps/index.html?viewer=BVMap
- Atlas of Living Australia (ALA)
<https://www.ala.org.au/>

Commonwealth Legislation:

- Environment Protection and Biodiversity Conservation Act 1999
http://classic.austlii.edu.au/au/legis/cth/consol_act/epabca1999588

State Legislation:

- Environmental Planning and Assessment Act 1979
http://classic.austlii.edu.au/au/legis/nsw/consol_act/epaaa1979389/
- Biodiversity Conservation Act 2016
http://classic.austlii.edu.au/au/legis/nsw/consol_act/bca2016309/
- Local Land Services Act 2016
http://classic.austlii.edu.au/au/legis/nsw/consol_act/lisa2013178/

Local Legislation:

- Wentworth Local Environmental Plan 2011
http://classic.austlii.edu.au/au/legis/nsw/consol_reg/wlep2011363/

2 Site Context and Landscape Features

2.1 Landscape Features

The landscape features for the site are described in Table 1.

Table 1. Landscape features

Landscape features	Description
IBRA Bioregion	The Subject land is within the Riverina IBRA Bioregion. Directly north of the Subject land within the buffer zone is the Murray Darling Depression IBRA Bioregion. Some features described in the BDAR reflect on the biodiversity of the Subject land concerning the nearby presence of the Murray Darling Depression IBRA Bioregion.
IBRA Sub-region	The Subject land resides within the Robinvale Plains IBRA Sub-region. Directly north of the Subject land is the South Olary Plain IBRA Sub-region.
LGA	The Subject land and buffer zone are located within the Wentworth Shire Council Local Government Area (LGA)
Mitchell landscape	The Subject land and buffer zone contain three Mitchell landscapes: The dominant landscape is the Murray Lakes, Swamps and Lunettes, which covers approximately 60% of the Subject land. Murray Lakes, Swamps and Lunettes (Mll): Large active freshwater lakes and swamps frequently flooded by the river, generally round or kidney-shaped. Often nested within larger relict Quaternary Lake features. Beaches, sand, and clay pellet lunettes and sandhills on the eastern margins. Lake beds and associated channels of grey cracking clay, beaches of brown to white sands, lunettes of deep cemented yellow to white sands, with or without interbedded strata of pelleted clay. Relief of lakes and channels to 10 m, lunettes to 20 m. Cover: 60% Murray Channels and Floodplains (Muc): Active channels and seasonally inundated floodplains of the Murray streams in Quaternary alluvium with associated billabongs, swamps, channels, levees and source bordering dunes, relief to 10 m. Includes scalded alluvial flats, broad elevated floodplains and associated relict channels; isolated sandy rises, relief to 5 m. Cover: 35% Mallee Cliffs Sandplains (Mcs): Extensive, slightly undulating sandplain of Quaternary aeolian sands with east-west trending dunes, often with blowouts, partly scalded broad swales and small depressions, relief 6 to 10 m. Solonized brown soils, calcareous loamy sand, texture-contrast soils on the plain, red and brown sands on dunes, non-cracking grey or brown clays in depressions. Cover: 5%
Native vegetation cover	Native vegetation within the Subject land covers 45.7 ha, and non-native vegetation covers 22.1 ha. Native vegetation within the Subject land and buffer area covers 1154.9 ha, and non-native vegetation covers 149.8 ha.
Rivers, streams, and estuaries	There are no rivers, streams, or estuaries within the Subject land; however, there are two notable features in the extended landscape: Murray River: The Murray River is a nationally significant and highly regulated waterway. Location: 3.7 km southwest of Subject land Gol Gol North Creek: This creek is maintained at the weir pool level (Lock 11) to supply water to irrigators and residents and operates as an inlet channel for Gol Gol Swamp and Lake Gol Gol. Location: 2 km east of the Subject land
Wetlands	There is no wetland present within the Subject land. There are three water bodies in the extended landscape; however, several factors such as inadequate environmental watering or heavy salt content makes these waterways not worthy of further assessment: Mourquong Saltwater Disposal Basin: Also known as the Mourquong Evaporation Basin, is a disposal site for saline drainage water pumped via a salt interception scheme that minimises saline groundwater discharge to the Murray River. The Basin receives a low volume of highly saline groundwater. It is not expected to present any direct interactions with the Subject land. Location: 3.5 km west of the Subject land

	Lake Gol Gol: has not received environmental water since early 2017. The lake is infrequently inundated; water is only present during a high river or local high rainfall events, thereover water does not persist for extended periods due to evapotranspiration. Location: 2 km east of the Subject land Gol Gol Swamp: infrequently contains water, as the natural drainage channel has been diverted along North Gol Gol Creek for irrigation and controlled ecological purposes. Location: 4.3 km east of the Subject land
Connectivity of different areas of habitat	The Subject land has several connective habitat features. Spanning north and south along the western boundary of the Subject land is mallee woodland vegetation made up of predominantly <i>Eucalyptus dumosa</i> and <i>Eucalyptus oleosa</i> overstorey with a range of Chenopods, other small shrubs, and herbs; similar to, and mapped as predominantly PCT 170 transitioning to PCT 58 to the north. Along the eastern perimeter and part of the southern perimeter of the development, the footprint is an open woodland dominated by <i>Eucalyptus largiflorens</i> overstorey and a sparsely covered Chenopod understorey; similar to and mapped as PCT 15.
Areas of geological significance and soil hazard features	No areas of geological significance are present within the Subject land or the surrounding landscape.
Areas of outstanding biodiversity value	There are no declared AOBVs within the Subject land or the surrounding landscape.
Landscape features identified in the SEARs	A SEARs has been addressed as part of the development of this BDAR; there are no landscape features on the Subject land or the surrounding landscape addressed within the SEARs.

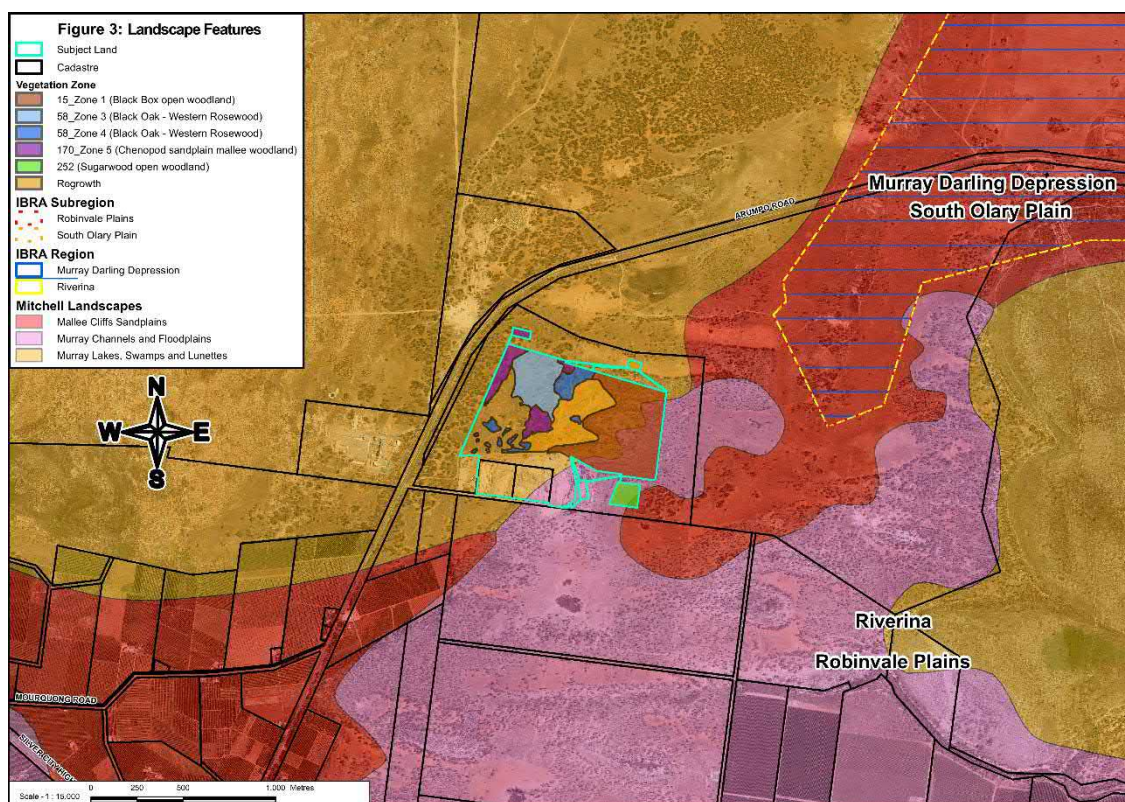


Figure 3. Landscape Features

3 Native Vegetation

3.1 Native vegetation extent

There is approximately 45.75 ha of native vegetation occurring within the Subject land, based on aerial photo interpretation; this is comprised of:

- 19.76 ha (PCT 15: Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (Mainly Riverina Bioregion and Murray Darling Depression Bioregion)) (Table 2)
- 10.50 ha (PCT 58: Black Oak – Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion) (Table 3)
- 4.54 ha (PCT 170: Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones) (Table 4)
- 1.70 ha (PCT 252: Sugarwood open woodland of the inland plains mainly Murray Darling Depression Bioregion) (Table 5)
- 8.93 ha Regrowth (Table 6)
- 22.05 ha Exotic ground cover, or bare ground

Aerial interpretation of the Subject land and buffer area has determined that there is 88.52% cover of native vegetation and 11.48% cover of clearing, non-native vegetation, or infrastructure.

Table 2. Description of PCT 15 in the Subject land

Black Box open woodland wetland with chenopod understory mainly on the outer floodplains in south-western NSW (Mainly Riverina Bioregion and Murray Darling Depression Bioregion)			
Vegetation Formation	Semi-arid woodlands (Grassy sub-formation)		
Vegetation Class	Inland floodplain woodlands		
Vegetation Type	PCT ID	15	
	Common Community Name	Black Box open woodland wetland	
The approximate extent within the Subject land	19.76 ha	Percentage of PCT cleared in Bioregion	50%
Species relied upon for PCT information	Species Name	Relative abundance	
	<i>Eucalyptus largiflorens</i>	40%	
	<i>Rhagodia spinescens</i>	20%	
	<i>Maireana pyramidata</i>	10%	
	<i>Atriplex vesicaria</i>	5%	
Justification of evidence used to identify the PCT	<i>Eucalyptus largiflorens</i> is the dominant overstorey species in this vegetation community. The vegetation is relatively intact and open. Most of the <i>Eucalyptus largiflorens</i> appear to have grown during a single episodic event. There is evidence of past logging for posts, poles, or firewood. The understory species are sparsely diverse, with a low number of plants present in this vegetation community.		
	PCT 15 is considered to be the most appropriate PCT to identify this community based on: <i>Eucalyptus largiflorens</i> is the dominant overstorey species, contributing to nearly 100% of canopy cover. - The understory species present in this vegetation community are characteristic of the identified PCT. - The location of this development area is within the Riverina Bioregion. - It is located appropriately within the outer floodplains of south-western NSW. This PCT has been assessed and identified as the formation, class, and type associated with the PCT Mapping.		
TEC Status	Not a TEC		
Examples image			

Table 3. Description of PCT 58 in the Subject land

Black Oak – Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion			
Vegetation Formation	Semi-arid woodlands (Shrubby sub-formation)		
Vegetation Class	Semi-arid sand plain woodlands		
Vegetation Type	PCT ID	58	
	Common Community Name	Black Oak - Western rosewood	
The approximate extent within the Subject land	10.50 ha	Percentage of PCT cleared in Bioregion	50%
	Species Name		Relative abundance
Species relied upon for PCT information	<i>Sclerolaena patentiscuspis</i>		35%
	<i>Dissocarpus paradoxus</i>		30%
	<i>Casuarina pauper</i>		15%
	<i>Alectryon oleifolius</i> subsp. <i>canescens</i>		10%
Justification of evidence used to identify the PCT	<i>Casuarina pauper</i> is the dominant overstorey species in this vegetation community. The vegetation is widely dispersed in an open woodland formation. The Black Oak varies distinctly in height and form; however, it appears in moderate abundance. The understorey species are sparsely diverse, stands of Rosewood are scattered across the PCT.		
	PCT 58 is considered to be the most appropriate PCT to identify this community based on:		
	<i>Casuarina pauper</i> is the dominant overstorey species, contributing up to 100% of canopy cover. - The understorey species present in this vegetation community are characteristic of the identified PCT. - The development area is on the fringe of the Murray Darling Depression Bioregion.		
	This PCT has been assessed and identified as the formation, class, and type associated with the PCT Mapping.		
TEC Status	Not a TEC		
Examples image			

Table 4. Description of PCT 170 in the Subject land

Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones			
Vegetation Formation	Semi-arid Woodlands (Shrubby sub-formation)		
Vegetation Class	Sand plain mallee woodlands		
Vegetation Type	PCT ID	170	
	Common Community Name	Chenopod sandplain mallee woodland	
The approximate extent within the Subject land	4.54 ha	Percentage of PCT cleared in Bioregion	41%
	Species Name		Relative abundance
Species relied upon for PCT information	<i>Dissocarpus biflorus</i>		30%
	<i>Eucalyptus dumosa</i>		12%
	<i>Eucalyptus oleosa</i>		10%
	<i>Pittosporum angustifolium</i>		8%
Justification of evidence used to identify the PCT	<i>Eucalyptus oleosa</i> and <i>Eucalyptus dumosa</i> are the dominant overstorey species in this vegetation community. The overall density of the vegetation is relatively higher than the other PCT's in this area. A variety of episodic events have formed a range of tree forms. The understorey species form a diverse shrubby sub-formation.		
	PCT 170 is considered to be the most appropriate PCT to identify this community based on: <i>Eucalyptus dumosa</i> and <i>E. oleosa</i> dominate the overstorey species composition. - The understorey species present in this vegetation community are characteristic of the identified PCT. - The location of this development area is within the Riverina Bioregion. - The landscape elements are predominantly characteristic of a sand plain. This PCT has been assessed and identified as the formation, class, and type associated with the PCT Mapping.		
TEC Status	Not a TEC		
Examples image			

Table 5. Description of PCT 252 in the Subject land

Sugarwood open woodland of the inland plains mainly Murray Darling Depression Bioregion			
Vegetation Formation	Semi-arid woodlands (Shrubby sub-formation)		
Vegetation Class	Semi-arid sand plain woodlands		
Vegetation Type	PCT ID	252	
	Common Community Name	Sugarwood open woodland	
The approximate extent within the Subject land	1.7 ha	Percentage of PCT cleared in Bioregion	50%
Species relied upon for PCT information	Species Name	Relative abundance	
	<i>Myoporum platycarpum</i>	2%	
	<i>Sclerolaena pentatropis</i>	60%	
	<i>Dissocarpus biflorus</i>	10%	
	<i>Enchylaena tomentosa</i>	8%	
Justification of evidence used to identify the PCT	<i>Myoporum platycarpum</i> is the dominant overstorey species in this vegetation community. The vegetation is sparse, with only a few overstorey species standing out as identifiers. The few <i>Myoporum platycarpum</i> have grown separately and are not the same age. The understorey species are limited to <i>Sclerolaena pentatropis</i> and <i>Dissocarpus biflorus</i> .		
	PCT 252 is considered to be the most appropriate PCT to identify this community based on: <i>Myoporum platycarpum</i> is the only overstorey species contributing to 100% of the available canopy cover. - The understorey species present in this vegetation community most closely represent the identified PCT. - The development area is on the fringe of the Murray Darling Depression Bioregion. - There are representative PCT 252 mapped nearby, which match the composition of this location.		
TEC Status	Not a TEC		
Examples image			

Table 6. Description of regrowth in the Subject land

Regrowth			
Vegetation Formation	N/A		
Vegetation Class	N/A		
Vegetation Type	PCT ID	N/A	
	Common Community Name	N/A	
The approximate extent within the Subject land	8.93 ha	Percentage of PCT cleared in Bioregion	N/A
Species relied upon for PCT information	Species Name		Relative abundance
			%
			%
			%
			%
Justification of evidence used to identify the PCT	The area identified as regrowth provides clear visual evidence of historical soil extraction activities. This evidence includes a stark difference in surface levels when compared to the adjoining native vegetation; uneven terrain caused by earthmoving activities; the lack of topsoil and presence of exposed heavier subsoil; the presence of large areas of bare ground and exotic plant ground cover; and the lack of mature native vegetation. The flora present within these sections is characteristic of young, early colonisation and regrowth; subsequently, many of these plants do not directly fit the surrounding PCTs. Regrowth is defined in Part 60H (1) of the <i>Local Land Services Act 2013</i>. as any native vegetation regrown since 1 January 1990. Previously soil extraction activity records cannot be sourced for this property, yet aerial photography provides evidence indicating that these areas have been impacted by clearing and soil extraction activities since the mid to late 1980s.		
TEC Status	N/A		
Examples image			

3.2 Justification for non-native vegetation

Areas that comprise primarily bare ground and exotic ground cover flora were identified through aerial imagery and on-site assessment. The areas considered non-native have been historically used as borrow pits for loam, access for waste and resource management traffic. A wide range of weeds dominates these areas, and juvenile Narrow-leaf Hopbush is present in some locations (Figure 4).

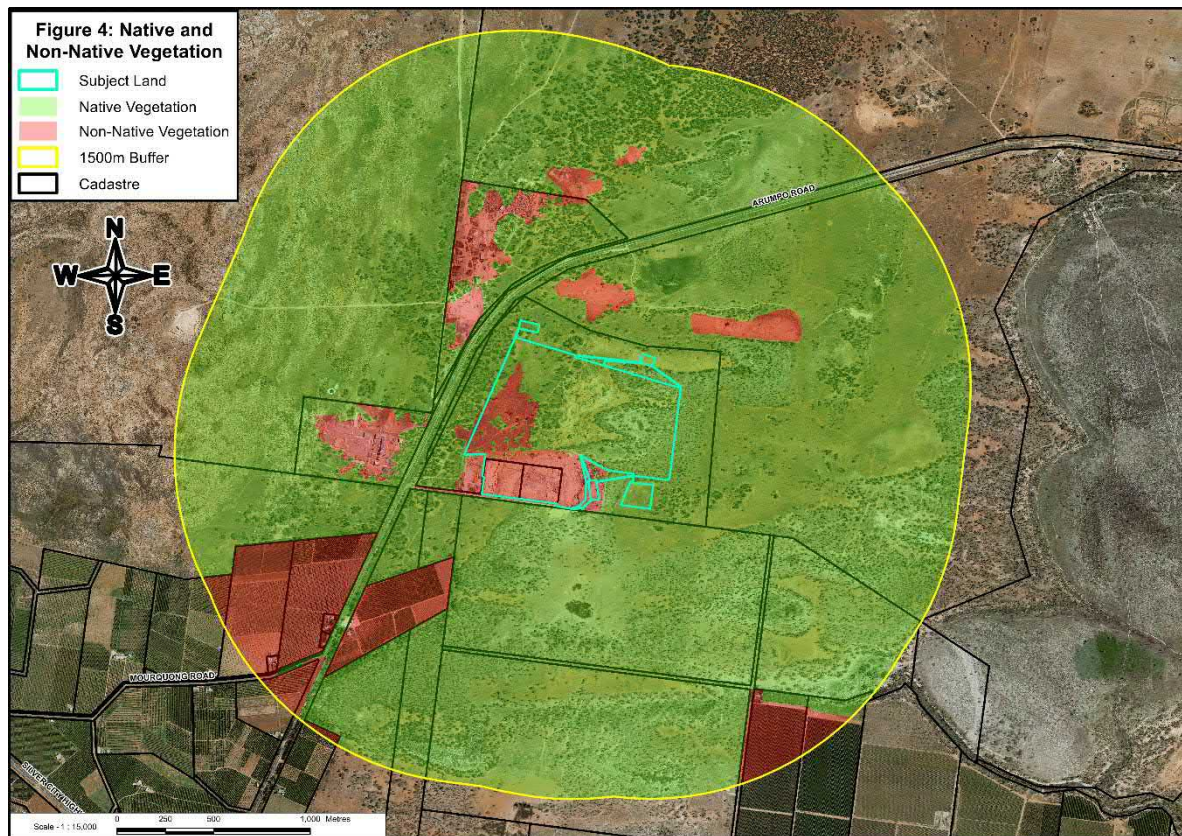


Figure 4. Native and Non-Native Vegetation

3.3 Vegetation integrity assessment

As described in Section 1, an existing development consent for establishing borrow pits was issued in January 2017 (DA15/154); this covers part of the BLE and is identified in Figure 1. The development consent included the progressive removal of native vegetation to establish borrow pit sites until 2053.

DPIE has requested that the impacts and offset requirements within the area covered by the existing development consent be accounted for separately from the area outside of the existing development consent. Table 8 describes the vegetation zones outside the existing consent area, and Figure 5 describes the vegetation zones inside the existing consent area.

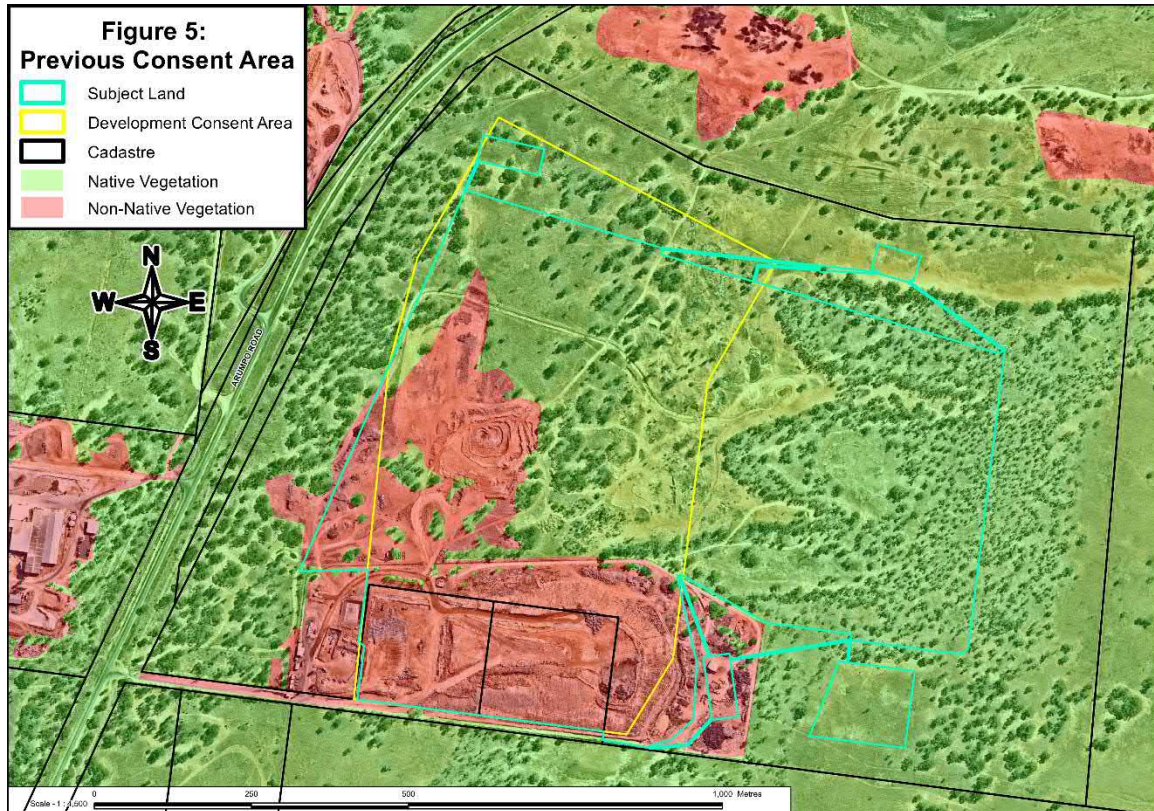


Figure 5. Development Consent and Subject Land Native and Non-Native Vegetation

3.3.1 Vegetation zones

An overview inspection, aerial imagery analysis, detailed floristic plots, and in-situ analysis have been used to identify the vegetation zone conditions. Four PCT's were identified within the Subject land, stratified into five distinct broad condition states. The zones were defined based on their overall health, overstorey composition, understorey condition, and land management. A sixth vegetation zone (Zone 2) in the southwest corner of the development site was identified to account for proposed vegetation removal under a previous concept design. Zone 2 consisted of good quality vegetation (PCT 58) and was subsequently avoided in the final concept design.

Sixteen vegetation integrity plots were assessed, evenly representative of the zone size, and randomly distributed across individual zones (Figure 6, Table 7, and Table 8).

The BAM was used for each plot, and the composition, structure, function, and vegetation integrity scores were obtained from the BAM-C (Table 9 and Table 10).

Table 7. Vegetation zones including the existing consent area - Case 00024930

PCT ID	Zone Number	Stratification unit / Condition class	The area impacted (ha)	Survey effort (# plots)	Zone size (ha)
15	1	15_Zone_1_CA Good quality vegetation, aligns closely with the representative PCT benchmark; there is little bare ground or litter within this zone.	0.57	5	0.57
58	3	58_Zone_3_CA Poor quality vegetation, aligns closely with the representative PCT benchmark; this zone shows very little disturbance from earthworks and vehicles/machinery.	6.99	3	6.99
	4	58_Zone_4_CA Moderate quality vegetation, aligns with the representative PCT benchmark; however, there is significant disturbance from earthworks and vehicles/machinery. This zone has a wider range of understorey plants which increases the subsequent diversity of flora.	3.38	2	3.51
170	5	170_Zone_5_CA Moderate quality vegetation, aligns mostly with the representative PCT benchmark; there is significant degradation in areas from litter and roadways; however, most of the old-growth is healthy.	4.49	4	4.54

Table 8. Vegetation zones outside the existing consent area - Case 00025590

PCT ID	Zone Number	Stratification unit / Condition class	The area impacted (ha)	Survey effort (# plots)	Zone size (ha)
15	1	15_Zone_1_Outside_CA Good quality vegetation, aligns closely with the representative PCT benchmark; there is little bare ground or litter within this zone.	19.19	5	19.2
58	4	58_Zone_4_Outside_CA Poor quality vegetation, aligns closely with the representative PCT benchmark; this zone shows very little disturbance from earthworks and vehicles/machinery.	0.12	2	0.12
170	5	170_Zone_5_Outside_CA Moderate quality vegetation, aligns with the representative PCT benchmark; however, there is significant disturbance from earthworks and vehicles/machinery. This zone has a wider range of understorey plants which increases the subsequent diversity of flora.	0.05	4	0.05
252	6	252_Zone_6_Outside_CA Poor quality vegetation, very sparse overstorey of <i>Myoporum platycarpum</i> with a low diversity understorey, dominated by shrubs.	1.70	2	1.7

Table 9. Current vegetation integrity scores including the existing consent area - Case 00024930

Zone ID	Composition score	Structure score	Function score	Vegetation integrity score
15_Zone_1_CA	44.9	58.7	70.7	57.1
58_Zone_3_CA	12.3	66.3	17.3	24.2
58_Zone_4_CA	24.4	80.6	34.6	40.8
170_Zone_5_CA	27.4	81.5	54.3	49.5

Table 10. Current vegetation integrity scores outside the existing consent area - Case 00025590

Zone ID	Composition score	Structure score	Function score	Vegetation integrity score
15_Outside_CA	44.9	58.7	70.7	57.1
58_Outside_CA	24.4	80.6	34.6	40.8
170_Outside_CA	27.4	81.5	54.3	49.5
252_Outside_CA	6.9	65.7	6.4	14.2

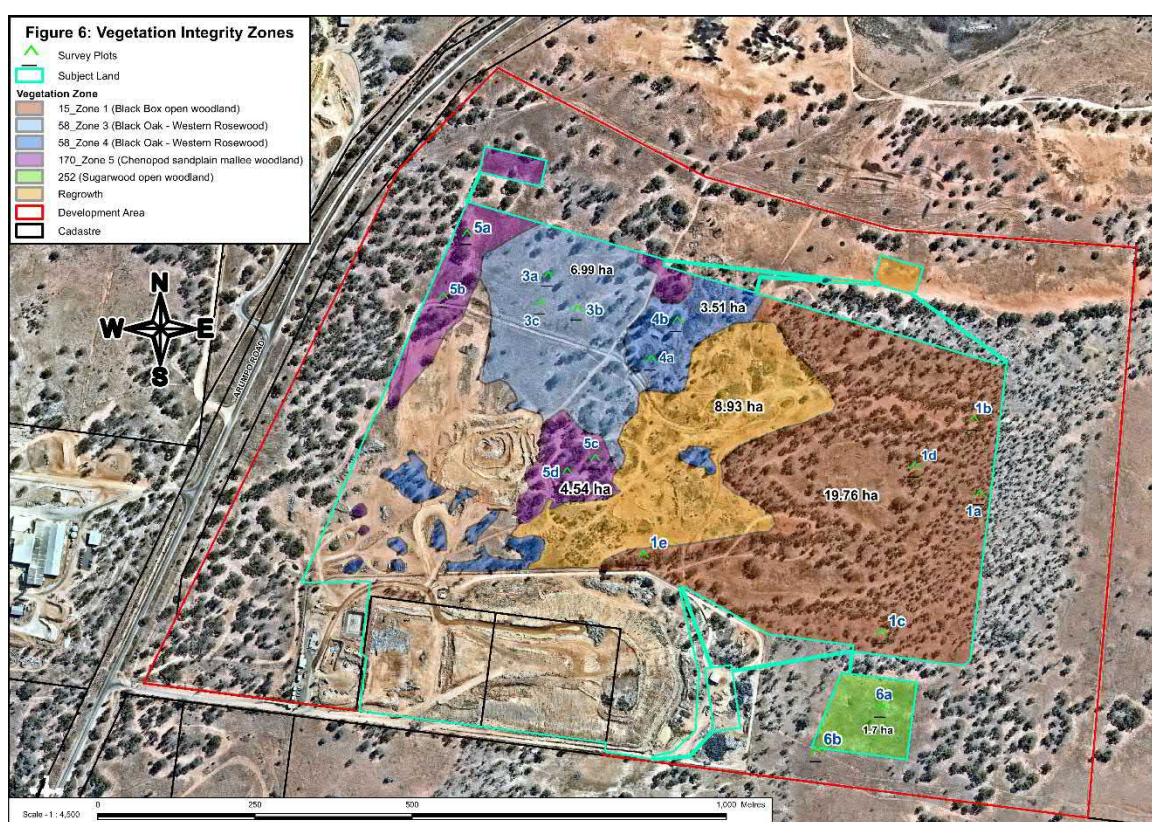


Figure 6. Vegetation Integrity Zones

4 Threatened Species

4.1 Ecosystem credit species

The Biodiversity Assessment Method Calculator (BAM-C) determined the ecosystem credit species associated with the PCTs present on the Subject land. The species have been listed in Table 11 along with their associated habitat, state listing, and national listing.

Table 11. Ecosystem credit species

Ecosystem credit species	Vegetation Type(s)	NSW: BC Act listing status	National: EPBC Act listing status
<i>Artamus cyanopterus</i> subsp. <i>cyanopterus</i> (Dusky Woodswallow)	PCT 15: Black Box open woodland wetland PCT 58: Black Oak - Western Rosewood PCT 170: Chenopod sandplain mallee woodland PCT 252: Sugarwood open woodland	Vulnerable	Not Listed
<i>Certhionyx variegatus</i> (Pied Honeyeater)	PCT 15: Black Box open woodland wetland PCT 58: Black Oak - Western Rosewood PCT 170: Chenopod sandplain mallee woodland PCT 252: Sugarwood open woodland	Vulnerable	Not Listed
<i>Chalinolobus picatus</i> (Little Pied Bat)	PCT 15: Black Box open woodland wetland PCT 58: Black Oak - Western Rosewood PCT 170: Chenopod sandplain mallee woodland PCT 252: Sugarwood open woodland	Vulnerable	Not Listed
<i>Cinclosoma castanotum</i> (Chestnut Quail-thrush)	PCT 170: Chenopod sandplain mallee woodland	Vulnerable	Not Listed
<i>Circus assimilis</i> (Spotted Harrier)	PCT 15: Black Box open woodland wetland PCT 58: Black Oak - Western Rosewood PCT 170: Chenopod sandplain mallee woodland PCT 252: Sugarwood open woodland	Vulnerable	Not Listed
<i>Daphoenositta chrysoptera</i> (Varied Sittella)	PCT 15: Black Box open woodland wetland PCT 58: Black Oak - Western Rosewood PCT 170: Chenopod sandplain mallee woodland PCT 252: Sugarwood open woodland	Vulnerable	Not Listed
<i>Falco hypoleucos</i> (Grey Falcon)	PCT 15: Black Box open woodland wetland PCT 58: Black Oak - Western Rosewood PCT 170: Chenopod sandplain mallee woodland PCT 252: Sugarwood open woodland	Endangered	Not Listed
<i>Glossopsitta porphyrocephala</i> (Purple-crowned Lorikeet)	PCT 170: Chenopod sandplain mallee woodland	Vulnerable	Not Listed
<i>Grus rubicunda</i> (Brolga)	PCT 170: Chenopod sandplain mallee woodland	Vulnerable	Not Listed
<i>Hamirostra melanosternon</i> (Black-breasted Buzzard)	PCT 15: Black Box open woodland wetland PCT 58: Black Oak - Western Rosewood PCT 170: Chenopod sandplain mallee woodland	Vulnerable	Not Listed

	PCT 252: Sugarwood open woodland		
<i>Hieraaetus morphnoides</i> (Little Eagle)	PCT 15: Black Box open woodland wetland PCT 58: Black Oak - Western Rosewood PCT 170: Chenopod sandplain mallee woodland PCT 252: Sugarwood open woodland	Vulnerable	Not Listed
<i>Lichenostomus cratitius</i> (Purple-gaped Honeyeater)	PCT 170: Chenopod sandplain mallee woodland	Vulnerable	Not Listed
<i>Lophochroa leadbeateri</i> (Major Mitchell's Cockatoo)	PCT 15: Black Box open woodland wetland PCT 58: Black Oak - Western Rosewood PCT 170: Chenopod sandplain mallee woodland PCT 252: Sugarwood open woodland	Vulnerable	Not Listed
<i>Lophoictinia isura</i> (Square-tailed Kite)	PCT 15: Black Box open woodland wetland PCT 58: Black Oak - Western Rosewood PCT 252: Sugarwood open woodland	Vulnerable	Not Listed
<i>Melanodryas cucullata</i> subsp. <i>cucullata</i> (Hooded Robin (south-eastern form))	PCT 15: Black Box open woodland wetland PCT 58: Black Oak - Western Rosewood PCT 170: Chenopod sandplain mallee woodland PCT 252: Sugarwood open woodland	Vulnerable	Not Listed
<i>Ninox connivens</i> (Barking Owl)	PCT 15: Black Box open woodland wetland	Vulnerable	Not Listed
<i>Nyctophilus corbeni</i> (Corben's Long-eared Bat)	PCT 58: Black Oak - Western Rosewood PCT 170: Chenopod sandplain mallee woodland	Vulnerable	Not Listed
<i>Pachycephala inornata</i> (Gilbert's Whistler)	PCT 58: Black Oak - Western Rosewood PCT 170: Chenopod sandplain mallee woodland	Vulnerable	Not Listed
<i>Polytelis anthopeplus</i> subsp. <i>monarchoides</i> (Regent Parrot (eastern subspecies))	PCT 15: Black Box open woodland wetland PCT 58: Black Oak - Western Rosewood PCT 170: Chenopod sandplain mallee woodland	Endangered	Not Listed
<i>Saccolaimus flaviventris</i> (Yellow-bellied Sheathtail-bat)	PCT 15: Black Box open woodland wetland PCT 58: Black Oak - Western Rosewood PCT 170: Chenopod sandplain mallee woodland	Vulnerable	Not Listed
<i>Stagonopleura guttata</i> (Diamond Firetail)	PCT 58: Black Oak - Western Rosewood PCT 170: Chenopod sandplain mallee woodland	Vulnerable	Not Listed
<i>Vespadelus baverstocki</i> (Inland Forest Bat)	PCT 15: Black Box open woodland wetland PCT 58: Black Oak - Western Rosewood PCT 170: Chenopod sandplain mallee woodland	Vulnerable	Not Listed

4.1.1 Justification for exemptions

One fauna species has been identified as unlikely to occur within the Subject land due to habitat constraints and have been excluded from the candidate ecosystem credit species.

4.1.1.1 Fauna

Haliaeetus leucogaster

Haliaeetus leucogaster is a large bird of prey, reaching an adult height of 75-85 cm and a 180-220 cm wingspan. This species is commonly found in known communities in which it occurs in NSW; most occurrence records are distributed across the Australian coastline and along the rivers and wetlands of the Murray-Darling Basin. This species inhabits large areas of open water, particularly larger rivers, swamps, lakes, and the ocean.

Haliaeetus leucogaster is not likely to occur within the Subject land. The BAM-C requires a habitat constraint that is not present: *waterbodies - within 1 km of a rivers, lakes, large dams or creeks, wetlands, and coastlines.*

4.2 Species credit species

The BAM-C has provided several candidate species credit species listed as threatened species under the BC Act and predicted to occur within the Subject land. Thereover, the BAM-C has concluded that the proposal may cause a significant impact to threatened species based upon the location and the presence of the previously detailed PCTs (Table 12).

Table 12. Species credit species

Species credit species	Sensitivity to gain class	NSW: BC Act listing status	Nation: EPBC Act listing status	Listed Habitat Constraints (TBDC)	Included or excluded	Reason for inclusion or exclusion
<i>Austrostipa metatoris</i> (A Spear-grass)	High Sensitivity to Potential Gain	Vulnerable	Vulnerable	- N/A	Included	Likely to occur on-site
<i>Burhinus grallarius</i> (Bush Stone-curlew)	High Sensitivity to Potential Gain	Endangered	Not Listed	- Fallen/standing dead timber including logs	Included	Likely to occur on-site
<i>Casuarina obesa</i> (Swamp She-oak)	Very High Sensitivity to Potential Gain	Endangered	Not Listed	- Waterbodies: brackish or saline areas within 100 m from rivers or lakes.	Excluded	Habitat constraints
<i>Eucalyptus leucoxylon</i> subsp. <i>pruinosa</i> (Yellow Gum)	High Sensitivity to Potential Gain	Vulnerable	Not Listed	- N/A	Included	Likely to occur on-site
<i>Haliaeetus leucogaster</i> (White-bellied Sea-eagle)	High Sensitivity to Potential Gain	Vulnerable	Not Listed	- Other: living or dead mature trees within suitable vegetation within 1 km of a rivers, lakes, large dams or creeks, wetlands, and coastlines. - Waterbodies: Within 1 km of a rivers, lakes, large dams or creeks, wetlands, and coastlines	Excluded	Habitat constraints
<i>Hamirostra melanosternon</i> (Black-breasted Buzzard)	Moderate Sensitivity to Potential Gain	Vulnerable	Not Listed	- Waterbodies: land within 40 m of riparian woodland on inland watercourses/waterholes containing dead or dying eucalypts.	Excluded	Habitat constraints
<i>Hieraaetus morphnoides</i> (Little eagle)	Moderate Sensitivity to Potential Gain	Vulnerable	Not Listed	- Other: nest trees - live (occasionally dead) large old trees within vegetation.	Included	Likely to occur on-site
<i>Lophochroa leadbeateri</i> (Major Mitchell's cockatoo)	High Sensitivity to Potential Gain	Vulnerable	Not Listed	- Hollow bearing trees: living or dead trees with hollows greater than 10 cm diameter.	Included	Likely to occur on-site
<i>Lophoictinia isura</i> (Square-tailed Kite)	Moderate Sensitivity to Potential Gain	Vulnerable	Not Listed	- Other: Nest trees	Included	Likely to occur on-site
<i>Ninox connivens</i> (Barking Owl)	High Sensitivity to Potential Gain	Vulnerable	Not Listed	- Hollow bearing trees: living or dead trees with hollows greater than 20 cm diameter and greater than 4 m above the ground.	Included	Likely to occur on-site
<i>Pimelea serpyllifolia</i> subsp. <i>serpyllifolia</i> (Thyme Rice-flower)	High Sensitivity to Potential Gain	Endangered	Not Listed	- N/A	Included	Likely to occur on-site
<i>Polytelis anthopeplus</i> subsp. <i>monarchoides</i> (Regent Parrot (eastern subspecies))	High Sensitivity to Potential Gain	Endangered	Vulnerable	- Hollow bearing trees: living or dead <i>E. camaldulensis</i> with hollows greater than 5 cm diameter, greater than 5 m above the ground, or trees with DBH of greater than 40 cm, within 1 km of watercourses or billabongs. Trees can be isolated but within 20 km of larger patches of mallee.	Excluded	Habitat constraints

4.2.1 Justification for exemptions

One flora species and three fauna species have been identified as unlikely to occur within the Subject land due to habitat constraints and have been excluded from the candidate species credit species.

4.2.1.1 Flora

Casuarina obesa

Casuarina obesa is a branching shrub to small form tree that grows between 3-15 m in height. This species is not commonly found in known communities in which it occurs in NSW; most occurrence records are present in salt-affected areas and communities placed as plantings for agroforestry. This species grows in slightly moist saline soil and along shorelines of permanent, ephemeral, or relict lakes.

Casuarina obesa is not likely to occur within the Subject land. The BAM-C requires a habitat constraint that is not present: *waterbodies, brackish or saline areas within 100 m from rivers or lakes*. Therefore, a targeted survey is not required.

4.2.1.2 Fauna

Haliaeetus leucogaster

Haliaeetus leucogaster is a large bird of prey, reaching an adult height of 75-85 cm and a 180-220 cm wingspan. This species is commonly found in known communities in which it occurs in NSW; most occurrence records are distributed across the Australian coastline and along the rivers and wetlands of the Murray-Darling Basin. This species inhabits large areas of open water, particularly larger rivers, swamps, lakes, and the ocean.

Haliaeetus leucogaster is not likely to occur within the Subject land. The BAM-C requires a habitat constraint that is not present: *other: living or dead mature trees within suitable vegetation within 1 km of a rivers, lakes, large dams or creeks, wetlands, and coastlines*. Therefore, a targeted survey is not required.

Hamirostra melanosternon

Hamirostra melanosternon is a large bird of prey, reaching an adult height of 51-61 cm and a 150 cm wingspan. This species is not commonly found in known communities in which it occurs in NSW; most occurrence records are found throughout mainland Australia, except for the Western Australian deserts. This species inhabits a range of inland habitats; however, spending much of its time around watercourses within proximity to grasslands and sparsely timbered woodlands.

Hamirostra melanosternon is not likely to occur within the Subject land. The BAM-C requires a habitat constraint that is not present: *waterbodies: land within 40 m of riparian woodland on inland watercourses/waterholes containing dead or dying eucalypts*. Therefore, a targeted survey is not required.

Polytelis anthopeplus subsp. *Monarchoides*

Polytelis anthopeplus subsp. *monarchoides* is a slim, medium-sized parrot, reaching an adult height of 37-42 cm and a 53-57 cm wingspan. This species is commonly found in known communities in which it occurs in NSW; most occurrence records are found along with the Murray River and adjoining areas of mallee; however, there are also scattered records along the Darling River. This species inhabits forests along the Murray, Wakool, and lower Murrumbidgee Rivers, particularly nesting in mature and healthy River Red Gum.

Polytelis anthopeplus subsp. *monarchoides* is not likely to occur within the Subject land. The BAM-C requires a habitat constraint that is not present: *hollow-bearing trees: living or dead E*.

camaldulensis with hollows greater than 5 cm diameter, greater than 5 m above the ground OR trees with DBH of greater than 40 cm, within 1 km of watercourses or billabongs. Trees can be isolated but within 20 km of mallee. Therefore, a targeted survey is not required.

4.2.2 Species requiring further assessment

4.2.2.1 Flora

Austrostipa metatoris

Austrostipa metatoris is a perennial spear-grass that grows in a tussock form up to 1 m in height. This species is commonly found in known communities of which it occurs in NSW; most occurrence records are present in the Murray Valley, with scattered records in Lake Cargelligo and Nymagee. This species grows in the Murray Valley's sandy areas, including sandhills, sand ridges, undulating plains, and flat open mallee country.

Austrostipa metatoris is believed to potentially occur within the Subject land. The geographical distribution and habitat requirements, along with BAM-C identification, have determined that a targeted survey is required.

Months of Survey											
January	February	March	April	May	June	July	August	September	October	November	December
☐	☐	☐	☐	☐	☐	☐	☐	☐	☒	☒	☐

Eucalyptus leucoxylon subsp. *pruinosa*

Eucalyptus leucoxylon subsp. *pruinosa* is a long-lived small to medium-sized tree that grows erect from a single stump up to 20 m in height. This species is not commonly found in known communities in which it occurs in NSW; most occurrence records are present in scattered remnants through Barham, Euston, along the Murray River, and in some south-western NSW State Forests. This species grows at the bases of sandy rises and on loamy clay flats on the floodplains of the Murray River and its tributaries in the Riverina Bioregion.

Eucalyptus leucoxylon subsp. *pruinosa* is believed to potentially occur within the Subject land. The geographical distribution and habitat requirements, along with BAM-C identification, have determined that a targeted survey is required.

Months of Survey											
January	February	March	April	May	June	July	August	September	October	November	December
☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒

Pimelea serpyllifolia subsp. *serpyllifolia*

Pimelea serpyllifolia subsp. *serpyllifolia* is a long-lived small woody shrub that grows in a densely branched, sprawling yet rarely prostrate form up to 1.5 m in height. This species is not commonly found in known communities in which it occurs in NSW; most occurrence records are present along far south-western NSW in the Euston district. This species grows in scrub and woodland on calcareous soils. Often found in sandy red soils supporting mallee scrub.

Pimelea serpyllifolia subsp. *serpyllifolia* is believed to potentially occur within the Subject land. The geographical distribution and habitat requirements, along with BAM-C identification, have determined that a targeted survey is required.

Months of Survey											
January	February	March	April	May	June	July	August	September	October	November	December
☐	☐	☐	☐	☐	☐	☒	☒	☒	☒	☒	☐

4.2.2.2 Fauna

Burhinus grallarius

Burhinus grallarius is a large, slim, ground-dwelling bird, reaching an adult height of 55 cm and a 55-60 cm wingspan. This species is not commonly found in known communities in which it occurs in NSW; most occurrence records are scattered across Australia except for the central southern coast and inland, the far south-east corner, and Tasmania. This species inhabits open forests and woodlands, which have a sparse grassy ground layer and fallen timber.

Burhinus grallarius is believed to potentially occur within the Subject land. The geographical distribution and habitat requirements, along with BAM-C identification, have determined that a targeted survey is required.

Months of Survey											
January	February	March	April	May	June	July	August	September	October	November	December
☐	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒

Hieraaetus morphnoides

Hieraaetus morphnoides is a small, stocky bird of prey, reaching an adult height of 45-55 cm and a 120 cm wingspan. This species is commonly found in known communities of which it occurs in NSW; most occurrence records are found throughout mainland Australia. This species inhabits open Eucalypt forest, woodland, and open woodland, including She-oak and Acacia woodlands.

Hieraaetus morphnoides is believed to potentially occur within the Subject land. The geographical distribution and habitat requirements, along with BAM-C identification, have determined that a targeted survey is required.

Months of Survey											
January	February	March	April	May	June	July	August	September	October	November	December
☐	☐	☐	☐	☐	☐	☐	☒	☒	☒	☐	☐

Lophochroa leadbeateri

Lophochroa leadbeateri is a small parrot, reaching an adult height of 40 cm and an 80 cm wingspan. This species is commonly found in known communities in which it occurs in NSW; most occurrence records are found across the arid and semi-arid inland of Australia. This species inhabits both treed and treeless arid zone communities, always within reach of a water body.

Lophochroa leadbeateri is believed to potentially occur within the Subject land. The geographical distribution and habitat requirements, along with BAM-C identification, have determined that a targeted survey is required.

Months of Survey											
January	February	March	April	May	June	July	August	September	October	November	December
☐	☐	☐	☐	☐	☐	☐	☐	☒	☒	☒	☒

Lophoictinia isura

Lophoictinia isura is a small to medium-sized, long-winged bird of prey, reaching an adult height of 55-60 cm and a 130 cm wingspan. This species is commonly found in known communities in which it occurs in NSW; most occurrence records are predominantly located to the northeast and along the major west-flowing river systems; however, records show its migration south-east for breeding during summer. This species inhabits dry woodlands, open forests, open Acacia scrub, and low open Eucalypt woodland patches.

Lophoictinia isura is believed to potentially occur within the Subject land. The geographical distribution and habitat requirements, along with BAM-C identification, have determined that a targeted survey is required.

Months of Survey											
January	February	March	April	May	June	July	August	September	October	November	December
☒	☐	☐	☐	☐	☐	☐	☐	☒	☒	☒	☒

Ninox connivens

Ninox connivens is a medium-sized, large-winged hawk-owl, reaching an adult height of 40-45 cm and a 120 cm wingspan. This species is not commonly found in known communities of which it occurs in NSW; most occurrence records are sparsely scattered across the Australian mainland except for arid regions. This species inhabits woodland and open forest, including fragmented remnants and partly cleared farmland.

Ninox connivens is believed to potentially occur within the Subject land. The geographical distribution and habitat requirements, along with BAM-C identification, have determined that a targeted survey is required.

Months of Survey											
January	February	March	April	May	June	July	August	September	October	November	December
☐	☐	☐	☐	☒	☒	☒	☒	☒	☒	☒	☒

4.2.3 Targeted surveys

Targeted surveys were undertaken in October of 2021. October formed a period in which all targeted threatened species were active per their 'Months of Survey' chart. Weather conditions for all survey dates were recorded in-situ and retrieved from the Bureau of Meteorology (BOM), where on-site recording equipment was not capable.

4.2.3.1 Community survey and Database searches

A community survey was established, engaging local birdlife and naturalist groups to provide knowledge of targeted threatened species distribution within the Buronga area. A Threatened Species Community Survey Document was published for comment between the 21st and 31st of October 2021.

4.2.3.2 Transects survey

A transect survey was performed with a 10-metre maximum distance between parallel field traverses. The maximum distance between transect lines was determined at the rate required for *Austrostipa metatoris*, which encompassed the transect requirements of all other targeted flora species. While the transects survey was performed, surveyors undertook opportunistic flushing of organic litter for the Bush-Stone curlew and hollow recording for the Barking owl.

Table 13. Transect Survey Information

Date	Targeted Species	Maximum Temperature (°C)	Minimum Temperature (°C)	Rainfall (mm)	Max Wind Gust (km/h)
18 th October 2021	- Yellow Gum - Thyme Rice-flower - A Spear-grass - Bush Stone-curlew	11.8	28.4	0	SW 39

4.2.3.3 Spot count surveys

A total of 51 quadrat surveys took place over three days; fifteen 2ha/20-minute systematic surveys and two 500 m area surveys were performed each day. The quadrates were assigned to cover the entire development footprint, and all sightings or calls from birds within their quadrats were recorded. Opportunistic flushing of organic litter for the Bush-Stone curlew and hollow recording for the Barking owl occurred while traversing between quadrats

Table 14. Quadrat Survey Information

Date	Targeted Species	Maximum Temperature (°C)	Minimum Temperature (°C)	Rainfall (mm)	Max Wind Gust (km/h)
19 th October 2021	- Barking Owl	7.9	22.7	0	SSE 41
21 st October 2021	- Bush Stone-curlew	13.4	31.7	0	SSE 43
22 nd October 2021	- Square-tailed Kite - Little Eagle - Major Mitchell's Cockatoo	12.7	23.6	0	SW 50

4.2.3.4 Nocturnal surveys

Nocturnal surveys were conducted over five separate days; each survey was regulated to two hours beginning in the late evening, 15 minutes before sunset. The nocturnal surveys targeted the Barking Owl and the Bush Stone-Curlew. Callbacks were performed using a 360-degree speaker, and any responses or observations were recorded. Spotlighting preceded the callbacks, and while spotlighting areas of interest and recorded hollows were searched.

Table 15. Nocturnal Survey Information

Date	Targeted Species	Maximum Temperature (°C)	Minimum Temperature (°C)	Rainfall (mm)	Max Wind Gust (km/h)
18 th October 2021	- Barking Owl - Bush-stone Curlew	24	22	0	NNE 21
21 st October 2021		31	29	0	NE 15
24 th October 2021		22	20	0	N 14
29 th October 2021		20	18	0	N 22
30 th October 2021		21	20	0	NE 15

4.2.4 Targeted Survey Results

Table 16. Targeted Survey Results

Species	Presence / Absence	Survey Effort	Survey Results
Yellow Gum (<i>Eucalyptus leucoxylon subsp. pruinosa</i>)	Absent	- Community survey - Database searches - Transect survey	This species has not been recorded within the subject land and was not observed within the development site. This species is not known to occur in the extended landscape; the nearest recording appears over 170 km southeast, dated 2003 (ALA). While the soil and PCT composition provide suitable habitat for this species to occur within the development footprint, the Community survey responses indicated that the species had not been known to occur in the area. Transect Surveys confirmed that the species was not present.
Thyme Rice-flower (<i>Pimelea serpyllifolia subsp. serpyllifolia</i>)	Absent	- Community survey - Database searches - Transect survey	This species has not been recorded within the subject land and was not observed within the development site. This species is not known to occur in the extended landscape; the nearest recording of a Thyme Rice-flower appears over 40 km southeast, dated 2000 (ALA). While the soil and PCT composition provide suitable habitat for this species to occur within the development footprint, the Community survey responses indicated that the species had not been known to occur in the area. Transect Surveys confirmed that the species was not present.
A Spear-grass (<i>Austrostipa metatoris</i>)	Absent	- Community survey - Database searches - Transect survey	This species has not been recorded within the subject land and was not observed within the development site. This species is not known to occur in the extended landscape; the nearest recording of an <i>Austrostipa metatoris</i> appears over 75 km southeast, dated 1947 (ALA); Extensive research was conducted to ensure accurate monitoring and reporting of the species within the survey effort; however, this species is only known to occur within isolated and well-studied areas. Community surveys reported no responses indicated that there is little knowledge of this species generally. Transect Surveys confirmed that the species was not present; however, several species of <i>Austrostipa</i> were collected, identified, and recorded.
Barking Owl (<i>Ninox connivens</i>)	Absent	- Community survey - Database searches - Nocturnal survey	This species has not been recorded within the subject land and was not observed within the development site. This species is not known to occur in the extended landscape; the nearest recording of a Barking Owl appears 7 km south (in central Mildura), dated 1944 (ALA) – A recent observation places them over 37 km west, dated 2006 (ALA)
Bush Stone-curlew (<i>Burhinus grallarius</i>)	Absent	- Community survey - Database searches - Transect survey - Nocturnal survey	This species has not been recorded within the subject land and was not observed within the development site. This species is not known to have been spotted in the extended landscape; however, a single nearby recording appears around 5 km south, dated 2013 (ALA)
Square-tailed Kite (<i>Lophoictinia isura</i>)	Absent	- Community survey - Database searches - Transect survey - Spot count survey	This species has not been recorded within the subject land and was not observed within the development site. This species is not known to occur in the extended landscape. There are several records of this species as close by as 3 km from the development area; however, these sightings range from 1988 to 1857; a close by and recent recording

			6 km south, dated 2007 (ALA), has not been confirmed upon location visits.
Little Eagle <i>(Hieraetus morphnoides)</i>	Absent	- Community survey - Database searches - Transect survey - Spot count survey	This species has not been recorded within the subject land and was not observed within the development site. This species is not known to occur in the extended landscape; There are several records of this species as close by as 4 km from the development area, several of these sightings were recorded between 2000 and 2010 (ALA); however, the lacking identification of this species from the public and the insufficient observations during the extensive field surveys has concluded that this species is not present within the development area.
Major Mitchell's Cockatoo <i>(Lophochroa leadbeateri)</i>	Absent	- Community survey - Database searches - Transect survey - Spot count survey	This species has not been recorded within the subject land and was not observed within the development site. This species is known to occur beyond the extended landscape along the Murray River; the nearest recording of the Major Mitchell's Cockatoo appears 3 km north (in central Mildura), dated 2019 (ALA). Although the local sighting is notable, this species is often seen overhead travelling vast distances; this recording is contingent on an aerial spot.

5 Matters of National Environmental Significance

A protected matters search tool (PMST) report under the *Environmental Protection and Biodiversity Conservation Act 2009* was generated on 22 June 2021 to identify Matters of National Environmental Significance (MNES) that potentially occur within the Subject land. The PMST report was based on a 10 km buffer taken from a point at the centre of the Subject land (Appendix A); the relevant protected matters relating to biodiversity include:

- Wetlands of International Importance (Ramsar)
- Listed Threatened Ecological Communities
- Listed Threatened Species
- Listed Migratory Species
- State and Territory Reserves
- Nationally Important Wetlands

5.1 Wetlands of international importance (Ramsar)

The protected matters report indicated three wetlands of international importance:

- Banrock Station wetland complex
- Riverland
- Coorong and Lakes Alexandrina and Albert

The Subject land is many hundreds of river kilometres upstream of these three wetlands, which are situated in South Australia. The nearest of these is 'Riverland', which is 170 km as the crow flies and approximately double this distance by the Murray River.

5.2 Listed threatened ecological communities

The protected matters report indicated one threatened ecological community:

- Buloke Woodlands of the Riverina and Murray-Darling Depression Bioregion

Buloke has not been identified within the Subject land, buffer area, or known to occur within the extended landscape.

5.3 Listed threatened species

The protected matters report indicated twenty-five threatened species, comprising twelve birds, six fish, one frog, two mammals, and four plants. As described in the habitat assessment for the listed threatened species (Table 13), two of these species are considered to have potential habitat within the Subject land; these species are:

- *Falco hypoleucos* (Grey Falcon)
- *Nyctophilus corbeni* (Corben's Long-eared Bat)

Table 17. Listed Threatened Species

Name	Habitat	Habitat present	Likelihood of occurrence	Potential for impact
Birds				
<i>Botaurus poiciloptilus</i> (Australasian Bittern)	Permanent freshwater wetlands with tall, dense vegetation.	Absent	Unlikely	No
<i>Calidris ferruginea</i> (Curlew Sandpiper)	Intertidal mudflats of sheltered coasts and non-tidal swamps.	Absent	Unlikely	No
<i>Falco hypoleucos</i> (Grey Falcon)	Arid to semi-arid shrubland, grassland and wooded watercourses.	Present	Unlikely	Possible
<i>Grantiella picta</i> (Painted Honeyeater)	Boree, Brigalow, and Box-Gum Woodlands and Box-Ironbark Forests.	Absent	Unlikely	No
<i>Leipoa ocellata</i> (Malleefowl)	Tall, dense, and floristically rich mallee with Spinifex understorey.	Absent	Unlikely	No
<i>Limosa lapponica</i> subsp. <i>baueri</i> (Nunivak Bar-tailed Godwit)	Coastal, intertidal habitats around seagrass, and infrequently saltmarsh.	Absent	Unlikely	No
<i>Manorina melanotis</i> (Black-eared Miner)	Mature, unfragmented mallee on fertile soil.	Absent	Unlikely	No
<i>Numenius madagascariensis</i> (Eastern Curlew)	Intertidal sand and mudflat habitat around seagrass vegetation.	Absent	Unlikely	No
<i>Pedionomus torquatus</i> (Plains-wanderer)	Semi-arid lowland grasslands on hard red-brown soils.	Absent	Unlikely	No
<i>Pezoporus occidentalis</i> (Night Parrot)	Spinifex grasslands in stony or sandy areas.	Absent	Unlikely	No
<i>Polytelis anthopeplus</i> subsp. <i>monarchoides</i> (Regent Parrot)	Large, mature, healthy River Red Gum along the Murray River.	Absent	Unlikely	No
<i>Rostratula australis</i> (Australian Painted Snipe)	Fringes of swamps, marshes and dams with Lignum or low scrub.	Absent	Unlikely	No
Fish				
<i>Bidyanus bidyanus</i> (Silver Perch)	Upper reaches and highlands or turbid slow-flowing rivers.	Absent	Unlikely	No
<i>Craterocephalus fluviatilis</i> (Murray Hardyhead)	Open, shallow, slow, or still habitats, often dense aquatic vegetation.	Absent	Unlikely	No
<i>Galaxias rostratus</i> (Flathead Galaxias)	Still or gentle flowing rocky or sandy habitats, the margin of waterbodies.	Absent	Unlikely	No
<i>Maccullochella macquariensis</i> (Trout Cod)	Fast-flowing rocky, gravel habitats; or slow-flowing lowland rivers.	Absent	Unlikely	No
<i>Maccullochella peelii</i> (Murray Cod)	Freshwater, clear, rocky streams or slow-flowing turbid water bodies.	Absent	Unlikely	No
<i>Macquaria australasica</i> (Macquarie Perch)	Deep sandy or clay rivers or small rocky upland streams.	Absent	Unlikely	No
Frogs				
<i>Litoria raniformis</i> (Growling Grass Frog)	Still or slow-flowing water with mats of floating or submerged vegetation.	Absent	Unlikely	No
Mammals				
<i>Nyctophilus corbeni</i> (Corben's Long-eared Bat)	Mallee, box, Buloke communities, or Ironbark, Cypress-pine vegetation.	Present	Unlikely	Possible
<i>Phascogale cinereus</i> (Koala)	Eucalypt woodlands and forests.	Present	Unlikely	No
Plants				
<i>Lepidium monoplacoides</i> (Winged Pepper-creep)	Open Buloke or Eucalypt woodlands, seasonally waterlogged and fertile.	Absent	Unlikely	No
<i>Solanum karsense</i> (Menindee Nightshade)	Solonchized brown soils or floodplain grey clays, open Black Box woodland.	Present	Unlikely	No
<i>Swainsona murrayana</i> (Slender Darling-pea)	Floodplains or grassy woodlands with grey, red or brown cracking clay soils.	Absent	Unlikely	No
<i>Swainsona pyrophila</i> (Yellow Swainson-pea)	Mallee scrub on sandy or loamy soil, including disturbed woodland.	Present	Unlikely	No

5.4 Listed migratory species

The protected matters report indicated 15 listed migratory species, comprising one marine bird, one terrestrial bird, and 13 wetland birds. As described in the habitat assessment for the listed migratory species (Table 14), none of these species are considered to have potential habitat within the Subject land.

Table 18. Listed migratory species

Name	Habitat	Habitat present	Likelihood of occurrence	Potential for impact
Migratory Marine Birds				
<i>Apus pacificus</i> (Fork-tailed Swift)	Ranging habitats, coastal, inland, urban, open plains, and semi-arid.	Absent	Unlikely	No
Migratory Terrestrial Birds				
<i>Motacilla flava</i> (Yellow Wagtail)	Brackish wetlands, salt marshes, coastal and partly inland pastures.	Absent	Unlikely	No
Migratory Wetland Birds				
<i>Actitis hypoleucos</i> (Common Sandpiper)	Coastal or inland wetlands, saline, or fresh, rocky, and muddy shores.	Absent	Unlikely	No
<i>Calidris acuminata</i> (Sharp-tailed Sandpiper)	Inland freshwater wetlands and mudflats, shallow with vegetation.	Absent	Unlikely	No
<i>Calidris ferruginea</i> (Curlew Sandpiper)	Intertidal sand and mudflat habitat or littoral and estuarine habitats.	Absent	Unlikely	No
<i>Calidris melanotos</i> (Pectoral Sandpiper)	Sand and mudflats, Fresh and saltwater marshes, or dry lakes.	Absent	Unlikely	No
<i>Calidris ruficollis</i> (Red-necked Stint)	Intertidal mudflats, or partly inland around coastal wetlands.	Absent	Unlikely	No
<i>Charadrius bicinctus</i> (Double-banded Plover)	Saltmarshes, beaches, estuaries, and coastal and inland pastures.	Absent	Unlikely	No
<i>Gallinago hardwickii</i> (Latham's Snipe)	Vegetated freshwater wetlands, salt marshes, and coastal pastures.	Absent	Unlikely	No
<i>Limosa lapponica</i> (Bar-tailed Godwit)	Estuarine mudflats, mangroves, and coastal regions.	Absent	Unlikely	No
<i>Limosa limosa</i> (Black-tailed Godwit)	Intertidal sand and mudflat habitat, or inland muddy lakes and swamps.	Absent	Unlikely	No
<i>Numenius madagascariensis</i> (Eastern Curlew)	Intertidal sand and mudflat habitat around seagrass vegetation.	Absent	Unlikely	No
<i>Tringa glareola</i> (Wood Sandpiper)	Inland freshwater wetlands, particularly shallow with vegetation.	Absent	Unlikely	No
<i>Tringa nebularia</i> (Common Greenshank)	Estuarine mudflats, mangroves, coastal regions, and inland pastures.	Absent	Unlikely	No
<i>Tringa stagnatilis</i> (Marsh Sandpiper)	Brackish wetlands, particularly lagoons, rivers, and swamps.	Absent	Unlikely	No

5.5 State and Territory Reserves

The protected matters report identified two State Reserves, both occurring in Victoria. The reserves are:

- Kings Billabong Park
- River Murray Reserve

Kings Billabong Park borders the Murray River. However, it is 8.4 km from the BLE and is well upstream, so there will be no impact from the BLE.

The River Murray Reserve is a continuous linear reserve along the Victorian bank of the Murray River. The nearest point is 3.7 km from this development. There is no waterway connecting the development with the Murray River, so there will be no impact on the river from the BLE.

5.6 Nationally Important Wetlands

The protected matters report identified one Nationally Important Wetland, which is in Victoria. The wetland is:

- Kings Billabong Wetlands

Kings Billabong Wetlands is on the Victorian bank of the Murray River and one of the main features in the Kings Billabong Park. Kings Billabong Wetlands is 9.8 km from the BLE and is well upstream, so there will be no impact from the BLE.

6 Avoid and minimise impacts

6.1 Assessment of impacts

The potential for direct impacts on biodiversity is limited to the clearing of native vegetation and habitat. Direct and indirect impacts are identified below. This section of the BDAR addresses several impacts associated with the BLE, such as nature, extent, frequency, duration, and the timing of impacts. In addition, the likelihood and consequences of impact risk have been addressed with a risk matrix (Appendix F) (ISO 31000).

6.1.1 Direct impacts

The construction and operational phases of the BLE present direct impacts (Table 15) on biodiversity values that cannot be avoided. In addition, the BLE will sequentially impact all native vegetation within the Subject land.

Table 19. Direct Impacts

Impact	Nature (Description)	Extent	Frequency	Duration	Timing	Risk Rating	Consequence
- Native flora destruction - Habitat loss	Loss of overstorey and shrub layer for a long period, potential reduction in flora diversity and threatened flora, impact on fauna species due to habitat loss, i.e., loss of tree hollows and logs, loss of large old trees suitable for raptor nesting and parrots, understorey, further infringement on threatened species habitat. Habitat loss and consequent reductions of connectivity for movement of fauna across the site.	Construction area	Every 3-4 years	At all times	During construction	Very High	Significant for flora; however, adoption of controls will reduce the impact on fauna
Native fauna injuries/fatalities/displacement	Fauna displacement/injuries/death during clearing operations.	Subject land	Infrequently	At all times	At all times	High	Minor

6.1.2 Indirect impacts

There are several factors (Table 16) that may have indirect impacts on biodiversity values. The indirect impacts may not be an immediate or obvious effect; however, long-term may have severe impacts on flora and fauna if not addressed.

Table 20. Indirect Impacts

Impact	Nature	Extent	Frequency	Duration	Timing	Risk Rating	Consequence
• Hazardous and waste materials	Waste materials present a risk to wildlife.	Active cells	Ongoing	Regularly	During event	Moderate	Very High
• Landscape and visual amenity	Construction and operational visual impacts and landscape/topographical changes may exacerbate habitat fragmentation and fauna displacement.	Active cells	Ongoing	Regularly	All times	Moderate	High
• Native fauna injuries/fatalities/displacement	Traffic collisions, entrapment of fauna in excavations, trenches or pipes/conduits during construction, displacement, or injuries to fauna during clearing operations.	Subject land	Regularly	At all times	At all times	High	Minor
• Noise and Vibration	Construction-related noise and vibration may cause an impact relating to the displacement of fauna (plant and traffic).	Active cells and construction zones	Ongoing	Regularly	Operational hours	Moderate	Very High
• Odour, gas, and dust	Construction and operational phase odour, gas (methane), noise, vibration, dust, and light generation may affect fauna.	Active cells	Ongoing	Regularly	At all times	Moderate	High
• Pest animals	Waste attracting pest animals to the site, e.g., foxes, predation by foxes and feral cats, loss of natural regeneration or damage to revegetation by rabbits, land disturbance by rabbits encourages weeds, potential loss of native forbs and grasses by rabbits.	Subject land	Ongoing	Regularly	At all times	Moderate	High
• Priority noxious weeds	Competition for space, harbour for pest animals, reduced biodiversity value.	Subject land	Ongoing	Regularly	At all times	Moderate	Moderate
• Soils and groundwater contamination	Leachate intercepts groundwater and potential contamination of groundwater or soil because of construction activities.	Active cells and construction area	Regularly	Infrequently	Rain or watering events	Moderate	High
• Fauna disturbance/fatalities by traffic	Construction and operational traffic for landfills may directly impact native fauna and flora, particularly if vehicles stray from designated tracks and roads.	Subject land	Ongoing	Infrequently	During event	High	High

• Water erosion	Stormwater runoff causes soil erosion and sedimentation.	Active cells and construction zones	Ongoing	Regularly	Rain or watering events	Moderate	High
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6.2 Safeguards and management measures

All construction and operational works will be managed to minimise the impacts on native flora and fauna. The proponent has considered the controls below, which aim to preserve habitat, minimise interactions with wildlife, manage biosecurity footprint, discourage (where manageable) wildlife from entering the development site while operational, and ensure that personnel are aware of flora fauna carers and their contact details.

The Buronga landfill and BLE have a biosecurity duty legislatively monitored through the NSW *Biosecurity Act 2015* and NSW *Biodiversity Regulation 2017*. The Biosecurity legislation provides controls for selected pest animals and noxious pest plants. In addition, the BLE will have a Landfill Environmental Management Plan (LEMP) developed for the construction and operation phases. A LEMP will include the industry-standard controls for landfill construction and development, including traffic, machinery, materials, soils, water, weed, and pollutant management.

The safeguards and management measures detailed in Table 17 are designed to inform the development of a CEMP and minimise impacts on the biodiversity of the Subject land.

Table 21. Safeguards and management measures

Impact	Safeguards and management measures	Timing	Responsibility
• Soils and groundwater contamination • Hazardous and waste materials • Water discharge	The LEMP covers: - Erosion and sediment control stormwater and wastewater management. - Solid waste management.	During construction and operation	Land Manager
• Pest plant and animals	Action should be taken that any priority noxious weeds occurring on the site will not be further dispersed and pest animals controlled. It is recognised that complete eradication of noxious weeds is unlikely as much green waste and external soil receipts are likely to carry the seed or other vegetative material of noxious weeds. Therefore, the following measures should be adopted: - Priority noxious weeds are managed under the <i>Biosecurity Act 2015</i>, priority noxious weeds covered in the LEMP. - Pest animal control is addressed in the LEMP.	During construction and operation	Land Manager
• Native fauna injury, fatality, and displacement	Native fauna and flora must be protected from construction activities to comply with the legislative requirements of the State BC Act and Federal EPBC Act. The following measures should be adopted: - Engaging an environmental consultant to provide detailed advice prior to clearing a new cell.	During construction	Land Manager

	- Establishing controls to prevent works from occurring outside the Subject land. - Engage a suitably qualified ecologist during native vegetation clearing operations to rescue and relocate any native fauna which may be injured or displaced.		
• Odour, gas, noise, vibration, and dust • Landscape and visual amenity	Covering and storage: - Covering the storage face daily to minimise odour and gas emissions. Wetting, filling, and capping roads with road base: - Wetting any unsealed roads and tracks during heavy use or high wind days. - Cap main access roads with compacted rubble.	During construction and operation	Land Manager
• Native flora destruction • Habitat loss	It is expected that all operators consider the implications of native vegetation removal on threatened and non-threatened flora and fauna. A vast quantity of vegetation is likely to be permitted for removal; however, it is unnecessary to remove all permitted vegetation unless it obstructs or impedes the development footprint. The staging of clearing for cell development reduces impacts. Avoiding non-permitted vegetation and engaging in revegetation and rehabilitation can strongly counteract the detrimental effects of habitat loss. Providing an alternative and often necessary location for displaced fauna will mitigate the long-term effects of habitat destruction; measures may include: - Informing and training staff and contractors where destruction of flora is not permitted. - Clearing of native vegetation will conversely include relocation and spreading of logs and dead trees with hollows outside of the development footprint instead of disposal or burning. - Clearing of a cell is undertaken as soon as practicable to needing the cell for landfill. - Rehabilitation with local flora species to match soil type is undertaken as soon as practicable after a cell reaches capacity.	During construction and operation	Land Manager

6.3 Location, Construction, and Operation

6.3.1 Modes and technologies

There is a range of methods and technologies identified in this section that will assist in avoiding and minimising impacts on biodiversity during the establishment and operation of the BLE. Some of these technologies also apply to the whole property, including the existing landfill.

Location

There are no modes or technologies involved with the location of the BLE.

Construction

- Accurate mapping and assessment.
- Strategic approach in determining cell size.
- Identification of habitat trees.
- Relocation of important habitat – logs/fallen trees.
- Care in topsoil management.
- Accurate survey of cells and any other construction works and adherence to boundaries.
- Clarity in the on-ground marking of activity areas.

Operation

- Adherence to the on-ground marking of activity areas.
- Careful timing of key operations involving habitat destruction, revegetation etc.
- Erosion control and dust suppression.
- Monitoring and response.
- Actions and controls to protect wildlife.
- Containment of liquid waste.
- Prevention of off-site movement of solid waste.

6.3.2 Site selection - Alternative locations

Location

The BLE is suitably located to avoid and minimise impacts.

The development site was selected because:

- More than half of the Subject land for the BLE has an existing consent, as described earlier in this report. Logically, this consent is followed through and expanded to meet the community's needs in the long term. Not capitalising on the existing consent would mean the costs already accrued in obtaining that consent would be lost, along with a great deal of data and knowledge and result in a major delay in having a new landfill site approved and operational. The additional costs incurred in abandoning the current location would be significant.
- The BLE extends the footprint of the current landfill, consolidating disturbance to one location instead of creating a separate disturbance at a greenfield site. Clustering land development to one location rather than separating them across more than one site minimises biodiversity impacts.
- Most of the Subject land for the BLE has been heavily disturbed by the existing landfill's past and current operational activities. Furthermore, previous land use of rangeland grazing, loam extraction, and cutting of trees for firewood, fence posts or vine trellising (being so

close to an irrigation district and towns) has significantly reduced the quality of native vegetation.

- There is existing infrastructure already on-site, such as access tracks, site office, staff amenities, machinery sheds, and fencing in place on the property that will serve the BLE, avoid biodiversity impacts, and avoid the cost of constructing/duplicating these features on a greenfield site.
- A high-quality bitumen road runs past the entrance to the current property, which will require upgrading if the BLE proceeds. Alternative sites may require major road upgrades with additional biodiversity impacts and the added cost of road works.
- The BLE is located where there is existing electricity and town water supply infrastructure serving the existing landfill. Therefore, expanding the facility negates the potential impact on biodiversity and increased cost of constructing a new transmission line and water main to a greenfield site that may not have these services close by and is unlikely to have them on-site.
- The BLE is centrally located, being a short distance from the main sources of waste (Gol Gol, Buronga, Dareton, and Wentworth in NSW, and Mildura, Red Cliffs, Irymple, and Merbein in Victoria). The Mildura landfill is likely to close in a few years as it is near capacity with no possibility of expansion at the current location near the city's heart. The BLE is ideally located to receive all forms of waste from Mildura Rural City Council in the near future, minimising the distance for transport, hence reducing cost.
- The BLE location is not in or near a flood zone or wetland, thus avoiding impacts on biodiversity and not needing investment in flood levies and building and maintaining all-weather access roads across a floodplain above flood level.

Construction

There are no construction phase elements involved in site selection for the BLE.

Operation

There are no operation phase elements involved in site selection for the BLE.

6.3.3 Avoid and minimise through proposal design

Location

There are no further proposal design elements associated with the location of the BLE. The presence of existing infrastructure already in place on cleared land will serve the BLE and not need to be built or relocated. This point has been covered in several dot points in Section 6.3.2.

Construction

The design of the BLE consists of 11 substages which are then each divided into three cells, which will be progressively cleared, developed, and rehabilitated over the life of the landfill. This approach will reduce biodiversity impacts both in the short term and longer-term, as only the operational cells will be completely devoid of native vegetation at any one time.

Landfill cells will be rehabilitated in accordance with NSW Solid Waste Landfill Guidelines to provide a suitable surface for revegetation with endemic native trees, shrubs, and grasses. The capping soil will be at least 1.2 m deep and consist of overburden from cell construction, i.e. topsoil (nominally upper 0.2 m) and subsoil (nominally within 2 m of the surface) of the natural soil profile. The vegetation will be selected from species associated with the natural open woodland species, with

the exact species selected dependent on the seed or tube stock available at the time of final capping construction.

In brief, there will be three stages in the life of a cell:

- Clearing native vegetation, removal of topsoil and overburden, placement of liner, leachate collection system, and surface stormwater drains in readiness for receipt of waste.
- Landfill operation until a cell is full – mean life of a cell is estimated to be approximately three years.
- Rehabilitation: including capping with overburden, placement of topsoil, and revegetation.

This will minimise loss of habitat at any one time and allow fauna to relocate closer to adjoining undisturbed and rehabilitated areas when land clearing occurs.

Incorporating a buffer zone along the Arumpo Road boundary avoids visual impacts of the development from the road and provides refuge and connectivity for wildlife when adjacent cells of the same vegetation type are cleared. A buffer zone along the eastern boundary similarly will provide refuge and connectivity for wildlife when cells to the west with similar vegetation types are cleared. Areas of buffer zones being retained have a higher overall vegetation quality than the area to be cleared.

Three leachate storage dams and a stormwater dam planned for the BLE have been sited to minimise impacts on native vegetation. The areas selected have almost no overstorey trees, and the understorey is of poor quality, dominated by weeds and bare ground. Stormwater ponds have also been sited to avoid and minimise impacts on native vegetation, i.e. by utilising previously disturbed sites where possible (current landfill footprint or footprint of previous soil extraction).

For the clearing operation and related works, a range of measures/actions should be adopted to avoid or minimise impacts on wildlife as follows:

- The cell boundary (area to be cleared) should be surveyed and marked with labelled white pegs, only the target area cleared.
- Clearing of native vegetation should not occur in Spring to avoid breeding time for most bird species.
- Before clearing overstorey, trees should be inspected by a suitably qualified expert to determine which trees have a high habitat value; such trees identified should be marked “H” with white paint on the trunk at chest height.
- During the removal of habitat trees, a suitably qualified expert must be present to rescue and relocate displaced wildlife or convey injured wildlife to a suitable carer or veterinary surgery.
- Logs and trees (live and dead) with hollows as determined and marked by a suitably qualified expert should be carefully relocated to the adjoining rehabilitation area or nearest buffer zone and conserved to provide habitat for reptiles displaced during the clearing operation.
- The boundary between a buffer zone and any adjoining cell being developed should be delineated with a temporary fence consisting of steel star posts and bunting. This fence should remain in place during the cell's life and remain until the rehabilitation earthworks are completed.

- During construction, any trenches left open overnight should be inspected for entrapped wildlife and action is taken to relocate them.
- Any pipelines or conduits being installed should be sealed off overnight to ensure wildlife does not enter and become trapped.
- Any lengths of pipes or conduits in stockpiles or laid out on the ground (power, water, or drainage) should be inspected before placement to ensure wildlife is not present.
- Any new access tracks being constructed through non-cleared areas should be outside the dripline of overstorey trees.
- Topsoil must be removed from the entire cell area after clearing and transferred directly to a cell being rehabilitated. If topsoil is being stored, it should be placed in an area away from the clearing, with the stockpile having a 2V:1H batter and a maximum height of 1.5 m. If storage of overburden and topsoil is required, it should be at locations not deemed to be native vegetation.

Operation

For rehabilitation, a range of measures/actions/technologies should be adopted to minimise impacts on flora and fauna as follows:

- Care should be taken to ensure that overburden does not contaminate topsoil during removal, storage, and placement.
- The best timing of the earthworks involved in removing, storage and placement of overburden and topsoil is between January and April, which would precede revegetation works in May. These timelines would minimise the length of time for exposing bare, freshly placed soil to erosion by wind and water. The batter slopes around the perimeter of a cell undergoing rehabilitation should be as specified in the guidelines.
- A rehabilitation plan including revegetation is outlined in the next few points. The proponent is advised to seek a suitably qualified expert in the year before the first round of rehabilitation to expand this outline and provide advice.
- The proponent should consider using light contour ripping and applying surface stabilisers, e.g. polymers, organic mulches, or a cover crop (rye corn) to temporarily stabilise a cell undergoing rehabilitation. The establishment of the naturally occurring native vegetation such as PCT 15 and PCT 58 (as mapped in this report) should follow local provenance seed/seedlings. Method to be used could be either direct seeding, planting of tube stock, or a combination of both. It is suggested that tree guards be used for tube stock unless effective rabbit control has been undertaken. A target density that is consistent with the relevant PCT benchmark is considered reasonable for a revegetation area. In all but the wettest years, planted tube stock will require several water applications to each planted seedling during the first year of establishment.
- Just before planting, the need for weed control or the use of weed mats should be assessed. This need is unlikely but should be considered.
- It is noted that for direct seeding, not all seeds will germinate in the first year.
- Placement of logs/hollow trees on a rehabilitation area to be stored during the clearing of the adjacent cell should occur on completion of the capping with overburden and topsoil, but before revegetation commences.
- A revegetated area should be monitored in the Spring of the year of planting, and if considered a failure (number of plants are well below the target density) due to drought, rabbits, locust plague etc., then replanting should occur in late Autumn of the next year.

- Rabbits should be monitored and controlled, taking advice from Western Local Lands Services or a suitably qualified expert, before any rehabilitation works commence and then be routinely monitored (and controlled if necessary) for the entire property.

6.3.4 Other site constraints

Location

There are no other site constraints involved in the location of the BLE.

Construction

There are no construction phase elements involving other site constraints.

Operation

Controls should be put in place to ensure indiscriminate dumping of waste and random earthworks do not occur, particularly for the buffer zones, as this may create a rabbit/fox/feral cat harbour. Aside from potential pest animal harbour, the presence of heaps of soil and waste materials, particularly hard rubbish and plastic, in the buffer zone is not consistent with the notion of increasing/protecting the biodiversity value of these areas *per se*.

Another constraint (risk) in having much of the BLE adjacent to a buffer zone is wildfire. A fire could originate from three locations:

- Outside the property, particularly from Arumpo Road.
- The buffer zone – lightning strike.
- An active cell or other location in the BLE due to dumping of smouldering rubbish, machinery malfunction, or any common fire causation.

The ingress of wildfire to the landfill area and surroundings will have a high impact on biodiversity and the operation of the landfill. Maintenance of firebreaks is one possible method of reducing this risk. Fire management has been addressed in a separate report by others.

Site constraints that need to be addressed to minimise biodiversity impacts during construction and operation of the landfill are:

- Each winter, the property should be monitored for infestations of priority noxious weeds. This BDAR identifies four weeds in this category (Wheel Cactus, Prickly Pear, Bridal Creeper, and African Boxthorn). These weeds should be tackled at low density, as they can readily invade undisturbed areas of mature native vegetation. If any of these invasive weeds are detected, they should be controlled by physical removal if small or treatment with a registered herbicide if large. If present, these weeds will spread slowly through the property; birds and foxes eat the fruit and transport and disperse the seed.
- Domestic livestock and feral goats may be present; they should be excluded from the property.
- Firewood collection should be prohibited in buffer zones but could remove woody debris from clearing a cell after hollow trees and logs have been relocated and conserved for wildlife habitat.
- Prohibiting non-essential traffic from the non-operational parts of the BLE, particularly the buffer zones.

6.4 Prescribed impacts

The BC Regulations (Clause 6.1) identifies prescribed actions as ‘impacts on biodiversity values’ under the biodiversity offset scheme. The following listed impacts are relevant to the BLE:

- The impacts of development on ... habitat of threatened species or ecological communities – human-made structures.
- The impacts of development on ... habitat of threatened species or ecological communities – non-native vegetation.
- The impacts of development on the connectivity of different areas of habitat of threatened species that facilitates the movement of those species across their range.
- The impacts of development on the movement of threatened species that maintains their lifecycle.
- The impact of vehicle strikes on threatened species of animals or on animals that are part of a threatened ecological community.

6.4.1 Structures

There are no identified human-made structures that exist or are subject to be cleared during the construction of the BLE.

6.4.2 Non-native vegetation

The BLE will impact up to 22.05 ha of highly disturbed exotic groundcover vegetation. No identified threatened species are likely to forage or inhabit the sparse and heavily disturbed exotic vegetation within the Subject land.

Several non-threatened bird species are commonly present in the existing Buronga landfill (Table 18) due to the facility operating as a waste and resource management facility; however, the BLE is not expected to disturb the foraging of these species; contrastingly, the BLE is anticipated to increase fauna foraging.

Table 22. Non-Threatened species observations

Scientific name	Common name
<i>Pelecanus conspicillatus</i>	Australian Pelican
<i>Threskiornis moluccus</i>	Australian White Ibis
<i>Vanellus miles</i> subsp. <i>novaeollandiae</i>	Black-shouldered Lapwing (Masked Lapwing)
<i>Ocyphaps lophotes</i>	Crested Pigeon
<i>Eolophus roseicapilla</i>	Galah
<i>Columba livia</i>	Rock Dove
<i>Chroicocephalus novaeollandiae</i>	Silver Gull

All observations were made on 29 March 2021.

6.4.3 Vegetation corridors

The subject land is located within a much larger body of native vegetation; contiguous vegetation spans the north, south, and eastern perimeter. The BLE is expected to clear all native vegetation within the Subject land progressively.

The habitat within the Subject land is not likely to impact significantly important corridors for any assessed threatened species. In addition, the BLE would not impact the connectivity of habitats for threatened species that can move through the Subject land due to the highly intact buffer zone and extended landscape.

6.4.4 Threatened species movement

Due to the progressive use and rehabilitation intended in the BLE, the edge effect of clearing is not likely to cause any significant impacts on the health and life cycles of threatened species; furthermore, progressive rehabilitation is likely to reduce habitat fragmentation and unlikely to lead to long-term decreases in local threatened populations.

6.4.5 Vehicles

The BLE is not likely to increase vehicle strikes on threatened species, although there will be a potential increase in traffic due to increasing operations and access. The frequent change of vehicle access routes over the BLEs life will be limited to a single landfill cell except for transition periods where two cells will temporarily be active.

The traffic accessing the waste and resource management facility will have a limited speed for travelling, inherently limiting the frequency and likelihood of collisions. Furthermore, there are no additional vehicle entrances along Arumpo Road outlined in the BLE, which does not increase the likelihood of vehicle strikes. An emergency access gate for light vehicles has been requested in the north-eastern corner of the property; however, it will be locked and rarely used.

Any increase in vehicle strikes on native fauna resulting from the BLE will be negligible.

7 Impact summary

7.1 Identification and assessment of entities at risk of SAI

An impact is an SAI if it is likely to contribute significantly to the risk of a threatened species or ecological community identified as at risk of SAI. Threatened species and ecological communities (entities) at risk of SAI are listed by the NSW Government and identified on the DPIE website, on the Threatened Biodiversity Data Collection (TBDC) database and by the BAM-C. One candidate species credit species, Thyme Rice-Flower (*Pimelea serpyllifolia subsp. serpyllifolia*), is identified as an SAI entity. However, the targeted, threatened species surveys conducted in October of 2021 did not identify this species or show any presence within the development site. As a result, it has been identified that there are no entities at risk of SAI on the site.

7.2 Impacts requiring offsets

The development impacts requiring offsets for native vegetation impacts are outlined in Table 19. The development impacts requiring offsets for threatened species and threatened species habitat are outlined in Table 20.

Table 23. Native vegetation impacts requiring offset

PCT ID	PCT Name	Vegetation Class	Vegetation Formation	Direct impact (ha)
PCT 15	Black Box open woodland wetland with chenopod understory mainly on the outer floodplains in south-western NSW (Mainly Riverina Bioregion and Murray Darling Depression Bioregion)	Inland floodplain woodlands (PCT 15)	Semi-arid woodlands (Grassy sub-formation)	19.76
PCT 58	Black Oak – Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion	Semi-arid sand plain woodlands (PCT 58 & 252)	Semi-arid woodlands (Grassy sub-formation)	10.50
PCT 170	Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones	Sand plain mallee woodlands (PCT 170)	Semi-arid woodlands (Grassy sub-formation)	4.54

7.2.1 Impacts on native vegetation

The development impacts within the subject area on the allocated vegetation zones require offsetting due to their area and vegetation integrity scores. The ecosystem credit requirements have been calculated using the floristic survey data and are listed in Table 21 (inside the existing consent area) and Table 22 (outside the consent area).

Table 24. Ecosystem credits for plant community types - Case 00024930 (inside existing consent area)

Vegetation zone	Vegetation zone name	Area (ha)*	Current vegetation integrity score	Future vegetation integrity score	Credits required	BAM case NO.
1	15_Zone_1_CA	0.6	53.8	N/A	14	00024930
3	58_Zone_3_CA	7.0	57.5	N/A	74	
4	58_Zone_4_CA	3.4	35.8	N/A	60	
5	170_Zone_5_CA	4.5	49.5	N/A	83	
Total credit requirements for Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)					14	00024930
Total credit requirements for Black Oak – Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion					134	
Total credit requirements for Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones					83	

* Numbers have been rounded

Table 25. Ecosystem credits for plant community types - Case 00025590 (outside existing consent area)

Vegetation zone	Vegetation zone name	Area (ha)*	Current vegetation integrity score	Future vegetation integrity score	Credits required	BAM case NO.
1	15_Zone_1_Outside_CA	19.2	57.1	N/A	479	00025590
4	58_Zone_4_Outside_CA	0.1	40.8	N/A	2	
5	170_Zone_5_Outside_CA	0.05	49.5	N/A	1	
6	252_Zone_6_Outside_CA	1.7	14.2	N/A	0	
Total credit requirements for Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)					479	00025590
Total credit requirements for Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion					2	
Total credit requirements for Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones					1	
Total credit requirements for Sugarwood open woodland of the inland plains (mainly Murray Darling Depression Bioregion)					0	

* Numbers have been rounded

7.2.2 Impacts on credit species

Targeted surveys were conducted in October of 2021. The results of the Targeted Surveys identified that no species requiring further assessment were present within the development footprint. The credit requirements for the targeted, threatened species is described in Table 23 and Table 24.

Table 26. Species credit requirements - Case 00024930 (inside existing consent area)

Species Name	Vegetation zones	Current vegetation integrity score	Area (ha)/Count (no. individuals)	Biodiversity risk weight	Credits required	BAM case NO.
<i>Austrostipa metatoris</i> A spear-grass	15_Zone_1_CA	57.1	0	2	0	00024930
	58_Zone_3_CA	24.2	0	2	0	
	58_Zone_4_CA	40.8	0	2	0	
	170_Zone_5_CA	49.5	0	2	0	
Total credit requirements for <i>Austrostipa metatoris</i>					0	
<i>Burhinus grallarius</i> Bush Stone-curlew	15_Zone_1_CA	57.1	0	2	0	00024930
	58_Zone_3_CA	24.2	0	2	0	
	58_Zone_4_CA	40.8	0	2	0	
	170_Zone_5_CA	49.5	0	2	0	
Total credit requirements for <i>Burhinus grallarius</i>					0	
<i>Eucalyptus leucoxylon</i> subsp. <i>pruinosa</i> Yellow Gum	15_Zone_1_CA	57.1	0	2	0	00024930
	58_Zone_3_CA	24.2	0	2	0	
	58_Zone_4_CA	40.8	0	2	0	
	170_Zone_5_CA	49.5	0	2	0	
Total credit requirements for <i>Eucalyptus leucoxylon</i> subsp. <i>pruinosa</i>					0	
<i>Hieraetus morphnoides</i> Little Eagle	15_Zone_1_CA	57.1	0	1.5	0	00024930
	58_Zone_3_CA	24.2	0	1.5	0	
	58_Zone_4_CA	40.8	0	1.5	0	
	170_Zone_5_CA	49.5	0	1.5	0	
Total credit requirements for <i>Hieraetus morphnoides</i>					0	
<i>Lophochroa leadbeateri</i> Major Mitchell's Cockatoo	15_Zone_1_CA	57.1	0	2	0	00024930
	58_Zone_3_CA	24.2	0	2	0	
	58_Zone_4_CA	40.8	0	2	0	
	170_Zone_5_CA	49.5	0	2	0	
Total credit requirements for <i>Lophochroa leadbeateri</i>					0	
<i>Lophoictinia isura</i> Square-tailed Kite	15_Zone_1_CA	57.1	0	1.5	0	00024930
	58_Zone_3_CA	24.2	0	1.5	0	
	58_Zone_4_CA	40.8	0	1.5	0	
	170_Zone_5_CA	49.5	0	1.5	0	
Total credit requirements for <i>Lophoictinia isura</i>					0	
<i>Ninox connivens</i> Barking Owl	15_Zone_1_CA	57.1	0	2	0	00024930
	58_Zone_3_CA	24.2	0	2	0	
	58_Zone_4_CA	40.8	0	2	0	
	170_Zone_5_CA	49.5	0	2	0	
Total credit requirements for <i>Ninox connivens</i>					0	
<i>Pimelea serpyllifolia</i> subsp. <i>serpyllifolia</i> Thyme Rice-Flower	15_Zone_1_CA	57.1	0	3	0	00024930
	58_Zone_3_CA	24.2	0	3	0	
	58_Zone_4_CA	40.8	0	3	0	
	170_Zone_5_CA	49.5	0	3	0	
Total credit requirements for <i>Pimelea serpyllifolia</i> subsp. <i>serpyllifolia</i>					0	

* E = Ecosystem Credit Species, S = Species Credit Species

Table 27. Species credit requirements - Case 00025590 (outside existing consent area)

Species Name	Vegetation zones	Current vegetation integrity score	Area (ha)/Count (no. individuals)	Biodiversity risk weight	Credits required	BAM case NO.
<i>Austrostipa metatoris</i> A spear-grass	15_Zone_1_Outside_CA	57.1	0	2	0	00025590
	58_Zone_4_Outside_CA	40.8	0	2	0	
	170_Zone_5_Outside_CA	49.5	0	2	0	
	252_Zone_6_Outside_CA	14.2	0	2	0	
Total credit requirements for <i>Austrostipa metatoris</i>					0	
<i>Burhinus grallarius</i> Bush Stone-curlew	15_Zone_1_Outside_CA	57.1	0	2	0	00025590
	58_Zone_4_Outside_CA	40.8	0	2	0	
	170_Zone_5_Outside_CA	49.5	0	2	0	
	252_Zone_6_Outside_CA	14.2	0	2	0	
Total credit requirements for <i>Burhinus grallarius</i>					0	
<i>Eucalyptus leucoxylon</i> subsp. <i>pruinosa</i> Yellow Gum	15_Zone_1_Outside_CA	57.1	0	2	0	00025590
	58_Zone_4_Outside_CA	40.8	0	2	0	
	170_Zone_5_Outside_CA	49.5	0	2	0	
	252_Zone_6_Outside_CA	14.2	0	2	0	
Total credit requirements for <i>Eucalyptus leucoxylon</i> subsp. <i>pruinosa</i>					0	
<i>Hieraetus morphnoides</i> Little Eagle	15_Zone_1_Outside_CA	57.1	0	1.5	0	00025590
	58_Zone_4_Outside_CA	40.8	0	1.5	0	
	170_Zone_5_Outside_CA	49.5	0	1.5	0	
	252_Zone_6_Outside_CA	14.2	0	1.5	0	
Total credit requirements for <i>Hieraetus morphnoides</i>					0	
<i>Lophochroa leadbeateri</i> Major Mitchell's Cockatoo	15_Zone_1_Outside_CA	57.1	0	2	0	00025590
	58_Zone_4_Outside_CA	40.8	0	2	0	
	170_Zone_5_Outside_CA	49.5	0	2	0	
	252_Zone_6_Outside_CA	14.2	0	2	0	
Total credit requirements for <i>Lophochroa leadbeateri</i>					0	
<i>Lophoictinia isura</i> Square-tailed Kite	15_Zone_1_Outside_CA	57.1	0	1.5	0	00025590
	58_Zone_4_Outside_CA	40.8	0	1.5	0	
	170_Zone_5_Outside_CA	49.5	0	1.5	0	
	252_Zone_6_Outside_CA	14.2	0	1.5	0	
Total credit requirements for <i>Lophoictinia isura</i>					0	
<i>Ninox connivens</i> Barking Owl	15_Zone_1_Outside_CA	57.1	0	2	0	00025590
	58_Zone_4_Outside_CA	40.8	0	2	0	
	170_Zone_5_Outside_CA	49.5	0	2	0	
	252_Zone_6_Outside_CA	14.2	0	2	0	
Total credit requirements for <i>Ninox connivens</i>					0	
<i>Pimelea serpyllifolia</i> subsp. <i>serpyllifolia</i> Thyme Rice-Flower	15_Zone_1_Outside_CA	57.1	0	3	0	00025590
	58_Zone_4_Outside_CA	40.8	0	3	0	
	170_Zone_5_Outside_CA	49.5	0	3	0	
	252_Zone_6_Outside_CA	14.2	0	3	0	
Total credit requirements for <i>Pimelea serpyllifolia</i> subsp. <i>serpyllifolia</i>					0	

* E = Ecosystem Credit Species, S = Species Credit Species

7.3 Impacts not requiring offset

PCT 252 (Zone 6) does not require an offset as the vegetation integrity was not ≥ 20 (where a PCT does not represent a TEC) as per 9.2.1 of the BAM. The development impacts not requiring an offset for native vegetation impacts are outlined in Table 25. The development impacts not requiring offset for threatened species and threatened species habitat are outlined in Table 26.

Table 28. Native vegetation impacts not requiring an offset

PCT ID	PCT Name	Vegetation Class	Vegetation Formation	Direct impact (ha)
PCT 252	Sugarwood open woodland of the inland plains mainly Murray Darling Depression Bioregion	Semi-arid sand plain woodlands (PCT 58 & 252)	Semi-arid woodlands (Grassy sub-formation)	1.70

7.4 Areas not requiring assessment

There has been historic clearing of native vegetation and preliminary development of a waste and resource management facility within the development site. In addition, a zone directly north of the preliminary development (within the Subject land) has been assessed as historic clearing and regrowth that is Category 1 exempt land as per Part 60H (1) of the *Local Land Services Act 2013*. Therefore, these areas do not require assessment for ecosystem credits.

8 References

Green Edge Environmental (2016), Statement of Environmental Effects, Borrow Pits for Buronga Landfill Cover, Buronga Landfill for Wentworth Shire Council

NSW OEH's Biodiversity Assessment Method (BAM) calculator

www.lmbc.nsw.gov.au/bamcalc.

NSW OEH's BioNet threatened biodiversity database

www.bionet.nsw.gov.au/.

OEH Threatened Species Profiles

www.environment.nsw.gov.au/threatenedSpeciesApp/

OEH BioNet Vegetation Classification Database (OEH 2017)

www.environment.nsw.gov.au/NSWVCA20PRapp/default.aspx

OEH BioNet VIS Mapping

www.environment.nsw.gov.au/research/VISmap.html

Office of Environment and Heritage (OEH) (2021).

Biodiversity Assessment Method

NSW Government SEED Mapping

geo.seed.nsw.gov.au/Public_Viewer/index.html?viewer=Public_Viewer&locale=en-AU

SW Biodiversity Values Map

www.lmbc.nsw.gov.au/Maps/index.html?viewer=BVMap

Environment Protection and Biodiversity Conservation Act 1999

http://classic.austlii.edu.au/au/legis/cth/consol_act/epabca1999588

Environmental Planning and Assessment Act 1979

http://classic.austlii.edu.au/au/legis/nsw/consol_act/epaaa1979389/

Biodiversity Conservation Act 2016

http://classic.austlii.edu.au/au/legis/nsw/consol_act/bca2016309/

Local Land Services Act 2013

http://classic.austlii.edu.au/au/legis/nsw/consol_act/lisa2013178/

Wentworth Local Environmental Plan

http://classic.austlii.edu.au/au/legis/nsw/consol_reg/wlep2011363/

ISO 31000 Risk Management

<https://www.iso.org/iso-31000-risk-management.html>

Atlas of Living Australia (ALA)

<https://www.ala.org.au/>

9 Appendices

Appendix A: EPBC Protected Matters Search Tool – 10 km Buffer



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: 22/06/21 09:27:57

[Summary](#)

[Details](#)

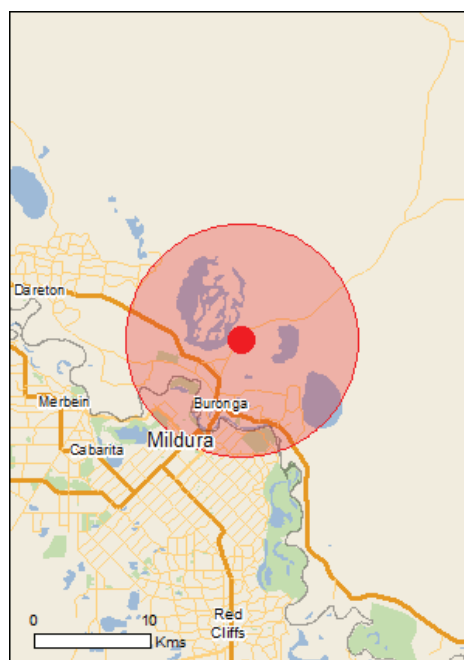
[Matters of NES](#)

[Other Matters Protected by the EPBC Act](#)

[Extra Information](#)

[Caveat](#)

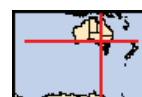
[Acknowledgements](#)



This map may contain data which are
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[Coordinates](#)

Buffer: 10.0Km



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:	3
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	6
Listed Threatened Species:	25
Listed Migratory Species:	15

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:	2
Commonwealth Heritage Places:	None
Listed Marine Species:	24
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:	2
Regional Forest Agreements:	None
Invasive Species:	28
Nationally Important Wetlands:	1
Key Ecological Features (Marine)	None

Details

Matters of National Environmental Significance

Wetlands of International Importance (Ramsar)		[Resource Information]
Name	Proximity	
Banrock station wetland complex	150 - 200km upstream	
Riverland	100 - 150km upstream	
The coorong, and lakes alexandrina and albert wetland	200 - 300km 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
Buloke Woodlands of the Riverina and Murray-Darling Depression Bioregions	Endangered	Community may occur within area
Buloke Woodlands of the Riverina and Murray-Darling Depression Bioregions	Endangered	Community may occur within area
Buloke Woodlands of the Riverina and Murray-Darling Depression Bioregions	Endangered	Community may occur within area
River Murray and associated wetlands, floodplains and groundwater systems, from the junction with the Darling River to the sea	Approval Disallowed	Community may occur within area
River Murray and associated wetlands, floodplains and groundwater systems, from the junction with the Darling River to the sea	Approval Disallowed	Community may occur within area
River Murray and associated wetlands, floodplains and groundwater systems, from the junction with the Darling River to the sea	Approval Disallowed	Community may occur within area

Listed Threatened Species [Resource Information]

Name	Status	Type of Presence
Birds		
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat known to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat likely to occur within area
Grantiella picta Painted Honeyeater [470]	Vulnerable	Species or species habitat known to occur within area
Leipoa ocellata Malleefowl [934]	Vulnerable	Species or species habitat likely to occur within area
Limosa lapponica baueri Nunivak Bar-tailed Godwit, Western Alaskan Bar-tailed Godwit [86380]	Vulnerable	Species or species habitat may occur within area
Manorina melanotis Black-eared Miner [449]	Endangered	Species or species

Name	Status	Type of Presence
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	habitat may occur within area Species or species habitat may occur within area
Pedionomus torquatus Plains-wanderer [906]	Critically Endangered	Species or species habitat may occur within area
Pezoporus occidentalis Night Parrot [59350]	Endangered	Extinct within area
Polytelis anthopeplus monarchoides Regent Parrot (eastern) [59612]	Vulnerable	Species or species habitat likely to occur within area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat known to occur within area
Fish		
Bidyanus bidyanus Silver Perch, Bidyan [76155]	Critically Endangered	Species or species habitat known to occur within area
Craterocephalus fluviatilis Murray Hardyhead [56791]	Endangered	Species or species habitat likely to occur within area
Galaxias rostratus Flathead Galaxias, Beaked Minnow, Flat-headed Galaxias, Flat-headed Jollytail, Flat-headed Minnow [84745]	Critically Endangered	Species or species habitat likely to occur within area
Maccullochella macquariensis Trout Cod [26171]	Endangered	Species or species habitat may occur within area
Maccullochella peelii Murray Cod [66633]	Vulnerable	Species or species habitat known to occur within area
Macquaria australasica Macquarie Perch [66632]	Endangered	Species or species habitat may occur within area
Frogs		
Litoria raniformis Growling Grass Frog, Southern Bell Frog, Green and Golden Frog, Warty Swamp Frog, Golden Bell Frog [1828]	Vulnerable	Species or species habitat known to occur within area
Mammals		
Nyctophilus corbeni Corben's Long-eared Bat, South-eastern Long-eared Bat [83395]	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 may occur within area
Plants		
Lepidium monoplacoides Winged Pepper-cress [9190]	Endangered	Species or species habitat may occur within area
Solanum karsense Menindee Nightshade [7776]	Vulnerable	Species or species habitat may occur within area
Swainsona murrayana Slender Darling-pea, Slender Swainson, Murray Swainson-pea [6765]	Vulnerable	Species or species habitat likely to occur within area

Name	Status	Type of Presence
Swainsona pyrophila Yellow Swainson-pea [56344]	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

Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area
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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 known to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
Calidris ruficollis Red-necked Stint [860]		Species or species habitat known to occur within area
Charadrius bicinctus Double-banded Plover [895]		Species or species habitat known to occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat may occur within area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area
Limosa limosa Black-tailed Godwit [845]		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
Tringa glareola Wood Sandpiper [829]		Species or species habitat known to occur within area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat known to occur within area
Tringa stagnatilis Marsh Sandpiper, Little Greenshank [833]		Species or species habitat known to 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
Defence - KAIRIVU BARRACKS - MILDURA

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
Ardea ibis Cattle Egret [59542]		Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat known to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
Calidris ruficollis Red-necked Stint [860]		Species or species habitat known to occur within area
Charadrius bicinctus Double-banded Plover [895]		Species or species habitat known to occur within area
Charadrius ruficapillus Red-capped Plover [881]		Species or species habitat known to occur within area
Chrysococcyx osculans Black-eared Cuckoo [705]		Species or species habitat known 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 known to occur within area
Himantopus himantopus Pied Stilt, Black-winged Stilt [870]		Species or species habitat known to occur within area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur

Name	Threatened	Type of Presence
Limosa limosa Black-tailed Godwit [845]		within area Species or species habitat known to occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area
Motacilla flava Yellow Wagtail [644]		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
Recurvirostra novaehollandiae Red-necked Avocet [871]		Species or species habitat known to occur within area
Rostratula benghalensis (sensu lato) Painted Snipe [889]	Endangered*	Species or species habitat known to occur within area
Stiltia isabella Australian Pratincole [818]		Species or species habitat known to occur within area
Tringa glareola Wood Sandpiper [829]		Species or species habitat known to occur within area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat known to occur within area
Tringa stagnatilis Marsh Sandpiper, Little Greenshank [833]		Species or species habitat known to occur within area

Extra Information

State and Territory Reserves	[Resource Information]
Name	State
Kings Billabong Park	VIC
River Murray Reserve	VIC

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 Resources Audit, 2001.	

Name	Status	Type of Presence
Birds		
Acridotheres tristis Common Myna, Indian Myna [387]		Species or species habitat likely to occur within area

Name	Status	Type of Presence
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
Sturnus vulgaris Common Starling [389]		Species or species habitat likely to occur within area
Turdus merula Common Blackbird, Eurasian Blackbird [596]		Species or species habitat likely to occur within area
Mammals		
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
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		
Asparagus asparagoides Bridal Creeper, Bridal Veil Creeper, Smilax, Florist's Smilax, Smilax Asparagus [22473]		Species or species habitat likely to occur within area
Cabomba caroliniana Cabomba, Fanwort, Carolina Watershield, Fish Grass, Washington Grass, Watershield, Carolina Fanwort, Common Cabomba [5171]		Species or species habitat may occur within area
Carrichtera annua Ward's Weed [9511]		Species or species habitat may occur within

Name	Status	Type of Presence
Chrysanthemoides monilifera Bitou Bush, Boneseed [18983]		area Species or species habitat may occur within area
Chrysanthemoides monilifera subsp. monilifera Boneseed [16905]		Species or species habitat likely to occur within area
Cylindropuntia spp. Prickly Pears [85131]		Species or species habitat likely to occur within area
Eichhornia crassipes Water Hyacinth, Water Orchid, Nile Lily [13466]		Species or species habitat likely to occur within area
Lycium ferocissimum African Boxthorn, Boxthorn [19235]		Species or species habitat likely to occur within area
Olea europaea Olive, Common Olive [9160]		Species or species habitat may occur within area
Opuntia spp. Prickly Pears [82753]		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
Solanum elaeagnifolium Silver Nightshade, Silver-leaved Nightshade, White Horse Nettle, Silver-leaf Nightshade, Tomato Weed, White Nightshade, Bull-nettle, Prairie-berry, Satansbos, Silver-leaf Bitter-apple, Silverleaf-nettle, Trompillo [12323]		Species or species habitat likely to occur within area

Nationally Important Wetlands		[Resource Information]
Name		State
Kings Billabong Wetlands		VIC

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

-34.12638 142.19865

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.

Appendix B: Previous Development Consent



Wentworth Shire Council

26-28 Adelaide Street WENTWORTH NSW 2648
PO Box 81 WENTWORTH NSW 2648

Our Reference: HH:DOC/17/1166
Your Reference: DA15/134
Contact: Health & Planning Division
Phone: 03 5027 5027
Date: 24 January 2017

Mr Peter Kozlowski
Wentworth Shire Council
PO Box 81
WENTWORTH NSW 2648

Email: council@wentworth.nsw.gov.au

Dear Peter

DA15/134 BURONGA LANDFILL BORROW PIT / PITS ARUMPO ROAD LOT 1 DP 1037845 WENTWORTH

I refer to your development application regarding the above mentioned property. Development consent has now been granted subject to conditions. Please read the attached notice of determination and conditions contained within schedule 1 carefully to ensure your obligations in regard to this consent are adhered to.

If you require any further information please contact the Health & Planning Division on Tel: (03) 5027 5027.

Yours faithfully

KEN ROSS
DIRECTOR HEALTH & PLANNING
ATTACHMENT



Health & Planning Division
26- 28 Adelaide Street
Po Box 81
WENTWORTH NSW 2648
Tel: 03 5027 5027
council@wentworth.nsw.gov.au

Notice of Determination of a Development Application

issued under the *Environmental Planning and Assessment Act 1979*
Section 81(1)(a)

Our Ref:	DOC/17/1166
Development application no:	DA15/134
Applicant name:	Wentworth Shire Council
Applicant address:	PO Box 81 WENTWORTH NSW 2648
Owner name:	Wentworth Shire Council
Owner address:	PO Box 81 WENTWORTH NSW 2648
Land to be developed:	Arumpo Road Lot 1 DP 1037845 Wentworth
Type of approved development:	Buronga Landfill Borrow Pits
Determination:	In accordance with Section 80 of the EP&A Act 1979 your application has been granted subject to conditions.
Conditions of granting consent and reasons	The conditions imposed on the consent in accordance with Section 80A of the EP&A Act 1979 and the reason for imposition of those conditions are attached as Schedule 1.
Review of determination	Section 82A of the EP&A Act 1979 provides that the applicant may request Council review a condition(s) of the development consent. Any such request for a review of the determination by Council must be lodged with Council within six (6) months (as provided by Sec 97 of the Act)
Right of appeal of determination:	An applicant who is dissatisfied with the determination of their development application (including a determination on a review under Section 82A) may appeal to the Land and Environment Court within 6 months after; a) the date on which the applicant receives this notice of determination or review, or b) the date on which the application is taken to have been determined. (refer to Sec 97 of the EP&A Act).
Date of determination:	24 January 2017
Date from which consent operates:	24 January 2017 <i>Note - If granted subject to a condition that the consent is not to operate until the applicant satisfies a consent authority with respect to a particular condition then the date from which the determination operates must not be endorsed on the application until that condition has been satisfied.</i>

Date on which consent lapses: 23/01/2022 at midnight
(refer to Sec 95 and 95A of the EP&A Act)

Building Code of Australia building classification Nil

Details of any review by Planning Assessment Commission N/A

Integrated development N/A
approval bodies that have given general terms of approval in relation to the development as per section 93 of the EP&A Act

Rights of appeal of objectors N/A

Other approvals N/A
List Local Government Act 1993 approvals granted under S 78A(5)

Signed **KEN ROSS**
DIRECTOR HEALTH & PLANNING
under delegation on behalf of the Shire of Wentworth

Date 24 January 2017

Note 1 *If there is any discrepancy between the approved plan attached to this determination and the conditions in Schedule No 1 to this determination, then the conditions override the plan. All conditions listed in Schedule No 1 must be complied with to comply with this consent*

Note 2 *Schedule 2 contains advisory notes which assists in compliance with conditions listed on Schedule 1.*

Note 3 *This approval relates to development consent only and before any building, demolition or subdivision works are carried out a construction certificate must be obtained.*

SCHEDULE 1

PRESCRIBED CONDITIONS

1.	The Proponent shall comply with the prescribed conditions of approval under Clause 98 of the Environmental Planning and Assessment Regulation 2000, in relation to the requirements of the Building Code of Australia.
2.	A sign must be erected in a prominent position on any site on which building work, subdivision work or demolition work is being carried out: (i) Showing the name, address and telephone number of the principal certifying authority for the work, and (ii) Showing the name of principal contractor (if any) for any building work and a telephone number on which that person may be contacted outside working hours, and (iii) Stating that unauthorized entry to the work site is prohibited.

GENERAL CONDITIONS

3.	The development hereby authorised shall be carried out strictly in accordance with the conditions of this approval and stamped approved documents listed below • Locality & Zoning Map by Aurecon • Conceptual Site Plan by Geolyse 214455 01C_E01 Dated 14 July 2015 • Review of Environmental Factors - Vegetation Removal Map by Ece Tunali Page 14 of 17 • Statement of Environmental Effects by Greenedge Environmental W1602 Dated 23 June 2016 NOTE: Where there is inconsistency between the Environmental Impact Statement and these conditions, the conditions of this approval shall apply.
4.	Approval is for the quarrying and extraction of material for landfill covering.
5.	Without the further consent of the Wentworth Shire Council, in writing, this permit shall lapse and have no force or effect unless the use or development hereby permitted is substantially commenced within 5 years of the date of this permit.
6.	To ensure Aboriginal objects identified in the Aboriginal Cultural Heritage Assessment are not harmed during the construction of the proposal, an Aboriginal Heritage Impact Permit (AHIP) in accordance with Part 6 of the National Parks and Wildlife Act 1974 will need to be obtained from the Office of Environment and Heritage. Works must not commence until the AHIP is sought and granted. The AHIP application must be accompanied by appropriate documentation and mapping as outlined on page 6 of Applying for an Aboriginal Heritage Impact Permit, Guide for Applicants (OEH 2011). Consultation with the Aboriginal community undertaken as part of an AHIP application must be in accordance with the Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010. All works undertaken must be in accordance with the conditions of the AHIP.
7.	If any Aboriginal object is discovered and/or harmed in, on or under the land, the proponent must:

	a) not further harm the Aboriginal object b) immediately cease all work at the particular location c) secure the area so as to avoid further harm to the Aboriginal object d) notify the Office of Environment and Heritage (OEH) as soon as practicable on 131555, providing any details of the Aboriginal object and its location, and e) not recommence any work at the particular location unless authorised in writing by OEH.
8.	No removal of gravel and fill or disturbance of vegetation outside of the designated work area will be permitted without the written approval of the Wentworth Shire Council.
9.	Operations within the worksite shall be carried out in accordance with the requirements of the NSW Workcover Code of Practice for excavation work.
10.	Quarrying and ancillary activities must be carried out in a manner that will minimise emissions of dust from the site.
11.	The beneficiary of this consent must ensure that any plant and equipment used on site, or in connection with the project is: a) Maintained in a proper and efficient condition; and b) Operated in a proper and efficient manner.
12.	1) A sign must be erected in a prominent position on any work site on which work involved in the erection or demolition of a building is being carried out: a) Stating that unauthorised entry into the work site is prohibited; b) Showing the name of the principal contractor (or person in charge of work site), and a telephone number at which that person may be contacted at any time for business purposes and outside working hours; and c) Showing the name, address and telephone number of the Principal Certifying Authority for the work. 2) Any sign must be maintained while building work or demolition work is being carried out, but must be removed when the work has been completed.
13.	The work undertaken must satisfy applicable occupational health and safety and construction safety regulations, including any WorkCover Authority requirements to prepare a health and safety plan. Site fencing must be installed sufficient to exclude the public from the site. Safety signs must be erected that; warn the public to keep out of the site, and provide a contact telephone number for enquiries. Further information and details regarding occupational health and safety requirements for construction sites can be obtained from the internet at www.workcover.nsw.gov.au
14.	The beneficiary of this consent must ensure that all necessary licences, permits and approvals are obtained and kept up-to-date as required throughout the life of the project. No condition of this approval removes the obligation for the beneficiary of this consent to obtain, renew or comply with such licences, permits or approvals.

15.	In addition to meeting the specific performance criteria established under this approval, the beneficiary of this consent must implement all reasonable and feasible measures to prevent and /or minimise any harm to the environment that may result from the construction, operation or decommissioning of the project.
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CONDITIONS FROM AGENCIES

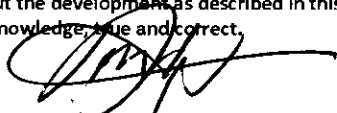
Office of Environment & Heritage - have provided advisory notes. These are attached in their entirety and therefore form part of this determination.

REASONS FOR CONDITIONS

- a) To ensure compliance with the terms of the Environmental Planning and Assessment Act.
- b) To ensure work is sustainable and that an appropriate level of provision of amenities and services occurs within the Shire and to occupants of lots.
- c) To minimise environmental impact and impact on public assets, degradation of natural resources and to enhance amenity.
- d) To provide for a quality environment, safe and efficient movement of people and to ensure public safety and interest.

 Health & Planning Division 26- 28 Adelaide Street PO Box 81 WENTWORTH NSW 2648 Tel: 03 5027 5027 council@wentworth.nsw.gov.au	Application for Development made under the <i>Environmental Planning and Assessment Act 1979</i> Section 78A
	R/No 212923 13/10/2015

FEES & CHARGES			
DA No.	Assessment No.	Receipt No.	Date
Lodgement Fee Job No: 1410-1140	830.00	Plan Reform Fee Job No: 9915-5910	140.80
		Advertising Fee Job No: 1410-1050	
Would you like a copy of the receipt? ☒ Yes ☐ No			

PART A – APPLICANT'S DETAILS	
Name/s Peter Kozlowski	
Company Name (if applicable) Wentworth Shire Council	
Postal Address PO Box 81 Wentworth, NSW 2648	
Contact No. 03-5027 5027	Alternate No.
Email peter.kozlowski@wentworth.nsw.gov.au	
I apply for approval to carry out the development as described in this application. I declare that all the information in this application and checklist is to the best of my knowledge, true and correct.	
Signature/s 	Date 27/6/16

PART B - PROPERTY DETAILS	
Lot/ Section / DP Numbers can be found on the Rates Notice or Certificate of Title for the land. In relation to mooring sites, Part B relates to the property adjacent to the proposed site.	
Street No.	Street Name Arumpo Road
Town/Locality Buronga	Postcode 2739
Lot No/s Lot 1	Section DP No/s 1037845

PART C – DEVELOPMENT DETAILS		
☐ Erection of Dwelling ☐ Swimming Pool ☒ Use of Land/ building ☐ Other – Please specify	☐ Erection of Shed / Garage ☐ Demolition ☐ Deferred Commencement	☐ Additions / Alterations to Dwelling ☐ Subdivision ☐ Mooring Site
Detailed description of development The proposed area will be used as borrow pits to provide soil to Buronga Landfill's waste operations to use as daily cover material to bury the waste, disposed and also interim and final cover material.		
Existing development / use – e.g. existing dwelling, vacant land Vacant Land		
Total estimated cost (inclusive GST) \$220,000		

PART D – OWNER'S DETAILS

☒ Details are the same as Part A – Applicant's Details (Note: All owners are still required to sign the form)

Name/s

Company Name (if applicable)

Postal Address

Contact No.

Alternate No.

Email

Do you agree to receive all correspondence via email? ☒ Yes ☐ No

As owner/s of the land to which this application relates to, I/we consent to carry out the development described in this application. I/we also authorise:

- Council representatives to enter the property for the purpose of site inspections;
- Council to make copies of all the documents for the purpose of determining the application or to people who may be affected by the proposal

Note:

- If more than one owner every owner must sign.
- If you are signing on the owner's behalf as their legal representative, you must state the nature of your legal authority and attach documentary evidence (e.g. power of attorney, executor, trustee, company director)
- If the owner is a company, a current ASIC extract must be supplied as documentary evidence and application must be signed by 2 directors.
- If the land is Crown Land, consent will be required from NSW Trade & Investment – Crown lands. Please refer to separate attachment Landowner's Consent: Landowner's consent application.

Name Peter Kozlowski

Signature

Date

27/6/16

Name

Signature

Date

If more than two signatures are required please attach a separate document.

PART E – SUBDIVISION

No. of Lots:

Existing

Proposed

Are you proposing to install a new road/s?

☐ Yes

☒ No

If yes, how many?

Will this be a staged development?

☐ Yes

☒ No

If yes, how many?

Description of stages

PART F – OTHER APPROVALS

I require consideration as Integrated Development

☐ Yes

☒ No

If yes, include Attachment A

I require consideration as a Mooring Site

☐ Yes

☒ No

If yes, include Attachment B

I require a Construction Certificate (CC) to be lodged at the same time as the development application. If yes, include Construction Certificate Application Form.

☐ Yes

☒ No

NOTE: Additional fees may apply for the relevant approvals.

PART G – ENVIRONMENTAL IMPACT

One of the following must be completed for all applications

- ☒ Statement of Environmental Effects (SEE) – refer Attachment C
or
☐ Environmental Impact Statement (EIS) - Designated Development Only

Is your proposal on land, that is, or part of critical habitat? Or is your proposal likely to have a significant effect on threatened species, populations, ecological communities or their habitats?

- ☐ Yes – Please attach a Species Impact Statement
☒ No – Please explain in the Statement of Environmental Effects

PART H – DISCLOSURE OF POLITICAL DONATIONS AND GIFTS

Under Section 147 of the Environmental Planning and Assessment Act 1979, any reportable political donations to a councillor and / or any gift to a Councillor or Council Employee within a two (2) year period before the date of this application must be publicly disclosed.

Are you aware of any person with a financial interest in this application who made a reportable donation or gift within the last two (2) years?

- ☐ Yes – Please complete the Political Donations and Gifts Disclosure Statement and lodge it with this application (available from the Council website)
☒ No – In signing this application I undertake to advise the Council in writing if I become aware of any person with a financial interest in this application who has made a political donation or has given a gift in the period from the date of lodgement of this application and the date of determination.

NOTE: Failure to disclose relevant information is an offence under the Act. It also an offence to make a false disclosure statement.

PART I – SUPPORTING INFORMATION

To enable assessment of your application, Council requires the following supporting information. Please note, if the information is not provided this may lead to your application being rejected or delayed.

- ☒ 3 x A3 copies of each of the following plans for approval
 ☐ Floor Plan
 ☐ Site Plan
 ☐ Elevation Plan
☐ 3 copies of the BASIX Certificate
☒ Completed Statement of Environmental Effects (refer Part G above)

NOTE: If both the applicant and owner are happy to receive all correspondence via email, only 1 set of plans needs to be submitted with application. However if hard copies are required, submit 3 copies.

Privacy and Personal Information Protection Notice

The personal information provided on this form is collected by Wentworth Shire Council for the purposes of processing this application by Council Employees and other authorised persons. This form will be stored within Council's record management system and may be available for public access and/or disclosure under various NSW Government legislation.

	Health & Planning Division 26- 28 Adelaide Street Po Box 81 WENTWORTH NSW 2648 Tel: 03 5027 5027 council@wentworth.nsw.gov.au	Development Application Notes for completing a Development Application
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FEES & CHARGES

There are two fees that are payable on lodgement of this application. These are:

- **Lodgement Fee** – This is a fee charged by Council that is set by the NSW Government, which is aimed at covering a portion of Council's costs for the processing of the application.
- **Advertising Fee** – Charged in accordance with NSW Legislation for Designated and Integrated Developments.

A schedule of fees are available on the Wentworth Shire website under the Council Business Tab. Alternatively you can call Council's Health & Planning Division on 03 5027 5027.

PART A – APPLICANT'S DETAILS

Anyone can apply for approval; it does not necessarily have to be the owner of the land; however the owner will still need to provide consent in Part D – Owner's Details. Please complete the details of the person who is applying for this consent.

NOTE: It is the applicant's responsibility to provide Council with any additional details that may be requested.

PART B – PROPERTY DETAILS

This section asks you to provide details on the land where the development / building work is to be situated. These details are available on your rates notice or a Certificate of Title.

NOTE: Not all properties have a section number.

PART C – DEVELOPMENT DETAILS

Select from the list the most appropriate description of your development. Note: you can select more than one option.

Provide a detailed description of your proposal including any details such as building works, earthworks and any demolition work to be carried out. If there is not enough room, please attach a separate document.

The cost of the project should include but not limited to building construction, building materials, landscaping, drainage, fencing, labour and drainage but not include the cost of the land.

PART D – OWNER'S DETAILS

The owner of the land is generally the people/ company listed on the Title to the Land. All owners listed on the title must sign the application form giving consent to the proposed development / building works. If there is not enough room, please attach a separate document.

If the owner is a Company/ partnership etc, then evidence of role of signatories is to be supplied in the form of an Company Extract from the ASIC website.

PART E – SUBDIVISION

Only complete this section if your development is a subdivision.

PART F – OTHER APPROVALS

You can apply for other approvals at the same time as lodging your Development Application. If you require on of these approvals, please complete the appropriate paperwork and submit with your DA.

Note: Additional fees may apply for the relevant approval. Contact Council's Health & planning Division on 03 5027 5027 if you are unsure.

PART G – ENVIRONMENTAL IMPACT

Environmental Impact is an important part of the application and must be completed in order for your development application to be assessed. Council has developed a Statement of Environmental Effects to assist you in preparing this information.

PART H – DISCLOSURE OF POLITICAL DONATIONS & GIFTS

This section must be completed by applicant and owners. If you selected yes, you will need to fill out the Political Donations and Gifts Disclosure Statement and lodge it with this application.

PART I – SUPPORTING INFORMATION

Most applications will require a Site Plan, Floor Plan and Elevations. Below is a guide to assist in what information is required to be submitted with your development application.

Site Plan

A site plan is a birds-eye view of the existing and proposed development on the site and its position in relation to boundaries and neighbouring developments.

- North point and scale
- Street name and number
- Name and contact details of who prepared the plans
- Location of
 - property boundaries and
 - any existing physical and natural features e.g. building, vegetation, driveways etc
 - Existing easements and/or utility services e.g. water, sewer, stormwater drains, discharge points etc
 - Existing and proposed structure/s and/or additions
 - Vehicle access and car parking
 - New vehicle crossings
- Site dimensions (length, width and site area)
- Relative location of adjoining buildings
- Existing and proposed site ground levels and floor levels
- Contour lines of site and spot levels at all corners of the building
- Extent of cut and fill to be carried out
- Swimming Pools must show pool fencing, gates, reduced height levels (RLs) reduced to existing/proposed levels, location of filters/pumps and backwash connections.

Floor Plans

A floor plan is a birds-eye view of your existing and/or proposed layout of rooms within the development.

- Existing Internal layout (required for alterations and additions)
- Proposed internal layout

The above plans should include:

- Room uses, wall/partitions, areas and dimensions
- Location of stairs and essential fire safety measures (if any)
- Floor levels and steps in floor levels (RLs)
- Wall structure type and thickness
- Calculations of all existing and proposed floor areas

Elevation Plans

Elevation plans are a side on view of your proposal that shows all 4 sides (north, south, east and west).

- Height of existing and proposed structure/s and/or additions
- Existing and proposed surface finishes e.g. brick wall, tile, colourbond roof
- Location and heights of windows
- Levels for roof ridge, floor and ceiling (expressed as Reduced Levels (RLs) or levels to AHD
- Roof Pitch

PART I – SUPPORTING INFORMATION CONTINUED
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BASIX Certificate

- A BASIX Certificate is required for:
 - all new habitable buildings
 - alterations and additions over \$50,000
 - swimming pools and spas with a capacity of 40,000 litres or more
- For further information or to apply visit: www.basix.nsw.gov.au

**Statement of
Environmental Effects**

- A template version is available to be filled out, refer to Part G Environmental Impact

NOTE:

- All plans are to be drawn to scale and provided in A3 size (where possible).
- If both the applicant and owner are happy to receive all correspondence via email, only 1 set of plans needs to be submitted with the application. However if hard copies are required, submit 3 copies.

Statement of Environmental Effects: Borrow pits for Buronga Landfill Cover



greenedge
environmental

Buronga Landfill
For Wentworth Shire
Council

Business name Green Edge Environmental P/L

ABN 17 707 655 926

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Principle Chris Alderton

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Rev	Purpose of document	Author	Reviewer	Issue date
A	Draft report for internal review	C. Alderton	L. Alderton	12 April 2016
B	Draft report for client review	C. Alderton	C. Alderton	15 June 2016
0	For lodgement with DA	C. Alderton	C. Alderton	23 June 2016

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Executive Summary

The Buronga Landfill is located on Arumpo Road, approximately 28km east of Wentworth. Access to the proposed site is via the sealed Arumpo Road and service road into the landfill (refer to Appendix A).

The proposed project site is for the development of borrow pits to provide landfill cover for the existing landfill and then be converted to landfill cells for future use. The proposal will allow for the continued operations and management of the existing facility. It is expected based on the current level of demand that the cells will be used for landfill until the year 2053. The site is located in the municipality of Wentworth, and referred to as Lot 1 DP1037845. The land is freehold owned by the Wentworth Shire Council (WSC).

The objective of this proposal is to develop soil borrow pits to be used at the adjacent landfill site as landfill cover, to adhere to the Environmental Protection Licence conditions. The borrow pits created would be converted to landfill cells for future expansion of the landfill site.

The proposed location of the borrowing is in previously disturbed area, with black oak, mallee and hopbush requiring removal. The groundcover species, cannonball, poverty bush and common heliotrope and agricultural weeds dominate the site. The operation will be undertaken in various stages over the lifespan of the project.

Site preparation will involve removing trees and shrubs by mechanical grubbing. Topsoil (where applicable) will be windrowed for re-spreading across the top of the landfill site when it is full. During the borrowing process, the read loam soil will be ripped by a Cat D6 dozer and a front end loader (938) will load the soil directly onto a tip truck and trailer. No crushing or processing is required. Minimal stockpiling will occur, and only as required.

The following table summarises the potential impact of the project, following a thorough on-site assessment and various database searches on threatened species and cultural heritage. Overall, the level of impact is expected to be low and this is further reduced through the implementation of mitigation measures summarised in Section 4.

Summary of potential impacts

Section	Potential Impact	Summary of Impacts
4.1	Natural resource use	Removal of borrow material
4.2	Hydrology and geomorphology	No impact
4.3	Erosion and sedimentation	No impact
4.4	Surface water	No impact
4.5	Groundwater	No impact
4.6	Soils	Removal and stockpile of topsoil for respreading, borrow material for landfill cover
4.7	Matters of NES	No impact
4.8	Flora	Removal of vegetation, no impact on threatened species

4.9	Fauna	No impact on critical habitat for threatened species
4.10	Weeds and pests	No impact
4.11	Heritage	Unlikely impacts to unknown sites and objects based on desktop and on site assessment. AHIP will be gained for the open site located as part of the due diligence process.
4.12	Air quality	Some vehicle emissions and dust from borrowing activity, will not cause problems due to low population density
4.13	Socio and economic	No adverse impacts
4.14	Transport	No public roads to be used for carting activities
4.15	Noise and vibration	Use of machinery to extract, load and cart borrow material
4.16	Bushfire hazards	No impacts
4.17	Chemical and Hazardous Substance	No impacts, none stored on site, oils, grease, fuel
4.18	Waste Minimisation	No impacts
4.19	Stormwater Management	No off-site impacts

The cumulative environmental impacts from the proposal will be minimal. As stated throughout Section 4 of this Statement of Environmental Effects, each identified impact has been assessed for its potential threat to the environment. Mitigation measures will help minimise the impact the proposal will have on the study area as well as off-site impacts.

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APPENDICES

Appendix A: Map Series

Appendix B: Assessment of significance and threatened species searches

Appendix C: AHIMS Database Search

Appendix D: Artefact Scatter 1 – site card

Appendix E: Cultural Heritage Contingency Plan

Appendix F: Site Photos

1.0 The proposal

1.1 Locality

The Buronga Landfill is located on Arumpo Road, approximately 28km east of Wentworth. Access to the proposed site is via the sealed Arumpo Road and service road into the landfill (refer to Appendix A).

The proposed project site is for the development of borrow pits to provide landfill cover for the existing landfill and then be converted to landfill cells for future use. The proposal will allow for the continued operations and management of the existing facility. It is expected based on the current level of demand that the cells will be used for landfill until the year 2053. The site is located in the municipality of Wentworth, and referred to as Lot 1 DP1037845. The land is freehold and owned by the Wentworth Shire Council (WSC).

1.2 Objective of the proposal

The objective of this proposal is to develop soil borrow pits (extraction of soil) to be used at the adjacent landfill site as landfill cover, to adhere to the Environmental Protection Licence conditions. The borrow pits created would be converted to landfill cells for future expansion of the landfill site. Up to five additional borrow/cells are proposed, covering an area of 43.82ha (Appendix A).

Table 1 outlines the proposed project characteristics.

Table 1: Characteristics of the proposed project

Cell no	Cell area (ha)	Estimated commencement	Operational period	Comments
One	8.73	2015/2016	To June 2020	Part of existing landfill
Two	7.21	2019/20	July 2020 to June 2026	Staged development as landfill cover for existing landfill.
Three	7.22	2025/26	July 2026 to June 2032	Cover material for cell one (existing landfill)
Four	6.22	2031/32	July 2032 to June 2040	Staged development as landfill cover for existing landfill.
Five	8.19	2039/40	July 2040 to June 2048	Staged development as landfill cover for existing landfill.
Six	6.25	2047/48	July 2048 to June 2053	Staged development as landfill cover for existing landfill.

1.3 Estimated costs and commencement

The project will cost in the order of \$220,000 (ex GST) and cell three to be used as landfill cover is proposed to commence in mid-2016.

1.4 Description of borrow operations

The proposed location of the borrow pits is in a previously disturbed area, with black oak, mallee and hopbush requiring removal. The groundcover species, cannonball, poverty bush and common heliotrope and agricultural weeds dominate the site. The operation will be undertaken in various stages over the lifespan of the project.

Site preparation will involve removing trees and shrubs by mechanical grubbing. Topsoil (where applicable) will be windrowed for re-spreading across the top of the landfill site when it is full. During the borrowing process, the red loam soil will be ripped by a Cat D6 dozer and a front end loader (938) will load the soil directly onto a tip truck and trailer. No crushing or processing is required. Minimal stockpiling will occur, and only as required.

The soil will be progressively removed in small sections, working in an orderly pattern. The site will be dug down to between 5 and 9m deep.

1.5 Site lay out plans

The site layout is presented in Appendix A along with coordinates for each corner of the proposed cells. All mapping coordinates are GDA 1994, MGA Zone 54.

1.6 Site preparation

Site preparation for the proposed development will consist of:

- formally marking the proposed development area (including 'no go' zones) using flagging or bunting
- marking trees to be retained outside of proposal area
- grubbing trees and shrubs that will not be retained in the proposal area, staged to ensure no soil erosion occurs
- stripping and windrowing of topsoil as required for each stage
- installing 'truck entering' signs and general safety signs.

1.7 Infrastructure considerations

No permanent infrastructure will be required on site.

1.8 Rehabilitation

Other than ensuring erosion does not occur to the cell wall, and a safe and gentle slope (1:2 batters) is achieved, no rehabilitation is proposed as the borrow pits will become landfill cells.

1.9 Previous and existing operations

The site has been subject to historical grazing, wood cutting and quarrying activity. These activities no longer occur and the area has been fenced (security and six-strand stock fence).

1.10 Consideration of the alternatives and justification

All viable alternatives have been considered, including:

- trucking in borrow material from other areas
- using old soil quarries from other properties
- finding new sites in new locations and importing to Buronga landfill.

All above options have been considered and costed. The preferred option is presented in this SEE. The option relevant to this proposal is favoured, as it:

- has a good supply of borrow material
- will have minimal impact on the immediate and surrounding environment
- will not cause impacts to threatened flora or fauna
- will enable soil to be extracted and used near to where it is required and allow for future landfill expansion
- the site adheres to the siting restrictions of the Environmental Guidelines: Solid Waste Landfills, Second edition 2016 (EPA, 2016)

No other existing or likely future uses or activities on or near the site would be disadvantaged by this proposal. The land is zoned for the purpose of waste disposal. The land was purchased by the WSC for this purpose. The proposal will not affect any world heritage properties, national heritage places, wetlands of international importance (Ramsar sites) or Commonwealth marine areas.

2.0 Planning context

2.1 Purpose of this report

This Statement of Environmental Effects (SEE) has been prepared by Green Edge Environmental on behalf of WSC, which is the proponent and the consent authority under the Wentworth Local Environmental Plan 2011 (Reg 1.6) and Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

The purpose of the SEE is to describe the proposal, to document the likely impacts of the proposal on the environment, and to detail protective measures to be implemented.

The description of the proposed works and associated environmental impacts have been undertaken in context of the Environmental Planning and Assessment Regulation 2000, the *Threatened Species Conservation Act 1995* (TSC Act), the *Fisheries Management Act 1994* (FM Act), and the Australian Government's *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

This SEE helps to fulfil the requirements of Section 79C of the EP&A Act that WSC examine and take into account to the fullest extent possible, all matters affecting or likely to affect the environment by reason of the activity.

2.2 Legislation and approvals required

The WSC is the consent authority to which this SEE will be lodged. The proposed location is in south-western New South Wales.

The overarching state legislation in relation to this activity is the *Environmental Planning and Assessment Act 1979* (EP&A Act) and Environmental Planning and Assessment Regulation 2000. The activity is required for the operation and management of the existing licenced waste facility and is not listed under schedule 3 of the Environmental Planning and Assessment Regulation 2000, therefore not designated development.

The *Mining Act 1992* does not apply to this proposal as under the Mining Regulations (2012), schedule 1, soil is not a listed mineral.

An EPA licence under the protection of the *Environment Operations Act 1997*, is currently in place (EPL 20209).

The *Native Vegetation Act 2003* (NV Act) regulates the clearing of native vegetation in NSW. All clearing of remnant native vegetation or protected regrowth requires landholders to seek approval by obtaining a Property Vegetation Plan (PVP) from Local Land Services. WSC will work with the Western Local Lands Service to ensure appropriate offsets are in place utilising their existing offset area.

The development complies with the requirements of the *Fisheries Management Act 1994*, including the aquatic habitat protection and threatened species conservation provisions in Parts 7 and 7A.

The *Threatened Species Conservation Act 1995* (TSC Act) lists a number of factors to consider when deciding whether there will be a significant impact on threatened species, populations or ecological communities and their habitats.

A Species Impact Statement (SIS) is required when the level of determined significance is 'likely'. As stated in Section 4, the proposal is not likely to significantly impact on a

threatened species, population or ecological community. Therefore, the proposal does not require approval under the TSC Act, or the completion of a SIS.

The National Parks and Wildlife Act 1974 (NPW Act), administered by the Office of Environment and Heritage (OEH), is the primary legislation for the protection of some aspects of Aboriginal cultural heritage in New South Wales.

Part 6 of the NPW Act provides specific protection for Aboriginal objects and declared Aboriginal places by establishing offences of harm. There are a number of defences and exemptions to the offence of harming an Aboriginal object or Aboriginal place. One of the defences is that the harm was carried out under an Aboriginal Heritage Impact Permit (AHIP).

This project has assessed that impacts to any unknown cultural heritage sites of significance is unlikely, but as an isolated scatter was found a cultural heritage assessment adhering to the *Code of Practice for Archaeological Investigation of Aboriginal objects in NSW* and an AHIP is required (refer to section 4.11).

Under the Federally administered *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act), actions which are likely to have a significant impact on matters of National Environmental Significance (NES) require approval from the Commonwealth Minister for Environment and Heritage. Matters of NES include:

- world heritage properties
- national heritage places
- wetlands of international importance (listed under the Ramsar Convention)
- listed threatened species and ecological communities
- migratory species protected under international agreements
- Commonwealth marine areas
- the Great Barrier Reef Marine Park
- nuclear actions (including uranium mines)
- a water resource, in relation to coal seam gas development and large coal mining development.

No matters of NES will be impacted upon by the proposed project.

The objectives of the *Water Management Act (2000)* are to provide for the sustainable and integrated management of the water sources of the state for the benefit of both present and future generations. One key aim is to integrate the management of water sources with the management of other aspects of the environment, including the land, its soil, its native vegetation and its native fauna. This act will not be triggered as the water will be extracted through existing water licences.

2.3 Relevant policies

The State Environmental Planning Policy (Infrastructure) 2007 (Infrastructure SEPP) aims to assist in the effective delivery of public infrastructure across the NSW. This is achieved by improving certainty and regulatory efficiency through a consistent planning assessment and approvals regime for public infrastructure and services, and through the clear definition of environmental assessment and approval processes for public infrastructure and services facilities.

The Infrastructure SEPP 2007 is applicable as the projects will assist in maintaining public infrastructure:

Under Clause 121 Development without consent—general states

(3) Development for the purpose of the recycling of construction and demolition material, or the disposal of virgin excavated natural material (as defined by the *Protection of the Environment Operations Act 1997*) or clean fill, may be carried out by any person with consent on land on which development for the purpose of industries, extractive industries or mining may be carried out with consent under any environmental planning instrument.

2.4 Local environmental plans

Wentworth Local Environmental Plan (LEP) 2011

The site is located within the Wentworth local government area and as such the Wentworth LEP 2011 applies. Under the LEP, WSC is the determining authority. Applicable sections of the LEP include:

Cultural Heritage Conservation

Clause 5.10 of the LEP specifies the requirements of the consent authority in relation to impacts on areas of cultural and heritage significance. This project has assessed that impacts to any unknown cultural heritage sites of significance is unlikely (refer to section 4.11).

Biodiversity Conservation

Clause 7.4 of the LEP specifies the consent authority must consider any adverse impacts from the proposal on the following:

- the condition, ecological value and significance of the fauna and flora on the land
- the importance of the vegetation on the land to the habitat and survival of native fauna
- any potential to fragment, disturb or diminish the biodiversity structure, function and composition of the land
- any likely adverse impact on the habitat elements providing connectivity on the land.

An assessment of the likely impacts of the proposal is located in Section 4.

Draft Western Local Strategic Plan

The State Strategic Plan and the Western Local Strategic Plan (in draft) will assist Local Land Services achieve its vision of resilient communities in productive healthy landscapes. To achieve this vision, Local Land Services needs to align all of its work with its mission of being a customer-focused business that enables improved primary production and better management of natural resources. The goals of the Plan include:

- Self-reliant, adaptive and prepared communities
- Productive, biosecure and sustainable primary industries operating in resilient landscapes
- Effective, efficient and integrated service delivery underpinned by collaboration, adaptive management and local decision making

The strategies that underpin these goals are around supporting land managers capacity to improve land management and enterprise viability, collaborate with industry and government to adapt to climate change, involve local people in decision making to drive continuous improvement in the services, policies and projects and an adaptive approach to planning, implementation and service delivery

Other than the implementation of the NV Act, the Local Lands Service has no regulatory authority on this project.

2.5 Relevant guidelines

A number of guidelines were consulted during the preparation of this SEE including:

- Environmental Guidelines: Solid Waste Landfills, Second edition, NSW EPA (2016)
- Agricultural Issues for Extractive Industries Development Factsheet (Department of Primary Industries)
- Threatened Biodiversity Survey and Assessment: Guidelines for Developments and Activities (Working Draft, 2004, Department of Environmental and Conservation)
- Threatened Species Assessment of Significance Guidelines (DEH, undated)
<http://www.environment.nsw.gov.au/threatenedspecies/tsaguide.htm>

2.6 Zoning

Under the Wentworth LEP, the proposed project area is zoned Special Purpose Zone - Infrastructure (SP2). Under this zone, 'waste or resource management facility' means a waste or resource transfer station, a resource recovery facility or a waste disposal facility.

2.7 Determining authority

Under the Wentworth Local Environmental Plan 2011 - Reg 1.6, the determining authority is the WSC.

2.8 Stakeholder consultation

The following relevant stakeholders have been consulted on the proposal and their recommendations and requirements have contributed to the development of the SEE, where applicable, including:

- NSW Office of Environment and Heritage
- Local Lands Service - Western
- Wentworth Shire Council

3.0 Location

3.1 Site description

The proposed project area is located on land that has been historically used for grazing, wood cutting and quarrying. The area is located to the east of the Arumpo Road, approximately 2.5km north of the Silver City Highway.

Two vegetation types occur on site which meet the Plant Community Type criteria, including:

- Black Oak - Western Rosewood open woodland on deep sandy loams of Murray-Darling Depression and Riverina Bioregions (Benson 58 or plant community type LM108)
- Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones (Benson 170 or plant community type LM116)

These PCT's are mapped in Appendix A.

3.2 Land systems and geology

The proposed project is located within the Murray Basin Geological province. Quaternary material covers almost all of the area. Quaternary alluvial deposits comprise the riverine plain. Scattered aeolian (windblown) deposits also occur throughout (Cunningham *et al* 1992).

The Murray Basin is a shallow depression filled with marine and terrestrial sediments to a maximum depth of 600m over the last 50-60 million years. Shallow seas have moved back and forth across the plains several times, leaving traces of parallel beach ridges and limestone sediments under the dunefields. At one stage, the coast reached as far inland as Balranald (OEH, 2011).

Sandy surface sediments have been extensively reworked into dunes and sandplains that have blown onto the Cobar peneplain. Some dunes have consistent east-west linear patterns, others are parabolic, suggesting differences in vegetation cover, sand supply or age. The Darling River and streams in the Riverina have cut through the sands and constructed numerous overflow lakes such as the Sayers Lake system and the abandoned pleistocene channels and basins of the Willandra Lakes complex (OEH, 2011).

Saline groundwaters have formed salt basins in many places where the sandplain or dune topography intersects the water table. All lakes and swamps have well-formed lunettes on their eastern margins that record evidence of climate change and human occupation. A few bedrock ridges rise above the sandplains as isolated ranges (OEH, 2011).

The proposed project area is gently undulating with a gentle slope towards the east. The site is on a slight north-south ridge and the elevation across the site is between 37 and 44m Australian Height Datum (AHD).

3.3 Hydrology and geomorphology

No creeks, streams or waterways run through the proposed site. The proposed activity will not impact on the hydrogeology and geomorphology of the site.

3.4 Soil

Soils in the depositional basin are deep red sands with variable sandy profiles under dunes, and gradational profiles in the sandplains. Most soils have a moderate to high level of calcium carbonate in the profile (ANRA, 2009).

Sandplains contain deep calcareous loams to loamy sands. These are associated with sandy red-brown duplex soils. Limestone nodules are exposed in some areas (ANRA, 2009).

Soils and vegetation differ according to the landform. On the dunefields red, brown and yellow calcareous sands occur with more clayey materials in the swales. On sandplains the soil tends to be heavier with brown gradational or texture contrast profiles, and mallee is found only on sandy rises (OEH, 2011).

Vegetation communities on site are linked to soil type. The deep red loams support the Black oak community and the heavier loam over clay soil support the mallee communities. To the east, outside of the project area, is a Black box community on silty sand over riverine clay.

3.5 Climate

The annual average minimum temperature is 10.3 °C, monthly values varying from 4.3°C during July (the lowest on record is -4.4°C) to 16.5°C during January. There are four nights per annum when the temperature falls below 0°C. The annual average maximum temperature is 23.6°C - monthly values vary from 15.2°C in July to 31.9°C in January (the highest on record is 50.8°C). There are, on average, 77 days per annum when the temperature exceeds 30°C, including 30 hot days when the temperature rises above 35°C (BOM, 2012).

The mean annual rainfall for the Wentworth area is 292mm (refer to Table 2). The lowest rainfall on record is 113mm and the highest on record is 705mm. Rainfall reliability in the area is generally very low (BOM, 2015).

Table 2: Mildura Airport Rainfall Data

	Jan	Feb	Mar	Apr	Ma	Jun	Jul	Au	Sep	Oct	Nov	Dec
Mean monthly rainfall (mm)	21.1	20.3	18	18.5	25.6	22.9	26.4	26.7	27.8	30.6	24	23.4
Highest monthly rainfall (mm)	92.2	100.9	128.2	120.4	86.3	82.2	59.4	74.8	88.3	120.6	129.9	181.2
Lowest monthly rainfall (mm)	0	0	0	0	0	0	0.6	1.2	3	0	0	0
Highest daily rain (mm)	3.6	3.1	3.4	4.2	6.8	7.9	9.3	9	7.6	7.1	5.5	4.3

4.0 Environmental impacts and management

This section outlines the environmental impacts of extracting soil for landfill, covering the existing landfill and converting the borrow areas to landfill cells for future use.

4.1 Natural resource use

The natural resource to be won is soil, which is required to be used for cover on the nearby existing landfill. Under the EPL held by WSC, the landfill is to be covered each night. The borrow areas will then be converted to landfill cells for future use.

4.1.1 Mitigation measures

- Borrow pit sites to be marked out using permanent markers indicating 'no go zones'
- The development will be staged, removal of trees and stripping of topsoil will only occur as required based on the demand level for cover material
- Supervision of earthworks will be undertaken by a suitably qualified/experienced person as per WSC policies
- Staff trained in best practice management in earthworks to minimise impacts on non-target natural resources

4.2 Hydrology and geomorphology

No creeks, streams or waterways run through the proposed project site. The nearest permanent natural water supply is the Gol Gol Creek, which is approximately 2km south east, and the Murray River, approximately 4.2km to the south west of the site. Due to the distances from these water sources and the shallow depth over which earthworks will occur, no impacts to the hydrology and geomorphology of the surrounding environment are expected.

4.2.1 Mitigation measures

- Adhere to the Buronga Landfill – Landfill Environmental Management Plan (WSC, 2015)
- Adhere to the Environmental Protection Licence (20209) conditions and reporting requirements.

4.3 Erosion and sedimentation

The proposal is unlikely to cause erosion down slope, due to the gentle slope in topography of the surrounding land. To minimise erosion, topsoil will only be stripped as required to develop the borrow pits. During borrowing, controls such as sediment fences will be employed as required. Borrow pit walls will be developed so a safe and gentle slope (1:2 batters) is achieved

The existing access track will be maintained by spreading gravel (if required) to protect the soil during carting activity to minimise fugitive dust.

4.3.1 Mitigation measures

- Borrow pit sites to be marked using permanent markers indicating 'no go zones'

- Temporary sediment control structures shall be maintained at all times during borrowing and checked, repaired, replaced or cleaned out after any significant rainfall event
- Staff trained in best practice management in erosion and sedimentation control
- Adhere to the Buronga Landfill – Landfill Environmental Management Plan (WSC, 2015)

4.4 Surface water

No creeks, streams or waterways run through the proposed project site. The proposal will not impact on any Ramsar listed wetlands.

No hazardous materials will be stored on site and no sewerage facilities will be established that could impact on surface water flows, should they occur.

The water to be used on site for dust suppression and earthworks will come from existing WSC water licence supplies.

Most plant and equipment will be serviced either at the WSC depot off site, or at another designated location. Contingency plans adhering to relevant Australian standards and guidelines will be developed to deal with any spills that may occur. Machinery will be checked daily to ensure that there are no leakages of oil, fuel or other liquids.

4.4.1 Mitigation measures

- Daily pre-start machinery checks will be made for leaks of oil, fuel or other liquids
- Contingency plans will be in place to deal with spills, adhering to relevant Australian standards and guidelines and conforming to leading practice
- All vehicles to be serviced off-site
- Staff inducted on refuelling procedures, which will be stored with refuelling equipment
- No machinery, fuels, oils, chemicals, hazardous substances or other earthmoving equipment will be stored within the borrow site when not in use
- Adhere to the Buronga Landfill – Landfill Environmental Management Plan (WSC, 2015)

4.5 Groundwater

The site is situated within the Murray Geological Basin, which is located within the Murray-Darling surface water drainage basin. The Murray Geological Basin comprises up to 600 m of Cenozoic sedimentary deposits with basin contours showing dominant north east trending troughs and ridges.

The main depositional centre is known as the Renmark Trough bounded to the west by the Hamley Fault, separating it from a smaller depression to the west. The Neckerboo Ridge is a basement high located east of the Darling River. The site is situated on the eastern flank of the Renmark Trough, west of the Neckerboo Ridge (in GHD, 2012).

The site is underlain by the Lower Remark Group aquifer hosted by fluvio-lacustrine sediments comprising fine to medium grained quartz sand and carbonaceous silt and clay. The regional groundwater flow direction in the vicinity of the site is expected to be in a south westerly direction towards the Murray River. Recharge to the aquifer is typically from the basin margins, with groundwater flow being towards the basin depocentre in the vicinity of Renmark (in GHD, 2012).

Aquifer yields are generally high and commonly exceed 5 L/s. This reflects significant thicknesses of interbedded fine to medium-grained micaceous quartz sands in the fluvial sequences. A search of the NSW groundwater database identified aquifer yields only over 50 L/s are estimated for the central basin, due to partial filling of the troughs by medium to coarse quartz sands of the Warina Sand basal deposit (GHD, 2012).

Groundwater in the Lower Renmark Group is suitable for stock use only, with typical salinities between 11,000 and 13,000 mg/L total dissolved solids (TDS). In this area, recharge is mostly via bed leakage from the Darling River further to the north (in GHD, 2012).

A search of the NSW Natural Resource Atlas database was conducted identifying groundwater bores within 2 km of the site (by GHD on 1 December 2009) and is presented in Table 3. A total of five boreholes were listed within 1 km, and a further 20 bores 1 - 2 km from the site. Based on the information available, a total of nine boreholes were considered, details of which are summarised in Table 3.

Table 3: Groundwater Well Data

Number	Approx RL	BH Depth (mbgl)	Water level (mbgl)	Water level (RL)
GW088479	40.5	61	7.37	33.13
GW087083	39	20	9.29	29.71
GW088168	40	10.5	nd	na
GW087039	40	11	nd	na
GW087074	40	14	nd	na
GW087038	40	11	nd	na
GW087328	40	16	nd	na
GW087325	45	14	nd	na
GW088305	35	21	1.54	33.46

All boreholes considered within the vicinity of the site were registered as monitoring wells, suggesting that they are not used for groundwater abstraction to any significant degree. These boreholes vary in depth from 10.5 to 61.0 metres below ground level (mbgl). Information on water levels was only available for three of the boreholes and varied from 1.5 to 7.4 mbgl (RL29.71 to RL33.46). Note that the majority of the borehole RLs (and hence the RLs of the water levels) are based on limited topographical information and are only accurate to +/- 5 m (GHD, 2012).

Geolyse (2015) undertook a hydrogeological assessment based on the data provided in GHD (2012) of the Buronga landfill and made the following conclusions:

Based on Geolyse's review of existing hydrogeological assessments and available groundwater monitoring data for the Buronga Landfill, this assessment finds that sufficient information exists to demonstrate that groundwater impacts have not yet been detected, and can be managed such that any future impact can be minimised.

Conclusions from the GHD Geotechnical Investigation demonstrate that during groundwater monitoring in 2010 and 2012 there was no indication of existing leachate migration into the off-site groundwater. In addition, the GHD Engineering Report identifies a thick, low permeability clay layer (undisturbed, 3.3×10^{-10} m/s) that forms an effective aquitard beneath the landfill. It is also noted material can and will be sourced on-site to provide a capping layer that will meet EPA's criteria of 1×10^{-8} m/s).

Further, the comparison of groundwater data obtained by GHD to data reported in the 2013-14 Annual Return (for EPL 20209) indicates that changes observed in groundwater quality parameters are likely due to natural fluctuations in regional groundwater quality, as opposed to existing leachate migration into off-site groundwater.

Appropriate leachate minimisation and management measures are already identified in the Buronga Landfill LEMP; these measures are implemented at the Buronga Landfill to mitigate the risk of leachate contaminating groundwater aquifers below the site, and to manage any groundwater contamination should it occur.

Based on the above conclusions, this assessment adequately addresses the requirements of condition U5.1 of EPL 20209 as:

- *No adverse impacts to groundwater have been identified in this assessment and given that the site has been operating as a landfill for several years (since 1934), it is unlikely that leachate is emanating from the existing unlined Buronga Landfill and adversely impacting on groundwater; and*
- *There are adequate leachate minimisation and management measures implemented at the landfill to mitigate the risk of adverse impacts to groundwater, and to manage any groundwater contamination.*

Based on Geolyse (2015) review no groundwater impacts are expected.

4.5.1 Mitigation measures

- Daily pre-start machinery checks for leaks of oil, fuel or other liquids
- Contingency plans will be in place to deal with spills, adhering to relevant Australian Standards and Guidelines and conforming to leading practice
- No machinery, fuels, oils, chemicals, hazardous substances or other earthmoving equipment will be stored within the borrow site when not in use
- Staff inducted on refuelling procedures, which will be stored with refuelling equipment
- Adhere to the Buronga Landfill – Landfill Environmental Management Plan (WSC, 2015).

4.6 Soils

All of the proposed project area has been disturbed due to continuous grazing by livestock, rabbits, and timber removal to facilitate grazing and for fencing materials. More recently, quarrying activity in the north-eastern section has occurred. The material to be won consists of suitable borrow material required to adhere to the EPL.

The topsoil will be managed to ensure that on completion of borrowing, topsoil can be re-spread on the landfill capping and rapid germination of the seed store can occur. Regularly servicing machinery off-site, adhering to the WSC's refuelling policy and

ensuring a spill kit is on-site at all times will ensure that existing soil retained on site will be free from contamination.

4.6.1 Contamination

The existing soil is not known to be contaminated and no new contamination is expected as a result of undertaking the proposed activity.

4.6.2 Acid sulphate soils

There are no areas that are subjected to periods of sustained inundation followed by drying which can lead to the production of acid sulphate soils. When potential acid sulphate soils are disturbed or exposed to oxygen, the iron sulphides are oxidised to sulfuric acid and the soil becomes strongly acidic (usually below pH 4). These soils are then called actual acid sulphate soils and they have a pH of less than 4.0 (Department of Environmental Resources Management, 2009).

4.6.3 Mitigation measures

- Staff to be trained in best practice management in soil conservation and management
- Staff inducted on refuelling procedures, which will be stored with refuelling equipment
- A spill kit will be permanently attached to the portable fuel cart, which is brought on to site each day
- All machinery to be serviced off site
- Supervision of earthworks will be undertaken by a suitably qualified/experienced person as per WSC policies
- Borrow material will only be extracted and used as required
- Borrowing will only occur during suitable conditions e.g not on days of rain, high wind or flooding.

4.7 Matters of National Environmental Significance

An Environmental Protection and Biodiversity Conservation (EPBC) Act Protected Matters Search Tool report was generated for the study area on a 5km buffer. The report indicated:

- no World Heritage Areas near the proposed site
- no items of National Heritage Places near the proposed site
- the study site is located upstream from three (3) wetlands of international importance
- no Commonwealth Marine areas near the proposed site
- potential for two (2) threatened ecological communities to exist within the proposed site
- potential for sixteen (16) threatened species to occur in the vicinity of the proposed site
- potential for eight (8) migratory species to occur within the vicinity of the proposed site.

Further assessments undertaken as part of this project revealed that no matters of national significance will be impacted upon, and therefore, no referral under the EPBC Act is required.

4.8 Flora

4.8.1 Bioregion and PCT type

The proposed project site is located in the Murray Darling Depression Bioregion of the Lower Murray-Darling Catchment.

According to the NSW Native Vegetation Classification and Assessment Project (NSWVCA), two vegetation communities occur on-site:

- Black Oak - Western Rosewood open woodland on deep sandy loams of Murray-Darling Depression and Riverina Bioregions (Benson 58 or plant community type LM108)
- Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones (Benson 170 or plant community type LM116).

Details of this PCT are shown in Table 4.

Table 4: PCT characteristics

PCT	Dominant canopy spp	Main associated spp	Landscape position	Characteristic mid-storey spp	Characteristic groundcover spp	Other diagnostic features
LM108	Black Oak (<i>Casuarina pauper</i>), Western Rosewood (<i>Alectryon oleifolius</i> subsp. <i>canescens</i>)	Sugarwood (<i>Myoporum platycarpum</i> subsp. <i>platycarpum</i>), <i>Pittosporum angustifolium</i>	On level to undulating sandplains, sandy rises and interdune swales.	Wilga (<i>Geijera parviflora</i>), Silver Cassia (<i>Senna</i> form taxon 'artemisioides'), <i>Senna eremophila</i> , <i>Exocarpos aphyllus</i> , Thorny Saltbush (<i>Rhagodia spinescens</i>), Black Bluebush (<i>Maireana pyramidata</i>), <i>Maireana brevifolia</i>	<i>Sclerolaena diacantha</i> , <i>Austrostipa nitida</i> , Speargrass (<i>Austrostipa scabra</i> subsp. <i>scabra</i>), <i>Zygophyllum apiculatum</i> , <i>Polycalymma stuartii</i> , <i>Tetragonia moorei</i> , <i>Salsola tragus</i> subsp. <i>tragus</i> ,	Mid-high (about 7 m high) low open woodland or isolated clumps of trees. Occurs on calcareous earths (pH >7) of red to red-brown loam, sand and texture contrast soils. Widely distributed in the far south-western NSW mainly in the Murray Darling Depression Bioregion.
LM116	White Mallee (<i>Eucalyptus dumosa</i>), Glossy-leaved Red Mallee (<i>Eucalyptus oleosa</i>), Snap and Rattle (<i>Eucalyptus gracilis</i>), Red Mallee (<i>Eucalyptus socialis</i>), Narrow-leaved Red Mallee	White Cypress Pine (<i>Callitris glaucophylla</i>), Slender Cypress Pine (<i>Callitris gracilis</i> subsp. <i>murrayensis</i>), Western Rosewood (<i>Alectryon oleifolius</i> subsp. <i>canescens</i>), Bulloak (<i>Allocasuarina luehmannii</i>), Black Oak	On aeolian sandplains or in interdune plains or swales.	<i>Chenopodium curvispicatum</i> , Pearl Bluebush (<i>Maireana sedifolia</i>), <i>Maireana georgei</i> , Black Bluebush (<i>Maireana pyramidata</i>), <i>Maireana pentatropis</i> , <i>Maireana brevifolia</i> , <i>Maireana erioclada</i> , Sugarwood (<i>Myoporum platycarpum</i>	Ruby Saltbush (<i>Enchylaena tomentosa</i>), <i>Atriplex stipitata</i> , <i>Zygophyllum apiculatum</i> , <i>Zygophyllum aurantiacum</i> , <i>Dissocarpus paradoxus</i> , <i>Chenopodium desertorum</i> subsp. <i>desertorum</i>	Bull mallee woodland or open mallee shrubland most usually about 8 m tall. Occurs on calcareous red-brown, sandy-loam or loamy clay soils, sometimes containing limestone nodules.

(Eucalyptus leptophylla)	(Casuarina pauper)	subsp. platycarpum), Acacia microcarpa, Silver Cassia (Senna form taxon 'artemisioides'),
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4.8.2 Threatened species

A database search was undertaken on 9 February 2016 of the NSW Environment and Heritage (BioNet Atlas of NSW Wildlife) and the Department of the Environment websites to identify threatened species that may be found within the proposed project site as listed under the *Threatened Species Conservation Act 1995* (TSC Act) and the *Environmental Protection and Biodiversity Act 1999* (EPBC Act).

A desktop search of the online databases was undertaken as follows:

- NSW Environment and Heritage BioNet Atlas of NSW Wildlife (refer to Appendix B)
- Department of the Environment, Environmental Protection and Biodiversity Conservation (EPBC) Protected Matters Report (refer to Appendix B).

No threatened flora species were identified from a 5km² radius database search.

4.8.3 Threatened communities

The above-mentioned databases were also searched for threatened communities. Four threatened communities were listed, including:

- *Acacia loderi* shrublands
- *Acacia melvillei* Shrubland in the Riverina and Murray-Darling Depression bioregions
- Sandhill Pine Woodland in the Riverina, Murray-Darling Depression and NSW South Western Slopes bioregions
- Bullock Woodlands of the Riverina and Murray-Darling Bioregions

None of these communities occur at the proposed project site or will be impacted upon by the proposal.

4.8.4 Flora site assessment

A general flora assessment was conducted across the proposed project site and the surrounding area on 18 February 2016 by Chris Alderton (B App Sci). The half-day assessment, adhering to Table 5.1 Survey Effort (DEC, 2004), focused on areas of likely higher vegetation values and active searches of likely habitat for reptiles and small mammals. Weather conditions were a clear sky, maximum temperature of 30°C and no wind.

According to the DEC field survey methods (DEC, 2004), the study area was 'random stratified' assessment based on vegetation type, aerial imagery information and the site assessment. The survey method undertaken is described as a 'stratified ramble assessment', where the whole site was assessed, with particular focus on areas of higher quality habitat (older trees with potential for nests and hollows, better quality

vegetation) that could be potentially impacted upon. Two vegetation types occur within the study site. The stratification units included (refer to Appendix A):

- Chenopod sandplain mallee woodland
- Black oak – western rosewood open woodland
- Black box open woodland

The study area does form part of a corridor linking the black box woodlands to the Mallee between the Gol Gol Lake and The Mourquong Swamp. There are other connections between these landscape features so the connectivity value is lower than if there were no other linkages. Hollow and nest bearing trees were observed within the study area and mitigation activities prior to removal should be adhered to (Section 4.8.5). The vegetation condition on-site was observed as 'low' according to DEC (2004).

The flora assessment revealed no vegetation species; populations or communities, which are of local, regional or state conservation significance (refer to Table 5).

Table 5: Flora Species recorded on-site

Scientific name	Common name	Threatened/Status
<i>Acacia homalphylla</i>	Yarran	No
<i>Acacia oswaldi</i>	Umbrella wattle	No
<i>Acacia victoriae</i>	Prickly acacia	No
<i>Alectryon oleifolius</i>	Western rosewood	No
<i>Allocasuarina pauper</i>	Black oak	No
<i>Atriplex stipitata</i>	Bitter saltbush	No
<i>Callitris glaucophylla</i>	White Cypress-pine	No
<i>Chenopodium melanocarpum</i>	Black Crumbweed	No
<i>Dissocarpus paradoxa</i>	Cannon ball	No
<i>Eucalyptus largiflorens</i>	Black box	No
<i>E. socialis</i>	Pointed Mallee	No
<i>Enchylaena tomentosa</i>	Ruby saltbush	No
<i>E. gracilis</i>	Yorrell	No
<i>Lysiana exocarpi</i> ssp. <i>exocarpi</i>	Harlequin mistletoe	No
<i>Marieana brevifolia</i>	Yanga Bush	No
<i>Marieana sedifolia</i>	Peal bluebush	No
<i>Myoporum patycarpum</i>	Sugarwood	No
<i>Nicotiana glauca</i>	Native Tobacco	No

Scientific name	Common name	Threatened/Status
<i>Pittosporum angustifolium</i>	Native apricot	No
<i>Rhagodia spinescens</i>	Hedge saltbush	No
<i>Sclerolaena diacantha</i>	Grey copperburr	No
<i>Solanum esuriale</i>	Quena	No
<i>Zygophyllum apiculatum</i>	Common Twin leaf	No

Denotes introduced species

4.8.5 Mitigation measures

- Borrowing site to be marked out using permanent markers indicating 'no go zones'
- Species profiles to be kept on-site of threatened species that have potential to inhabit the site
- Prior to removal of vegetation, trees shall be checked for fauna that may be present and if found, individuals shall be relocated by suitably trained and accredited persons.

4.9 Fauna

4.9.1 Threatened species

A database search was undertaken on 9 February 2016 of the NSW Environment and Heritage (BioNet Atlas of NSW Wildlife) and the Department of the Environment websites to identify threatened species that may be found within the proposed project site as listed under the *Threatened Species Conservation Act 1995* (TSC Act) and the *Environmental Protection and Biodiversity Act 1999* (EPBC Act).

A desktop search of the online databases was undertaken as follows:

- NSW Environment and Heritage BioNet Atlas of NSW Wildlife (refer to Appendix B)
- Department of the Environment, Environmental Protection and Biodiversity Conservation (EPBC) Protected Matters Report (refer to Appendix B).

None of these species were recorded during site assessments on 18 February 2016.

Table 6 lists the fauna species with state and national conservation significance that have the potential to occur within the study area. The column in Table 6 headed 'comment', identifies the suitability of the site for the particular species, such as for habitat utilisation, nesting/burrowing requirements, food and water requirements and the vegetation type preferred by the species. Five of those species have 'potential habitat' so have been assessed for significance, as per the Threatened Species Assessment Guidelines (DECC, 2007) (Appendix B).

green

Table 6: Listed Fauna Species

Class	Common name	Species name	State	National	Comment
Aves	Freckled Duck	<i>Stictonetta naevosa</i>	V		No potential habitat, prefer permanent freshwater swamps and creeks with heavy growth of Cumbungi, Lignum or Tea-tree.
Aves	Spotted Harrier	<i>Circus assimilis</i>	V		Potential habitat
Aves	Little Eagle	<i>Hieraaetus morphnoides</i>	V		Potential habitat
Aves	Square tailed-kite	<i>Lophoictinia isura</i>	V		Potential habitat
Aves	Curlew Sandpiper	<i>Curlew Sandpiper</i>	E	CE	No potential habitat, it generally occupies littoral and estuarine habitats, and in New South Wales is mainly found in intertidal mudflats of sheltered coasts
Aves	Major Mitchell's Cockatoo	<i>Lophochroa leadbeateri</i>	V		Potential habitat
Aves	Purple-crowned Lorikeet	<i>Glossopsitta porphyrocephala</i>	V		Potential habitat
Aves	Black-chinned Honeyeater	<i>Melithreptus gularis gularis</i>	V		Predicted to occur at this location, unlikely habitat requirements on site. Occupies mostly upper levels of drier open forests or woodlands dominated by box and ironbark eucalypts, especially Mugga Ironbark (<i>Eucalyptus sideroxylon</i>), White Box (<i>E. albens</i>), Inland Grey Box (<i>E. microcarpa</i>), Yellow Box (<i>E. melliodora</i>), Blakely's Red Gum (<i>E. blakelyi</i>) and Forest Red Gum (<i>E. tereticornis</i>).
Aves	Gilbert's whistler	<i>Pachycephala inornata</i>	V		Unlikely habitat, the Gilbert's Whistler occurs in a range of habitats within NSW, though the shared feature appears to be a dense shrub layer.
Aves	Australian Painted Snipe	<i>Rostratula australis</i>	E	E	No potential habitat prefers fringes of swamps, dams and nearby marshy areas where there is a cover of grasses,

green

Class	Common name	Species name	State	National	Comment
					lignum/low scrub.
Mammal	Spotted-tailed Quoll	<i>Dasyurus maculatus</i>	V	E	No potential habitat and not known from this region.
Amphibia	Southern Bell-frog	<i>Litoria raniformis</i>	E	V	No potential habitat

4.9.2 Fauna site assessment

A general fauna assessment was conducted across the proposed area, including nearby areas of intact vegetation, by Chris Alderton (B App Sci). The assessment also focused on the access to the site and surrounding habitats. It was noted that nests and hollows exist within the area proposed to be removed. To minimise impacts a staged approach to vegetation clearing will be undertaken, that is only vegetation required to be removed is and not all cells at once. The three-step process as outlined in Section 4.9.3 shall be used at all times to minimise disturbance to birds and other hollow dwelling species.

The fauna assessment revealed no species; population or communities, which are of local, regional or state conservation significance (refer to Table 7). The number of species recorded on site was average for the timing of the assessment, weather conditions, quality of habitat foraging areas, food and water sources.

Table 7: Fauna species recorded on site

Scientific name	Common name	Threatened
<i>Columba livia domestica</i>	Pigeon	No
<i>Corvus bennetti</i>	Little Crow	No
<i>Eolophus roseicapilla</i>	Galah	No
<i>Gymnorhina tibicen</i>	Australian Magpie	No
<i>Manorina melanocephala</i>	Noisy Miner	No
<i>Ocyphaps lophotes</i>	Crested Pigeon	No
<i>Psephotus varius</i>	Mulga Parrot	No
<i>Ctenotus sp.</i>	Stripped Skink	No

4.9.3 Mitigation measures

- Borrow pits and stockpiles are to be examined prior to work starting each day to remove any reptiles or other fauna that may be within the work site
- Profiles of threatened species that have potential to inhabit the site will be kept on site.
- A three step tree removal process should be undertaken where:
 - 1. the tree is hit with a hard object (ie sledge hammer or excavator bucket), five minutes before the tree is brought to the ground
 - 2. The tree is felled and left to remain in place overnight to allow any animals to escape
 - 3. The felled tree is removed to the stockpile location for rehabilitation at a later date.

4.10 Weeds and pests

Weed and pest animal assessments were conducted within the proposed borrow area on 18 February 2016, recording weed and pest attributes by Chris Alderton (B App Sci). Twelve weed species were observed and three introduced fauna species refer to Table 8 which also lists the species status.

Table 8: Weed and pest observed

Scientific name	Common name	Status
<i>Carrichtera annua</i>	Wards Weed	
<i>Centaurea calcitrapa</i>	Star thistle	
<i>Cucumis myriocarpus</i>	Paddy melon	
<i>Datura Spp.</i>	Downy thorn-apple	
<i>Heliotropium europaeum</i>	Common heliotrope	
<i>Lycium ferocissimum</i>	African Boxthorn	Class 4 – Locally controlled, WoNS
<i>Marrubium vulgare</i>	Horehound	Class 4 – Locally controlled
<i>Nothoscordum inodorum</i>	Onion weed	
<i>Psilocaulon tenure</i>	Match-head Plant	
<i>Salvia verbenaca</i>	Wild Sage	
<i>Schinus sp.</i>	Peppercorn	
<i>Tribulus terrestris</i>	Caltrop	
<i>Columba livia domestica</i>	Pigeon	
<i>Oryctolagus cuniculus</i>	European Rabbit	
<i>Bos sp.</i>	Cattle	

4.10.1 Mitigation measures

- Machinery will be washed down off-site prior to entering the proposed borrow areas to ensure it is weed free
- The WSC weeds officer to monitor the area regularly.

4.11 Heritage

A site inspection was conducted 18 April 2016 by Sarah Watts from Sunset Archaeological Services who holds a Bachelor of Archaeology with Honours. The site inspection included participation by Noel Johnston and Rodney Lawson of the Barkindji community.

The site inspection involves a pedestrian survey which progressed on north to south transects from the western side of the project area to the eastern side. Participants were spaced between 1.5 to 4 meters apart during the physical survey providing a detailed survey of approximately 80% of the project area. Visibility during the survey varied between 50 to 80 % with the poorer areas of visibility being those around the existing trees due to leaf litter and denser low lying vegetation while the open cleared land (western side) provided great visibility with the only hindrance being small patches of grasses and ground vegetation.

The western side of the project area appears to have only been disturbed by grazing animals and rabbits during warren preparation. While the eastern side of the project area has been significantly disturbed during loam extraction and later motor bike riders. It was noted there was significant amount of rubbish on the ground surface and eroding

out of the soil on the eastern side suggesting repetitive ground disturbances. There are mature trees throughout the project area but none of these trees showed any signs of Aboriginal cultural scarring.

At the conclusion of the onsite inspection only one site was discovered, Buronga Landfill Artefact Scatter 1, at co-ordinates E610565 N 6223164 Zone 54 and consisted of a sandstone core split in two. A site card was lodged with NSW Office of Environment and Heritage and an AHIP should be gained for this site.

The assessment did not reveal any other areas where conservation activities to protect cultural heritage material are required. Historical quarrying in the north-east corner of the project area provides an indication of subsurface conditions.

The Murray River is located approximately 4.2km south west of the project site, which would have provided a permanent water supply and the Gol Gol Creek and lakes would have filled intermittently only during times of a high river and emptied back to the river on flood recession. The proposed borrow area did not contain features that the Aboriginal monitors believed warranted further investigation.

An Aboriginal Heritage Information Management System (AHIMS) database search was undertaken of the lot and DP, with a 1km buffer (refer Appendix C). Two Aboriginal sites were recorded north of the proposed borrow area, both open sites.

The Due Diligence Code of Practice for the Protection of Aboriginal Objects in NSW (DECCW, 2010) was reviewed to determine if an Aboriginal Heritage Impact Permit (AHIP) is required. Section 8 of this document provides a flow chart of the due diligence process.

This project has assessed that impacts to any unknown cultural heritage sites of significance is unlikely, but as an isolated scatter was found, therefore, a cultural heritage assessment adhering to the Code of Practice for Archaeological Investigation of Aboriginal objects in NSW and an AHIP is required.

As outlined in the Due Diligence Code of Practice for the Protection of Aboriginal Objects in NSW, a number of assessments and tests have been undertaken to ensure no harm is caused to places of Aboriginal significance.

This code sets out the reasonable and practicable steps that individuals and organisations need to take in order to:

1. identify whether or not Aboriginal objects are, or are likely to be, present in an area.
2. determine whether or not their activities are likely to harm Aboriginal objects (if present).
3. determine whether an AHIP application is required.

In following the generic due diligence process, the following processes have occurred (refer to Table 9)

Table 9: Due diligence process

Step	Guide	Response
<i>1a. Will the proposed activity disturb the ground surface or any recorded culturally modified trees?</i>	Review project footprint in relation to the AHIMS search to determine whether the proposed activity will disturb the ground surface or involve vegetation clearance including lopping.	Yes - move to step 2a(i)
<i>2a(i). Search the AHIMS database and determine whether any Aboriginal sites have been recorded in or within 1000 metres of the project area.</i>	If not already undertaken, undertake 'basic' AHIMS search of the project area with a 1000 metre buffer of the project area Lot and DP. Append AHIMS basic search results ☒	Two sites - go to step 2a(ii)
<i>2a(ii). Obtain copies of AHIMS records</i>	If not already undertaken from step 2, undertake 'extensive' AHIMS search of the project area with a 1000 metre buffer of the project area Lot and DP. Append AHIMS extensive search results ☒ Map project area and all AHIMS results using GDA94 latitude and longitude data. If not already undertaken at step 2 above, map AHIMS results and append ☒ Request and review copies of all site cards within the searched area. Append all site cards ☒	Number of Aboriginal objects in the searched area: Two Aboriginal Sites In all instances, go to step 2a(iii)
<i>2a(iii). Review other sources of information to determine whether Aboriginal objects are likely to be present in the project area?</i>	If you are aware of other sources of information, you need to use these to identify whether or not Aboriginal objects are likely to be present in the project area. Previous studies ☒ Previous reports ☒ Previous archaeological surveys ☒ Review relevant Local Environmental Plan, notably Schedule 5 and maps ☐ Other ☐ Append results ☐	As a result of step 2a(iii), are there likely to be additional Aboriginal objects or areas of Aboriginal cultural heritage sensitivity present in the project area? Yes - describe nature, extent and significance below. Go to step 2b An Aboriginal Cultural Heritage Assessment (ACHA) was undertaken in around 2000 and a second in 2010 at a Gypsum Mine nearby at the Mourquong Lake which did not locate any cultural heritage assets. An ACHA was undertaken in 2008 at the Australian Vintage Winery waste water expansion site which also did not located are areas of CH significance.

		An ACHA was conducted in 1992 for National Parks and Wildlife by J.L. Craib. The study included the area between Wentworth and Gol Gol with part of the study focusing on Lake Mourquong. During the survey along the eastern lunette of Lake Mourquong only two pieces of chipped stone were discovered, a silcrete core and a quartz flake. No cultural heritage was discovered within the survey areas on the western margins of the lake. Describe the expected nature, extent and significance of the Aboriginal objects and/or areas of Aboriginal cultural heritage sensitivity. As previous studies concluded the higher frequency of cultural heritage sites are likely to be found within one kilometre from a fresh water source. As the activity area is 1.7 kilometres from the Gol Gol Lake and 500 meters from Lake Mourquong there is a possibility of finding Aboriginal cultural heritage. The cultural heritage most likely to be found include hearths, lithic scatter, scarred trees, shell deposits and ancestral burials.
<i>2b. Having regard to landscape features, are Aboriginal objects likely to be present in the project area?</i>	Is any part of the proposed activity on land that is not disturbed land <u>and</u>: Within 200 metres of waters? ☐ Within a sand dune system? ☐ On a ridge top, ridge line or headland? ☐ Within 200 metres below or above a cliff face? ☐ Within 20 metres of, or in a cave, rock shelter, or a cave mouth? ☐ Append mapped results ☐	No boxes checked and reasonable to conclude that there are no known Aboriginal objects or a low probability of objects occurring in the project area - no further due diligence required. Proceed with caution There are no features present within the project area which are likely to contain Aboriginal Cultural heritage.
3. Can you avoid harm to the object or disturbance of the landscape feature?	Where, as a result of step 2a(i, ii, iii) you think it is likely that there are Aboriginal objects present in the project area, describe whether you can avoid harm to those objects. Where you have checked any boxes in step 2b above, describe whether you can redesign the project area to avoid the landscape feature(s). Append results ☐	Due diligence site assessment recommended.

4. Engage heritage consultant to undertake visual inspection and desktop assessment for the purposes of due diligence.	Undertake a desktop assessment of Aboriginal heritage. This must consider the project area as a whole, not just the particular area(s) where Aboriginal object(s) have been recorded on AHIMS or where landscape features are located. At a minimum this should include existing knowledge of Aboriginal cultural heritage from previous reports or studies, including any reports from AHIMS. Append results of the desktop assessment ☐ Undertake a visual inspection of the project area to determine whether Aboriginal objects are present, or likely to be present in the project area. Ground truth recorded Aboriginal objects in and adjacent to the project area. The visual inspection must be undertaken by a person with expertise in locating and identifying Aboriginal objects, i.e., a consultant with appropriate qualifications, or an Aboriginal person or landholder with experience in locating and identifying Aboriginal objects. Append results of the visual inspection ☐	No - no further due diligence required. Proceed with caution A site inspection was conducted 18 April 2016 by Sarah Watts from Sunset Archaeological Services who holds a Bachelor of Archaeology with Honours. The site inspection included participation by Noel Johnston and Rodney Lawson of the Barkindji community. The site inspection involves a pedestrian survey which progressed on north to south transects from the western side of the project area to the eastern side. Participants were spaced between 1.5 to 4 meters apart during the physical survey providing a detailed survey of approximately 80% of the project area. Visibility during the survey varied between 50 to 80 % with the poorer areas of visibility being those around the existing trees due to leaf litter and denser low lying vegetation while the open cleared land (western side) provided great visibility with the only hindrance being small patches of grasses and ground vegetation. The western side of the project area appears to have only been disturbed by grazing animals and rabbits during warren preparation. While the eastern side of the project area has been significantly disturbed during loam extraction and later motor bike riders. It was noted there was significant amount of rubbish on the ground surface and eroding out of the soil on the eastern side suggesting repetitive ground disturbances. There are mature trees throughout the project area but none of these trees showed any signs of Aboriginal cultural scarring. At the conclusion of the onsite inspection only one site was discovered, Buronga Landfill Artefact Scatter 1, at co-ordinates E610565 N 6223164 Zone 54 and consisted of a sandstone core split in two (refer Appendix D).
Step 5. Further investigations and impact assessment	Step 5 must be undertaken by a person with expertise in Aboriginal cultural heritage management.	A cultural heritage assessment adhering to the Code of Practice for Archaeological Investigation of Aboriginal objects in NSW and an AHIP is required.

4.11.1 Other cultural heritage

The State Heritage Register (NSW Environment and Heritage) database was used to determine if any areas of historic value were located on or nearby the proposed project site. There are no other known cultural heritage sites within the proposed project area. This was to be expected due to the remoteness of the proposed project area and the lack of visible remnants located through the on site assessment.

4.11.2 Mitigation measures

- Follow the contingency plan outlined in Appendix E
- If any Aboriginal object is discovered and/or harmed in, or under the land, while undertaking earthwork activities, the proponent must:
 1. Not further harm the object
 2. Immediately cease all work at the particular location
 3. Secure the area so as to avoid further harm to the Aboriginal object
 4. Notify OEH as soon as practical on 131555, providing any details of the Aboriginal object and its location
 5. Not recommence any work at the particular location unless authorised in writing by OEH.

4.12 Air quality

The nearest residence and receptor is located more than 1.2km south-west of the borrow site and the nearest public road is approximately 200m west. Given the remoteness from any residence or public road, there will be no impact from the expected minor raised dust that may occur from time to time during heavy vehicle movements and plant operation.

The key performance indicator will be no complaints or raised dust received at the residences over 1.2km away. Ongoing monitoring will occur visually by dust observed around the residences. Records of increased dust will be kept and recorded with the property's rainfall records. The response mechanism will be to stop activity causing dust if possible or to mitigate using sprayed water. Compliance will be enforced by the on-site WSC team leader.

Practices associated with earthworks that could affect air quality include bush fire, exhaust emissions from vehicles and plant and windblown dust during operational periods. To mitigate dust, rock will be applied to the road between the borrow pit and the landfill as required to minimise raised dust from transport activities.

Where dust becomes an issue, despite the laying of crushed rock, water may be sprayed over the tracks.

4.12.1 Mitigation measures

- No burning of timber or other combustible materials will occur on-site
- All plant and equipment will be equipped with fire extinguishers
- Staff shall be trained in firefighting techniques in the event of a bushfire, or fire on plant or equipment
- All vehicles and plant will be regularly serviced, be in good working order and emissions will be kept within manufacturers standards
- Roads between the borrow pit and landfill will be maintained to the WSC quality standards allowing efficient and safe operation

- Borrowing/carting operations will cease if severe wind conditions are present.

4.13 Socio and economic

The objective of this proposal is to secure a source of cover material to allow the landfill to operate within its licence conditions. This borrow material will allow local residences to continue to use the landfill. The beneficiaries of this proposal will be local residents and businesses as they will be able to continue to dispose of their rubbish and recycle products to ensure that there is as little harm to the environment as possible.

4.13.1 Economic

The expected cost of the development is approximately \$220,000 by the time the borrow pits are operational. Additional costs include the maintenance of plant and equipment required for borrowing and carting cover material.

The operation will employ local drivers and operators throughout the life of the landfill. The economic returns to the local economy will be by way of income through employment. The flow-on effects are important to the Wentworth, Dareton and Buronga areas.

4.13.2 Social

The proposal will not disadvantage any individuals or communities, and consultation with all known affected groups has been undertaken.

As required by any construction site in NSW, appropriate signage will be placed around the borrow area, including truck turn in, PPE and general safety signs. Due to the shallow depth of the borrow pit, no safety fencing will be required.

4.13.3 Impact on the community

Although the character of the area would be slightly affected, by minimising the extent of the impact and undertaking rehabilitation, there would be minimal long-term impacts.

4.13.4 Visual impact

The proposed borrow areas will have low visual impact due to the screening of native vegetation between the Arumpo Road and the project area. The Borrow areas will be converted in to landfill cells and repurposed. Ongoing rehabilitation of the existing landfill will occur once it is full.

4.13.5 Mitigation measures

- Appropriate signage as required under legislation and adherence with best practice management
- Adhere to the Buronga Landfill – Landfill Environmental Management Plan (WSC, 2015).

4.14 Transport

The proposed project will utilise existing tracks from the Arumpo Road to the borrow site. No trucks will be required to use the Arumpo Road (or any other road network) for carting borrow material between the borrow site and the landfill.

A bulldozer, front end loader, two tip trucks and up to two light vehicles will be required.

This project will be undertaken with adherence to relevant legislation and best practice management.

It is expected that a contractor and/or WSC staff will travel to the site each day (up to two light vehicles) between 6.30am and 7.30am. There may be up to 25 truck movements per day and the contractor/WSC staff will leave the site between 4pm and 6pm each evening. The impact of these additional short-term vehicle movements will not impact the existing traffic mix, consisting of local landholders, travellers and stock carting transport.

4.14.1 Mitigation measures

- Staff shall be trained in fire fighting techniques in the event of a bushfire, or fire on plant or equipment
- Adhere to the Buronga Landfill – Landfill Environmental Management Plan (WSC, 2015).

4.15 Noise and vibration

The main source of noise may arise from the use of heavy machinery to extract and load borrow material; and trucks to cart the material between sites. Considering the distance of the project area from the nearest residence (receptor) is over 1km away; and the hours of operation (7am to 6pm Monday to Friday and 8am to 12noon Saturday), any noise created will not cause a significant detrimental impact on the surrounding land users.

Table 10 is adapted from Bassett Acoustics (2007) in the Northern Expressway Noise and Vibration Technical Paper, which predicts noise levels without mitigation in urban environments. In rural environments, 50dB is acceptable. Noise decreases with distance, so with the nearest receptor 1km away the predicted dB will be well below acceptable limits.

Table 10: Predicted dB(A) noise levels at various distances

Plant type	7m	25m	50m	100m	200m
Front end loader	88	77	71	65	59
Large Bulldozer	92	81	75	69	63
Road truck	83	72	66	60	54
Crushing plant	91	80	74	68	62

Major sources of ground vibration include bulldozers (ripping), front end loaders and truck movements during work. Vibrations generated from construction and earthmoving activities are expected to be similar in magnitude as those generated from the operation of similar equipment to be used.

Ground vibration impacts at specific levels of magnitude may either:

- disturb occupants of buildings
- disturb contents of buildings by rattling, shaking or movements

- affect structural integrity of a building.

Table 11 indicates the approximate vibration levels that may be expected for various vibration sources (Bassett Acoustics, 2007). Due to the nearest receptor being over 1km away, no vibration is expected due to the large distance between activity and receptor.

Table 11: Approximate generated ground vibration levels (mm/s) for various sources

Activity	Typical levels of ground vibration
Hydraulic rock breakers	4.5mm/s @5m 1.30mm/s @10m 0.4mm/s @20m 0.10mm/s @50m
Bulldozer	1-2mm/s @5m (approx.) 2mm/s @15m >0.3mm/s@<30m
Truck traffic (irregular surfaces)	0.1-2.0mm/s at footings of buildings 10-20m from a road way

4.15.1 Mitigation measures

- Plant and equipment serviced and using manufacturers specified mufflers
- Borrowing operations to occur on site only during business hours (7am-6pm Monday to Friday and 8am -12pm Saturday).

4.16 Bushfire hazards

Due to the nature of the proposal and the composition of vegetation species at the site, it is highly unlikely that the vegetation would carry a fire. The wide spacing of individual trees and the limited amount of dry matter of grass species present (due to the arid climate and grazing) would not be conducive to the spread of fire.

No bushfires are known to have spread through the area in the last 25 years.

4.16.1 Mitigation measures

- No burning of timber or other combustible materials will occur on site
- All plant and equipment will be equipped with fire extinguishers
- Staff shall be trained in firefighting techniques in the event of a bushfire, or fire on plant or equipment
- All vehicles and plant will be regularly serviced, be in good working order and emissions to be kept within manufacturers standards
- Adhere to the Buronga Landfill – Landfill Environmental Management Plan (WSC, 2015).

4.17 Chemical and hazardous substance management

No hazardous substances will be stored on site. Limited hazardous substances will be brought on site, in particular fuels and lubricants, eg. oil, grease and distillate, as the fuel for heavy equipment will be transported as required on utility, trailer or fuel truck. Best management practices will be followed when these substances are transferred and in use as stipulated by WSC work practices. Empty containers will be taken off the site and suitably disposed of to landfill or for recycling.

4.17.1 Mitigation measures

- Staff trained in best practice in chemical and hazardous substance management
- All vehicles and machinery to be regularly serviced, be in good working order and emissions to be kept within manufacturers standards
- Staff shall be trained in fire fighting techniques in the event of a bushfire, or fire on plant or equipment
- All vehicles serviced off-site
- Staff inducted on refuelling procedures, which will be stored with refuelling equipment
- No fuels or lubricants to be stored on site
- In the event of unexpected breakdown of heavy machinery on the site, the spill kit will be used to prevent leakage of petroleum products to the soil - should soil contamination occur, soil will be removed to a licensed facility as per EPA guidelines
- Any discarded oils, worn machinery parts, damaged tyres, broken hoses or empty containers will be removed to a waste storage area on the day they are generated.

4.18 Waste minimisation and management

The work site will operate in a tidy, rubbish-free state. Any wastes generated will be contained and removed from the site for recycling or safe disposal. No environmental problems are anticipated with the disposal of potential waste.

4.18.1 Mitigation measures

- Staff will be trained in best practice in all areas of earthworks.

4.19 Stormwater management

The WSC has a stormwater management plan in place, which will be implemented throughout the life of the project. The aim of this plan is to ensure that all stormwater is retained on-site and there are no off-site impacts. The plan includes measures for maintaining current roads and borrow areas. Due to the porous nature of the loamy soil, stormwater infiltrates quickly through the soil profile and rarely causes a problem.

4.19.1 Mitigation measures

- Maintain current stormwater management plan
- Install cut-off drains as required
- Install silt fences and erosion control as required
- Adhere to the Buronga Landfill – Landfill Environmental Management Plan (WSC, 2015).

4.20 Cumulative environmental impacts

The cumulative environmental impacts of the proposal will be minimal. As stated throughout Section 4, each identified impact has been assessed for its potential threat to the environment. Mitigation measures will help minimise the impact on the proposed project area, as well as off-site impacts.

4.21 Summary of mitigation measures

A range of mitigation measures will be put in place to ensure the proposal has minimal impact on the environment, both on site and off site, including:

- Daily pre-start machinery checks for leaks of oil, fuel or other liquids
- Contingency plans will be in place to deal with spills, adhering to relevant Australian Standards and Guidelines and conforming to leading practice
- The development will be staged, removal of trees and stripping of topsoil will only occur as required based on the demand level for cover material
- No machinery, fuels, oils, chemicals, hazardous substances or other earthmoving equipment will be stored within the borrow site when not in use
- Staff inducted on refuelling procedures, which will be stored with refuelling equipment
- Adhere to the Buronga Landfill – Landfill Environmental Management Plan (WSC, 2015)
- Staff to be trained in best practice management in soil conservation and management
- Staff inducted on refuelling procedures, which will be stored with refuelling equipment
- A spill kit will be permanently attached to the portable fuel cart, which is brought on to site each day
- All machinery to be serviced off-site
- Supervision of earthworks will be undertaken by a suitably qualified/experienced person as per WSC policies
- Borrow material will only be extracted and used as required
- Borrowing will only occur during suitable conditions e.g not on days of rain, high wind or flooding
- Borrowing site to be marked out using permanent markers indicating 'no go zones'
- Species profiles to be kept on-site of threatened species that have potential to inhabit the site
- Prior to removal of vegetation, trees shall be checked for fauna that may be present and if found, individuals shall be relocated by suitably trained and accredited persons.
- Machinery will be washed down off-site prior to entering the proposed borrow areas to ensure it is weed free
- The WSC weeds officer to monitor the area regularly
- Borrow pits and stockpiles are to be examined prior to work starting each day to remove any reptiles or other fauna that may be within the work site
- Profiles of threatened species that have potential to inhabit the site will be kept on site.

- A three step tree removal process should be undertaken where:
 - 1. the tree is hit with a hard object (ie sledge hammer or excavator bucket), five minutes before the tree is brought to the ground
 - 2. The tree is felled and left to remain in place overnight to allow any animals to escape
 - 3. The felled tree is removed to the stockpile location for rehabilitation at a later date.
- Follow the contingency plan outlined in Appendix E
- If any Aboriginal object is discovered and/or harmed in, or under the land, while undertaking earthwork activities, the proponent must:
 1. Not further harm the object
 2. Immediately cease all work at the particular location
 3. Secure the area so as to avoid further harm to the Aboriginal object
 4. Notify OEH as soon as practical on 131555, providing any details of the Aboriginal object and its location
 5. Not recommence any work at the particular location unless authorised in writing by OEH
- No burning of timber or other combustible materials will occur on-site
- All plant and equipment will be equipped with fire extinguishers
- Staff shall be trained in fire fighting techniques in the event of a bushfire, or fire on plant or equipment
- All vehicles and plant will be regularly serviced, be in good working order and emissions will be kept within manufacturers standards
- Roads between the borrow pit and landfill will be maintained to the WSC quality standards allowing efficient and safe operation
- Borrowing/carting operations will cease if severe wind conditions are present.
- Appropriate signage as required under legislation and adherence with best practice management
- Plant and equipment serviced and using manufacturers specified mufflers
- Borrowing operations to occur on site only during business hours (7am-6pm Monday to Friday and 8am -12pm Saturday).
- Maintain current stormwater management plan
- Install cut-off drains as required
- Install silt fences and erosion control as required
- Staff trained in best practice in chemical and hazardous substance management
- No fuels or lubricants to be stored on site
- In the event of unexpected breakdown of heavy machinery on the site, the spill kit will be used to prevent leakage of petroleum products to the soil - should soil contamination occur, soil will be removed to a licensed facility as per EPA guidelines
- Any discarded oils, worn machinery parts, damaged tyres, broken hoses or empty containers will be removed to a waste storage area on the day they are generated.

5.0 Risk Management

Table 12 provides an overview of the risks associated with the proposed project. The table should be read down the left hand side column to identify the issues at the site and then the activities, processes or facilities are listed across the top of the table.

The table has been completed using a risk assessment of low (L), medium (M) and high (H) and not applicable (n/a).

Table 12: Environmental Risk Identification Matrix

Issue	Activity, Process or Facility													
	Land preparation, vegetation & topsoil	All quarrying activities including earth moving	Mine development and mining, surface &	Use/maintenance of roads, tracks and	Waste rock emplacement management	Mineral processing facilities and operations	Ore/product stockpiling and handling	Tailings impoundment management	water management including storm event	Hazardous materials & fuel, handling/spills	Sewerage	Other infrastructure use and operation	Rubbish disposal	Rehabilitation activities
Natural resources use	M	L	L	L	L	L	L	n/a	L	L	n/a	L	L	L
Hydrology and geomorphology	L	L	L	L	L	L	L	n/a	M	L	n/a	L	L	M
Floodplain and riparian habitat	L	L	L	L	L	L	L	n/a	L	L	n/a	L	L	L
Erosion and sedimentation	L	L	L	L	L	L	L	n/a	L	L	n/a	L	L	L
Surface water	L	L	L	L	L	L	L	n/a	L	L	n/a	L	L	L
Groundwater	L	L	L	L	L	L	L	n/a	L	L	n/a	L	L	L
Soils	M	M	M	M	L	L	L	n/a	L	L	n/a	L	L	L
Flora	M	L	M	L	L	L	L	n/a	L	L	n/a	L	L	L
Fauna	L	L	L	L	L	L	L	n/a	L	L	n/a	L	L	L
Weeds and pests	L	L	L	L	L	L	L	n/a	L	L	n/a	L	L	L
Heritage	M	L	L	L	L	L	L	n/a	L	L	n/a	L	L	L

	Activity, Process or Facility															
Issue	Land preparation, vegetation & topsoil	All construction activities including earth moving	Mine development and mining, surface &	Use/maintenance of roads, tracks and	Waste rock emplacement management	Mineral processing facilities and operations-	Ore/product stockpiling and handling	Tailings impoundment management	water management including storm event	Hazardous materials & fuel, handling/spills	Sewerage	Other infrastructure use and operation	Rubbish disposal	Rehabilitation activities	Rehabilitation maintenance, pending	Rehabilitated land and remaining features
Air quality	L	L	L	L	L	L	L	n/a	L	L	n/a	L	L	L	L	L
Socio and economic	L	L	L	L	L	L	L	n/a	L	L	n/a	L	L	L	L	L
Transport	L	L	L	L	L	L	L	n/a	L	L	n/a	L	L	L	L	L
Noise and vibration	L	L	L	L	L	L	L	n/a	L	L	n/a	L	L	L	L	L
Bushfire hazards	L	L	L	L	L	L	L	n/a	L	L	n/a	L	L	L	L	L
Chemical and hazardous substance management	L	L	L	L	L	L	L	n/a	L	L	n/a	L	L	L	L	L
Waste minimisation and mgt	L	L	L	L	L	L	L	n/a	L	L	n/a	L	L	L	L	L
Stormwater management	L	L	L	L	L	L	L	n/a	L	L	n/a	L	L	L	L	L

Legend – L=Low, M=medium, n/a not applicable

6.0 Summary of impacts and conclusions

Table 13 summarises the potential impact of the project, following a thorough on site assessment and various database searches on threatened species and cultural heritage. Overall, the level of impact is expected to be low and this is further reduced through the implementation of mitigation measures summarised in Section 4.

Table 13: Summary of potential impacts

Section	Potential Impact	Summary of Impacts
4.1	Natural resource use	Removal of borrow material
4.2	Hydrology and geomorphology	No impact
4.3	Erosion and sedimentation	No impact
4.4	Surface water	No impact
4.5	Groundwater	No impact
4.6	Soils	Removal and stockpile of topsoil for respreading, borrow material for landfill cover
4.7	Matters of NES	No impact
4.8	Flora	Removal of vegetation, no impact on threatened species
4.9	Fauna	No impact on critical habitat for threatened species
4.10	Weeds and pests	No impact
4.11	Heritage	Unlikely impacts to unknown sites and objects based on desktop and on site assessment. AHIP will be gained for the open site located as part of the due diligence process.
4.12	Air quality	Some vehicle emissions and dust from borrowing activity, will not cause problems due to low population density
4.13	Socio and economic	No adverse impacts
4.14	Transport	No public roads to be used for carting activities
4.15	Noise and vibration	Use of machinery to extract, load and cart borrow material
4.16	Bushfire hazards	No impacts
4.17	Chemical and Hazardous Substance	No impacts, none stored on site, oils, grease, fuel
4.18	Waste Minimisation	No impacts
4.19	Stormwater Management	No off-site impacts

7.0 References

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Appendix B: Assessment of significance and threatened species searches

Assessment of significance for borrow pit development adjacent to Buronga Landfill

Introduction

This assessment of significance is part of the review of environmental factors, 28km west of Wentworth, NSW. The proposed borrow pit location is located north of the existing licence landfill known as Buronga Landfill.

The objective of this proposal is to secure a source of borrow material (soil) to be used for daily cover as required under the landfills environmental protection licence. The proposal is to extract borrow material up to 13m deep across up to five (5) new cells. The proponent is the Wentworth Shire Council (WSC).

In respect to terrestrial biodiversity values, the area has been modified (grazing, vegetation clearing, and quarrying) and contains the species commonly found in such environments, including native grasses, rangeland groundcover and introduced species.

The proposed works occur within the WSC municipal area and within the Local Lands Service - Western. The proposed borrow site is located in the Murray Darling Depression Bioregion.

According to the NSW Native Vegetation Classification and Assessment Project (NSWVCA), the vegetation at the site is classified as:

- Black Oak - Western Rosewood open woodland on deep sandy loams of Murray-Darling Depression and Riverina Bioregions (Benson 58 or plant community type LM108)
- Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones (Benson 170 or plant community type LM116).

A database search was undertaken on 9 February 2016 of the NSW Environment and Heritage (BioNet Atlas of NSW Wildlife) and the Department of the Environment websites to identify threatened species that may be found within the proposed quarrying site as listed under the *Threatened Species Conservation Act 1995* (TSC Act) and the *Environmental Protection and Biodiversity Act 1999* (EPBC Act).

A desktop search of the online databases was undertaken as follows:

- NSW Environment and Heritage BioNet Atlas of NSW Wildlife
- Department of the Environment, Environmental Protection and Biodiversity Conservation (EPBC) Protected Matters Report

The following threatened species have potential to occupy the site and have triggered a seven part assessment of significance:

- Spotted Harrier (*Circus assimilis*)
- Little Eagle (*Hieraaetus morphnoides*)
- Square tailed-kite (*Lophoictinia isura*)
- Major Mitchell's Cockatoo (*Lophochroa leadbeateri*)
- Purple-crowned Lorikeet (*Glossopsitta porphyrocephala*)

Spotted Harrier (*Circus assimilis*) (Vulnerable – NSW)

(a) In the case of a threatened species, state whether the life cycle of the species is likely to be disrupted such that a viable local population of the species is likely to be placed at risk of extinction.

The Spotted Harrier occurs throughout the Australian mainland, except in densely forested or wooded habitats of the coast, escarpment and ranges, and rarely in Tasmania. Individuals disperse widely in NSW and comprise a single population. Occurs in grassy open woodland including Acacia and mallee remnants, inland riparian woodland, grassland and shrub steppe. It is found most commonly in native grassland, but also occurs in agricultural land, foraging over open habitats including edges of inland wetlands. Due to the large habitat range of the species, the lifecycle is not likely to be disrupted such that a viable local population is likely to be placed at risk of extinction.

(b) In the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction.

N/A – The Spotted Harrier is not considered an endangered population at this location.

(c) In the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:

(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or

(ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction.

N/A – Spotted Harrier is not considered an endangered ecological community, but a single species.

(d) In relation to the habitat of a threatened species, population or ecological community:

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality.

Due to the small nature of the proposal and no habitat observed on site, the proposal is not cause fragmentation or isolations from other foraging/hunting habitats. The habitat proposed to be modified is not critical to the long term survival of the species.

(e) Whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly).

No critical habitat was observed on site, therefore will not have an adverse effect on critical habitat (either directly or indirectly).

(f) Whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan.

A recovery plan has not been developed for this species but recovery actions are outlined under the Saving Our Species program.

(g) Whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process

The action constitutes part of the following key threatening processes as listed in the *TSC Act 1995* Schedule 3:

- Clearing of native vegetation (as defined and described in the final determination of the Scientific Committee to list the key threatening process)

Little Eagle (*Hieraaetus morphnoides*) (Vulnerable – NSW)

(a) In the case of a threatened species, state whether the life cycle of the species is likely to be disrupted such that a viable local population of the species is likely to be placed at risk of extinction.

The Little Eagle is found throughout the Australian mainland excepting the most densely forested parts of the Dividing Range escarpment. It occurs as a single population throughout NSW. The species occupies open eucalypt forest, woodland or open woodland. Due to the large habitat range of the species, the lifecycle is not likely to be disrupted such that a viable local population is likely to be placed at risk of extinction.

(b) In the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction.

N/A – The Little Eagle is not considered an endangered population at this location.

(c) In the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:

(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or

(ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction.

N/A – The Little Eagle is not considered an endangered ecological community, but a single species.

(d) In relation to the habitat of a threatened species, population or ecological community:

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality.

Due to the small nature of the proposal and no habitat observed on site, the proposal is not cause fragmentation or isolations from other foraging/hunting habitats. The habitat proposed to be modified is not critical to the long term survival of the species.

(e) Whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly).

No critical habitat was observed on site, therefore will not have an adverse effect on critical habitat (either directly or indirectly).

(f) Whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan.

A recovery plan has not been developed for this species but recovery actions are outlined under the Saving Our Species program.

(g) Whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process

The action constitutes part of the following key threatening processes as listed in the *TSC Act 1995* Schedule 3:

- Clearing of native vegetation (as defined and described in the final determination of the Scientific Committee to list the key threatening process)

Square tailed-kite (*Lophoictinia isura*) (Vulnerable- NSW)

(a) In the case of a threatened species, state whether the life cycle of the species is likely to be disrupted such that a viable local population of the species is likely to be placed at risk of extinction.

The Square-tailed Kite ranges along coastal and subcoastal areas from south-western to northern Australia, Queensland, NSW and Victoria. In NSW, scattered records of the species throughout the state indicate that the species is a regular resident in the north, north-east and along the major west-flowing river systems. Found in a variety of timbered habitats including dry woodlands and open forests. Shows a particular preference for timbered watercourses. In arid north-western NSW, has been observed in stony country with a ground cover of chenopods and grasses, open acacia scrub and patches of low open eucalypt woodland. Due to the large habitat range of the species, the lifecycle is not likely to be disrupted such that a viable local population is likely to be placed at risk of extinction.

(b) In the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction.

N/A – The Square tailed-kite is not considered an endangered population at this location.

(c) In the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:

(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or

(ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction.

N/A – The Square tailed-kite is not considered an endangered ecological community, but a single species.

(d) In relation to the habitat of a threatened species, population or ecological community:

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality.

Due to the small nature of the proposal and no habitat observed on site, the proposal is not cause fragmentation or isolations from other foraging/hunting habitats. The habitat proposed to be modified is not critical to the long term survival of the species.

(e) Whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly).

No critical habitat was observed on site, therefore will not have an adverse effect on critical habitat (either directly or indirectly).

(f) Whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan.

A recovery plan has not been developed for this species but recovery actions are outlined under the Saving Our Species program.

(g) Whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process

The action constitutes part of the following key threatening processes as listed in the *TSC Act 1995* Schedule 3:

- Clearing of native vegetation (as defined and described in the final determination of the Scientific Committee to list the key threatening process)

Major Mitchell's Cockatoo (*Lophochroa leadbeateri*) (Vulnerable - NSW)

(a) In the case of a threatened species, state whether the life cycle of the species is likely to be disrupted such that a viable local population of the species is likely to be placed at risk of extinction.

The Major Mitchell's Cockatoo is found across the arid and semi-arid inland, from south-western Queensland south to north-west Victoria, through most of South Australia, north into the south-west Northern Territory and across to the west coast between Shark Bay and about Jurien. In NSW it is found regularly as far east as about Bourke and Griffith, and sporadically further east than that. Inhabits a wide range of treed and treeless inland habitats, always within easy reach of water. Feeds mostly on the ground, especially on the seeds of native and exotic melons and on the seeds of species of saltbush, wattles and cypress pines. Due to the large habitat range of the species, the lifecycle is not likely to be disrupted such that a viable local population is likely to be placed at risk of extinction.

(b) In the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction.

N/A – The Major Mitchell's Cockatoo is not considered an endangered population at this location.

(c) In the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:

(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or

(ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction.

N/A – The Major Mitchell's Cockatoo is not considered an endangered ecological community, but a single species.

(d) In relation to the habitat of a threatened species, population or ecological community:

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality.

Due to the small nature of the proposal and no habitat observed on site, the proposal is not cause fragmentation or isolations from other foraging/hunting habitats. The habitat proposed to be modified is not critical to the long term survival of the species.

(e) Whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly).

No critical habitat was observed on site, therefore will not have an adverse effect on critical habitat (either directly or indirectly).

(f) Whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan.

A recovery plan has not been developed for this species but recovery actions are outlined under the Saving Our Species program.

(g) Whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process

The action constitutes part of the following key threatening processes as listed in the *TSC Act 1995* Schedule 3:

- Clearing of native vegetation (as defined and described in the final determination of the Scientific Committee to list the key threatening process)

Purple-crowned Lorikeet (*Glossopsitta porphyrocephala*) (Vulnerable - NSW)

(a) In the case of a threatened species, state whether the life cycle of the species is likely to be disrupted such that a viable local population of the species is likely to be placed at risk of extinction.

The Purple-crowned Lorikeet occurs across the southern parts of the continent from Victoria to south-west Western Australia. It is uncommon in NSW, with records scattered across the box-ironbark woodlands of the Riverina and south west slopes, the River Red Gum forests and mallee of the Murray Valley as far west as the South Australian border, and, more rarely, the forests of the South Coast. The species is nomadic and most, if not all, records from NSW are associated with flowering events. Found in open forests and woodlands, particularly where there are large flowering eucalypts. Also recorded from mallee habitats. Feed primarily on nectar and pollen of flowering Eucalypts, including planted trees in urban areas. Due to the large habitat range of the species, the lifecycle is not likely to be disrupted such that a viable local population is likely to be place at risk of extinction.

(b) In the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction.

N/A – The Purple-crowned Lorikeet is not considered an endangered population at this location.

(c) In the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:

(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or

(ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction.

N/A – The Purple-crowned Lorikeet is not considered an endangered ecological community, but a single species.

(d) In relation to the habitat of a threatened species, population or ecological community:

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality.

Due to the small nature of the proposal and no habitat observed on site, the proposal is not cause fragmentation or isolations from other foraging/hunting habitats. The habitat proposed to be modified is not critical to the long term survival of the species.

(e) Whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly).

No critical habitat was observed on site, therefore will not have an adverse effect on critical habitat (either directly or indirectly).

(f) Whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan.

A recovery plan has not been developed for this species but recovery actions are outlined under the Saving Our Species program.

(g) Whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process

The action constitutes part of the following key threatening processes as listed in the *TSC Act 1995* Schedule 3:

- Clearing of native vegetation (as defined and described in the final determination of the Scientific Committee to list the key threatening process)

Conclusions

The assessment of significance for:

- Spotted Harrier (*Circus assimilis*)
- Little Eagle (*Hieraaetus morphnoides*)
- Square tailed-kite (*Lophoictinia isura*)
- Major Mitchell's Cockatoo (*Lophochroa leadbeateri*)
- Purple-crowned Lorikeet (*Glossopsitta porphyrocephala*)

revealed that the potential impacts of the proposal on these threatened species are extremely unlikely and where there could be potential impacts they will be very low. Potential minor impacts resulting from the proposed quarry are not expected to increase the likelihood of a threatened or endangered species becoming extinct.

The assessment of significance for these threatened species does not trigger the requirement for a species impact statement (SIS). The proposal is deemed to be non-significant for the assessed

species. In determining the significance of the proposed works on threatened species, the following matters were taken into consideration:

- implementation of the proposed works, including pre construction, construction, operation and maintenance phases
- activities to be undertaken in the area following the proposed works
- all direct and indirect impacts, on and off site impacts through all phases
- the frequency and duration of each known or likely impact/action
- the total impact which can be attributed to that action over the entire geographic area affected initially and over time
- the sensitivity of the receiving environment
- the degree of confidence with which the impacts of the action are known and understood.

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Australian Government
Department of 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: 07/02/16 21:47:15

[Summary](#)

[Details](#)

[Matters of NES](#)

[Other Matters Protected by the EPBC Act](#)

[Extra Information](#)

[Caveat](#)

[Acknowledgements](#)



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[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:	3
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	2
Listed Threatened Species:	16
Listed Migratory Species:	8

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:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	10
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Commonwealth Reserves Marine:	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:	24
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		150 - 200km upstream
Riverland		100 - 150km upstream
The coorong, and lakes alexandrina and albert wetland		200 - 300km 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
Buloke Woodlands of the Riverina and Murray-Darling Depression Bioregions	Endangered	Community may occur within area
River Murray and associated wetlands, floodplains and groundwater systems, from the junction with the Darling River to the sea	Approval Disallowed	Community may occur within area

Listed Threatened Species		[Resource Information]
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Name	Status	Type of Presence
Birds		
Botaurus poeciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat known to occur within area
Grantiella picta Painted Honeyeater [470]	Vulnerable	Species or species habitat may occur within area
Leipoa ocellata Malleefowl [934]	Vulnerable	Species or species habitat likely to occur within area
Manorina melanotis Black-eared Miner [449]	Endangered	Species or species habitat may occur within area
Pedionomus torquatus Plains-wanderer [906]	Critically Endangered	Species or species habitat may occur within area
Pezoporus occidentalis Night Parrot [59350]	Endangered	Extinct within area
Polytelis anthoepus monarchoides Regent Parrot (eastern) [59612]	Vulnerable	Species or species habitat likely to occur within area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area
Fish		
Craterocephalus fluviatilis Murray Hardyhead [56791]	Endangered	Species or species habitat likely to occur within area

Name	Status	Type of Presence
Maccullochella peelii Murray Cod [66633]	Vulnerable	Species or species habitat may occur within area
Frogs		
Litoria raniformis Growling Grass Frog, Southern Bell Frog, Green and Golden Frog, Warty Swamp Frog [1828]	Vulnerable	Species or species habitat known to occur within area
Mammals		
Nyctophilus corbeni Corben's Long-eared Bat, South-eastern Long-eared Bat [83395]	Vulnerable	Species or species habitat likely to occur within area
Phascogaleus 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 may occur within area
Plants		
Lepidium monoplacoides Winged Pepper-cress [9190]	Endangered	Species or species habitat likely to occur within area
Solanum karsense Menindee Nightshade [7776]	Vulnerable	Species or species habitat likely to occur within area
Swainsona murrayana Slender Darling-pea, Slender Swainson, Murray Swainson-pea [6765]	Vulnerable	Species or species habitat likely to occur within area
Listed Migratory Species		
* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.		
[Resource Information]		
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		
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area
Migratory Wetlands Species		
Ardea alba Great Egret, White Egret [59541]		Species or species habitat known 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 likely to occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat may occur within area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat likely to occur within area

Other Matters Protected by the EPBC Act

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		
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Ardea alba Great Egret, White Egret [59541]		Species or species habitat known 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 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 known to occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area
Rostratula benghalensis (sensu lato) Painted Snipe [889]	Endangered*	Species or species habitat likely to occur within area
Tringa nebularia Common Greenshank, Greenshank [832]		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 Resources Audit, 2001.	

Name	Status	Type of Presence
Birds		
Acridotheres tristis Common Myna, Indian Myna [387]		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
Sturnus vulgaris Common Starling [389]		Species or species habitat likely to occur within area
Turdus merula Common Blackbird, Eurasian Blackbird [596]		Species or species habitat likely to occur within area
Mammals		
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
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		
Asparagus asparagoides Bridal Creeper, Bridal Veil Creeper, Smilax, Florist's Smilax, Smilax Asparagus [22473]		Species or species habitat likely to occur within area
Cabomba caroliniana Cabomba, Fanwort, Carolina Watershield, Fish		Species or species

Name	Status	Type of Presence
Grass, Washington Grass, Watershield, Carolina Fanwort, Common Cabomba [5171]		habitat may occur within area
Carrichtera annua Ward's Weed [9511]		Species or species habitat may occur within area
Chrysanthemoides monilifera subsp. monilifera Boneseed [16905]		Species or species habitat likely to occur within area
Cylindropuntia spp. Prickly Pears [85131]		Species or species habitat likely to occur within area
Lycium ferocissimum African Boxthorn, Boxthorn [19235]		Species or species habitat likely to occur within area
Opuntia spp. Prickly Pears [82753]		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

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.

For species where the distributions are well known, maps are digitised from sources such as recovery plans and detailed habitat studies. Where appropriate, core breeding, foraging and roosting areas are indicated under 'type of presence'. For species whose distributions are less well known, point locations are collated from government wildlife authorities, museums, and non-government organisations; bioclimatic distribution models are generated and these validated by experts. In some cases, the distribution maps are based solely on expert knowledge.

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

-34.12239-142.20254

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](#)
- [Parks and Wildlife Commission NT, Northern Territory Government](#)
- [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, Atherton and Canberra](#)
- [University of New England](#)
- [Ocean Biogeographic Information System](#)
- [Australian Government, Department of Defence](#)
- [Forestry Corporation, NSW](#)
- [Geoscience Australia](#)
- [CSIRO](#)
- 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.

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[Department of the Environment](#)
 GPO Box 787
 Canberra ACT 2601 Australia
 +61 2 6274 1111

Appendix E: Cultural Heritage Contingency Plan

Appendix D: Artefact Scatter 1 – site card

STILL BEING PROCESSED NOT YET AVAILABLE



AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : Buringa Landfill 2
Client Service ID : 220235

SiteID	SiteName	State	Zone	Easting	Northing	Contact	Site Status	Site Category	Site Types	Records
46-3-0092	Buringa Loose Pit 1	GDA	S4	611120	6223710	Open site	Valid	Artefact : 1		
	Contact Searle					Recorders Time Capsule Earth			Permits 2442	
46-3-0093	Buringa Loose Pit 2	GDA	S4	611900	6223670	Open site	Valid	Artefact : 1		
	Contact Searle					Recorders Time Capsule Earth			Permits 2495	

Report generated by AHIMS Web Service on 12/04/2016 for Chris Allecton for the following area of Lot : 1, DP/DP1037045 with a buffer of 1000 meters. Additional Info : REF: Number of Aboriginal sites and Aboriginal objects found is 2

This information is not guaranteed to be free from error omission. Office of Environment and Heritage (OEH) and its employees disclaim liability for any act done or omission made on the information and consequences of such act or omission.

If your search shows Aboriginal sites or places what should you do?

- You must do an extensive search if AHIMS has shown that there are Aboriginal sites or places recorded in the search area.
- If you are checking AHIMS as a part of your due diligence, refer to the next steps of the Due Diligence Code of practice.
- You can get further information about Aboriginal places by looking at the gazettal notice that declared it. Aboriginal places gazetted after 2001 are available on the [NSW Government Gazette](http://www.nsw.gov.au/gazette) (<http://www.nsw.gov.au/gazette>) website. Gazettal notices published prior to 2001 can be obtained from Office of Environment and Heritage's Aboriginal Heritage Information Unit upon request

Important information about your AHIMS search

- The information derived from the AHIMS search is only to be used for the purpose for which it was requested. It is not to be made available to the public.
- AHIMS records information about Aboriginal sites that have been provided to Office of Environment and Heritage and Aboriginal places that have been declared by the Minister;
- Information recorded on AHIMS may vary in its accuracy and may not be up to date. Location details are recorded as grid references and it is important to note that there may be errors or omissions in these recordings,
- Some parts of New South Wales have not been investigated in detail and there may be fewer records of Aboriginal sites in those areas. These areas may contain Aboriginal sites which are not recorded on AHIMS.
- Aboriginal objects are protected under the National Parks and Wildlife Act 1974 even if they are not recorded as a site on AHIMS.
- This search can form part of your due diligence and remains valid for 12 months.



Office of
Environment
& Heritage

AHIMS Web Services (AWS) Search Result

Purchase Order/Reference : Buronga Landfill 2

Client Service ID : 220335

Chris Alderton

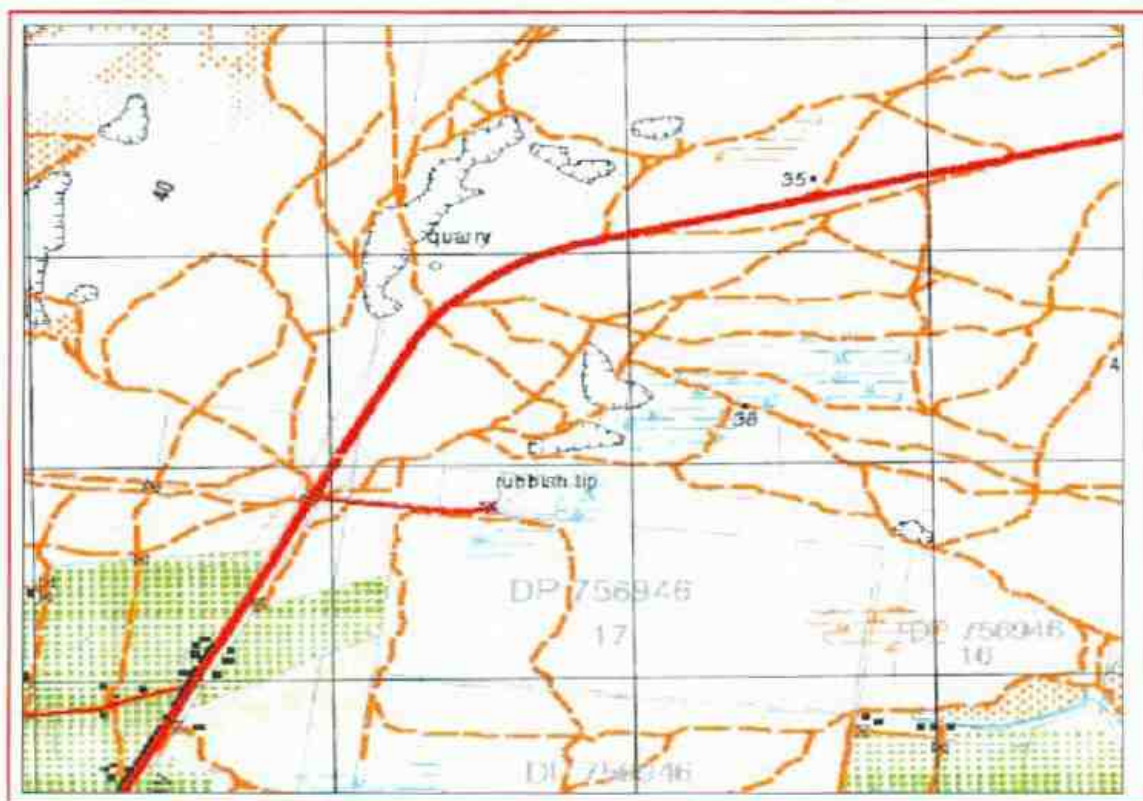
Date: 12 April 2016

c/o Springton Post Office
Springton South Australia 5235
Attention: Chris Alderton
Email: chris_alderton@hotmail.com

Dear Sir or Madam:

AHIMS Web Service search for the following area at Lot : 1, DP:DP1037845 with a Buffer of 1000 meters, conducted by Chris Alderton on 12 April 2016.

The context area of your search is shown in the map below. Please note that the map does not accurately display the exact boundaries of the search as defined in the paragraph above. The map is to be used for general reference purposes only.



A search of the Office of the Environment and Heritage AHIMS Web Services (Aboriginal Heritage Information Management System) has shown that:

2	Aboriginal sites are recorded in or near the above location.
0	Aboriginal places have been declared in or near the above location. *

Appendix C: AHIMS Database Search

NSW Endangered Ecological Communities

Data from the BioNet Atlas of NSW Wildlife website, which holds records from a number of custodians. The data are only indicative and cannot be considered a comprehensive inventory, and may contain errors and omissions. Species listed under the Sensitive Species Data Policy may have their locations denatured (* rounded to 0.1Å; ** rounded to 0.01Å). Copyright the State of NSW through the Office of Environment and Heritage. Search criteria : Public Report of all Valid Records of Communities in selected area [North: -34.05 West: 142.14 East: 142.24 South: -34.15] returned 0 records for 3 entities.

Report generated on 9/02/2016 9:57 PM

Kingdom	Class	Family	Species Code	Scientific Name	Exotic	Common Name	NSW status	Comm. status	Records	Info
Community				<i>Acacia loderi</i> shrublands		Acacia loderi shrublands	E3		P	
Community				<i>Acacia melvillei</i> Shrubland in the Riverina and Murray-Darling Depression bioregions		Acacia melvillei Shrubland in the Riverina and Murray-Darling Depression bioregions	E3		K	
Community				Sandhill Pine Woodland in the Riverina, Murray-Darling Depression and NSW South Western Slopes bioregions		Sandhill Pine Woodland in the Riverina, Murray-Darling Depression and NSW South Western Slopes bioregions	E3		P	

NSW threatened and endangered fauna

Data from the BioNet Atlas of NSW Wildlife website, which holds records from a number of custodians. The data are *only* indicative and cannot be considered a comprehensive inventory, and may contain errors and omissions. Species listed under the Sensitive Species Data Policy may have their locations denatured (^ rounded to 0.1°, ^^ rounded to 0.01°). Copyright the State of NSW through the Office of Environment and Heritage. Search criteria : Public Report of all Valid Records of Animals in selected area [North: -34.05 West: 142.14 East: 142.24 South: -34.15] returned a total of 1,096 records of 177 species.

Report generated on 9/02/2016 9:54 PM

Kingdom	Class	Family	Species Code	Scientific Name	Common Name	NSW status	Comm. status	Records
Animalia	Amphibia	Hylidae	3207	<i>Litoria raniformis</i>	Southern Bell Frog	E1,P	V	1
Animalia	Aves	Anatidae	0214	<i>Stictonetta naevosa</i>	Freckled Duck	V,P		1
Animalia	Aves	Accipitridae	0218	<i>Circus assimilis</i>	Spotted Harrier	V,P		3
Animalia	Aves	Accipitridae	0225	<i>Hieraaetus morphnoides</i>	Little Eagle	V,P		2
Animalia	Aves	Accipitridae	0230	^^ <i>Lophoictinia isura</i>	Square-tailed Kite	V,P,3		1
Animalia	Aves	Rostratulidae	0170	<i>Rostratula australis</i>	Australian Painted Snipe	E1,P	E	4
Animalia	Aves	Scolopacidae	0163	<i>Calidris acuminata</i>	Sharp-tailed Sandpiper	P	C,J,K	1
Animalia	Aves	Scolopacidae	0161	<i>Calidris ferruginea</i>	Curlew Sandpiper	E1,P	CE,C,J,K	1
Animalia	Aves	Cacatuidae	0270	^ <i>Lophochroa leadbeateri</i>	Major Mitchell's Cockatoo	V,P,2		2
Animalia	Aves	Psittacidae	0259	^^ <i>Glossopsitta porphyrocephala</i>	Purple-crowned Lorikeet	V,P,3		1
Animalia	Aves	Meliphagidae	8303	<i>Melithreptus gularis gularis</i>	Black-chinned Honeyeater (eastern subspecies)	V,P		8
Animalia	Aves	Pachycephalidae	0403	<i>Pachycephala inornata</i>	Gilbert's Whistler	V,P		5
Animalia	Mammalia	Dasyuridae	1008	<i>Dasyurus maculatus</i>	Spotted-tailed Quoll	V,P	E	1

Contingency plan in the event of Aboriginal material being found

Aboriginal object is discovered and/or harmed in, or under the land, while undertaking earthwork activities, the proponent must:

1. Not further harm the object;
2. Immediately cease all work at the particular location;
3. Secure the area so as to avoid further harm to the Aboriginal object;
4. Notify OEH as soon as practical on 131555, providing any details of the Aboriginal object and its location; and
5. Not recommence any work at the particular location unless authorised in writing by OEH.

Appendix F: Site Photos



Photo 1: Typical Black-oak woodland community on site



Photo 2: Typical mallee community on site



Photo 3: On top of the existing landfill looking north towards to borrow pit area.



Photo 4: Regrowth on historical quarrying areas.



Photo 5: Historical quarrying amongst Black oak trees



Photo 6: Buronga Landfill Artefact scatter 1.



REVIEW OF ENVIRONMENTAL FACTORS

Name of Project: Buronga Landfill Borrow Pits

Plan Registration Numbers:

Lot 1, DP1037845



Document Prepared by Ece (Izzy) Tunali

Plan Registration Numbers: Lot1, DP1037845

Description of Activity

1. Location of activity: (include planning control / zoning of site)

Wentworth Shire Council, NSW

Arumpo Road, Gol Gol, Wentworth, NSW. Lot 1, DP1037845

Planning Zone SP2, Special Purpose Zone 2-Infrastructure (Waste or Resource Management Facility) adjacent to Lots 197 & 212 DP 756946

2. Description of activity (including all temporary and ancillary works)

(a). Use of proposed waste cells as borrow pits to supply cover material for the Buronga Landfill Waste Operations

3. Have environmental safeguards and mitigation measures been developed for the activity?

No impacts on environment is expected

4. List the attached plans, maps, photographs and diagrams of the site.

Buronga Landfill Proposed Site Layout showing waste cells which will be used as borrow pits, which is the subject of this DA.

5. Estimated cost of activity and planned time of commencement:

- \$200,000+ GST
- Works are scheduled to commence November 2015

6. Reasons for the activity:

Buronga Landfill is running out of covering material so we need to adopt the proposed waste cells as a burrow pits to maintain cover material.

It is an EPA requirement to daily cover the waste, disposed at the landfill as well as interim cover.

Are there any alternatives other than the preferred option?

No

Does the current LEP and/or REP affect the activity?

No

Please select the relevant approval bodies that have been consulted through this process or those that require consultation.

- Wentworth Shire Council
- NSW EPA

7. Site Conditions (include existing road conditions, present traffic and forecast traffic)

The subject site is located approximately 5 km from Victorian/ New South Wales border. It is located about 2.5 km North on the Arumpo Road from the Silver City Highway turnoff. The subject land is adjacent to the existing waste management facility, located within the existing Special Purpose Zone 2 (SP2)-Infrastructure (Waste or Resource Management Facility), and is separated from sensitive land uses. The surrounding road system has the capacity to cater for the traffic movements associated with the development

8. Project Design

See attached plans

9. Access

Access will be via the Service Road from the Arumpo Road

Existing Environment

10. Site Description:

The subject area has been purchased by Council, which is around 117 hectares of land to the north of the existing Landfill site, as future expansion. This Land is zoned SP2 under Wentworth Local Environmental Plan 2011 (Wentworth LEP) which allows for landfill and waste management uses.

The site also consists of a former mining site located to the east of the proposed borrow pits.

The proposed borrow pits site is set within a rural landscape predominantly comprising of agricultural land uses and scattered remnant native vegetation. Land surrounding the subject site is not developed and currently acts as a buffer between the site and surrounding uses and activities.

The nearest farmland is located approximately 500 m to the south-west of the site, Lake Gol Gol is located approximately 1.5 km to the east and an industrial site is approximately 450 m to the west. There are a few residential dwellings along Arumpo Road with the nearest residence being located over 800 m to the south-west of the subject site.

Arumpo Road adjoins the western boundary of the subject site. A small unsealed road runs along the northern boundary of the subject site beginning at Arumpo Road travelling north before turning east and then running south within the eastern boundary of the subject site

11. Surrounding Land Use:

- Buronga Landfill- Crown Lands

12. Soil Type:

Sandy loam and clay

13. Climate:

- Temperate, Semi-arid.

14. Flora and Fauna:

- The proposed development area includes some native and non-native vegetation which are classified as Black Box and Chenopod Mallee. During excavation activities these will be removed and transported to landfill.
- None of the threatened species identified in EPBC Protected Matters Search are expected to occur within the work zone as activities will be restricted to the areas already classified as SP2

15. Cultural Heritage within or adjacent to property (including Aboriginal Heritage);

- Please see attached records of heritage search. Works will immediately cease if an item of Cultural Heritage is found.

16. Is the activity to be carried out on / near a wetland community or bushfire prone.

- No. Buronga Landfill is not an identified wetland community and is not listed on the Directory of Important Wetlands.
- Bushfire prone zone area coverage ratio is 51%. Please see attached map.

Impact Assessment

Physical and Chemical Impacts:

- **Is the activity likely to impact on soil quality or land stability?**
No
- **Is the activity likely to affect a water body, watercourse or wetland or natural drainage system?**
No
- **Is the activity likely to change flood regimes, or be affected by flooding?**
No
- **Does the proposal involve the use, storage, or transport of hazardous substances, or the use or generation of chemicals which may build up residues in the environment?**
No
- **Does the activity involve the generation, or disposal of gaseous, liquid or solid wastes or emissions?**
No
- **Will the activity involve the emission of dust, odours, noise, vibration, or radiation in the proximity of residential / urban areas or other sensitive locations?**
Yes – noise and vibrations will be produced at the site, however, it will be contained within normal construction tolerances.
- **Will the activity increase the erosion hazard at the site?**
No

Biological Impacts

- **Is any vegetation to be cleared or modified?**
Vegetation to be cleared in association with excavation works for the soil provision from the proposed waste cells. It will include clearing of a mix of non-native and native species. Vegetation removal associated with works will be predominately introduced species, being black box tress and Chenopod Mallee shrubs. There will also be the removal of some shrubs and dead trees.
- **Is there potential for any known threatened flora and/or fauna species to occur in close proximity to the site or the locality?**
None known
- **Is the activity consistent with any applicable recovery plans or threat abatement plans?**
N/A
- **Is the activity likely to affect any conservation agreement entered into under the *National Parks and Wildlife Act 1974* applied to the land in which the activity relates?**
No
- **Has the activity considered the effect on any wilderness area (see *Wilderness Act 1987*) in the locality?**
No known impacts / no known wilderness area

Community Impacts:

- **Is the activity likely to affect existing community services or infrastructure?**
No
- **Does the activity affect sites of importance to the local or broader community for their recreational or other values of access to these sites?**
No
- **Is the activity likely to have an impact on economic factors, including impacts on employment, industry and property value?**
No
- **Is the activity likely to have an impact on the safety of the community?**
No
- **Is the activity likely to cause a bushfire risk?**
No
- **Does the activity affect the visual or scenic landscape?**
No
- **Is the activity likely to cause noise, pollution, visual impacts, and loss of privacy, glare or overshadowing to members of the community?**

Yes, noise – within construction tolerances.
- **Is the activity likely to affect the use of, or the community's ability to use, natural resources?**
No

Natural Resources Impacts

- **Is the activity likely to result in the degradation of any NPWS conservation area?**
No

Note: Refer to the Plan of Management for that conservation area if the activity will impact it.

Aboriginal Cultural Heritage Impacts

IF AN ABORIGINAL SITE OF SIGNIFICANCE IS IDENTIFIED, PLEASE STOP WORK IMMEDIATELY AND CONSULT THE LOCAL LALC AND OFFICE OF ENVIRONMENT AND HERITAGE

- **Does the proposal affect areas subject to Native Title Claims?**
None Known

Other Cultural Heritage Impacts

- **Is there an impact on places, buildings, landscapes or moveable heritage items?**
No
- **Is any vegetation or cultural landscape value likely to be affected (e.g. gardens and settings, introduced exotic species, or evidence of broader remnant land uses)?**
No

IF THE PROPOSED ACTIVITY IS LIKELY TO AFFECT AQUATIC SPECIES AND THEIR HABITATS PLEASE FILL IN THE DETAILS BELOW.

- **What is the name of the adjacent watercourse(s)?**

Lake Gol Gol is located approximately 1.5 km to the east of the subject site

Description of works to be undertaken including methods of construction, and timing and duration of works:

- **Please identify the obstructions to fish passage – temporary and permanent.**

N/A

- **Please describe the aquatic habitat conditions at the site particularly riparian and aquatic vegetation, water depth, permanence of water flow and snags in the vicinity of the proposed works.**

N/A

- **Please identify the potential impacts upon aquatic and riparian habitats (both temporary and permanent)**

N/A

- **What are the proposals to mitigate the impacts upon riparian and aquatic vegetation and aquatic habitat?**

N/A

- **What are the potential impacts upon water quality of the proposed works?**

N/A.

- **What are the proposals to mitigate the impacts upon water quality?**

N/A

- **What aquatic species (including threatened species, populations and ecological communities) are known to occur within the locality?**

N/A

Summary of Impacts

- **Please summarise the main impacts of the activity**

The proposal results in no unacceptable impacts. There will be positive impacts as a result of this development.

1-Environmentally, capping is essential for the degeneration of the waste disposed at Buronga Landfill. Therefore proposal would contribute to the sustainable development of the site.

2-Financially, Council does not need to pay to import soil to Buronga Landfill for their waste procedures.

3-Proposal is consistent with relevant planning instruments and policies

- **What are the benefits of such an activity?**

The proposed modifications would improve the function and operation of the Buronga Waste Management Facilities therefore considered to maintain the public interest.

Declarations

The environmental impact of the proposed activity has been examined, considered and assessed in accordance with the requirements of the *Environmental Planning and Assessment Act 1979*

- No significant impact on the existing environment
- No significant impact pending further information
- REF refused as impact on environment is significant

Comments

Lce (122y) Tinali
Waste Project Manager

Name of Assessing Officer



Signature of Assessing Officer

Appendix A: Buronga Landfill and Proposed Borrow Pits Concept Drawing



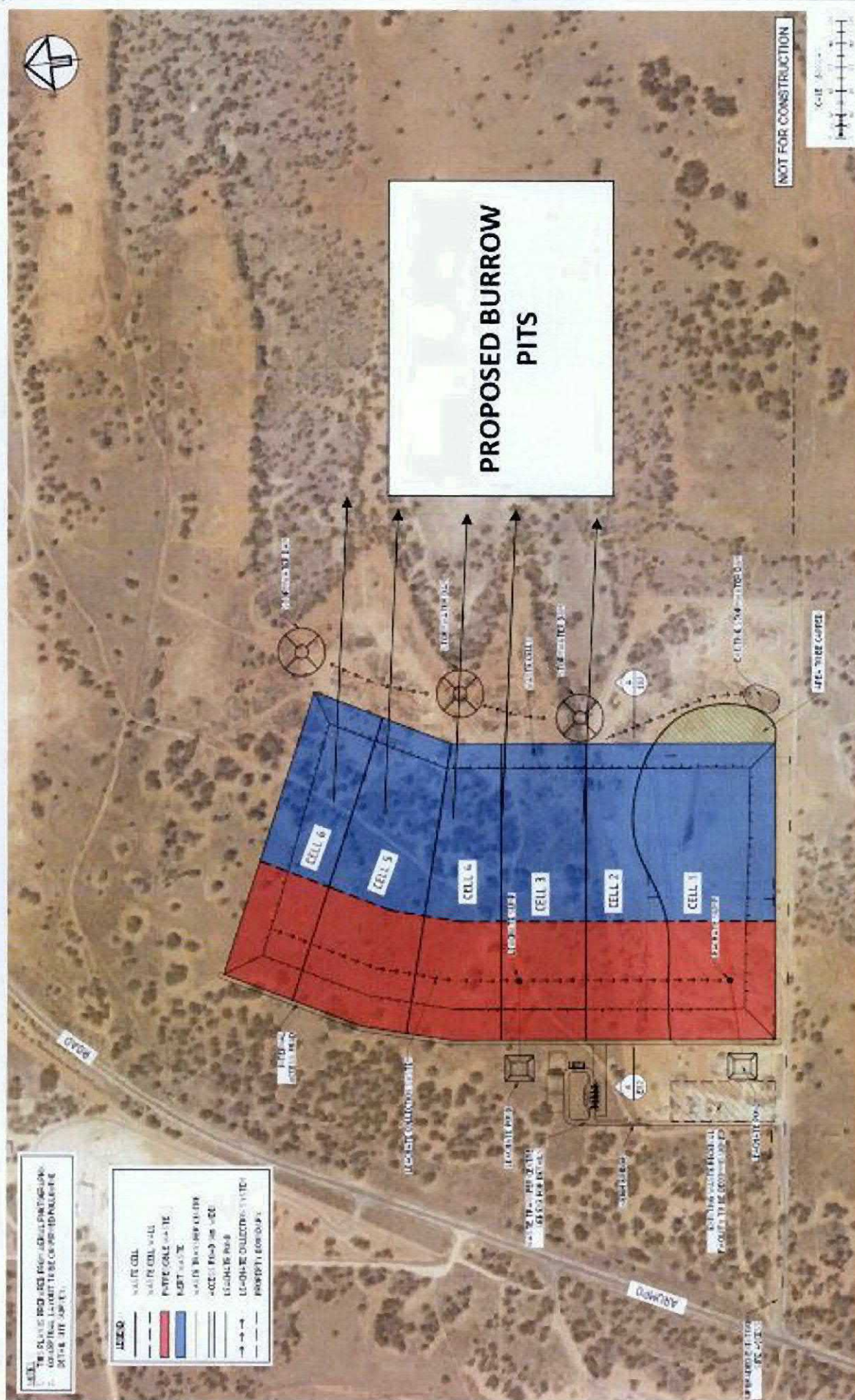
Legend

-  Cadastre
-  Zone Boundary
-  Subject Lands

- SP2 Infrastructure Zone
- RU1 Primary Production Zone

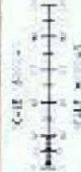
LOCALITY & ZONING
Buronga, NSW

aurecon



**PROPOSED BURROW
PITS**

NOT FOR CONSTRUCTION



CONCEPTUAL SITE PLAN


GEOLYSE

WENTWORTH SHIRE COUNCIL

APPENDIX A: AFFIDAVIT
WENTWORTH SHIRE COUNCIL

[illegible][illegible]

Appendix B: AHIMS Search Results Buronga Landfill and Proposed Borrow Pits



Ece Tunali

Date: 27 August 2015

26-28 Adelaide Street

Wentworth 2048

Attention: Ece Tunali

Email: waste.officer1@wentworth.nsw.gov.au

Dear Sir or Madam:

AHIMS Web Service search for the following area at Lot : 1, DP:DP1037845 with a Buffer of 50 meters, conducted by Ece Tunali on 27 August 2015.

The context area of your search is shown in the map below. Please note that the map does not accurately display the exact boundaries of the search as defined in the paragraph above. The map is to be used for general reference purposes only.



A search of the Office of the Environment and Heritage AHIMS Web Services (Aboriginal Heritage Information Management System) has shown that:

0	Aboriginal sites are recorded in or near the above location.
0	Aboriginal places have been declared in or near the above location. *

If your search shows Aboriginal sites or places what should you do?

- You must do an extensive search if AHIMS has shown that there are Aboriginal sites or places recorded in the search area.
- If you are checking AHIMS as a part of your due diligence, refer to the next steps of the Due Diligence Code of practice.
- You can get further information about Aboriginal places by looking at the gazettal notice that declared it. Aboriginal places gazetted after 2001 are available on the NSW Government Gazette (<http://www.nsw.gov.au/gazette>) website. Gazettal notices published prior to 2001 can be obtained from Office of Environment and Heritage's Aboriginal Heritage Information Unit upon request

Important information about your AHIMS search

- The information derived from the AHIMS search is only to be used for the purpose for which it was requested. It is not to be made available to the public.
- AHIMS records information about Aboriginal sites that have been provided to Office of Environment and Heritage and Aboriginal places that have been declared by the Minister;
- Information recorded on AHIMS may vary in its accuracy and may not be up to date. Location details are recorded as grid references and it is important to note that there may be errors or omissions in these recordings,
- Some parts of New South Wales have not been investigated in detail and there may be fewer records of Aboriginal sites in those areas. These areas may contain Aboriginal sites which are not recorded on AHIMS.
- Aboriginal objects are protected under the National Parks and Wildlife Act 1974 even if they are not recorded as a site on AHIMS.
- This search can form part of your due diligence and remains valid for 12 months.

Appendix C: Vegetation Removal Map



NTS

BURONGA LANDFILL AND PROPOSED BORROW VEGETATION REMOVAL MAP

Appendix D: BURONGA LANDFILL AND PROPOSED BORROW PITS-BUSH FIRE ZONING MAP



- A1 Lot Text
- A2 Lot Text Small Lots
- A3 Lot Text Large Lots
- Road Text
- Boundaries
- LGA
- Property
- Bushfire Prone
- Buffer
- Vegetation Category 1
- Vegetation Category 2
- LEP 2011
- Land Zoning
- Enterprise Corridor
- DG National Parks and Nature Reserves
- E1 Environmental Conservation
- E2 Environmental Management
- IN1 General Industrial
- IN2 Light Industrial
- RS Large Lot Residential
- RE1 Public Recreation
- RE2 Private Recreation
- RU1 Primary Production
- RU3 Forestry
- RU5 Village
- SP1 Special Activities
- SP2 Infrastructure
- SP3 Towns
- UV1 Natural Vegetation
- UV2 Recreational Vegetation

BURONGA LANDFILL AND PROPOSED BORROW PITS-BUSH FIRE ZONING

NTS

Appendix C: BAM Field Sheets

Assessor(s) Initials	Date	Area (ha)	PCT Number	Zone Number	Plot Abbreviation	
TM, SE, HR	8/4/21		15	1	a	
Within 20 x 20 m plot		Species Name	Foliage	Abund.	Function	
Species Name	Foliage	Abund.	Within 20 x 50 m plot			
Eucalyptus laevis	8	10	TG	Tree DBH	Count	
Rodgersia sp.	5	300	FG	80+ cm		
Dioscorea biflora	1	40	SG	50 - 79 cm		
Atriplex stipitata	1	40	SG	30 - 49 cm		
Endoloma tomentosa	0.5	20	SG	20 - 29 cm		
Rosa Poly	0.2	20	SG	10 - 19 cm		
Scholaria diac	0.1	20	SG	5 - 9 cm		
Sclerolaena pend	0.2	40	SG	Tree Regeneration <5 cm	X	
Chenopodium spp	0.1	10	SG	Hollow Bearing Trees	X	
Logs						
Within 20 x 50 m plot						
Total Length >10cm diam.						
SG	3.1	190		7.5m	Count	
SG	3.1	7				
TG	8	1				
FG	5	1				
Foliage Cover: Recorded as either Decimals if less than 1%, Whole Numbers up to 5%, or to the nearest 5% if >5% cover.						
- Decimals (0.1, 0.2, 0.3...)						
- Whole Numbers (1, 2, 3...)						
- Nearest 5% (5, 10, 15...)						
Abundance: Recorded as either Counts if less than 10, or estimated in intervals when >10.						
- Counts (1, 2, 3...)						
- Estimates (10, 20, 30...)						
- Estimates 'Intervals' (100, 200, 300...)						
Vegetation Integrity - Function						
Within five 1m2 plots		Plot Number				Average Sum
		1	2	3	4	5
Litter Cover		50	10	70	40	10
Bare Ground Cover		35	35	20	45	65
Cryptogam Cover		10	50	2	10	20
Rock Cover		0	0	0	0	0
Weeds		Foliage	Abund.	Weeds	Foliage	Abund.
0						

Assessor(s) Initials	Date	Area (ha)	PCT Number	Zone Number	Plot Abbreviation				
TM, SE HR	8/4/24		15	1	8				
Within 20 x 20 m plot			Species Name	Foliage	Abund.	Function			
Species Name	Foliage	Abund.				Within 20 x 50 m plot			
Eucalyptus larg.	10	2	TG			Tree DBH	Count		
Enchylomena torben	5	100	SG			80+ cm			
Dissocarpus bifl	1	20	SG			50 - 79 cm			
Scandernia diacantha	1	50	SG			30 - 49 cm	11	2	
Roly Poly	0.1	20	SG			20 - 29 cm	11	2	
Chenopodium spp	0.1	3	SG			10 - 19 cm	111	3	
Solanum esuriale	0.1	10	FG			5 - 9 cm	1	1	
						Tree Regeneration <5 cm		X	
SG	7.2	193				Hollow Bearing Trees		✓	
SG	7.2	5				Logs			
TG	10	1				Within 20 x 50 m plot			
FG	0.1	1				Total Length >10cm diam.			
						14 m Count			
						2.5, 7, 2, 2, 0.5			
						Foliage Cover: Recorded as either Decimals if less than 1%, Whole Numbers up to 5%, or to the nearest 5% if >5% cover. - Decimals (0.1, 0.2, 0.3...) - Whole Numbers (1, 2, 3...) - Nearest 5% (5, 10, 15...) Abundance: Recorded as either Counts if less than 10, or estimated in intervals when >10. - Counts (1, 2, 3...) - Estimates (10, 20, 30...) - Estimates 'Intervals' (100, 200, 300...)			
Vegetation Integrity - Function									
Within five 1m2 plots			Plot Number					Average Sum	
			1	2	3	4	5		
			Litter Cover	1	70	5	15	60	30.2
			Bare Ground Cover	99	20	95	80	5	59.8
			Cryptogam Cover	0	0	0	5	3	1.6
			Rock Cover	0	0	0	0	0	0
			Weeds	Foliage	Abund.	Weeds	Foliage	Abund.	
			Arabian Grass	0.5	100				
			Living Stone fl	0.1	5	HT			

[illegible]

Assessor(s) Initials	Date	Area (ha)	PCT Number	Zone Number	Plot Abbreviation	
TN, SE, HR	8/4/21		15	1	d	
Within 20 x 20 m plot						
Species Name	Foliage	Abund.	Species Name	Foliage	Abund.	
Eucalyptus largefl	25	2	TG			
Maireana brevifl.	5	50	SG			
Enchlasia tenuis	5	100	SG			
Rondeletia apic.	5	300	FG			
Achyrocline satureioides	1	50	SG			
Dioscorea bifl.	1	50	SG			
Rosa pumila	1	50	SG			
Sclerolaena parvula	1	100	SG			
Sclerolaena dioica	0.5	50	SG			
Chenopodium spp	0.1	10	SG			
Rhagodia spinescens	0.1	1	SG			
Function						
Tree DBH						
Count						
80+ cm						
50 - 79 cm						
30 - 49 cm						
20 - 29 cm						
10 - 19 cm						
5 - 9 cm						
Tree Regeneration <5 cm						
Hollow Bearing Trees						
Logs						
Total Length >10cm diam.						
25m Count						
1, 6, 1, 2, 6, 5, 4						
Foliage Cover: Recorded as either Decimals if less than 1%, Whole Numbers up to 5%, or to the nearest 5% if >5% cover. - Decimals (0.1, 0.2, 0.3...) - Whole Numbers (1, 2, 3...) - Nearest 5% (5, 10, 15...)						
Abundance: Recorded as either Counts if less than 10, or estimated in intervals when >10. - Counts (1, 2, 3...) - Estimates (10, 20, 30...) - Estimates 'Intervals' (100, 200, 300...)						
Vegetation Integrity - Function						
Within five 1m² plots						
Plot Number						
Average Sum						
Litter Cover	10	85	3	45	5	29.6
Bare Ground Cover	80	10	20	40	75	45
Cryptogam Cover	8	0	75	5	15	20.6
Rock Cover	0	0	0	0	0	0
Weeds						
Foliage						
Abund.						
Weeds						
Foliage						
Abund.						
Wing Noddy						
3						
100						
HT						

Assessor(s) Initials	Date	Area (ha)	PCT Number	Zone Number	Plot Abbreviation		
TM, SE	4/5/21		15	1	E		
Within 20 x 20 m plot		Species Name	Foliage	Abund.	Function		
Species Name	Foliage	Abund.	Within 20 x 50 m plot				
Rhagodia spinesc	8	80	SG		Tree DBH	Count	
Dioscorea	3	200	SG		80+ cm	1	
Enchylaena	1	50	SG		50 - 79 cm		
Sclerolaena diacantha	0.5	30	SG		30 - 49 cm	11111	
Rol. Pol. Pol.	0.1	10	SG		20 - 29 cm	11111	
Chenopodium	0.1	5	SG		10 - 19 cm	111	
Alaria brevifolia	0.1	10	SG		5 - 9 cm		
Eucalyptus laurina	15	9	TG		Tree Regeneration < 5 cm	X	
Melaleuca lanceolata	1	2	SG		Hollow Bearing Trees	✓	
Exocarpus acrotylus	1	1	SG		Logs		
Austroanthodia	0.1	20	GG		Within 20 x 50 m plot		
Sclerolaena pend	0.3	20	SG		Total Length > 10cm diam.		
Vittadinia	0.1	1	FG		29		
Austroslip	0.1	1	GG		3, 1.5, 2, 1.5, 1, 6, 2, 5 2, 5		
TG	15	1			Foliage Cover: Recorded as either Decimals if less than 1%, Whole Numbers up to 5%, or to the nearest 5% if > 5% cover. - Decimals (0.1, 0.2, 0.3...) - Whole Numbers (1, 2, 3...) - Nearest 5% (5, 10, 15...)		
SG	15.1	10					
GG	0.2	2					
FG	0.1	1					
Abundance: Recorded as either Counts if less than 10, or estimated in intervals when > 10. - Counts (1, 2, 3...) - Estimates (10, 20, 30...) - Estimates 'Intervals' (100, 200, 300...)							
Vegetation Integrity - Function							
Within five 1m2 plots			Plot Number				
			1	2	3	4	5
Litter Cover			70	70	60	80	20
Bare Ground Cover			20	20	20	15	75
Cryptogam Cover			0	0	0	0	0
Rock Cover			0	0	0	0	0
Weeds	Foliage	Abund.	Weeds		Foliage	Abund.	
Schinus molle	0.1	30					
Wing amaranth	3	200	HT				
Chickweed	0.1	20					
Mediterranean Turnip	0.1	50					

Assessor(s) Initials	Date	Area (ha)	PCT Number	Zone Number	Plot Abbreviation			
TM, SE, DB, HR	06/04/21		58	3	a			
Within 20 x 20 m plot			Species Name	Foliage	Abund.	Function		
Species Name	Foliage	Abund.	Within 20 x 50 m plot					
Casuarina pauciflora	2	0	TG	Tree DBH	Count	☐		
Ropora Apiculata	.1	1	FG	80+ cm				
Dissocarpus paradoxus	20	1000	SG	50 - 79 cm	1			
Scleroloma latifolius	20	2000	SG	30 - 49 cm	1	✓		
Maieria Brevifolia	.2	6	SG	20 - 29 cm				
Scleroloma Dicanthe	.4	100	SG	10 - 19 cm				
Tomentosa	.2	10	SG	5 - 9 cm				
Roly Poly	.1	1	SG	Tree Regeneration <5 cm		✗		
Atriplex stipitata	.1	12	SG	Hollow Bearing Trees		✓		
Logs								
SG	41	7		Within 20 x 50 m plot				
FG	0.1	1		Total Length >10cm diam.				
TG	2	0		HT 1	Count 6			
Foliage Cover: Recorded as either Decimals if less than 1%, Whole Numbers up to 5%, or to the nearest 5% if >5% cover. - Decimals (0.1, 0.2, 0.3...) - Whole Numbers (1, 2, 3...) - Nearest 5% (5, 10, 15...) Abundance: Recorded as either Counts if less than 10, or estimated in intervals when >10. - Counts (1, 2, 3...) - Estimates (10, 20, 30...) - Estimates 'Intervals' (100, 200, 300...)								
Vegetation Integrity - Function								
Within five 1m2 plots			Plot Number					Average Sum
			1	2	3	4	5	
Litter Cover			80.5	30	5	10	5	11
Bare Ground Cover			86	50	35	45	70	52
Cryptogam Cover			820	8	35	5	2	13.4
Rock Cover			80	0	0	0	0	0
Weeds			Foliage	Abund.	Weeds	Foliage	Abund.	
W:4 Moan			.1	20	HT			

Assessor(s) Initials	Date	Area (ha)	PCT Number	Zone Number	Plot Abbreviation		
TM, SE, HR	7/4/21		58	3	D		
Within 20 x 20 m plot		Species Name	Foliage	Abund.	Function		
Species Name	Foliage	Abund.	Within 20 x 50 m plot				
Sclero palawii	30	2000	SG	Tree DBH	Count		
Sclero diacanth	5	200	SG	80+ cm			
Roepora apic	0.1	2	FG	50 - 79 cm	1		
Dissocarpus para	20	500	SG	30 - 49 cm	4		
		3		20 - 29 cm			
SG	55	2700		10 - 19 cm			
FG	0.1	1		5 - 9 cm			
			SG-3	Tree Regeneration <5 cm	0		
			FG-1	Hollow Bearing Trees	0		
Logs							
Within 20 x 50 m plot							
Total Length >10cm diam.							
17 Count							
2, 2.5, 4.5, 5.1, 2							
Foliage Cover: Recorded as either Decimals if less than 1%, Whole Numbers up to 5%, or to the nearest 5% if >5% cover. - Decimals (0.1, 0.2, 0.3...) - Whole Numbers (1, 2, 3...) - Nearest 5% (5, 10, 15...)							
Abundance: Recorded as either Counts if less than 10, or estimated in intervals when >10. - Counts (1, 2, 3...) - Estimates (10, 20, 30...) - Estimates 'Intervals' (100, 200, 300...)							
Vegetation Integrity - Function							
Within five 1m2 plots		Plot Number					Average Sum
		1	2	3	4	5	
	Litter Cover	10	5	2	5	70	18.4
	Bare Ground Cover	80	60	30	65	5	48
	Cryptogam Cover	0.1	20	60	20	0	20.02
	Rock Cover	0	0	0		1	0.2
	Weeds	Foliage	Abund.	Weeds	Foliage	Abund.	
	Sage	0.1	1				

Assessor(s) Initials	Date	Area (ha)	PCT Number	Zone Number	Plot Abbreviation			
TM, SE, DB, HK	06/04/21		58	3	C			
Within 20 x 20 m plot			Species Name	Foliage	Abund.			
Species Name	Foliage	Abund.	Function					
			Within 20 x 50 m plot					
Sclerolena latentic	20	2000	SG	Tree DBH	Count			
D.35carput	10	1000	SG	80+ cm				
Tomenpasa	1	1	SG	50 - 79 cm				
				30 - 49 cm				
SG	30.1	3000		20 - 29 cm				
				10 - 19 cm				
				5 - 9 cm				
				Tree Regeneration <5 cm	X			
				Hollow Bearing Trees	X			
Logs								
Within 20 x 50 m plot								
Total Length >10cm diam.								
Cont								
Foliage Cover: Recorded as either Decimals if less than 1%, Whole Numbers up to 5%, or to the nearest 5% if >5% cover. - Decimals (0.1, 0.2, 0.3...) - Whole Numbers (1, 2, 3...) - Nearest 5% (5, 10, 15...) Abundance: Recorded as either Counts if less than 10, or estimated in intervals when >10. - Counts (1, 2, 3...) - Estimates (10, 20, 30...) - Estimates 'Intervals' (100, 200, 300...)								
Vegetation Integrity - Function								
Within five 1m2 plots			Plot Number					
			1	2	3	4	5	Average Sum
Litter Cover			10	5	5	10	5	7
Bare Ground Cover			70	78	80	60	70	71.6
Cryptogam Cover			1	1	3	3	1	1.8
Rock Cover			1	0	0	0	6	0.2
Weeds			Foliage	Abund.	Weeds	Foliage	Abund.	
Arabian grass			0.1	10				
Sage			10	2000				
onion weed			4	500				
Camel melon			0.1	1				
Barley grass			0.1	1				

Assessor(s) Initials	Date	Area (ha)	PCT Number	Zone Number	Plot Abbreviation			
TM SE HR	7/4/21		58	4	a			
Within 20 x 20 m plot		Species Name	Foliage	Abund.	Function			
Species Name	Foliage	Abund.	Within 20 x 50 m plot					
Maireana brevifolia	15	15	SG	Tree DBH	Count			
Dioscorea bifida	3	50	SG	80+ cm				
Endytia tenuifolia	2	10	SG	50 - 79 cm				
Sclerolaena patens	5	200	SG	30 - 49 cm				
Koeleria apiculata	0.1	2	FG	20 - 29 cm				
Austrostipa scabra	0.1	5	GG	10 - 19 cm				
Elatostemma	0.1	10		5 - 9 cm				
Rohdea polystachya	0.1	2	SG	Tree Regeneration <5 cm	X			
Vittadina	0.1	10	FG	Hollow Bearing Trees	X			
Sclerolaena diacantha	0.2	30	SG	Logs				
		307		Within 20 x 50 m plot				
SG	25.3	3076		Total Length >10cm diam.				
FG	0.2	122		Count				
GG	0.1	1						
			SG - 6					
			FG - 2					
			GG - 1					
Foliage Cover: Recorded as either Decimals if less than 1%, Whole Numbers up to 5%, or to the nearest 5% if >5% cover. - Decimals (0.1, 0.2, 0.3...) - Whole Numbers (1, 2, 3...) - Nearest 5% (5, 10, 15...) Abundance: Recorded as either Counts if less than 10, or estimated in intervals when >10. - Counts (1, 2, 3...) - Estimates (10, 20, 30...) - Estimates 'Intervals' (100, 200, 300...)								
Vegetation Integrity - Function								
Within five 1m2 plots			Plot Number					Average Sum
			1	2	3	4	5	
Litter Cover			40	2	60	1	25	25.6
Bare Ground Cover			40	80	10	98	70	59.6
Cryptogam Cover			5	10	0	0	0	3
Rock Cover			0	1	0	0	0	0.2
Weeds			Foliage	Abund.	Weeds	Foliage	Abund.	
Onion Weed			1	150				
Star Thistle			3	300				
Wild sage			0.3	100				
Arabian Grass			0.3	100				
Maltese Crocus			0.1	10				

[illegible]

[illegible]

[illegible]

Assessor(s) Initials	Date	Area (ha)	PCT Number	Zone Number	Plot Abbreviation			
TM SE HR	7/4/21		Neller 170	5	C			
Within 20 x 20 m plot		Species Name	Foliage	Abund.	Function			
Species Name	Foliage	Abund.	Within 20 x 50 m plot					
Dioscarpos bifl	3	150	SG		Tree DBH	Count		
Eucalyptus oleosa	5	10	TG		80+ cm			
Sclerolaena pend	1	50	SG		50 - 79 cm			
Roly Poly	0.1	5	SG		30 - 49 cm	1(1)	4	
Endoglossa torn	0.3	10	SG		20 - 29 cm	101	3	
					10 - 19 cm	11111	5	
SG	4.4	284			5 - 9 cm	11	2	
TG	5	1	SG - 4		Tree Regeneration <5 cm			X
			TG - 1		Hollow Bearing Trees			✓
Logs								
Within 20 x 50 m plot								
Total Length >10cm diam.								
34 m Count								
17, 8, 1, 5, 3								
Foliage Cover: Recorded as either Decimals if less than 1%, Whole Numbers up to 5%, or to the nearest 5% if >5% cover. - Decimals (0.1, 0.2, 0.3...) - Whole Numbers (1, 2, 3...) - Nearest 5% (5, 10, 15...)								
Abundance: Recorded as either Counts if less than 10, or estimated in intervals when >10. - Counts (1, 2, 3...) - Estimates (10, 20, 30...) - Estimates 'Intervals' (100, 200, 300...)								
Vegetation Integrity - Function								
Within five 1m2 plots			Plot Number					Average Sum
			1	2	3	4	5	
Litter Cover			40	84	95	80	80	75.8
Bare Ground Cover			50	15	5	15	10	19
Cryptogam Cover			0	0	0	0	0	0
Rock Cover			0	0	0	0	0	0
Weeds			Foliage	Abund.	Weeds	Foliage	Abund.	
Wing Nodiflor			1	30	HT			

[illegible]

Assessor(s) Initials	Date	Area (ha)	PCT Number	Zone Number	Plot Abbreviation		
TM, SE, HR	8/4/21		252	6	a		
Within 20 x 20 m plot		Species Name	Foliage	Abund.	Function		
Species Name	Foliage	Abund.	Within 20 x 50 m plot				
Dioscorea bifl	6	500	SG	Tree DBH	Count	☐	
Sclerophyllum pend	15	1000	SG	80+ cm			
Enchylasma tomentos	0.5	10	SG	50 - 79 cm	1	1	
Marrubium brevif	0.1	1	SG	30 - 49 cm			
Myoporum platycarp	1	0	TG	20 - 29 cm			
				10 - 19 cm			
SG	21.6	1541	4	5 - 9 cm			
TG	1	1		Tree Regeneration <5 cm		X	
			SG 4	Hollow Bearing Trees		✓	
			TG 1	Logs			
				Within 20 x 50 m plot			
				Total Length >10cm diam.			
				9 m Count			
				9			
				Foliage Cover: Recorded as either Decimals if less than 1%, Whole Numbers up to 5%, or to the nearest 5% if >5% cover. - Decimals (0.1, 0.2, 0.3...) - Whole Numbers (1, 2, 3...) - Nearest 5% (5, 10, 15...)			
				Abundance: Recorded as either Counts if less than 10, or estimated in intervals when >10. - Counts (1, 2, 3...) - Estimates (10, 20, 30...) - Estimates 'Intervals' (100, 200, 300...)			
Vegetation Integrity - Function							
Within five 1m2 plots			Plot Number				
			1	2	3	4	5
Litter Cover			10	30	20	15	20
Bare Ground Cover			70	60	50	70	70
Cryptogam Cover			10	1	1	5	2
Rock Cover			0	0	0	0	0
Average Sum			19				
Weeds			Foliage	Abund.	Weeds	Foliage	Abund.
Arabian Grass			1	300			
Onion Weed			0.1	2			

Pine stump

[illegible]

Appendix D: BAM-C Credit Sheets

Proposal Details

Assessment Id	Proposal Name	BAM data last updated *
00024826/BAAS18175/21/00024930	Buronga Landfill Expansion Inside Previous Consent Area	24/11/2021
Assessor Name	Report Created	BAM Data version *
Troy Muster	03/12/2021	50
Assessor Number	BAM Case Status	Date Finalised
BAAS18175	Finalised	03/12/2021
Assessment Revision	Assessment Type	
0	Major Projects	

* Disclaimer: BAM data last updated may indicate either complete or partial update of the BAM calculator database. BAM calculator database may not be completely aligned with Bionet.

Ecosystem credits for plant communities types (PCT), ecological communities & threatened species habitat

Zone	Vegetation zone name	TEC name	Current Vegetation integrity score	Change in Vegetation integrity (loss / gain)	Area (ha)	BC Act Listing status	EPBC Act listing status	Species sensitivity to gain class (for BRW)	Biodiversity risk weighting	Potential SAI	Ecosystem credits
Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)											
4	15_Zone_1_CA	Not a TEC	57.1	57.1	0.57			High Sensitivity to Potential Gain	1.75		14
										Subtotal	14

BAM Credit Summary Report

Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion										
2	58_Zone_3_CA	Not a TEC	24.2	24.2	7			High Sensitivity to Potential Gain	1.75	74
3	58_Zone_4_CA	Not a TEC	40.8	40.8	3.4			High Sensitivity to Potential Gain	1.75	60
									Subtotal	134
Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones										
1	170_Zone_5_CA	Not a TEC	49.5	49.5	4.5			High Sensitivity to Potential Gain	1.50	83
									Subtotal	83
									Total	231

Species credits for threatened species

Vegetation zone name	Habitat condition (Vegetation Integrity)	Change in habitat condition	Area (ha)/Count (no. individuals)	BC Act Listing status	EPBC Act listing status	Biodiversity risk weighting	Potential SAI	Species credits
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Proposal Details

Assessment Id	Proposal Name	BAM data last updated *
00024826/BAAS18175/21/00025590	Buronga Landfill Expansion Outside Previous Consent Area	24/11/2021
Assessor Name	Report Created	BAM Data version *
Troy Muster	03/12/2021	50
Assessor Number	BAM Case Status	Date Finalised
BAAS18175	Finalised	03/12/2021
Assessment Revision	Assessment Type	
0	Major Projects	

* Disclaimer: BAM data last updated may indicate either complete or partial update of the BAM calculator database. BAM calculator database may not be completely aligned with Bionet.

Ecosystem credits for plant communities types (PCT), ecological communities & threatened species habitat

Zone	Vegetation zone name	TEC name	Current Vegetation integrity score	Change in Vegetation integrity (loss / gain)	Area (ha)	BC Act Listing status	EPBC Act listing status	Species sensitivity to gain class (for BRW)	Biodiversity risk weighting	Potential SAI	Ecosystem credits
Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)											
1	15_Zone_1_Outside_CA	Not a TEC	57.1	57.1	19.2			High Sensitivity to Potential Gain	1.75		479
										Subtotal	479

BAM Credit Summary Report

Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion										
3	58_Zone_4_Outside_CA	Not a TEC	40.8	40.8	0.12			High Sensitivity to Potential Gain	1.75	2
									Subtotal	2
Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones										
2	170_Zone_5_Outside_CA	Not a TEC	49.5	49.5	0.05			High Sensitivity to Potential Gain	1.50	1
									Subtotal	1
Sugarwood open woodland of the inland plains mainly Murray Darling Depression Bioregion										
4	252_Zone_6_Outside_CA	Not a TEC	14.2	14.2	1.7			High Sensitivity to Potential Gain	1.75	0
									Subtotal	0
									Total	482

Species credits for threatened species

Vegetation zone name	Habitat condition (Vegetation Integrity)	Change in habitat condition	Area (ha)/Count (no. individuals)	BC Act Listing status	EPBC Act listing status	Biodiversity risk weighting	Potential SAI	Species credits
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Appendix E: Risk Matrix

Risk Matrix						
Risk Criteria	Consequences	Negligible (NE)	Minor (MI)	Moderate (MO)	Significant (SI)	Major (MA)
Likelihood		Environmental impacts or local, low significance, temporary, and reversible. Negligible impact on flora and fauna	Minor effects on the biological or physical environment. Easily rehabilitated, temporary, and short-term effect. Minor impact on flora and fauna.	Moderate short-term effects but no long-lasting effects on ecosystem function. A significant change, rehabilitated with difficulty. Moderate impact on flora and fauna.	Long-term severe environmental effects. Likely to result in a regulatory investigation, permanent environmental harm requires immediate attention. Significant impact on flora and fauna.	Severe long term environmental impairment of the ecosystem function. Destruction of sensitive features, severe impact, irreversible, or widespread. Significant impact on flora and fauna.
Almost Certain (A)	Event is expected to occur in most circumstances. [At least once per month]	M	H	VH	E	E
Likely (B)	The event will probably occur in most circumstances. [At least once a year]	M	H	H	VH	E
Possible (C)	The event should occur at some time. [At least once in 5 years]	L	M	H	H	VH
Unlikely (D)	The event could occur at some time. [At least once in 25 years]	L	M	M	H	H
Rare (E)	The event may occur only in exceptional circumstances. [Less than once in 25 years]	L	L	L	M	M

