

Native Vegetation Clearance Proposal – Olympic Dam airport upgrade

Clearance under the Native Vegetation Regulations 2017

09/09/2019

Gawler IBRA region Olympic Dam

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1. Application information

Applicant:	BHP Billiton Olympic Dam Corporation Pty Ltd. (ODC)		
Key contact:	Alice Taysom (alice.taysom@bhp.com)		
Landowner: (if the applicant is not the landowner, you must attach written permission)	<p>BHP Billiton Olympic Dam Corporation Pty Ltd. (ODC) – approximately 52.73 ha of native vegetation clearance is proposed on Lot 704, Certificate of Title volume 5140, Folio 477, owned by ODC.</p> <p>ODC License to Occupy – approximately 6.09 ha of native vegetation clearance is proposed on Crown Land (Crown Record volume 5787, Folio 986), where ODC has a license to occupy (License No OL017944).</p> <p>Adjacent Crown Land - approximately 0.19 ha of native vegetation clearance is proposed on adjacent Crown Land (Crown Record volume 6017, Folio 774) which ODC have a license to occupy (License No OL017944).</p> <p>Road reserve – approximately 0.06ha of native vegetation clearance is proposed on Roadside land owned by Roxby Council</p>		
Site Address:	Olympic Dam airport, Olympic Dam, South Australia		
Local Government Area:	Roxby Downs Municipal Council	Hundred:	Out of Hundreds (Andamooka)
Certificate of Title:	Lot 704, Volume 5140/ Folio 477 (Airport site) Lot 2018, Volume 5747/ Folio 986 (Crown Record) Lot 2114, Volume 6017/ Folio 774 (Car Park only)	Section/Allotment:	N/A
Summary of Application			
Proposed clearance area:	Native vegetation clearance is planned within project area of 191 hectares (ha). Of this, 13.18ha will be cleared for short-term use in order to build a temporary construction		

	<p>compound to house personnel, vehicles and equipment during the construction phase of the project.</p> <p>After this time, this area will be allowed to regenerate, hence the reduction loading is proposed for vegetation in this area. Construction vehicles will utilise existing access tracks where possible, to minimise disturbance of vegetation, although it is noted that a small number of additional access tracks may be required within the total 191ha area in this application and this has been allowed for within impact area calculations. Approximately, 45.89ha of native vegetation will be permanently cleared in order to develop the new runway, terminal buildings and car parking facilities. Therefore, the project requires a total of 59.08ha of native vegetation clearance within a 191ha area, 13.18ha of which will be allowed to regenerate within three years following disturbance.</p> <p>The entire project area falls within the Gawler IBRA bioregion and the Roxby subregion.</p> <p>Following a desktop assessment and three site surveys, no flora or fauna species or Threatened Ecological Community listed under the <i>Environment Protection and Biodiversity Conservation Act 1999</i> are considered likely to be significantly impacted by this project. It is considered that a referral under the provisions of the Act is not required for potential impacts to these MNES categories, other MNES categories are not considered here.</p>
Applicable regulation and purpose of the clearance	<p>Clearance of native vegetation is required to allow construction of a new larger runway to enable Olympic Dam airport to meet CASA regulations.</p> <p>ODC is applying for permission to clear native vegetation under Part 6, Regulation 12(34) – “Infrastructure”, for the purpose of ongoing mining and processing activities. These regulations permit clearance of vegetation for infrastructure that is approved under the <i>Development Act</i> where the Minister has declared that the clearance is in the public interest or is required in connection with the provision of infrastructure to a building or proposed building, or to any place.</p>
Level of risk	<p>Clearance Level 4, Based on Rangelands Assessment with SAAL region. This is based on the Total Biodiversity Score (4,265.07) exceeding the threshold of 2,500.</p>
Proposed SEB offset:	<p>The proponent chooses to offset native vegetation clearance with existing SEB credits associated with existing / proposed sites that are accredited for provision of SEB offsets:</p> <p>On June 30 2019, ODC have available credit of 31,339 SEB points associated with the Gosse Springs SEB Area and 267,143 SEB points available for the Emerald Springs SEB Area, which are considered adequate to offset the proposed clearance. Final offset strategy to be confirmed with NVMBU.</p>

2. Background

2.1 Purpose of the proposal

BHP Billiton Olympic Dam Corporation Pty Ltd (ODC) owns the Olympic Dam airport, South Australia, in the SA Arid Lands Natural Resource Management Region. ODC propose to upgrade the existing Olympic Dam airport. These upgrades include construction of a larger runway to comply with CASA regulations; upgrades to the terminal building to comply with Federal security requirements and upgrades to the existing car park to meet current and future demand. Native vegetation will be cleared in order to carry out the runway and carpark upgrades, but terminal building works will remain within a previously cleared footprint.

In order to carry out these upgrades, a temporary construction compound will be built to accommodate the vehicles, personnel and equipment required for construction, requiring additional clearance of Native Vegetation adjacent to the airfield. Once construction has finished, this area will be allowed to regenerate. Given the arid environment and

the type of vegetation that is being cleared (e.g. Mulga trees, Saltbush and chenopod shrubland) it is considered that regeneration would occur, where standard clearance and rehabilitation techniques will be deployed as part of the construction environmental management plan (e.g. temporary stockpile of vegetative material devoid of invasive weed species that can be spread over the site etc).

2.2 Background

Project Overview

The proposed runway will be constructed approximately 100m north of the currently operational Olympic Dam airport runway, approximately 4km south of the operational Olympic Dam mine site, South Australia.

A temporary construction compound will be built outside the current airfield perimeter fence and will house the equipment, vehicles and temporary personnel site office during the construction phase of the project.

Existing car parks will be upgraded to accommodate additional carparks in the current location with small remnant patches of native vegetation and amenity vegetation being cleared.

Summary of Baseline Environment

The project is located in northern South Australia, in the Gawler IBRA bioregion in the South Australian Arid Lands NRM region. The region is characterized mainly by dunefields, swales and stony plains.

Typical vegetation includes low open shrublands and tall open woodlands. Five vegetation associations were identified in the Project Area across three key habitat/ landform types: sandplains, dunes and swales, stony plains, covering 191 hectares. The condition of vegetation in these associations recorded during the field survey was generally medium according to the Native Vegetation Council's Rangelands Assessment Method (i.e. graph in electronic scoresheet). Across the area the vegetation is generally relatively intact, but in some areas is highly disturbed (e.g. low impact grazing by rabbits in the airside vegetation and moderate to heavy grazing by kangaroos and rabbits outside the fence-line where pest species have not been controlled).

The environment of the region has been influenced by nearby mining operations at Olympic Dam as well as previous construction of Olympic Dam airport and surrounding infrastructure. Existing influences include construction of roads and mining infrastructure between Olympic Dam mine site, the Olympic Dam airport and also the Roxby Downs municipality. In addition, dust generated by mining activities will also have an impact on the surrounding environment.

Weeds are present in the region, particularly ephemeral species that can respond favourably to cool season rains. Whilst the density of weeds is generally low in these arid areas, they are relatively common along tracks, roadsides and other areas of disturbance. The most common weeds in the region are the environmental weeds *Carrichtera annua* (Ward's Weed), which dominates chenopod shrublands and Western Myall Woodlands on clayloams, and *Brassica tournefortii* (Wild Turnip) which occurs on sand dunes where present (BHP Billiton, 2009b).

Land tenure

The proposed development will occur across three land titles including private freehold of the current airport land, held by ODC; the Crown land which the new runway will cross into, to the east of the current runway; and the Crown land the existing car park is located on (Figure 1 below).

The current airport site occurs on Lot 704, of Certificate of Title Volume 5140 Folio 477 in the Area named Olympic Dam. This land is owned and operated by ODC. The majority of the runway will be located within this allotment. However approximately 59 meters of the proposed runway will be sited within the adjacent Crown Land; Crown Record Volume 5787 Folio 986. ODC maintain a License to Occupy over this land (License No OL017944) and are currently pursuing a variation to that License to reflect this development application. The temporary construction compound that will house personnel, equipment and vehicles during the construction phase of the project will also be placed on the ODC owned land.

The car parks that will be extended are located on another parcel of Crown Land; Crown Record Volume 6017 Folio 774. This land is owned by the Crown and leased by ODC. The License to Occupy as referred above (OL017944) applies to this land. The land is situated between the Airport land and the Roxby Downs township and accommodates the Olympic Dam Village accommodation and industrial/commercial precinct.

2.3 General location map

Maps relating to this project area provided as follows:

- Figure 1: Location Map showing boundaries of properties impacted by the Project
- Figure 2: Site Map showing vegetation associations mapped throughout the Project Area
- Figure 3: Clearance map showing areas of proposed vegetation clearance

Figure 1: Location Map showing boundaries of properties impacted by the Project

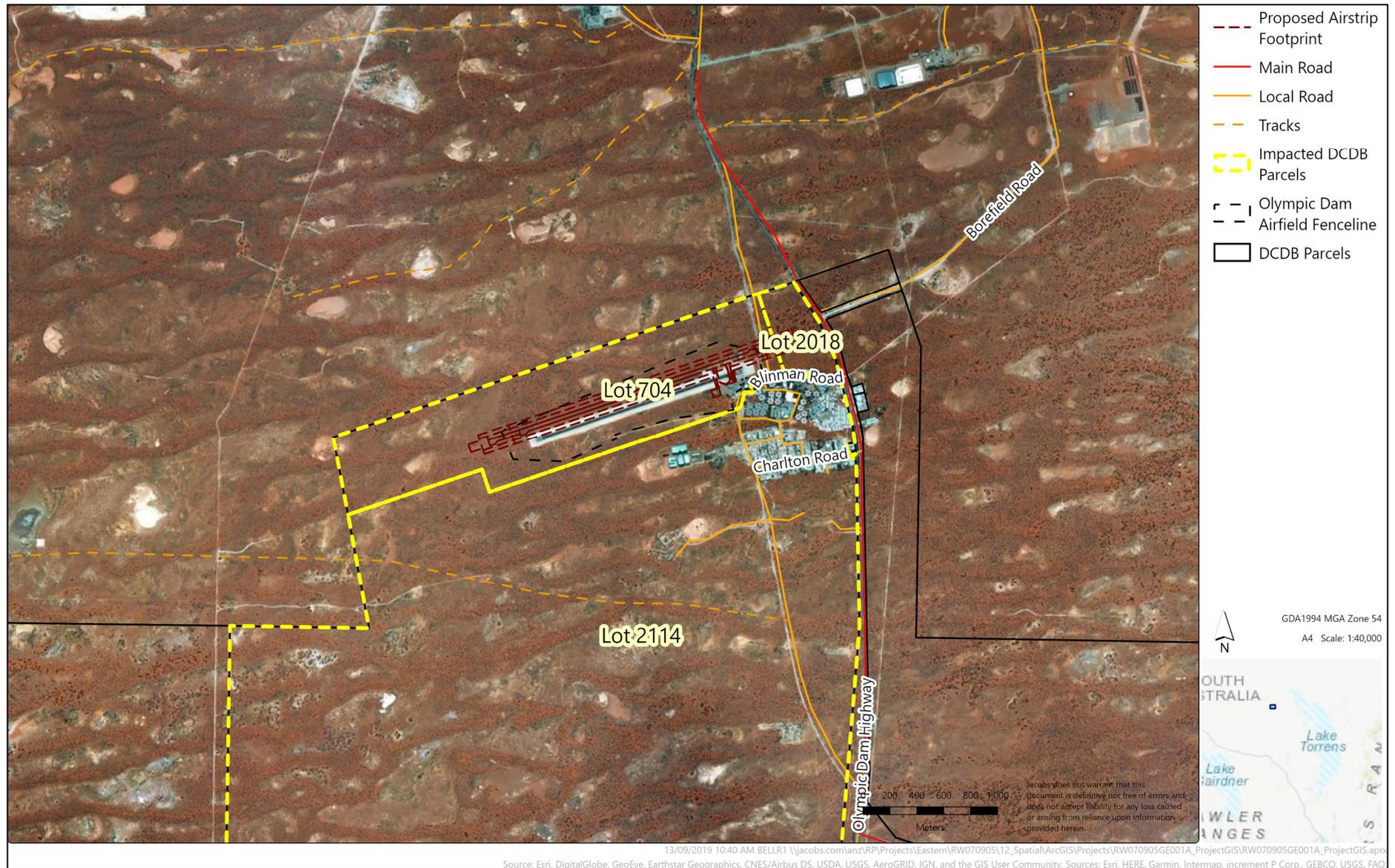
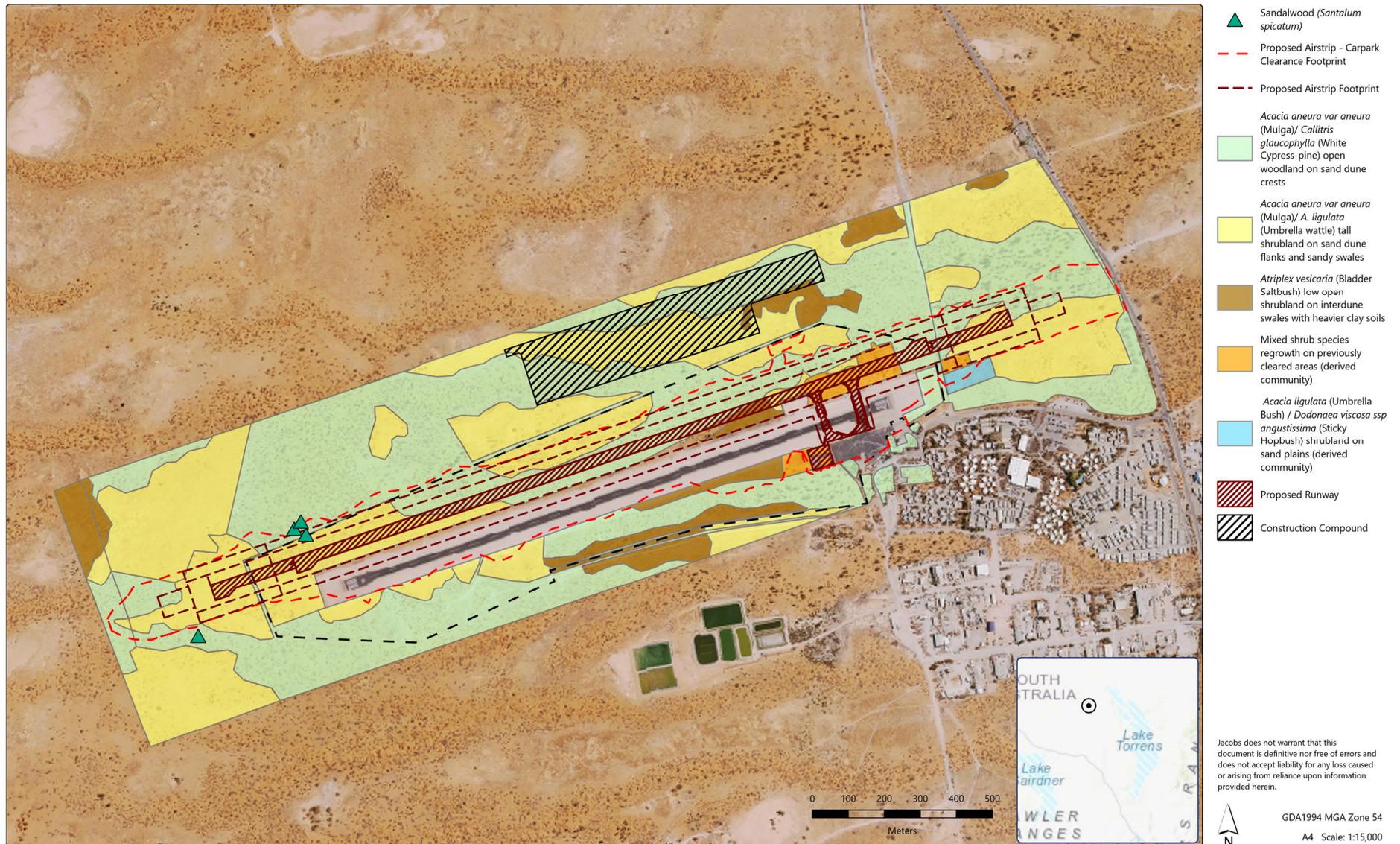
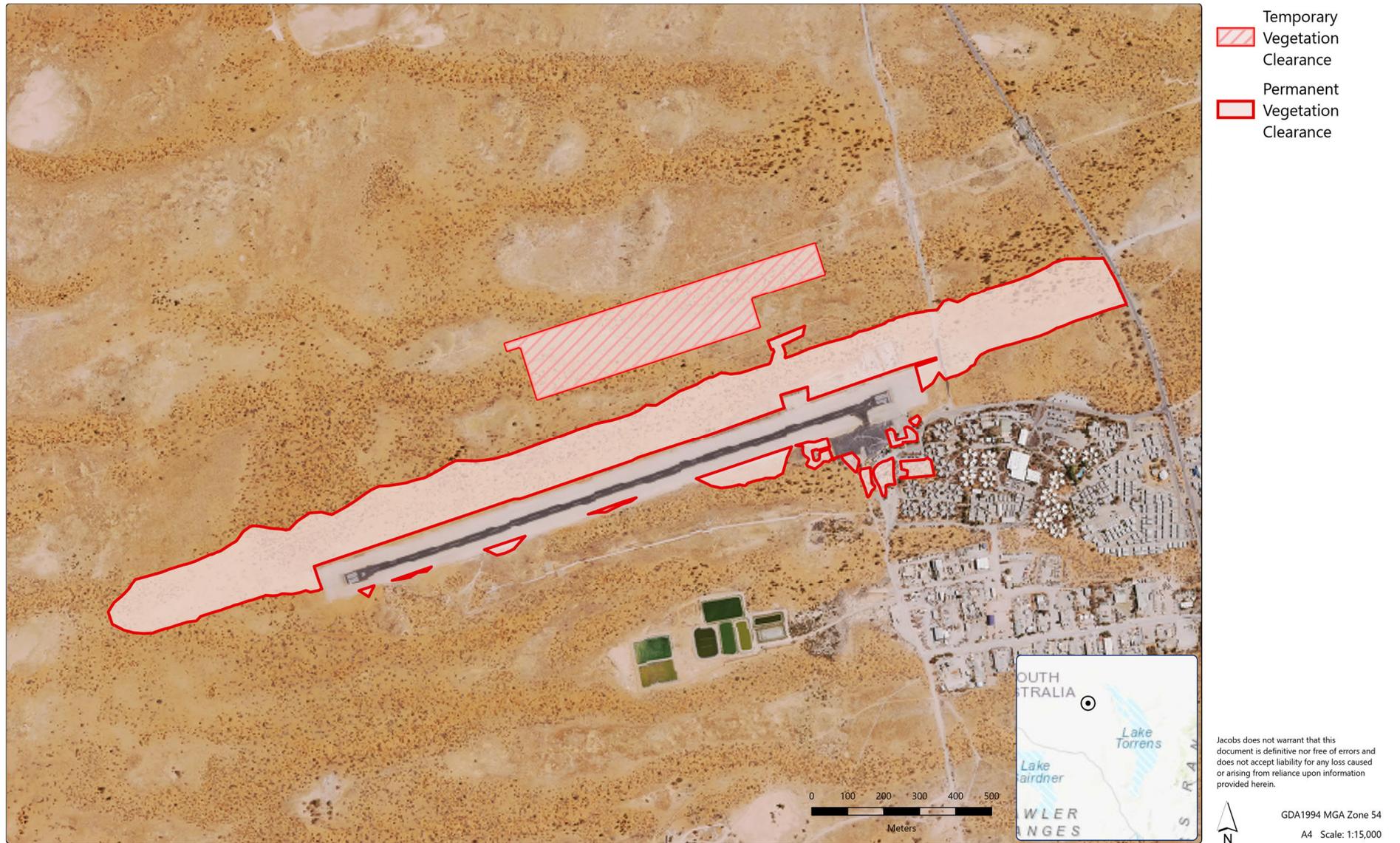


Figure 2: Site Map showing vegetation associations mapped throughout the Project Area



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Figure 3: Proposed vegetation clearance



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2.4 Approvals required or obtained under other legislation (including past clearance approvals)

Native Vegetation Act 1991

Clearance under the *Native Vegetation Act 1991* (SA) is the subject of this application

Development Act 1993

Pending approval for Development Act 1993. Details of Development Applications relating to the Project:

Application	Involving	Categorization	Likely Lodgement Date	Expected Decision Date
(Temporary – 18 months) Construction Compound	Stockpile of soil and base materials, batching plant, water storage, office and amenities car parking	Category 1. No referrals, no public notification	12 September	16 October
Runway, Taxiway, Apron and airport structures (lighting etc)	New runway, north of and parallel to existing. Extension of taxiway and construction of new taxiway. Construction of third apron to west of existing.	Category 1. Referral to EPA. No public notification.	24 September	3 December
Terminal Buildings and Car Parking	Partial demolition and additions to existing departure lounge to accommodate check-in, baggage handling, security and departure lounge. New Induction Centre to be constructed north of new terminal buildings. Upgrade of existing car parks and extension of car parking area to include undeveloped areas.	Category 1. No referrals, no public notification	27 September	15 November
Batching Plant (responsibility of construction contractor)	Temporary batching plant for the preparation of bitumen/asphalt for the establishment of the new runway tarmac	Category 1. Referral to EPA. No public notification.	25 November	3 February

The proposed construction compound, new runway and car parking will introduce a new use to the land in which it is situated, and as such, constitutes a change in the use of land in accordance with Section 6(1)(c) of the Act, and therefore ‘development’ in accordance with Section 4(1) of the Development Act, 1993 (Development Act).

Pursuant to Schedule 8 (clause 11) and Schedule 22 (Part 8, section (1)) of the Development Regulations 2008, an activity involving an aerodrome, being facilities estimated to be used for –

(a) more than 200 flight movements per year but excluding facilities more than 3 kilometers from residential premises not associated with the facilities; or

(b) more than 2 000 flight movements per year in any case,

is to be referred to the Environment Protection Authority (EPA).

The Council must take ‘direction’ from the EPA – i.e. if the EPA requests the Council to place conditions to the consent, or to refuse the application, the Council must do so, in accordance with Part 1, Section 2(d) of Schedule 8, of the Regulations. Matters to be considered by the EPA include noise impacts from differing aircraft utilizing the

relocated runway and air quality impacts during construction and operation. A pre-lodgment meeting has been held with the EPA regarding noise impact assessment, and modelling outputs reflect the requests of the EPA.

The terminal buildings and lighting structures adjacent the apron are considered 'building work' for the purposes of Section 4(1) of the Development Act.

The batching plant requires development approval for the (temporary) erection of a structure and change of use of land in accordance with Sections 4(1) and 6(1) (respectively) of the Development Act, and as an activity that satisfies the criteria of Schedule 22 of the Development Regulations 2008, as necessitating referral to the Environment Protection Authority.

As such, the above elements require Development Approval in accordance with Section 32 of the Development Act, 1993.

Fire and Emergency Services Act 2005

NA

Water Resources Act 1997

The subject site is not considered to be at risk of flooding as there are no watercourses or natural waterbodies located within or adjacent to the site. There are artificial water bodies nearby, such as Roxby Downs sewage ponds and evaporation ponds associated with the tailings retention system (TRS) as detailed in the BHP Ecological Impact Statement (BHP 2009, Chapter 15 'Terrestrial Ecology').

Environment Protection and Biodiversity Conservation Act 1999

BHP have undertaken a self-assessment of the potential for the Project to result in a significant impact to Matters of National Environmental Significance (MNES) and have concluded that the Project will result in no significant impacts on MNES. Effort relevant to the existing environment and project proposed has been made to understand the potential for MNES to be present within the Project Area and, subsequently, to understand the impacts on these MNES. This includes desktop assessment and multiple in-field assessments to identify environmental values present at the Project Site.

Coast Protection Act 1972

Not relevant to this site, given location.

Pastoral Land Management and Conservation Act 1989

Approximately 10% of the runway length (the eastern-most 242 meters of the runway (totaling 28,238 m² (2.8 hectares) will extend into the adjacent Crown Land, being Crown Record Volume 5787 Folio 986. BHP maintain an Annual License to Occupy over this land (License No OL017944) for 'town development' (commercial or industrial purposes).

Correspondence from Mr Barry Fryar of the Department for the Environment and Water has confirmed that the License terms "is consistent with an extension of the airstrip if required over the subject crown land", subject to gaining all relevant regulatory approvals, such as Development Approval and Native Vegetation Clearance Approval.

Environment Protection Act 1993

A batching plant is likely to be established on site, for a period of up to 12 months.

The batching plant will require Development Approval from the Council, and in processing the development application, the Council must refer the proposal to the EPA.

Development Approval and a licence from the EPA will be required to be obtained by the operator, prior to establishing and operating the batching plant.

Pursuant to Schedule 8 (clause 11) and Schedule 22 (Part 8, section (1)) of the Development Regulations 2008, an activity involving an aerodrome, being facilities estimated to be used for –

(a) more than 200 flight movements per year but excluding facilities more than 3 kilometers from residential premises not associated with the facilities; or

(b) more than 2 000 flight movements per year in any case,

is to be referred to the Environment Protection Authority (EPA).

The Council must take 'direction' from the EPA – i.e. if the EPA requests the Council to place conditions to the consent, or to refuse the application, the Council must do so, in accordance with Part 1, Section 2(d) of Schedule 8, of the Regulations. Matters to be considered by the EPA include noise impacts from differing aircraft utilizing the relocated runway and air quality impacts during construction and operation. A pre-lodgment meeting has been held with the EPA regarding noise impact assessment, and modelling outputs reflect the requests of the EPA.

River Murray Act 2003

NA, given location.

National Parks and Wildlife Act 1972

The Project is located approximately 10km south of Arid Recovery but is not in the vicinity of a National Park. Impacts to species listed under National Parks Schedules have been considered in the DA, and potential for these species to occur within clearance areas are also considered in the Rangeland Assessments, influencing the Unit Biodiversity Score / Total Biodiversity Score for the Vegetation Association and associated clearance offsets.

Natural Resources Management Act 2004

It is anticipated the EPA will request a Construction Environmental Management Plan (CEMP) when responding to the referral under the Development Act. Provision of this information will be a responsibility of the construction contractor, who are likely to be engaged before the end of 2019. The CEMP will include a range of mitigation and management measures, including vehicle hygiene to avoid the spread of weeds, with a particular focus on WoNS and declared weeds.

Aboriginal Heritage Act 1988

Native Title does not apply to the Airport Site. However, ODC is currently undertaking an assessment of the potential impact that works associated with the Olympic Dam Airport Upgrade may have upon ethnographic sites within the Airport Site. Following review, a survey of the area impacted may be required, in conjunction with communication with the Kokatha Group. The Olympic Dam Agreement and ILUA apply for the Airport Site and will be used as guiding documents for construction and communication with the Kokatha Group.

3. Method

The Project Area is defined as “191 hectares surrounding the existing Olympic Dam airport runway (Figure 2).

The Study Area is defined as “The area surrounding the Project Area with a circular 20km buffer radiating from a single point, the centre of the existing Olympic Dam airport runway”.

3.1 Flora assessment

The flora assessment included both desktop and field components. A baseline desktop study was conducted to assess the potential for any threatened or protected species (both Commonwealth and State listed) to occur within the Project Area.

Desktop Assessment

The desktop assessment involved a review of information from a range of sources including:

- The EPBC Protected Matters database via the online Search Tool with a buffer of 50km
- A Biological Database of South Australia (BDBSA) search extract covering the Study Area (20 km buffer) (obtained 9 July 2019).
- An updated review of the BDBSA extract for a 50km buffer zone to identify threatened fauna and flora recorded within 20 years, with <1km reliability to inform Rangeland Assessment Manual (RAM) sheets for this application
- DEWNR’s NatureMaps (2019); and
- Draft Environmental Impact Statement, Chapter 15 – Terrestrial Ecology (2009)

An assessment of the likelihood of flora and TECs (Threatened Ecological Community) occurring was undertaken for threatened species identified in the EPBC PMST search results (Appendix 1). The likelihood ratings assigned include ‘Highly Likely’, ‘Likely’, ‘Possible’, ‘Unlikely’, with the assessment taking the following criteria into consideration (summarized in Table 1 below):

- Date of most recent record (with more weight being given to records within the past 20 years)
- Proximity of the records (distance to the project area)
- Knowledge of species habitat preferences, local population literature
- As per Rangeland Assessment Method, EPBC species highlighted as ‘known’ in the PMST results are considered to have a greater potential for occurrence, however data used to inform the PMST is known to be conservative.

Table 1: *Likelihood of occurrence criteria*

Likelihood category	Criteria
Unlikely	There is a lack of suitable habitat for the species (or community) and a lack of proximate or recent historic records which indicate previous or current occurrence (i.e. BDBSA records older than 20 years). Faunal records exist only within a captive fenced reserve (i.e. Arid Recovery) rather than occurring naturally in a wild population.
Possible	Suitable habitat is present for the species at the impact site, but no or very limited recent (BDBSA last 20 years) database record(s) exist from the study area. Due to the use of 1-way gates at Arid Recovery, the possibility exists for some threatened mammal individuals to have survived predation outside of the perimeter fence.
Likely	Suitable habitat is present on site and multiple recent database records exist from the study area within the last 20 years.

Likelihood category	Criteria
Present	Presence indicated by known recent (within 20 years) records within the study area, habitat present within the study area or observed during site survey of the study area.

Field Survey Methodology

A Jacobs field team of a senior ecologist (Rick Barratt, accredited NVC consultant) and graduate ecologist conducted a foot survey of the project site and surrounds on 21st June 2019, 2nd August 2019 and 27th August 2019 in order to:

- Map and describe native vegetation in the project area, including descriptions of disturbance levels and condition;
- Identify any threatened species and/or ecosystems or important wildlife habitat present at the site;
- Review the vegetation communities present in relation to the Principles of Clearance (Schedule 1) and exemption 5(1)(d) (Regulation 12(34)) of the Native Vegetation Act 1991;
- Review ecological values present at the site in relation to the provisions of the EPBC Act;
- Identify any environmental management issues which will require further consideration, including declared weed species;
- Data was recorded to the required standards under the Native Vegetation Act 1991, i.e. Rangeland Assessment method (DEW 2019) at 9 sites representing the key vegetation communities present; and

The surveyed area included the Project Area as defined in Figure 2. The field survey gathered information to map and describe native and exotic vegetation communities present within the project footprint.

3.2 Fauna assessment

The fauna assessment included both desktop and field components as per fauna assessment, see Section 3.1 above), with results provided in Section 4.1 below.

The desktop assessment reviewed information from a range of sources including:

- Aerial imagery and related vegetation and species mapping (NatureMaps 2019)
- A Biological Database of South Australia (BDBSA) search extract covering the study area plus a 50km buffer
- An EPBC Act Protected Matters database search for the study area plus a 50km buffer
- A review of existing previous studies for study area and surrounds such as:
 - BHP Draft Environmental Impact Statement (2009)
 - OZ Minerals EPBC Assessment of Protected Matters for the Olympic Dam to Prominent Hill transmission line (2018)

The ecological field survey undertaken on 21st June, 2nd August and 27th August 2019 included:

- A vegetation survey of the Project Area using the Rangelands Assessment Method (RAM)
- An assessment of habitat suitability for threatened fauna listed under the EPBC Act and NPW Act
- Targeted species refuge habitat assessment for the Nationally listed Plains Mouse (*Pseudomys australis*, listed as Vulnerable) based on outcomes of desktop assessment. Data collection methods followed those of Moseby (2012), Arid Recovery and are in line with the survey guidelines for EPBC listed threatened mammals (DSEWPac 2011)
- Summary of Plains Mouse Targeted assessment methodology included:
 - A 20 minute search by two people per four hectare area
 - Recording soil characteristics such as the soil type along with the type and extend of cracks
 - Recording habitat characteristics including signs of current or past Plains Mouse presence such as scats, burrows or tracks
 - Recording the vegetation community in that area

4. Assessment Outcomes

Provide information on the following assessment criteria. For more information see the NVC's [Guide for Applications to Clear Native Vegetation](#).

4.1 Vegetation Assessment

General description of the vegetation, the site and matters of significance

Region

The Project Area is located in the Gawler Bioregion defined under the Interim Biogeographical Regionalisation of Australia (IBRA). The Project Area also intersects two IBRA subregions within this bioregion: Roxby and Arcoona Plateau.

The Gawler Bioregion is characterised by semi-arid to arid flat topped to rounded hills, rocky quartzite hills, sandstone plateaus, depositional plains, gibber plains and salt-encrusted lake beds. Typical vegetation includes open woodlands of Black Oak and Myall, open Mallee Scrub, chenopod shrublands (Bluebush / Saltbush) and tall Mulga shrublands. The native vegetation across the area is generally relatively intact, but in some areas, particularly near stock watering points, it is highly disturbed.

The environment of the region has been influenced by pastoral activities and infrastructure (e.g. sheep and cattle stations) and mining operations such as Olympic Dam, as well as the construction and operation activities of the Woomera Rocket Range (Department of Defense, 2018). Grazing by livestock and rabbits has led to extensive habitat modification across the region and coupled with the introduction of predators such as foxes and cats, has resulted in the extinction of many small to medium sized mammals (Morton, 1990).

Weeds are present in the region, particularly ephemeral species that can respond favourably to cool season rains. Whilst the density of weeds is generally low in these arid areas, they are relatively common along tracks, near dams, roadsides and other areas of disturbance. The most common weeds in the region, are the environmental weeds *Carrichtera annua* (Ward's Weed), which dominates chenopod shrublands and Western Myall Woodlands on clayloams, and *Brassica tournefortii* (Wild Turnip) which occurs on sand dunes where present (BHP Billiton, 2009).

Desktop Assessment Outcomes – Flora & Fauna

EPBC Act Protected Matters Summary

Table 2 summarises the results of the EPBC Protected Matters database search of the study area. The table presents the likelihood of occurrence of Protected Matters identified within the database, based on Biological Database of South Australia records (within 50km to align with Rangelands Method Assessment), knowledge of the site and knowledge of the species. For further detail about the likelihood justification refer to Appendix 7 (Jacobs Ecological Assessment report).

Table 2: *Likelihood of occurrence of EPBC listed Threatened and/ or migratory species*

Species	Common Name	Commonwealth Status	Likelihood
Birds			
<i>Amytornis modestus</i>	Thick-billed Grasswren	Vulnerable	Possible. No BDBSA records in study area. However, species listed as being present in Olympic Dam SML (BHP 2009b). Chenopod habitat mapped as present in the study area.
Migratory			
Migratory Marine			

Species	Common Name	Commonwealth Status	Likelihood
<i>Apus pacificus</i>	Fork-tailed Swift	Migratory Marine	Possible. No records within study area (BDBSA 2019) but species is highly mobile
Migratory Terrestrial			
<i>Motacilla cinerea</i>	Grey Wagtail	Migratory Terrestrial	Unlikely. No records within study area. Vagrant to SA
<i>Motacilla flava</i>	Yellow Wagtail	Migratory Terrestrial	Unlikely. No records within study area. Vagrant to SA
Migratory Wetland			
<i>Calidris acuminata</i>	Sharp-tailed Sandpiper	Migratory Wetland	Possible. No recent records within study area, only eight historic records (BDBSA) and a further three anecdotal sighting reported (ALA).
<i>Calidris melanotos</i>	Pectoral Sandpiper	Migratory Wetland	Unlikely. No records within study area.
Mammals			
<i>Macrotis lagotis</i>	Greater Bilby	Vulnerable	Possible. Records prevalent within Arid Recovery fenced reserve.
<i>Dasyurus geoffroii</i>	Western Quoll	Vulnerable	Possible. Species reintroduced to Arid Recovery Reserve in low numbers.
<i>Pseudomys australis</i>	Plains Rat / Mouse	Vulnerable	Likely. 336 records within study area (BDBSA 2013-2018) of which 306 were recorded within the Arid Recovery fenced Reserve. Irruptive species responsive to periods of rainfall.
<i>Bettongia lesueur</i>	Burrowing Bettong	Vulnerable	Possible. Records prevalent within Arid Recovery fenced reserve.
<i>Leporillus conditor</i>	Greater Stick-nest rat	Vulnerable	Possible. Records exist only within Arid Recovery fenced reserve.
<i>Permeles bougainville bougainville</i>	Western Barred Bandicoot	Endangered	Possible. Records prevalent within Arid Recovery fenced reserve.

BDBSA Summary

BDBSA records were obtained for the site with a 50km buffer to allow for the paucity of records within the actual site and to meet NVMU requirements as per the Rangelands Assessment Manual (DEW 2019). Several threatened flora and fauna have been recorded within 50 km of the site and these are summarised in Table 3. The last column defines whether these species were observed during the site survey or are likely to occur based on known distribution and habitat preferences.

Table 3: BDBSA summary of threatened species recorded within 50km of the site (study area, within 20 years, < 1km reliability)

Species Name	Common Name	NPW Act	Likelihood
Birds			
<i>Anhinga novaehollandiae</i>	Australasian Darter	Rare	Unlikely. Lack of habitat. Two records in study area (BDBSA 1999-2000)
<i>Anas rhynchotis rhynchotis</i>	Australasian Shoveler	Rare	Unlikely. Lack of habitat. Four records in study area (BDBSA 1999)
<i>Cladorhynchus leucocephalus</i>	Banded Stilt	Vulnerable	Unlikely. Lack of habitat. Four records in study area (BDBSA 1999-2001)
<i>Oxyura australis</i>	Blue-billed Duck	Rare	Unlikely. Lack of habitat. Three records in study area (BDBSA 2000)
<i>Neophema chrysostoma</i>	Blue-winged Parrot	Vulnerable	Unlikely. Lack of habitat. Two records in study area (BDBSA 1999, 2004)
<i>Actitis hypoleucos</i>	Common Sandpiper	Rare	Unlikely. Lack of habitat. Eight records in study area (BDBSA 1999-2001)
<i>Phaps histrionica</i>	Flock Bronzewing	Rare	Possible. Found in broad range of habitat. 16 records in study area (BDBSA 2013)
<i>Plegadis falcinellus</i>	Glossy Ibis	Rare	Unlikely. Lack of habitat. Two records in study area (BDBSA 1999, 2001)
<i>Podiceps cristatus</i>	Great Crested Grebe	Rare	Unlikely. Lack of habitat. Two records in study area (BDBSA 1999)
<i>Gallinago hardwickii</i>	Latham's Snipe	Rare	Unlikely. Lack of habitat. Three records in study area (BDBSA 2000-1)
<i>Egretta garzetta</i>	Little Egret	Rare	Unlikely. Lack of habitat. One record in study area (BDBSA 2001)
<i>Biziura lobate</i>	Musk Duck	Rare	Unlikely. Lack of habitat. 32 records in study area (BDBSA 2000-1)
<i>Oriolus sagittatus sagittatus</i>	Olive-backed Oriole	Rare	Unlikely. Vagrant to SA. One record in study area (BDBSA 2012)
<i>Neophema splendida</i>	Scarlet-chested parrot	Rare	Possible. Two records in study area (BDBSA 2001)
<i>Porzana tabuensis</i>	Spotless Crake	Rare	Unlikely. Lack of habitat. One record in study area (BDBSA 2000)
<i>Tringa glareola</i>	Wood Sandpiper	Rare	Unlikely. Lack of habitat. Three records in study area (BDBSA 2000-1)
Mammals			
<i>Bettongia lesueur</i>	Burrowing Bettong	Endangered	Possible. Species prevalent in Arid Recovery Reserve.
<i>Macrotis lagotis</i>	Greater Bilby	Vulnerable	Possible. Species prevalent in Arid Recovery Reserve.
<i>Leporillus conditor</i>	Greater Stick Nest Rat	Vulnerable	Possible. Species only present in Arid Recovery Reserve.
<i>Myrmecobius fasciatus</i>	Numbat	Endangered	Possible. Species reintroduced to Arid Recovery Reserve and has not been observed since 2007.
<i>Pseudomys australis</i>	Plains Mouse	Vulnerable	Likely. Species prevalent in Arid Recovery Reserve.
<i>Permeles bougainville bougainville</i>	Western-barred Bandicoot	Endangered	Possible. Species prevalent in Arid Recovery Reserve.
<i>Dasyurus geoffroii</i>	Western Quoll	Endangered	Possible. Species reintroduced to Arid Recovery Reserve in low numbers.
Plants			
<i>Atriplex kochiana</i>	Koch's Saltbush	Vulnerable	51 records within study area (BDBSA 2005/6)
<i>Atriplex morrisii</i>		Vulnerable	One record within study area (BDBSA 2015)
<i>Brachyscome eriogona</i>		Rare	One record within study area (BDBSA 2004)
<i>Cyperus dactyloides</i>		Vulnerable	One record within study area (BDBSA 2004)
<i>Frankenia cupularis</i>		Rare	One record within study area (BDBSA 2012)
<i>Orobanche cernua var. australiana</i>	Australian Broomrape	Vulnerable	One record within study area (BDBSA 2004)

Details of the vegetation associates/scattered trees proposed to be impacted

Vegetation Associations

Five vegetation associations were observed across the site, described across 10 Rangeland Assessment Method (RAM) sites (Table 4). Mapped vegetation associations are provided in Figure 2 above.

A summary of the vegetation recorded across the 10 RAM sites is provided here (**Error! Reference source not found.**), with further details and images below.

Table 4: Summary statistics of vegetation associations within the project area

Vegetation Association	RAM Site	Site specific vegetation community	Area within project area (ha) ¹	Temporary Proposed Impact Area (ha) ¹	Permanent Proposed Impact Area (ha) ¹	Average UBS ¹	TBS ¹
1. <i>Acacia aneura</i> var <i>aneura</i> (Mulga) / <i>Callitris glaucophylla</i> (White Cypress Pine) low open woodland / tall shrubland on sand dunes	OD01	<i>Acacia aneura</i> var <i>aneura</i> (Mulga) / <i>Alectryon oleifolius</i> ssp <i>canescens</i> (Bullock Bush) low open woodland / tall shrubland	100.46	6.80	22.86	71.38	2,117; (1632, permanent; + 485 temporary)
	OD04	<i>Acacia aneura</i> var <i>aneura</i> (Mulga) / <i>Callitris glaucophylla</i> (White Cypress Pine) low open woodland / tall shrubland					
	OD06	<i>Callitris glaucophylla</i> / <i>Acacia aneura</i> var <i>aneura</i> low open woodland					
	OD07	<i>Acacia ramulosa</i> (Horse Mulga) tall open shrubland					
2. <i>Acacia aneura</i> var <i>aneura</i> (Mulga) tall open shrubland on dune flanks and sandy interdune swales	OD03	<i>Acacia aneura</i> var <i>aneura</i> (Mulga) tall open shrubland	74.91	6.08	18.28	74.72	1,820 (1366 permanent; + 454 temporary)
3. <i>Atriplex vesicaria</i> (Bladder Saltbush) low open shrubland on interdune	OD02	<i>Atriplex vesicaria</i> (Bladder Saltbush) low open shrubland	11.70	0.31	1.64	70.11	137 (115 permanent; 22 temporary)
	OD08	<i>Acacia ramulosa</i> (Horse Mulga) tall open shrubland					

swales with heavier soils	OD10	<i>Atriplex vesicaria</i> low open shrubland on interdune swale with duplex soil					
4. <i>Dodonaea viscosa</i> ssp <i>angustissima</i> (Sticky Hopbush) shrubland / <i>Atriplex vesicaria</i> (Bladder Saltbush) low open shrubland (derived community)	OD05	<i>Dodonaea viscosa</i> ssp <i>angustissima</i> (Sticky Hopbush) open shrubland (derived regrowth community)	3.16	NA	2.85	62.27	178
5. <i>Acacia ligulata</i> (Umbrella Bush) / <i>Dodonaea viscosa</i> ssp <i>angustissima</i> (Sticky Hopbush) shrubland on sand plains (derived community)	OD09	<i>Atriplex vesicaria</i> (Bladder Saltbush) low open shrubland	0.78	NA	0.26	51.12	13
		TOTAL:	191.00	13.19	45.89	65.92	4,265

¹Ha = hectares, UBS = Unit Biodiversity Score, TBS = Total Biodiversity Score; Where more than one RAM site occurs in a vegetation association, the UBS scores of each site have been averaged for that association;

Vegetation Association 1: *Acacia aneura* var *aneura* (Mulga) / *Callitris glaucophylla* (White Cypress Pine) low open woodland / tall shrubland.

Acacia aneura var *aneura* (Mulga) / *Callitris glaucophylla* (White Cypress Pine) low open woodland / tall shrubland on sand dune crest with deep loamy sand soils. Scattered stands of *Alectryon oleifolius* ssp *canescens* (Bullock Bush), *Hakea leucoptera* (Needlebush) and *Dodonaea viscosa* ssp *angustissima* (Sticky Hopbush) are also present together with a patchy understorey including *Enchylaena tomentosa* (Ruby Saltbush) and *Lycium australe* (Australian Boxthorn). Annual and short-lived perennial grasses and herbs dominate the ground storey with species including *Aristida holathera* (Tall Kerosene-grass), *Enneapogon avenaceus* (Oatgrass) and *Trichodesma zeylenica* (Cattle Bush) (Figure 4-2). On some deeper dune crests, *Acacia ramulosa* (Umbrella Mulga) replaces Mulga as the dominated overstorey species with similar mid and ground storey species present (Figure 4).

No National threatened species were found in this vegetation association although a State listed Rare flora species (*Santalum spicatum*, 'Sandalwood') was recorded at two locations in the survey area (Figure 2,3). The Flock Bronzewing (*Phaps histrionica*) was recorded in the study area previously although not observed on any of the site visits.

RAM sites (representing vegetation communities) that comprised this association included OD1, OD4 and OD7.

Table 5: *Acacia aneura* var *aneura* (Mulga) / *Callitris glaucophylla* (White Cypress Pine) low open woodland / tall shrubland summary information

Overstorey species	<i>Acacia aneura</i> / <i>Acacia ramulosa</i> / <i>Callitris glaucophylla</i>
Midstorey species	<i>Alectryon oleifolius</i> ssp. <i>canescens</i> , <i>Dodonaea viscosa</i> ssp. <i>angustissima</i> , <i>Enchylaena tomentosa</i> , <i>Lycium australe</i>
Threatened species	Threatened Flora Score 0.08, threatened Fauna Score 0.02
Declared or significant weeds	NA
Vegetation condition (Rangelands Assessment score category)	Medium
Unit Biodiversity Scores	RAM sites OD1, OD4, OD6, OD7; Average 71.38
Total Biodiversity Score	2,117.42
Photo Easting / Northing	53 J 680679/ 6626361



Figure 3: Site OD01 RAM site (representative site for vegetation association 1)

Vegetation Association 2: *Acacia aneura* var *aneura* (Mulga) tall open shrubland on dune flanks and sandy swales

Dune flanks and sandy swales with *Acacia aneura* var *aneura* (Mulga) tall open shrubland with a tussock grass and woody forb understory. Species included *Sclerolaena diacantha* (Grey Copperburr), *S. tricuspis* (Streaked Poverty-bush), *Eragrostis eriopoda* (Woolybutt) and *Enneapogon avenaceous* (Oatgrass) (Figure 5). This vegetation association includes a small area, less than 1ha, at the eastern end of the existing runway where the overstorey trees have been cut down due to being in the approaching flightpath.

Minimal weeds and disturbance in this vegetation association. There were no EPBC species recorded in this vegetation association, nor were there any NP&W threatened species. However, BDBSA records indicate that *Santalum spicatum* ('Sandalwood', listed as Rare) may be present in addition to two fauna species: Flock Bronzewing (*Phaps histrionica*, listed as Rare) and the Plains Mouse (*Pseudomys australis*, listed as Vulnerable both Nationally and Statewide).

RAM site OD03 represented this vegetation association and has been used in all calculations regarding clearance of this vegetation association for this project.

Table 6: *Acacia aneura var aneura* (Mulga) tall open shrubland on dune flanks and sandy swales summary information

Overstorey species	<i>Acacia aneura var aneura</i> (Mulga)
Midstorey species	<i>Sclerolaena diacantha</i> / <i>S. tricuspis</i> / <i>Eragrostis eriopoda</i> / <i>Enneapogon avenaceus</i>
Threatened species	Threatened Flora Score 0.08, Threatened Fauna Score 0.08
Declared or significant weeds	NA
Vegetation condition (Rangelands Assessment score category)	Medium
Unit Biodiversity Scores	74.72
Total Biodiversity Score	1,820.18
Photo Easting / Northing	53 J 680456/ 6626350



Figure 5: Site OD03 RAM site (representative site for vegetation association 2)

Vegetation Association 3: *Atriplex vesicaria* (Bladder Saltbush) low open shrubland on sandy clay swales

Swales with *Atriplex vesicaria* (Bladder Saltbush) low open shrubland with understorey species including *Sclerolaena tricuspis* (Streaked Poverty Bush), *Osteocarpum acropterum* (Bonefruit) and *Eragrostis setifolia* (Neverfail). Scattered individual *Acacia tetragonaphylla* (Dead Finish) and small clumps of *Lycium australe* (Australian Boxthorn) may be present.

No EPBC listed species were observed in this vegetation association during the site survey. However, this vegetation association represents potential Plains Mouse habitat. No refuge habitat, i.e. cracking clay and gilgais, were observed during the surveys but it could be used during a population eruption phase. BDBSA records also indicate that the State listed Flock Bronzewing (*Phaps histrionica*, listed as Rare) could be present.

RAM sites (representing vegetation communities) that comprised this association included OD2, OD8 and OD10.

Table 7: *Atriplex vesicaria* (Bladder Saltbush) low open shrubland on sandy clay swales summary information

Overstorey species	<i>Atriplex vesicaria</i>
Midstorey species	<i>Sclerolaena tricuspis</i> / <i>Osteocarpum acropterum</i> / <i>Eragrostis setifolia</i>
Threatened species	Threatened Flora Score 0, threatened Fauna Score 0.08
Declared or significant weeds	NA
Vegetation condition (Rangelands Assessment score category)	Medium
Unit Biodiversity Scores	RAM sites OD2, OD8, OD10; Average: 70.11
Total Biodiversity Score	136.71
Photo Easting / Northing	53 J 680475/ 6626202



Figure 6: Site OD02 RAM site (representative site for vegetation association 3)

Vegetation Association 4: *Dodonaea viscosa ssp angustissima* (Sticky Hopbush) shrubland / *Atriplex vesicaria* (Bladder Saltbush) low open shrubland (derived community) on previously cleared areas.

Highly modified swales with *Dodonaea viscosa ssp angustissima* (Sticky Hopbush) shrubland / *Atriplex vesicaria* (Bladder Saltbush) low open shrubland regrowth in previously cleared areas (including shallow borrow pits) adjacent to the north western end of the existing runway

No EPBC of State listed flora or fauna were recorded in this vegetation association during site surveys. However, it is possible that the Flock Bronzewing (*Phaps histrionica*, listed as Rare) could be present based on broad habitat preference.

RAM site OD05 represented this vegetation association and has been used in all calculations regarding clearance of this vegetation association for this project.

Table 8: *Dodonaea viscosa ssp angustissima* (Sticky Hopbush) shrubland / *Atriplex vesicaria* (Bladder Saltbush) low open shrubland (derived community) on previously cleared areas summary information

Overstorey species	<i>Dodonaea viscosa ssp. angustissima</i>
Midstorey species	<i>Atriplex vesicaria</i>
Threatened species	Threatened Flora Score 0, threatened Fauna Score 0.02
Declared or significant weeds	NA
Vegetation condition	Medium

(Rangelands Assessment score category)	
Unit Biodiversity Scores	62.27
Total Biodiversity Score	177.47
Photo Easting / Northing	53 J 680745/ 6626290



Figure 7: Site OD05 RAM site (representative site for vegetation association 4)

Vegetation Association 5: *Acacia ligulata* (Umbrella Bush) / *Dodonaea viscosa ssp angustissima* (Sticky Hopbush) shrubland on sand plains (derived community)

Acacia ligulata (Umbrella Bush) / *Dodonaea viscosa ssp angustissima* (Sticky Hopbush) shrubland on sand plains adjacent to the eastern approach to the existing runway. Overstorey trees and taller shrubs have been removed (cut out) from this derived community (Figure 8).

RAM site OD09 represented this vegetation association and has been used in all calculations regarding clearance of this vegetation association for this project.

Table 9: *Acacia ligulata* (Umbrella Bush) / *Dodonaea viscosa ssp angustissima* (Sticky Hopbush) shrubland on sand plains (derived community) summary information

Overstorey species	<i>Acacia ligulata</i>
Midstorey species	<i>Dodonaea viscosa ssp. angustissima</i>
Threatened species	Threatened Flora Score 0.08, threatened Fauna Score 0.08
Declared or significant weeds	NA
Vegetation condition	Medium

(Rangelands Assessment score category)	
Unit Biodiversity Scores	51.12
Total Biodiversity Score	13.29
Photo Easting / Northing	53 J 681107.24/ 6626320.21



Figure 8: Site OD09 RAM site (representative site for vegetation association 5)

Site map showing areas of proposed impact

Refer to Figure 3 above

4.2 Requirements of the Regulation

Provide information on how the proposed clearance meets the requirements of the regulation.

- i. Identify the regulation under which the proposed clearance is applicable and demonstrate that it meets all the criteria of the regulation contained in Division 5 and Schedule 1

The provisions of the Native Vegetation Act 1991 (the NV Act) provide for the clearance of native vegetation either by application to the Native Vegetation Council (NVC) for consent to clear or under exemptions contained in the Native Vegetation Regulations 2017 (the Regulations).

Given that approval for this project is via the Development Act, it is considered that vegetation clearance required for this project falls under the provisions of Schedule 1, Division 5 of the NV Act which provide for the clearance of native vegetation under Part 6 (other Activities) Regulation 12 (34) as described below:

(34) - 'Infrastructure':

(1) Clearance of vegetation—

(a) incidental to the construction or expansion of a building or infrastructure where the Minister has, by instrument in writing, declared that the Minister is satisfied that the clearance is in the public interest; or

(b) required in connection with the provision of infrastructure or services to a building or proposed building, or to any place,

provided that any development authorisation required by or under the Development Act 1993 has been obtained.

(2) In this clause—

infrastructure includes—

(a) flood mitigation works; and

(b) an airstrip; and

(c) a shipping channel; and

(d) a public reservoir.

Accordingly, for clearance under Division 5 of the Regulations, the Data Report must include information on the following matters:

- (1) Identify the activity under Schedule 1 Part 4, 5 or 6 in the Regulation for which permission is being sought.
- (2) Provide information that demonstrates that the proposed clearance meets all the parts specified under the activity (e.g. Development Application)
- (3) Provide any other information that demonstrates that the clearance complies with relevant NVC guidelines related to their activity.

Based on pathway 4. Risk Assessment, activities that require clearance of native vegetation will require a Significant Environmental Benefit (SEB) offset to be delivered. Clearance may occur with a risk assessment to determine the SEB required.

- ii. Risk Assessment - determine the level of risk and provide information to support the risk assessment— see [Guide for Applications to Clear Native Vegetation](#)

For this project the level of risk is identified as follows:

- Patch size of area to be cleared is 59.08 hectares. This comprises a temporary area of clearance of 13.18 hectares and a permanent area of clearance of 45.89 hectares.
- Total Biodiversity Score of the areas to be cleared (combined) is 4,265.07
- Clearance approval under Level 4, given the Total Biodiversity Score (4,265.07) exceeds the 2,500 threshold.

Given the site is in the SAAL NRM region and the proposed clearance has a Total Biodiversity Score greater than 2500, the project conforms with Level 4 vegetation clearance as per NVC Guide to the Native Vegetation Regulations 2017 (NVC, 2017). A desktop and field study incorporating a review of EPBC and BDBSA data bases has been completed (see Jacobs, 2019 (Appendix 7)).

- iii. Provide any other information that demonstrates that the clearance complies with any relevant NVC guidelines related to the activity.

As discussed above, EPBC Act nationally threatened species (Plains Mouse – Vulnerable, Thick-billed Grasswren – Vulnerable and *Frankenia plicata* -Endangered) are not expected to be significantly affected by clearance for the Olympic Dam Airport Upgrade. However, it is noted that both the existing Gosse Springs SEB area and the proposed Emerald Springs SEB offset area provide areas of suitable habitat for the threatened fauna within their existing areas of occupancy and subsequent SEB offsets could ensure further optimal habitat is protected and enhanced to support these species and other regionally important EPBC listed species, as required.

4.3 Address the Mitigation Hierarchy

When exercising a power or making a decision under Division 5 of the Native Vegetation Regulations 2017, the NVC must have regard to the mitigation hierarchy - see the [Guide for Applications to Clear Native Vegetation](#)

The NVC will assess the measures taken to avoid and minimize impacts on biodiversity and rare or threatened species or ecological communities within the property or immediate vicinity of the development.

Demonstrate how the clearance proposal addresses the following:

- a) Avoidance – outline measures taken to avoid clearance of native vegetation such as making adjustments to the location, design, size or scale of the activity in order to reduce the impact.

The project design has been developed to avoid vegetation and utilise existing cleared areas and tracks where possible in order for the project to be viable. Avoidance measures include:

- Development footprint primarily in existing cleared areas in proximity to existing infrastructure
- Development avoids better quality vegetation;
- The site access locations, identified within the preliminary design, avoid clearance of roadside vegetation; and
- Clearance for fence construction / maintenance will be minimised where possible, e.g. utilising existing cleared areas for laydown of materials and equipment.
- Existing access tracks will be used as a priority. New tracks will be required for transportation of materials to/from the proposed construction compound and site of the runway.
- All terminal buildings will be situated on existing bituminised areas and therefore do not result in disturbance to vegetation.
- Advice is currently being sought from the South Australian Country Fire Service regarding any outstanding requirements relating to their assessment when they are referred the development application under the Development Act, 1993.

- b) Minimization – if clearance cannot be avoided, outline measures taken to minimize the extent, duration and intensity of impacts of the clearance on biodiversity to the fullest possible extent.

- The intention of the project is to only clear the poorest quality vegetation on the site as per the approved footprint.
- Clearance is primarily required for construction of the new runway and car parks (permanent clearance) while the clearance required for the construction compound will be temporary and the area will be allowed to regenerate once construction has finished.
- The area proposed for the construction compound is a conservative estimate, conversations are underway with construction contractors regarding stockpile logistics and whether materials from nearby stockpiles on the wider site can be used immediately rather than requiring stockpiling. If this strategy is available, the clearance associated with the temporary construction compound could be minimized.
- Clearance will be minimised where possible. Vegetation management for the vegetation that is not cleared will include a number of standard operating techniques that will be outlined in the site's CEMP and OEMP.

Design controls that would be used include:

- Restrict the disturbance footprint to the minimum necessary to safely carry out the required construction activities (i.e. use of ODC internal Environmental Disturbance Permit (EDP) process to ensure unplanned impacts to native vegetation are avoided, minimized (including rehabilitation) and / or offset where activities cannot be avoided;
- Use existing disturbed or degraded areas where practicable (e.g. for laydown areas);
- Avoid undertaking the activities or storing relevant equipment within remnant vegetation;
- Waste management;
- Drainage management; and
- Minimise ground disturbance; design will consider use of existing tracks wherever possible, minimising new clearance and associated risk of weed incursions.

c) Rehabilitation or restoration – outline measures taken to rehabilitate ecosystems that have been degraded, and to restore ecosystems that have been degraded, or destroyed by the impact of clearance that cannot be avoided or further minimized, such as allowing for the re-establishment of the vegetation.

Onsite management measures to rehabilitate or restore ecosystems only relate to general environmental management as per the CEMP and OEMP that will be developed as per the DA conditions (i.e. only clear the vegetation patches that are approved and ongoing weed management). Given the nature of the existing land use the vegetation that is not cleared will be managed for fire safety and weed control, however specific rehabilitation or restoration will not be undertaken.

d) Offset – any adverse impact on native vegetation that cannot be avoided or further minimized should be offset by the achievement of a significant environmental benefit that outweighs that impact.

It is acknowledged that an SEB offset applies for vegetation clearance. The proponent proposes to use SEB credits associated with protection of existing SEB offset areas Gosse Springs (remaining available credit) and newly approved Emerald Springs SEB area, located approximately 120km north of Olympic Dam.

5. Significant Environmental Benefit

A Significant Environmental Benefit (SEB) is required for approval to clear under Division 5 of the Native Vegetation Regulations 2017. The NVC must be satisfied that as a result of the loss of vegetation from the clearance that an SEB will result in a positive impact on the environment that is over and above the negative impact of the clearance.

As mentioned previously, the estimated maximum clearance area for this project is 59.08ha, across five vegetation associations in a total Project Area of 191ha. A representative RAM sheet for each vegetation association is provided in Appendix 2. Table 10 summarizes the Total Biodiversity Scores (TBS) and SEB points required for each vegetation association due to be impacted in this Project.

Table 10: Summary of the Scores for the areas of each vegetation association to be cleared (permanent plus temporary)

RAM Sheet	Vegetation Association	Total Area of proposed impact ¹ (ha)	Average UBS	Total Biodiversity Score	SEB Hectares Required	SEB points required ²
OD01 OD04 OD06 OD07	<i>Acacia aneura</i> var <i>aneura</i> (Mulga) / <i>Callitris glaucophylla</i> (White Cypress Pine) low open woodland / tall shrubland on sand dunes	29.66	71.38	2,117.13	246.06	1,968.52
OD3	<i>Acacia aneura</i> var <i>aneura</i> (Mulga) tall open shrubland on dune flanks and sandy interdune swales	24.36	74.72	1,820.18	209.03	1,672.24
OD02 OD08 OD10	<i>Atriplex vesicaria</i> (Bladder Saltbush) low open shrubland on interdune swales with heavier soils	1.95	70.11	136.71	16.50	132.03
OD05	<i>Dodonaea viscosa</i> ssp <i>angustissima</i> (Sticky Hopbush) open shrubland (derived regrowth community)	2.85	62.27	177.47	23.30	186.41
OD09	<i>Atriplex vesicaria</i> (Bladder Saltbush) low open shrubland (derived community)	0.26	51.12	13.29	1.74	13.96
	Total	59.08	65.92	4,265.07	496.63	3,973.17

¹Note; includes temporary construction, and includes loadings presented in Table 11 below. ²Reported as 'SEB points' of loss in the RAM sheets attached.

SEB reduction loadings (0.5, 0.3 and 0.2) are applied to temporary clearance based on the time taken to initiate rehabilitation after the clearance has taken place (3 years, 5 years and 7 years).

Of the 59.08ha being cleared, 13.18ha will be temporarily cleared and rehabilitated once construction has finished, which is anticipated to be within three years. As a result, the within three years clearance loading (0.5) has been applied to these areas for the current project and is summarized in Table 11 below. The application of this loading does not alter the Total Biodiversity Score, but it does alter the SEB points required for that clearance, (i.e. the SEB points required are reduced the quicker the rehabilitation occurs).

Table 11: SEB points required from Vegetation Associations within the temporary construction compound area of clearance

VA #	Vegetation Association Description	RAM Sheet #	Average UBS	Total Biodiversity Score	Size of area being cleared (ha)	SEB Points of Loss Required to clear	SEB Points of Loss (with 0.5 loading)
1	<i>Acacia aneura</i> var <i>aneura</i> (Mulga) / <i>Callitris glaucophylla</i> (White Cypress Pine) low open woodland / tall shrubland	OD01 OD04 OD07	71.38	485.28	6.80	254.77	127.39
2	<i>Acacia aneura</i> var <i>aneura</i> (Mulga) tall open shrubland on dune flanks and sandy swales	OD03	74.72	454.06	6.08	238.38	119.19
3	<i>Atriplex vesicaria</i> (Bladder Saltbush) low open shrubland with heavier clay soils	OD02 OD08 OD10	70.11	21.63	0.31	11.36	5.68
	Total		72.07	960.97	13.18	504.51	252.26

ACHIEVING AN SEB

Indicate how the SEB will be achieved by ticking the appropriate box:

- Establish a new SEB Area on land owned by the proponent. **Provide information below.**
- Use SEB Credit that the proponent has established. Provide the SEB Credit Ref. No. 2019/4002/010
- Apply to have SEB Credit assigned from another person or body. The [application form](#) needs to be submitted with this Data Report.
- Apply to have an SEB to be delivered by a Third Party. The [application form](#) needs to be submitted with this Data Report.
- Pay into the Native Vegetation Fund

FOR AN ON-GROUND SEB

If a proponent proposes to achieve the SEB on-ground, the following information must be provided:

Ownership:	BHP Billiton Olympic Dam Corporation Pty. Ltd. (ODC)		
Site Address:			
Local Government Area:	NA – Out of Councils	Hundred:	Out of Hundreds (Andamooka)
Title Details:	Volume 5140 Folio 575	Section:	Section 1516 and 1475

Information on proposed on-ground SEB

Patches of vegetation assessed using the Bushland or Rangeland Assessment Method need to include information about each vegetation association for a proposed SEB:

- Area (ha)
- Unit Biodiversity score
- Gain Score
- Map showing the location of each vegetation association proposed as the SEB

BHP intend to exhaust the remaining Gosse Springs SEB credit (prior to using the Emerald Springs SEB credit) that was approved under the older DLWBC 2005 ratio system. In the event that Gosse Springs credit is unavailable, BHP propose to use the NVC endorsed Emerald Springs SEB credit area to offset native clearance associated with this project.

Gosse Springs and Emerald Springs SEB offset credit information summarized below:

Average SEB Points per ha = 7.08

Gosse Springs SEB credit remaining at the end of FY19 = 4,424.3 ha

Gosse Springs SEB credit remaining converted into SEB Points = 31,339

Emerald Springs area = 37,714 ha of habitat

Emerald Springs SEB Point Provided = 267,143

The NVC SEB advice letters are provided in Appendices 5 and 7, the Management Plans for Gosse Springs and Emerald Springs SEB areas in Appendices 4 and 6, and the SML data report in Appendix 8 which includes details of the Rangeland Assessments conducted for SEB credit endorsement.

Emerald Springs is located approximately 620km NNW of Adelaide and 120km North of Olympic Dam and lies within the Stuart Creek Pastoral Lease / Station, along the Oodnadatta Track and on the western shores of Lake Eyre South (Lake Eyre National Park). It is also adjacent to the western side of the already established SEB area, Gosse Springs (which is also adjacent to the Finnis Springs Indigenous Lands) and the eastern boundary of the Wabma Kadarbu Conservation Park.

The Emerald Springs paddock was originally proposed as an SEB area in the BHP Billiton Olympic Dam Expansion Draft Environment Impact Statement (2009) as it contains nationally threatened species and communities, including two spring groups, Emerald and Walkarinna Springs (Nationally Endangered Great Artesian Basin (GAB) Springs).

The proposed Emerald Springs SEB also contains important natural and cultural heritage sites including, the original Ghan railway and the Curdimurka Railway Siding Complex (a registered state heritage site) (Figure 5). The area also provides access for tourists to view the southern shoreline of Lake Eyre National Park. Illegal camping and other trespassing (4WD and motorbike exploration), largely near the Oodnadatta Track and Lake Eyre South, is an ongoing issue.

Emerald Springs SEB Offset Provision Summary information:

- Area (ha) of proposed offset: 38,022
- Unit Biodiversity Score: 51.07 (average from all assessed SEB offset sites)

- Total Biodiversity Score: 2,101,970.89 (total of all sites)
- UBS gain score: 6.42
- SEB points provided: 267,142.70 (UBS gain x area, total of all sites)

Table 1. Vegetation Associations and Landform types in the Emerald Springs SEB assessment area

Broad Vegetation Association already mapped	Veg Type / Stratified Associations	Area (ha)	Landform type	Comments
Acacia +/- Eucalyptus & Melaleuca Shrubland & other low, largely samphire &/or chenopod, shrublands	Tall Shrubland & Low Shrubland	8,096.5	Drainage lines/ Floodouts	Could develop into Open Woodland if young Coolabah grow higher. Also includes salt lakes and claypans as these were not effectively mapped or assessed due to remoteness.
Rushland/sedgeland & tall shrubland	Tall Shrubland & Low Sedgeland	27.4	Springs/ Mound springs	Sedgeland at Emerald Spring & Melaleuca open tall shrubland mainly at Walkarina Springs.
Low open shrubland (largely Nitrebush & chenopod)	Low Shrubland	18,864.9	Plains - undulating	Landform type generally difficult to differentiate from Floodouts, due to the cryptic nature of the drainage patterns in the area.
Hummock grassland (dune canegrass)	Grassland	7,741.4	Dune fields	
Very open tussock (Mitchell grass) Grassland & very open low chenopod shrublands	Grassland or Low Shrubland	2,983.8	Plains - level	Stony plains; Gibber.
Non-habitat		308		Tracks, borrow-pits/quarries, ruins/old infrastructure etc.
TOTAL		37,714		

Provide relevant background information relating to the proposed SEB Area. Include land use history, management actions or encumbrances.

Management actions detailed in the Emerald Springs Native Vegetation Management Plan include:

- Stock removal & Exclusion through erection of stock-proof fencing & quarterly monitoring
- Control of illegal public access through erection of fencing and improved signage
- Active control of feral herbivores with annual ongoing monitoring
- Removal of weed species and quarterly monitoring
- Maintain the health of the springs and conduct annual monitoring

Provide a description of the vegetation (vegetation associations, dominant species, significant weeds, threatened species and general description of the condition).

Emerald Springs is mainly dominated by low open chenopod, samphire and/or Nitre-bush (*Nitraria billardierei*) shrublands on undulating sandy to loamy plains. Samphire low shrublands are dominating to higher order drainage lines and flood-outs with Old Man Saltbush (*Atriplex nummularia*) and emergent River Coober (*Acacia stenophylla*) becoming increasingly common further downstream and into lower order drainage lines and floodplains.

Margaret Creek is the highest order drainage line and flows through the southern section of the proposed offset, in to Lake Eyre South. Its bank-vegetation is dominated by River Coober (*A. stenophylla*), +/- Coolabah (*Eucalyptus coolabah*) and/or Inland Paper-bark (*Melaleuca glomerata*), with an understory dominated by Samphires (*Tecticornia sp.*) and Lignum (*Duma florulenta*). However, as the Creek approaches Lake Eyre South, the vegetation becomes

increasingly more dominated by dense swards of Samphires (*T. indica* ssp. and *T. halocnemoides* ssp.), as other former dominants drop out.

The dune fields (largely low, roughly parallel, dunes with a general north east-south west orientation) were dominated by Dune canegrass (*Zygochloa paradoxa*) grasslands, which are in very poor condition - presumably drought-affected and not apparently due to grazing pressure. The level plains are very sparsely vegetated and assumed to be largely dominated by Mitchell Grass (*Astrebla lappacea*) very open grasslands, although not obvious at the time, due to the prevailing conditions and nature of the species.

The springs, although degraded by cattle grazing pressure, are dominated by Salt Couch (*Sporobolus virginicus*) and Bore-drain sedge (*Cyperus laevigatus*), with the Walkarinna Group also dominated by Inland Paper-bark (*M. glomerata*).

Weeds

A single Athel Pine (*Tamrix aphylla*) tree in poor condition was recorded but no other Weeds of national Significance (WoNS) or Declared species were observed, likely due to the prevailing dry conditions at the time of survey.

Threatened species & Communities

The Emerald Springs SEB offset area contains two Great Artisan Basin (GAB) spring groups: the Emerald and Walkarinna springs which are listed as Endangered under the EPBC Act (1999).

Previous surveys in 2012 determined that the Thick-billed Grasswren, Blue-winged Parrot (*Neophema chrysostoma*), Painted Honeyeater (*Grantiella picta*), Banded Stilt (*Cladorhynchus leucocephalus*), Plains Rat (*Pseudomys australis*), *Swainsona oligophylla*, and *Swainsona minutiflora* utilise the proposed SEB area (BHP Olympic Dam 2012). Summary of findings is located in Figure 9 below.

Thick-billed Grasswrens were observed and heard at several locations within the area and believed to be sparsely widespread in the area in suitable habitat. An unconfirmed sighting of three Plains Wanderers was made in the adjacent BHP SEB, Gosse Springs, during this assessment (reviewed by the SA Ornithological Association (SAOA) Rare Birds Committee). Potential habitat for this species exists in the area, although it is outside its normal range and likely sub-optimal habitat. Dense samphire habitat in the lower Margaret Creek may provide suitable habitat for Night Parrot and, although its presence is unlikely, this will be investigated for acoustic song-meter monitoring. The Emerald Springs area lies within the natural range of Plains Mouse. Although only small areas of optimal habitat (cracking clays in canegrass swamps) were observed during the assessment, it is possible more optimal habitat exists in more remote areas of the area that were not able to be accessed within the constraints of this assessment methodology. However, larger areas of sub-optimal habitat are believed to exist and the species could be expected to proliferate in the area during a population eruption. *Frankenia plicata* was not observed, but difficult to accurately identify and unlikely to be present as the Arcoona plateau is where its preferred habitat and most reliable records are from.

Table 2. A preliminary review of databases (Atlas of Living Australia (ALA) and the EPBC Act Protected Matters Search Tool (PMST)) for species and communities listed under the EPBC and NPW SA Acts.

Plant species	Common Name	Recorded during survey (Site/s)	Suitable habitat &/or BDBSA record (Y)	Conservation status		
				AUS	SA	Region
<i>Swainsona oligophylla</i>			Y		R	
<i>Swainsona minutiflora</i>	Small-flower Swainson-pea		Y		V	
Vegetation Association						
Great Artesian Basin (GAB) Springs		Y		EN	E	
Fauna species						
<i>Amytornis modestus ssp. indulkanna</i>	Thick-billed Grasswren	Y	Y	VU		
<i>Pseudomys australis</i>	Plains Mouse		Y	VU	V	
<i>Pedionomus torquatus</i>	Plains Wanderer	Possibly observed nearby (Gosse SEB) - TBC	Possibly suitable habitat	CR	E	
<i>Neophema chrysostoma</i>	Blue-winged Parrot	Y	Y		V	
<i>Cladorhynchus leucocephalus</i>	Banded Stilt		Y		E	
<i>Dasyercus cristicauda</i>	Crest-tailed Mulgara (Ampurta)		Y	VU		
<i>Pezoporus occidentalis</i>	Night Parrot		Possibly suitable habitat	EN	E	
AUS=Australia EPBC Act 1999: CR = Critically Endangered, EN = Endangered, VU = Vulnerable SA=South Australia NPW Act 1972: E = Endangered, V = Vulnerable, R = Rare Region (Fauna) - RE = Regionally Extinct, CR = Critically Endangered, EN = Endangered, VU = Vulnerable, RA = Rare, NT = Near Threatened, LC = Least Concern, DD = Data Deficient, NE = Not Evaluated Region (Plants) - E=Endangered, T=Threatened, V=Vulnerable, R=Rare, K=status uncertain, but considered likely to be either rare, vulnerable or endangered, U=Uncommon, Q=Not yet assessed but flagged as being of possible significance, N=Common						

Figure 9: Table 2 from the Emerald Springs Native Vegetation Management Plan

General description of condition

Due to survey in an extended dry period, native vegetation was noted to be in poor condition with regeneration being expected to follow periods of rain.

Table 1, BHP Emerald Springs Native Vegetation Management Plan

Table 1. Vegetation Associations and Landform types in the Emerald Springs SEB assessment area

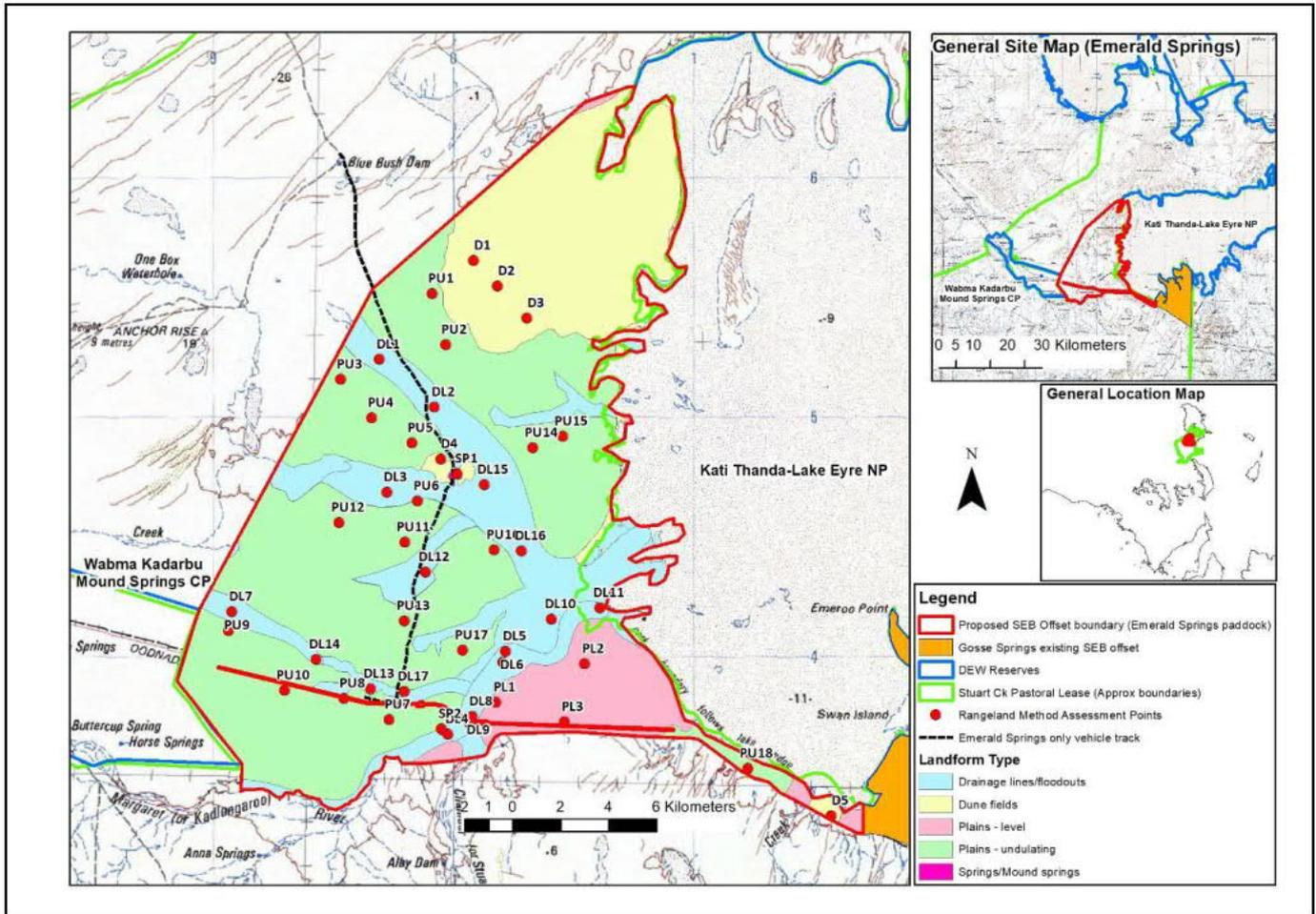
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Non-habitat		308		Tracks, borrow-pits/quarries, ruins/old infrastructure etc.
TOTAL		37,714		

Photographs of the proposed SEB Area and associated GPS points.

See attached Emerald Springs SEB management plan (Appendix 4)

Spatial information – please provide a site map showing the proposed SEB Area, and location map showing landscape features.

See attached Emerald Springs SEB management plan (Appendix 4)



SEB Management Plan

A Native Vegetation Management Plan is required as part of the Conditions of Consent for clearance. The Management Plan is preferred at the time of submitting the clearance application however it can be lodged within the 6-12 week assessment process if required. The Management Plan template is found under [Tools for Accredited Consultants](#). The Management Plan can be attached in the appendices.

Approved SEB Management Plans for the proposed offset areas are provided in Appendix 4

FOR A PAYMENT SEB

If a proponent proposes to achieve the SEB by paying into the Native Vegetation Fund, summary information must be provided on the amount required to be paid:

- Rainfall factor
- Economies of scale
- Payment amount required (including admin. fee)

NA for this project