

NORTH SCOTTSDALE
BOTANICAL & FAUNA HABITAT SURVEY
For ABX4 PTY LTD
15th February 2013



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1.0 Introduction: ABX4 Pty Ltd a wholly owned subsidiary of Australian Bauxite Ltd is undertaking an exploratory program in an area to the north of Scottsdale and is proposing to undertake a drilling program of targeted locations within State Forest, Forest Reserve and freehold properties within the EL.

The exploration program will involve numerous shallow drill holes which will not require the clearing and/or leveling of drill pad sites and so is expected to have a minimal impact on the ground surface and adjacent vegetation.

A botanical and fauna habitat survey is required of the target areas as part of the MRT licence conditions to determine any likely impacts on threatened species, threatened vegetation communities and other natural values.

1.1 Objectives: The objectives of this survey were to;

- Undertake a desktop survey to confirm the known biological records and the natural values present in the exploration area and in the vicinity.
- Undertake a field survey of the exploration target areas to observe and record the natural values present including the vegetation types and plant communities, the flora and in particular any threatened species and potential habitat for species of threatened fauna.
- Determine the possible impacts of the proposed exploration program on the natural values present and make recommendations on how those impacts can be minimised.

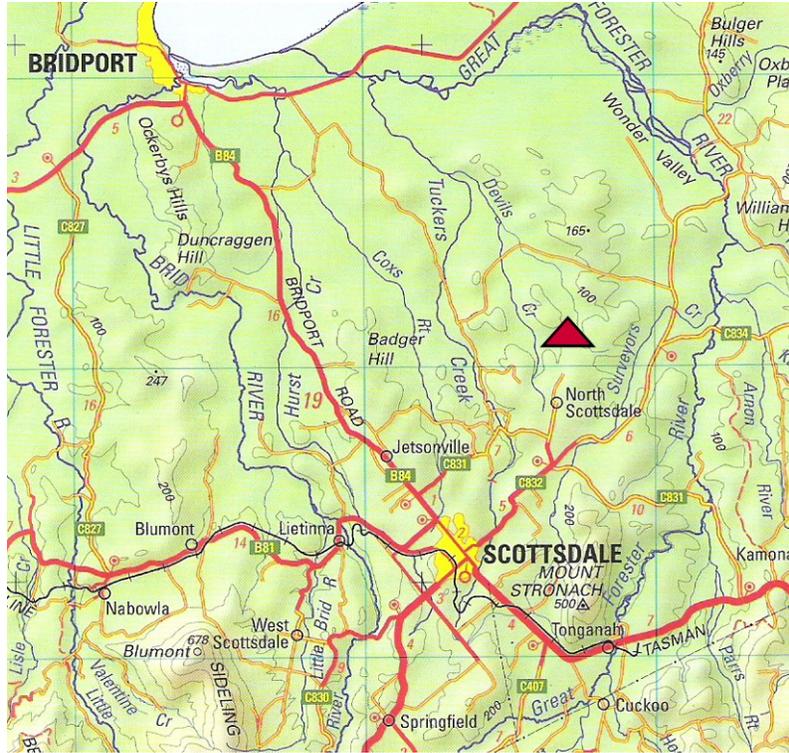
1.2 Location of Study Area:



MAP REF: Tasmap 1:25,000, Sheet No. 5445, Pearly Brook

BIOREGION: Flinders

GRID REF: 548040E – 5454100N and 546280E - 5451700
(All Grid References MGA Zone 55 GDA94)

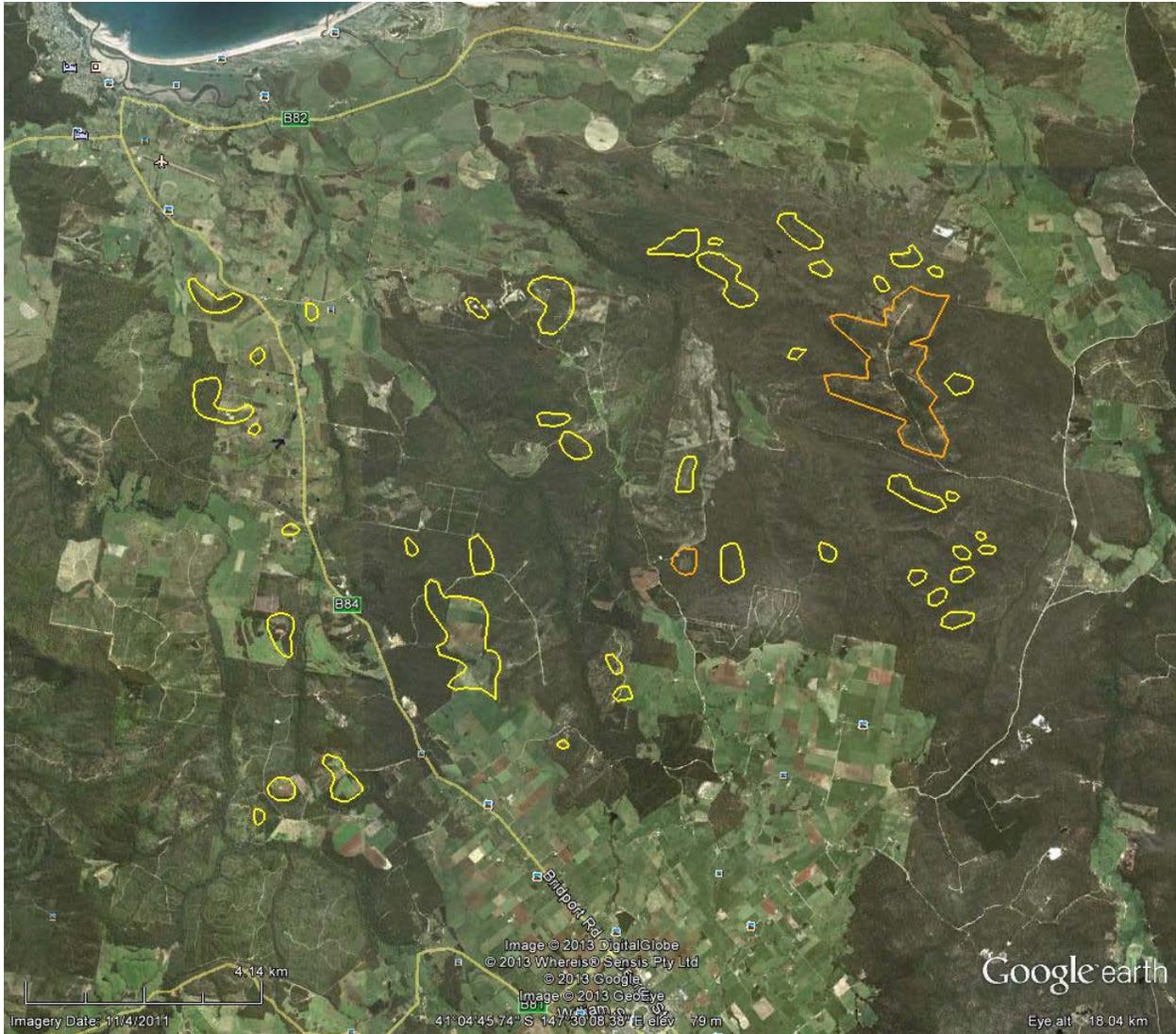


MAP 1. Location of survey area to the north of Scottsdale.

1.3 Site Description:

The exploration target area is located about 10km to the north-east of Scottsdale and to the west of Old Waterhouse Road. Glennons Road extends westwards from Old Waterhouse Road and bisects the target area. The area consists of a series of undulating and forested hills up to 700 metres in height interspersed with creek-lines and broad soaks.

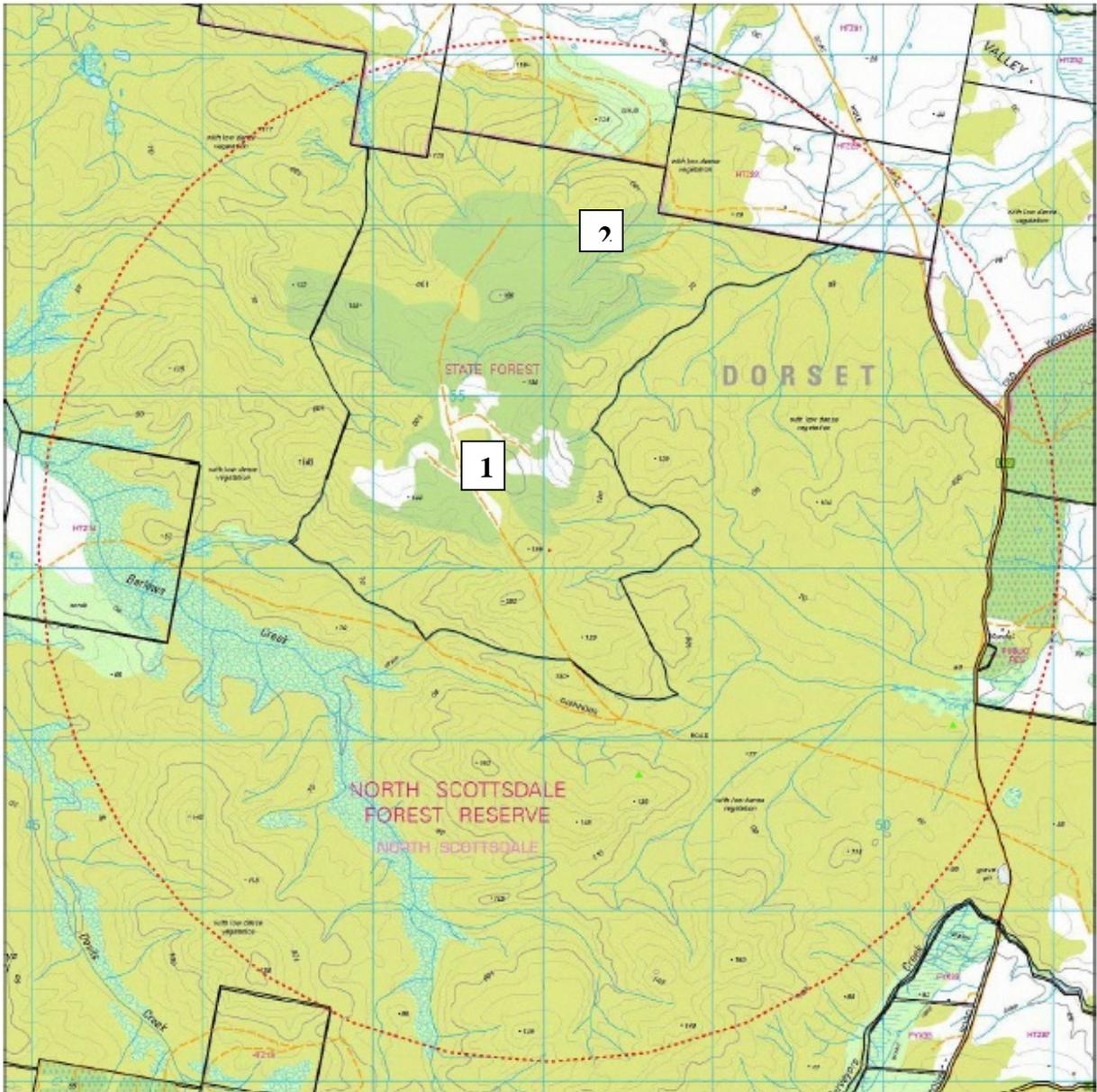
The survey involved two distinct areas, one to the north of Glennons Road within an area of State Forest which has been subject to logging operations and included areas of recently established Eucalypt plantation. The second area was to the south of Glennons Road within the North Scottsdale Forest Reserve. An additional two targets were located on nearby freehold land to the immediate east of the Forest Reserve which is owned by Mr Rex Lethborg.



MAP 2: GoogleEarth image detailing target locations across the North Scottsdale EL. The target areas subject to this survey and report are located in the eastern half of the EL.

X: 544842
Y: 5457297

X: 551242
Y: 5457297



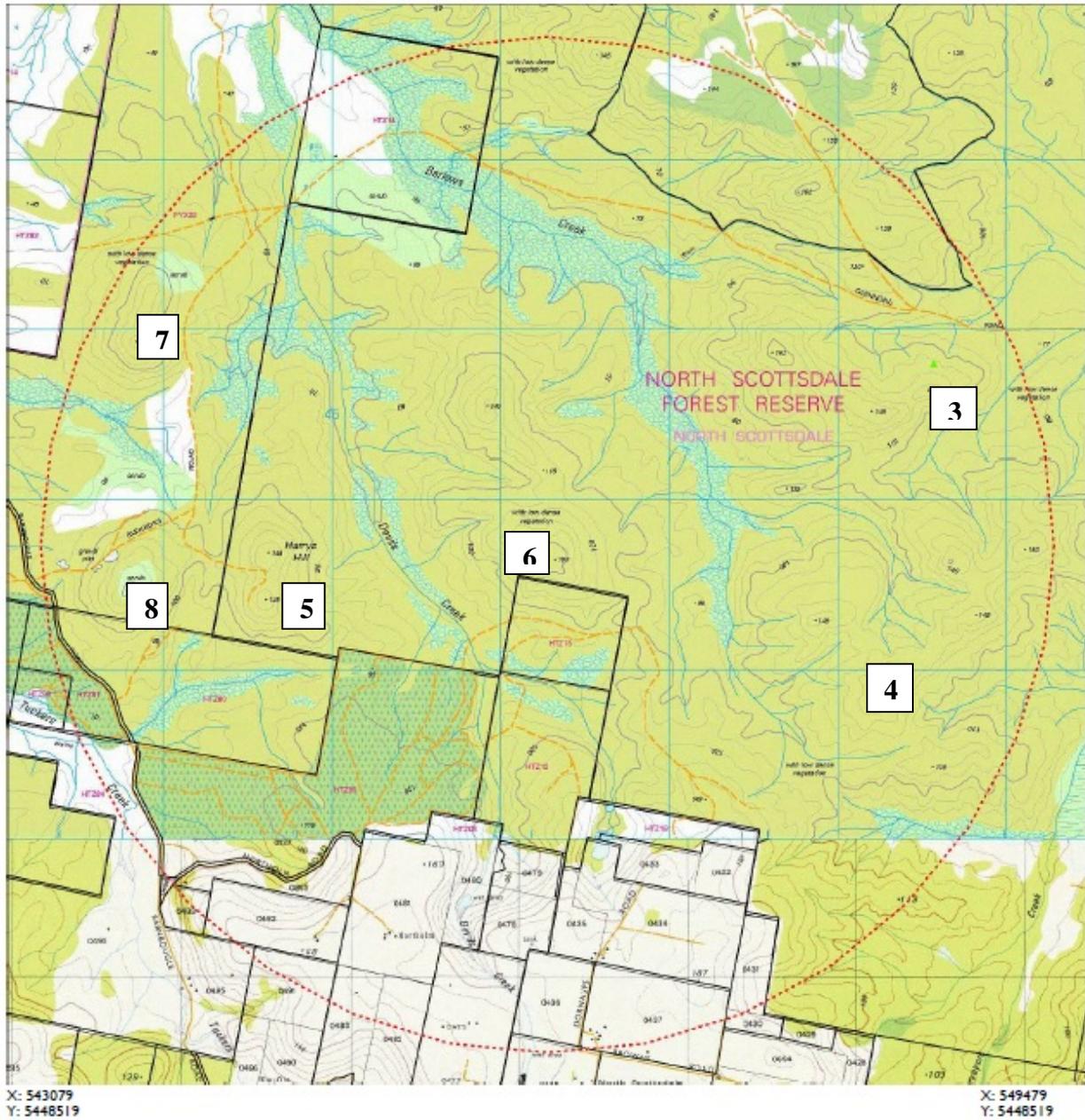
X: 544842
Y: 5450897

X: 551242
Y: 5450897

**MAP 3. Survey Areas 1 and 2 within state forest north of Glennons Road.
Within 3,000 metres of reference point. GRID REF: 548040E – 5454100N**

X: 543079
Y: 5454919

X: 549479
Y: 5454919



X: 543079
Y: 5448519

X: 549479
Y: 5448519

MAP 4. Target/ Survey Areas 3, 4, 5 and 6 within the North Scottsdale Forest Reserve south of Glennons Road.

Target/ Survey Areas 7 and 8 on freehold property to the west of the North Scottsdale Forest Reserve.

Within 3,000 metres of reference point. GRID REF: 546280E – 5451700N

2.0 Desktop Survey of Natural Values:

The DPIPWE database “The Natural Values Atlas” was accessed for the known biological records of the locality and environs. Records of threatened species of flora and fauna known to occur within a 5,000 metre radius of the location were also accessed. Data sourced included the vegetation types and plant communities, the occurrence of any threatened vegetation communities, the recorded locations of any threatened species of plants and threatened fauna known or expected to occur in the vicinity.

REFERENCE POINTS for the locality: 548040E – 5454100N and 542680E – 5451700N.

Desktop Survey Results:

VEGETATION COMMUNITIES:

The following vegetation communities are mapped under the TasVeg mapping program as occurring within 3,000 metres of each of the study area reference points.

VEGETATION COMMUNITY	TASVEG CODE	MAPPING COLOUR	EXTENT IN STUDY AREA
<i>Eucalyptus amygdalina</i> Coastal Forest & Woodland	DAC	Bright green	The most widespread forest community in the survey area.
<i>Eucalyptus obliqua</i> Dry Forest & Woodland	DOB	Dark green	A number of scattered and localized patches within the area of the forest reserve.
<i>Eucalyptus amygdalina</i> – <i>Eucalyptus obliqua</i> Damp Sclerophyll Forest	DSC	Medium green with horizontal lines	Patches in south of study area and outside of the target areas.
<i>Eucalyptus ovata</i> Forest & Woodland	DOV	Dark green with horizontal white lines	6 very small and localized occurrences on valley floors and moist areas within the forest reserve.
<i>Eucalyptus obliqua</i> Wet Forest (undifferentiated)	WOU	Medium blue	Large patch within the area of state forest north of Glennons Road (most has since been clearfelled and converted to plantation)
<i>Eucalyptus obliqua</i> Wet Forest with Broadleaved Shrubs	WOB	Medium blue with horizontal lines	Along valley floor of Devils Creek and the western slopes of Harrys Hill within the forest reserve.
<i>Melaleuca squarrosa</i> Scrub	SMR	Cerise with diagonal lines	Scattered patches along creeks valley floors and soaks within the forest reserve.
<i>Leptospermum</i> Scrub	SLW	Pink with horizontal yellow lines	Two small patches about 2km east of target area 2.
Wet Heathland	SHW	Orange with “x”	Large patches on the wide poorly drained valley floors to the north and west of the state forest and north-west of the forest reserve along Barlows Creek.
Inland Heathland (undifferentiated)	SHU	Orange with “z”	Patch associated with the above community to the north of the forest reserve.
Eastern Buttongrass Moorland	MBE	Yellow with horizontal lines	Part of the valley floor vegetation mainly along Devils and Barlows Creeks.
Buttongrass Moorland with Emergent Shrubs	MBS	Yellow with diagonal lines	Part of the valley floor vegetation mainly along Devils and Barlows Creeks.
Plantations	FPL	White with zig zag lines	East of the state forest and south-west of the forest reserve. Recent plantations replacing WOU is not shown on the TasVeg map.

TABLE 1: Vegetation Communities and extent within the study area as per TasVeg mapping program.

X: 544842
Y: 5457297

X: 551242
Y: 5457297



X: 544842
Y: 5450897

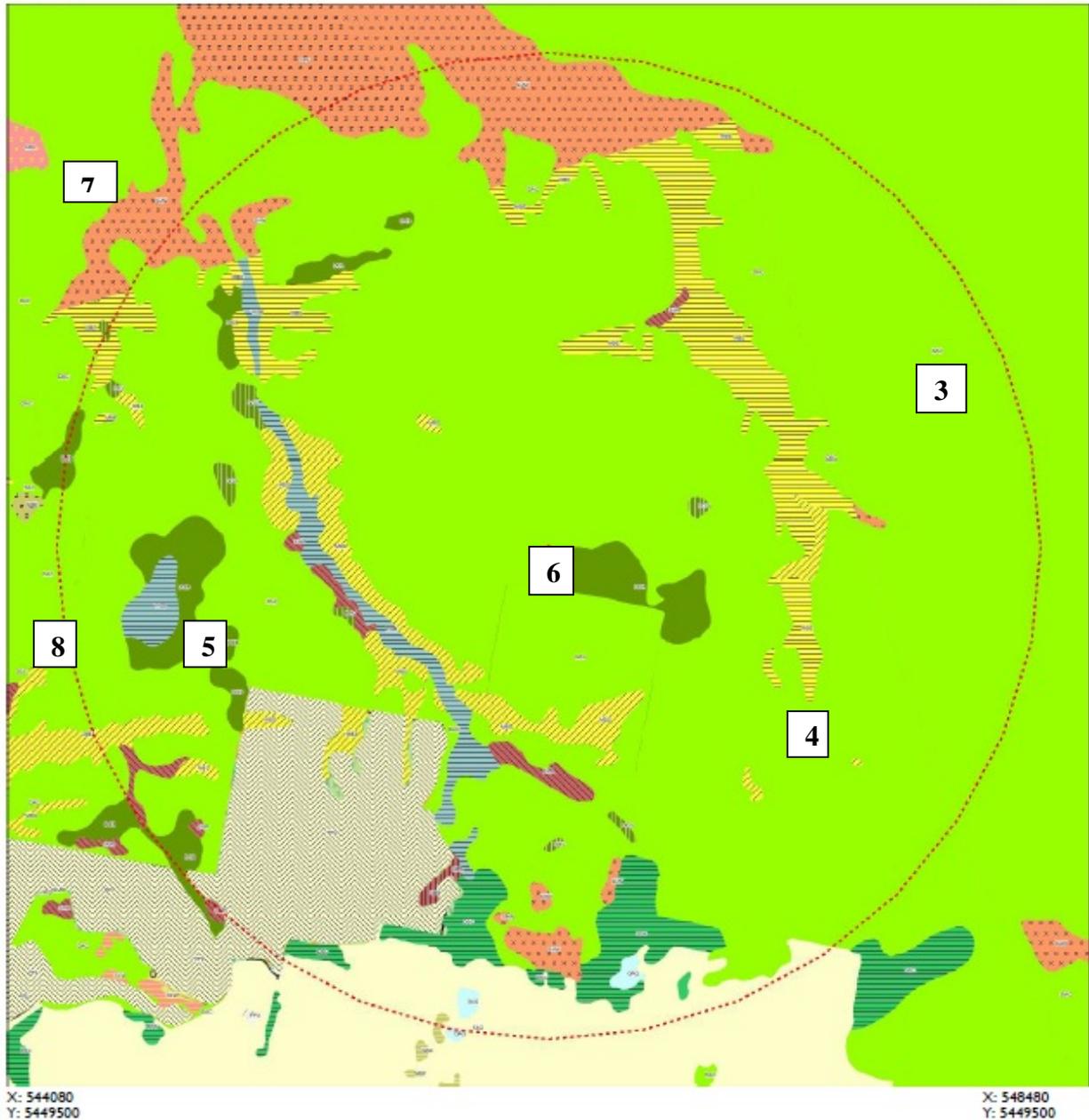
X: 551242
Y: 5450897

FIGURE 1: Vegetation Communities as per TasVeg mapping program within 3,000 metres of Survey Area Reference Point. GRID REF: 548040E – 5454100N. State Forest

CODE:	DAC	.....	<i>Eucalyptus amygdalina</i>	Coastal Forest & Woodland
	DOB	.....	<i>Eucalyptus obliqua</i>	Dry Forest & Woodland
	DOV	.....	<i>Eucalyptus ovata</i>	Forest & Woodland
	WOU	.....	<i>Eucalyptus obliqua</i>	Wet Forest (undifferentiated)
	SHW	.....		Wet Heathland
	SLW	.....	<i>Leptospermum</i>	Scrub
	MBE	.....		Eastern Buttongrass Moorland
	MBS	.....		Buttongrass Moorland with Emergent Shrubs
	FAG	.....		Agricultural Land / FPI Plantation

X: 544080
Y: 5453900

X: 548480
Y: 5453900



X: 544080
Y: 5449500

X: 548480
Y: 5449500

FIGURE 2. Vegetation communities as per TasVeg mapping program within 2,000 metres of survey area reference point, GRID REF: 546280E – 5451700N. Target Area 6. North Scottsdale Forest Res.

- CODE: DAC *Eucalyptus amygdalina* Coastal Forest & Woodland
 DOB *Eucalyptus obliqua* Dry Forest & Woodland
 DSC *Eucalyptus amygdalina* – *Eucalyptus obliqua* Damp Sclerophyll Forest
 DOV *Eucalyptus ovata* Forest & Woodland
 WOB *Eucalyptus obliqua* Wet Forest over Broad-leaved Shrubs
 SMR *Melaleuca squarrosa* Wet scrub
 SHW Wet Heathland
 MBE Eastern Buttongrass Moorland
 MBS Buttongrass Moorland with Emergent Shrubs
 FPL Plantation
 FAG Agricultural Land

THREATENED VEGETATION COMMUNITIES:

One native vegetation community mapped within the study area is listed as threatened under the Tasmania *Nature Conservation Act 2002*.

- *Eucalyptus ovata* Forest & Woodland is listed as an endangered native vegetation community under the Act as it has been subject to extensive clearing and fragmentation for agriculture across the state but particularly so in the northern Midlands. Its current stronghold is around the West Tamar region.

There are 6 very small and localized patches mapped within the area of the Forest Reserve, however they are located on the valley floors and are outside of the locations being targeted by this exploration program and will not be affected.

VEGETATION COMMUNITIES OF CONSERVATION SIGNIFICANCE

- *Eucalyptus amygdalina* Coastal Forest and Woodland (DAC). Although the community is relatively widespread it is under-reserved in some bio-regions, particularly in its old-growth condition.
- *Eucalyptus obliqua* Dry Forest and Woodland (DOB) is also under-reserved in some bio-regions despite being relatively widespread. Old-growth forests in particular are of high conservation value.
- *Eucalyptus obliqua* Wet Forest (undifferentiated) (WOU). Old-growth forests of this community are also of high conservation value. It is targeted for forest harvesting.
- Most heathlands have a relatively high level of species diversity and are therefore of high conservation value.
- Vegetation communities associated with wetlands, creeks and streams such as *Melaleuca squarrosa* Scrub are also of high value.

THREATENED FLORA:

Two species of threatened flora listed under the Tasmanian *Threatened Species Protection Act 1995* and/or the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* is recorded on the “Natural Values Atlas” database as occurring within 3,000 metres of the study area reference points.

- *Hierochloe rariflora* the Cane Holy Grass. With one record from 2001 in the vicinity of Target Area 3 within the Forest Reserve. The species is listed as being rare under the Tasmanian Act.
- *Lepidosperma forsythii* the Stout Rapier Sedge. One 1986 record from near a creek-line to the immediate north of the junction of Glennons Road and Old Waterhouse Road. The species is listed as being rare under the Tasmanian Act. There is a further single record from within 5,000 metres.

No further species of threatened flora are recorded from within 4,000 metres of the reference points.

The following three species of threatened flora have been recorded from between 4,000 and 5,000 metres from the study area reference points.

- *Gynatrix pulchella* the Fragrant Hemp Bush with one record dated 2009. It is a riparian species recorded from along the Great Forester River. It is listed as being rare under the Tasmanian Act.
- *Hypolepis muelleri* the Harsh Groundfern with 19 records from 2008/2009 from along the Great Forester River. It also is listed as being rare under the Tasmanian Act.
- *Xanthorrhoea bracteata* the Shiny Grasstree, with one record dated 2007 from the north-west of the study area.

THREATENED FAUNA:

Five species of threatened fauna listed under the above Acts are recorded on the database as occurring within 3,000 metres of the study area reference points. No species have been recorded from within 500 metres of the study area reference points.

- The Tasmanian Devil *Sarcophilus harrisii* is now listed as being endangered under both State and Commonwealth Acts due to the impact of the disease DFT. There are 4 sight records on the database from within 3,000 metres dated 1988, 1993 and 2005.
- The Spotted-tailed Quoll *Dasyurus maculatus* subsp *maculatus*. A single record dated 1979. The Quoll is listed as being rare in Tasmania and vulnerable nationally.
- Eastern-barred Bandicoot *Parameles gunnii* is relatively widespread in Tasmania but is rare on the mainland and is listed as being vulnerable under the Commonwealth Act. There is a single record on the database dated from 1994.
- The Tasmanian subspecies of Wedge-tailed Eagle *Aquila audax* subsp *fleayi*. The bird is listed as being endangered under both State and Commonwealth Acts and requires large trees within tracts of old-growth forest for nesting. There are 3 known nest trees for the eagle within the study area.
Nest ID No. 1207. GRID REF: 548428E – 5455919N. Located within the State Forest. This nest was last recorded in September 2010 and it was in use at the time.
Nest ID No. 1208. GRID REF: 548015E – 5454316N. Located within the State Forest and was last recorded in 2010.
Nest ID No. 1209. GRID REF: 548867E – 5451137N. Located within the North Scottsdale Forest Reserve and last recorded in 2010.
There are also 5 sight records of the species on the database.
- The Scottsdale Burrowing Crayfish *Engaeus spinicaudatus*. This species is restricted to the Scottsdale area and is listed as being endangered under both State and Commonwealth Acts. There are two records from 1990 on the database.

The following six species of threatened fauna have been recorded on the database as occurring between 3,000 and 5,000 metres from the study area reference points.

- The Tasmanian Devil *Sarcophilus harrisii*. A further two sight records from 1988 and 1993.
- The Wedge-tailed Eagle *Aquila audax* subsp *fleayi*. A further two nest trees are recorded in locations to the west of the survey area and west of Barnbugle Road.
Nest ID No. 1210. GRID REF: 541387E – 5452080N. Last recorded in 2003.
Nest ID No. 1868. GRID REF: 542833E – 5448541N. Last recorded in 2010.
- The White Goshawk *Accipiter novaehollandiae*. Nest tree record from 2009.

Nest ID No. 1833. GRID REF: 549109E – 5451995N. Recorded adjacent to the Great Forester River to the east of the study area. The bird is listed as being endangered in Tasmania and requires mature wet forest as habitat and old-growth trees for nesting.

- The Australian Grayling *Prototroctes mareana* is a fish which moves between fresh and salt water habitats and is listed as being vulnerable under both State and Commonwealth Acts. There are two records from 2007/08 from the Great Forester River.
- The Giant Freshwater Lobster *Astacopsis gouldi*. Is an aquatic species of rivers and streams and is listed as being vulnerable under both State and Commonwealth Acts. There are five records, from 1991 (x2), 2000, 2008 and 2009.
- The Scottsdale Burrowing Crayfish *Engaeus spinicaudatus*. There are a further 20 records on the database from creek, streams and valley floors in the wider location.

The following seven species of threatened fauna could occur in the locality based on habitat mapping and on the known geographical range of each.

- The New Holland Mouse *Pseudomys novaehollandiae* is listed as being endangered in Tasmania and vulnerable nationally. The species is known to occur in dry heathlands and open forests on sandy soils in the north-east of Tasmania.
- The Tussock Skink *Pseudemoia pagenstecheri* is a grassland species which is considered to be vulnerable in Tasmania. It inhabits some types of native grasslands.
- The Eastern Dwarf Galaxias *Galaxiella pusilla* is considered to be vulnerable in Tasmania and nationally.
- The Spotted Marsh Frog *Limnodynastes peroni* is endangered in Tasmania. This frog can occur in the north-west and north-east of the state and requires large swamps, weedy lagoons and dams with abundant marginal vegetation as habitat.
- The Green and Golden Frog *Litoria raniformis* is considered to be vulnerable in Tasmania and Nationally. It is found mainly in the north of the state and requires deep pools, lagoons, ponds and dams with aquatic vegetation as habitat.
- The Chaostola Skipper (Butterfly) *Antipodia chaostola* is considered to be endangered in Tasmania and Nationally. The species occurs in dry open forest in eastern Tasmania and is dependent on *Gahnia radula* as a food plant.
- The Scottsdale Hydrobiid Snail *Beddomeia minima* is listed as being rare in Tasmania. Many species of hydrobiid snails have very localized distributions and can be limited to a single stream or catchment.

3.0 Field Survey:

The field survey was undertaken over two days on Wednesday 23rd January and Thursday 7th February 2013.

Methodology: The survey followed existing vehicular tracks throughout the survey areas and focused on the target locations on the hill tops where drilling is proposed as detailed on Maps No.3 and No.4.

Survey areas have been numbered from 1 to 8 and these locations are plotted on the above maps. Vascular plant species were recorded, vegetation communities were observed and cross-referenced with the TasVeg map sourced from the Natural Values Atlas database.

Limitations: This survey was conducted in summer when many species are past flowering, particularly the ground layer flora. No botanical survey can guarantee that all flora will be observed and recorded in a single survey in one year due to seasonal and annual variation in abundance and the possible absence of flowers and fertile material for identification. Ephemeral species which may have been present includes species of orchids, lilies, herbs, grasses and other graminoids. However all significant species known to occur in the study areas and their environs have been considered in this report.

3.1 Field Survey Results:

SURVEY AREA 1 and 2: State Forest north of Glennons Road, Study Area Grid Reference Point: 548042E – 5454097N. This area has been subject to forest harvesting, both selective logging and areas of clear-fell which have since been planted to Eucalypt plantation. The survey followed an existing forestry road which extended from Glennons Road and northwards for a distance of about 3.5 kilometres to near the end of the previous forestry operations. There are also numerous access and snig tracks associated with the plantation development and the selectively logged area to enable access for the proposed drilling program.

VEGETATION COMMUNITIES: The first 400 metres and the last 750 metres of the forestry road passed through *Eucalyptus obliqua* Dry Forest (DOB). The forest within the first 400m is in a near natural condition and has not been subject to forest harvesting. This area contained trees with a wide range of ages including some original mature old-growth trees, and some of the oldest trees were observed to possess hollows which would be potential fauna habitat. The forest over the last 750 metres or so of the road had been selectively but extensively logged and is in the very early stages of regeneration. Numerous mature and old-growth trees have been retained however.

The intervening 2.4 km of forestry road passes through vegetation which would have originally been *Eucalyptus obliqua* Wet Forest (WOU), but it has been largely clear-felled and replaced with Eucalypt plantation. The plantation trees are still relatively young and the understorey vegetation which has re-established under these trees is typical of the composition of species which would have been present in the wet forest community pre-logging.

THREATENED VEGETATION COMMUNITIES: No vegetation community listed as threatened under the Tasmanian *Nature Conservation Act 2002* was present in the areas surveyed.

THREATENED FLORA: No species of flora listed under the Tasmanian *Threatened Species Protection Act 1995* or the Commonwealth *Environment Protection & Biodiversity Conservation Act 1999* were observed during the survey.

One species of threatened flora is recorded on the Natural Values Atlas database from this survey area but were not observed during the field survey. The Stout Rapiersedge *Lepidosperma forsythia* is listed as being rare in Tasmania. There is one record of this plant near a creek-line adjacent to Old Waterhouse Road.

THREATENED FAUNA: No species of threatened fauna was observed during the survey and no evidence of the presence of threatened species such as scats of Tasmanian Devils or Spotted-tailed Quolls were observed. The Natural Values Atlas database records the Scottsdale Burrowing Crayfish *Engaeus spinicaudatus* as occurring in the wider location. This species is listed as being endangered under both State and Commonwealth Acts. It is a species of wet poorly drained areas such as the broad soaks and valleys with Buttongrass and Wet Scrub vegetation within this area, however these locations are not the target of the exploration program and so there will be no impact on this species. No Wedge-tailed Eagles were observed despite the fact that there are two known nest trees recorded on the atlas from within the survey area, as detailed below.

The Spotted-tailed Quoll, Tasmanian Devil and the Eastern-barred Bandicoot have all been recorded on the database in the past from within 3,000 metres of the survey area reference point.

THREATENED FAUNA HABITAT: No specific threatened fauna habitat was observed during the field survey however there were old-growth trees present which possessed hollows and these would provide potential fauna habitat including for some threatened species. No mature trees will be directly impacted by the proposed exploration program so there will be no threat to any such potential habitat.

The Natural Values Atlas database records two known nest trees of Wedge-tailed Eagles within the study area.

Nest ID No. 1207 at GRID REF: 548042E – 5454097. This nest is located within a small area of retained wet forest adjacent to the plantation about 1.4km from the Glennons Road junction. It was last recorded in 2010 and was being used by the pair of eagles during that season.

Nest ID. No.1208 at GRID REF: 548015E – 5454316N. This nest tree is located in an area of retained forest in the north-east corner of the target area outlined in orange on the GoogleEarth map, and just outside of the selectively logged area of forest. The site is located about 3km in a direct line from the Glennons Road junction. This nest was last surveyed in 2010.

It is most likely that the same pair of birds utilizes both nest sites in different seasons so that only one nest would be active in any one year. The exploration activities however should keep clear these two locations prior to February when the nesting season should be nearing its end.

ENVIRONMENTAL WEEDS: No weeds were observed during the survey.

SURVEY AREA 3, 4, 5 and 6. are each located within the North Scottsdale Forest Reserve to the south of Glennons Road. Survey Area Grid Reference Point 546279E – 5451719N. The exploration program within this forest reserve is targeting the hill tops where there are known deposits of bauxite. The hills were accessed via existing but quite overgrown 4WD tracks and well used trail bike tracks which extend from Glennons Road and throughout the forest reserve.

VEGETATION COMMUNITIES: The predominant community across this survey area was *Eucalyptus amygdalina* Coastal Forest, a dry forest form of spaced low branched trees of relatively low stature and with a low shrubby understorey dominated by Manuka Teatree *Leptospermum scoparium*. This community occurred across the low and middle slopes of the hills. It was also present across the broader valley floors although in this moister environment *Eucalyptus ovata* was present as a co-dominant tree. These areas are not being targeted by the

exploration program and will not be impacted except for the re-clearing of the existing overgrown 4WD tracks to enable access. The vegetation on the tops of the hills changes quite abruptly with the change in geology from the previous community to a dry forest community dominated by *Eucalyptus obliqua*. *Eucalyptus obliqua* Dry Forest and Woodland (DOB) was only observed on the hilltops in the survey area. There were also some differences in the composition of species in the understorey between the two vegetation types with very little *Leptospermum scoparium* on the hilltops, and more of species such as Bracken and understorey trees such as Prickly Box *Bursaria spinosa*, Native Cherry *Exocarpus cupressiformis*, Black Sheoak *Allocasuarina littoralis*, and small trees of Blackwood *Acacia melanoxylon*. The forest of both vegetation types comprised trees of mixed ages including mature and old-growth trees, some with upper trunk and branch hollows which would be potential fauna habitat. There were however very few young Eucalypt saplings or seedlings which would indicate that it has been number of years since the last fire. The proposed exploration program will have minimal impact on both vegetation communities.

The creek-lines and broad valley floors which extend through the area will not be impacted by the proposed exploration program and they were not specifically surveyed, however they were observed to have a diverse mix of vegetation communities as is indicated on the TasVeg maps included with this report including Buttongrass Moorland, *Melaleuca* Scrub with *Melaleuca squarrosa* or *Melaleuca squamea*, and Heathlands. TasVeg also records *Eucalyptus ovata* Forest & Woodland and that species of Eucalypt was observed to be present along the valley floors.

THREATENED VEGETATION COMMUNITIES: No vegetation community listed under the Tasmanian *Nature Conservation Act 2002* was observed in the areas to be targeted by the exploration program.

THREATENED FLORA: One species of threatened flora which is listed under one of the above Acts was observed during the field survey.

- *Pultenaea mollis* the Soft Bushpea was observed and recorded in survey area No.5 adjacent to Harrys Hill, in the south-west corner of the Forest Reserve. Approximately 14 mature plants were observed within a radius of 15 metres adjacent to and on both sides of the existing 4WD track which is to be utilized to access the area. The plant is listed under the Tasmanian Act as being vulnerable.

GRID REF: 544603E – 5451582N (4m +/-) single plant

GRID REF: 544592E – 5451602N (5m +/-) Five plants within 5 metres and a further three within 10 metres.

GRID REF: 544615E – 5451613N (5m +/-) Five plants within 3 metres.



PHOTO 1. *Pultenaea mollis* at Harrys Hill.



PHOTO 2. *Pultenaea mollis* .. P. Milner File Photo.

Pultenaea mollis is a small shrub with soft hairy leaves which can grow up to about a metre in height.

The plant flowers in spring with yellow pea-shaped flowers so it was not in flower at the time of the survey but is readily identifiable by the brown papery bracts and open seed pods which are held on the plant over summer. The plant grows in heathy woodland vegetation on gravely substrates in the north-east of the state and occurs mainly around Lefroy, Georgetown and Weymouth. The species has not been recorded in this location previously and here forms an outlier from the main area of the plant's occurrence. Although the plant is not growing on the hill top area targeted for drilling its proximity to the access track will make it susceptible to disturbance and impact from vehicles and equipment accessing the area. Damage to the plants should however be avoided by the clear flagging of each plant and with the briefing and instruction of the field crew in recognizing the plant and its location prior to any exploration activities being undertaken.

One other species of threatened flora is recorded on the Natural Values Atlas as occurring in the Forest reserve area but was not observed during this field survey. *Hierochloe rariflora* the Cane Holygrass is listed as being rare under the Tasmanian Act. There is one record of this grass in the north-east of the survey area at GRID REF: 548567E – 5452793N (100m +/-).

THREATENED FAUNA: One species of threatened fauna was observed during the field survey.

- The Wedge-tailed Eagle *Aquila audax* subsp *fleayi*. A single bird was observed in the air at tree-top height in the vicinity of Harrys Hill GRID REF: 544600E – 5451600N (100m +/-).

No other species of threatened fauna was observed during the survey and no evidence of the presence of threatened species such as scats of Tasmanian Devils or Spotted-tailed Quolls were observed. The Natural Values Atlas database records the Scottsdale Burrowing Crayfish *Engaeus spinicaudatus* as occurring in the wider location. This species is listed as being endangered under both State and Commonwealth Acts. It is a species of wet poorly drained areas such as the broad soaks and valleys with Buttongrass and Wet Scrub vegetation in the area which are not the target of the exploration program, and so there will be no impact on this species or its habitat.

THREATENED FAUNA HABITAT: No specific threatened fauna habitat was observed during the field survey however there were old-growth trees present which possessed hollows and these would provide potential fauna habitat including for some threatened species, including basal hollows which may be potential den sites for Tasmanian Devils or Spotted-tailed Quolls. No mature tree however will be directly impacted by the proposed exploration program so there will be no threat to any such potential habitat.

The Natural Values Atlas database records a single known nest tree of the Wedge-tailed Eagle within the study area.

Nest ID No. 1209 at GRID REF: 548867E – 5451137N. The nest tree is located on the south facing slopes of a hill in the east of the survey area about 2.8km from the survey area reference point. The nest was last recorded in 2010. The location is close to one of the mapped target sites (No.4) and exploration activities should not occur near this location prior to February. An existing trail bike track is also close to this location.

The creek-lines and valley floors which extend through the area of the forest reserve would provide potential habitat for the Scottsdale Burrowing Crayfish, and the heathlands which are mapped on valley floors to the north of the survey area may be potential habitat for the New Holland Mouse, however these areas will not be impacted by the exploration program.

No suitable or potential habitat was observed during the survey for the White Goshawk, the Giant Tasmanian Lobster, the Green and Golden Frog, the Striped Marsh Frog, the Australian Grayling or the Dwarf Galaxia. The vegetation in the area is considered to be marginal habitat for the Eastern-barred Bandicoot.

ENVIRONMENTAL WEEDS: No weeds were observed in the area during the field survey.

SURVEY AREA 7 and 8: A further two target sites were located on nearby freehold property to the immediate west of the North Scottsdale Forest Reserve on land which is owned by Mr Rex Lethborg. Both sites have been cleared of native vegetation and are currently in a ploughed state. The exploration program in these two locations will not impact on any remaining natural values.
TARGET GRID REF: 543750E – 5453200N (approx)
TARGET GRID REF: 543805E – 5451491N.

4.0 CONCLUSIONS:

The proposed exploration program will have minimal impact on the vegetation communities in the location and all target locations are located on hill tops with *Eucalyptus obliqua* Dry Forest community. No threatened vegetation community was observed in any of the target areas during the field survey.

There are two main issues to be addressed, firstly the proximity of the three known Wedge-tailed Eagle nest trees and the localized occurrence of the threatened species of flora *Pultenaea mollis*.

The three known nest trees of the Wedge-tailed Eagle in the area are each located within or close to exploration target areas. The two options are to either avoid these locations between the month of August and January and possibly the two shoulder months of July and February or to inspect each of the sites and determine which one if any are currently being used by the pair of eagles which inhabit this territory. A Wedge-tailed Eagle was observed during the field survey.

It is considered that the proposed exploration program will not impact on any other threatened fauna or on any potential habitat for threatened species of fauna which are known or could potentially occur in the wider locality.

No environmental weeds were observed during the survey. No symptomatic evidence of the presence of *Phytophthora* was observed during the survey.

5.0 Recommendations:

VEGETATION COMMUNITIES:

- No mature trees will need to be felled to accommodate any of the drill sites. Site drill holes clear of mature trees and well clear of any old-growth trees which may be present in the target areas.
- Ensure the adequate containment within each drill pad site of all silt, dust, sediment and other contaminants resulting from the drilling program to avoid impacting on adjacent soils and ground stratum vegetation.
- Utilise existing vehicular tracks and snig tracks for access to drill sites within the area of State Forest north of Glennons Road.(Areas 1 and 2)
- Limit the clearing along the existing but overgrown tracks through the North Scottsdale Forest Reserve south of Glennons Road to the minimum necessary for access. (Areas 3, 4, 5 and 6)

THREATENED VEGETATION COMMUNITIES:

- No vegetation communities listed under the *Tasmanian Nature Conservation Act 2002* will be impacted by the proposed drilling program and no specific action is required.

THREATENED FLORA:

- About 14 plants of *Pultenaea mollis*, a species of threatened flora was observed and recorded during the field survey along the existing access track in the vicinity of Survey area No.5. near Harrys Hill and will need to be avoided. All plants should be clearly flagged prior to any exploration activities in the location. The field crew should also be briefed and instructed on the recognition of the plant in the field and the occurrence of the plant in the location prior to any exploration activities being undertaken.

THREATENED FAUNA:

- One species of threatened fauna was observed during the field survey however the Wedge-tailed Eagle was on the wing and no specific action is necessary. No evidence of the presence of the Tasmanian Devils or Spotted-tailed Quolls was observed and no specific action is required.

THREATENED FAUNA HABITAT:

- There are 3 known nest trees of Wedge-tailed Eagles within the survey area and in the vicinity of exploration target locations. The areas of the 3 nest trees should be avoided during the eagle's breeding season between August and January and possible also the two shoulder months of July and February. Should exploration activities be undertaken during those months then an alternative would be to conduct a targeted survey of each of the nest trees in order to determine which nest tree is being utilized by the pair of birds in that breeding season. That one nest tree site will then need to be avoided while the nest is in use.
- No other specific habitat for threatened species of fauna was observed during the survey and no defined action is required in addition to those recommendations to limit impacts detailed under vegetation communities.

ENVIRONMENTAL WEEDS:

- No environmental weeds were present in the areas surveyed. As a precautionary measure and in order to prevent the introduction of weeds into weed free areas all equipment and machinery should be subject to a wash-down procedure to remove any soil or mud which could contain weed seeds before being transported into and out of the exploration area.

PHYTOPHTHORA:

- Accepted protocols in regard to hygiene and wash-down procedures for all machinery and equipment, including the drill rig itself should be followed, to ensure that the pathogen is not inadvertently introduced into disease free locations by way of extraneous soil, mud and gravel adhered to tyres, work-boots and equipment.

Philip Milner

Vegetation Consultant

Appendix 1: Vegetation Communities and Species Recorded

1. *Eucalyptus obliqua* Dry Forest and Woodland

(TasVeg Code DOB)

This community was present in the area of State Forest in survey area No.2 which has been selectively logged and as the upper slope and hill top vegetation within the North Scottsdale Forest Reserve in survey areas 3, 4 5 and 6 where there was a relatively abrupt change in vegetation from the surrounding Black Peppermint Forest. The difference in the plant community correlated to the change in geology from granite derived sands and gravels on the lower to mid slopes to the bauxite on the upper slopes and hill tops. The proposed exploration program will be undertaken within this vegetation community.

This community is relatively widespread in the north, east and south-east of Tasmania from sea-level to about 600 metres.

DOMINANT TREES	COMMON NAME	FREQUENCY
<i>Eucalyptus obliqua</i>	Stringybark	common
SECONDARY TREES		
<i>Eucalyptus amygdalina</i>	Black Peppermint	occasional around margin of community
<i>Eucalyptus viminalis</i>	White Gum	uncommon
UNDERSTOREY TREES AND TALL SHRUBS		
<i>Acacia melanoxylon</i>	Blackwood	occasional
<i>Acacia longifolia</i> subsp <i>sophorae</i>	Coast Wattle	localised
<i>Acacia verticillata</i>	Prickly Moses	occasional
<i>Allocasuarina littoralis</i>	Black Sheoak	occasional
<i>Banksia marginata</i>	Silver Banksia	occasional
<i>Exocarpus cupressiformis</i>	Native Cherry	occasional
MEDIUM SHRUBS		
<i>Bursaria spinosa</i>	Prickly Box	occasional
<i>Goodia lotifolia</i>	Goldentip	localised
<i>Hakea teretifolia</i>	Dagger Needlebush	uncommon
<i>Leptomeria drupaceae</i>	Currantbush	occasional
<i>Leptospermum scoparium</i>	Manuka	occasional
<i>Olearia lirata</i>	Forest Daisybush	uncommon
<i>Pomaderris elliptica</i>	Yellow Dogwood	uncommon
<i>Pomaderris pilifera</i>	Hairy Dogwood	uncommon
<i>Prostanthera lasianthos</i>	Christmas Mintbush	localised
<i>Pultenaea daphnoides</i>	Heartleaf Bushpea	uncommon
<i>Ricinocarpus pinifolius</i>	Wedding Bush	occasional
<i>Ziera arborescens</i>	Stinkwood	uncommon

APPENDIX 1 (cont)

Eucalyptus obliqua Dry Forest & Woodland (cont)

SMALL SHRUBS

<i>Acacia myrtifolia</i>	RedstemWattle	uncommon
<i>Acrotriche serrulata</i>	Ants Delight	occasional
<i>Aotus ericoides</i>	Goldenpea	occasional
<i>Astroloma humifusum</i>	Cranberry Heath	occasional
<i>Amperea xiphoclada</i>	Broom Spurge	uncommon
<i>Davesia ulicifolia</i>	Spiky Bitterpea	uncommon
<i>Epacris impressa</i>	Common Heath	occasional
<i>Hibbertia procumbens</i>	Spreading Guineaflower	uncommon
<i>Hibbertia riparia</i>	Erect Guineaflower	uncommon
<i>Lomatia tinctoria</i>	Guitarplant	occasional
<i>Persoonia juniperina</i>	Prickly Geebung	uncommon
<i>Pimelea humilis</i>	Dwarf Riceflower	uncommon
<i>Platylobium formosum</i>	Handsome Flatpea	occasional
<i>Pultenaea gunnii</i>	Golden Bushpea	occasional
<i>Styphelia adscendens</i>	Golden Heath	uncommon

HERBS & HERB-LIKE PLANTS

<i>Acaena novaezelandiae</i>	Buzzy	occasional
<i>Goodenia lanata</i>	Trailing Native-primrose	uncommon
<i>Lobelia gibbosa</i>		
<i>Viola hederaceae</i>	Ivy-leafed Violet	occasional
<i>Wahlengergia sp.</i>		

ORCHIDS

<i>Dipodium roseum</i>	Hyacinth Orchid	occasional
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GRASSES & GRAMINOIDS

<i>Dianella tasmanica</i>	Tasman Flax-lily	uncommon
<i>Gahnia grandis</i>	Cutting Grass	occasional
<i>Lepidospermum sp.</i>	A Sword Sedge	occasional
<i>Lepidosperma sp.</i>	A Rapier Sedge	occasional
<i>Lomandra longifolia</i>	Mat-rush	common

FERNS & ALLIED PLANTS

<i>Calochlaena dubia</i>	Rainbow Fern	occasional
<i>Pteridium esculentum</i>	Bracken	common

2. *Eucalyptus obliqua* Wet Forest

(TasVeg Code WOU)

This community was observed in survey area No.1 however it has been largely cleared and replaced with plantation Eucalypts although the understorey which has regrown would be representative of the species composition which would have been present originally.

Eucalyptus obliqua Wet Forest in its numerous forms is found throughout the State in areas of relatively high rainfall although it is widely targeted for forest harvesting. Old-growth forms of the community is of high conservation value.

DOMINANT TREES	COMMON NAME	FREQUENCY
<i>Eucalyptus obliqua</i>	Stringybark	occasional
SECONDARY TREES		
<i>Acacia melanoxylon</i>	Blackwood	uncommon
PLANTATION TREES		
<i>Eucalyptus nitens</i>	Shining Gum	introduced
UNDERSTOREY TREES & LARGE SHRUBS		
<i>Acacia verticillata</i>	Prickly Moses	common
<i>Banksia marginata</i>	Silver Banksia	occasional
<i>Bursaria spinosa</i>	Prickly Box	occasional
<i>Olearia argophylla</i>	Musk	occasional
<i>Pomaderris apetala</i>	Dogwood	occasional
MEDIUM SHRUBS		
<i>Olearia lirata</i>	Forest Daisybush	common
<i>Pultenaea daphnoides</i>	Heart-leaf Pea	occasional
<i>Ziera arborescens</i>	Stinkwood	common
SMALL SHRUBS		
<i>Epacris impressa</i>	Common Heath	occasional
<i>Lomatia tinctoria</i>	Guitarplant	occasional
HERBS & HERB-LIKE PLANTS		
<i>Viola hederaceae</i>	Ivy-leafed Violet	occasional
GRASSES & GRAMINOIDS		
<i>Gahnia grandis</i>	Cutting Grass	occasional
<i>Lepidosperma sp.</i>	A Sword Sedge	occasional
<i>Lomandra longifolia</i>	Matrush	occasional
FERNS & ALLIED PLANTS		
<i>Calochlaena dubia</i>	Rainbow Fern	common

Pteridium esculentum Bracken common

**3. *Eucalyptus amygdalina* Coastal Forest and Woodland
(TasVeg Code DAC)**

Black Peppermint Coastal Forest and Woodland was the most prevalent vegetation community in the area as a whole although it was more widespread within the North Scottsdale Forest Reserve to the south of Glennons Road. It occurred across the mid to lower slopes of the hills in the area and was replaced on the upper slopes and hill tops by the Dry Stringybark community. On the lowest slopes and on valley floors where there was additional soil moisture *Eucalyptus ovata* occurred as a co-dominant tree with the Peppermint or replaced it altogether. Scrub and/or Buttongrass vegetation replaced the forested communities along the creek-lines and the poorly drained valley floors.

DOMINANT TREES	COMMON NAME	FREQUENCY
<i>Eucalyptus amygdalina</i>	Black Peppermint	common
SECONDARY TREES		
<i>Eucalyptus obliqua</i>	Stringybark	occasional on upper slopes
<i>Eucalyptus ovata</i>	Swamp Gum	occasional on lower slopes
UNDERSTOREY TREES & LARGE SHRUBS		
<i>Banksia marginata</i>	Silver Banksia	occasional
<i>Exocarpus cupressiformis</i>	Native Cherry	occasional
MEDIUM SHRUBS		
<i>Acacia terminalis</i>	Sunshine Wattle	uncommon
<i>Allocasuarina monilifera</i>	Necklace Sheoak	common
<i>Hakea teretifolia</i>	Dagger Needlebush	uncommon
<i>Leptomeria drupacea</i>	Currant Bush	occasional
<i>Leptospermum scoparium</i>	Manuka	very common
<i>Melaleuca squarrosa</i>	Scented Paperbark	localised
<i>Pomaderris elliptica</i>	Yellow Dogwood	occasional
<i>Pultenaea daphnoides</i>	Heart-leaf Pea	occasional
SMALL SHRUBS		
<i>Acacia gunnii</i>	Ploughshare Wattle	localised
<i>Acacia myrtifolia</i>	Redstem Wattle	uncommon
<i>Acacia suaveolens</i>	Sweet Scented wattle	common
<i>Acrotriche serrulata</i>	Ants Delight	occasional
<i>Aotus ericoides</i>	Goldenpea	occasional
<i>Astroloma humifusum</i>	Cranberry Heath	occasional
<i>Calytrix tetragona</i>	Fringe-myrtle	localised
<i>Epacris impressa</i>	Common Heath	occasional
<i>Goodenia lanata</i>	Trailing Native-primrose	uncommon

<i>Hibbertia acicularis</i>	Prickly Guineaflower	occasional
APPENDIX 1 (cont)		
<i>Eucalyptus amygdalina</i> Coastal Forest & Woodland (cont)		
SMALL SHRUBS (cont)		
<i>Leucopogon collinus</i>	White Beardheath	uncommon
<i>Leucopogon ericoides</i>	Pink Beardheath	occasional
<i>Leucopogon virgatus</i>	Twiggy Beardheath	uncommon
<i>Lomatia tinctoria</i>	Guitarplant	uncommon
<i>Persoonia juniperina</i>	Prickly Geebung	uncommon
<i>Platylobium formosum</i>	Handsome Flatpea	common
<i>Pultenaea mollis</i>	Soft Bushpea	localised
<i>Ricinocarpus pinifolius</i>	Wedding Bush	common
<i>Styphelia adscendens</i>	Golden Heath	occasional
ORCHIDS		
<i>Dipodium roseum</i>	Hyacinth Orchid	occasional
GRASSES & GRAMINOIDS		
<i>Gahnia grandis</i>	Cutting Grass	occasional
<i>Hypolaena fastigiata</i>	Tassel Roperush	occasional
<i>Lepidosperma sp</i>	A Swordsedge	occasional
<i>Leptocarpus tenax</i>	Slender Twinerush	localised
<i>Lomandra longifolia</i>	Matrush	occasional
<i>Patersonia fragilis</i>	Short-stem Purple-flag	uncommon
FERNS & ALLIED PLANTS		
<i>Gleichenia microphylla</i>	Scrambling Coral Fern	localised
<i>Pteridium esculentum</i>	Bracken	common
<i>Selaginella uliginosa</i>	Swamp Spike-moss	occasional

NOTE: Plants in bold type are listed as threatened species.

REFERENCES

1. DPIWE Website www.naturalvaluesatlas.dpiw.tas.gov.au
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3. Harris s, & Kitchener A, (2005), *From Forest to Fjaeldmark*, DPIW Tasmania
4. Wapstra H, A & M, Gilfedder L, *The Little Book of Common Names for Tasmanian Plants*



PHOTO 3: Established Eucalypt Plantation replacing the original *Eucalyptus obliqua* Wet Forest (WOU) in Survey Area No.1.



PHOTO 4: *Eucalyptus obliqua* Dry Forest (DOB) following selective logging. Survey Area No.2.



PHOTO 5: *Eucalyptus amygdalina* Coastal Forest & Woodland within the North Scottsdale Forest reserve.



PHOTO 6. *Eucalyptus amygdalina* Coastal Forest and Woodland fairly typical of the vegetation on the mid and lower slopes within the North Scottsdale Forest Reserve.



PHOTO 7: *Eucalyptus obliqua* Dry Forest Survey Area 4. within the North Scottsdale Forest Reserve.



PHOTO 8: *Eucalyptus obliqua* Dry Forest near Survey Area No.5.



PHOTO 9. *Eucalyptus obliqua* Dry Forest within the North Scottsdale Forest Reserve. Fairly typical of the vegetation on the upper slopes and hill tops in the reserve.



PHOTO 10. Trail bike track to be utilized as access to Survey Area No.6.



PHOTO 11. *Eucalyptus obliqua* Dry Forest on Survey Area No.6.



PHOTO 12. Harrys Hill in background (Survey Area 5). Photo taken from near Survey Area 6.



PHOTO 13. North Scottsdale Forest Reserve. Photo taken from Survey Area 7.



PHOTO 14. Scrub community typical of the valley floor vegetation within the Forest Reserve.