environmental management

saunders havill group

Howard Springs Sand Plains, Howard Springs
EPBC Act Referral

BORAL®

Boral Resources (QLD) Pty Limited

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surveying town planning urban design environmental management landscape architecture

Referral of proposed action

Project title: Howard Springs Sand Extraction Expansion

1 Summary of proposed action

1.1 **Short description**

The proposed action involves the expansion of an existing sand extraction area in the Howard Springs Sand Plains, which is located approximately 25 kilometres (km) east of Darwin at Howard Springs in the Northern Territory. This referral addresses a proposed extension of the extraction footprint of approximately 195 ha. The expansion of the existing sand extraction area will allow for continued operations at the site without the requirement of new ancillary infrastructure.

1.2 **Latitude and longitude**

Table 1: Latitudes and longitudes of the proposed expansion.

2016/7699 Coordinates (GDA94 MGA z52)							
Area	**ID**	**Longitude**	**Latitude**	**Area**	**ID**	**Longitude**	**Latitude**
A	1	131.080993480	-12.4406254842	**C**	1	131.088307946	-12.4568049464
A	2	131.086659946	-12.4391963258	**C**	2	131.088329000	-12.4581130000
A	3	131.086658000	-12.4389750000	**C**	3	131.088926554	-12.4580442302
A	4	131.088795000	-12.4386480000	**C**	4	131.089235672	-12.4667644797
A	5	131.088858613	-12.4456204097	**C**	5	131.086888345	-12.4667416269
A	6	131.084990320	-12.4448056283	**C**	6	131.081325213	-12.4670578708
A	7	131.084437695	-12.4441570880	**C**	7	131.081446610	-12.4665227020
A	8	131.082401498	-12.4423650174	**C**	8	131.082480811	-12.4654320220
A	9	131.081677753	-12.4413088892	**C**	9	131.083808408	-12.4628253035
				C	10	131.084414612	-12.4614327626
B	1	131.088861428	-12.4456808728	**C**	11	131.085496099	-12.4591961930
B	2	131.100110000	-12.4456110000	**C**	12	131.086347488	-12.4581093120
B	3	131.100145000	-12.4491340000				
B	4	131.089032238	-12.4558228474				

1.3 **Locality and property description**

Contextually the Howard Springs extraction area is located approximately 25 km east of Darwin on the Howard Sand Plains and is accessed from Howard Springs via Gunn Point Road. The current extraction site is located north of Gunn Point Road and is confined by Howard River on the western boundary, the Howard Springs Hunting Reserve adjacent to the northern boundary, and disturbed bushland towards the east.

The Howard Sand Plains covers an area of 264 km^2 within the Howard River region. These sand plains are a Northern Territory (NT) Site of Conservation Significance (SOCS) as they contain Sandsheet Heath vegetation. Sandsheet heath is generally made up of lightly scattered trees (example species include *Melaleuca nervosa*, *Grevillea pteridifolia* and *Banksia dentata*) over a dense herbaceous layer made up of a large diversity of sedges and herbs. Almost 60% of the sand plains are privately-owned freehold land, with large portions in the north-east of the region pastoral leasehold and vacant Crown land. The main land use is horticulture and rural residential. Sand and gravel are extracted from generally shallow, but extensive, surface excavations within the SOCS.

The Howard Springs sand extraction site is currently operational and has been so since 1990 with Boral commencing their operations in 1994, therefore the site is already highly disturbed in many areas. The sand extraction activities usually involve vegetation stripping early in the process to access shallow sand reserves. The tenement at Howard Springs is an operating quarry facility producing fine sand, coarse sand and some gravel products with current operations covering approximately 180 ha. Boral propose to extend the existing extraction footprint by approximately 195 ha into adjacent areas that appear to have undergone some level of disturbance however contain vegetation communities of various quality. Disturbance has been from past and present mining operations, recreational uses (such as four wheel driving activities and shooting), dumping of rubbish, and vegetation clearing for access to the Howard River.

The referral area covers approximately 195 hectares including approximately 136 ha of vegetation clearing mapped as Open Forest under the Natural Resources map. Refer to **Figure 1** for the site context and **Figure 2** for the site aerial.

1.4 **Size of the development footprint or work area (hectares)**

The total development footprint is approximately 195 hectares and includes 136 ha of vegetation clearing.

1.5 **Street address of the site**

Howard Springs Sand Extraction Site, Howard Springs, Northern Territory. Refer to **Figure 1** for the site context.

1.6 **Lot description**

The referral area covers area on two land parcels - Parcel Numbers 4116 and 3601.

1.7 **Local Government Area and Council contact (if known)**

No Local Government Contact.

1.8 **Time frame**

The project has completed relevant Northern Territory approval processes, and is able to commence post confirmation of EPBC Act requirements. It is anticipated that works to expand the existing extraction area will begin in 2016.

1.9	**Alternatives to proposed action**	**X**	**No** The site has been strategically selected by Boral as it is an extension to the existing sand extraction site, therefore will not require the establishment of ancillary infrastructure that would be required if a completely new site was selected. Historically, and currently the site, and its surrounds are under sand extraction, so the proposed action is in keeping with land use intent. The next best alternative to Boral for coarse-sand and gravel materials is located approximately 75 km away at their Mt Bundey operations and (it is estimated) will result in a doubling of the cost of providing such materials which would need to be factored into all construction occurring in the Northern Territory. Other areas from which similar resources might be extracted are inferior as to their quality and location and will result in a major disruption to the supply of construction materials in the Darwin region. There would also be increased truck movements over much longer distances, increasing risks associated with safety, noise and greenhouse gas emissions. There is no known substitute location for the fine-sand materials – a new source would need to be found, which would result in a new extraction location with new impacts, an unknown quality, and a range of other disruptions.
			Yes, you must also complete section 2.2
1.10	**Alternative time frames etc**	**X**	**No** Alternative timeframes are not proposed.
			Yes, you must also complete Section 2.3. For each alternative, location, time frame, or activity identified, you must also complete details in Sections 1.2-1.9, 2.4-2.7 and 3.3 (where relevant).
1.11	**State assessment**	**X**	**No**
			Yes, you must also complete Section 2.5
1.12	**Component of larger action**	**X**	**No** The project is not being developed as part of a component of a larger action.
			Yes, you must also complete Section 2.7
1.13	**Related actions/proposals**	**X**	**No** This referral is not related to other actions in the region.
			Yes, provide details:
1.14	**Australian Government funding**	**X**	**No** The proponent has not received funding from the Australian Government to undertake the project.
			Yes, provide details:
1.15	**Great Barrier Reef Marine Park**	**X**	**No** The proposed action is not located inside the Great Barrier Reef Marine Park.
			Yes, you must also complete Section 3.1 (h), 3.2 (e)

2 Detailed description of proposed action

2.1 Description of proposed action

The proposed action represents an important opportunity to expand upon an existing sand extraction site, maximising the use of existing roadways and infrastructure, with minimal impacts to the environment. The proposed site is on the Howard Springs Sand Plains, in Howard Springs, Northern Territory. The central portion of the site is already heavily disturbed by existing extraction activities which have occurred in some form since 1990. The existing extraction area covers approximately 180 ha, while the proposed expansion will cover an additional 195 ha (refer to **Plan 1**). A proportion of the expansion area is already modified through historical extraction activities, construction of roads and recreational activities (refer to **Plan 2**).

There are ten existing Mining Leases over the property, shown in **Table 2**. These tenements have been periodically reviewed over time however given the nature of the extractive works, the bulk of the site has been highly disturbed from the time the tenements were originally granted. A review of historical aerial imagery was undertaken to identify disturbance levels over time. Due to the remote location of the area data is limited however aerial and satellite imagery was able to be sourced from 1985, 1995 2004, and 2010 (refer to **Plan 2**). The imagery shows much of the area, including the proposed expansion area, has been previously disturbed by sand extraction and other activities.

Table 2: Mining tenements on the property

Mining Tenement	Originally Granted
EMLN9	April 1999
EMLN52	April 1991
EMLN53	April 1991
EMPN1166	November 1997
EMPN1329	April 2000
EMPN1330	April 2000
EMP23325	July 2002
EMP23600	November 2002
EMP23611	February 2003
EML24626	June 2006

The expansion will require the clearing of vegetation consisting mostly of terrestrial woody (Eucalyptus dominated) and low open woodland (dominated by Sorghum) vegetation (refer to **Attachment 2 – Ecological Assessment Report** for further detail). The proposed site exists in a disturbed and fragmented landscape, with existing and historical extraction sites, residential development, and roads. Some tracts of vegetation remain throughout the landscape, however these vegetation patches are largely low density, and are disturbed and fragmented by existing and historical land uses. **Attachment 2** and **Plans 2 and 3** provide further detail on the vegetation in the surrounding areas, reflecting a high level of fragmentation of ecological habitat.

2.2 Alternatives to taking the proposed action

There are no alternatives proposed (refer to response 1.9).

2.3 Alternative locations, time frames or activities that form part of the referred action

There are no alternatives proposed (refer to response 1.10).

2.4 Context, planning framework and state/local government requirements

The proposed action is planned to occur on land adjacent to an existing sand extraction, in an area zoned as Water Management under the Northern Territory Planning Scheme.

The subject site is located within the Darwin and Surrounds area, in the Northern Territory. The project is currently subject to the provisions of the *Northern Territory Planning Scheme*, as well as any other relevant Territory legislation.

The existing extraction site has gained ten mining leases as tabulated (with dates) in the response to **2.1** above. These mining leases also cover much of the expansion site (shown on **Figure 2**). The Howard Springs tenements are operated pursuant to Authorisation No. 0712-01 granted under the Northern Territory Mining Management Act and pursuant to the detailed requirements of a site specific Mining Management Plan approved by the Department of Mines and Energy in December 2014.

The Mining Management Plan is the detailed document required under the Mining Management Act by which all companies holding mining tenements must operate. It contains extensive provisions relating to Boral's projects on the tenements, their proposed activities and mining schedules, site conditions and detailed provisions relating to all aspects of environmental management and performance. It also contains a rehabilitation and closure plan, performance objectives and many other matters.

No other State or Local approvals are required for ongoing operations however, a number of conditions, including monitoring and annual reporting, are required to be met throughout the life of the project in order for the permits to remain current.

2.5 Environmental impact assessments under Commonwealth, state or territory legislation

No environmental impact assessments are required under Commonwealth or State legislation.

2.6 Public consultation (including with Indigenous stakeholders)

As described in the Mining Management Plan for the site, Boral will continue to undertake consultation with a range of key stakeholders, including (but not limited to) Koolpinyah Station, Department of Mines and Energy, Department of Land Resource Management, Department of Transport, Department of Lands, Planning and Environment, Department of Business, and the Aboriginal Areas Protection Authority.

2.7 A staged development or component of a larger project

Not applicable. Refer to response to 1.12 and 1.13.

3 Description of environment & likely impacts

3.1 Matters of national environmental significance

3.1 (a) World Heritage Properties

Description

Not applicable. Refer to **Attachment 1 – PMST Results**.

Nature and extent of likely impact

Not applicable

3.1 (b) National Heritage Places

Description

Not applicable. Refer to **Attachment 1 – PMST Results**.

Nature and extent of likely impact

Not applicable

3.1 (c) Wetlands of International Importance (declared Ramsar wetlands)

Description

Not applicable. Refer to **Attachment 1 – PMST Results**.

Nature and extent of likely impact

Not applicable

3.1 (d) Listed threatened species and ecological communities

Description

MNES Desktop Assessment

The Protected Matters Search Tool using a ten kilometre radius from the centre of the expansion site identified the following matters protected under the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act) as having potential to occur on site:

- One listed threatened flora species;
- Sixteen listed threatened fauna species; and
- Forty-five listed migratory species.

Full search results are provided in **Attachment 1**.

A review of specific habitat niches and distribution of these listed flora and fauna species and TECs using the SPRAT database, Northern Territory Natural Resource (NR) maps, *Territory Parks and Wildlife Conservation Act 2012* searches, vegetation communities known to occur on-site, and previous reporting in the local area was carried out to identify the potential for any of these species to be present on site or impacted by the expansion. Field surveys were also carried out in

May 2015 and January 2016 specifically targeting EPBC listed species. A detailed description of the field methods utilised and results of these surveys are provided in the site specific Ecological Assessment Report included as **Attachment 2**.

Desktop and field assessment generally ruled out the potential for most of these listed matters to occur. This was primarily due to the combined influences of:

- Current and historic extraction activities at the site;
- Lack of suitable niche habitat across the site, such as large undisturbed waterbodies, rocky outcrops, and coastal habitats;
- Influences from surrounding uses such as residential expansion and recreational activities (4WDing, motorbikes, etc.);
- Fragmentation of the site by roads, including Gunn Point Road; and
- Evidence of disturbance and weed incursion throughout the site.

Overall, the assessment identified a low potential for Red Goshawk (Vulnerable), Partridge Pigeon (eastern) (Vulnerable), Masked Owl (northern) (Vulnerable), Fawn Antechinus (Vulnerable), Brush-tailed Rabbit-rat (Vulnerable), Northern Brush-tailed Phascogale (Vulnerable), and Bare-rumped Sheathtail Bat (Critically Endangered) to occur on-site. These species are considered to have a low likelihood of presence due to the site containing low value habitat or food sources. The surrounding environment provides an abundance of similar or better habitat, and the site is not considered to provide any significant or unique values for these species. Other reasons these species are unlikely to occur on the site include:

- There are no confirmed recordings for most of these species within 100 km of the site;
- Disturbance from Increased urbanisation around the expansion area including frequent burn off for fire management reducing nesting or denning habitat; and
- Limited availability of nesting habitats and hollows.

Field surveys did not detect any evidence of these species utilising the site including a lack of detection with baited cages and motion-detection cameras (refer to **Table 3** and **Attachment 3**). **Plan 3** shows field survey effort across the site.

The assessment considered that there is some potential for Northern Quoll (Endangered) and *Typhonium taylori* (a herb) to be present on-site due to the availability of potential habitat, and as it has been recorded in the general area. However, the abundance of available habitat in the surrounding area, evidence of regular fire regimes, and the low number of hollows observed on-site limit the value this particular site provides for these listed species. A further assessment of the potential for occurrence on-site, and the potential for significant impacts on these species is provided below.

A number of migratory species were considered to have potential to utilise the site or be fly-over species, with the Rainbow Bee-eater and Cattle Egret observed on site (refer to **Attachment 3**). The action is not expected to impact on any of these migratory species.

No other EPBC–listed threatened species are considered likely to occur on-site or be affected by the action (refer to **Table 3** and **Attachment 3**). Note the PMST results included a number of sea turtle species which have not been included in **Table 3** due to the lack of habitat on-site.

Table 3: Likelihood of Occurrence Schedule for EPBC Act Listed Species

HABITAT ASSESSMENT FOR LISTED EPBC SPECIES				
Risk of Impact	**Common Name**	**Status**	**Description of Community / Habitat**	**Risk of Impact**
Birds				
Calidris ferruginea	Curlew Sandpiper	Critically Endangered	This is a migratory species. In the Northern Territory, the Curlew Sandpiper mostly occur around Darwin, north to Melville Island and Cobourg Peninsula, and east and south-east to Grove Peninsula, Groote Eylandt and Sir Edward Pellew Island. This species mainly occurs in the intertidal mudflats in sheltered coastal areas such as estuaries, bays, inlets and lagoons, and also around non-tidal swamps, lakes and lagoons near the coast. They forage on mudflats and nearby shallow water. At high tide they are known to forage among low sparse emergent vegetation, such as saltmarsh and sometimes in flooded paddocks or inundated saltflats. No suitable habitat was observed throughout the assessment area. **This species is not expected to occur on site.**	Low
Erythrotriorchis radiatus	Red Goshawk	Vulnerable	A wide ranging and highly mobile species generally observed over eucalypt habitats. This species prefers forest and woodland with a mosaic of vegetation types, large prey populations (birds) and permanent water. The vegetation types include eucalypt woodland, open forest, tall open forest, gallery rainforest, swamp sclerophyll forest and rainforest margins. Habitat has to be open enough for fast attack and manoeuvring in flight, but provide cover for ambushing of prey. Potential suitable foraging habitat observed within the Woodland area dominated by *Eucalyptus miniata* (Darwin Woollybutt) and *Eucalyptus tetrodonta* (Darwin Stringybark). These areas are consistent with the descriptions of community habitat values. Field surveys didn't find any indications of this species presence or usage of the site and similar habitat exists throughout the Darwin and Howard Springs region. **This species may occasionally utilise the site due to its broad range and high mobility, however, no high value habitat is present.**	Low
Erythrura gouldiae	Gouldian Finch	Endangered	The largest population in the Northern Territory of the Gouldian Finch occurs in the Yinberrie Hills with smaller populations at and around Kakadu National Park, Newry Station-keep River National Park and at Bradshaw Field Training Area and the proposed Limmen National Park. This species inhabits open woodlands that are dominated by Eucalyptus trees and support a ground cover of Sorghum and other grasses. Its breeding habitat is usually confined to ridges and rocky foothills, but the tendency to nest in these upland areas is more likely due to the presence of Sorghum grasses rather than the actual topography of the landscape. It has also been recorded in undescribed thickets of vegetation along streams and gorges and at the margins of stands of mangroves. The Gouldian Finch drinks regularly and is often seen at watering points and associated habitat.	Low

			Although no breeding habitat was observed on site or within close proximity of the site, open woodlands that are dominated by Eucalypt trees and that support a ground layer dominated by Sorghum was located. Due to a lack of breeding habitat, including rocky ridges and foothills, **the species is highly unlikely to occur**.	
Geophaps smithii smithii	Partridge Pigeon (eastern)	Vulnerable	The Partridge Pigeon occurs in sub-coastal areas of the Northern Territory with most records in Kakadu National Park and between Katherine and Darwin. This species lives primarily in open forest and woodland dominated by *Eucalyptus tetrodonta* (Darwin Stringbark) and *Eucalyptus miniata* (Darwin Woollybutt) that has a structurally diverse understorey. It nests on the ground, usually where there is plenty of vegetation cover but prefers to forage where the ground layer is open or on bare ground in recently burnt areas. The woody vegetation observed throughout the investigation area, particularly within the northern and eastern portion of the site is dominated by *Eucalyptus miniata* (Darwin Woollybutt) and *Eucalyptus tetrodonta* (Darwin Stringybark) and has a ground layer dominated by Sorghum intrans (Sorghum). Field surveys did not find any indications of this species presence or usage of the site and similar habitat exists throughout the Darwin and Howard Springs region. **This species may occasionally utilise the site due to its broad range and high mobility, however, no high value habitat is present.**	Low
Numenius madagascariensis	Eastern Curlew	Critically Endangered	The Eastern Curlew is most commonly associated with sheltered coasts, especially estuaries, bays, harbours, inlets and coastal lagoons, with large intertidal mudflats or sandflats often with beds of seagrass. This species does not breed in Australia. No suitable habitat was observed throughout the assessment area. **This species is not expected to occur on site.**	Low
Rostratula australis	Australian Painted Snipe	Endangered	The Australian Painted Snipe is usually found in shallow inland wetlands, either freshwater or brackish, that are either permanently or temporarily filled. The species has a scattered distribution throughout many parts of Australia, with a single record from Tasmania. No suitable habitat was observed throughout the assessment area. **This species is not expected to occur on site.**	Low
Tyto novaehollandiae kimberli	Masked Owl (northern)	Vulnerable	In the Northern Territory, this species occurs from the Cobourg Peninsula down to Katherine and Jasper Gorge, and to the east at McArther River, although its distribution is largely	Low

			unknown, it has been recorded from riparian forest, rainforest, open forest, Melaleuca swamps and the edges of Mangroves, as well as along the margins of sugar cane fields. The Masked Owl feeds in open woodland on small to medium-sized terrestrial mammals. Potential suitable foraging habitat observed within the Woodland area dominated by *Eucalyptus miniata* (Darwin Woollybutt) and *Eucalyptus tetrodonta* (Darwin Stringybark) and along the Howard River. These areas are consistent with the descriptions of community habitat values. Field surveys did not find any indications of this species presence or usage of the site and similar habitat exists throughout the Darwin and Howard Springs region. **This species may occasionally utilise the site due to its broad range and high mobility, however, no high value habitat is present.**	
Mammals				
Antechinus bellus	Fawn Antechinus	Vulnerable	The Fawn Antechinus is only found in the forests and woodlands in the lowlands of the monsoonal tropics of the Northern Territory. This species lives primarily in open forest and woodland dominated by *Eucalyptus tetrodonta* (Darwin Stringbark) *and Eucalyptus miniata* (Darwin Woollybutt) particularly where these forests have a relatively dense shrubby understorey. It shelters in tree hollows and fallen logs. It shows preference for areas exposed to cooler and less frequent fires. Potential suitable habitat observed within the Woodland area dominated by *Eucalyptus miniata* (Darwin Woollybutt) and *Eucalyptus tetrodonta* (Darwin Stringybark). However, this species requires a relatively dense understorey where it would shelter in tree hollows and fallen logs. Regular fire regimes have altered the understorey observed on site reducing the density of the understorey and increasing the density of the ground layer, dominated by Sorghum species. It is also noted that the number of fallen logs has also reduced in value and have been burnt out further reducing the habitat values. Records show the species to occur in Garig Gunak Barlu National Park, Kakadu National Park, and Litchfield National Park. One individual was previously identified on Melville Island, however it has not been recorded since in spite of a recent survey effort on the Tiwi Islands. Recent surveys have failed to record it across central and eastern Arnhem Land where it was previously recorded in the 1930s and 1940s. **This species is not expected to occur on site.**	Low
Conilurus penicillatus	Brush-tailed Rabbit-rat	Vulnerable	The Brush-tailed Rabbit-rat has been recorded in near-coastal areas between Center Island in the east to near the mouth of the Victoria River in the west. There are no recent records (post 1950) from much of its historically recorded range. This species however is largely restricted to mixed Eucalypt open forest and woodland, or on dunes with Casuarina, seeming to prefer habitats that are not burnt annually, that have an understorey of predominantly perennial grasses and a sparse-to-moderate middle storey. It shelters during the day in tree hollows, hollow logs and sometimes in the crowns of Pandanus or sand palms.	Low

			The woody vegetation observed throughout the investigation area is dominated by *Eucalyptus miniata* (Darwin Woollybutt) and *Eucalyptus tetrodonta* (Darwin Stringybark), which contains suitable habitat for this species. However, this species prefers habitat that is not annually burnt with evidence of fire recorded throughout the investigation area reducing its likelihood of occurrence. More recent records have been restricted to Tiwi Islands, Inglis Island, a small area within Kakadu National Park and on Cobourg Peninsula. **This species is not expected to occur on site.**	
Dasyurus hallucatus	Northern Quoll	Endangered	The Northern Quoll occupies a diversity of habitats across its range which includes rocky areas, Eucalypt forests and woodlands, rainforests, sandy lowlands and beaches, shrubland, grasslands and desert. Eucalypt forest or woodland habitats usually have a high structural diversity containing large diameter trees, termite mounds or hollow logs for denning purposes. The woody vegetation observed throughout the investigation area is dominated by *Eucalyptus miniata* (Darwin Woollybutt) and *Eucalyptus tetrodonta* (Darwin Stringybark), which contains suitable habitat for this species. However, cane toads have had a significant impact on this species which may have had a negative impact within the local area. Although this species has been recorded within the local area, very few hollow logs were observed within the proposed expansion area most likely a result of continuing fire management and burn offs. **This species has low potential to occur on site due to the presence of low value foraging habitat.**	Low
Mesembriomys gouldii gouldii	Black-footed Tree-rat	Endangered	The Black-footed Tree-rat is restricted to forests and woodlands of the northern Kimberley and mainland Northern Territory. This species dens mostly in tree hollows, but occasionally in dense foliage (notably of Pandanus). It occurs mostly in lowland open forests and woodlands dominated by *Eucalyptus miniata* (Darwin Woollybutt) and *Eucalyptus tetrodonata* (Darwin Stringybark). The woody vegetation observed throughout the investigation area is dominated by *Eucalyptus miniata* (Darwin Woollybutt) and *Eucalyptus tetrodonta* (Darwin Stringybark), which contains suitable habitat for this species. Evidence of fire recorded throughout the investigation area reduces its likelihood of occurrence as a result of limited fallen logs and den sites. **This species has low potential to occur on site due to low value habitat.**	Low
Petrogale concinna canescens	Naberlek	Endangered	This small wallaby is restricted to the monsoonal tropics of the Northern Territory where it has been recorded from a series of isolated rocky sites. They shelter in caves in cliffs and rockpiles typically dominated by sandstones but occasionally by granites.	Low

			No suitable habitat was observed throughout the assessment area. **This species is not expected to occur on site.**	
Phascogale pirata	Northern Brush-tailed Phascogale	Vulnerable	The Northern Brush-tailed Phascogale is recorded from tall open forests dominated by *Eucalyptus miniata* (Darwin Woollybutt) and *Eucalyptus tetrodonta* (Darwin Stringybark). This species utilises hollows in trees for nesting purposes. The woody vegetation observed throughout the investigation area is dominated by *Eucalyptus miniata* (Darwin Woollybutt) and *Eucalyptus tetrodonta* (Darwin Stringybark), which contains suitable habitat for this species. All recent records are restricted to Kakadu National Park area with historical records mainly confined to Litchfield National Park. Regular burning has also reduced the number of available hollow logs for habitat for this species. Field surveys did not find any indications of this species presence or usage of the site and similar habitat exists throughout the Darwin and Howard Springs region. **This species is not expected to occur on site.**	Low
Saccolaimus saccolaimus nudicluniatus	Bare-rumped Sheathtail Bat (Qld)	Critically Endangered	This species was first recorded in 1979 in the Kapalga area of Kakadu National Park and there are less than five confirmed records since that time. The Bare-rumped Sheathtail Bat occurs mostly in lowland areas, typically in a range of woodland, forest and open environments. The small number of confirmed roosts located in Australia have all been in tree hollows. The woody vegetation observed throughout the investigation area is dominated by *Eucalyptus miniata* (Darwin Woollybutt) and *Eucalyptus tetrodonta* (Darwin Stringybark), which contains suitable habitat for this species. All recent records have been from Kakadu lowlands and it is considered unlikely to be found at the site due to the high levels of disturbance. **This species is considered unlikely to occur on site.**	Low
Xeromys myoides	Water Mouse	Vulnerable	The Water Mouse is found in coastal areas of Northern Territory and Queensland in coastal wetlands such as lagoons, swamps and sedged lakes close to fore dunes. It forages amongst the mangroves at low tide and a high tide returns to the adjacent sedgelands for shelter. No suitable habitat was observed throughout the assessment area. **This species is not expected to occur on site.**	Low
Plants				
Typhonium taylori	A Herb	Endangered	This species is endemic to Northern Territory and known from the edge of the Howard River floodplain. Little is known about the ecology of this herb however it occurs in seasonally	Low

			saturated sandy soil in nutrient poor grass/sedgeland with occasional *Melaleuca viridiflora* (Paperbark). This species has been recorded in similar habitat to bladderwort species. The location of the proposed sand extraction area to the south of Gunn Point Road contains vegetation consistent with the previous known habitat that this species has been identified in. Extensive searches within this habitat were completed however no specimens were identified on site. This species has the potential to occur on the site. **This species has the potential to occur on site, however detailed targeted surveys did not locate any individuals.**	
Reptiles				
Acanthophis hawkei	Plains Death Adder	Vulnerable	The Plains Death Adder occurs on flat, treeless cracking soil plains of northern Australia. No suitable habitat was observed throughout the assessment area. **This species is not expected to be recorded on site.**	Low

Northern Quoll (*Dasyurus hallucatus*)

*Dasyurus hallucatus (*Northern Quoll) occurs in a wide range of vegetation communities, with the highest value habitats considered to be rocky areas. The SPRAT profile for the Northern Quoll states that habitat generally encompasses some form of rocky area for denning purposes, with surrounding vegetated habitats used for foraging and dispersal. Rocky habitats are usually of high relief, often rugged and dissected but can also include tor fields or caves in low lying areas (SPRAT profile). The Northern Quoll dens in hollow logs, rock crevices and caves, tree hollows, and occasionally in termite mounds. It is common in many eucalypt open forests as these usually have a high structural diversity containing large diameter trees, termite mounds or hollow logs for denning purposes, such as those forests dominated by *Eucalyptus miniata* (Darwin Woolybutt) and *Eucalyptus tetradonta* (Darwin Stringybark) located within the proposed expansion areas. Prime habitat in the northern regions is sandstone escarpment (Braithwaite & Griffiths 1994) (SPRAT profile). Most foraging is on the ground, but it is also an adept climber. Northern Quolls are thought to have home ranges of approximately 35 ha, with the home range of males during the breeding season increasing to >100 ha.

Due to the vegetation communities on-site there is some potential for individuals to occasionally utilise the site for foraging. There is no denning habitat present on-site in the expansion area. Any use of the site by the species is expected to be infrequent, by a small number of individuals for the following reasons:

- While the site includes vegetation communities known to provide foraging habitat for the species, it is of low quality and similar, better habitat is present throughout the Howard Springs Sand Plains, and Northern Territory;
- Field traverse of the proposed expansion areas did not identify any suitable denning habitat. Rock crevices and caves were not observed on or near the expansion area;
- Bushfires regularly burn through the site, and the NT government conducts controlled burns along Gunn Point Road, which have resulted in a small number of hollow logs within the ground layer;
- The presence of *Rhinella marinus* (Cane Toad) throughout the area further reduces the potential presence of the Northern Quoll as this species is particularly susceptible to the poison of Cane Toads;
- The map from the Northern Territory Government Department of Land Resource Management paper "*Threatened Species of the Northern Territory- Northern Quoll (Dasyurus hallactus)*" indicates that the species has been historically observed in the area, however it has not been recorded within 3 km of the to the proposed expansion areas or vegetation communities present on the site (Refer to **Attachment 2**);
- Targeted field investigations for the Northern Quoll included the deployment of motion detection cameras around the proposed extraction areas, random meander surveys, and spotlighting. Combined with previous surveys on-site, no species or indications of its presence have been recorded in an area of 370 ha (existing and proposed extraction areas); and
- The small number of hollows were not of suitable size for denning.

While it is possible that the Northern Quoll infrequently uses the site for foraging, it is considered unlikely that any individual would utilise it regularly.

As the site potentially provides foraging habitat for the Northern Quoll, an assessment against *the Significant Impact Guidelines 1.1 – Matters of National Environmental Significance* was conducted (refer to **Table 5**) to ascertain whether or not the action could potentially impose a significant impact on the species.

Table 5: Significant Impact Assessment – Northern Quoll

Significant Impact Criteria	Description	Impact
An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:		
1. Lead to a long term decrease in the size of an important population of a species.	While the site contains potential foraging habitat for the Northern Quoll, no individuals or den habitats were seen on, or adjoining, the site. The Northern Quoll range is restricted to the Top End, within the NT, and it is known to occur on smaller islands in the Northern Territory and has been recorded from 15	**No significant impact likely**

	conservation reserves in the Northern Territory, including Howard Springs, east of the project site (SPRAT profile). The proposed sand extraction expansion site is not considered to support an important population of the species or significant habitat therefore the proposed action is considered unlikely to lead to a long term decrease in the size of any local Northern Quoll populations.	
2. Reduce the area of occupancy of an important population.	No dens were observed across the site. While the proposed action will remove some potential foraging habitat, given the abundant availability of suitable habitat in the surrounding landscape and the greater region, the development proposal is unlikely to have a significant impact on the area of occupancy of the species.	**No significant impact likely**
3. Fragment an existing important population into two or more populations.	The SPRAT species profile outlines due to the recent decline, genetic differentiation of Northern Quolls is probable, with recent genetic analyses showing a marked genetic disjunction between populations in Queensland and those in the Northern Territory and Western Australia. It goes on to say, in light of these results it is likely that recently isolated populations in the Northern Territory (due to Cane Toads) may also become more genetically distinct from each other. While the site is located in the Northern Territory, and there are Cane Toads present on-site, no Northern Quolls were observed, nor any suitable denning habitat. The proposed action is for an expansion to an existing extraction site. It is not considered that the proposed action is likely to fragment a population into two or more populations.	**No significant impact likely**
4. Adversely affect habitat critical to the survival of a species.	Habitat critical to the survival of the Northern Quoll species is considered to include open Eucalypt forests and woodlands with a high structural diversity containing large diameter trees, termite mounds or hollow logs for denning purposes. The proposed action will result in the removal of some low quality potential foraging habitat, however this habitat is disturbed by existing extraction activities on-site, neighboring land development, and arterial roads, and subject to edge effects from surrounding development. This habitat on-site is not considered to be unique or of special value or critical to the survival of the species. The Northern Territory landscape provides abundant eucalypt and similar genera, which are available for Northern Quoll foraging. Given its disturbed nature, and lack of denning habitat, the vegetation on-site is not considered to be critical habitat for Northern Quoll.	**No significant impact likely**
5. Disrupt the breeding cycle of an important population.	The site surveys did not identify any evidence of breeding Northern Quolls, nor suitable habitat for denning. Dens are made in rock crevices, tree holes or occasionally termite mounds (SPRAT profile), of which none were observed on-site, or immediately adjacent. As a result, it is considered that the proposed action is unlikely to disrupt the breeding cycle of an important population.	**No significant impact likely**
6. Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.	The habitat on site did not contain any special or unique values, in particular it did not contain habitat suitable for denning. The removal of site vegetation is unlikely to have a significant impact on the availability of habitat throughout the broader landscape, given the vast quantity and availability of vegetation in the surrounding area.	**No significant impact likely**
7. Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat.	The proposed action is an expansion of the existing use on-site which is a common activity throughout the area, therefore, it is considered unlikely that the proposed action will result in the introduction of an invasive species. Further, weed and pest management is addressed through the mine management plan.	**No significant impact likely**
8. Introduce disease that may cause the species to decline.	The project consists of an expansion of the current use on the site (and common within the greater area), and it is therefore considered unlikely that the proposed action will introduce disease into the area that may cause the species to decline. Additionally, trucks and equipment used on-site are all locally sourced.	**No significant impact likely**
9. Interfere substantially with the recovery of the species.	The nine main objectives of the draft National Recovery Plan for the Northern Quoll include:	**No significant impact likely**

	- Protect Northern Quoll populations on offshore islands from invasion and establishment of Cane Toads, Cats and other potential invasive species. - Foster the recovery of Northern Quoll sub-populations in areas where the species has survived alongside Cane Toads. - Halt declines in areas not yet colonised by Cane Toads. - Halt declines in areas recently colonised by Cane Toads. - Maintain secure populations and source animals for future reintroductions/introductions, if they become appropriate. - Reduce the risk of Northern Quoll populations being impacted by disease. - Reduce the impact of pastoral land management practices on Northern Quolls. - Raise public awareness of the plight of Northern Quolls and the need for biosecurity of islands and Western Australia. The proposed expansion site and associated activities will not interfere with any of the recovery objectives. Additionally, the site is not on an offshore island, and is an area already colonised by Cane Toads. No Northern Quolls were observed on-site, and the site is already heavily disturbed by extraction activities. The subject site has not been identified as an important habitat or den site and the action is considered unlikely to interfere with the recovery of the species.	

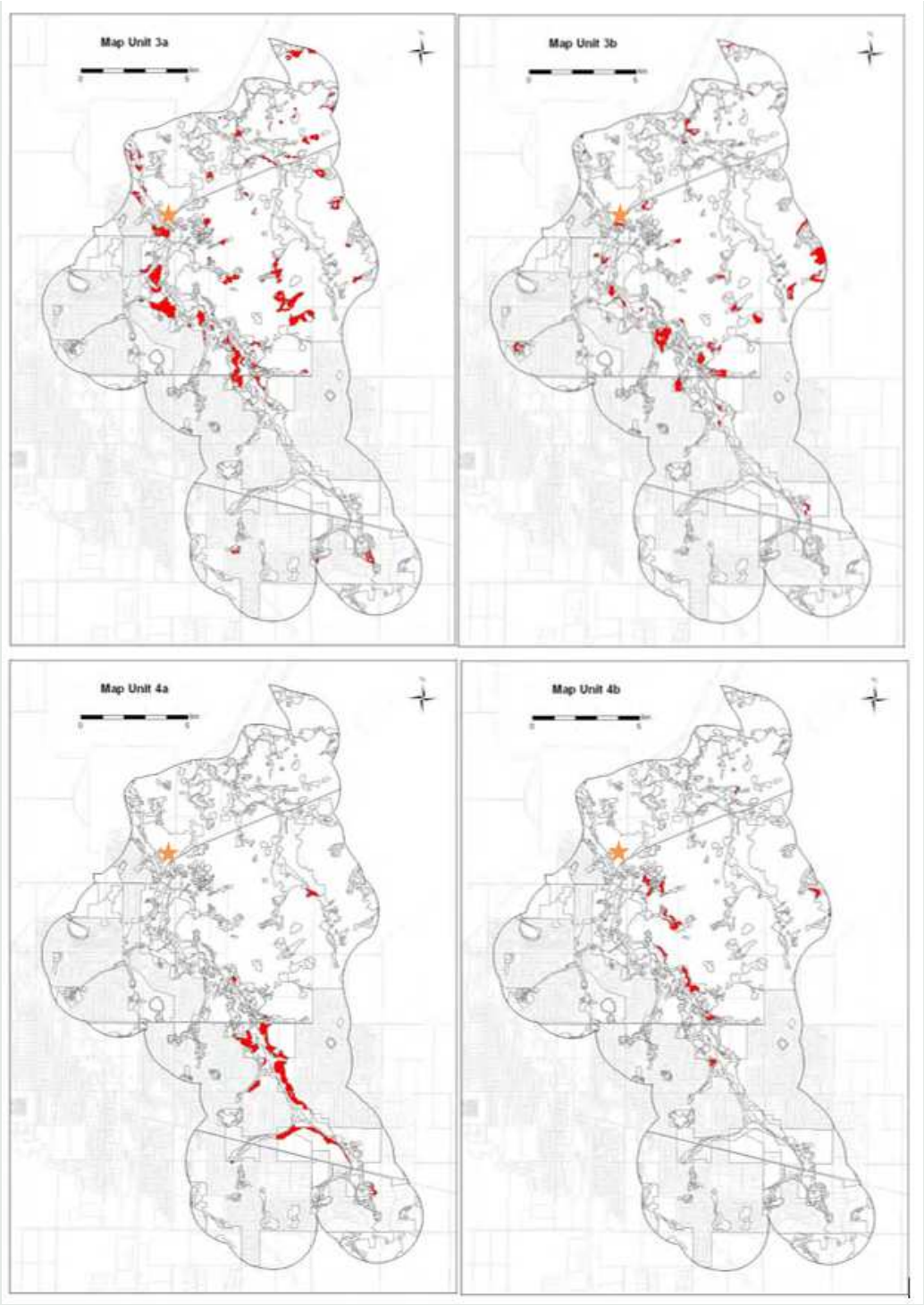
Assessment against the *Significant Impact Guidelines 1.1* found the proposed action would not have a significant impact on the Northern Quoll.

Typhonium taylori

Typhonium taylori is endemic to the Northern Territory, where it is known from only a few records (two listed with DoE and four on the Atlas of Living Australia) the Howard River floodplain in the Darwin rural area (see image below). The collections are likely to have come from the same population in the Howard Springs sand sheet area. The entire known population is estimated to have an extent of occurrence of 0.2 km^2 with the entire area of occupancy estimated to be 0.02 km^2 (EPBC Listing Advice). The referral site is not within the known extent of occurrence. The herb, *T. taylori* occurs in vegetation associated with the Howard River Flood Plain. Liddle et. al. (2013) states that *T. taylori* was found in heath vegetation communities 4a, 4b, 3a and 3b. The vegetation is described as:

> *3a: "Melaleuca nervosa+/- Pandanus spiralis (Screw Palm) low open woodland with a Sorghum intrans, Eriachne trisecta mid tussock grassland understorey."*
> *3b: "Melaleuca nervosa, Grevillea pteridifolia (Fern-leaved Grevillea) low open woodland with Dapsilanthus spathaceus low open sedgeland ground layer",*
> *4a: "Verticordia cunninghamii (Cunningham's Featherflower) and Banksia dentata mid open heathland with an emergent Melaleuca nervosa and Grevillea pterdidifolia (Fern-leaved Grevillea) low open woodland with Dapsilanthus spathaceus mid open sedgeland ground layer" and*
> *4b: "Grevillea pteridifolia (Fern-leaved Grevillea) +/- Melaleuca nervosa low open woodland with or without a mid-layer of Pandanus spiralis (Screw Palm) and Verticordia cunninghamii (Cunningham's Featherflower) low isolated trees or heath shrubs and a Dapsilanthus spatheceus mid open sedgeland understorey."*

The mapped distributions of these communities are shown below (with the approximate site location indicated by an orange star) (source: Liddle et al. 2013). Based on mapped distributions, communities 3a and 3b may be found in proximity to the site, however 4a and 4b are not located on or near the site.



While the maps (below) from the Northern Territory Government Department of Land Resource Management paper "*Threatened Species of the Northern Territory- Typhonium taylori*" and the Atlas of Living Australia indicate that the species has historically been recorded in the vicinity of the proposed extraction area (refer to **Attachment 2**), and it is noted that the site contains a mosaic of vegetation types consistent with previous habitats that *T. taylori* has been identified in, no individuals were seen on the site, despite targeted survey effort, and the referral area does not exist within the known occupancy of the species.

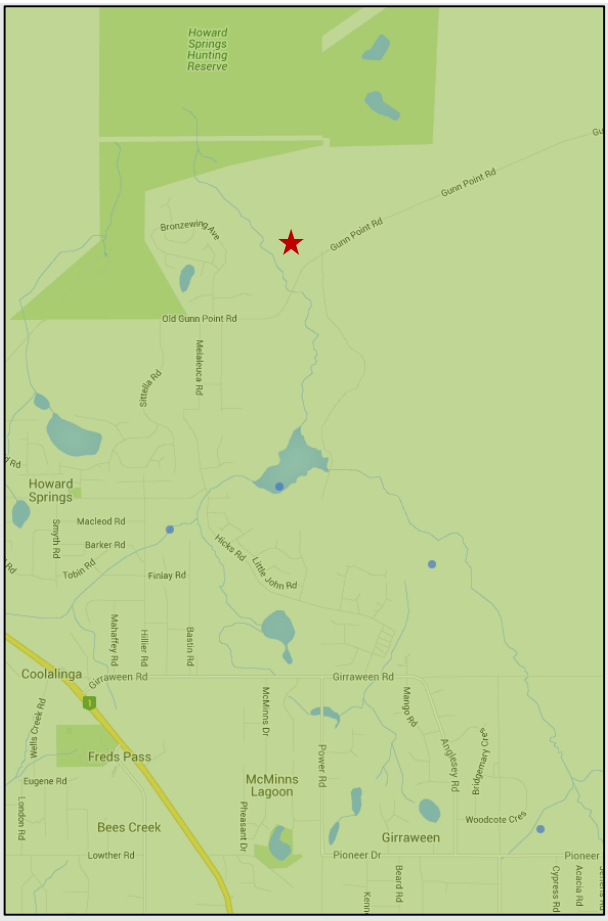


Image showing records of *T. taylori* – Source: Atlas of Living Australia. Blue dots represent *T. taylori* records. Star represents approximate project site.

Due to the possibility for *T. taylori* to be present on-site, and the limited knowledge about the locations of this species outside of the few records available, it was considered important to conduct detailed investigations for the species. The species has been recorded to flower in mid-January. Field surveys were conducted in February, which was considered as close as logistically possible to carry out the surveys to the probable flowering period, as January is prohibitive due to access limitations resulting from heavy rains. EPBC guidelines specify that it is essential surveys are carried out during the wet season which is considered to be November to April in the Top End. Detailed field surveys were carried out in the areas considered to be the highest value habitat locations for the species based on desktop and initial survey in 2015 (refer to field survey effort on **Plan 3**). The field assessment included meander surveys where active searches for the species were conducted by two Senior Ecologists, in an effort to record the presence of the species.

While *T. taylori* is considered to have potential to occur on-site, no specimens were observed during these targeted field surveys. Additionally, the surveys found that potential habitat for this species is limited to only small areas within the proposed expansion site, to the south of Gunn Point Road. As there is the potential for *Typhonium taylori* to occur on-site, an assessment against *the Significant Impact Guidelines 1.1 – Matters of National Environmental Significance* was conducted (refer to **Table 7**) to ascertain whether or not the action could potentially impose a significant impact on the species.

Table 7: Significant Impact Assessment – *Typhonium taylori*

Significant Impact Criteria	Description	Impact
An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:		
1. Lead to a long term decrease in the size of an important population of a species.	While the site has potential to contain suitable habitat for *Typhonium taylori*, no specimens were recorded during targeted searches in February 2016, which is the closest time to the flowering period that the site was accessible. Known records of this species come from a maximum of four occurrences within the Howard Springs Sand Plains, with the closest record being 4 km to the south of the site.	**No significant impact likely**

	The available habitat consists of the flood plain habitat near the Howard River, to the west and south of the site. Based on the lack of observation of this species, and the confirmation during site survey that suitable habitat only occurs in small areas within the proposed expansion area south of Gunn Point Road, the site is considered unlikely to support an important population of the species. Subsequently, the proposed action is considered unlikely to lead to a long term decrease in the size of any *Typhonium taylori* populations.	
2. Reduce the area of occupancy of an important population.	No individuals (or evidence of) *Typhonium taylori* were observed on-site. While the proposed action will remove some potential habitat, given the area of Howard Springs Sand Plains in the area, the development proposal is unlikely to have a significant impact on the area of occupancy of the species. Further, the field survey found potential habitat was only located in isolated sections of the site, south of Gunn Point Road, with detailed targeted searches not locating any individuals.	**No significant impact likely**
3. Fragment an existing important population into two or more populations.	The SPRAT species profile outlines that there is insufficient data to assess the population size of *Typhonium taylori*. The species is known based on only two records, and these are thought to be likely of the same species. Given the existing disturbance on-site due to current and historical sand extraction activities, and that no *T. taylori* specimens were observed on-site, and availability of potential habitat on-site is limited to some small areas south of Gunn Point Road, it is considered unlikely that the proposed action will fragment a population into two or more populations.	**No significant impact likely**
4. Adversely affect habitat critical to the survival of a species.	While the species has potential to occur on-site, no individual were observed in February 2016 despite targeted site surveys. There are also other areas of Howard Springs Sand Plains in the area which would provide suitable habitat for the species. The site already is heavily disturbed by extraction activities, and the lack of specimens observed on-site would suggest that the proposed expansion is unlikely to adversely affect habitat critical to the survival of the species.	**No significant impact likely**
5. Disrupt the breeding cycle of an important population.	No individuals were observed on-site, therefore it is not considered that the proposal would impact the breeding cycle of an important population.	**No significant impact likely**
6. Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.	The habitat on-site did not contain any special or unique values. Field survey confirmed a limited amount of the preferred habitat on-site, restricted to small areas south of Gunn Point Road. Its removal is unlikely to have a significant impact on the availability of suitable flood plain habitat throughout the Howard Springs area. The removal of a small area of potential habitat on-site is not likely to lead to species decline, particularly in an area where no specimens were recorded.	**No significant impact likely**
7. Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat.	The proposed action is an expansion of the existing use on-site which is a common activity throughout the area, therefore, it is considered unlikely that the proposed action will result in the introduction of an invasive species. Further, weed and pest management is addressed through the mine management plan.	**No significant impact likely**
8. Introduce disease that may cause the species to decline.	The project consists of an expansion of the current use on the site (and common within the greater area), and it is therefore considered unlikely that the proposed action will introduce disease into the area that may cause the species to decline. Additionally, trucks and equipment used on-site are all locally sourced.	**No significant impact likely**
9. Interfere substantially with the recovery of the species.	Recommendations for the recovery of the species were focused on undertaking further survey and mapping; protecting all known localities of the species; and undertaking further research on the impact of altered hydrological regimes. The subject site has not been identified as an important habitat for this species, and no specimens were found on-site. The proposed expansion is considered unlikely to interfere with the recovery of the species.	**No significant impact likely**

As per the assessment against the *Significant Impact Guidelines 1.1*, the proposed action is considered unlikely to have a significant impact on *T. taylori*. No specimens were observed on-site, and it is considered that there is sufficient available area within the Howard Springs flood plains to provide habitat for this species.

Nature and extent of likely impact

No EPBC Act listed species were observed on-site or in areas adjoining the site. As stated above, it is considered that the abundance of suitable habitat in the surrounding area would likely mitigate any potential negligible impact on the fauna species, should they visit the site.

In terms of potential impacts on MNES, the project will result in the following:

- Removal of approximately 136 ha of previously disturbed open forest which has the potential to provide low value foraging habitat for the Northern Quoll. Similar, less disturbed habitat is present throughout the Darwin and Howard Springs regions;
- Expansion of extraction activities in an area possibly suitable for *T. taylori*, south of Gunn Point Road;
- Potential injury or death to fauna species as a result of vegetation clearing; and
- Increased vehicle usage during and after construction, which pose potential threats to some fauna species.

As discussed above, a number of factors diminish the adversity of impacts caused by the proposed clearing of 136 hectares of vegetation. These factors can be summarised as:

- The proposed action is to occur on a site already disturbed by extraction activities, and have for decades, with other extraction activities also occurring in the surrounding landscape;
- The proposal requires the clearing of approximately 136 ha that is mapped as Open Forest under the NT Natural Resources mapping;
- Field investigation confirmed vegetation on-site to include approximately:
  - 47.5 ha of grassland plains with scattered regrowth open woody vegetation
  - 109 ha of grassland plains for Eucalyptus dominated vegetation
  - 2 ha of waterholes
  - 9 ha of vegetation associated with Howard River - not being cleared as part of the proposed action
- The vegetation suitable for most listed species is the Eucalyptus dominated vegetation, however on site the understory of these communities has been highly impacted and contains limited nesting habitats and hollows;
- For most species, there is a large distance from the proposed expansion site to the locations where the species have been recorded;
- Increased urbanisation around the expansion area has resulted in frequent burning for fire management, invasion of feral animals, and weed incursion;
- The lack of evidence of these species on-site, including a lack of detection with motion-detection cameras;
- No *T. taylori* specimens were observed on-site after extensive targeted searches were carried out for the species; and
- Vegetation clearing will be undertaken sequentially under the guidance of a fauna spotter-catcher. This will ensure that the potential for injury or death to fauna, if present, as a result of clearing is minimised. Additionally, any listed fauna found on-site will be relocated to an area with more suitable habitat, and a lower chance of mortality.

As such, the proposal is considered unlikely to impose a significant impact on any EPBC protected species.

3.1 (e) Listed migratory species

Description

An EPBC Act Protected Matters Search Tool with a ten kilometre radius identified 45 migratory species as having potential to occur on-site (**Attachment 1**). Of these listed migratory species, *Haliaeetus leucogaster* (White-bellied Sea-eagle), *Merops ornatus* (Rainbow Bee-eater), and *Ephippiorhynchus asiaticus* (Black-headed Stalk) were observed as either fly-over species, perched within trees, or within the fringing vegetation around the Melaleuca waterholes. While some of these migratory species are protected under various international agreements, they are relatively common throughout eastern and northern Australia and the site is not considered to provide any unique or high ecological values for these species. Marine species such as fresh and salt water crocodiles have been observed in and round the site. In particular, fresh water crocodiles are known to exist within detention ponds on site. These species are common in the Northern Territory and their presence suggest they are unaffected by extraction at the site.

Nature and extent of likely impact

The proposed action is not considered to have a significant impact on migratory species given the current extraction operations on-site and the lack of unique or significant habitat.

3.1 (f) Commonwealth marine area

(If the action is <u>in</u> the Commonwealth marine area, complete 3.2(c) instead. This section is for actions taken outside the Commonwealth marine area that may have impacts on that area.)

Description

Not applicable. Refer to **Attachment 1 – PMST Results**.

Nature and extent of likely impact

Not applicable

3.1 (g) Commonwealth land

(If the action is on Commonwealth land, complete 3.2(d) instead. This section is for actions taken outside Commonwealth land that may have impacts on that land.)

Description

Three Commonwealth land results came up during the PMST Search, including:

Defence - KOWANDI NORTH COMMUNICATION STATION

Defence - KOWANDI SOUTH REPEATING STATION

Defence - SHOAL BAY RECEIVING STATION

Refer to **Attachment 1 – PMST Results**.

Nature and extent of likely impact

None of these stations exist on, or adjacent to, the proposed expansion site, therefore there will be no impact on these Commonwealth lands.

3.1 (h) The Great Barrier Reef Marine Park

Description

Not applicable. Refer to **Attachment 1 – PMST Results**.

Nature and extent of likely impact

Not applicable

3.1 (i) A water resource, in relation to coal seam gas development and large coal mining development

Description

Not applicable. Refer to **Attachment 1 – PMST Results**.

Nature and extent of likely impact

Not applicable

3.2 Nuclear actions, actions taken by the Commonwealth (or Commonwealth agency), actions taken in a Commonwealth marine area, actions taken on Commonwealth land, or actions taken in the Great Barrier Reef Marine Park

3.2 (a)	**Is the proposed action a nuclear action?**	**X**	No
			Yes (provide details below)
	If yes, nature & extent of likely impact on the whole environment		

3.2 (b)	**Is the proposed action to be taken by the Commonwealth or a Commonwealth agency?**	**X**	No
			Yes (provide details below)
	If yes, nature & extent of likely impact on the whole environment		

3.2 (c)	**Is the proposed action to be taken in a Commonwealth marine area?**	**X**	No
			Yes (provide details below)
	If yes, nature & extent of likely impact on the whole environment (in addition to 3.1(f))		

3.2 (d)	**Is the proposed action to be taken on Commonwealth land?**	**X**	No
			Yes (provide details below)
	If yes, nature & extent of likely impact on the whole environment (in addition to 3.1(g))		

3.2 (e)	**Is the proposed action to be taken in the Great Barrier Reef Marine Park?**	**X**	No
			Yes (provide details below)
	If yes, nature & extent of likely impact on the whole environment (in addition to 3.1(h))		

3.3 Other important features of the environment

3.3 (a) Flora and fauna

The following provides a brief description of other flora and fauna values found on-site during desktop and field surveys:

Flora

The field surveys in May 2015 and February 2016 defined the vegetation communities on-site according to species composition and level of disturbance. The field survey effort and vegetation communities are described below, and shown in **Plan 2**.

1. Terrestrial Woody Vegetation

- Eucalyptus dominated vegetation, occurs mainly within the north and western portions of the lease area as well as largely dominating the surrounding vegetation communities
- *Eucalyptus miniata* (Woollybutt) is the dominant canopy species recorded throughout this portion of the site with scattered *Eucalyptus tetrodonta* (Darwin Stringybark)
- The sparse understorey typically contained *Cycas armstrongii* (Cycad), Acacia species, *Livistonia humilis* (Sand Palm), and *Planchonia careya* (Cocky Apple)
- The ground layer is dominated by *Sorghum intrans* (Sorghum). Other native terrestrial grass species were also observed.

2. Low Open Woodland Vegetation

- The area south of the current operations is dominated by *Sorghum intrans* (Sorghum) and contains patchy terrestrial species including *Pandanus spiralis* (Screwpine), *Melaleuca nervosa* (Fibrebark) and *Grevillia pteridifolia* (Fern-leaved Grevillea)
- A large portion of the site appeared to have undergone high levels of disturbance and at the time of the assessment contained little value for listed threatened flora or fauna species.

3. Waterholes dominated by fringing Melaleuca vegetation

- A number of large waterholes were observed throughout the northern portion of the site containing scattered and patchy *Melaleuca nervosa* (Fibrebark) specimens. Aquatic plants including a number of waterlilies were observed throughout each of the waterholes, with the shallower waterholes also containing patches of macrophyte species

4. Howard River

- Howard River is located along the western boundary of the site. Canopy vegetation is dominated by native riparian species, however the shrub and ground layer contained a number of introduced species including patches of *Megathyrsus maximus* (Guinea Grass)
- A number of cleared access tracks were observed along the edge of the Howard River within the area assessed

5. Areas previously and currently undergoing extraction

- This refers to the majority of the site, which has been influenced by the extraction industry, and more recently recreational four-wheel driving. A large portion of this area is currently under water with access tracks scattered throughout the area
- Small patches of regrowth vegetation were observed throughout the drier portion of the area dominated by Acacia species. Some of the waterholes also contained fringing Melaleuca regrowth.

Refer to **Attachment 2** for the Ecological Assessment Report, containing full site details.

Fauna

The existing vegetation on-site was observed to contain only a low number of small hollows, limiting the ability for the habitat to support small mammals, microbats and some bird species. Despite searches as per EPBC Act Guidelines (refer Response **3.1(d)**), no threatened fauna species listed under the EPBC Act were recorded during field studies. The site's ability to support listed threatened fauna species, which are generally highly sensitive, specialised, and require particular habitat features, is highly unlikely for the majority of the listed EPBC Act or NCA protected species.

Overall, two amphibian, 44 bird, three mammal, and three reptile species were recorded on-site (refer to **Table 8** and **Attachment 2**). Stratified log, leaf litter, and habitat searches did not reveal any listed threatened species utilising the site. The vast majority of fauna species recorded on-site are considered common to the local area.

Table 8: Site Fauna Species

Species Name	Common Name
Birds	
Acridotheres tristis	Common Myna
Anhinga melanogaster	Darter
Anseranas semioalmata	Magpie Goose
Aprosmictus coccineopterus	Red-winged Parrot
Aquila audax	Wedge-tailed Eagle
Ardea alba	Great Egret
Ardea intermedia	Intermediate Egret
Ardea pacifica	White-necked Heron
Cacatua fitzroyi	Sulphur-crested Cockatoo
Calyptothynchus banksii	Red-tailed Black Cockatoo
Centropus melanurus	Pheasant Coucal
Chalcophaps indica	Emerald Dove
Climacteris melanura	Black-tailed Treecreeper
Coracina melanops	Black-faced Cuckoo-shrike
Corvus orru	Torresian Crow
Coturnix ypsilophora	Brown Quail
Dacelo leachii	Blue-winged Kookaburra
Dendrocygna eytoni	Plumed Whistling Duck
Dicrurus baileyi	Spangled Drongo
Egretta novaehollandiae	White-faced Heron
Entomyzon albipennis	Blue-faced Honeyeater
Eolophus kuhli	Galah
Ephippiorhynchus asiaticus	Black-necked Stork
Eurystomus orientalis	Dollarbird
Geopelia placida	Peaceful Dove
Grallina neglecta	Magpie-lark
Haliaeetus leucogaster	White-bellied Sea-Eagle
Haliastur sphenurus	Whistling Kite
Lichenostomus unicolor	White-gaped Honeyeater
Malurus cruentatus	Red-backed Fairy Wren
Manorina melvillensis	Yellow-throated Minor
Merops ornatus	Rainbow Bee-eater
Milvus migrans	Black Kite
Pelecanus conspicillatus	Australian Pelican
Phalacrocoraz varius	Pied Cormorant

Podargus phalaenoides	Tawny Frogmouth
Rhipidura picata	Willie Wagtail
Tadorna radjah	Radjah Shelduck
Taeniopygia annulosa	Double-barred Finch
Threskiornis molucca	Australian White Ibis
Threskiornis spinicollis	Straw-necked Ibis
Todiramphus macleayii	Forest Kingfisher
Trichoglossus rubritorquis	Rainbow Lorikeet
Vanellus miles	Masked Lapwing
Reptiles	
Crocodylus johnstoni	Freshwater Crocodile
Tropidonophis mairii	Keelback
Dendrelaphis punctulata	Common Tree Snake
Amphibians	
Rhinella marina	Cane Toad
Uperoleia daviesae	Howard Springs Toadlet
Mammals	
Bubalus bubalis	Water Buffalo
Canis lupus dingo	Wild Dog
Sus scrofa	Wild Pig

3.3 (b) Hydrology, including water flows

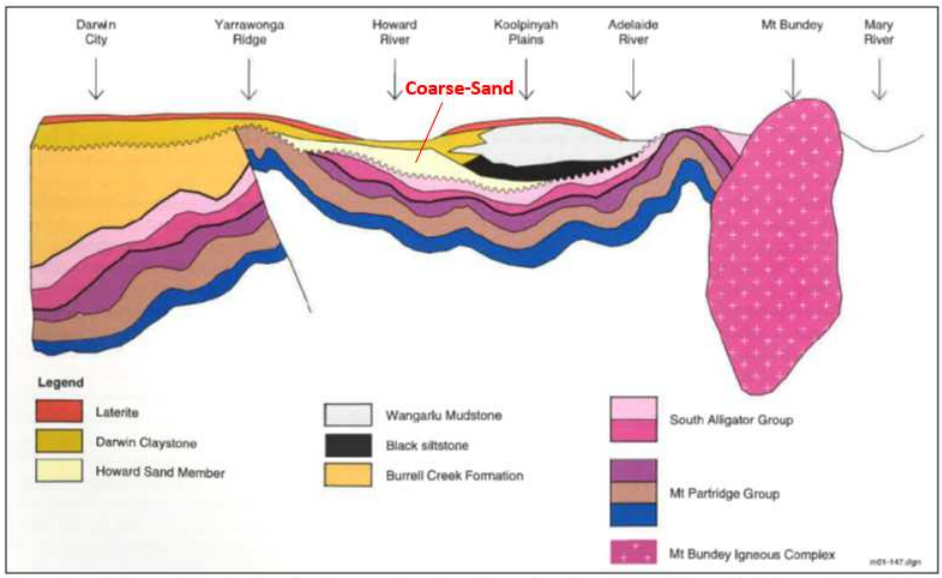
The Howard River borders the western boundary of the existing and proposed expansion extraction area. Aside from the Howard River, there are a few low lying areas, with Melaleuca species, in the central east of the site, which has some overland flow running into it. The remainder of the site did not have any obvious waterways during the site investigations.

Groundwater Impact Assessment

Ongoing monitoring of groundwater levels is carried as part of routine operations at the site including both quantitative and qualitative assessment methods. Significant evidence has been obtained through these surveys to confirm that the mining operations at Howard Springs have negligible effect on the groundwater (summarised below).

Site Geology

The Howard Springs site is comprised of coarse-grained indurated sandstone and claystone. These units are directly overlain by clay overburden; a laterite cap; and a thin layer of surface sediments in some places. The indurated sandstone is part of the Howard Sand Member. These deposits are restricted to a band less than 2 km wide adjacent to the Howard River. The sand was deposited during the Cretaceous (90 Ma) in shallow water, offshore marine bars, and at river mouths (Doyle, 2001). The Howard Sand Member is a coarse-sand deposit of in-situ argillaceous sandstone which has been heavily indurated and deconsolidated. It sits on top of the weathered unconformity with the Koolpinyah Dolomite, which is the main aquifer within the region.



Geology of the Darwin Region showing the Howard Sand Member as the only coarse-sand formation (after Doyle, 2001).

Coarse-sand extraction is restricted to the upper weathered portions of the Howard Sand Member – well above the permeable unconformity with the Koolpinyah Dolomite. Stiffening and cementation of the sandstone prevents mechanical extraction of the resource at depths greater than 16 m below the natural surface level. This sandstone, which forms the base of extraction, is hard; intact; tightly bound; clayey and highly impermeable.

The deconsolidated coarse-sand resource (above the cemented floor level) is bound by a clay matrix comprising 20-35% of the deposit. This clay matrix decreases the permeability of the sandstone, restricting groundwater inflow to a localised zone of influence. Being clayey and massive in nature, the resource does not contain faults, fractures or fissures of high permeability.

On a larger scale, the site contains steeply dipping interbedded units of claystone. These impermeable claystone units are not extracted and form larger scale impermeably barriers, which further reduce the potential for groundwater drawdown.

Photo of the 2013A extraction cell showing the site's geological sequence. The resource has impermeable laterite and clay overburden above; impermeable sandstone below; low permeability deconsolidated sandstone laterally; and lager scale impermeable claystone barriers laterally.

Groundwater Surveys

The potential impacts of extractive operations on groundwater are continually monitored and assessed by Boral geologists and site staff. The ongoing monitoring program included a detailed review of potential groundwater depression in June 2012 using the following methodology:

1. The extraction cell (worked from 2007-2013) was dewatered to RL -3.9m. Dewatering stabilised the water level at -4 m +/- 0.5 m from January to end of May.
2. The five surrounding ponds stabilised under normal operating conditions over the same period, noting process water was contained in a closed loop of two ponds.
3. An aerial LIDAR survey was used to survey water levels in the five ponds on-site. All readings were between RL 5.5-5.9 m. An old pond, >750 m away, had a water level of 4.8 m (with a free draining level of 5.2 m).
4. Four test pits were excavated 10-40 m from the dewatered pond and RL of water were estimated. All test pits contained water levels between RL 5.8-6.0 m.

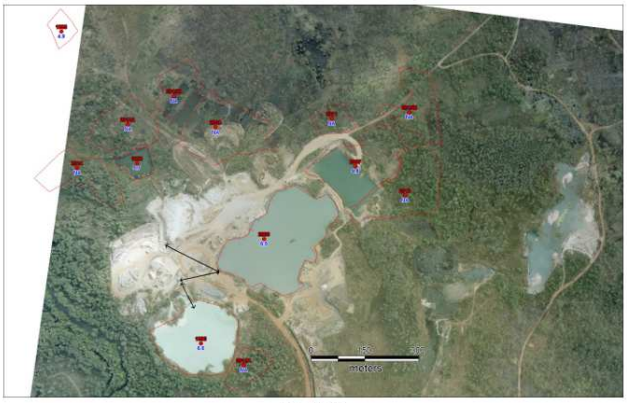
The surveys confirmed that there was no lowering of the groundwater level due to the dewatering of the extraction pond. The standing water level in operational ponds (those used in the closed water loop) and old disused ponds was uniform at 5.8-6.0 m over the 1 km^2 operational area. There was no lowering of the pond outside the operational area, which was just 0.3 m below free draining level. Most significantly, groundwater was also encountered at 5.8-6.0 m just 10-40 m from the dewatered pond, confirming the very low permeability of the clayey sandstone.

The water level in the ponds adjacent to the extraction cells is closely monitored at all times; and is confirmed in annual aerial surveys using LIDAR. Additionally, a drop in the pond levels greater than 2 m would make the site inoperable, as water would drop below the permanent pumps set up for processing water. This has never occurred.

The historical pond levels are included in Table 1 below. Aerial photographs including the pond depths since 2007 are also included below.

Pond	Status	Jul-2007	Apr-2009	Apr-2010	May-2011	Apr-2012	May-2013	May-2014	May-2015
1990	Processing Water	6.6	5.6	5.8	5.6	5.9	NA	NA	NA
1995	Standing Water	4.9	4.8	4.9	4.9	4.8	4.9	4.9	4.9
1998	Sediment Trap	5.7	5.8	5.7	5.9	5.6	5.8	6.2	6
2000	Processing Water	6.5	5.8	6.4	5.6	5.5	5.6	5.9	5.6
2007	Extraction Cell	4.8	5.9	4.5	5.6	-3.9	1.5	6.9	6.9
2008	Standing Water		5.9	6.5	5.9	5.8	5.6	6.1	5.9
2011			5.9	6.5	6.7	5.5	6.2	7.1	6.8
2012							-6.4	6.9	6.9
2013A								-1.2	6
2013B								3.6	5.9
2014									-2.5
2015A									-3.5
2015B									6.8

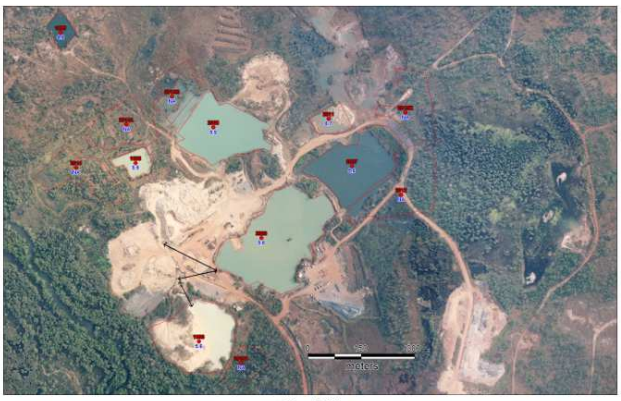
	Process water pond (water transfers in/out)
	Disused pond (standing water level - no water transfer in/out)
	Sediment pond (water transfers in/out)
	Extraction cell (dewatered for short term extraction)
	Exhausted pond used as sediment pond which has filled over time)



June 2007

April 2010

April 2009 (note site was not flown in 2008)

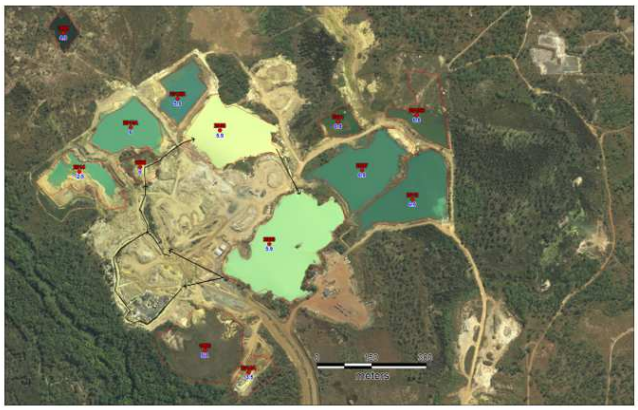


May 2011

April 2012

May 2013

May 2014



May 2015

Extraction Methods

Boral employs extraction and processing methodologies which mitigate the potential for groundwater drawdown. The extraction methodology is summarised as follows:

1. Strip vegetation with dozer and stockpile for rehabilitation
2. Strip topsoil with dozer and stockpile for rehabilitation
3. Extract laterite with excavator/ dump truck and stockpile for reuse or dump in exhausted pits
4. Extract clay overburden with excavator and dump truck, and permanently dump in exhausted pits
5. Mechanically extract coarse-sand with excavator and dump trucks

The small volume of groundwater which enters the pit is pumped out of the extraction cell into nearby exhausted ponds (10-100 m). Each pond is in part of the Howard Sand Member, and are hydraulically connected by the slightly permeable sand layer. The placement of water into the completed but not backfilled pits provides a short term elevated local water storage sitting above the surrounding water table which returns to the extracted pit via the slightly impermeable sandy unit. This method therefore recharges the aquifer in close proximity to the extraction cell; so that negligible drawdown of the water table occurs.

Summary

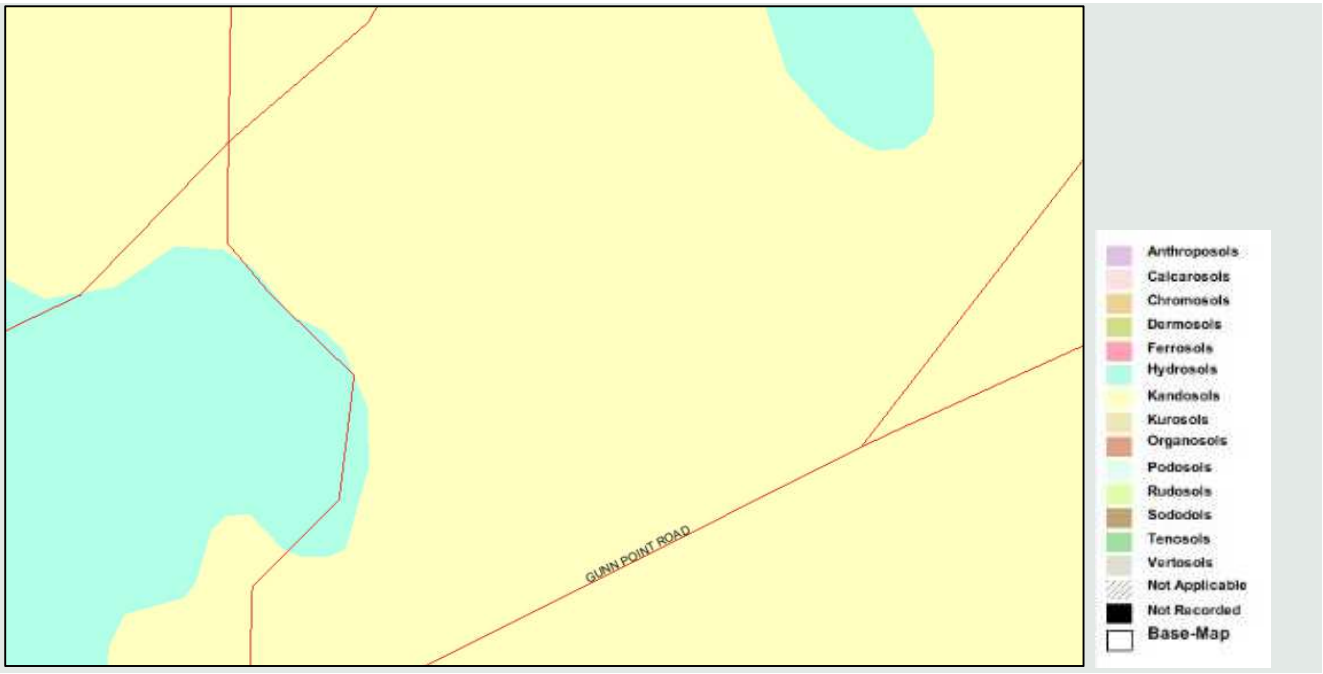
The characteristics of the resource, together with the method used to recharge the exhausted ponds, effectively eliminates the potential for coarse-sand mining to cause a depression in the water table. There is significant evidence to support this conclusion:

- The clayey sand has low permeability;
- The site contains larger scale beds of impermeable claystone which form larger scale barriers;
- Groundwater ingress into extraction cells is very slow;
- Nearby ponds, connected via the Howard Sand Member to the extraction pits, do not drain into the dewatered extraction pits;
- New pits do not intersect groundwater at depressed levels; and
- Test pits do not intersect groundwater at depressed levels.

3.3 (c) Soil and Vegetation characteristics

Vegetation values across the site are limited due to clearing for the existing quarry and previous land uses. Vegetation is a mosaic of terrestrial woody vegetation and low open woodland vegetation, as described above in response to **3.3(a)**.

The Australian Soil Resource Information System (ASRIS) maps the site as containing Kandosols. Kandosols do not have a strong texture contrast between the A and B horizons. They have a massive or weakly structured B horizon and are not calcareous. Parent material of Kandosols ranges from highly siliceous, siliceous to intermediate in composition. These soils are found in poorly drained sites (yellow and grey kandosol) with rainfall between 300 mm and 1400 mm and in well-drained sites (brown and red kandosol) with rainfall between 250 mm and 1400 mm. Generally, Kandosols have low to moderate agricultural potential with moderate chemical fertility and water-holding capacity (Gray & Murphy 2002).



3.3 (d) Outstanding natural features

No outstanding natural features have been identified across the site. In particular, the site's previous and current use as a sand extraction area, immediately adjacent to Gunn Point Road, and surrounded by cleared areas and a network of roads and access ways has fragmented it from other habitat areas in the landscape. Previous disturbances in the greater local area have significantly reduced the ecological value of the site and no outstanding natural features can be identified.

3.3 (e) Remnant native vegetation

The vegetation observed on-site is described under **3.3a** above.

3.3 (f) Gradient (or depth range if action is to be taken in a marine area)

The natural site contours are largely flat across the project site, with a slight incline in the central east, and lower lying land along the Howard River flood plain.

3.3 (g) Current state of the environment

The site was found to be largely disturbed as a result of existing sand extraction activities on the property, maintained clearing for access roads, invasion from exotic weeds, and adjacent land clearing. The majority of site vegetation has been previously disturbed, with the current extraction activities covering 180 ha, and the large area to the south of these operations described as Low Open Woodland Vegetation, that has undergone high levels of disturbance and at the time of the assessment contained little value for listed threatened flora or fauna species. Small patches of regrowth vegetation were observed throughout the drier portion of the previous extraction areas dominated by Acacia species. Some of the waterholes also contained fringing Melaleuca regrowth.

Some areas of Terrestrial Woody Vegetation were observed mainly within the north and western portions of the lease area, with Eucalyptus dominated vegetation with Woollybutt as is the dominant canopy species and scattered Darwin Stringybark, a sparse understorey of Cycad, Acacia species, Sand Palm, and Cocky Apple, and a ground layer dominated by Sorghum. A number of large waterholes were also observed throughout the northern portion of the site containing scattered and patchy Fibrebark specimens. Aquatic plants including a number of waterlilies were observed throughout each of the waterholes, with the shallower waterholes also containing patches of macrophyte species.

The site in its current condition is not considered to provide any unique habitat features or values to the broader landscape. The vegetation that is present on-site is not considered significant or unique within the broader landscape and habitat availability. In addition, contextually, the site is situated in a fragmented landscape, with an existing

extraction site on the property, completely cleared lands surrounding, and roads and access tracks scattered all around the site.

Refer to **Attachment 2** for further results of the site assessment.

3.3 (h) Commonwealth Heritage Places or other places recognised as having heritage values

Not applicable (refer to **Attachment 1 – PMST Results**).

3.3 (i) Indigenous heritage values

There are no known cultural heritage values on the site. The results of AAPA searches for the project found that no Aboriginal Sacred Sites are located on the Howard Springs site. Results of searches from the DLRM database of heritage sites found that no heritage sites are listed within the project area.

3.3 (j) Other important or unique values of the environment

The site is not located near other notable environmental features that are likely to be affected by the proposed action.

3.3 (k) Tenure of the action area (eg freehold, leasehold)

The entire extent of the site is freehold land.

3.3 (l) Existing land/marine uses of area

The property is currently under extraction operations in the central portion, and unused in the proposed expansion areas. Surrounding land uses are rural residential, residential development, extractive uses, grazing, and arterial roads.

3.3 (m) Any proposed land/marine uses of area

The proposed use of the land is to expand the existing sand extraction area.

4 Environmental Outcomes

The Howard Springs sand extraction expansion development will result in the removal of some vegetation within the site area to enable completion of the expansion. As highlighted throughout this referral document, the vegetation on-site is impacted and fragmented by previous land uses, surrounding roads, extractive operations, and residential developments. It is considered unlikely that the *T. taylori* and Northern Quoll occur on-site, with no evidence of any species listed under the EPBC Act was found on-site during targeted site investigations. Given the high level of disturbance on-site, and the lack of evidence of these species, the proposed expansion is not considered to result in a Significant Impact on a *Matter of National Environmental Significance*.

Environmental aspects and impacts will be managed via the DME approved Mine Management Plan (MMP). The MMP provides environmental management measures pertaining to vegetation clearing, flora and fauna, dust, weeds, and rehabilitation. The MMP is revised and submitted for approved by the DME on an annual basis to ensure environmental management practices are regularly reviewed and updated in light of new information and regulatory requirements.

The project is being referred as a Not Controlled Action as it is not considered to have a significant impact on any MNES. However, in the event the Department of the Environment disagree with the assessment outlined in this referral a number of outcomes based measurement measures have been drafted to assist the referral process. These conditions have been included in Section 5 of this referral. It should be noted that all of the management measures included in this referral are required under the MMP covering the site. The management plans will include compliance reporting to council to ensure they are being successfully implemented on ground.

5 Measures to avoid or reduce impacts

The primary impact on the natural environment as a result of the project is the clearing of native vegetation (both mature and regrowth) on-site. A number of management measures will be employed prior to, as well as during clearing and establishment of the expansion that firstly avoid environmental impacts, and if not avoidable, reduce, minimise, and mitigate the environmental impacts. These measures will be put in place to comply with Boral Resources (Qld) Pty Ltd's internal Environmental Management System, internal environmental policy and responsibilities, and to meet Boral's environmental duty of care.

The MMP includes the following environmental objectives, each with specific targets:

- Manage the threat of weeds spreading;
- Manage animal pest species;
- Keep working areas clear and uncluttered;
- Sustainable development and rehabilitation of worked areas;
- Monitor impacts of operations in respect to environmental compliance;
- Protecting biodiversity;
- Recycling material; and
- Maintain extractive operations within granted area.

The MMP details identification of environmental aspects and impacts, applies a risk rating to each, and provides management and prevention measures and monitoring requirements for each. It also documents induction and training requirements, stakeholders and consultation, incident reporting, and inspection and reporting requirements. The MMP is revised and submitted for approved by the DME on an annual basis.

The management measures are specifically aimed at avoiding and reducing impacts on the natural environment as a result of the proposed development.

6 Conclusion on the likelihood of significant impacts

6.1 Do you THINK your proposed action is a controlled action?

X	No, complete section 6.2
	Yes, complete section 6.3

6.2 Proposed action IS NOT a controlled action.

The construction and operational phases of the Howard Springs Sand Extraction Expansion are not considered to have a significant impact on Matters of National Environmental Significance (MNES) and as such, do not warrant a 'controlled action' determination. As detailed in this referral, no MNES are considered to be impacted by the proposal. In particular, the project is not considered to have a significant impact on Northern Quoll as a result of the clearing of vegetation due to the following conclusions:

- No Northern Quoll individuals (or evidence of) were observed on-site;
- No denning habitat for the Northern Quoll was observed on-site; and
- The site is already heavily disturbed, with an existing sand extraction operation.

Management measures will be implemented in accordance with the site MMP. While no Northern Quoll or *Typhonium taylori* individuals were recorded on-site, the management measure will also ensure that impact to these species as result of vegetation clearing is avoided.

Given these factors, it is unlikely that the proposed action will have a significant impact on MNES and as such, is **not considered to be a controlled action**.

6.3 Proposed action IS a controlled action

Not applicable

7 Environmental record of the responsible party

		Yes	No
7.1	**Does the party taking the action have a satisfactory record of responsible environmental management?** **Provide details**	**X**	
7.2	**Has either (a) the party proposing to take the action, or (b) if a permit has been applied for in relation to the action, the person making the application - ever been subject to any proceedings under a Commonwealth, State or Territory law for the protection of the environment or the conservation and sustainable use of natural resources?** **If yes, provide details**		**X**
7.3	**If the party taking the action is a corporation, will the action be taken in accordance with the corporation's environmental policy and planning framework?** **If yes, provide details of environmental policy and planning framework**	**X**	
7.4	**Has the party taking the action previously referred an action under the EPBC Act, or been responsible for undertaking an action referred under the EPBC Act?** **Provide name of proposal and EPBC reference number (if known)**		**X**

8 Information sources and attachments

(For the information provided above)

8.1 References

- Atlas of Living Australia. Accessed 08 April 2016. http://spatial.ala.org.au/?q=lsid:%22urn:lsid:biodiversity.org.au:apni.taxon:264575%22&cm=geospatial_kosher
- **Australian Soil Resource Information System**, http://www.asris.csiro.au/
- **Department of the Environment.** 2016. *Conilurus penicillatus in Species Profile and Threats Database*, Department of the Environment, Canberra. Available from: http://www.environment.gov.au/sprat. Accessed Tue, 29 Mar 2016 14:58:27 +1100.
- **Department of the Environment**. **(**No date). Consultation Document on Listing Eligibility and Conservation Actions *Mesembriomys gouldii gouldii* (Black-footed tree-rat (Kimberley and mainland Northern Territory)).
- **Department of the Environment.** 2016. *Dasyurus hallucatus in Species Profile and Threats Database*, Department of the Environment, Canberra. Available from: http://www.environment.gov.au/sprat. Accessed Wed, 23 Mar 2016 17:33:50 +1100.
- **Department of the Environment.** 2016. *Phascogale pirata in Species Profile and Threats Database,* Department of the Environment, Canberra. Available from: http://www.environment.gov.au/sprat. Accessed Tue, 29 Mar 2016 15:19:09 +1100.
- **Department of the Environment.** 2016. *Typhonium taylori in Species Profile and Threats Database*, Department of the Environment, Canberra. Available from: http://www.environment.gov.au/sprat. Accessed Wed, 23 Mar 2016 17:32:10 +1100
- **Department of the Environment.** 2016. *Saccolaimus saccolaimus nudicluniatus in Species Profile and Threats Database*, Department of the Environment, Canberra. Available from: http://www.environment.gov.au/sprat. Accessed Tue, 29 Mar 2016 15:24:57 +1100.
- **Department of Land Resource Management.** 2012. Threatened Species of the Northern Territory - Black-footed Tree-rat (*Mesembriomys gouldii*). Northern Territory Government.
- **Department of Land Resource Management**. 2012. Threatened Species of the Northern Territory - Northern Quoll (*Dasyurus hallactus*). Northern Territory Government.
- **Department of Natural Resources, Environment, and the Arts**. 2006. Threatened Species of the Northern Territory - *Typhonium taylori*. Northern Territory Government.
- **Gray, J.M. & Murphy, B.W.** 2002. *Predicting Soil Distribution*, Joint Dept. of Land & Water Conservation (DLWC) & Aust. Society for Soil Science Technical Poster, DLWC, Sydney. Accessed via: http://www.soil.org.au/soil-types.htm on Wed 30 March 2016.
- **Liddle, D.T., P.Harkness, J. Westaway, D.L.Lewis and I.D. Cowie.** 2013. *Vegetation communities and plant biodiversity of the seasonally saturated lands of the Howard Sand Plains Site of Conservation Significance in the Northern Territory of Australia*. Report to the Australian Government Caring for our Country Initiative. Northern Territory Government Department of Land Resource Management. Palmerston.

8.2 Reliability and date of information

Refer to response at 8.1

8.3 Attachments

		✓ attached	Title of attachment(s)
You must attach	figures, maps or aerial photographs showing the project locality (section 1)	✓	- Project locality – Figures 1 & 2 - GIS file - Plan 1 – Proposed Expansion Plan - Plan 2 – Historical Imagery
	GIS file delineating the boundary of the referral area (section 1)		
	figures, maps or aerial photographs showing the location of the project in respect to any matters of national environmental significance or important features of the environments (section 3)	✓	- Project locality - Figures 1 & 2 - Plan 2 – Historical Imagery
If relevant, attach	copies of any state or local government approvals and consent conditions (section 2.5)	N/A	
	copies of any completed assessments to meet state or local government approvals and outcomes of public consultations, if available (section 2.6)	N/A	
	copies of any flora and fauna investigations and surveys (section 3)	✓	- Attachment 1 – Protected Matters Search Tool Results - Attachment 2 – Ecological Assessment Report - Plan 3 – Field Survey Effort
	technical reports relevant to the assessment of impacts on protected matters that support the arguments and conclusions in the referral (section 3 and 5)	✓	- Attachment 2 – Ecological Assessment Report - Plan 3 – Field Survey Effort
	report(s) on any public consultations undertaken, including with Indigenous stakeholders (section 3)	N/A	

9 Contacts, signatures and declarations

Project title: Howard Springs Quarry Expansion

9.1 Person proposing to take action

1. Name and Title:	Travis Potts General Manager – Northern Territory
2. Organisation:	Boral Resources (Qld) Pty Ltd
3. EPBC Referral Number:	N/A
4: ACN / ABN:	46 009 671 809
5. Postal address:	PO Box 125, Kelvin Grove DC, QLD 4059
6. Telephone:	0401 896 608
7. Email:	Travis.potts@boral.com.au
8. Name of designated proponent (if not the same person at item 1 above:	As above
9. ACN/ABN of designated proponent (if not the same person named at item 1 above):	As above
I qualify for exemption from fees under section 520(4C)(e)(v) of the EPBC Act because I am:	N/A
If you are small business entity you must provide the Date/Income Year that you became a small business entity:	N/A
I would like to apply for a waiver of full or partial fees under Schedule 1, 5.21A of the EPBC Regulations. Under sub regulation 5.21A(5), you must include information about the applicant (if not you) the grounds on which the waiver is sought and the reasons why it should be made:	N/A

Declaration	I declare that to the best of my knowledge the information I have given on, or attached to this form is complete, current and correct. I understand that giving false or misleading information is a serious offence. I agree to be the proponent for this action. I declare that I am not taking the action on behalf of or for the benefit of any other person or entity.
Signature	 Date 5/5/16

9.2 Person preparing the referral information (if different from 9.1)

Name	Sam Maynard
Title	Senior Environmental Scientist
Organisation	Saunders Havill Group Pty Ltd
ACN / ABN (if applicable)	24 144 972 949
Postal address	9 Thompson Street, Bowen Hills, QLD 4006
Telephone	(07) 3251 9434
Email	sammaynard@saundershavill.com
Declaration	I declare that to the best of my knowledge the information I have given on, or attached to this form is complete, current and correct. I understand that giving false or misleading information is a serious offence.
Signature	 Date 5/5/16