

# **NARACOOPA MINERAL SANDS PTY LTD**

**EL 25/2007 DRILLING PROGRAM 2018-19  
ENVIRONMENTAL MITIGATION MEASURES  
26 MARCH 2018**



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**Document Status**

Revision	Author	Reviewer and Organisation	Date
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1	R Barnes C McCoull	Vishwa Welagedara, NMS	26-3-2018

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## **1. INTRODUCTION**

### **1.1 LOCATION**

The exploration works are proposed for areas covered by exploration licence EL25/2007.

The exploration licence (EL) extends between the existing Naracoopa Sand Mine Northern and Southern Deposit mining leases and overlaps a large area of Sea Elephant Bay. The EL area is 77 square kilometres / blocks, of which approximately 52 km<sup>2</sup> overlaps the seabed in the bay (refer to Figure 1 and Figure 2).

The northern-most tip of the exploration licence includes a portion of the Lavinia State Reserve, which is a listed Ramsar wetland. The Lavinia Point-Cowper Point dune system also overlaps the northern extent of the EL. This dune system is an important coastal landform/relic. The Sea Elephant Conservation Area overlaps these two areas as well as the northern portion of the EL (Figure 3). The Eldorado Conservation Area overlaps the central portion of the EL; the Naracoopa Blowhole Geoconservation Area and the coastline along the bay is a Public Reserve.

Most of the exploration area on land is situated over natural dune landscape with remnant or partly cleared and disturbed native vegetation, bisected by several roadways, tracks and fencelines.

Several cleared/cropped or pasture areas occur along the south-eastern boundary of the EL. Historical line clearing grids exist near the southern boundary of the EL, which are only faintly visible on a recent aerial photograph and appear to have successfully rehabilitated naturally.

The purpose of this plan was to conduct flora and fauna surveys to identify the most appropriate access routes to drill sample locations for mineral sand sampling as part of the Naracoopa Mineral Sands Mine on King Island.

### **1.2 EXPLORATION DRILLING PROGRAM**

A Geophysical Works Program conducted in 2017 provided the opportunity to refine the areas for drill-based sampling.

The drilling program is scheduled for 2018 – start date of April – May 2018.

Figure 4 shows the exploration drill line locations on the land portion of the EL – there are 27 lines proposed to be drilled. The rationale for selecting these lines is discussed within the exploration report prepared for the geophysical works.

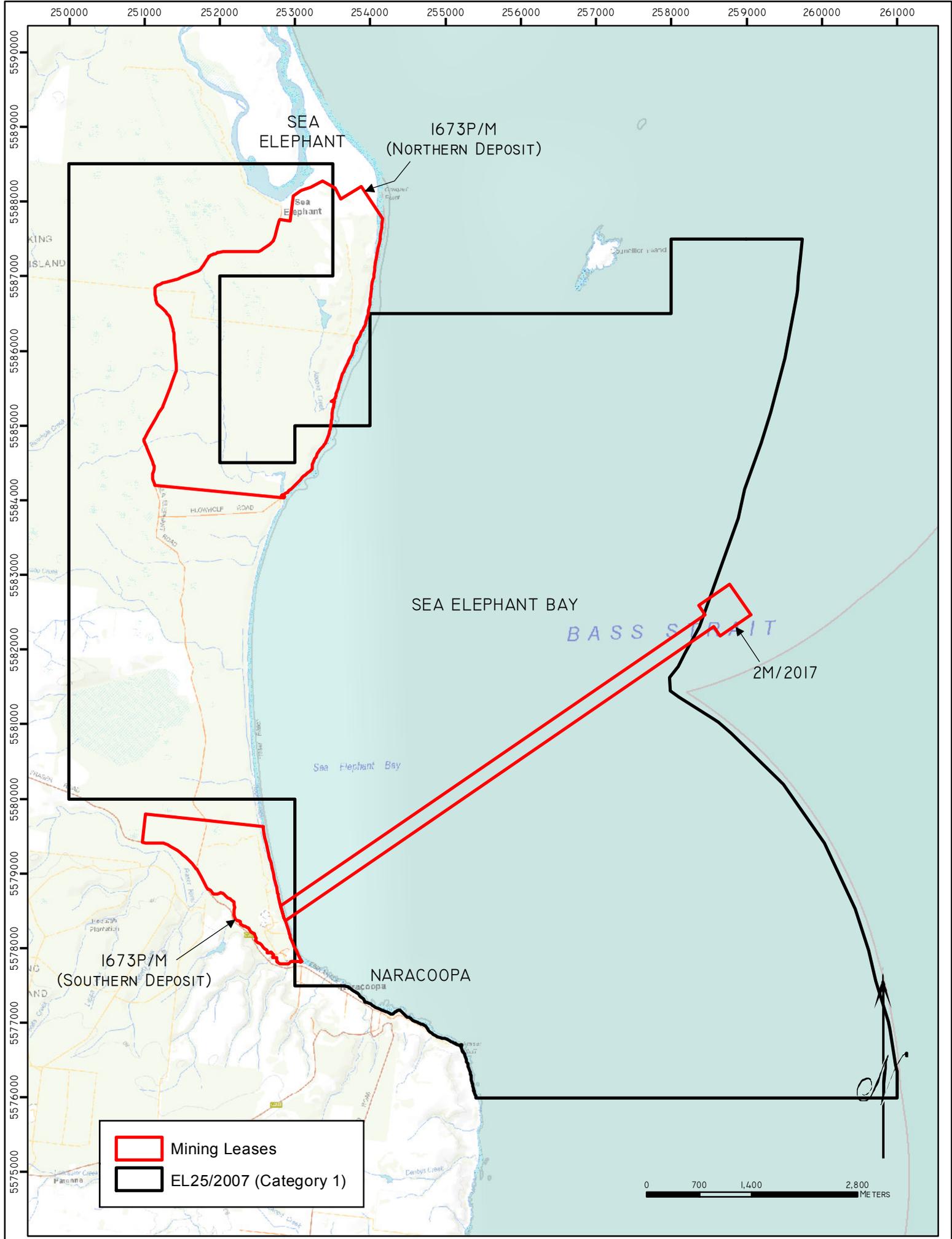
Where possible, existing access roads, tracks and old exploration gridlines will be used to minimise the need for vegetation clearance, track development and drainage works. Any overhanging vegetation will be cut along existing access tracks, any logs restricting access will be cut and removed, old drainage will be re-opened and additional drainage provided as necessary.

This report documents the environmental management measures to be applied during the exploration works in addition to those relevant actions described in the *Mineral Exploration Code of Practice (Fifth Edition - 2012)*.

This document provides Environment protection Guidelines to assist the exploration team in identifying and managing environmental impacts in an appropriate manner.

### **1.3 ACRONYMS**

DPIPWE	Department of Primary Industries, Parks, Water and Environment
EL	Exploration Licence
GIS	Geographic Information System
NVA	Natural Values Atlas (database maintained by DPIPWE)

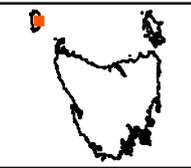


Mining Leases  
 EL25/2007 (Category 1)

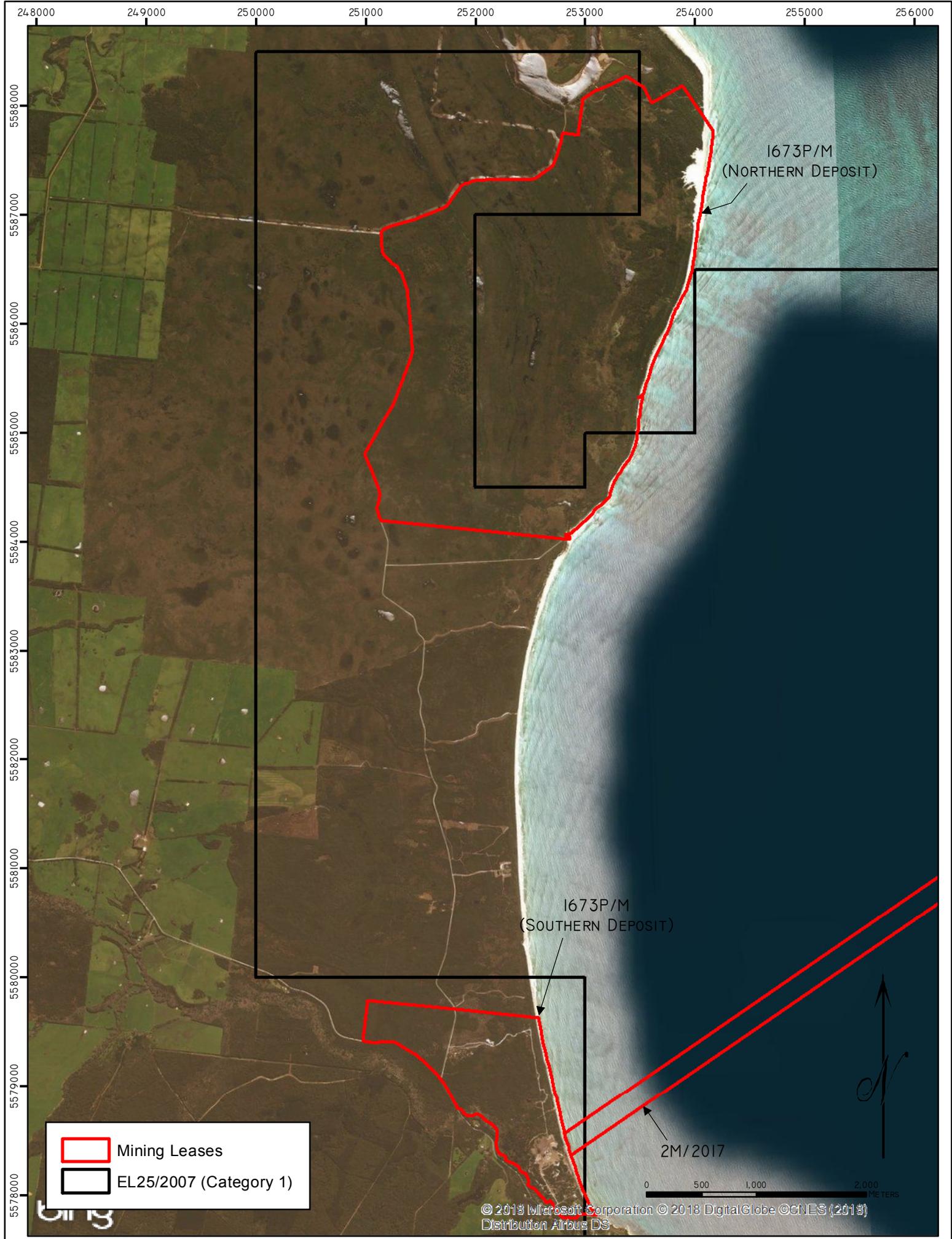
0 700 1,400 2,800 METERS

NARACOOPA MINERAL SANDS MINE  
 EL WORKS PROGRAM 2018 - DRILLING  
 FIGURE I: EXPLORATION LICENCE  
 LOCATION

  
 PO Box 1 New Town TAS 7008  
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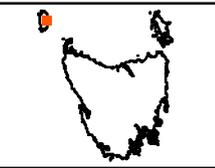


DATUM: GDA94  
 GRID: MGA ZONE 55  
 TASMAR: SEA ELEPHANT  
 NARACOOPA  
 CLIENT: NARACOOPA MINERAL  
 SANDS PTY. LTD.  
 DATE: 25TH MAR 2018

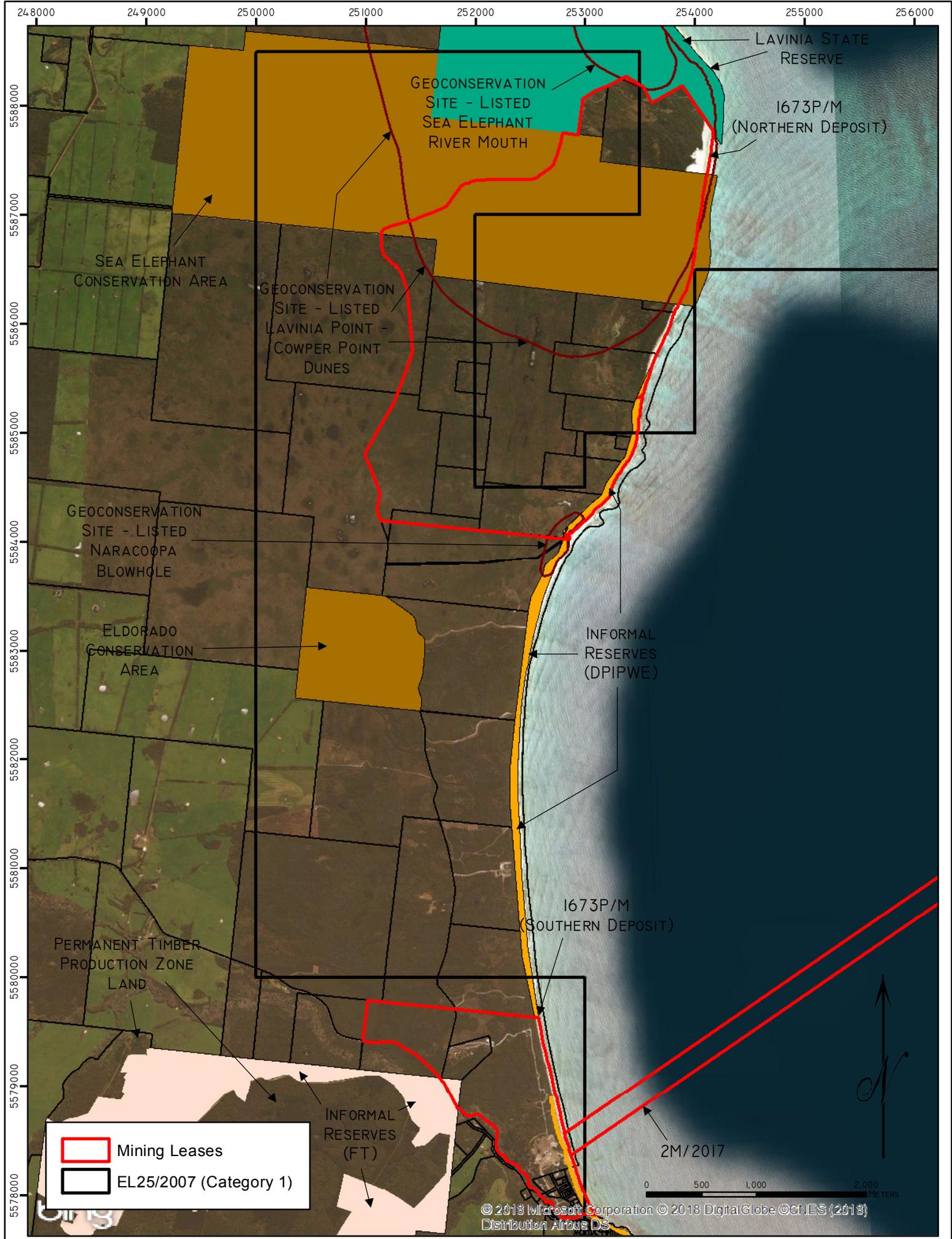


NARACOOPA MINERAL SANDS MINE  
EL WORKS PROGRAM 2018 - DRILLING  
FIGURE 2: EXPLORATION LICENCE (TERRESTRIAL)  
(OVER AERIAL PHOTO)

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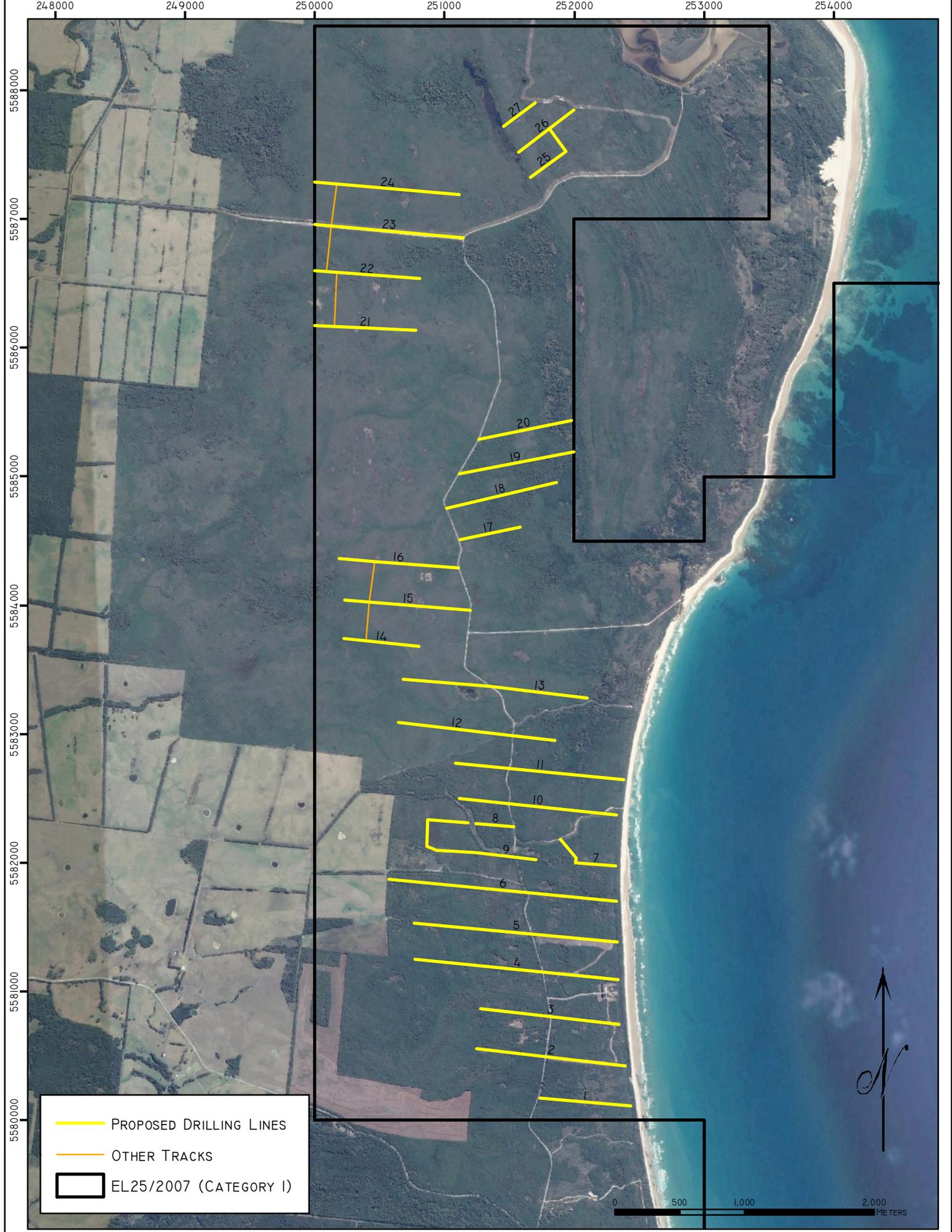


NARACOOPA MINERAL SANDS MINE  
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 FIGURE 3: CONSTRAINTS

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— PROPOSED DRILLING LINES  
— OTHER TRACKS  
 EL25/2007 (CATEGORY I)

NARACOOPA MINERAL SANDS MINE  
 EL WORKS PROGRAM 2018 - DRILLING  
 FIGURE 4: PROPOSED DRILLING LINES FOR FUTURE DRILLING

  
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## 2. FLORA

### 2.1 Vegetation

A list of vegetation communities that occur within the EL is provided in Table 1.

Most threatened vegetation communities can be avoided by the drill lines.

One community, King Island eucalypt woodland (DKG), is unlikely to be avoid in all cases due to its occurrence on sandy ridgelines that extend for considerable distances parallel to the beach (ie old dune series).

**Table 1** - Vegetation and other land use categories observed on or near the survey lines

TASVEG community (code)	Threatened native vegetation community <sup>#</sup>	Impact Management Approach
<i>Eucalyptus brookeriana</i> wet forest (WBR)	Yes	Avoid
<i>Eucalyptus globulus</i> King Island forest (WGK)	Yes	Avoid
Freshwater aquatic herbland (AHF)	Yes	Avoid
King Island eucalypt woodland (DKG)	Yes	Avoid or minimise eucalypt removal
<i>Melaleuca ericifolia</i> swamp forest (NME)	Yes	Avoid or minimise tree removal, traverse in dry conditions
Coastal heathland (SCH)	No	Minimise clearing width of track
Coastal scrub (SSC)	No	Minimise clearing width of track
<i>Leptospermum scoparium</i> – <i>Acacia mucronata</i> forest (NLA)	No	Minimise clearing width of track
<i>Leptospermum scoparium</i> – <i>Melaleuca squarrosa</i> swamp forest (NLM)	No	Minimise clearing width of track
Wet heathland (SHW)	No	Minimise clearing width of track
<i>Acacia longifolia</i> coastal scrub (SAC)	No	Minimise clearing width of track
<i>Pteridium esculentum</i> fernland (FPE)	No	None
Extra-urban miscellaneous (FUM)	No	None
Agricultural land (FAG)	No	None

<sup>#</sup> Threatened native vegetation communities are those listed in Schedule 3A of the *Nature Conservation Act 2002*

### 2.2 Threatened Flora Species

The ML and EL area have been the subject of extensive surveys by Van Diemen Consulting Pty Ltd, some of the records within the NVA are those of the authoprs of this report.

A search of data in the Natural Values Atlas identified several threatened flora species have been recorded within EL25/2007. These includes orchids and other herbaceous plants being located within the EL area (*Caladenia pusilla*, *Utricularia tenella*, *Solanum opacum*, *Hypolepis muelleri*, *Elaeocarpus reticulatus* and *Cyrtostylis robusta*).

The map series in Figure 6 shows those areas where specific measures need to be applied because of the proximity of threatened flora species.

A permit to take listed species will need to be sought from the Department of Primary Industries, Parks, Water and Environment to take a few plants of the following species - *Utricularia tenella*, *Stylidium despectum*, *S. beaugleholei*, *Caladenia pusilla* and *Hypolepis muelleri*.

No flora species listed on the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* have been recorded near drill lines.

### 2.3 Weeds and Exotic Species

No plant species listed as a Weed of National Significance on the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* have been recorded near drill lines.

Management actions have been identified to manage the risk of spreading weeds and other pathogens in the area from the exploration works (see section 4).

### 2.4 *Phytophthora cinnamomi* (PC)

Root-rot fungus (*Phytophthora cinnamomi*, PC) is a soil borne pathogen that causes death in a wide range of native plant species often leading to floristic and structural changes in susceptible plant communities.

PC evolved in tropical areas and requires warm, as well as moist, soils for at least some time of the year to produce sporangia and release zoospores. Only those areas of the State that are below an altitude of about 700m above sea level have soils sufficiently warm for this to occur. Vegetation types below 700m elevation may not be wholly or partly susceptible if closed canopies keep soil temperatures cool during the summer months, such as tall wet eucalypt forests over rainforest species, or rainforest communities.

PC can be spread through the movement of infected soil or plant material by people or animals and can even be transported by water percolating through soil or via surface water, such as in creeks and other drainage lines. Transport of PC to new areas is usually through soil/dirt adhering to vehicles and machinery. Transport into non-roaded areas of high human usage is mainly via bushwalking items such as tents or footwear but can also occur by bird activity.

The fungus is not always evident in the landscape as it attacks root systems of susceptible species, usually causing death in new growth or the yellowing of leaves followed by loss of vigour and, in most cases, death. The fungus can inhabit the root systems of resistant species without any visible signs of infection within the host plant.

PC samples were not taken for analysis as numerous susceptible species (e.g. *Banksia marginata*, *Sprengelia incarnata*, *Epacris obtusifolia*) were observed in the Survey Area to exhibit 'classic' signs of infection (e.g. yellowing or withering of new growth). Indeed, no areas within wet heathland and coastal heathland communities (susceptible communities) were observed to be free of this pathogen.

### 3. FAUNA

No fauna species listed on the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* or the Tasmanian *Threatened Species Protection Act 1995* have been recorded near the drill program lines during surveys for the broader NMS project.

Notes are provided below on each of the fauna species of relevance to the exploration works.

#### **Green and gold frog or Growling grass frog (*Litoria raniformis*)**

Green and golden frogs are active during both day and night throughout the warmer months and can sometimes be seen basking out of the water amongst vegetation or on rocks and logs, the only Tasmanian frog to exhibit this behaviour. All Access routes avoid wetland habitat that may be used by this species.

#### **Striped marsh frog (*Limnodynastes peroni*)**

Drill lines and locations can avoid wetland and swamp paperbark forest habitat that may be used by this species.

#### **King Island green rosella (*Platycercus caledonicus brownii*)**

No nesting hollows are present (coastal scrub without hollow forming trees). No trees with suitably sized nesting hollows are present along the Access routes and drill sample locations. The removal of large living *Banksia marginata* trees (potential foraging resource) in the heathland and scrub habitats in the northern area of the EL will be avoided.

#### **King Island brown thornbill (*Acanthiza pusilla archibaldi*)**

From the scant information available for this cryptic species, it mainly inhabits tall scrub dominated by wet sclerophyll shrub and tea-tree species and eucalypt dominated wet forests. These habitats have been avoided by the Access routes and drill sample locations.

#### **White bellied sea eagle (*Haliaeetus leucogaster*)**

No known nests occur within 500m or 1km line of sight of the Access routes or drill sample locations.

#### **Southern hairy red snail (*Austrochloritis victoriae*)**

There is no wet to damp eucalypt forest with a leaf litter – organic soil layer along the Access routes or near the drill sample locations.

#### **Orange-bellied parrot (*Neophema chrysogaster*)**

There is no saltmarsh, wetland or other suitable foraging habitat for this species along the Access routes or near the drill sample locations.

#### **Tussock skink (*Pseudemoia pagenstecheri*)**

There are no grasslands dominated by *Poa* along the Access routes or near the drill sample locations.

## **4. EXPLORATION LINE MANAGEMENT**

### **4.1 LOCATION**

There are 27 drill lines proposed for the drilling program (Figure 4).

### **4.2 ENVIRONMENTAL MANAGEMENT MEASURES**

The project operator is committed to achieving high quality environmental outcomes through the implementation of environmental management systems to protect the natural environment.

A series of Environment Protection Guidelines (EPG's) have been developed which specifically outline environmental protection requirements for this project.

The following Environment Protection Guidelines are included:

- EPG 1: Disturbance to terrestrial and aquatic flora and fauna
- EPG 2: Working near eucalypt trees
- EPG 3: Working near large remnant Banksia trees that are alive
- EPG 4: Working near wet areas and watercourses
- EPG 5: Erosion, sedimentation and surface run-off

### **4.3 CONTROL MEASURES FOR WEED AND PATHOGEN CONTROL**

Weed and pathogen management actions will need to be applied across the exploration program regardless of the drill line location.

These are described below.

- Vehicles, machinery and equipment involved in clearing of vegetation, excavation and drilling activities will be washed prior to their entry into site.
- The washing down of vehicles, machinery and equipment will occur in an appropriate location, such as a hardstand associated with a works area or industrial wash bay located at the mine site.
- The following process should be applied in washing down vehicles, machinery and equipment (Note: Do NOT apply water to equipment that may be damaged by water)
  - Locate washdown site and prepare the surface or construct bunding as required.
  - Safely park the vehicle free of any hazards (e.g. electrical), ensure the engine is off and the vehicle is immobilised.
  - Look over the vehicle/machine/equipment, inside and out, for where dirt, plant material including seeds are lodged. Pay attention to the underside of the vehicle, radiators, spare tyres, foot wells and bumper bars.
  - Remove any guards, covers or plates if required being careful of any parts that may cause injury.
  - Knock off large clods of mud, use a crow bar if required and sweep out the cabin.
  - Use a vacuum or compressed air where available for removing dried plant material like weed seeds and chaff in radiators and other small spaces where this material lodges. Brush off dry material if no other facilities are available.
  - Clean down with a high-pressure hose (using potable drinking water) and stiff brush/crowbar.

- Start with the underside of the vehicle, wheel arches, wheels (including spare). Next do the sides, radiator, tray, bumper bars etc and finally upper body. Some vehicles may need to be moved during washdown to facilitate washing eg tracked machinery.
- Clean associated implements, eg buckets.
- Check there is no loose soil or plant material that could be readily dislodged or removed.
- Wash effluent away from the machinery and do not drive through wash effluent.

#### **4.2.2 Waterways, wetlands and swampy areas**

Figures 5a, b and c illustrate the general locations of watercourses, wetlands and swampy areas where surface water or wet ground may be encountered.

EPG's 4 and 5 need to be applied where relevant.

#### **4.2.3 Threatened Flora**

Figures 6a-i, a-ii, b-i, b-ii and c-i and c-ii illustrate the NVA recorded locations of threatened flora species.

EPG 1 will need to be applied where relevant.

A permit to take listed species will need to be sought from the Department of Primary Industries, Parks, Water and Environment to take a few plants of the following species - *Utricularia tenella*, *Stylidium despectum*, *S. beagleholei*, *Caldenia pusilla* and *Hypolepis muelleri*. Plants of these species may be affected by the exploration works, especially where the drill lines will be accessed from Sea Elephant Road (many of the small ephemeral species occur within the roadside drain).

Additional measures will need to be applied if stipulated in a permit issued by the DPIPW.

#### **4.2.4 Threatened Fauna**

Figure 7 illustrates the NVA recorded locations of threatened flora species.

EPG 1 will need to be applied where relevant.

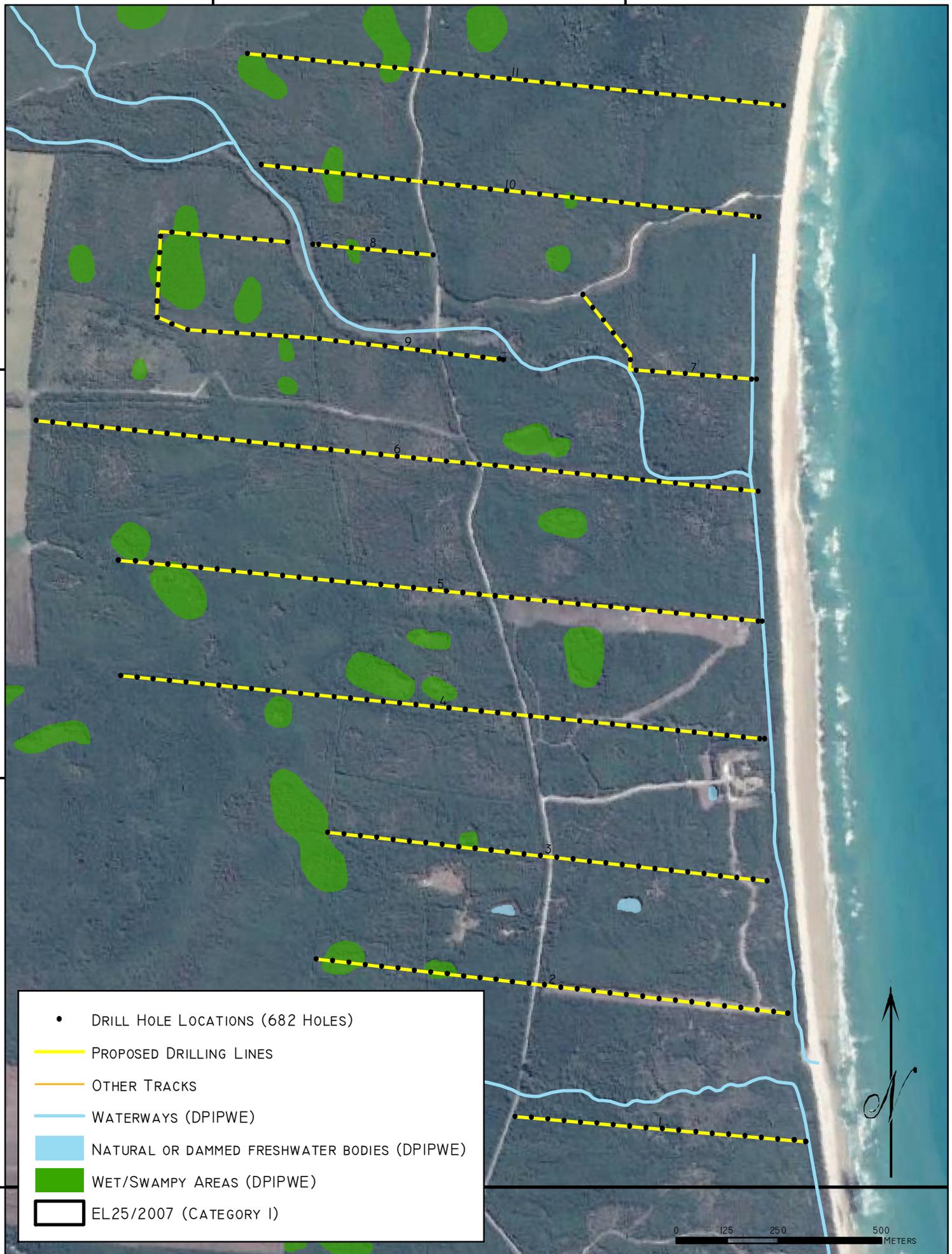
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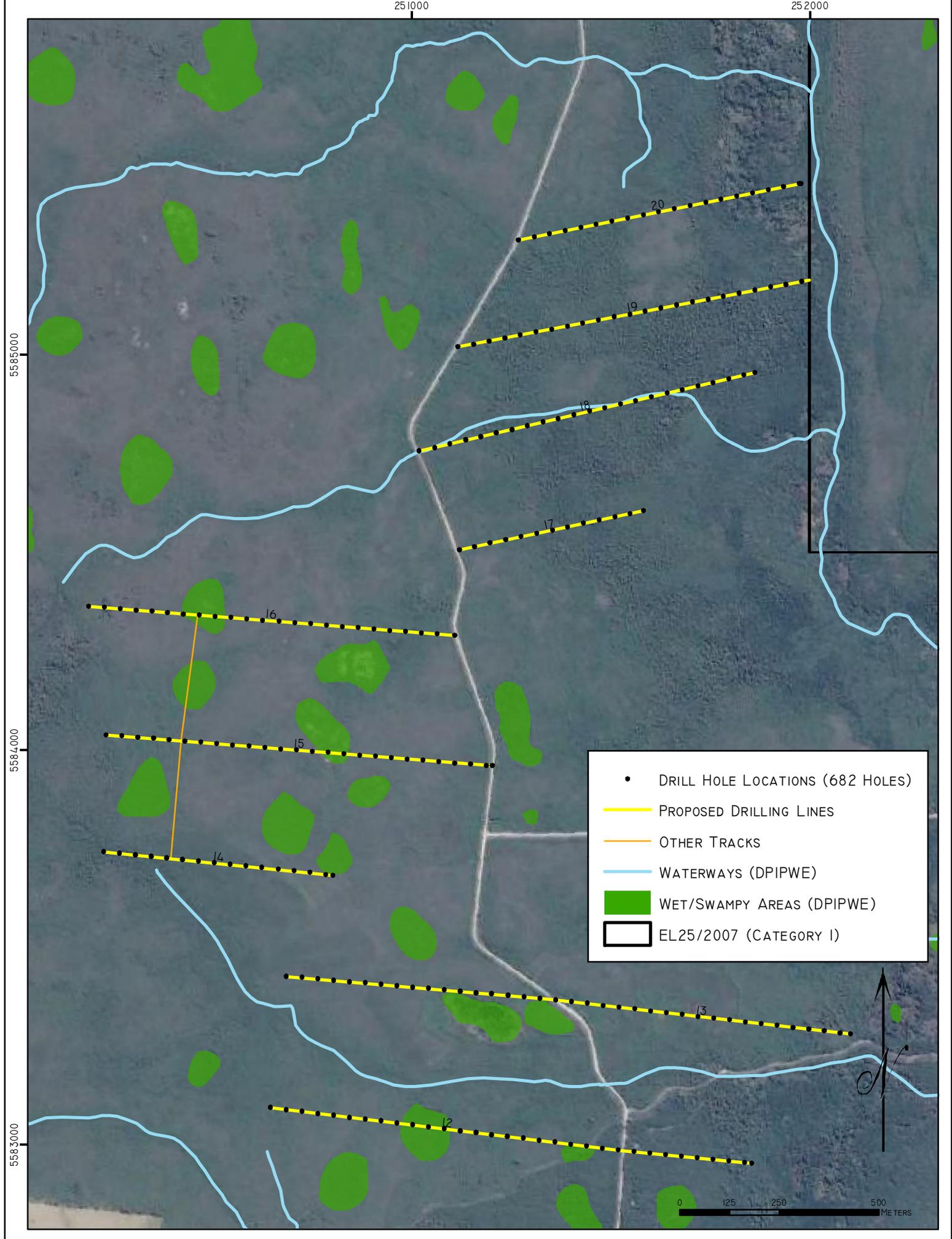
- DRILL HOLE LOCATIONS (682 HOLES)
- PROPOSED DRILLING LINES
- OTHER TRACKS
- WATERWAYS (DPIPWE)
- NATURAL OR DAMMED FRESHWATER BODIES (DPIPWE)
- WET/SWAMPY AREAS (DPIPWE)
- EL25/2007 (CATEGORY I)

NARACOOPA MINERAL SANDS MINE  
 EL WORKS PROGRAM 2018 - DRILLING  
 FIGURE 5A: HYDROLOGY ON THE DRILLING LINES

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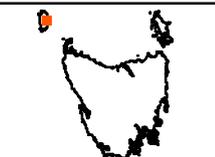


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 EL WORKS PROGRAM 2018 - DRILLING  
 FIGURE 5B: HYDROLOGY ON THE DRILLING LINES

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- DRILL HOLE LOCATIONS (682 HOLES)
- PROPOSED DRILLING LINES
- OTHER TRACKS
- WATERWAYS (DPIPWE)
- WET/SWAMPY AREAS (DPIPWE)
- EL25/2007 (CATEGORY I)

0 125 250 500 METERS

NARACOOPA MINERAL SANDS MINE  
 EL WORKS PROGRAM 2018 - DRILLING  
 FIGURE 5C: HYDROLOGY ON THE DRILLING LINES

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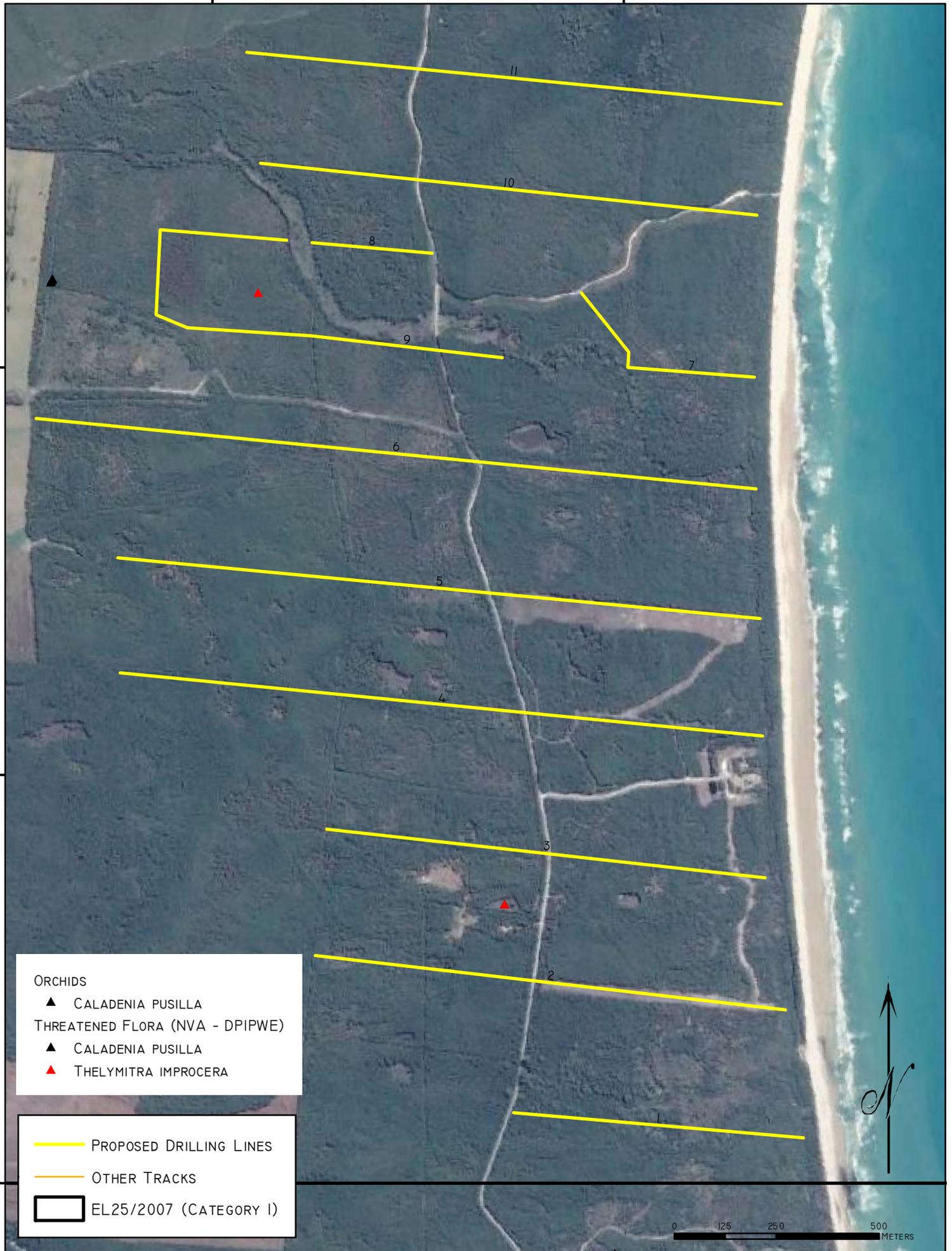
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ORCHIDS

▲ CALADENIA PUSILLA

THREATENED FLORA (NVA - DPIPWE)

▲ CALADENIA PUSILLA

▲ THELYMITRA IMPROCERA

— PROPOSED DRILLING LINES

— OTHER TRACKS

□ EL25/2007 (CATEGORY I)

0 125 250 500 METERS



NARACOOPA MINERAL SANDS MINE  
EL WORKS PROGRAM 2018 - DRILLING  
FIGURE 6A-I: OBSERVED AND KNOWN THREATENED  
FLORA ON THE DRILLING LINES



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251000

252000

5582000

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5580000



THREATENED FLORA (NVA - DPIPWE)

▲ UTRICULARIA TENELLA

— PROPOSED DRILLING LINES

— OTHER TRACKS

□ EL25/2007 (CATEGORY I)

0 125 250 500 METERS



NARACOOPA MINERAL SANDS MINE  
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 FIGURE 6A-II: OBSERVED AND KNOWN THREATENED  
 FLORA ON THE DRILLING LINES



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251000

252000

 PROPOSED DRILLING LINES  
 OTHER TRACKS  
 EL25/2007 (CATEGORY I)

FERNS AND FERN ALLIES

-  HYPOLEPIS MUELLERI

ORCHIDS

-  CALADENIA PUSILLA

SHRUBS AND TREES

-  ELAEOCARPUS RETICULATUS
-  HEDYCARYA ANGUSTIFOLIA

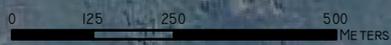
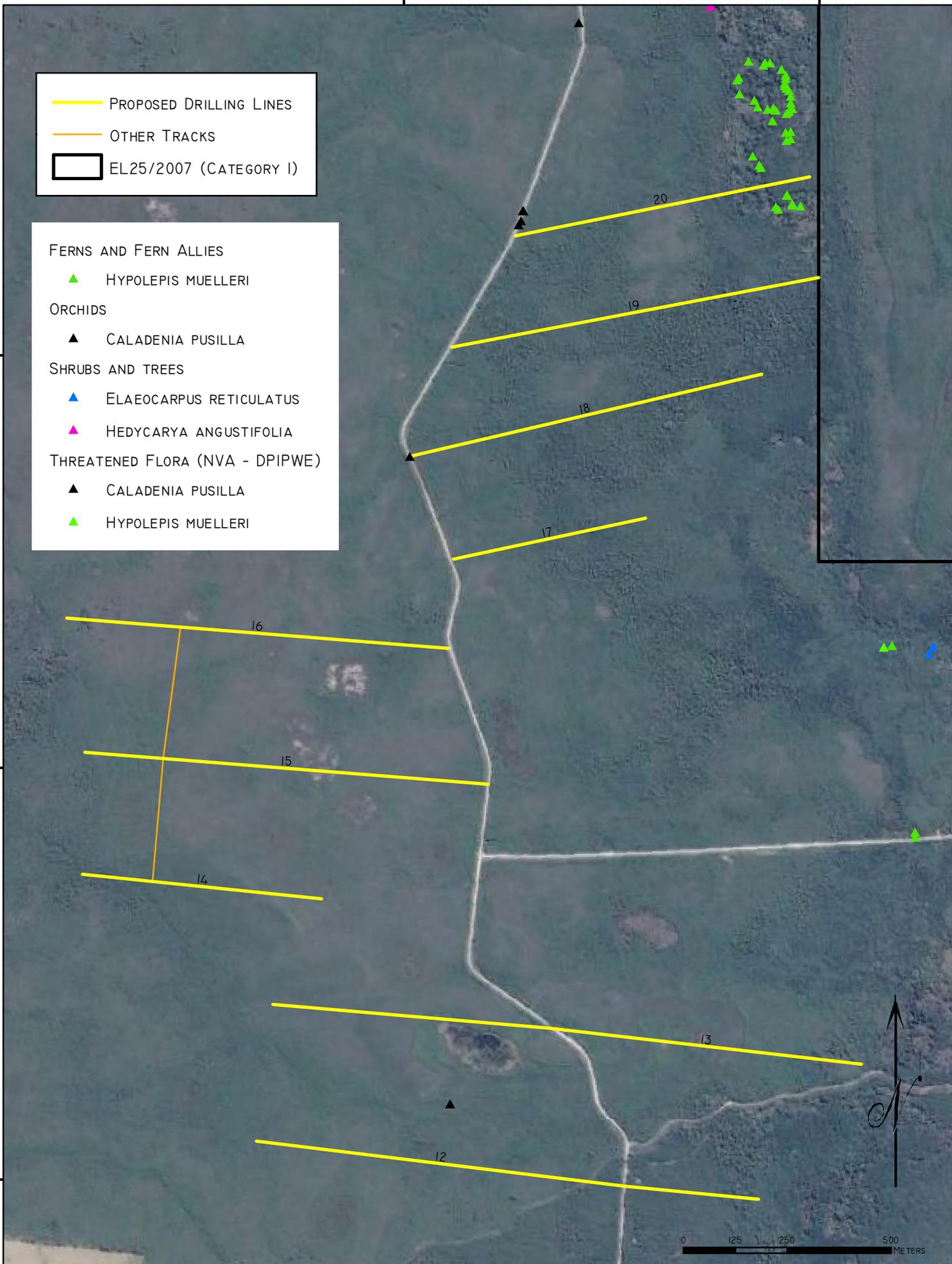
THREATENED FLORA (NVA - DPIPWE)

-  CALADENIA PUSILLA
-  HYPOLEPIS MUELLERI

5585000

5584000

5583000



NARACOOPA MINERAL SANDS MINE  
 EL WORKS PROGRAM 2018 - DRILLING  
 FIGURE 6B-I: OBSERVED AND KNOWN THREATENED  
 FLORA ON THE DRILLING LINES

  
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251000

252000

 PROPOSED DRILLING LINES  
 OTHER TRACKS  
 EL25/2007 (CATEGORY I)

HERBS AND FORBES

-  GRATIOLA PUBESCENS (V/-)
-  STYLIDIUM DESPECTUM (R/-)
-  UTRICULARIA TENELLA (R/-)

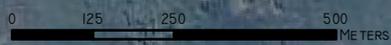
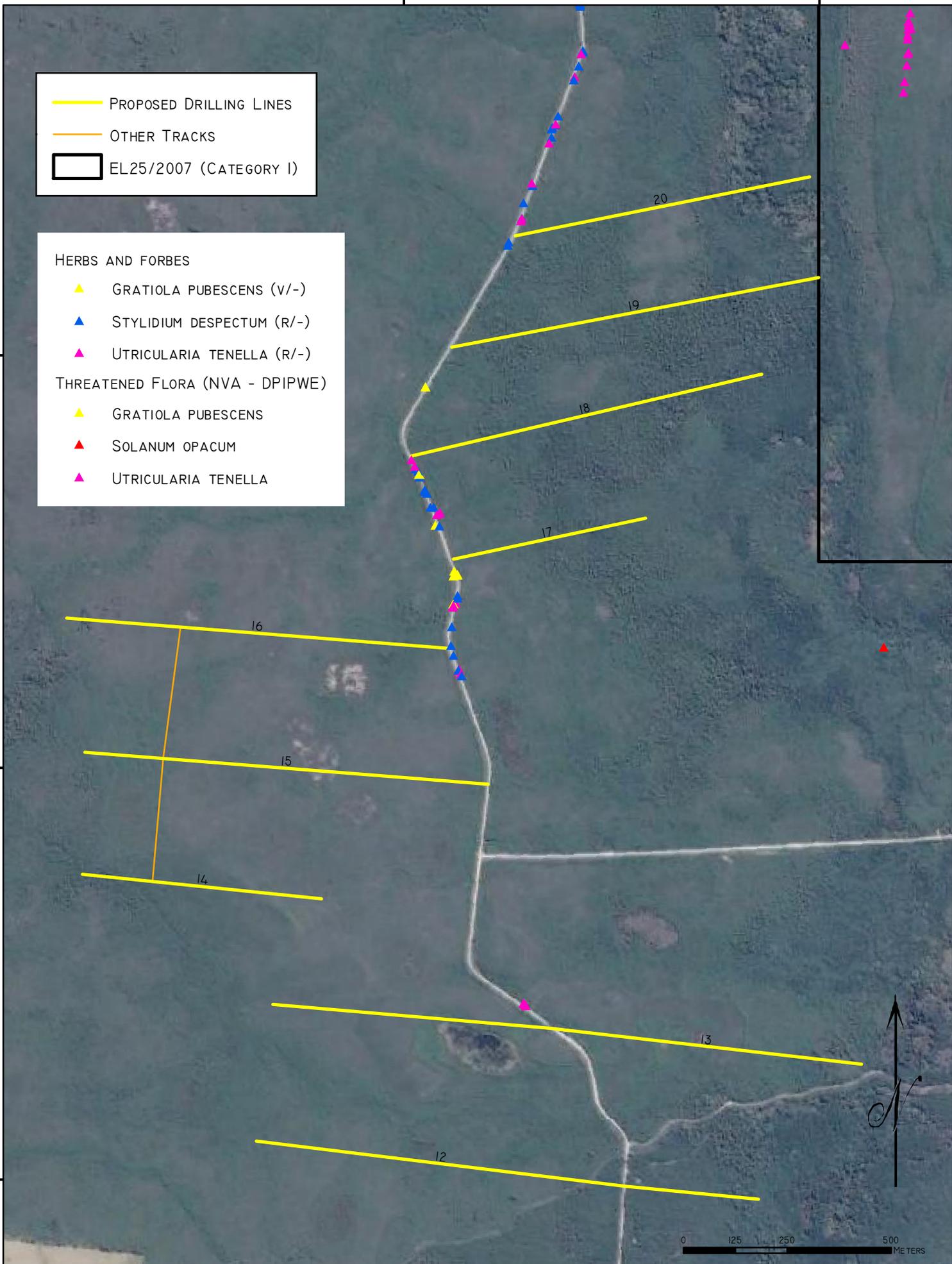
THREATENED FLORA (NVA - DPIPWE)

-  GRATIOLA PUBESCENS
-  SOLANUM OPACUM
-  UTRICULARIA TENELLA

5585000

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5583000



NARACOOPA MINERAL SANDS MINE  
 EL WORKS PROGRAM 2018 - DRILLING  
 FIGURE 6B-II: OBSERVED AND KNOWN THREATENED  
 FLORA ON THE DRILLING LINES

  
 PO Box 1 New Town TAS 7008  
BASE DATA BY TASMAR. © STATE OF TASMANIA  
 BASE IMAGE © GOOGLE EARTH



DATUM: GDA94  
 GRID: MGA ZONE 55  
 TASMAR: SEA ELEPHANT  
 NARACOOPA  
 CLIENT: NARACOOPA MINERAL  
 SANDS PTY. LTD.  
 DATE: 25TH MAR 2018

25 0000

25 1000

25 2000

FERNS AND FERN ALLIES

▲ HYPOLEPIS MUELLERI

ORCHIDS

▲ CALADENIA PUSILLA

SHRUBS AND TREES

▲ ELAEOCARPUS RETICULATUS

▲ HEDYCARYA ANGUSTIFOLIA

THREATENED FLORA (NVA - DPIPWE)

▲ ELAEOCARPUS RETICULATUS

▲ HEDYCARYA ANGUSTIFOLIA

5588000

5587000

5586000

- PROPOSED DRILLING LINES
- OTHER TRACKS
- EL25/2007 (CATEGORY I)

0 125 250 500 METERS



NARACOOPA MINERAL SANDS MINE  
EL WORKS PROGRAM 2018 - DRILLING  
FIGURE 6C-I: OBSERVED AND KNOWN THREATENED  
FLORA ON THE DRILLING LINES

*an Diemen* CONSULTING  
PO Box 1 New Town TAS 7008  
BASE DATA BY TASMAR, © STATE OF TASMANIA  
BASE IMAGE © GOOGLE EARTH



DATUM: GDA94  
GRID: MGA ZONE 55  
TASMAR: SEA ELEPHANT  
NARACOOPA  
CLIENT: NARACOOPA MINERAL  
SANDS PTY. LTD.  
DATE: 25TH MAR 2018

25 0000

25 1000

25 2000

HERBS AND FORBES

- ▲ EPILOBIUM PALLIDIFLORUM (R/-)
- ▲ GRATIOLA PUBESCENS (V/-)
- ▲ STYLIDIUM BEAUGLEHOLEI (R/-)
- ▲ STYLIDIUM DESPECTUM (R/-)
- ▲ UTRICULARIA TENELLA (R/-)

THREATENED FLORA (NVA - DPIPWE)

- ▲ GRATIOLA PUBESCENS
- ▲ SOLANUM OPACUM
- ▲ UTRICULARIA TENELLA

5586000

5587000

5586000

- PROPOSED DRILLING LINES
- OTHER TRACKS
- EL25/2007 (CATEGORY I)

0 125 250 500 METERS



NARACOOPA MINERAL SANDS MINE  
 EL WORKS PROGRAM 2018 - DRILLING  
 FIGURE 6C-II: OBSERVED AND KNOWN THREATENED  
 FLORA ON THE DRILLING LINES



PO Box 1 New Town TAS 7008

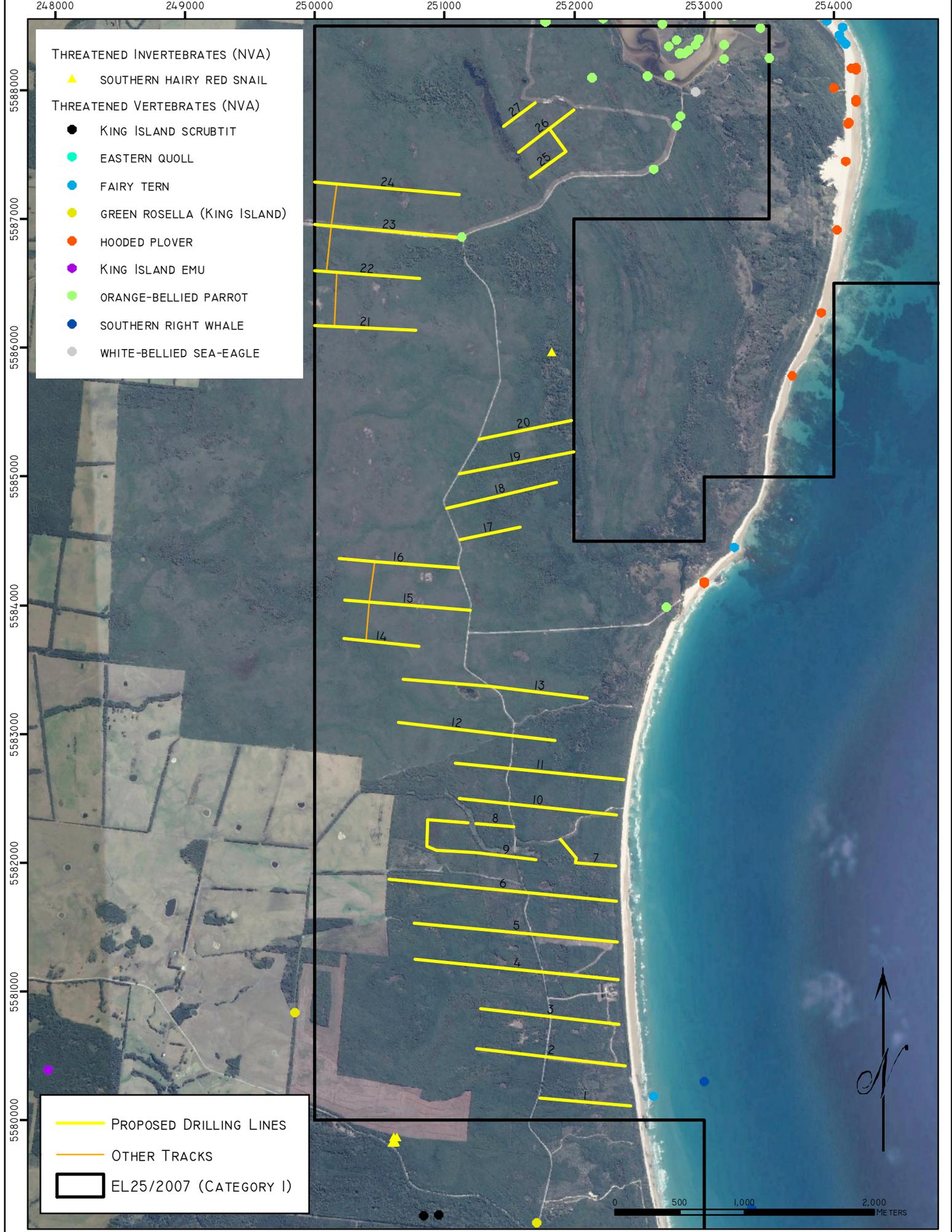
BASE DATA BY TASMGP, © STATE OF TASMANIA  
BASE IMAGE © GOOGLE EARTH



DATUM: GDA94  
 GRID: MGA ZONE 55  
 TASMGP: SEA ELEPHANT  
 NARACOOPA

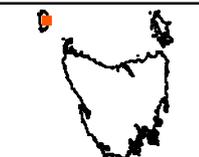
CLIENT: NARACOOPA MINERAL  
 SANDS PTY. LTD.

DATE: 25TH MAR 2018



NARACOOPA MINERAL SANDS MINE  
 EL WORKS PROGRAM 2018 - DRILLING  
 FIGURE 7: KNOWN (NVA) THREATENED FAUNA

*an Diemen* CONSULTING  
 PO Box 1 New Town TAS 7008  
BASE DATA BY TASMAR. © STATE OF TASMANIA  
 BASE IMAGE © GOOGLE EARTH



DATUM: GDA94  
 GRID: MGA ZONE 55  
 TASMAR: SEA ELEPHANT  
 NARACOOPA  
 CLIENT: NARACOOPA MINERAL  
 SANDS PTY. LTD.  
 DATE: 25TH MAR 2018

## **5. REHABILITATION AND MONITORING**

### **5.1 REHABILITATION**

The drill lines created by the exploration works should naturally regenerate to their pre-exploration works condition over time due to the type of vegetation present (scrub, heathland etc) so seeding the areas is not required. Scrub, heathland and tea-tree forests are resilient community types and should quickly and easily regenerate in the absence of disturbance.

In some cases, due to the low nature of the vegetation vehicles and machinery may be able to traverse some areas without needing to cut or clear the standing vegetation. Such areas include open dry heathland and short regenerating scrub in the northern sections of the EL.

Slash created from the pruning and/or partial clearing of vegetation can be placed onto the disturbed areas created by route construction and drill sampling to enable some protection to the soil surface and provide an extra source of seed for regeneration. Canopy stored seed in adjacent vegetation and that which may already be present in the soil (soil 'seed bank') should otherwise be sufficient to facilitate regeneration.

### **5.2 MONITORING**

The early detection of Declared Weeds that enter the drill line locations is important to ensure that any control or eradication program has the highest likelihood of success.

A survey to identify any Declared Weeds associated with the drill lines created by the exploration program should be conducted at regular intervals for at least 3 years after the completion of the exploration works. This approach should enable the early detection of weed species before they reach an extent where control and eradication is very costly and/or difficult to achieve.

Surveys should ideally be conducted during peak growth seasons (September to April) to maximise the detectability of some plants, especially those with brightly coloured or distinctive flowers and growth habits.

The following monitoring regime will be applied for the project:

1. Surveys and assessments by a suitably qualified person will be made at no more than 6 monthly intervals to –
  - a. identify, record and map any new weed species not previously recorded;
  - b. assess and map the extent of known weed infestations to determine if they are becoming larger and/or more significant such that control measures can be modified; and
  - c. review/assess the weed control works that have been conducted and to provide advice, where necessary, on the management of weeds.
2. Areas where weed control/eradication works have occurred (eg spraying) will be assessed no more 12 months after the treatment occurred to determine if the measures implemented were successful. Where measures have proved unsuccessful, repetition and/or modification of the weed control technique(s) will be employed.

## **Appendix A: Environmental Protection Guidelines**

# ENVIRONMENT PROTECTION GUIDELINES

## NARACOOPA MINERAL SANDS MINE EXPLORATION PROJECT DRILL PROGRAM 2018-19

### ENVIRONMENTAL OBJECTIVES

The NMSEP is committed to achieving high quality environmental outcomes through the implementation of environmental management systems that are beneficial to the community and the natural environment.

### ENVIRONMENT PROTECTION GUIDELINES (EPG)

A series of Environment Protection Guidelines (EPG's) have been developed which specifically outline environmental protection requirements for this project.

The following Environment Protection Guidelines are included:

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- **EPG 1:** Disturbance to terrestrial and aquatic flora and fauna
- **EPG 2:** Working near eucalypt trees
- **EPG 3:** Working near large remnant *Banksia* trees that are alive
- **EPG 4:** Working near wet areas and watercourses
- **EPG 5:** Erosion, sedimentation and surface run-off

### **Objective**

To minimise the effect of the mineral exploration activities on local flora and fauna, particularly endangered and protected species.

### **Control Methods**

#### **General**

- Ensure all site workers are familiar with the conditions of the permits and environmental aspects of the project at the project induction;
- No refuelling of equipment, machines or vehicles is to occur within 50 m of a natural watercourse, waterbody or human constructed drain/watercourse;
- Bunding will be installed around storage areas for fuels and oils to prevent the spillage of fuels, oils or other hazardous substances into the water;
- Any activities that are likely to cause sediment to run-off into a watercourse/waterbody should not be carried out during wet weather;
- Exploration activities will be limited to day time to avoid impacts on nocturnal fauna; and
- Provide sealed bins for waste to discourage animal pests.

#### **Access Routes and Drill Sample Locations**

- The clearing of native vegetation along each drill line will be kept to a maximum of 4 m wide.
- Slash and other vegetative material accumulated through the clearing process will not be pushed or placed onto the native vegetation outside the 4 m buffer. Vegetation can be stockpiled within the 5 m wide buffer associated with the line marked by pink flagging tape.
- Slash resulting from clearing the access route and drill sample location will not be burnt.

**Objective**

To minimise damage to eucalypt trees along the drill lines and near drill sample locations.

**Background**

While eucalypts are uncommon on the eastern side of King Island near Naracoopa they provide an important food resource to local fauna, especially conservation significant birds (eg green rosella, swift parrot).

The occurrence of blue gum and Brooker's gum in the areas surveyed was limited to wet areas that rarely burn during wildfire or steeply incised gullies where they may be protected from fire. White gums are more common than either blue or Brooker's gums near Naracoopa but even these are restricted to small patches where fire frequency has been low enough to avoid them being burnt out of an area. White gums tend to occur on sandy ridgelines that are old strandlines.

Woodland with occasional white gums cannot be avoided for all drill lines.



Medium-sized multi-stemmed white gums may occur on some drill lines.

Lopping of limbs should minimise the long-term effect of the exploration program to these trees.



Most white gums that occur along or near the drill lines are small and multi-stemmed. Pruning of branches will enable vehicle access in most cases.

#### **Control Methods**

- Eucalypts should only be pruned or branches lopped (with chainsaw, loppers or similar) to enable safe passage of machinery and vehicles along a drill line;
- Eucalypts should not be completely removed such that they would have no ability to regenerate from either lopped branches or the retained basal stems;
- Only if **absolutely necessary** should all of the branches from a eucalypt be removed by pruning or lopping. In such cases, the branches should be cut at least 25 mm above the root-ball at a 45 degree angle to prevent rotting/fungal infection of the cut surfaces; and
- Lopped and pruned branches should be returned to the drill line once the machinery has left the area as some branches may contain seed capsules which would aid regeneration of eucalypts along the ground-disturbed route.

### Objective

To minimise damage to large remnant Banksia trees that are **alive** on drill lines.

This EPG **does not apply** to small regrowth Banksia shrubs (<2 m) or regenerating saplings along any drill line.

### Background

Banksia or honeysuckle (*Banksia marginata*) is a relatively common shrub to small tree on the eastern side of King Island near Naracoopa. Banksia trees have large flowers that often produce lots of nectar that provides an important food resource to local fauna, especially conservation significant birds (eg green rosella, swift parrot). Banksia trees are regenerating from seed in areas of heathland burnt by the 2011 wildfires in the northern section of the EL. It will be several years before they flower and again provide a food resource to local fauna. If another fire burns the northern area of the EL before the regenerating Banksia set seed then there is a possibility that some areas may 'lose' Banksia trees altogether.

The images below show the large Banksia trees over heathland and scrub that were unburnt by the 2011 King Island bushfires (left) and the burnt remnants of a Banksia from the 2011 fires (right).



### Control Methods

- Large living Banksia trees should not be completely removed or felled by the clearing of drill lines or Drill Sample locations;
- Large living Banksia trees should only be pruned, or branches lopped (with chainsaw, loppers or similar) to enable safe passage of machinery and vehicles along drill lines;
- No more than 50% of the branches on any single Banksia should be removed by pruning or lopping;
- Branches when pruned/lopped should be cut at a 45-degree angle to the ground to prevent rotting/fungal infection of the cut surfaces; and
- Lopped and pruned branches should be returned to the drill line once the machinery has left the area as some branches may contain cones which would aid regeneration of Banksia along the ground-disturbed route.

**Objective**

To minimise the potential impact on swamps, waterways, watercourses and wet areas from the exploration activities such as the damage to wet soils, swamps and watercourses.

**Background**

In some locations the drill lines may occur near waterways, swamps and drains or crosses watercourses. Drill lines have generally been located to avoid crossing watercourses (natural) and drains however some could not be avoided. There are also a few wet areas within otherwise dry heathland and scrub that will require the use of cut slash (tea-tree and paperbark sourced from the drill line clearing/slashing) to ensure that organic rich soils are protected whilst machinery use the drill line track.



A wet area dominated by scented paperbark that has organic rich sandy to peat soils. Slash should be used to enable machinery and vehicles to cross these areas without damaging the soil profile. Slash should be removed (spread along the route) when exploration works for that drill line have been completed.

**Control Measures**

The following control measures are to be established and monitored during the whole exploration program period for the relevant drill line.

- For shallow watercourse crossings, cut slash can be used to build-up the ground-level to enable traction for machinery and vehicles. All slash placed into or across a drain or watercourse must be removed after the exploration works have been completed.
- For man-made drains or large watercourse crossings a culvert may need to be used in conjunction with slash to allow safe passage of machinery and vehicles. Advice should be sought from a suitably qualified person on the required size of the culvert relative to the watercourse size and flow. Culvert and slash watercourse crossings can remain in situ after the exploration works have been completed.

### **Objective**

To minimise the potential for erosion on steep and/or erosive surfaces and to avoid sedimentation in waterways, swamps and drains.

### **Background**

In some locations steep sandy rises, eroded tracks and washouts have the potential to become highly erosive and hence a source of sediment that may impact on nearby waterways and drains.

The erosion and sedimentation controls must:

- Prevent sediment laden run-off entering adjoining waterways, swamps and drains;
- Prevent soil loss from disturbed areas through wind and water erosion; and
- Undertake clean-up and remediation on completion of exploration works;

### **Control Measures**

The following control measures are to be established and monitored during the whole exploration program period.

The erosion and sedimentation controls will include:

- Sediment control equipment (applicable to the soil texture) will be installed to minimise the suspension of sediment and subsequent contamination to any waterways or drainages;
- Sediment netting may be used at the low end of small soaks that drain into channels or swampy area to create an effective barrier to the movement of sediment. The netting will be checked weekly during the construction period and replaced as necessary. Straw and hay bales should be avoided as they may introduce weeds into areas that are otherwise weed-free;
- If construction intersects shallow groundwater then appropriate control methods will be implemented to ensure environmental disturbance is minimised and that any intersected water is prevented from directly entering drains or waterways. This may be achieved by the **temporary** diversion of water into existing vegetation or the digging of a **temporary** small detention pond. All temporary structures must be in-filled or removed after the exploration works have been completed;
- Wastes will not to be deposited into, hosed down or swept into any waterway or soak;
- Work likely to result in sediment run-off into drains and waterways will be avoided during wet weather;
- Refuelling of equipment, machines or vehicles is to occur at least 50 m away from a watercourse/drain; and
- A spill kit will be maintained on site near the source of fuel/oil and other chemicals. Multiple spill kits may be needed when there are multiple sources of fuel, oil or other chemicals needed for the construction process.

### **Monitoring of erosion control measures**

- Inspect erosion and sediment control devices regularly to ensure correct functioning and placement and that the available volume capacity is adequate; and

- Devices should be cleaned and/or replaced as required to ensure that they are functional.

#### **Emergency Response**

In the event of a significant failure of an erosion/sediment control device the following will be implemented:

- The Contractor will reinstate the erosion and sediment controls as soon as practicable.
- The Contractor will determine whether the failure constitutes a threat to any adjoining waterway or drain; advice may need to be sought from an ecologist or suitably qualified person as to the potential impact a sedimentation event may have on aquatic and semi-aquatic biota.
  - If not considered a threat to waterways, procedures are to be reviewed and the Mine Superintendent is to be advised of, and approve, any alterations or installation of additional and/or more effective erosion control devices.
  - If the failure constitutes a threat to any adjoining waterway or drain, the Exploration Superintendent is to be notified as soon as practicable and within 24 hours. The following may need to be applied -
    - additional and more effective erosion control devices should be installed as soon as practicable; and
    - any instructions provided by the Exploration Superintendent must be implemented as soon as practicable.