ENVIRONMENTAL ASSESSMENT

Sand Quarries, Gnangara

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ROCLA QUARRY PRODUCTS

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SUMMARY

Rocla is seeking approval to establish a yellow sand quarry within tenements E70/3279, E70/3275, E70/3276, M70/1306. These tenements are located in the Gnangara Pine Plantation within the City of Wanneroo and, to a lesser degree, the Shire of Gingin. The majority of the tenements also fall within the Gnangara-Moore River State Forest, which is Department of Environment and Conservation (DEC) managed land.

Currently there is a shortage of basic raw materials, particularly fill, required for development in the south-west of Western Australia. The key strategic sites outlined in this report will provide an important resource in the region for the next 50–60 years. Silica sand is utilised for use in domestic trade and international export.

It is proposed that the five tenements across the Gnangara Pine Plantation (refer Figure 1) will be first cleared by the Forest Products Commission (FPC) before Rocla commences operations. As a result of this, Rocla's environmental impacts will not include those associated with clearing.

Within the five tenement areas there are several Bush Forever sites, conservation category wetlands (CCWs) and resource enhancement wetlands (REWs). Excavation areas have not been finalised at the time of this report; however, proposed excavation areas have been marked (Figures 3a-d) allowing adequate buffers to be maintained from these areas at all times during construction and quarry operations.

The tenements will be mined in several stages. Exact staging will be discussed and confirmed with DEC and FPC and will be addressed closer to excavation dates. Extraction of construction sand will be market driven and historically approximately 10 million tonne of material is required annually by the northern Perth market. Different tenements will provide different types of sand to market, including: concrete, plastering, brick laying, fill sand and specialised sands for foundries, glass, grouts and other specialised uses. The sand will be screened on site and then transported off site to customers. Quarrying is proposed to commence at select tenements as soon as approval is issued and as required by market conditions.

Table A and Table B outline the key characteristics and management commitments of the project.

Table A: Project Key Characteristics

Project Component	Gnangara (M70/1306)	Neerabup (E70/3276)	Pinjar (E70/3275)	Two Rocks (E70/3279)
Excavation				
Quarry life	10+ years	50+ years	50+ years	50+ years
Total estimated material excavated	5 million + metres^3	25 million + metres^3	25 million + metres^3	25 million + metres^3
Total area of quarry footprint	214 ha (proposed excavation area)	2566 ha (proposed excavation area)	3595 ha (proposed excavation area)	5885 ha (proposed excavation area)
Estimated excavation rate	1000–2000 tonnes per day			
Maximum pit depth	Initially, 5 m above the estimated future water table			

Project Component	Gnangara (M70/1306)	Neerabup (E70/3276)	Pinjar (E70/3275)	Two Rocks (E70/3279)
Screening plant	A screening plant will be used at each site to screen oversized rock and organic material.			
Quarry Site Infrastructure				
Machinery				
Water Cart	18 kL capacity, used for dust suppression of haul road, pit floor and stockpiles.			
Front end loaders	Three Volvo 150E or similar			
Semi-trailers	Variable. From 10 m^3 to 40 m^3 capacity. Will be provided by customers. Vehicles used will be classified by Main Roads Western Australia			
Grader	One Cat 140G or similar. For maintaining roads, as required			
Service truck	Truck with 5000 L fuel capacity and tanks for separate lubricants, including a waste oil tank and evacuation pump.			
Light vehicles	Two for site operators.			
Diesel generators	One suitably-sized diesel generator			
Mobile screening plant	A washing and screening plant will be used to sort sand material after excavation			
Transport				
Truck movements and hours	Approximately 50 to 100 return truck movements per day of operation (depending on truck sizes). Only include noise from within the site. Off-site noise is not included.			
Workforce				
Operation	3–5 personnel during operation			
Hours of Operation	0600 to 1900 daily			

Table B: Summary of Commitments for All Tenement Areas

Environmental Factor	Summary	Management Commitment
Flora and Vegetation	The proposed excavation areas in each tenement are comprised solely of pine plantation and no native vegetation will be cleared as part of the proposal.	▪ The potential spread of weeds and dieback, if present, during operations will be prevented. ▪ Dust will be managed during the quarrying operations to protect surrounding native vegetation. ▪ The extent of vegetation clearing will not extend past that of the FPC and stumps will be cleared in stages. ▪ Adequate buffers will be maintained between excavation areas and adjacent native vegetation and Bush Forever sites. ▪ Vehicles will be restricted to designated roads. ▪ At the completion of operations, FPC will replant pine.
Dieback	The sites are considered un-interpretable, due to the absence of any indicator species. Hygiene guidelines will be implemented on site entry and exit. This policy will apply to all mobile excavation equipment as they have a high risk of carrying soil.	▪ All vehicles will be free of soil and plant material before entering the site. If any dirt or plant material has been picked up, the vehicle must be brushed down. ▪ Training programs and inductions will be conducted for site personnel. ▪ Area will be quarantined ahead of excavation. ▪ All surface water will be contained on site. Run-off from the quarry pit, stockpiles, cleaning down and haul roads will be contained, and not released into areas of native vegetation. ▪ Light vehicles and machinery will be restricted to access roads, tracks and the excavation area. ▪ No soil or vegetation will be brought on site. ▪ The site will be fenced to prevent uncontrolled access.

Environmental Factor	Summary	Management Commitment
Fauna	A variety of threatened fauna species may occur within and adjacent to the proposed sites. The quarry footprints are pine plantation so it is unlikely that suitable habitat for significant species will be directly disturbed by the project.	▪ No native vegetation will be cleared. ▪ Management measures will be implemented to reduce indirect disturbance of surrounding fauna habitat. ▪ Staged removal of pine stumps to allow for acclimatisation for any remaining fauna in the area. ▪ The control and monitoring of dust, noise and smoke. ▪ Induction of machinery operators involved in the operations and stump removal process. Operators will be advised to be alert for fauna, and to take steps to avoid impacts, where practical. ▪ Speed limits will apply on site to limit fauna fatalities. ▪ Non-native fauna will be prohibited from site.
Groundwater Resources	Groundwater abstraction is likely to occur from groundwater bores to be installed on each site, however pit dewatering will not be required as the maximum pit depth will remain above the water table.	▪ Quarry operations will not excavate to within 5 m (initially) of the estimated future maximum groundwater level (finished floor level). ▪ Monitoring bores will be installed across the site to assess water level, water quality. ▪ Bore data will be used to assess the finished floor level. ▪ Waste management to ensure all wastes are disposed of appropriately, minimising the risk of groundwater contamination. ▪ Surface water management will minimise the risk of contamination to groundwater via infiltration.
Acid Sulfate Soils	The proposed excavation areas do not include any areas of high ASS risk.	▪ An adequate buffer will be maintained to high to moderate ASS risk area at all times during operations. ▪ Excavation will not intersect the water table at any time during operations, minimising the risk of exposing potential ASS.
Noise	There are no residential dwellings within close proximity of the proposed excavation areas. Rocla do not expect significant noise issues to arise for the duration of operations.	To protect the amenity of the receiving environments from noise impacts, the following key management measures will be implemented during the construction and operation phase: ▪ Limiting construction work; operating 6.00 am to 7.00 pm, daily. ▪ Design the mine excavation areas to provide enhanced landform and constructed noise screening (i.e. bunds), when within 500 m of a residence. ▪ Maintain noise suppression devices in good condition on all operational machinery. ▪ Shut down equipment when not in use. ▪ Operate machinery only within the designated hours of operation. ▪ Schedule activities to minimise the likelihood of noise nuisance. ▪ Use the dedicated transport route. Record any complaints received regarding noise disturbance and instigate follow-up action instigated immediately to minimise the cause, to the greatest possible extent.

Environmental Factor	Summary	Management Commitment
Air Quality	There are no residential dwellings within close proximity to the proposed excavation areas. Local residents may be affected by the transportation of material along transport routes. Dust monitoring will only be required in the event of a legitimate complaint.	To prevent or minimise dust generation during quarry operations, the following dust management measures will be implemented during the construction and operation phase: ▪ The excavation will occur in stages. A key objective is to minimise the disturbance or open area at any one time, as far as practicable. ▪ Maintain haul road surface in a good condition and with suitable grades. ▪ Restrict vehicle movements to defined roads. ▪ All vehicles leaving the site are required to have covered loads. ▪ Use water as appropriate to wet down roads and trafficked areas (a water licence will be obtained). ▪ Use dust suppressants where appropriate (either mixed with water to enhance dust suppression and vegetation cover, or applied periodically to specific areas). ▪ Limit the speed of vehicles on the site. ▪ Apply surface treatments (e.g. mulch, ground cover) to stabilise any bare areas which might be prone to wind erosion. ▪ Define buffer areas within the site to avoid any unnecessary disturbance of stabilised surfaces or vehicle traffic. ▪ Limit the quantity of machinery / vehicles in operation. ▪ Inducting all contractors working within the sites. Record any complaints received and instigate follow-up action instigated immediately to minimise the cause, to the greatest possible extent.
Hydrocarbons and Waste	Hydrocarbons will be stored on site in a compliant bunded fuel tank and transported around the site in a mobile fuel tank. The following wastes may be produced by the proposed project: ▪ hydrocarbon and chemical contaminated waste ▪ general waste (e.g. kitchen waste, paper, cardboard) ▪ sewage and domestic wastewater.	▪ Procedures will be implemented for the correct handling, storage, spill management and clean up. ▪ Contaminated material will be removed and bio-remediated (if biodegradable) or disposed of at a licensed facility. ▪ Spill response equipment will be located in the vicinity of work areas, with site personnel trained in spill response management. ▪ The proposed fuel storage tanks to service the machinery will be required to comply fully with the *Australian Standard 1940:2004 The Storage and Handling of Flammable and Combustible Liquids*. This standard specifies requirements for security, bunding, signage, fire protection and handling.
Visual Amenity	It is not expected that the project will have a significant effect on the visual amenity of the nearest neighbours.	▪ The pit design will be such that natural topography and sand bunds will be utilised to shield the view of the mine from surrounding land uses. ▪ Ensure barrier fences and gates are compatible with the semi-rural style of the surround land areas and natural landscape. ▪ Ensure orderly storage and removal of disused equipment or waste.
Aboriginal Heritage	There are no registered Aboriginal heritage sites within the proposed excavation areas.	▪ Any significant sites identified during construction will not be removed, damaged or altered without approval under Section 18 of the *Aboriginal Heritage Act 1972*. ▪ Training will be provided to all construction workers detailing the importance of avoiding heritage sites and reporting of any suspected heritage sites. Exclusion zones will also be identified and clearly communicated to project personnel in the event of a heritage site being uncovered.

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1.0 INTRODUCTION

1.1 Background

Rocla Quarry Products Pty Ltd (Rocla) extracts, processes and distributes sands for pre-mixed concrete and concrete products for industrial uses, landscaping and other building and construction applications. In Western Australia, Rocla manage and operate a number of mine sites in the metropolitan area and surrounds, including the sand extraction sites proposed across the northern region of Perth (Figure 1).

The project area is partially located within the Banksia woodland belt of the Swan Coastal Plain (SCP). The native vegetation was cleared approximately 85 years ago to establish the Gnangara Pine Plantation. There are 22,000 ha of pine plantations within the Gnangara system, 5,000 ha of which has been harvested to date, as part of the Gnangara Sustainability Strategy (GSS), which is a joint project between the Department of Water (DoW), Department of Agriculture and Food WA, DEC, Department for Planning and Infrastructure, Forest Products Commission, Water Corporation and the CSIRO (GSS 2009). The GSS is a state government initiative which aims to provide a framework for a whole of government approach to address land use and water planning issues associated with the Gnangara groundwater system. Three pine plantations have been targeted for harvesting by 2028, with no new plantations to be established. Some of this area has been identified to be restored to native woodlands. The tenements described in this assessment have not been previously mined or excavated.

Rocla is seeking approval to establish a yellow sand quarry within tenements E70/3279, E70/3275, E70/3276, and M70/1306. These tenements are located in the Gnangara Pine Plantation within the City of Waneroo and Shire of Gingin. The majority of the tenements also fall within the Gnangara-Moore River State Forest (Figure 2), which is Department of Environment and Conservation (DEC) managed land.

It is proposed that the four tenements across the Gnangara Pine Plantation (refer Figure 1) will be first cleared by the Forest Products Commission (FPC) before Rocla commences operations. As a result of this, Rocla's environmental impacts will not include those associated with clearing. However, because the Gnangara-Moore River State Forrest is an Environmentally Sensitive Area, a clearing permit may be required.

1.2 Project Description

The objective of this project is to extract a variety of sands from within the "proposed excavation area" boundaries within the four tenements (Figures 3a–d). Some excavation of limestone may occur if encountered within the extraction area. If this occurs the limestone will be extracted and track crushed (or similar) to make the product suitable for market.

A working footprint of approximately 30 ha is proposed at any one time, with a further area of approximately 5 ha utilised for site infrastructure, including, but not limited to:

- sand screening and washing plant
- fuel tanks
- weighbridge
- wash down facility
- site office.

The tenements will be mined in several stages; staging will be discussed and confirmed with DEC and FPC and will be addressed closer to excavation dates. Extraction of construction sand will be market driven and historically approximately 10 million tonne of material is required annually by the northern Perth market. Different tenements will provide different types of sand to market, including: concrete, plastering, brick laying, fill sand and specialised sands for foundries, glass, grouts and other specialised uses.

The sand will be screened on site and then transported off site to customers. Quarrying is proposed to commence at select tenements as soon as approval is issued and as required by market conditions.

Rocla has completed a drilling program within three of the four tenements and identified proposed excavation areas. The drilling programs were extensive and incorporated over 500 drill holes. Detailed resource modelling has identified a resource of significant state importance and has quantified in excess of 80 million m^3 of high grade construction sands suitable to supply to the Perth market for the next 50+ years. Limestone is also available and may be extracted.

1.3 Market Demand for Product

Currently, there is a shortage of basic raw materials, particularly fill required for development in the south-west. The key strategic sites outlined in this report will provide a key resource for the next 50–60 years. Historically, approximately 10 million tonne of material is required annually by the northern Perth market.

1.4 Location

Figure 1 shows the location of all tenements in relation to each other.

1.4.1 Two Rocks (E70/3279)

The Smokebush Hill Road site in Two Rocks is located approximately 20 km north of Quinns Rock and covers an area of 7416 ha. The site is located partially within both the City of Wanneroo and the Shire of Gingin.

1.4.2 Pinjar (E70/3275)

The Tamega Road site in Pinjar is located approximately 15 km north-east of Quinns Rock and covers an area of 4868 ha. The site is located wholly within the City of Wanneroo.

1.4.3 Neerabup (E70/3276)

The McKinley Road site in Neerabup is located approximately 10 km north-east of Quinns Rock and covers an area of 4699 ha. The site is located wholly within the City of Wanneroo.

1.4.4 Gnangara (M70/1306)

The Boundary and Mulga Roads site in Gnangara is located approximately 15 km south-west of Quinns Rock and covers an area of 322 ha. The site is located wholly within the City of Wanneroo, bordering the City of Swan.

1.5 Relevant State Legislation

The EPA undertakes the environmental impact assessment (EIA) of some proposals and schemes referred to it under Part IV of the *Environmental Protection Act 1986*. EIA is a systematic and orderly evaluation of a proposal and its impact on the environment. The assessment includes considering ways in which the proposal, if implemented, could avoid or reduce any impact on the environment.

Rocla intend to seek approval under Section 38(a) of the *Environmental Protection Act 1986* (WA).

1.6 Purpose of this Report

This report has been prepared as an environmental summary to accompany a Section 38a referral to the Environmental Protection Authority (EPA).

1.7 Environmental Policy

Rocla is committed to the protection of the environment and continuous improvement of production and environmental practices. In protecting the environment, Rocla will:

- meet all statutory requirements
- minimise waste

- take demonstrable action to ensure maintenance of effective minimum levels of environmental control
- give consideration to the use of recycled material
- assess the environmental impact of the operations, handling, storage and disposal of sand products
- undertake regular monitoring and risk assessment, wherever there is potential for adverse impact on the environment, employees or the community
- provide employee training programs in implementing the Environmental Policy.

(Rocla 2002)

2.0 EXISTING ENVIRONMENT

2.1 Regional Setting

The following discusses the overall region, including all tenement areas.

The Interim Biogeographic Regionalisation for Australia (IBRA) classification system divides Australia into 85 bioregions and 403 subregions. The bioregions and subregions are the reporting unit for assessing the status of native ecosystems, their protection in the national reserve system and for use in the monitoring and evaluation framework in the Australian Government's current Natural Resource Management initiatives (DSEWPC 2012a).

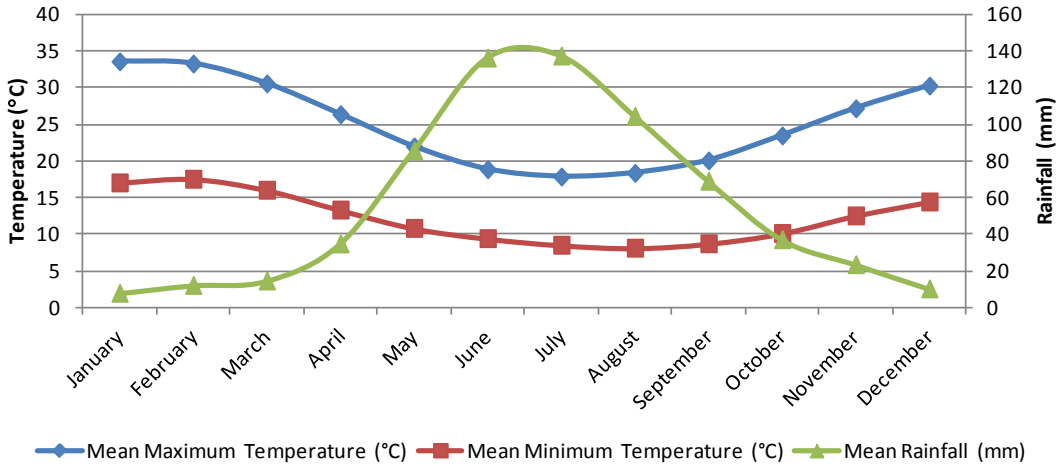
The proposed sand quarries are located within the Swan Coastal Plain 2 (SWA2) subregion, which lies within the Swan Coastal Plain Bioregion.

The Swan Coastal Plain (SCP) is a low-lying coastal plain, mainly covered with woodlands. It is dominated by Banksia or tuart on sandy soils, *Casuarina obesa* on outwash plains, and paperbark in swampy areas. In the east, the plain rises to discrusted Mesozoic sediments dominated by jarrah woodland. The climate is warm Mediterranean. Three phases of marine sand dune development provide relief. The outwash plains, once dominated by *C. obesa*-marri woodlands and *Melaleuca* shrublands, are extensive only in the south. (Mitchell et al. 2002)

The Perth subregion is composed of colluvial and Aeolian sands, alluvial river flats and coastal limestone. Heath and/or tuart woodlands are present on the limestone, Banksia and jarrah – Banksia woodlands on Quaternary marine dunes of various ages, and marri on colluvial and alluvials. The region includes a complex series of seasonal wetlands and also includes Rottnest, Carnac and Garden Islands. Rainfall ranges between 600 and 1000 mm annually. The subregional area is 1,333,901 ha. (Mitchell et al. 2002)

2.2 Climate

The proposed quarries are located just north of the Perth metropolitan area. The climate is classified as Mediterranean. The closest open climate station is located at the Pearce Royal Australian Air Force (RAAF) base. This area experiences hot, dry summers and cool, wet winters. Graph A below displays the average annual climate data for RAAF Pearce Station No. 09053 (BOM 2012).



(BOM 2012)

Graph A: Climatic Means from RAAF Pearce Station from 1940 to 2012Physical Environment

2.2.1 Geology and Soils

The following is an overall explanation of the geology and soils of the entire region, including all tenements, and then will focus on each individual tenement.

The SCP consists of Pliocene to Quaternary sediments (collectively termed "superficial formations" which comprise Aeolian, alluvial, swamp, estuarine and shoreline sediments) that were deposited on a gently seaward-sloping unconformity surface on top of Mesozoic sedimentary rocks (Bettany et al. 1960). The latter rocks include the Leederville Formation (Cretaceous) and the Yarragadee Formation (Jurassic). The major dune systems, oriented in a north–south direction, transect the SCP. The Bassendean dunes are the oldest (Pleistocene), lowest and most leached of the series. To the west of the Bassendean dune system are the calcareous Quindalup dunes, the youngest unit (Bettany et al. 1960). The superficial formations (i.e. sands, sandstone and limestone) support Perth's two major aquifers: the Gnangara mound north of the Swan River, and the Jandakot mound south of the river.

2.2.1.1 Two Rocks (E70/3279)

Regional geology mapping (Figure 4a) indicates that the site is predominantly Tamala limestone through the central and west portion of the site and Bassendean sand in the east. The far south-western portion of the site consists of S7 sand (pale and olive yellow, medium to coarse-grained, sub-angular quartz with a trace of feldspar, moderately sorted, of residual origin) with very minor stands of LS1 limestone (light yellowish brown, fine to coarse-grained, sub-angular to well-rounded quartz, trace of feldspar, shell debris, variably lithified, surface kankar, of eolian origin) and LS2 limestone (light yellowish brown, fine to coarse-grained, sub-angular to well-rounded quartz, trace of feldspar, shell debris, variably lithified, surface kankar, or eolian origin, abundant karstic). There are also two swamp deposits in the west and a small portion of Alluvium in the north-east.

2.2.1.2 Pinjar (E70/3275)

Regional geology mapping (Figure 4b) indicates that the site is predominantly S8 sand (very light grey at surface, yellow at depth, fine to medium-grained, sub-rounded quartz, moderately well sorted of eolian origin). The northern portion of the site is Bassendean sand and the south-western portion is S7 sand (pale and olive yellow, medium to coarse-grained, sub-angular quartz with a trace of feldspar, moderately sorted, of residual origin) with a small stand of LS1 limestone (light yellowish brown, fine to coarse-grained, sub-angular to well-rounded quartz, trace of feldspar, shell debris, variably lithified, surface kankar, of eolian origin). There is also a swamp deposit in the north-east corner.

2.2.1.3 Neerabup (E70/3276)

Regional geology mapping (Figure 4c) indicates that the site is predominantly S7 sand (pale and olive yellow, medium to coarse-grained, sub-angular quartz with a trace of feldspar, moderately sorted, of residual origin) and S8 sand (very light grey at surface, yellow at depth, fine to medium-grained, sub-rounded quartz, moderately well sorted of eolian origin), with small portions of LS1 limestone (light yellowish brown, fine to coarse-grained, sub-angular to well-rounded quartz, trace of feldspar, shell debris, variably lithified, surface kankar, of eolian origin) distributed throughout. The north-east portion of the site is underlain with S9 sand (yellowish brown, medium to coarse-grained, angular to sub-rounded quartz, some fine-grained pisolitic laterite, little fines, of lacustrine origin). A small portion on the eastern side of the site is S10 sand over pebbly silt (sand as per S8 overlying Mgs 1 gravelly silt).

2.2.1.4 Gnangara (M70/1306)

Regional geology mapping (Figure 4d) indicates that this site is predominantly S8 sand (very light grey at surface, yellow at depth, fine to medium-grained, sub-rounded quartz, moderately well sorted of eolian origin) and S10 sand (as S8 sand) with some small portions of peaty clay (dark grey and black with variable sand content of lacustrine origin) in the north-west and east of the tenement.

2.2.2 Acid Sulfate Soils

Acid Sulfate Soils (ASS) are naturally occurring soils and sediments containing iron sulfides, most commonly pyrite. When ASS are exposed to air the iron sulfides in the soil react with oxygen and water to produce a variety of iron compounds and sulfuric acid. The resulting acid can release other substances, including heavy metals, from the soil and into the surrounding environment. These materials are characterised by bright yellow or straw coloured mottles of the mineral jarosite and often contain dark reddish coloured streaks. Actual ASS have a soil pH of 4 or less. (DoE 2003)

2.2.2.1 Two Rocks (E70/3279)

The majority of the site has no ASS risk, however there is a small portion of "high to moderate risk of Acid Sulfate Soil (ASS) within 3 m of the natural soil surface (or deeper)" in the west and the eastern portion of the site is "moderate to low risk of Acid Sulfate Soil (ASS) within 3 m of the natural soil surface (or deeper)" (refer Figure 5a).

2.2.2.2 Pinjar (E70/3275)

The majority of the site is considered to be "moderate to low risk of Acid Sulfate Soil (ASS) within 3 m of the natural soil surface (or deeper)", except the south-east portion, which is a no ASS risk area (refer Figure 5b).

2.2.2.3 Neerabup (E70/3276)

The western portion of the site is at no risk of ASS. There is a small portion along the eastern boundary of "high to moderate risk of Acid Sulfate Soil (ASS) within 3 m of the natural soil surface (or deeper)" and the entire north-east of the site is considered to be "moderate to low risk of Acid Sulfate Soil (ASS) within 3 m of the natural soil surface (or deeper)" (refer Figure 5c).

2.2.2.4 Gnangara (M70/1306)

The site consists predominantly of "moderate to low risk of Acid Sulfate Soil (ASS) within 3 m of the natural soil surface (or deeper)", with a small portion of "high to moderate risk of Acid Sulfate Soil (ASS) within 3 m of the natural soil surface (or deeper)" in the north-west (refer Figure 5d).

2.2.3 Contaminated Sites

A search of the DEC Contaminated Sites database (DEC 2012) returned no contaminated sites within any of the tenements.

2.2.4 Topography

2.2.4.1 Two Rocks (E70/3279)

The site varies in height from 15 mAHD to 95 mAHD, with the lowest lying land in the south-west and the highest peak in the south-east (Figure 6a).

2.2.4.2 Pinjar (E70/3275)

The site varies in height from 50 mAHD to 100 mAHD, with the majority of the highest land in the south-east portion of the site. The northern portion of the site consists of far more gradual sloping land, in comparison to the greatly undulating land throughout the centre and south (Figure 6b).

2.2.4.3 Neerabup (E70/3276)

The site varies in height from 45 mAHD to 85 mAHD, with the majority of the lower lying land in the south, with the exception of an 85 mAHD peak in the most southern portion, and the higher land in the north and east (Figure 6c).

2.2.4.4 Gnangara (M70/1306)

The site varies in height from 50 m Australian Height Datum (AHD) to 75 mAHD. The highest point is within the northern section of the tenement, which consists of a central point at 75 mAHD, decreasing gradually to 55 mAHD. The southern portion of the tenement is comprised of much flatter land, with two central points at 60 mAHD, decreasing gradually to 50 mAHD in the outer areas of the site (Figure 6d).

2.2.5 Hydrology

The tenements are located within the Swan/Avon catchment, in the sub-catchment of Lower Swan. The Swan/Avon River has a total catchment area of 125,000 km^2, extending from Dalwallinu in the north, Southern Cross in the north-east and Lake King in the south-east, down to the river mouth at Fremantle.

Over a quarter of the SCP subregional land area from Wedge Island to Dunsborough is wetland (Mitchell et al. 2002). Most of the wetlands on the SCP occur in inter-dunal swales and are hence also orientated in the north-south direction. Although some are perched, the majority of the SCP wetlands are hydraulically connected to the underlying superficial aquifers. At low points in the landscape, the water table frequently intersects the land surface to form lakes and swamps (Salama et al. 2005).

Surface water quality of the wetlands largely reflects groundwater quality, with the Bassendean wetlands historically tending to be coloured, base-poor and slightly acidic, while wetlands on the Spearwood and Quindalup dunes tend to be richer in calcium carbonate with relatively high to very high pH.

2.2.5.1 Surface Water

Two Rocks (E70/3279)

The Loch McNess System, a nationally important wetland, is located approximately 5 km south of the site.

There are six CCWs within the site; one in the west and five in the east (Figure 7a). These CCWs have been excluded from the proposed excavation area boundary.

Pinjar (E70/3275)

There are no nationally important, or internationally significant, wetlands within a 10 km radius of this site.

There is one CCW within the northern portion of the site (Figure 7b). This CCW has been excluded from the proposed excavation area boundary.

Neerabup (E70/3276)

There are no nationally important, or internationally significant, wetlands within a 10 km radius of this site.

There are small sections of two CCWs in the north-eastern and one in the south-eastern portion of the site and one entire CCW in the southern portion of the site. There is also one REW in the southern portion of the site (Figure 7c). There are no CCWs or REWs within the proposed excavation area boundary.

Gnangara (M70/1306)

Joondalup Lake, a nationally important wetland, is located approximately 7 km west of the site.

There is a Conservation Category Wetland (CCW) located wholly within the northern section of the tenement and a large Resource Enhancement Wetland (REW) spanning across the central section of the tenement (Figure 7d). There are no CCWs or REWs within the proposed excavation area boundary.

2.2.5.2 Groundwater

Two Rocks (E70/3279)

Groundwater contours indicate that the groundwater flow direction is west towards the Indian Ocean (refer Figure 6a). The minimum groundwater contours across the site range from 0 mAHD in the south-west to 50 mAHD in the north-east. The average annual maximum groundwater mapping does not reach this site.

Perth Groundwater Atlas indicates that the site lies within the Gnangara Underground Water Pollution Control Area (Priority 1 Zone).

Pinjar (E70/3275)

Groundwater contours indicate that the groundwater flow direction is south-west towards the Indian Ocean (refer Figure 6b). The minimum groundwater contours across the site range from 35 mAHD in the south-west to 50 mAHD in the north-east. The maximum groundwater contour mapping reaches only the southern portion of the site and ranges from 35 mAHD in the south-west to 55 mAHD in the south-east.
Perth Groundwater Atlas indicates that the site lies within the Gnangara Underground Water Pollution Control Area (Priority 1 Zone).

Neerabup (E70/3276)

Groundwater contours indicate that the groundwater flow direction is west towards the Indian Ocean (refer Figure 6c). The maximum groundwater contours across the site range from 23 mAHD in the west to 63 mAHD in the east.

Perth Groundwater Atlas indicates that the site lies within the Gnangara Underground Water Pollution Control Area (Priority 1 Zone).

Gnangara (M70/1306)

Groundwater contours indicate that the groundwater flow direction is south-west towards the Indian Ocean (refer Figure 6d). The maximum groundwater contours range from 53 mAHD in the north-east to 47 mAHD in the south. The average annual maximum groundwater level in the vicinity of the site is 51 mAHD.

Perth Groundwater Atlas indicates that the site lies within the Gnangara Underground Water Pollution Control Area (Priority 1 Zone).

2.3 Biological Environment

2.3.1 Vegetation and Flora

It is important to note that Rocla will not be undertaking any clearing as part of this proposal, which will occur in areas of pine plantation after clearing is undertaken by the FPC. The following sections are simply an overview of the vegetation present in the region. However, a clearing permit may be required if any regrowth occurs after the pines are cleared as the Gnangara-Moore State Forrest is an Environmentally Sensitive Area.

Threatening processes include salinity, acidification, eutrophication and dieback. In addition, weeds like Watsonia and bridle creeper are spreading and feral animals, particularly rabbits and pigs, are pervasive (Mitchell et al. 2002).

2.3.1.1 Two Rocks (E70/3279)

A search of the EPBC Protected Matters Search Tool with a 10 km radius returned two TECs; Aquatic Root Mat Community in Caves of the SCP and Sedgelands in Holocene dune swales of the southern SCP. The search also returned seven species of threatened plants and 13 species of weeds that are likely to occur in the area (Appendix 1).

A NatureMap search with a 10 km radius revealed seven species of Bryopsid, 417 species of Dicotyledon (including one threatened, two priority one, one priority two, eight priority three and one priority four species), one species of fungus (priority two), two species of fungus (including one priority two species), three species of

Gymnosperm, 11 species of Lichen (including two priority two and one priority three species), 165 species of Monocotyledon (including one threatened and one priority four species) and one species of Pteridophyte (Appendix 2).

The site wholly encompasses Bush Forever Site 127. The site also intersects Bush Forever Sites 128, 284, 381, 396 and 406 along the southern and western boundaries (Figure 8a).

The vegetation complex present within Bush Forever sites 127 128 and 396 is:

- Spearwood Dunes
  - Cottesloe Complex – North.

The vegetation complexes present within Bush Forever site 284 are:

- Spearwood Dunes
  - Cottesloe Complex – North
- Quindalup Dunes
  - Quindalup Complex.

The vegetation complex present within Bush Forever site 381 is:

- Spearwood Dunes
  - Karrakatta Complex – North
  - Karrakatta Complex – North (one of two most northern occurrences)
  - Karrakatta Complex – Central and South (most northern occurrence).

The vegetation complexes present within Bush Forever site 406 are:

- Spearwood Dunes
  - Cottesloe Complex – North
- Quindalup Dunes
  - Quindalup Complex.

(Government of Western Australia 2000)

2.3.1.2 Pinjar (E70/3275)

A search of the EPBC Protected Matters Search Tool with a 10 km radius returned two TECs; Aquatic Root Mat Community in Caves of the SCP and Sedgelands in Holocene dune swales of the southern SCP. The search also returned 10 species of threatened plants and 13 species of weeds that are likely to occur in the area (Appendix 1).

A NatureMap search with a 10 km radius revealed one species of alga, 291 species of Dicotyledon (including one threatened and six priority three species), one species of fungus (priority two), two species of Gymnosperm, 106 species of Monocotyledon

(including one threatened and one priority four species), one species of Pteridophyte and one species of water mould (Appendix 2).

The site wholly encompasses three Bush Forever sites (94, 285 and 286). In addition, site 380 is intersected on the eastern boundary and sites 410 and 381 in the south-west (Figure 8b).

The vegetation complex present within Bush Forever sites 94, 285 and 286 is:

- Spearwood Dunes
  - Karrakatta Complex – North.

The vegetation complexes present within Bush Forever site 380 are:

- Bassendean Dunes
  - Bassendean Complex – North
  - Bassendean Complex – North Transition (restricted complex, contains significant area)
  - Bassendean Complex – Central and South Transition (restricted complex, contains significant area, most southern occurrence).
- Spearwood Dunes
  - Karrakatta Complex – North (most southern occurrence)
  - Karrakatta Complex – North Transition (restricted complex, contains significant area, most northern occurrence)
  - Karrakatta Complex – Central and South (restricted complex, contains significant area).

The vegetation complex present within Bush Forever site 381 is:

- Spearwood Dunes
  - Karrakatta Complex – North
  - Karrakatta Complex – North (one of two most northern occurrences)
  - Karrakatta Complex – Central and South (most northern occurrence).

The vegetation complex present within Bush Forever site 410 is:

- Spearwood Dunes
  - Karrakatta Complex – Central and South (most northern occurrence)
  - Cottesloe Complex – North
  - Cottesloe Complex – Central and South.

(Government of Western Australia 2000)

2.3.1.3 Neerabup (E70/3276)

A search of the EPBC Protected Matters Search Tool with a 10 km radius returned two TECs; Aquatic Root Mat Community in Caves of the SCP and Sedgelands in Holocene dune swales of the southern SCP. The search also returned nine species of threatened plants and 13 species of weeds that are likely to occur in the area (Appendix 1).

A NatureMap search with a 10 km radius revealed three species of alga, 281 species of Dicotyledon (including one threatened, two priority one, two priority two, seven priority three and two priority four species), one species of Gymnosperm, 130 species of Monocotyledon (including one threatened and one priority one species), two species of slime mould and one species of water mould (Appendix 2).

The site wholly encompasses 12 Bush Forever sites (1, 95, 136, 137, 139, 140, 425, 444, 446, 451, 455 and 457). In addition, eight Bush Forever sites (0, 135, 290, 293, 380, 410, 411 and 428) are intersected along the boundaries of the site (Figure 8c).

The vegetation complex present within Bush Forever sites 1, 410 and 411 is:

- Spearwood Dunes
  - Karrakatta Complex – Central and South (most northern occurrence)
  - Cottesloe Complex – North
  - Cottesloe Complex – Central and South.

The vegetation complexes present within Bush Forever sites 95, 135, 136, 137, 139, 140, 425, 428, 444, 446, 451, 455 and 457 are:

- Spearwood Dunes
  - Karrakatta Complex – Central and South
  - Cottesloe Complex – Central and South

- Wetlands
  - Pinjar Complex.

The vegetation complex present within Bush Forever sites 290 and 293 is:

- Spearwood Dunes
  - Karrakatta Complex – Central and South
  - Cottesloe Complex – Central and South.

The vegetation complexes present within Bush Forever site 380 are:

- Bassendean Dunes
  - Bassendean Complex – North

  - Bassendean Complex – North Transition (restricted complex, contains significant area)
  - Bassendean Complex – Central and South Transition (restricted complex, contains significant area, most southern occurrence)

- Spearwood Dunes
  - Karrakatta Complex – North (most southern occurrence)
  - Karrakatta Complex – North Transition (restricted complex, contains significant area, most northern occurrence)
  - Karrakatta Complex – Central and South (restricted complex, contains significant area).

2.3.1.4 Gnangara (M70/1306)

A search of the EPBC Protected Matters Search Tool with a 10 km radius returned one Threatened Ecological Community (TEC); assemblages of plants and invertebrate animals of tumulus (organic mound) springs of the SCP. The search also returned 12 species of threatened plants and 13 species of weeds that are likely to occur in the area (Appendix 1).

A NatureMap search with an 10 km radius revealed 14 species of Bryopsid, 447 species of Dicotyledon (including two threatened, three priority one, one priority two, two priority three and one priority four species), six species of fungus, three species of Gymnosperm, 224 species of Monocotyledon (including two threatened, one priority one, one priority two, three priority three and one priority four species), one species of Pteridophyte, one species of slime mould and one species of water mould (Appendix 2).

The western portion of the tenement intersects Bush Forever Site 326 (Figure 8d). The vegetation complexes present within this site are:

- Bassendean Dunes
  - Bassendean Complex – North
  - Bassendean Complex – Central and South (most northern occurrence)
  - Bassendean Complex – North Transition
- Wetlands
  - Pinjar Complex.

(Government of Western Australia 2000)

2.3.2 Fauna

A common species list compiled from the individual EPBC searches is shown in Table C below.

Table C: Common Species List (DSEWPC 2012b)

Species	Common Name	Status
Birds		
Botaurus poiciloptilus	Australasian bittern	Endangered
Calyptorhynchus banksii naso	Forest red-tailed black cockatoo	Vulnerable
Calyptorhynchus latirostris	Carnaby's Black-Cockatoo, short-billed black cockatoo	Endangered
Leipoa ocellata	Malleefowl	Vulnerable, Migratory
Rostratula australis	Australian painted snipe	Vulnerable
Sternula nereis nereis	Fairy tern (Australian)	Vulnerable
Merops ornatus	Rainbow bee-eater	Migratory
Haliaeetus leucogaster	White-bellied sea-eagle	Migratory
Ardea alba	Great egret, white egret	Migratory
Ardea ibis	Cattle egret	Migratory
Rostratula benghalensis s. lat.	Painted snipe	Vulnerable, Migratory
Insects		
Synemon gratiosa	Graceful Sun Moth	Endangered
Mammals		
Dasyurus geoffroii	Chuditch, western quoll	Vulnerable

2.3.2.1 Two Rocks (E70/3279)

A search of the EPBC Protected Matters Search Tool returned 13 threatened bird species (including seven migratory species), one insect and five mammals (including one threatened and four invasive species) (Appendix 1).

A NatureMap search with a 10 km radius returned five amphibians, 67 birds (including two threatened species), one invertebrate (threatened species), seven mammals (including one priority four and one priority five species) and 28 reptiles (Appendix 2).

2.3.2.2 Pinjar (E70/3275)

A search of the EPBC Protected Matters Search Tool returned 13 threatened bird species (including seven migratory species), one insect and five mammals (including one threatened and four invasive species) (Appendix 1).

A NatureMap search with a 10 km radius returned six amphibians, 26 birds (including one threatened species), one mammal and 16 reptiles (Appendix 2).

2.3.2.3 Neerabup (E70/3276)

A search of the EPBC Protected Matters Search Tool returned 14 threatened bird species (including seven migratory and one marine species), one insect and four mammals (including one threatened and three invasive species) (Appendix 1).

A NatureMap search with a 10 km radius returned four amphibians, 96 birds (including one threatened species), four invertebrates (including one threatened, two priority three and one priority four species), 11 mammals (including three threatened, one priority four and one priority five species) and 32 reptiles (including one "other specially protected fauna" species) (Appendix 2).

2.3.2.4 Gnangara (M70/1306)

A search of the EPBC Protected Matters Search Tool returned 19 threatened bird species (including 10 migratory and four marine species), one insect and four mammals (including one threatened and three invasive mammal species) (Appendix 1).

A NatureMap search with a 10 km radius returned 10 amphibians, 149 birds (including four threatened, one priority three, two priority four and two "other specially protected fauna" species), three invertebrates (including one threatened two priority three species), 22 mammals (including one threatened, two priority four and one priority five species) and 69 reptiles (including one priority three) (Appendix 2).

2.4 Social Environment

2.4.1 Land Use and Tenure

The tenements covered in this proposal encompass a large area; however, only areas of pine plantation will become excavation areas.

2.4.1.1 Two Rocks (E70/3279)

Major access roads (Breakwater Drive and Wanneroo Road) transect the tenement through the western portion (Figure 2).

2.4.1.2 Pinjar (E70/3275)

Surrounding land uses include the Commonwealth defence land uses; Gingin Satellite Airfield and Muchea Armament Range. In addition, the Muchea/Pearce Air Weapons Range, located approximately 2 km north-east of the site is a Commonwealth Heritage Place (Appendix 1, Figure 2).

2.4.1.3 Neerabup (E70/3276)

The tenement is surrounded by rural properties and market gardens (Figure 8c).

2.4.1.4 Gnangara (M70/1306)

Semi-rural properties and market gardens are present in close proximity to the western boundary of the tenement (Figure 8d).

2.4.2 Aboriginal Heritage

2.4.2.1 Two Rocks (E70/3279)

An EPBC search returned no known Indigenous sites within a 10 km radius of the site (Appendix 1). A search of the Aboriginal Heritage Enquiry System returned one "other heritage place"; Smokebush Waterhole, which is located within the western portion of the site (Appendix 3, Figure 9).

2.4.2.2 Pinjar (E70/3275)

An EPBC search and search of the Aboriginal Heritage Enquiry System returned no known Indigenous sites within a 10 km radius of the site (Appendix 1 and Appendix 3, respectively).

2.4.2.3 Neerabup (E70/3276)

An EPBC search and search of the Aboriginal Heritage Enquiry System returned two Indigenous sites in close proximity to the tenement; Doogarch Site (Indicative Place) and Orchestra Shell Cave (Appendix 1). The Aboriginal Heritage Enquiry System also returned two "other heritage places"; Dunstan's Quarry and Lake Neerabup. Aboriginal Heritage Enquiry System mapping indicates that these sites are to the south-west of the tenement boundary (Appendix 3).

2.4.2.4 Gnangara (M70/1306)

An EPBC search returned one Indigenous site; Wanneroo Scarred Tree (Appendix 1), however the location of this site is unknown. A search of the Aboriginal Heritage Inquiry System returned no known heritage sites (Appendix 3).

2.4.3 Natural Heritage

2.4.3.1 Two Rocks (E70/3279)

An EPBC search returned five indicative and three registered places within a 10 km radius of the site. Three historic sites were also named. (Appendix 1) The tenement encompasses a portion of the Gnangara-Moore River State Forest and a DEC Reserve (limestone quarry) (refer Figure 2).

2.4.3.2 Pinjar (E70/3275)

An EPBC search returned five indicative and two registered places within a 10 km radius of the site (Appendix 1). The tenement encompasses a portion of the Gnangara-Moore River State Forest and the Yeal Nature Reserve (refer Figure 2).

2.4.3.3 Neerabup (E70/3276)

An EPBC search returned four indicative and four registered places within a 10 km radius of the site (Appendix 1). The tenement encompasses a portion of the Gnangara-Moore River State Forest and a DEC Reserve (limestone quarry) (refer Figure 2).

2.4.3.4 Gnangara (M70/1306)

An EPBC search returned two indicative and five registered places within a 10 km radius of the site. Two historic sites were also named. (Appendix 1) The tenement is wholly located within the Gnangara-Moore River State Forest (refer Figure 2).

3.0 IMPACTS AND MANAGEMENT

3.1 Proposed Excavation Areas

Figures 3a–d indicate the proposed excavation areas, which consider all relevant environmental and social restrictive areas and their associated buffers. All impacts associated with mining activities undertaken on all sites will relate only to these areas.

The following impacts and management sections are based on all tenements as the issues are the same for all sites. It is also important to note that Rocla will be mining vacant land, after clearing has been undertaken by FPC, so the impacts relating to fauna, flora and vegetation are expected to be minimal.

3.1.1 Buffers

The proposed excavation area has been drafted to avoid all environmentally sensitive areas and has incorporated the following buffers:

- A 50 m buffer will be maintained from all CCWs.
- A 50 m buffer will be maintained from all REWs (only 30 m is required).
- A 50 m buffer will be maintained from all DoW bores.
- A 50 m buffer will be maintained from all "high to moderate risk" areas.
- A 50 m buffer will be maintained from all heritage sites.
- A 50 m buffer will be maintained from all road reserves.
- A 50 m buffer will be maintained between mining activities and areas of native vegetation.
- A 50 m buffer will be maintained between mining activities and rural properties on the proposed excavation area boundaries.

3.1.2 Site Infrastructure

Access to and from sites will occur from the tenement onto existing network roads for delivery to the local market.

3.2 Environmental

3.2.1 Geology, Soils and Landforms

There is no native topsoil available for rehabilitation at the sites. The mining excavation areas in all four tenements will solely consist of areas of *Pinus pinaster* plantation and the native seed bank would be negligible.

3.2.1.1 Acid Sulfate Soils

The majority of all sites are within a moderate to low risk area or no risk area and due to excavation activities not intersecting the water table, ASS risks are low. A suitable buffer would be maintained to any moderate to high risk areas at all times.

3.2.2 Hydrology

3.2.2.1 Surface Water

High infiltration rates are expected as a result of the large pore space and lack of water holding capacity of the Bassendean Sands.

There are no surface drainage lines within close proximity of any of the four proposed quarries and all existing runoff at the site is assumed to be via shallow dispersed flow.

Flooding and inundation of vegetation can cause vegetation stress and death; however, such impacts are unlikely from this project. Surface water may cause some temporary pooling in surrounding areas, although this pooling is expected to be of short duration due to the high infiltration rates and the likely short duration of any significant rain events. This temporary and infrequent pooling is unlikely to have a negative impact on surrounding vegetation outside of the tenements.

Potential surface water impacts include:

- erosion or scour at drainage outlets, occurring when surface flows are channelised by drainage design
- changes to natural hydrology (surface flows, erosion, inundation and surface/groundwater interaction)
- changes in surface water flows to nearby wetlands and lakes
- contamination of surface water with hydrocarbons or chemicals.

To manage the potential impacts the project sites will be designed, constructed and operated to avoid disruption of surface water flows and ensure that potential contaminants are not released into any surrounding wetlands, lakes or Bush Forever sites.

The two nationally important wetlands (Joondalup Lake and Loch McNess System) are considered to be far enough away (7 km and 5 km, respectively) from the respective operational areas that no additional management measures will be required.

To manage the potential impacts on water quality from the discharge of stormwater with elevated sediment levels or any other contaminants, the following practices will be implemented:

- A 50 m buffer will be maintained from all CCWS.
- A 30 m buffer will be maintained from all REWS.
- Tree stumps will be retained as long as possible.
- Stockpiles of erodible material will be located away from roads and pavements to minimise sediment transport in run-off.
- Each stage will be rehabilitated at completion of excavation.
- Spill response equipment will be available at each site.
- Bunds and drains will be established along the access roads to contain run-off.
- Hydrocarbon management measures will ensure surface water contamination does not occur (contamination and spills management will be implemented as per 3.2.3 and Section 3.2.3)

3.2.2.2 Groundwater

The excavation will take place into the hillside and will not intersect the water table.

The main potential impact to groundwater is contamination via hydrocarbons and sewerage. There are minimal hydrocarbons and chemicals to be stored on site, reducing the likelihood of any major groundwater contamination.

The majority of the sites lie within a Priority 1 (P1) Public Drinking Water Source Area (PDWSA). The objective of PDWSAs, as outlined in the Western Australian Planning Commission's State Planning Policy 2.7, *Public Drinking Water Source* Policy (2003), is to ensure that land use and development within PDWSAs is compatible with the protection and management of the public water supply. According to the policy, Priority 1 is the highest level of protection and, in areas with this classification, protection of the public water supply is the most important consideration with respect to use of the land.

The sites fall under the jurisdiction of State Planning Policy 2.2, *Gnangara Groundwater Protection* (2005), which lists mining as a "compatible with conditions" land use in Priority 1 protection areas. The conditions outlined in this policy pertain to the management of fuels and chemicals, and to the depth of excavation relative to the water table.

State-wide Planning Policy No. 1, *Policy and Guidelines for Construction and Silica Sand Mining in Public Drinking Water Source Areas* (WRC 1999), outlines guidelines for protection of water quality and quantity from sand extraction activities in PDWSAs. It lists the policy principles as follows:

- Operations in Public Drinking Water Source Ares will only be acceptable if it can be demonstrated that there is sufficient clearance above the water table.

- Fuel and chemical storage facilities shall meet the Commission's (now Department of Water) specified standards.

- Operations shall incorporate appropriate mine-site management procedures to ensure surface water run-off, waste disposal and water abstraction do not compromise the water resource objectives for the site.

- Operators shall demonstrate that end land uses are compatible with the water resource objectives for the area.

In addition to PDWSAs, State Planning Policy 2.7 also defines well-head protection zones in Priority 1 areas as having a 500 m radius, within which land uses and activities are restricted to prevent direct contamination of the water source at its point of abstraction.

A groundwater management plan (GMP) will be prepared and implemented to the satisfaction of the DoW for each site prior to the commencement of mining activities. In addition, monitoring bores will be installed to determine the depth to groundwater within the excavation areas and, as a result, the finished floor level of each site.

Management measures that will be implemented include:

- clearance of 5 m to estimated future maximum groundwater level, in the absence of on-site groundwater elevation data. After two years of monitoring has occurred, the finished floor level will have a clearance of 3 m to the estimated future maximum groundwater level in Priority 1 areas and 2 m in Priority 2 and other non-Priority areas

- contamination and spills management (with correct storage and handling there is little risk that a spill would move off site, or infiltrate groundwater beneath the site)

- surface water management (Section 3.2.2.1) will minimise the risk of contamination to groundwater via infiltration

- waste management (Section 3.2.3) to ensure that all wastes are disposed of appropriately, minimising the risk of groundwater contamination

- installation of monitoring bores at each site to measure levels and water quality.

In conjunction with the water level monitoring, it is proposed to monitor baseline groundwater quality. The future groundwater quality resulting from the excavation works can then be compared with the baseline data to assess any impacts associated with the site activities.

Table D outlines a potential monitoring program, which could be conducted over the 18 month period that water levels are recorded.

Table D: Proposed Baseline Monitoring Program

Location	Proposed Analytes	Potential Source	Frequency
Three bores adjacent to excavation	Total Petroleum Hydrocarbons	Hydrocarbon spill/ leak	Twice over water level monitoring period (winter high and summer low).
Three bores adjacent to excavation	pH, Total Iron, Total Aluminium	Acidic Groundwater from Regional Area	
Three bores adjacent to excavation	Total N, Total P	On-site toilets	
All bores	Water levels	Regional	Monthly

The specifics of this monitoring program may be adjusted pending results over the interim period. Final details will be provided to DoW in order to establish the appropriate excavation depth and water quality parameters for monitoring.

A 500,000 kL water licence will be applied for to allow for the washing of sand to meet market requirements, if the market determines this is required. This water allowance will also assist with dust management.

3.2.3 Hydrocarbons

Without appropriate management procedures there is the potential for incorrect storage of hydrocarbons and spillages to result in the contamination of soil, surface water and groundwater. Rocla will ensure that current management procedures based on Australian Standard *AS 1940-2004: The storage and handling of flammable and combustible liquids* are implemented to prevent any potential hydrocarbon contamination to the environment. Hydrocarbons will be managed during construction and operation to prevent any contamination to the surrounding environment.

3.2.3.1 Fuel Management

Rocla is committed to ensuring that its extraction activities do not adversely impact the local groundwater resources and this section outlines the site specific fuel management measures.

Several guidelines have been utilised in the development of fuel management measures, including:

- Statewide Policy No. 1: Policy and Guidelines for Construction and Silica Sand Mining in Public Drinking Water Source Areas (WRC 1999)

- Water Quality Protection Guidelines No. 1 – Water Quality Management in Mining and Mineral Processing: an overview (WRC 2000a)

- Water Quality Protection Note 60 – Tanks for mobile fuel storage in PDWSAs (DoW 2008)

- Water Quality Protection Note 65 – Toxic and hazardous substances: storage and use (DoW 2006)

- *Australian Standard AS 1940: 2004. The storage and handling of flammable and combustible liquids*.

Rocla will operate each quarry to minimise potential contamination by following these procedures:

- The proposed fuel storage tanks to service the machinery will be required to comply fully with the *Australian Standard 1940:2004* T*he Storage and Handling of Flammable and Combustible Liquids*.

- Procedures will be implemented for the correct handling, storage, spill management and clean up.

- Contaminated material will be removed and bio-remediated (if biodegradable) or disposed of at a licensed facility.

- Spill response equipment will be located in the vicinity of work areas, with site personnel trained in spill response management. Any spills or leaks will be cleaned up immediately. Any absorbent material that has become contaminated as a result of a spill or leak will be disposed of in accordance with legal requirements and contaminated soil will be taken off site by a licences waste contractor in accordance with relevant legislation. Any contaminated materials and soil will be disposed of at a licensed landfill facility.

Fuel management measures are important and will include:

- The site will consist of a self-bunded above-ground fuel tank.

- All care should be taken when coupling and uncoupling hoses between vehicles to minimise any loss of liquids.

- An emergency response plan should be prepared to address any spill that may result from a mobile refuelling vehicle or storage tank. The plan should be made available to all personnel on site.

- Provision of an adequate buffer separation distance between fuel storage facilities and conservation valued wetlands.

- A 3 m buffer zone of undisturbed sand profile will be maintained to the water table in Priority 1 areas and 2 m in Priority 2 and other non-Priority areas.

- No fuel storage tanks shall be installed in a wellhead protection zone.

3.2.3.2 Fuel Storage

The proposed mining operation will incorporate storage of hydrocarbons on all sites; one 17,500 L self bunded tank is proposed for each site. The proposed fuel storage tanks to service the machinery will be required to comply fully with the *Australian Standard 1940:2004 The storage and handling of flammable and combustible liquids.* A mobile service truck will be used to transport fuel to machinery on site.

3.2.3.3 Fuel Spill Prevention

The management practices which will be implemented to prevent fuel spillage to the soil and underlying water resources include:

- Fuel transfer points (delivery into tank and machine refuelling) will be located on concrete hardstand to capture potential fuel spills or leaks.

- Fuel transfer will be undertaken by hand to ensure that fuel is managed carefully without spillage. Connector hoses/funnels will be used to prevent fuel spillage.

- Refuelling buffers of at least 350 m will apply to all adjacent wetlands.

- Site personnel and operators of heavy machinery will be advised of the protocol in relation to refuelling, and actions to be undertaken in the event of a spillage. A copy of an Emergency Response Plan will be contained within each vehicle for quick access if required.

As specified in WRC (1999) a buffer of at least 2 m of undisturbed soil will be maintained to the water table to minimise the risk of contamination of groundwater from hydrocarbons and allow time for remediation to take place.

The following protocol will be applied in the case of a fuel spillage:

- The area of soil impacted is to be removed immediately. This may be undertaken via hand shovel or use of mechanical equipment if necessary. A shovel is to be kept on the service vehicle at all times).

- Visual analysis to confirm all impacted soil has been removed.

- The operating team are to phone the Operations Manager immediately to report the spillage.

- The Operations Manager is to inform the Department of Environment and Conservation of the spillage and remedial action undertaken.

- Should the spillage exceed 20 L, the Operations Manager will also contact the Water Corporation (1800 626 636) to advise of the spillage and remedial action proposed/undertaken. Laboratory testing of soils from the remediated area will also be undertaken to confirm all fuel was removed.

- Rocla Quarry Products "Incident Report" to be prepared and submitted to the Resource and Development Manager and the Health and Safety Advisor.

- Contaminated soil will be taken off site by a licensed waste contractor in accordance with relevant legislation.

- Contaminated absorbent material and soil will be disposed of to a licensed landfill facility in accordance with legal requirements.

3.2.3.4 Proposed Water Quality Monitoring Program

As specified in Section 3.2.2.2, it is proposed to monitor baseline groundwater quality. The monitoring will include hydrocarbon monitoring in bores that will be installed across the site. Table D (Section 3.2.2.2) summarises the proposed monitoring program, which will be conducted over the 18 month period that water levels are recorded.

3.2.4 Waste

It is important to manage waste properly to reduce the impacts to visual amenity, groundwater, soil and surface water contamination and human health issues. The following wastes will potentially be produced by the proposed project:

- hydrocarbon and chemical contaminated wastes
- general domestic waste
- sewerage and domestic wastewater.

The following waste management strategies will be implemented during operations:

- Hydrocarbons and chemical containers will be removed from site and disposed of at a licensed landfill facility at regular intervals.

- Sewage waste will be transported off site for treatment and disposal by a licensed contractor.

- Site personnel will be informed of on-site waste management procedures.
- Mobile machinery will store all waste oil and remove it from site daily.

3.2.5 Vegetation and Flora

No clearing of native vegetation is proposed to be undertaken as the proposed mining areas are located solely within pine plantation. The areas of pine plantation will be cleared by the FPC and Rocla will commence operations after clearing has occurred. However, a clearing permit may be required in the event of regrowth of native vegetation post-clearing of the pines.

During operations, the following management procedures will be followed:

- Adequate buffers will be maintained to all remnant vegetation in surrounding bush forever sites and nearby wetlands.
- Vehicles will be restricted to designated access roads.
- Areas will be cleared of tree stumps in stages, as they help stabilise the soil.

The extraction areas will be revegetated with pine plantation by the FPC after operations are complete in each area as part of their forestry management program.

It is likely that native vegetation will be planted within some of the extraction areas. This is mainly due to the impact that the removal of 20,000 ha of pine plantation will have on black cockatoo species. Rehabilitation of the pine plantation is estimated to cost $500 million and the post-mining restoration with *Banksia* species would assist with a significant environmental issue in relation to foraging habitat for black cockatoos. The majority of *Banksia* species are considered medium–high priority for planting for use by Carnaby's, whereas the four pine species listed are considered low-medium priority (DEC 2011).

3.2.5.1 Banksia Seed Farm

Rocla propose to construct Western Australia's first production seed farm for Banksia species required for the company's restoration work on the Perth Swan Coastal Plain. Rocla's intention to develop seed farms will secure *Banksia* seed for long-term future use in the Gnangara Pine Plantation for restoration, post-mining works, and will be the first of its type in Australia to address native seed supply through the use of innovative native seed farming. Importantly, the farm will underpin seed security for restoration of Banksia species important to sustaining natural foraging habitat for the Carnaby's Black-Cockatoo.

Full details are included as Appendix 4.

3.2.5.2 Dieback

The arrival and spread of dieback disease, otherwise known as Phytophthora root-rot, in Western Australia has been catastrophic for the biota of a number of south-west Australian ecosystems. It has also been a major problem for road construction, timber harvesting, mining and other industries since land managers realised that the movement of soil is the most important method of spread of the soil-borne pathogen (which is actually a water mould, not a fungus as previously believed). There are several species of *Phytophthora* present in native vegetation in the south-west of Western Australia, but by far the most widespread and destructive is *Phytophthora cinnamomi* thought to have been introduced soon after European settlement. (Dieback Consultative Council 2012)

Due to the removal of native vegetation during the 1920s to establish pine plantation within the mining tenement areas and the absence of dieback indicator species, it is not possible to detect whether dieback is present or not; the site is un-interpretable. As a result, the sites will be managed by way of the precautionary principle and as such, hygiene guidelines will be implemented prior to entry and exit of each site. Mobile excavation equipment will be targeted for dieback management as they hold the greatest risk of transporting soil.

The aim of dieback management during operations is to minimise the risk of entry of dieback to the sites. This is achieved by preventing the import of any soil or plant material on mobile equipment and vehicles. The risk of this transportation is low due to the vehicles and machinery travelling on sealed roads prior to entering site.

Management strategies for dieback control are very similar to that of weed control and the two practices should be considered together. Several of the practices outlined below are recommended for un-interpretable sites in the Management of *Phytophthora* dieback in Extractive Industries document (Dieback Working Group 2005).

- Unauthorised and/or unhygienic entry must not be permitted into the site. This may be achieved via restrictive fencing, and provision of parking areas off site. Similarly a boundary fence around the site will minimise the risks associated with boundary breaches.

- All vehicles or equipment entering the compound are to be "clean on entry", and therefore are required to be washed down prior to entering the site. Once clean, vehicles and equipment can move around within the site without hygiene restrictions. All footwear should also be clean upon entry to the site.

- Training programs and inductions shall be conducted for all site personnel.

- Areas will be "quarantined" ahead of excavation.

- All surface water and wash-down water will be contained. Run-off from the quarry pit, stockpiles and haul roads will be contained, and not released into areas of native vegetation.

- Light vehicles and machinery will be restricted to access roads, tracks and fire breaks, if present. Off-road driving will be prohibited and excavation equipment will be restricted to excavation areas only.

- Vehicles which travel off the limestone tracks must be cleaned down at the designated "clean down bay". Clean down will consist of
  - in dry soil conditions
    - use a brush and/or blow with air to remove clods of soil and a metal bar or spade to remove compacted soil, where necessary.
    - dust adhering to the sides of vehicles does not need to be removed.
    - material removed shall be collected on the limestone pad in the clean down bay and periodically covered with fresh limestone.
  - alternately (in wet soil conditions)
    - wash down using a suitable hose to remove all clods of soil.
    - clean wash-down water will be provided in an on-site mobile tank filled via water truck from an external clean source (mains water).
    - wastewater will be collected in a limestone lined controlled area within the clean down bay and allowed to drain through the limestone base.

- No soil or vegetation will be brought on-site, except that for use in rehabilitation. Only certified *Phytophthora* dieback free materials (e.g. soil, mulch and compost) will be brought to the site. Plants will be purchased from accredited nurseries and direct seeding would be considered, rather than planting seedlings.

3.2.5.3 Weeds

Earthworks, topsoil and overburden transportation, vehicle movement and several other factors have the potential to introduce additional weeds and spread existing populations of introduced flora within the proposed quarry sites. A weed is a non-native plant in any particular area or region and is considered a nuisance due to excessive growth and/or disturbance to the local ecosystem. The management strategies for weed management are similar to those of plant disease and generally, if dieback management procedures are followed, weeds will also be controlled.

The majority of the tenements consist of pine plantation or cleared areas of land. Databases searches have returned potential weed species in all four tenements. All sites will be monitored at the conclusion of operations for any signs of weeds and if they are found they will be removed, buried or sprayed with herbicide.

The following strategies will assist in minimising the risk of introducing weeds:

- All vehicles or equipment entering the compound are to be "clean on entry", and therefore are required to be washed down prior to entering the site. Once clean, vehicles and equipment can move around within the site without hygiene restrictions. All footwear should also be clean upon entry to the site.

- Any illegally dumped rubbish located during operations will be removed and disposed of as soon as practicable, as rubbish is a major source of weed species.

- Vegetation and topsoil from weed infested areas will be stripped and stockpiled separately from non-weed infested areas.

- Site personnel will be educated and inducted on weed risk reduction methods and the identification of problem species.

3.2.6 Fauna

The proposed sites have been planned to eliminate the requirement for clearing of native vegetation. The quarry footprints will be located within areas of cleared pine plantation and as a result it is unlikely that significant fauna habitat species will be impacted by the project. Some localised loss of fauna is possible due to the additional traffic around the quarry sites and between the quarry and customer locations. However, this impact is considered so minimal it is unlikely to be of any significance to the conservation status of any fauna that may be found within the region.

Other potential impacts to fauna include contaminated water consumption or coming into contact with hazardous substances resulting in sickness or death. In addition, stygofauna and troglofauna, if present, may also be affected by contamination, excavation, altering of groundwater levels and soil compaction by site machinery.

Management strategies that will be employed during operations include:

- no clearing of native vegetation

- rehabilitation of disturbed areas will occur once each stage is complete

- speed limits will apply on site to limit accidental road kill

- all site personnel will be informed of avoidance measures and the importance of avoiding causing harm to significant species. In addition, positive sighting of any significant species will be reported to the DEC as soon as practical.

- no non-native fauna will be permitted on the sites

- no excavation will occur below the water table, meaning impacts to any stygofauna and troglofauna that may be present is avoided.

3.2.7 Noise

The proposed operations are likely to generate some noise pollution as a result of the operation of earthmoving equipment, traffic along transport routes and noise generated by the screening machinery. However, the tenements are quite isolated and not adjacent to any sensitive premises.

Noise associated with quarrying falls under the *Mines Safety and Inspection Act 1994* and *Regulations 1995*. Management generally includes necessary hearing protection and conducting inductions and education for all site personnel.

Given the geology of the local area, no blasting or breaking of a dense duricrust will be required. The noise levels emitted from quarrying sand is expected to be much less in comparison to other forms of mining. Disturbance from vibrations is also expected to be minimal as no blasting is proposed.

Significant noise impacts are not expected from the operations across the five tenements and Rocla will ensure that all emissions comply with the requirements of the Environmental Protection (Noise) Regulations 1997 and the *Mining Act 1978* at all times. The distance between dwellings and screening bunds in place will offer sufficient buffers to not adversely impact nearby residents.

Research on noise impacts to fauna is limited, however, it is understood that fauna will adapt quickly to man-made noise in the absence of other significant threats. The noise generated by operations at the sites is unlikely to impact local fauna.

In general, sound travels along a line-of-sight and as a result the majority of noise management strategies involve locating equipment and plant in a topographical depression or behind stockpile bunds to reflect/absorb the noise. These tenements are well removed from sensitive land uses, however if operations are to occur within 500 m of a sensitive land use then the following strategies will be implemented to reduce noise impacts:

- The screening plant and excavation areas will be located behind stockpiles to reduce noise impacts to nearby residents.
- Operations will occur between 0600 and 1900 daily.
- All mobile equipment will be maintained with efficient mufflers and noise shielding devices.
- Mobile equipment without audible reversing alarms will be utilised where possible.
- All personnel will be provided with appropriate noise protection equipment and will be inducted on safe work practices.

- Access roads and tracks will be maintained to a suitable standard to reduce traffic noise as a result of empty trucks entering the site.

- Should a justifiable noise complaint be received during operations, Rocla commit to contracting an acoustic consultant to identify the noise source and provide possible solutions. Any complaints received regarding noise will be investigated immediately.

3.2.8 Dust

Excessive dust may impact the health of site personnel and surrounding vegetation. However, the tenements are quite isolated and not adjacent to any sensitive premises.

Dust generated from the proposed quarry operations is likely to be minimal and localised and may be caused by:

- earthworks during construction and operation
- clearing and stripping
- excavation
- screening
- loading and transport
- vehicle movement
- wind erosion of exposed surfaces.

The EPA Guidance Statement 18: *Prevention of Air Quality Impacts from Land Development Sites* (EPA 2000) outlines control of dust and smoke from land development sites. Assessments of potential dust impacts were undertaken using the Draft Guideline for the Development and Implementation of a Dust Management Program (DEC 2008).

The following factors were taken into account when calculating the dust risk of the proposed quarries:

- nuisance potential of yellow sand when disturbed
- topography
- exposed area on site
- nature of works
- proximity to sensitive receptors
- effect of prevailing winds.

The proposed quarries were assessed and resulted in an overall "low" site dust risk potential, predominantly due to the coarse material properties. Minimal control and contingency measures are required for this level of risk (DEC 2008).

Allowances will be made for water cart operation and Rocla will ensure the disturbed area exposed is kept to a minimum at all times. Adhering to the requirements of the *Mines Safety and Inspection Act 1994* and Regulations 1995, with respect to occupational health risks resulting from dust exposure, Rocla will ensure all personnel working on site will have access to adequate and efficient dust masks at all times.

Standard dust suppression measures will be implemented during construction and operations to minimise the impacts on surrounding vegetation. Management strategies that will be undertaken include:

- Dust suppression measures, such as water sprays, are implemented as necessary, in the event that high levels of dust are observed.
- Visual monitoring of dust will be undertaken daily.
- Tree stumps will be cleared in stages to assist with soil stabilisation.
- Access roads will be constructed of crushed limestone and well maintained.
- Activities will high dust generating potential will not be undertaken during adverse weather conditions.
- Vehicles will be confined to designated roads and tracks, with speed limits enforced.
- Material drop heights between loaders and trucks, and trucks to stockpiles, will be kept to the minimum practical height.
- Any complaints will be investigated immediately.

Pine plantation areas will be cleared in stages by the FPC to meet their requirements and markets. Once cleared, Rocla will extract from the area with approximately 20 ha open area at any given time. On completion of the extraction activities, the FPC will replant pines as part of their forestry management; this approach will minimise the size of open areas and in turn, minimise dust nuisance (refer Figure 10). It is also likely that the extraction areas will be rehabilitated with native *Banksia* species in order to assist in alleviating a significant environmental issue surrounding the lack of suitable foraging habitat for black cockatoos.

3.3 Social

3.3.1 Local Community

The local community may be impacted by noise, dust and truck movements to and from the sites. In the event of a community complaint, Rocla will investigate and take immediate action to remediate.

In line with management measures outlined in the EPA Guidance No. 3: *Separation Distances between Industrial and Sensitive Land Uses* (EPA 2005) a 300–500 m (depending on the size of the quarry) buffer will be maintained at all times.

3.3.2 Visual Amenity

Visual impact can occur when the operation is visible from neighbouring properties or roads. Impacts are greatest when operations occur high in the landscape, too close to neighbours, or if they have insufficient visual screening. The mining tenements are within areas of pine plantation and therefore excavation areas will be surrounded by pine plantation that has not been cleared for this proposal. The excavations areas have not been delineated and therefore it is not known the proximity to the nearest residence for any of the tenements, however, it is unlikely that the project will result in visual amenity impacts for local residents.

Potential management strategies include:

- rehabilitation of cleared pine plantation areas when excavation works are completed
- ensure barrier fences and gates are compatible with the semi-rural style of the surround land areas and natural landscape
- locate the screening plant so the stockpile area and fringing vegetation screen it from local residents or well-used roads
- locate buildings and other site infrastructure in areas of low visual impact
- locate stockpiles to create screening bunds
- adopt good house-keeping practices, such as orderly storage and removal of disused equipment or waste.

3.3.3 Aboriginal Heritage

Three of the four tenements have at least one indigenous site recorded in close proximity to the tenement boundary; however, none of the registered sites are recorded within the tenement boundaries. There is an "other heritage site" within the western portion of tenement E70/3279, however, mining will not occur in close proximity to this site.

While it is possible that there are other sites present that have not been registered, it is very unlikely given the duration of the current land use (pine plantation). Extraction and the associated operations have the potential to damage Aboriginal artefacts if they exist in the proposed mining footprint.

Should any evidence of early aboriginal occupation be uncovered during works, all activities will be stopped in compliance with the *Aboriginal Heritage Act 1972–1980* pending an assessment by a recognised consultant. If it is unavoidable that the operations will disturb a site, a Section 18 application will be made to the Department of Indigenous Affairs under the *Aboriginal Heritage Act 1972*.

4.0 APPROACH TO ENVIRONMENTAL ASSESSMENT

4.1 Stakeholder Consultation

Rocla attended a meeting with the EPA in March 2011 to discuss the approach for the referral of this proposal. It was decided to assess the four Gnangara sites (five tenements in total) in one single referral to reduce the documentation and time taken for the EPA to assess. It was discussed that should the proposals be assessed by the Office of the EPA under Section 38(a) of the *Environmental Protection Act 1986* (WA) the likely outcome would be an Assessment on Proponent Information (API), depending on the level of information provided with the referral.

In consultation with the FPC (pers. comm. Russell Warnes, late 2011) it was discussed that Rocla would manage and plan their operations to align with FPC forestry management and planning; Rocla will extract from recently harvested pine plantation areas. When extraction activities are completed, the FPC will replant pine. A 20 ha mine footprint is expected to be required for Rocla's operations.

Table E: Stakeholder Consultation

Stakeholder/ Organisation	Contact	Comment/Outcome
DEC	Owen Donovan	Various letter correspondence (2010–2011) regarding approvals for access to site for drilling program
DEC	Grant Lamb	Written correspondence (2010–2011) regarding gaining approval from Minister for Environment and exploratory drilling program.
DEC	Director General	Correspondence outlining the commitment and support of the development within E70/3276 and E70/3279, including notification of the Conservation Commission sign-off and progress of the application to the Minister for Environment.
DMP	Mike Freeman	Meeting on 17 June 2011 to discuss the proposal approach and requirement for material due to market demand
DoP	Geoff Findlay	Discussions regarding proposal in late 2010
DoW	James Mackintosh	Discussions and correspondence (2010–2011) regarding groundwater, separation levels and exploration works
EPA	Anthony Sutton, Darren Foster	Assessment of the proposal, referral approach and likely outcomes discussed at meetings on 11 March 2011 and 31 October 2011
FPC	Michael Lobb	Excavation activities will be planned and managed to coincide with forestry management and planning
Yued	N/A	A site visit to one of the tenements (E70/3279) was conducted on 18 and 19 August 2011 and the group were supportive of the development. Ongoing discussions with the group are occurring.

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5.0 MINE CLOSURE

5.1 Post-mining Land Use

The DEC, through the Gnangara Sustainability Strategy (GSS), has identified up to 19 potential ecological leakages throughout the pine plantations in Gnangara. In total, approximately 9,300 ha, or 60% of the area covered by the linkages, requires restoration (Maher 2009).

After the completion of yellow sand extraction, the land will be rehabilitated in accordance with a rehabilitation plan prepared in concurrence with the DEC.

5.2 Closure Plan

Rocla commit to decommissioning all infrastructures. FPC will replant pine in all excavated areas, unless rehabilitation with native vegetation is undertaken.

A formal Rehabilitation and Closure Plan will be submitted to the DEC as they are currently reviewing the rehabilitation requirements of the Gnangara Pine Plantation.

5.2.1 Landform Reconstruction

Once quarrying of each stage is complete, the excavation area will be backfilled with oversize screened material and reshaped. Overburden will be spread evenly over backfilled material and other areas where waste has been picked up. Surfaces will be ripped or ploughed along the contour to minimise erosion from water runoff and relieve compaction.

As part of the final landform reconstruction, surface drainage lines will be established to control surface run-off and minimise potential erosion.

5.2.2 Topsoil Replacement

There is no native topsoil available for rehabilitation at any of the sites as the area has been pine plantation since the 1920s and the native seed bank would be negligible.

5.2.3 Revegetation

Broadcast seeding will likely be required. The species list will depend on the future land use planned by the FPC and DEC. If it is determined to be Banksia woodland, the methods and species detailed by the Botanic Gardens and Parks Authority (Kings Park) will be used.

5.2.4 Decommissioning

At the end of the quarries' lives, Rocla will undertake the following actions to decommission the sites:

- all buildings and infrastructure removed
- any hard stand surfaces will be removed and used to backfill the pit
- overburden and scalps (oversize screened material) will be used as backfill
- the area will have the slopes and soils constructed to allow for regeneration of pine plantation or native vegetation
- broadcast seeding will likely be used, or native vegetation topsoil if available.

6.0 MONITORING AND REPORTING

All quarry activities and potential environmental impacts require ongoing monitoring to ensure legislation, policies, standards and guidelines are being met.

6.1 Inspections and Audits

Monthly environmental, health and safety (EHS) inspections will be undertaken by a suitably appointed EHS representative, using a pre-determined checklist. All corrective actions will be logged and must be completed.

6.2 Annual Reporting

Under the *Mining Act 1978*, mining lease holders are required to submit an Annual Environmental Report (AER) to the Department of Mines and Petroleum (DMP) each year. An AER will also be submitted to the DEC for the Works Approval Licence.

An AER will be prepared for each site and shall include:

- excavation progress, including volume of sand removed
- volume of material screened
- contingency actions and outcomes
- environmental incidents, if any
- community complaints and responses, if any.

6.3 Incidents and Complaints

Rocla commit to reporting any environmental incidents that may occur on site during operations. An environmental incident is any event that could or does result in an impact to the environment, including, but not limited to, the following:

- water (surface or ground) contamination
- soil contamination
- incorrect waste disposal
- illegal clearing of native vegetation
- wildlife fatalities
- hazardous material spills
- unauthorised land disturbance, including clearing or disturbance of heritage sites
- community complaints.

Rocla will systematically investigate any incidents that occur, identify the cause and implement management measures to eradicate the possibility of the incident reoccurring.

7.0 ENVIRONMENTAL SUMMARY

Environmental Factor	Environmental Objective	Potential Impacts	Management Measures	Predicted Outcome
Flora and Vegetation	▪ To maintain abundance, diversity, geographic distribution interconnectedness and productivity of flora at species and ecosystem levels through the avoidance or management of adverse impacts and improvement in knowledge.	▪ Disturbance to nearby conservation significant flora ▪ Changes to wetland hydrology ▪ Introduction and spread of weeds ▪ Introduction and spread of dieback ▪ Dust emission and deposition	▪ The potential spread of weeds and dieback, if present, during operations will be prevented. ▪ Dust will be managed during the quarrying operations to protect surrounding native vegetation. ▪ The extent of vegetation clearing will not extend past that of the FPC and stumps will be cleared in stages. ▪ Adequate buffers will be maintained between excavation areas and adjacent Bush Forever sites. ▪ Vehicles will be restricted to designated roads. ▪ At the completion of operations, adequate rehabilitation will occur across the sites. A rehabilitation plan will be devised and implemented to the satisfaction of the DEC and DMP.	▪ This proposal does not involve any native vegetation clearing and will therefore have minimal impact on this environmental factor. ▪ Detailed vegetation rehabilitation management for four rehabilitated sites
Fauna	▪ To maintain abundance, diversity, geographic distribution, interconnectedness and productivity of flora at species and ecosystem levels through the avoidance or management of adverse impacts and improvement in knowledge.	▪ Habitat fragmentation and disturbance and impacts due to loss and degradation of habitat through clearing. ▪ Physical Injury or Fatality ▪ Indirect Effects on Adjacent Habitats	▪ Rehabilitation of potential fauna habitat species after the completion of operations, dependant on FPC requirements. ▪ Management measures will be implemented to reduce indirect disturbance of surrounding fauna habitat. ▪ Staged removal of pine stumps to allow for acclimatisation for any remaining fauna in the area. ▪ The control and monitoring of dust, noise and smoke. ▪ Induction of machinery operators involved in the operations and stump removal process. Operators will be advised to be alert for fauna, and to take steps to avoid impacts, where practical. ▪ Speed limits will apply on site to limit fauna fatalities. ▪ Non-native fauna will be prohibited from site.	▪ No fauna species will cease to exist or have their conservation status adversely affected as a result of the implementation of this proposal. ▪ The proposal area (cleared pine plantation) does not contain any critical habitats for protected species or populations. ▪ The proposal will result in the reduction in the general availability of habitat (including fragmentation) for those fauna species that are present in the area.

Environmental Factor	Environmental Objective	Potential Impacts	Management Measures	Predicted Outcome
Groundwater Resources	▪ To maintain the integrity, ecological functions and environmental values of GDEs to ensure that any impacts are appropriately managed	▪ Impacting on GDEs in the area ▪ Oxidation of Potential Acid Sulfate Soils (no to low risk) ▪ Impact to Subterranean Fauna (from changes in GW level and direct impact)	▪ Quarry operations will not excavate to within 5 m of the estimated future maximum groundwater level. ▪ A Groundwater Management and Monitoring Plan (GMMP) will be developed and implemented when the quarries are operational. Following the collection of sufficient groundwater level data, the separation distance will reduce to 3 m (Priority 1 areas) and 2 m (Priority 2 and other non-Priority areas). It will include ongoing groundwater quality monitoring and the establishment of appropriate water quality criteria. The plan will be developed with input from DoW and DEC, with threshold levels being consistent with the intent of the ANZECC / ARMCANZ guidelines and the DoW guidelines: The Plan will also include provision for timely and appropriate responses to contingent events, including responses to possible temporary episodes of reduced water quality. ▪ Waste management to ensure all wastes are disposed of appropriately, minimising the risk of groundwater contamination. ▪ Surface water management will minimise the risk of contamination to groundwater via infiltration.	▪ There will be minimal, if any, impact to groundwater levels or water quality resulting from quarry operations.
Acid Sulfate Soils	▪ To maintain the integrity, ecological functions and environmental values of the soil and landform.	▪ Increase in heavy metal concentrations ▪ Loss of visual amenity	▪ An adequate buffer will be maintained to high to moderate ASS risk area at all times during operations. ▪ Excavation will not intersect the water table at any time during operations, minimising the risk of exposing potential ASS.	▪ The management measures will ensure that the risk of potential impacts occurring as a result of the quarrying operations is minimal.

Environmental Factor	Environmental Objective	Potential Impacts	Management Measures	Predicted Outcome
Noise	▪ To protect the amenity of nearby residents from noise impacts resulting from activities associated with the proposal by ensuring the noise levels meet statutory requirements and acceptable standards.	▪ Construction noise impacts upon local residents and workers. ▪ Ongoing operational noise impacts upon local residents and workers.	To protect the amenity of the receiving environments from noise impacts, the following key management measures will be implemented during the construction and operation phase: ▪ Limiting construction work; operating 6am to 7pm, daily. ▪ Design the mine excavation areas to provide enhanced landform and constructed noise screening (i.e. bunds). ▪ Maintain noise suppression devices in good condition on all operational machinery. ▪ Shut down equipment when not in use. ▪ Operate machinery only within the designated hours of operation. ▪ Schedule activities to minimise the likelihood of noise nuisance. ▪ Use the dedicated transport route. Record any complaints received regarding noise disturbance and instigate follow-up action instigated immediately to minimise the cause, to the greatest possible extent.	▪ The sand quarry site are relatively isolated from surrounding land uses. ▪ The predicted outcome of the proposed operations is that that the amenity of residents is unlikely to be affected by construction or operation noises.
Air Quality	▪ To ensure that emissions do not adversely affect environmental values or the health, welfare and amenity of people and land uses by meeting statutory requirements and acceptable standards	▪ Dust emissions may occur as a result of the excavation. ▪ Minor levels of exhaust emissions are anticipated from mine equipment. ▪ Vehicle movements associated with the quarry operations will result in exhaust emissions and potential dust emissions from unsealed roads.	To prevent or minimise dust generation during quarry operations, the following dust management measures will be implemented during the construction and operation phase: ▪ The excavation will occur over several stages. A key objective is to minimise the disturbance or open area at any one time, as far as practicable. ▪ Maintain haul road surface in a good condition and with suitable grades. ▪ Restrict vehicle movements to defined roads. ▪ All vehicles leaving the site are required to have covered loads. ▪ Use water as appropriate to wet down roads and trafficked areas. ▪ Use dust suppressants where appropriate (either mixed with water to enhance dust suppression and vegetation cover, or applied periodically to specific areas). ▪ Limit the speed of vehicles on the site. ▪ Apply surface treatments (e.g. mulch, ground cover) to stabilise any bare areas which might be prone to wind erosion. ▪ Define buffer areas within the site to avoid any unnecessary disturbance of stabilised surfaces or vehicle traffic. ▪ Limit the quantity of machinery / vehicles in operation. ▪ Inducting all contractors working within the sites. Record any complaints received and instigate follow-up action instigated immediately to minimise the cause, to the greatest possible extent.	▪ The predicted outcome is that emissions are unlikely to adversely affect the area's environmental values or the health, welfare and amenity of neighbouring residences. The objective of ensuring that emissions from construction works do not adversely affect environmental values or the health, welfare and amenity of people and land uses will be met through managing potentially adverse construction and operation impacts as per the air quality management measures.

Environmental Factor	Environmental Objective	Potential Impacts	Management Measures	Predicted Outcome
Hydrocarbons and Waste	▪ Ensure that emissions do not adversely affect environment values or the health, welfare and amenity of people and land uses by meeting statutory requirements and acceptable standards	▪ Contamination of local soil, groundwater or surface waters as a result of waste materials generated by construction and operation and the possible inadequate handling, storage or disposal of hydrocarbons and chemicals ▪ Sewerage and waste discharge adding nutrients and pollutants to the soil and groundwater.	▪ Procedures will be implemented for the correct handling, storage, spill management and clean up. ▪ Contaminated material will be removed and bio-remediated (if biodegradable) or disposed of at a licensed facility. ▪ Spill response equipment will be located in the vicinity of work areas, with site personnel trained in spill response management. ▪ The proposed fuel storage tanks to service the machinery will be required to comply fully with the Australian Standard 1940:2004 The Storage and Handling of Flammable and Combustible Liquids. This standard specifies requirements for security, bunding, signage, fire protection and handling.	▪ The objective of ensuring that emissions do not adversely affect environmental values or the health, welfare and amenity of people and land will be met through managing adverse construction impacts in accordance with Australian Standard 1940-2004, Guideline No. 1: Controlling Waste Generators (DoE, 2004a). ▪ The management of general and hazardous waste is expected to result in negligible environmental impacts.
Visual Amenity	▪ To ensure that aesthetic values are considered and measures are adopted to reduce visual impacts on the landscape to as low as reasonably practicable.	▪ Views of “natural” vegetation will be altered by the addition of a “man-made” excavation pit	▪ The pit design will be such that natural topography and sand bunds will be utilised to shield the view of the mine from surrounding land uses. ▪ Ensure barrier fences and gates are compatible with the semi-rural style of the surround land areas and natural landscape. ▪ Ensure orderly storage and removal of disused equipment or waste.	▪ The predicted outcome of the quarry operations will be a minor change in the nature of the natural vegetation in each area with an increased element of “man-made” structures impacting on the view-scape. ▪ Considering the limited surround land uses, the impact on visual amenity is expected to be minimal.
Aboriginal Heritage	▪ To ensure that changes to the biophysical environment do not adversely affect historical and cultural associations and comply with relevant heritage legislation.	▪ Damage or loss to Aboriginal heritage sites	▪ Any significant sites identified during construction will not be removed, damaged or altered without approval under Section 18 of the Aboriginal Heritage Act 1972. ▪ Training will be provided to all construction workers detailing the importance of avoiding heritage sites and reporting of any suspected heritage sites. Exclusion zones will also be identified and clearly communicated to project personnel in the event of a heritage site being uncovered.	▪ Significant sites identified from the Aboriginal Sites register and during construction will not be removed, damaged or altered without approval under Section 18 of the Aboriginal Heritage Act 1972. ▪ Only one registered “other heritage site” occurs within one of the tenements, so impact is expected to be minimal.

8.0 REFERENCES

Bettenay, E., McArthur, W.M. and Hingston, F.J. 1960, *The Soil Associations of Part of the Swan Coastal Plain, Western Australia,* CSIRO Division of Sois, Soil and Land Use Series No. 35.

Bureau of Meteorology (BoM) 2012, Climate Statistics for RAAF Pearce (Station No. 09053), http://www.bom.gov.au/climate/averages/tables/cw_009053.shtml

Department of Environment and Conservation (DEC) 2012, Contaminated Sites Database, https://secure.dec.wa.gov.au/idelve/css/, accessed March 2012.

Department of Environment and Conservation (DEC) 2012, Dieback Consultative Council, http://www.dec.wa.gov.au/content/view/316/97/, accessed April 2012.

Department of Environment and Conservation (DEC) 2011, *Plants used by Carnaby's Black Cockatoo*, list prepared by Christine Groom, 15 April 2011.

Department of Environment and Conservation 2008, Draft - *A Guideline for the Development and Implementation of a Dust Management Program*, May 2008

Department of Environment (DoE) 2003, *General Guidance on Managing Acid Sulfate Soils*, August 2003.

Department of Sustainability, Environment, Water, Population and Communities (DSEWPC) 2012, Australia's Bioregions (IBRA), /http://www.environment.gov.au/parks/nrs/science/bioregion-framework/ibra/#ibrabioregions

Department of Sustainability, Environment, Water, Population and Communities (DSEWPC) 2012, EPBC Protected Matters Search Tool, http://www.environment.gov.au/epbc/pmst/index.html, accessed March 2012.

Dieback Working Group 2005, "Best Practice Guidelines: Management of *Phytophthora* Dieback in Extractive Industries".

Environmental Protection Authority (EPA) 2005, Guidance for the Assessment of Environmental Factors No. 3: *Separation Distances between Industrial and Sensitive Land Uses*, June 2005.

Environmental Protection Authority (EPA) 2000, Guidance for the Assessment of Environmental Factors No 18: *Prevention of air quality impacts from land development sites.*

Maher, K 2009, "Restoration of *Banksia* woodland after the removal of pines at Gnangara: seed species requirements and prescriptions for restoration", report prepared on behalf of the Department of Environment and Conservation for the Gnangara Suitability Strategy.

Mitchell, D, Williams, K & Desmond, A 2002, *Swan Coastal Plain 2 (SWA2 – Swan Coastal Plain subregion)*, Department of Conservation and Land Management, January 2002.

Rocla Quarry Products 2002, *Environmental Policy*, The Amatek Group, Perth.

Water and Rivers Commission 1999, Statewide Policy No. 1: Policy and Guidelines for Construction and Silica Sand Mining in Public Drinking Water Source Areas.

FIGURES

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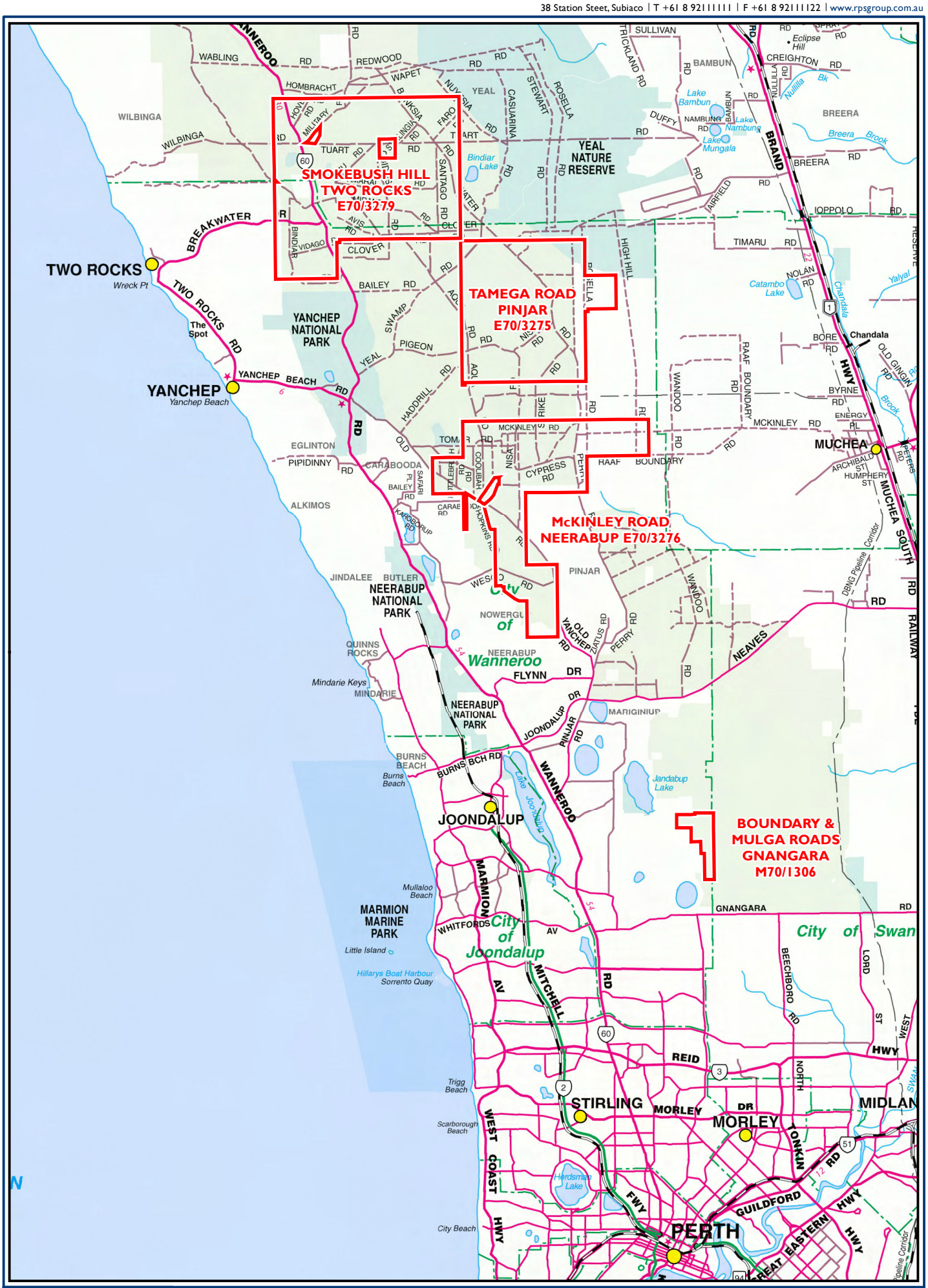

RPS

Job Number: L11438
Date: 17.10.12
Scale: Map - 1:250000 @ A4
Version: A
Drafted by: SC
Source: Landgate, 2008

0 1.25 2.5 5 7.5 10 km

Figure 1

Site Location

38 Station Steet, Subiaco | T +61 8 92111111 | F +61 8 92111122 | www.rpsgroup.com.au

WILBINGA
COONABIDGEE
LENNARD BROOK
BAMBUN
BREERA
YEAL
Conservation Park
SMOKEBUSH HILL
TWO ROCKS
E70/3279
Yeal Nature Reserve
TWO ROCKS
CHITTERING
TAMEGA ROAD
PINJAR
E70/3275
YANCHEP
Yanchep National Park
MUCHEA
Gnangara-Moore River State Forest
McKINLEY ROAD NEERABUP E70/3276
EGLINTON
CARABOODA
ALKIMOS
PINJAR
Neerabup Nature Reserve
NOWERGUP
JINDALEE
BUTLER
BULLSBROOK
RIDGEWOOD
QUINNS ROCKS
MERRIWA
NEERABUP
Gnangara-Moore River State Forest
CLARKSON
MINDARIE
Neerabup National Park
BANKSIA GROVE
CARRAMAR
TAMALA PARK
MARIGINIUP
MELALEUCA
KINROSS
BURNS BEACH
TAPPING
ASHBY
JANDABUP
CURRAMBINE
ILUKA
JOONDALUP
Lake Joondalup Nature Reserve
SINAGRA
Jandabup Nature Reserve
CONNOLLY
WANNEROO
BOUNDARY & MULGA ROADS
GNANGARA
M70/1306
OCEAN REEF
HEATHRIDGE
EDGEWATER
HOCKING
BELDON
GNANGARA
LEXIA
MULLALOO
PEARSALL
CRAIGIE
WOODVALE
KALLAROO
WANGARA
HILLARYS
PADBURY
KINGSLEY
MADELEY
DARCH
LANDSDALE
CULLACABARDEE
WHITEMAN

LEGEND
- Tenement Boundary

DEC Estate
- 5(1)(g) Reserve (Limestone Quarry)
- Conservation Park
- Miscellaneous Reserve
- National Park
- Nature Reserve
- State Forest

RPS

Job Number: L11438
Date: 17.10.12
Scale: 1:125000 @ A3
Revision: A
Drafted by: SC
Source: Orthophoto - Landgate Estates - DEC, 16.10.12

0 0.75 1.5 3 4.5 6 km

Figure 2

Site Context

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LEGEND

- Tenement Boundary E70 3279
- Proposed Excavation Area (6092ha)
- EPP Lake
- Bush Forever Boundary
- 50m Bush Forever Buffer
- Conservation Category Wetland
- Resource Enhancement Wetland
- 50m Conservation Category Wetland Buffer
- 30m Resource Enhancement Wetland Buffer
- High to Moderate Risk ASS
- 50m High to Moderate Risk of ASS Buffer
- Aboriginal Heritage Site
- 50m Aboriginal Heritage Site Buffer

WAPET RD
COCKATOO RD
WABLING RD
REDWOOD RD
CHRISTMAS RD
HOMBRACHT RD
MILJIAM RD
BORONIA RD
NUYTSIA RD
SHEOAK RD
406
HOVEA RD
STYGIA RD
STIRLINGIA RD
FARO RD
WILBINGA RD
TUART RD
BANKSIA RD
ACACIA RD
ACTION REQUIRED
EMU RD
E70 3279
IRMA RD
MOORE RD
WATER RD
CARABAH RD
AMARAL RD
BUSHWOOD FOLW
SMOKEBUSH RD
396
HYDRO RD
CALLITRIS RD
SANTAGO RD
BREAKWATER DR
BINDIA RD
TRINGA RD
AVIS RD
MIRANDA RD
127
CLOVER RD
OBIDOS RD
MISTLETOE RD
VIDAGO RD
LAGOS RD
WANNEROO RD
284
128
MITCHELL FWY
0
BAILEY RD
381
YEAL TRK
YEAL SWAMP RD
CURLEW RD
SCABRA RD
CHAT RD
AQUA RD
MIDDLETON RD
288
GHOST HOUSE RD
PIPIT RD
HAWK RD
BRUSH RD
ROBIN RD
CHAPMAN RD

Job Number: L11438
Date: 23.11.12
Scale: 1:40000 @ A3
Revision: A
Drafted by: SC
Source: Orthophoto - Landgate, 2011 Bush Forever - DPL, 30.09.09 Wetlands - DEC, 25.09.12 EPP - DEC, 1992 ASS - DEC, 25.01.11 Heritage Sites - DIA, 2012

0 0.25 0.5 1 1.5 2 km

RPS

Figure 3a

Proposed Excavation Area

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LEGEND

- Tenement Boundary E70 3275
- Proposed Excavation Area (3595ha)
- EPP Lake
- Bush Forever Boundary
- 50m Bush Forever Buffer
- Conservation Category Wetland
- Resource Enhancement Wetland
- 30m Resource Enhancement Wetland Buffer
- 50m Conservation Category Wetland Buffer
- High to Moderate Risk ASS
- 50m High to Moderate Risk of ASS Buffer
- Monitor Bore
- Production Bore
- Observation Bore

STEWART RD
CLOVER RD
DUNNART RD
SWAN RD
YEAL SWAMP RD
CURLEW RD
WATER RD
PERRY RD
ROSELLA RD
CHAT RD
SWALLOW RD
285
SCABRA RD
CHAT RD
CHAPMAN RD
94
286
ROBIN RD
380
E70 3275
DAVIESIA RD
WAGTAIL RD
PARROT RD
NISA RD
WREN RD
SWIFT RD
BANJO RD
381
PIGEON RD
TAMEGA RD
FOX RD
DUNE RD
145
P140
P140
P145
FROG RD
SHRIKE RD
381
P130
P130
410
408
DINGO RD
KESTREL RD
P120
0
PERRY RD
AQUA RD
409
P110
P110
PARROT RD

RPS

Job Number: L11438
Date: 18.10.12
Scale: 1:30000 @ A3
Revision: A
Drafted by: SC
Source: Orthophoto - Landgate, 2011 Bush Forever - DPL, 30.09.09 Wetlands - DEC, 25.09.12 EPP - DEC, 1992 ASS - DEC, 25.01.11 Heritage Sites - DIA, 2012

0 125 250 500 750 1,000 m

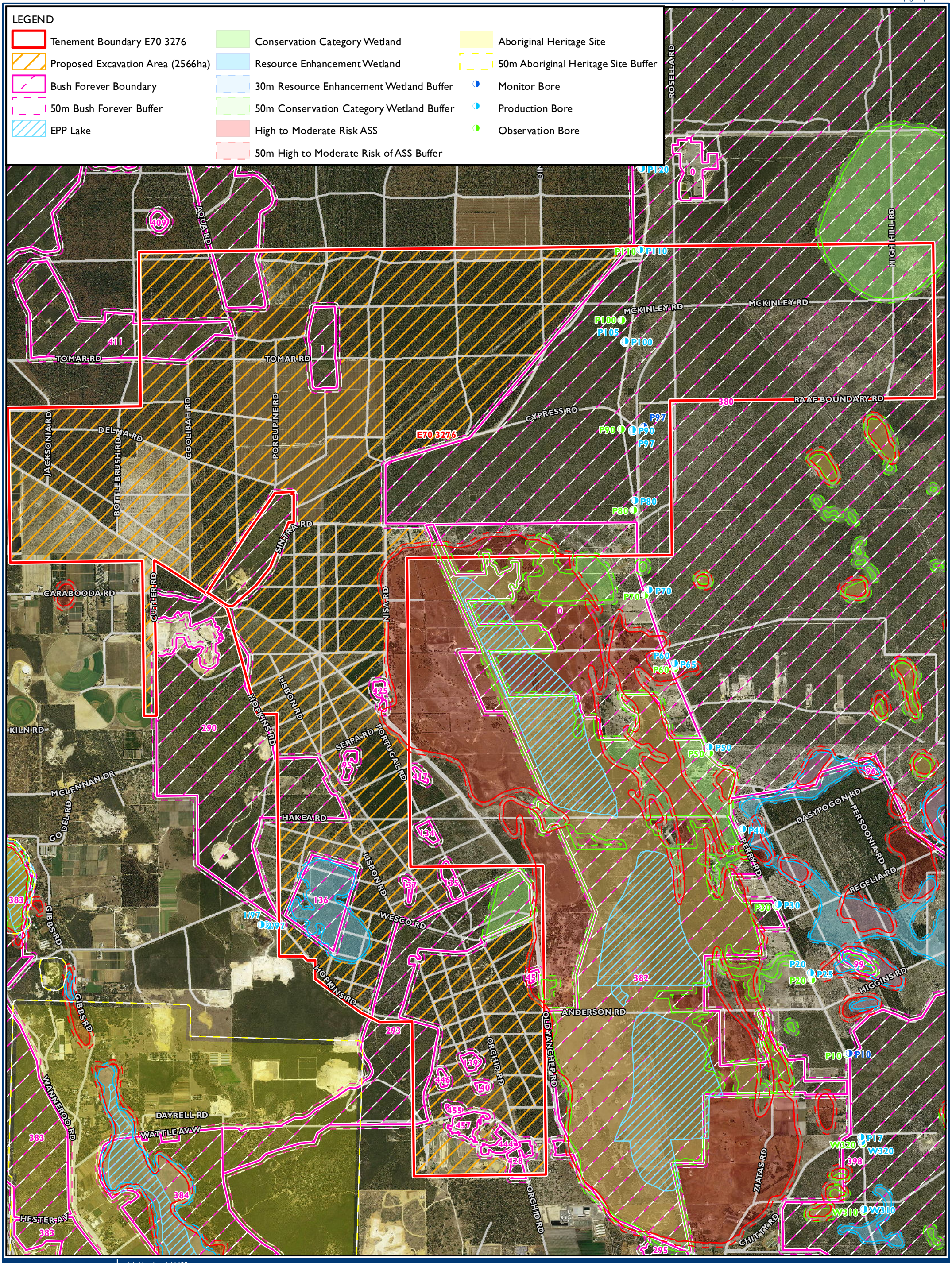
Figure 3b

Proposed Excavation Area

38 Station Steet, Subiaco | T +61 8 92111111 | F +61 8 92111122 | www.rpsgroup.com.au

LEGEND

- Tenement Boundary E70 3276
- Proposed Excavation Area (2566ha)
- Bush Forever Boundary
- 50m Bush Forever Buffer
- EPP Lake
- Conservation Category Wetland
- Resource Enhancement Wetland
- 30m Resource Enhancement Wetland Buffer
- 50m Conservation Category Wetland Buffer
- High to Moderate Risk ASS
- 50m High to Moderate Risk of ASS Buffer
- Aboriginal Heritage Site
- 50m Aboriginal Heritage Site Buffer
- Monitor Bore
- Production Bore
- Observation Bore



RPS

Job Number: L11438
Date: 18.10.12
Scale: 1:40000 @ A3
Revision: A
Drafted by: SC
Source: Orthophoto - Landgate Bush Forever - DPL, 30.09.09 Wetlands - DEC, 25.09.12 EPP - DEC, 1992 ASS - DEC, 25.01.11 Heritage Sites - DIA, 2012

0 0.25 0.5 1 1.5 2 km

Figure 3c

Proposed Excavation Area

38 Station Steet, Subiaco | T +61 8 92111111 | F +61 8 92111122 | www.rpsgroup.com.au

MULGA RD
WARBROOK RD
BUSH FOREVER SITE 326
ROSS ST
M70/1306
GIRONDE RD
PINE CREST WY
STONEY RD
JOYCE RD
STEEL RD
SYDNEY RD
FACEY RD
TURKEY RD
CLUBHOUSE L
KNIGHT RD
LENZO CT
LORIAN RD
HERITAGE TCE
VINTAGE L
TRAINOR RD
BUSH FOREVER SITE 193

LEGEND

- Tenement Boundary M70/1306
- Proposed Excavation Area (217ha)
- Bush Forever Boundary
- 50m Bush Forever Buffer
- Conservation Category Wetland
- Resource Enhancement Wetland
- 30m Resource Enhancement Wetland Buffer
- 50m Conservation Category Wetland Buffer
- High to Moderate Risk ASS
- 50m High to Moderate Risk of ASS Buffer

RPS

Job Number: L11438
Date: 22.05.12
Scale: 1:10000 @ A3
Revision: A
Drafted by: SC
Source: Orthophoto - Landgate Bush Forever - DPI, 30.09.09 Wetlands - DEC, 19.10.12 EPP - DEC, 1997 ASS - DEC, 25.01.11

0 50 100 200 300 400 m

Figure 3d

Proposed Excavation Area

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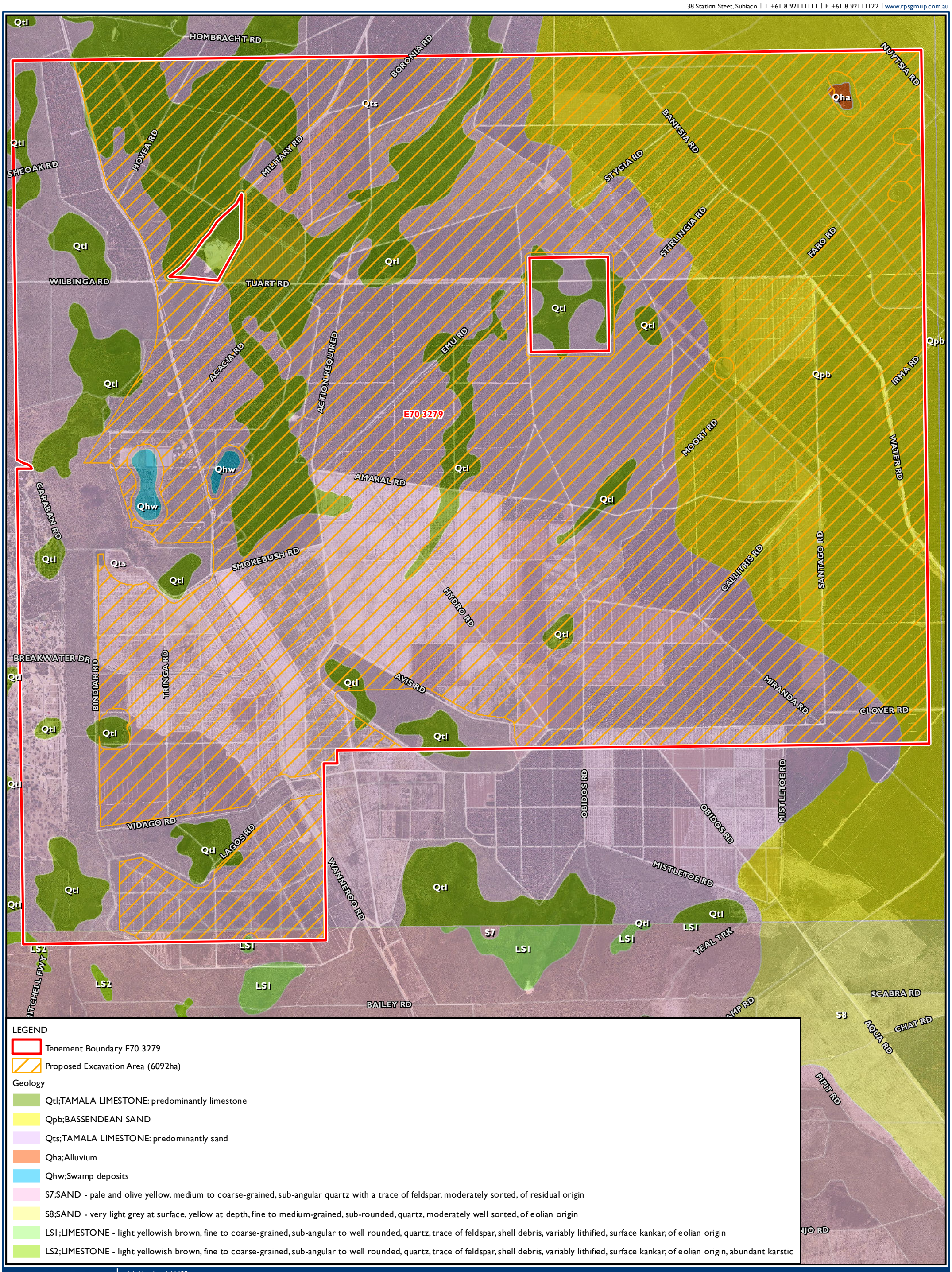


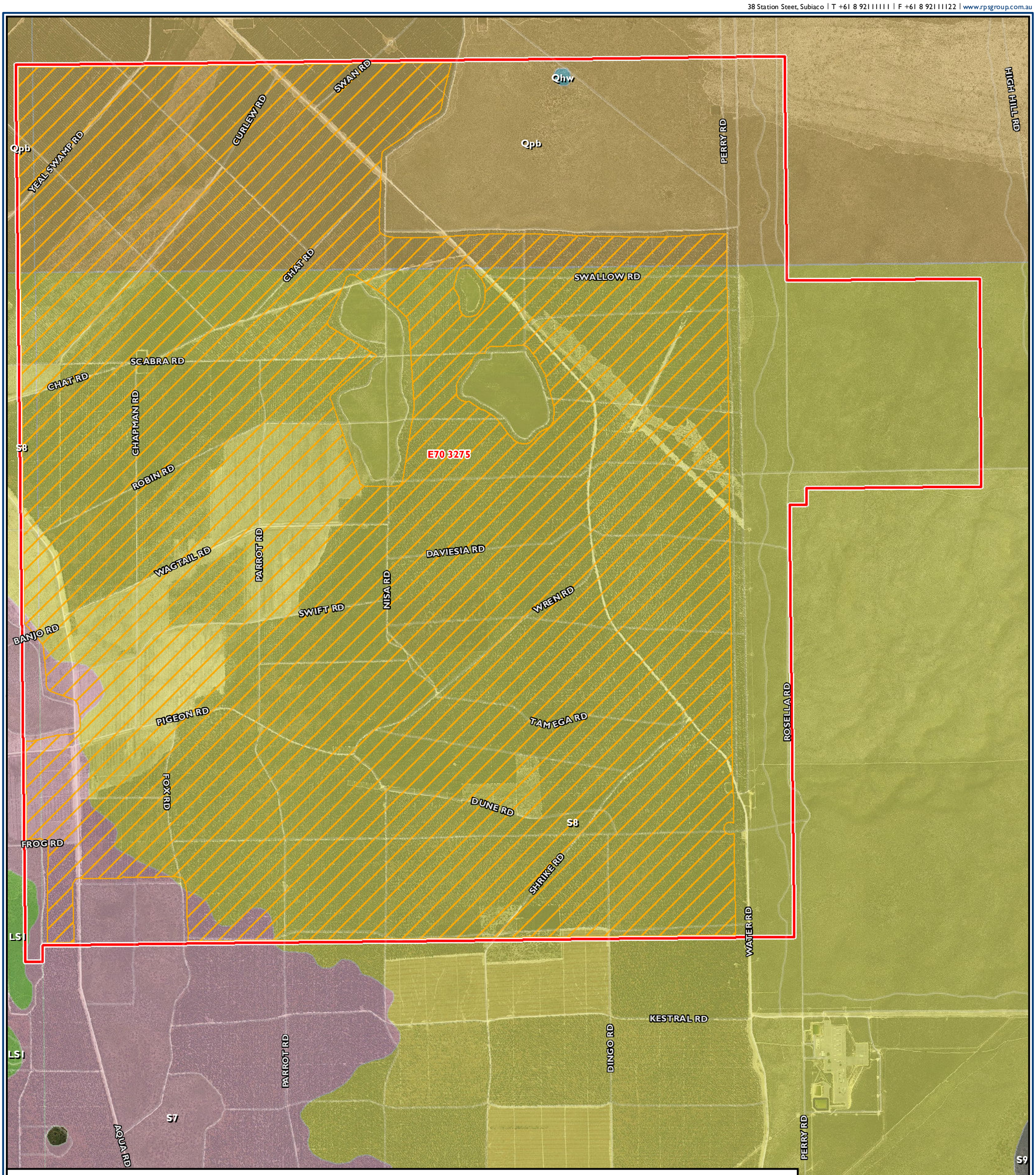
RPS

Job Number: L11438
Date: 23.11.12
Scale: 1:35000 @ A3
Revision: A
Drafted by: SC
Source: Orthophoto - Landgate Geology - DoIR, 1999

Figure 4a

Geology

38 Station Steet, Subiaco | T +61 8 92111111 | F +61 8 92111122 | www.rpsgroup.com.au



LEGEND

- Tenement Boundary E70 3275
- Proposed Excavation Area (3595ha)

Geology

- LS1:LIMESTONE - light yellowish brown, fine to coarse-grained, sub-angular to well rounded, quartz, trace of feldspar, shell debris, variably lithified, surface kankar, of eolian origin
- Qhw:Swamp deposits
- Qpb:BASSENDEAN SAND
- S7:SAND - pale and olive yellow, medium to coarse-grained, sub-angular quartz with a trace of feldspar, moderately sorted, of residual origin
- S8:SAND - very light grey at surface, yellow at depth, fine to medium-grained, sub-rounded quartz, moderately well sorted of eolian origin
- S9:SAND - yellowish brown, medium to coarse-grained, angular to sub-rounded, quartz, some fine grained pisolitic laterite, little fines, of lacustrine origin

RPS

Job Number: L11438
Date: 19.10.12
Scale: 1:30000 @ A3
Revision: A
Drafted by: SC
Source: Orthophoto - Landgate Geology - DoIR, 1999

0 125 250 500 750 1,000 metres

Figure 4b

Geology

38 Station Steet, Subiaco | T +61 8 92111111 | F +61 8 92111122 | www.rpsgroup.com.au

LEGEND

Tenement Boundary E70 3276

Proposed Excavation Area (2566ha)

Geology

Cps:PEATY CLAY - dark grey and black with variable sand content, of lacustrine origin

LS1:LIMESTONE - light yellowish brown, fine to coarse-grained, sub-angular to well rounded, quartz, a trace of feldspar, shell debris, variably lithified, surface kankar of eolian origin

LS2:LIMESTONE - light yellowish brown, fine to coarse-grained, sub-angular to well rounded, quartz, a trace of feldspar, shell debris, variably lithified, surface kankar of eolian origin

S4:SAND - greyish brown, medium to coarse-grained, quartz, variable silt content, moderately well sorted, of lacustrine origin

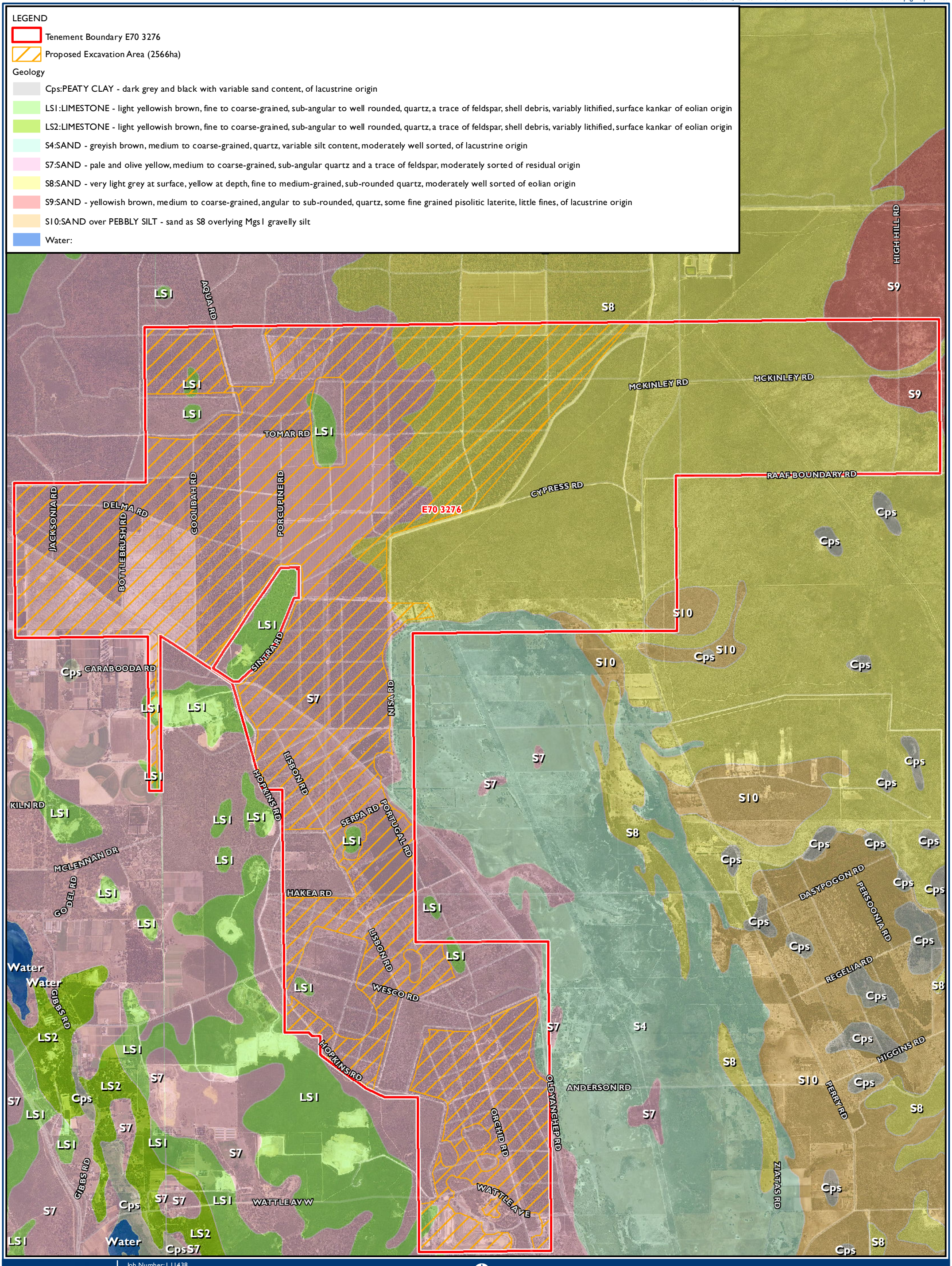
S7:SAND - pale and olive yellow, medium to coarse-grained, sub-angular quartz and a trace of feldspar, moderately sorted of residual origin

S8:SAND - very light grey at surface, yellow at depth, fine to medium-grained, sub-rounded quartz, moderately well sorted of eolian origin

S9:SAND - yellowish brown, medium to coarse-grained, angular to sub-rounded, quartz, some fine grained pisolitic laterite, little fines, of lacustrine origin

S10:SAND over PEBBLY SILT - sand as S8 overlying Mgs1 gravelly silt

Water:



Job Number: L11438
Date: 22.10.12
Scale: 1:40000 @ A3
Revision: A
Drafted by: SC
Source: Orthophoto - Landgate Geology - DoIR, 1999

0 0.25 0.5 1 1.5 2 km

Figure 4c

Geology

38 Station Steet, Subiaco | T +61 8 92111111 | F +61 8 92111122 | www.rpsgroup.com.au

S8
S10
S8
S10
MULGA RD
S10
WARBROOK RD
Cps
Cps
Cps
S10
ROSS ST
Cps
Cps
Cps
M70/1306
Water
Cps
Cps
GIRONDE RD
Cps
S8
PINE CREST WY
STEEL RD
STONEY RD
JOYCE RD
Cps
Cps
SYDNEY RD
Cps
FACEY RD
STEEL RD
TURKEY RD
CLUBHOUSE L
S10
KNIGHT RD
G2
LENZO CT
LAKELANDS DR
TRAINOR RD
TRAINOR RD

LEGEND

- Tenement Boundary M70/1306
- Proposed Excavation Area (217ha)

Geology

- S8: SAND - very light grey at surface, yellow at depth, fine to medium-grained, sub-rounded quartz, moderately well sorted of eolian origin
- S10: SAND - very light grey at surface, yellow at depth, fine to medium-grained, sub-rounded quartz, moderately well sorted of eolian origin
- G2: GRAVEL - strong brown, coarse, sub-rounded to rounded lateritised granite pebbles in clay-silt mixture, moderately sorted, of colluvial origin
- Cps: PEATY CLAY - dark grey and black with variable sand content of lacustrine origin
- Water:

RPS

Job Number: L11438
Date: 10.01.12
Scale: 1:10000 @ A3
Revision: A
Drafted by: SC
Source: Orthophoto - Landgate Geology - DoIR, 1999

0 62.5 125 250 375 500 m

Figure 4d

Geology

38 Station Steet, Subiaco | T +61 8 92111111 | F +61 8 92111122 | www.rpsgroup.com.au

LEGEND

- Tenement Boundary E70 3279
- Proposed Excavation Area (6092ha)
- Cadastre

Acid Sulfate Soil Risk Mapping

- High to Moderate Risk
- Moderate to Low Risk
- 50m High to Moderate Risk of ASS Buffer

WEDGETAIL RD
COCKATOO RD
WAPET RD
WABLING RD
REDWOOD RD
CHRISTMAS RD
HOMBRACHT RD
MILJTARY RD
BORONIA RD
NUYTSIA RD
HOVEA RD
SHEOAK RD
STYGIA RD
STIRLINGIA RD
FARO RD
BANKSIA RD
TUART RD
WILBINGA RD
ACTION REQUIRED
AGACIA RD
EMU RD
IRMA RD
E70 3279
MOORT RD
WATER RD
CARABAN RD
BUSHWOOD FOLW
AMARAL RD
SMOKEBUSH RD
HYDRO RD
CALLITRIS RD
SANTAGO RD
BREAKWATER DR
BINDIAR RD
TRINGA RD
AVIS RD
MIRANDA RD
CLOVER RD
VIDAGO RD
LAGOS RD
WANNEROO RD
OBIDOS RD
OBIDOS RD
MISTLETOE RD
MISTLETOE RD
MITCHELL FWY
YEAL TRK
YEAL SWAMP RD
CURLEW RD
BAILEY RD
SCABRA RD
CHAT RD
AQUA RD
MIDDLETON RD
FIPIT RD
CHAPMAN RD
HAWK RD
BRUSH RD
ROBIN RD
GHOST HOUSE RD

Job Number: L11438
Date: 23.11.12
Scale: 1:40000 @ A3
Revision: A
Drafted by: SC
Source: Orthophoto - Landgate, 2011 ASS - DEC, 25.01.10

RPS

0 0.25 0.5 1 1.5 2 km

Figure 5a

Acid Sulfate Soils Risk Mapping

38 Station Steet, Subiaco | T +61 8 92111111 | F +61 8 92111122 | www.rpsgroup.com.au

LEGEND

- Tenement Boundary E70 3275
- Proposed Excavation Area (3595ha)
- Cadastre

Acid Sulfate Soil Risk Mapping

- High to Moderate Risk
- Moderate to Low Risk
- 50m High to Moderate Risk of ASS Buffer

STEWART RD
CLOVER RD
DUNNART RD
HILL RD
YEAL SWAMP RD
CURLEWARD
SWAN RD
WATER RD
PERRY RD
ROSELLA RD
CHAT RD
SWALLOW RD
SCABRA RD
CHAT RD
CHAPMAN RD
ROBIN RD
E70 3275
PARROT RD
DAVIESIA RD
WAGTAIL RD
NISA RD
WREN RD
SWIFT RD
BANJO RD
PIGEON RD
TAMEGA RD
FOX RD
DUNE RD
FROG RD
SHRIKE RD
DINGO RD
KESTRAL RD
AQUA RD
PARROT RD
PERRY RD

RPS

Job Number: L11438
Date: 18.10.12
Scale: 1:30000 @ A3
Revision: A
Drafted by: SC
Source: Orthophoto - Landgate, 2011 ASS - DEC, 25.01.10

0 125 250 500 750 1,000 m

Figure 5b

Acid Sulfate Soils Risk Mapping

38 Station Steet, Subiaco | T +61 8 92111111 | F +61 8 92111122 | www.rpsgroup.com.au

LEGEND

- Tenement Boundary E70 3276
- Proposed Excavation Area (2566ha)
- Cadastre

Acid Sulfate Soil Risk Mapping

- High to Moderate Risk
- Moderate to Low Risk
- 50m High to Moderate Risk of ASS Buffer

FOX RD
PARROT RD
SHRIKE RD
WATER RD
ROSELLA RD
KESTRAL RD
DINGO RD
HIGH HILL RD
AQUA RD
MCKINLEY RD
TOMAR RD
RAAF BOUNDARY RD
CYPRESS RD
E70 3276
JACKSONIA RD
DELMA RD
BOTTLEBRUSH RD
COOLIBAH RD
PORCUPINE RD
SINTRA RD
CARABOODA RD
CUTHER RD
NISA RD
HOPKINS RD
LISBON RD
KILN RD
SERPA RD
PORTUGAL RD
MCLENNAN DR
GODEL RD
HAKEA RD
DASYPOGON RD
PERSOONIA RD
REGELIA RD
GIBBS RD
WESCO RD
PERRY RD
HIGGINS RD
OLD YANCHEP RD
ANDERSON RD
ORCHID RD
WATTLE AVE
WANNEROO RD
DAYRELL RD
WATTLE AV W
ZIATAS RD
OLD WEST RD
CHITTY RD
HESTER AV

RPS

Job Number: L11438
Date: 18.10.12
Scale: 1:40000 @ A3
Revision: A
Drafted by: SC
Source: Orthophoto - Landgate ASS - DEC, 25.01.10

0 0.25 0.5 1 1.5 2 km

Figure 5c

Acid Sulfate Soils Risk Mapping

38 Station Steet, Subiaco | T +61 8 92111111 | F +61 8 92111122 | www.rpsgroup.com.au

MULGA RD
WARBROOK RD
ROSS ST
M70/1306
GIRONDE RD
PINE CREST WY
STEEL RD
STONEY RD
JOYCE RD
SYDNEY RD
FACEY RD
TURKEY RD
CLUBHOUSE L
KNIGHT RD
LENZO CT
LAKELANDS DR
LORIAN RD
HERITAGE TCE
VINTAGE L
TRAINOR RD

LEGEND

- Tenement Boundary M70/1306
- Proposed Excavation Area (217ha)
- Cadastre

Acid Sulfate Soil Risk Mapping

- High to Moderate Risk
- Moderate to Low Risk
- 50m High to Moderate Risk of ASS Buffer

RPS

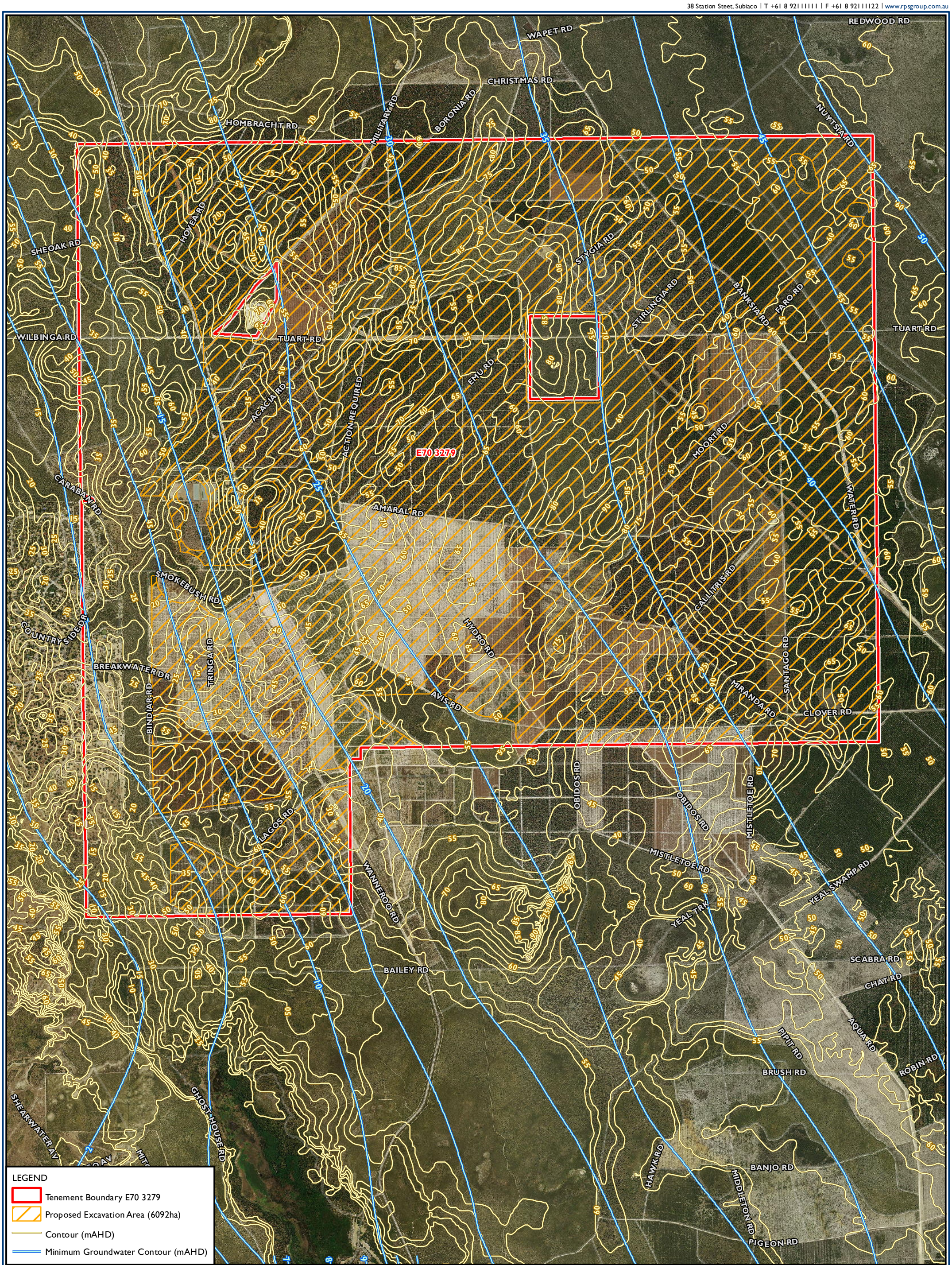
Job Number: L11438
Date: 22.05.12
Scale: 1:10000 @ A3
Revision: A
Drafted by: SC
Source: Orthophoto - Landgate ASS - DEC, 25.01.10

0 50 100 200 300 400 m

Figure 5d

Acid Sulfate Soils Risk Mapping

38 Station Steet, Subiaco | T +61 8 92111111 | F +61 8 92111122 | www.rpsgroup.com.au



RPS

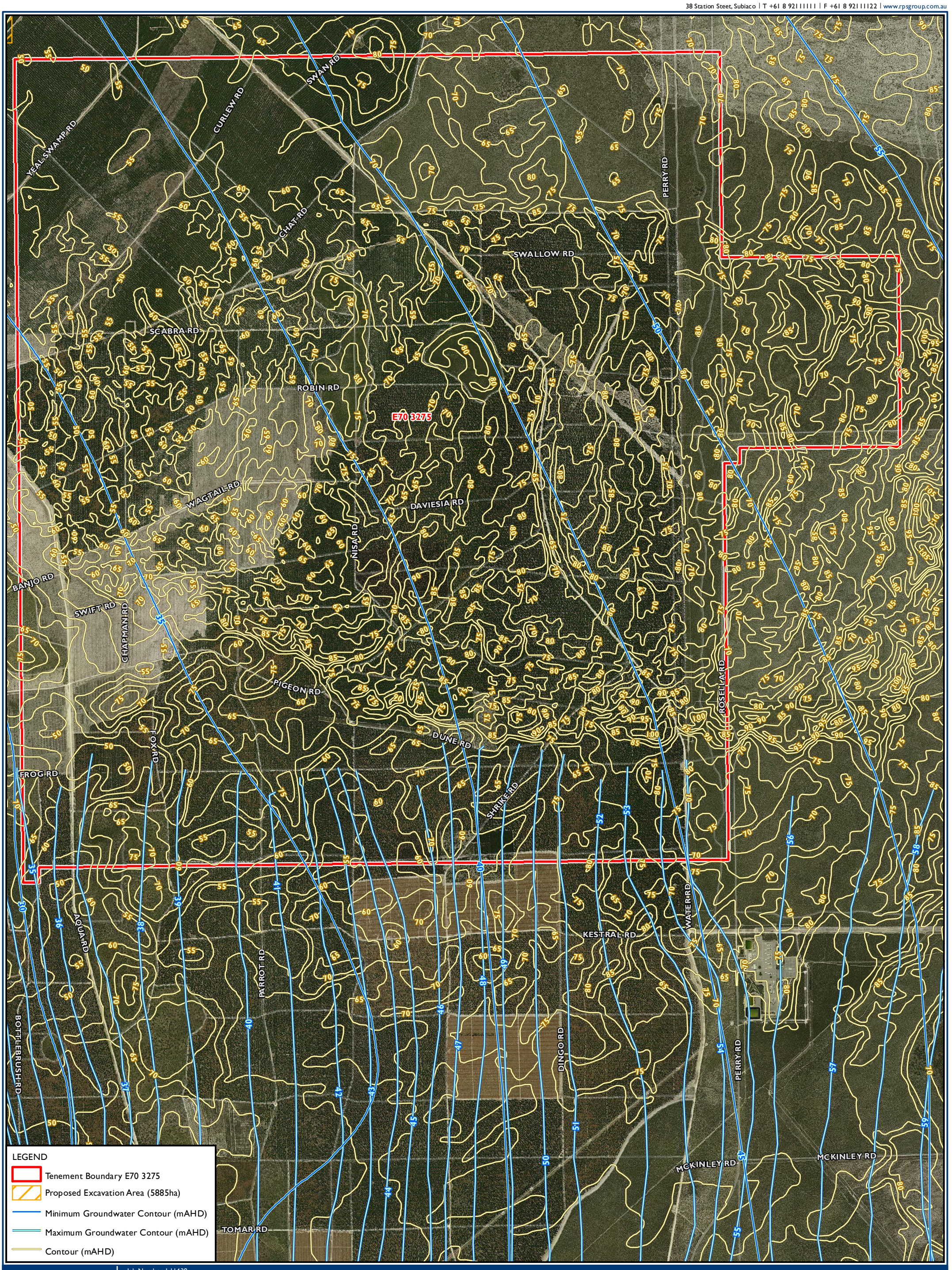
Job Number: L11438
Date: 23.11.12
Scale: 1:40000 @ A3
Revision: A
Drafted by: SC
Source: Orthophoto - Landgate Contours - Landgate Groundwater Contours - DoW, 2006

0 0.25 0.5 1 1.5 2 km

Figure 6a

Topography and Groundwater

38 Station Steet, Subiaco | T +61 8 92111111 | F +61 8 92111122 | www.rpsgroup.com.au



RPS

Job Number: L11438
Date: 19.10.12
Scale: 1:30000 @ A3
Revision: A
Drafted by: SC
Source: Orthophoto - Landgate Contours - Landgate Groundwater Contours - DoW, 2006

0 125 250 500 750 1,000 metres

Figure 6b

Topography and Groundwater Contours

38 Station Steet, Subiaco | T +61 8 92111111 | F +61 8 92111122 | www.rpsgroup.com.au

LEGEND

- Tenement Boundary E70 3276
- Proposed Excavation Area (2566ha)
- Contour (mAHD)
- Maximum Groundwater Contour (mAHD)

E70 3276

MARDO RD
FOX RD
PARROT RD
KESTRAL RD
DINGO RD
WATER RD
ROSELLA RD
HIGH HILL RD
AQUA RD
SHRIKE RD
MCKINLEY RD
TOMAR RD
JACKSONIA RD
DELMA RD
BOTTLEBRUSH RD
COOLIBAH RD
PORCUPINE RD
RAAF BOUNDARY RD
CYPRESS RD
SINTRA RD
GARABOODA RD
CUTLER RD
NISA RD
LISBON RD
SERPA RD
HOPKINS RD
HAKEA RD
WESCO RD
DASYPOGON RD
PERSOONIA RD
REGELIA RD
PERRY RD
HIGGINS RD
ANDERSON RD
OLDYANCHEP RD
ORCHID RD
WATTLE AV W
WATTLE AVE
ZIATAS RD
OLD WEST RD
CHITTY RD
SPENCE RD
PEDERICK RD
MATHER DR
GIBBS RD
DAYRELL RD

RPS

Job Number: L11438
Date: 22.10.12
Scale: 1:40000 @ A3
Revision: A
Drafted by: SC
Source: Orthophoto - Landgate Contours - Landgate Groundwater Contours - DoW, 2006

0 0.25 0.5 1 1.5 2 km

Figure 6c

Topography and Groundwater Contours

38 Station Steet, Subiaco | T +61 8 92111111 | F +61 8 92111122 | www.rpsgroup.com.au

MULGA RD
WARBROOK RD
ROSS ST
M70/1306
GIRONDE RD
STONEY RD
PINECREST WY
JOYCE RD
STEEL RD
SYDNEY RD
FACEY RD
TURKEY RD
CLUBHOUSE L
LAKELANDS DR
LENZO CT
KNIGHT RD
LORIAN RD
HERITAGE TCE
VINTAGE L
TRAINOR RD
TRAINOR RD

LEGEND
- Tenement Boundary M70/1306
- Proposed Excavation Area (217ha)
- Contour (mAHD)
- Maximum Groundwater Contour (mAHD)

RPS

Job Number: L11438
Date: 22.10.12
Scale: 1:10000 @ A3
Revision: A
Drafted by: SC
Source: Orthophoto - Landgate Contours - Landgate Groundwater Contours - DoW, 2006

0 62.5 125 250 375 500 m

Figure 6d

Topography and Groundwater

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LEGEND

- Tenement Boundary E70 3279
- Proposed Excavation Area (6092ha)
- EPP Lake

Wetland Mapping

- Conservation
- Resource Enhancement
- Multiple Use
- 50m Conservation Category Wetland Buffer
- 30m Resource Enhancement Wetland Buffer

E70 3279

WEDGETAIL RD
COCKATOO RD
REDWOOD RD
WAPET RD
CHRISTMAS RD
HOMBRACHT RD
MILITARY RD
BORONIA RD
NUYTSIA RD
SHEOAK RD
HOVEA RD
STYGIA RD
STIRLINGIA RD
FARO RD
BANKSIA RD
TUART RD
WILBINGA RD
IRMA RD
ACACIA RD
ACTION REQUIRED
EMU RD
MOORT RD
WATER RD
CARABAN RD
BUSHWOOD FOLW
AMARAL RD
SMOKEBUSH RD
HYDRO RD
CALLITRIS RD
SANTAGO RD
BREAKWATER DR
BINDIA RD
TRINGA RD
AVIS RD
MIRANDA RD
CLOVER RD
VIDAGO RD
LAGOS RD
WANNEROO RD
OBIDOS RD
MISTLETOE RD
MITCHELL FWY
BAILEY RD
YEAL TRK
YEAL SWAMP RD
CURLEW RD
SCABRA RD
CHAT RD
AQUA RD
MIDDLETON RD
PIPIT RD
HAWK RD
BRUSH RD
ROBIN RD
CHAPMAN RD
GHOST HOUSE RD

UFI 9865, UFI 9715, UFI 10013, UFI 10211, UFI 10011, UFI 10012, UFI 9864, UFI 9716, UFI 8002, UFI 8003, UFI 8010, UFI 10304, UFI 10305, UFI 10306, UFI 10498, UFI 10500, UFI 10443, UFI 10445, UFI 10444, UFI 10446, UFI 10499, UFI 10447, UFI 10570, UFI 10435, UFI 10493, UFI 10494, UFI 10436, UFI 10571, UFI 10437, UFI 10572, UFI 10303, UFI 10495, UFI 10496, UFI 10438, UFI 10590, UFI 10451, UFI 10448, UFI 10449, UFI 10450, UFI 10307, UFI 10582, UFI 10583, UFI 10587, UFI 10588, UFI 10589, UFI 10596, UFI 10597, UFI 10593, UFI 10595

Job Number: L11438
Date: 23.11.12
Scale: 1:40000 @ A3
Revision: A
Drafted by: SC
Source: Orthophoto - Landgate, 2011 Wetlands - DEC, 25.09.12 EPP - DEC, 1992

0 0.25 0.5 1 1.5 2 km

Figure 7a

Hydrology

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LEGEND

- Tenement Boundary E70 3275
- Proposed Excavation Area (3595ha)
- Cadastre

Wetland Mapping

- Conservation Category Wetland
- Resource Enhancement Wetland
- Multiple Use
- 50m Conservation Category Wetland Buffer
- 30m Resource Enhancement Wetland Buffer

UFI 10593
UFI 10785
UFI 10729
UFI 10725
UFI 10885
UFI 10598
UFI 10594
UFI 10781
UFI 10786
UFI 10732
UFI 10887
UFI 10886
UFI 10787
UFI 10733
UFI 10888
UFI 10734
UFI 10592
UFI 10788
UFI 10735
UFI 10736
UFI 10737
UFI 10720
UFI 10775
UFI 10774
UFI 10721
UFI 10722
UFI 10882
UFI 7936

STEWART RD
CLOVER RD
DUNNART RD
SWAN RD
YEAL SWAMP RD
CURLEW RD
WATER RD
ROSELLA RD
PERRY RD
CHAT RD
SWALLOW RD
SCABRA RD
CHAPMAN RD
ROBIN RD
E70 3275
PARROT RD
DAVIESIA RD
WAGTAIL RD
NISA RD
WREN RD
SWIFT RD
BANJO RD
PIGEON RD
TAMEGA RD
FOX RD
DUNE RD
FROG RD
SHRIKE RD
DINGO RD
KESTRAL RD
AQUA RD

Job Number: L11438
Date: 19.10.12
Scale: 1:30000 @ A3
Revision: A
Drafted by: SC
Source: Orthophoto - Landgate, 2011 Wetlands - DEC, 25.09.12 EPP - DEC, 1992

0 125 250 500 750 1,000 m

RPS

Figure 7b

Hydrology

38 Station Steet, Subiaco | T +61 8 92111111 | F +61 8 92111122 | www.rpsgroup.com.au

LEGEND

- Tenement Boundary E70 3276
- Proposed Excavation Area (2566ha)
- EPP Lake

Wetland Mapping

- Conservation
- Resource Enhancement
- Multiple Use
- 50m Conservation Category Wetland Buffer
- 30m Resource Enhancement Wetland Buffer

FOX RD
PARROT RD
SHRIKE RD
WATER RD
ROSELLA RD
KESTRAL RD
DINGO RD
HIGH HILL RD
UFI 7936
MCKINLEY RD
TOMAR RD
RAAF BOUNDARY RD
CYPRESS RD
E70 3276
JACKSONIA RD
DELMA RD
BOTTLEBRUSH RD
COOLIBAH RD
PORCUPINE RD
SINTRA RD
CARABOODA RD
GUTHER RD
NISA RD
LISBON RD
HOPKINS RD
SERPA RD
PORTUGAL RD
KILN RD
MCLENNAN DR
GODEL RD
HAKEA RD
WESCO RD
ORCHID RD
OLDYANCHEP RD
ANDERSON RD
WATTLE AVE
DAYRELL RD
WATTLE AV W
WANNEROO RD
HESTER AV
GIBBS RD
DASYPOGON RD
PERSOONIA RD
REGELIA RD
PERRY RD
HIGGINS RD
ZIATAS RD
CHITTY RD
OLD WEST RD
UFI 8067
UFI 7923
UFI 8069
UFI 7924
UFI 7925
UFI 7926
UFI 8058
UFI 8059
UFI 8061
UFI 8060
UFI 7916
UFI 7920
UFI 7921
UFI 7922
UFI 7915
UFI 15005
UFI 8065
UFI 8066
UFI 7917
UFI 8072
UFI 7935
UFI 7947
UFI 7948
UFI 7937
UFI 7934
UFI 13373
UFI 7939
UFI 7928
UFI 7927
UFI 7929
UFI 7930
UFI 7931
UFI 7932
UFI 7933
UFI 13374
UFI 8062
UFI 8157
UFI 7950
UFI 7951
UFI 7949
UFI 8086
UFI 8021
UFI 7938
UFI 8201
UFI 8017
UFI 8018
UFI 8019

Job Number: L11438
Date: 19.10.12
Scale: 1:40000 @ A3
Revision: A
Drafted by: SC
Source: Orthophoto - Landgate Wetlands - DEC, 25.09.12 EPP - DEC, 1992

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0 0.25 0.5 1 1.5 2 km

Figure 7c

Hydrology

38 Station Steet, Subiaco | T +61 8 92111111 | F +61 8 92111122 | www.rpsgroup.com.au

MULGA RD
WARBROOK RD
UFI 8120
UFI 8121
UFI 8122
UFI 8123
UFI 8340
M70/1306
ROSS ST
UFI 8102
UFI 8103
UFI 8104
GIRONDE RD
UFI 8341
PINECREST WY
STEEL RD
STONEY RD
JOYCE RD
UFI 8109
SYDNEY RD
UFI 8111
FACEY RD
TURKEY RD
CLUBHOUSE L
UFI 8113
KNIGHT RD
LENZO CT
LAKELANDS DR
LORIAN RD
UFI 8127
HERITAGE TCE
TRAINOR RD
VINTAGE L
UFI 8130

LEGEND

- Tenement Boundary M70/1306
- Proposed Excavation Area (217ha)
- EPP Lake

Wetland Mapping

- Conservation
- Resource Enhancement
- Multiple Use
- 50m Conservation Category Wetland Buffer
- 30m Resource Enhancement Wetland Buffer

RPS

Job Number: L11438
Date: 22.05.12
Scale: 1:10000 @ A3
Revision: A
Drafted by: SC
Source: Orthophoto - Landgate Wetlands - DEC, 19.10.12 EPP - DEC, 1997

0 50 100 200 300 400 m

Figure 7d

Hydrology

38 Station Steet, Subiaco | T +61 8 92111111 | F +61 8 92111122 | www.rpsgroup.com.au

LEGEND

- Tenement Boundary E70 3279
- Proposed Excavation Area (6092ha)
- Cadastre
- Bush Forever Site
- 50m Bush Forever Buffer

MILITARY RD
WEDGETAIL RD
WAPET RD
COCKATOO RD
WABLING RD
REDWOOD RD
CHRISTMAS RD
HOMBRACHT RD
BORONIA RD
NUYTSIA RD
WANNEROO RD
HOVEA RD
SHEOAK RD
406
STYGIA RD
STIRLINGIA RD
FARO RD
CASUARINA RD
WILBINGA RD
TUART RD
BANKSIA RD
ACACIA RD
ACTION REQUIRED
EMU RD
OBIDOS RD
IRMA RD
CARABAN RD
E70 3279
MOORT RD
WATER RD
AMARAL RD
BUSHWOOD FOLW
TIMBER GR
HARVEST CIR
COUNTRYSIDE DR
396
SMOKEBUSH RD
HYDRO RD
CALLITRIS RD
SANTAGO RD
MIRANDA RD
BREAKWATER DR
BINDIAR RD
TRINGA RD
AVIS RD
CLOVER RD
380
DUNNART RD
284
127
VIDAGO RD
OBIDOS RD
MISTLETOE RD
LAGOS RD
CURLEW RD
CHAT RD
REEF BREAK DR
128
YEAL TRK
YEAL SWAMP RD
0
BAILEY RD
SCABRA RD
CHAT RD
CHAPMAN RD
AQUA RD
381
SHEARWATER AV
ROBIN RD
BRUSH RD
PIPIT RD
WAGTAIL RD
SWIFT RD
PARROT RD
288
MITCHELL FWY
HAWK RD
MIDDLETON RD
BANJO RD
TOREOPANGO AV
GHOST HOUSE RD
415
PIGEON RD
FOX RD
414

Job Number: L11438
Date: 23.11.12
Scale: 1:50000 @ A3
Revision: A
Drafted by: SC
Source: Orthophoto - Landgate, 2011 Bush Forever - DPL, 30.09.09

0 0.25 0.5 1 1.5 2 km

RPS

Figure 8a

Bush Forever

38 Station Steet, Subiaco | T +61 8 92111111 | F +61 8 92111122 | www.rpsgroup.com.au

LEGEND
- Tenement Boundary E70 3275
- Proposed Excavation Area (3595ha)
- Cadastre
- Bush Forever Site
- 50m Bush Forever Buffer

BANKSIA RD
IRMA RD
MOORT RD
WATER RD
AIRFORCE RD
AMARAL RD
CASUARINA RD
STEWART RD
CALLITRIS RD
SANTIAGO RD
MIRANDA RD
OBIDOS RD
CLOVER RD
DUNNART RD
SWAN RD
MISTLETOE RD
ROSELLA RD
PERRY RD
CURLEW RD
CHAT RD
SWALLOW RD
285
YEAL TRK
YEAL SWAMP RD
BAILEY RD
381
SCABRA RD
94
286
ROBIN RD
E70 3275
BRUSH RD
PIPIT RD
WAGTAIL RD
DAVIESIA RD
CHAPMAN RD
SWIFT RD
PARROT RD
WREN RD
HAWK RD
MIDDLETON RD
BANJO RD
415
TAMEGA RD
HIGH HILL RD
PIGEON RD
FOX RD
DUNE RD
414
FROG RD
380
SHRIKE RD
HADDRILL RD
KESTRAL RD
DINGO RD
408
410
409
ADUARD
MARDO RD
MCKINLEY RD
411
TOMAR RD
JACKSONIA RD
RAAF BOUNDARY RD
DELMA RD
CYPRESS RD
E70 3276
COOLIBAH RD
PORCUPINE RD
BOTTLEBRUSH RD
OLD YANCHEP RD
DOOGARCH RD
JADE LOOP
SAFARI PL
SINTRA RD
ALKIMOS DR
BAILEY RD
129
290
CUTLER RD
NISA RD
CARABOODA RD
KAROBORUP RD
130
382

Job Number: L11438
Date: 18.10.12
Scale: 1:50000 @ A3
Revision: A
Drafted by: SC
Source: Orthophoto - Landgate, 2011 Bush Forever - DPL, 30.09.09

0 0.25 0.5 1 1.5 2 km

Figure 8b

Bush Forever

38 Station Steet, Subiaco | T +61 8 92111111 | F +61 8 92111122 | www.rpsgroup.com.au

LEGEND

- Tenement Boundary E70 3276
- Proposed Excavation Area (2566ha)
- Cadastre
- Bush Forever Site
- 50m Bush Forever Buffer

TAMEGA ROAD
PINJAR
E70/3275

E70 3276

SWIFT RD
CHAPMAN RD
PARROT RD
TAMEGA RD
ROSELLA RD
HIGH HILL RD
FOX RD
DUNE RD
SHRIKE RD
HADDRILL RD
KESTRAL RD
DINGO RD
AQUA RD
MARDO RD
TOMAR RD
MCKINLEY RD
RAAF BOUNDARY RD
CYPRESS RD
WATER RD
JACKSONIA RD
DELMA RD
BOTTLEBRUSH RD
COOLIBAH RD
PORCUPINE RD
SAFARI PL
BAILEY RD
SINTRA RD
CARABOODA RD
CUTLER RD
NISA RD
WANDOO RD
GREENLEES WY
KARORUP RD
KILN RD
HOPKINS RD
LISBON RD
SERPA RD
MCLENNAN DR
GODEL RD
HAKEA RD
DASYPOGON RD
REGELIA RD
WANNEROO RD
GIBBS RD
LOWERGUP RD
WESCO RD
PERRY RD
HIGGINS RD
STILT RD
ANDERSON RD
OLDYANCHEP RD
ORCHID RD
DAYRELL RD
WATTLE AV W
WATTLE AVE
MITCHELL FWY
HESTER AV
ZIATAS RD
OLD WEST RD
CHITTY RD
SPENCE RD
MATHER DR
PEDERICK RD
SKINK RD
BULOKE RD
WALYUNGA BVD
LIBERTY DR
CELEBRATION BVD
ALDERSEA CIR
HALL RD
AVERY ST
FLYNN DR
CECIL RD
KOALA RD
JAKES L

Job Number: L11438
Date: 18.10.12
Scale: 1:50000 @ A3
Revision: A
Drafted by: SC
Source: Orthophoto - Landgate Bush Forever - DPL, 30.09.09

RPS

0 0.375 0.75 1.5 2.25 3 km

Figure 8c

Bush Forever

38 Station Steet, Subiaco | T +61 8 92111111 | F +61 8 92111122 | www.rpsgroup.com.au

LEGEND

- Tenement Boundary M70/1306
- Proposed Excavation Area (217ha)
- Bush Forever Site
- 50m Bush Forever Buffer

RPS

Job Number: L11438
Date: 22.05.12
Scale: 1:25000 @ A3
Revision: A
Drafted by: SC
Source: Orthophoto - Landgate Bush Forever - DPL, 30.09.09

0 125 250 500 750 1,000 m

Figure 8d

Bush Forever

38 Station Steet, Subiaco | T +61 8 92111111 | F +61 8 92111122 | www.rpsgroup.com.au

LEGEND

- Tenement Boundary E70 3279
- Proposed Excavation Area (6092ha)
- Aboriginal Heritage Site
- 50m Aboriginal Heritage Site Buffer

WEDGETAIL RD
WAPET RD
COCKATOO RD
WABLING RD
REDWOOD RD
CHRISTMAS RD
HOMBRACHT RD
MILITARY RD
BORONIA RD
NUYTSIA RD
SHEOAK RD
HOVEA RD
STYGIA RD
NUYTSIA RD
STIRLINGIA RD
FARO RD
WILBINGA RD
TUART RD
BANKSIA RD
TUART RD
ACACIA RD
ACTION REQUIRED
EMU RD
IRMA RD
E70 3279
MOORT RD
WATER RD
CARABAN RD
AMARAL RD
BUSHWOOD FOLW
S02379
SMOKEBUSH RD
CALLITRIS RD
SANTAGO RD
HYDRO RD
BREAKWATER DR
BINDIA RD
TRINGA RD
AVIS RD
MIRANDA RD
CLOVER RD
VIDAGO RD
OBIDOS RD
OBIDOS RD
MISTLETOE RD
LAGOS RD
WANNEROO RD
MISTLETOE RD
MITCHELL FWY
YEAL TRK
YEAL SWAMP RD
CURLEW RD
SCABRA RD
BAILEY RD
CHAT RD
MIDDLETON RD
AQUA RD
CHAPMAN RD
PIPIT RD
GHOST HOUSE RD
HAWK RD
BRUSH RD
ROBIN RD

RPS

Job Number: L11438
Date: 23.11.12
Scale: 1:40000 @ A3
Revision: A
Drafted by: SC
Source: Orthophoto - Landgate, 2011 Heritage Sites - DIA, 2012

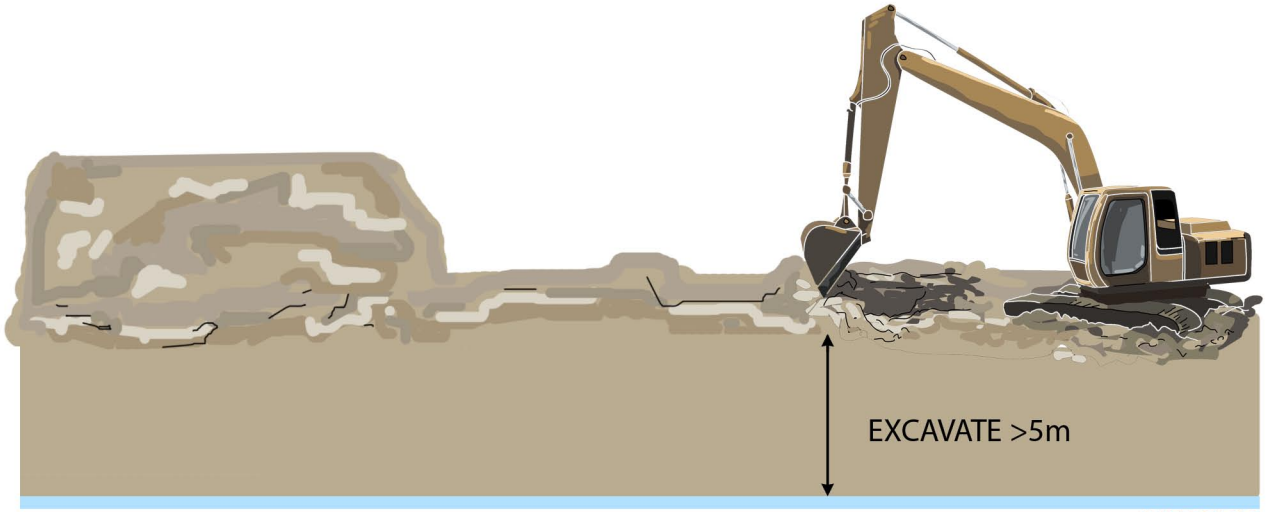
0 0.25 0.5 1 1.5 2 km

Figure 9

Aboriginal Heritage Site

PINE PLANTATION

HARVEST (Forestry Products Commission)



EXCAVATE (Rocla)

REPLANT PINE PLANTATION (Forestry Products Commission)

RPS

Job Number: L11439
Date: 28.06.12
Scale: Not to Scale @ A4
Revision: 0
Drafted by: SC
Source: RPS

Figure 10

Pine Plantation Cycle

APPENDIX 1

EPBC Protected Matters Search Results

Australian Government

Department of Sustainability, Environment, Water, Population and Communities

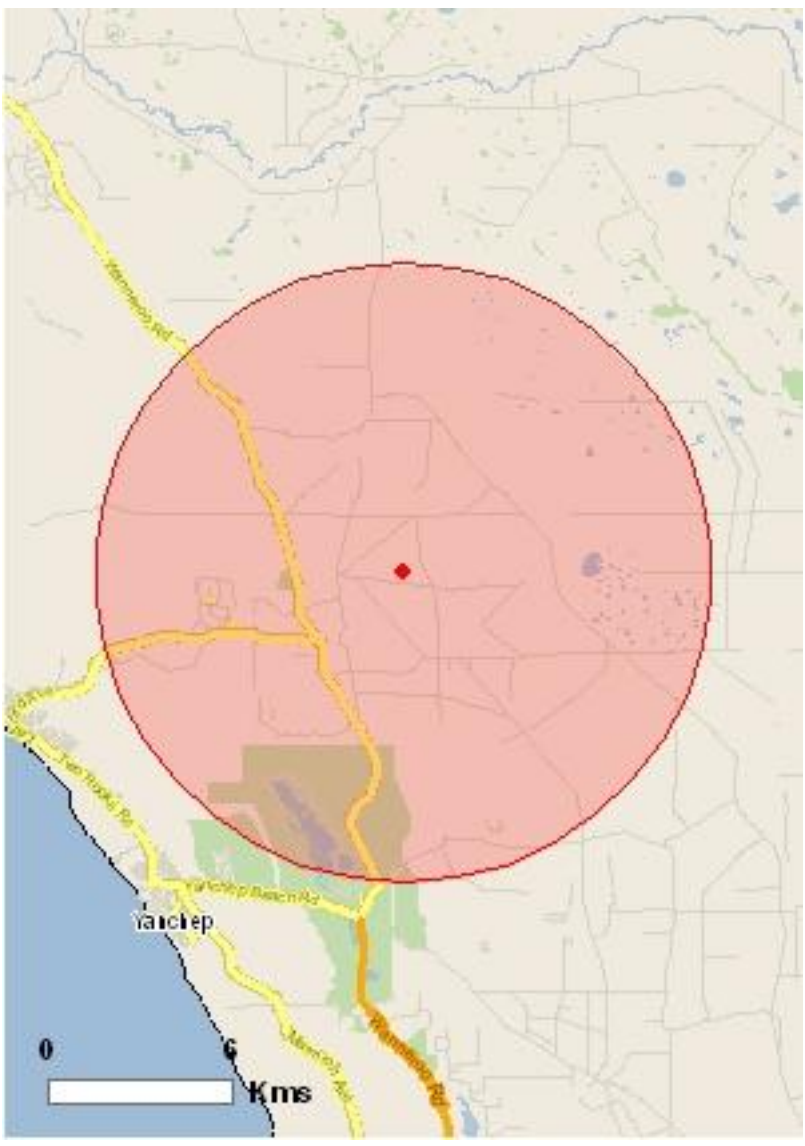
EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected.

Information on the coverage of this report and qualifications on data supporting this report are contained in the caveat at the end of the report.

Information about the EPBC Act including significance guidelines, forms and application process details can be found at http://www.environment.gov.au/epbc/assessmentsapprovals/index.html

Report created: 12/03/12 17:02:43



Coordinates

Buffer: 10.0Km

Summary

Matters of National Environment Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the Administrative Guidelines on Significance - see http://www.environment.gov.au/epbc/assessmentsapprovals/guidelines/index.html

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Areas:	None
Threatened Ecological Communities:	2
Threatened Species:	15
Migratory Species:	9

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place and the heritage values of a place on the Register of the National Estate. Information on the new heritage laws can be found at http://www.environment.gov.au/heritage/index.html

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

A permit may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species. Information on EPBC Act permit requirements and application forms can be found at http://www.environment.gov.

Commonwealth Lands:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	6
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have

Place on the RNE:	11
State and Territory Reserves:	2
Regional Forest Agreements:	None
Invasive Species:	17
Nationally Important Wetlands:	1

Details

Matters of National Environmental Significance

Threatened Ecological Communities [Resource Information]

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Name	Status	Type of Presence
Aquatic Root Mat Community in Caves of the Swan Coastal Plain	Endangered	Community known to occur within area
Sedgelands in Holocene dune swales of the	Endangered	Community known to

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Name	Status	Type of Presence
southern Swan Coastal Plain		occur within area

Threatened Species [Resource Information]

Name	Status	Type of Presence
BIRDS		
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat likely to occur within area
Calyptorhynchus banksii naso Forest Red-tailed Black-Cockatoo [67034]	Vulnerable	Species or species habitat may occur within area
Calyptorhynchus latirostris Carnaby's Black-Cockatoo, Short-billed Black-Cockatoo [59523]	Endangered	Breeding likely to occur within area
Leipoa ocellata Malleefowl [934]	Vulnerable	Species or species habitat may occur within area
Rostratula australis Australian Painted Snipe [77037]	Vulnerable	Species or species habitat may occur within area
Sternula nereis nereis Fairy Tern (Australian) [82950]	Vulnerable	Species or species habitat may occur within area
INSECTS		
Synemon gratiosa Graceful Sun Moth [66757]	Endangered	Species or species habitat may occur within area
MAMMALS		
Dasyurus geoffroii Chuditch, Western Quoll [330]	Vulnerable	Species or species habitat likely to occur within area
PLANTS		
Andersonia gracilis Slender Andersonia [14470]	Endangered	Species or species habitat may occur within area
Centrolepis caespitosa [6393]	Endangered	Species or species habitat may occur within area
Darwinia foetida Muchea Bell [83190]	Critically Endangered	Species or species habitat likely to occur within area
Epiblema grandiflorum var. cyaneum Baby Blue Orchid, Blue Babe-in-the-cradle Orchid [67182]	Endangered	Species or species habitat may occur within area
Eucalyptus argutifolia Yanchep Mallee, Wabling Hill Mallee [24263]	Vulnerable	Species or species habitat likely to occur within area
Grevillea curviloba subsp. incurva Narrow curved-leaf Grevillea [64909]	Endangered	Species or species habitat may occur within area
Lepidosperma rostratum Beaked Lepidosperma [14152]	Endangered	Species or species habitat likely to occur within area

Migratory Species		[Resource Information]
* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.		
Name	Threatened	Type of Presence
Migratory Marine Birds		
Apus pacificus Fork-tailed Swift [678]		Species or species habitat may occur within area
Ardea alba Great Egret, White Egret [59541]		Species or species habitat may occur within area
Ardea ibis Cattle Egret [59542]		Species or species habitat may occur within area
Migratory Terrestrial Species		
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat likely to occur within area
Leipoa ocellata Malleefowl [934]	Vulnerable	Species or species habitat may occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area
Migratory Wetlands Species		
Ardea alba Great Egret, White Egret [59541]		Species or species habitat may occur within area
Ardea ibis Cattle Egret [59542]		Species or species habitat may occur within area
Rostratula benghalensis s. lat. Painted Snipe [889]	Vulnerable*	Species or species habitat may occur within area

Other Matters Protected by the EPBC Act

Listed Marine Species		[Resource Information]
* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.		
Name	Threatened	Type of Presence
Birds		
Apus pacificus Fork-tailed Swift [678]		Species or species habitat may occur within area
Ardea alba Great Egret, White Egret [59541]		Species or species habitat may occur within area
Ardea ibis Cattle Egret [59542]		Species or species habitat may occur within area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat likely to occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within

Name	Threatened	Type of Presence
		area
Rostratula benghalensis s. lat.		
Painted Snipe [889]	Vulnerable*	Species or species habitat may occur within area

Extra Information

Places on the RNE [Resource Information]

Note that not all Indigenous sites may be listed.

Name	State	Status
Natural		
Caraban Management Priority Area	WA	Indicative Place
Ridges Management Priority Area	WA	Indicative Place
Ridges Management Priority Area and State Forest No 65	WA	Indicative Place
Two Rocks Open Space	WA	Indicative Place
Wabling Management Priority Area	WA	Indicative Place
Yanchep Flora Reserve	WA	Registered
Yanchep National Park	WA	Registered
Yeal - Gnangara Area	WA	Registered
Historic		
Concrete Bunkers	WA	Registered
Ghost House, Chauffeurs Room & Garage Ruins	WA	Registered
Gloucester Lodge including Garden and Pool	WA	Registered

State and Territory Reserves [Resource Information]

Name	State
Yanchep	WA
Yeal	WA

Invasive Species [Resource Information]

Weeds reported here are the 20 species of national significance (WoNS), along with other introduced plants that are considered by the States and Territories to pose a particularly significant threat to biodiversity. The following feral animals are reported: Goat, Red Fox, Cat, Rabbit, Pig, Water Buffalo and Cane Toad. Maps from Landscape Health Project, National Land and Water Resouces Audit,

Name	Status	Type of Presence
Mammals		
Felis catus		
Cat, House Cat, Domestic Cat [19]		Species or species habitat likely to occur within area
Oryctolagus cuniculus		
Rabbit, European Rabbit [128]		Species or species habitat likely to occur within area
Sus scrofa		
Pig [6]		Species or species habitat likely to occur within area
Vulpes vulpes		
Red Fox, Fox [18]		Species or species habitat likely to occur within area
Plants		
Asparagus asparagoides		
Bridal Creeper, Bridal Veil Creeper, Smilax, Florist's Smilax, Smilax Asparagus [22473]		Species or species habitat likely to occur within area
Brachiaria mutica		
Para Grass [5879]		Species or species habitat may occur within

Name	Status	Type of Presence
		area
Cenchrus ciliaris Buffel-grass, Black Buffel-grass [20213]		Species or species habitat may occur within area
Chrysanthemoides monilifera Bitou Bush, Boneseed [18983]		Species or species habitat may occur within area
Genista sp. X Genista monspessulana Broom [67538]		Species or species habitat may occur within area
Lantana camara Lantana, Common Lantana, Kamara Lantana, Large-leaf Lantana, Pink Flowered Lantana, Red Flowered Lantana, Red-Flowered Sage, White Sage, Wild Sage [10892]		Species or species habitat likely to occur within area
Lycium ferocissimum African Boxthorn, Boxthorn [19235]		Species or species habitat may occur within area
Olea europaea Olive, Common Olive [9160]		Species or species habitat may occur within area
Pinus radiata Radiata Pine Monterey Pine, Insignis Pine, Wilding Pine [20780]		Species or species habitat may occur within area
Rubus fruticosus aggregate Blackberry, European Blackberry [68406]		Species or species habitat likely to occur within area
Salix spp. except S.babylonica, S.x calodendron & S.x reichardtiji Willows except Weeping Willow, Pussy Willow and Sterile Pussy Willow [68497]		Species or species habitat likely to occur within area
Salvinia molesta Salvinia, Giant Salvinia, Aquarium Watermoss, Kariba Weed [13665]		Species or species habitat likely to occur within area
Tamarix aphylla Athel Pine, Athel Tree, Tamarisk, Athel Tamarisk, Athel Tamarix, Desert Tamarisk, Flowering Cypress, Salt Cedar [16018]		Species or species habitat likely to occur within area

Nationally Important Wetlands	[Resource Information]
Name	State
Loch McNess System	WA

Coordinates

-31.45492 115.70208

Caveat

The information presented in this report has been provided by a range of data sources as acknowledged at the end of the report.

This report is designed to assist in identifying the locations of places which may be relevant in determining obligations under the Environment Protection and Biodiversity Conservation Act 1999. It holds mapped locations of World Heritage and Register of National Estate properties, Wetlands of International Importance, Commonwealth and State/Territory reserves, listed threatened, migratory and marine species and listed threatened ecological communities. Mapping of Commonwealth land is not complete at this stage. Maps have been collated from a range of sources at various

Not all species listed under the EPBC Act have been mapped (see below) and therefore a report is a general guide only. Where available data supports mapping, the type of presence that can be determined from the data is indicated in general terms. People using this information in making a referral may need to consider the qualifications below and may need to seek and consider other

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Only selected species covered by the following provisions of the EPBC Act have been mapped:

- migratory and
- marine

The following species and ecological communities have not been mapped and do not appear in reports produced from this database:

- threatened species listed as extinct or considered as vagrants
- some species and ecological communities that have only recently been listed
- some terrestrial species that overfly the Commonwealth marine area
- migratory species that are very widespread, vagrant, or only occur in small numbers

The following groups have been mapped, but may not cover the complete distribution of the species:

- non-threatened seabirds which have only been mapped for recorded breeding sites
- seals which have only been mapped for breeding sites near the Australian continent

Such breeding sites may be important for the protection of the Commonwealth Marine environment.

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

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-Department of Sustainability and Environment, Victoria
-Department of Primary Industries, Parks, Water and Environment, Tasmania
-Department of Environment and Natural Resources, South Australia
-Parks and Wildlife Service NT, NT Dept of Natural Resources, Environment and the Arts
-Environmental and Resource Management, Queensland
-Department of Environment and Conservation, Western Australia
-Department of the Environment, Climate Change, Energy and Water
-Birds Australia
-Australian Bird and Bat Banding Scheme
-Australian National Wildlife Collection
-Natural history museums of Australia
-Museum Victoria
-Australian Museum
-SA Museum
-Queensland Museum
-Online Zoological Collections of Australian Museums
-Queensland Herbarium
-National Herbarium of NSW
-Royal Botanic Gardens and National Herbarium of Victoria
-Tasmanian Herbarium
-State Herbarium of South Australia
-Northern Territory Herbarium
-Western Australian Herbarium
-Australian National Herbarium, Atherton and Canberra
-University of New England
-Ocean Biogeographic Information System
-Australian Government, Department of Defence
-State Forests of NSW
-Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the Contact Us page.

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Australian Government

Department of Sustainability, Environment, Water, Population and Communities

EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected.

Information on the coverage of this report and qualifications on data supporting this report are contained in the caveat at the end of the report.

Information about the EPBC Act including significance guidelines, forms and application process details can be found at http://www.environment.gov.au/epbc/assessmentsapprovals/index.html

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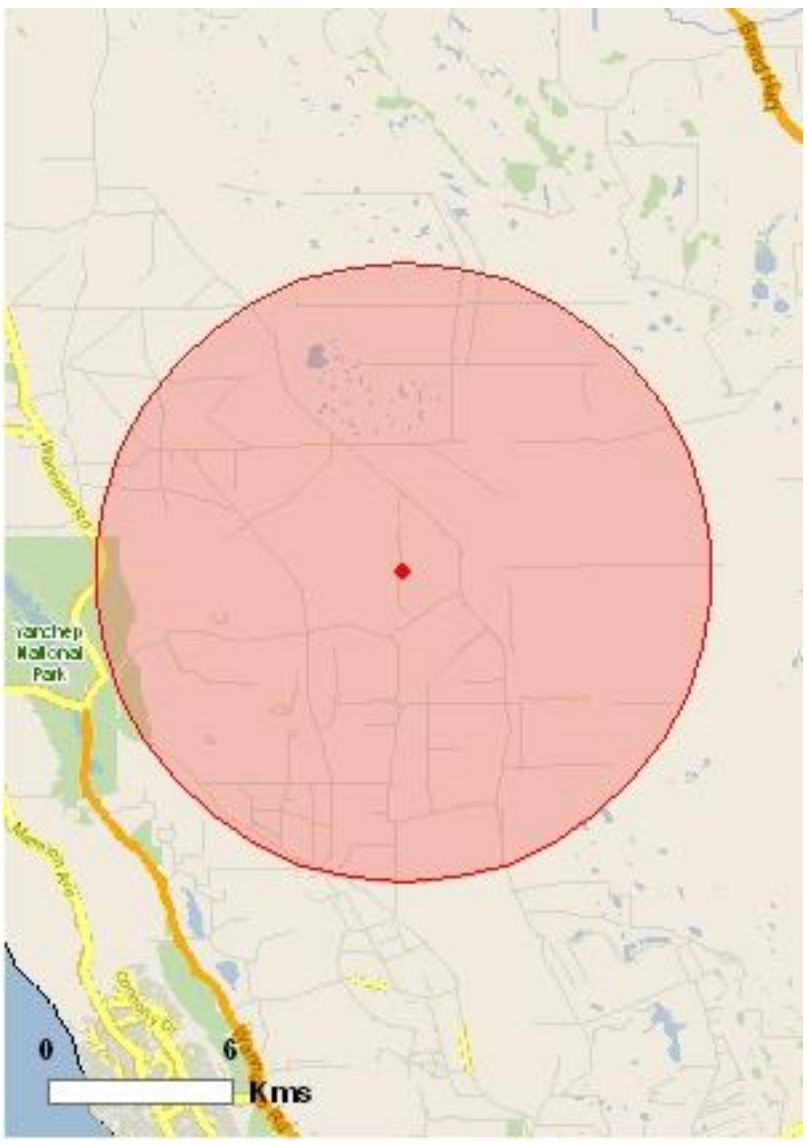

This map may contain data which are ©Commonwealth of Australia (Geoscience Australia), ©PSMA 2010

Coordinates

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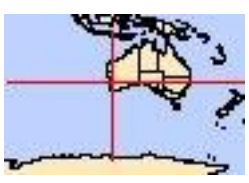

Summary

Matters of National Environment Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the Administrative Guidelines on Significance - see http://www.environment.gov.au/epbc/assessmentsapprovals/guidelines/index.html

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Areas:	None
Threatened Ecological Communities:	2
Threatened Species:	18
Migratory Species:	9

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place and the heritage values of a place on the Register of the National Estate. Information on the new heritage laws can be found at http://www.environment.gov.au/heritage/index.html

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

A permit may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species. Information on EPBC Act permit requirements and application forms can be found at http://www.environment.gov.

Commonwealth Lands:	2
Commonwealth Heritage Places:	1
Listed Marine Species:	6
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have

Place on the RNE:	7
State and Territory Reserves:	2
Regional Forest Agreements:	None
Invasive Species:	17
Nationally Important Wetlands:	None

Details

Matters of National Environmental Significance

Threatened Ecological Communities [Resource Information]

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Name	Status	Type of Presence
Aquatic Root Mat Community in Caves of the Swan Coastal Plain	Endangered	Community known to occur within area
Sedgelands in Holocene dune swales of the	Endangered	Community known to

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Name	Status	Type of Presence
southern Swan Coastal Plain		occur within area

Threatened Species [Resource Information]

Name	Status	Type of Presence
BIRDS		
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat likely to occur within area
Calyptorhynchus banksii naso Forest Red-tailed Black-Cockatoo [67034]	Vulnerable	Species or species habitat may occur within area
Calyptorhynchus latirostris Carnaby's Black-Cockatoo, Short-billed Black-Cockatoo [59523]	Endangered	Breeding likely to occur within area
Leipoa ocellata Malleefowl [934]	Vulnerable	Species or species habitat may occur within area
Rostratula australis Australian Painted Snipe [77037]	Vulnerable	Species or species habitat may occur within area
Sternula nereis nereis Fairy Tern (Australian) [82950]	Vulnerable	Species or species habitat may occur within area
INSECTS		
Synemon gratiosa Graceful Sun Moth [66757]	Endangered	Species or species habitat may occur within area
MAMMALS		
Dasyurus geoffroii Chuditch, Western Quoll [330]	Vulnerable	Species or species habitat likely to occur within area
PLANTS		
Andersonia gracilis Slender Andersonia [14470]	Endangered	Species or species habitat may occur within area
Centrolepis caespitosa [6393]	Endangered	Species or species habitat likely to occur within area
Chamelaucium sp. Gingin (N.G.Marchant s.n. 4/11/1988) Gingin Wax [64649]	Endangered	Species or species habitat may occur within area
Darwinia foetida Muchea Bell [83190]	Critically Endangered	Species or species habitat likely to occur within area
Epiblema grandiflorum var. cyaneum Baby Blue Orchid, Blue Babe-in-the-cradle Orchid [67182]	Endangered	Species or species habitat may occur within area
Eucalyptus argutifolia Yanchep Mallee, Wabling Hill Mallee [24263]	Vulnerable	Species or species habitat likely to occur within area
Grevillea curviloba subsp. curviloba Curved-leaf Grevillea [64908]	Endangered	Species or species habitat likely to occur within area

Name	Status	Type of Presence
[Grevillea curviloba subsp. incurva](#)		
Narrow curved-leaf Grevillea [64909]	Endangered	Species or species habitat may occur within area
[Lepidosperma rostratum](#)		
Beaked Lepidosperma [14152]	Endangered	Species or species habitat likely to occur within area
[Thelymitra stellata](#)		
Star Sun-orchid [7060]	Endangered	Species or species habitat likely to occur within area

Migratory Species [Resource Information]

* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.

Name	Threatened	Type of Presence
Migratory Marine Birds		
[Apus pacificus](#)		
Fork-tailed Swift [678]		Species or species habitat may occur within area
[Ardea alba](#)		
Great Egret, White Egret [59541]		Species or species habitat may occur within area
[Ardea ibis](#)		
Cattle Egret [59542]		Species or species habitat may occur within area
Migratory Terrestrial Species		
[Haliaeetus leucogaster](#)		
White-bellied Sea-Eagle [943]		Species or species habitat likely to occur within area
[Leipoa ocellata](#)		
Malleefowl [934]	Vulnerable	Species or species habitat may occur within area
[Merops ornatus](#)		
Rainbow Bee-eater [670]		Species or species habitat may occur within area
Migratory Wetlands Species		
[Ardea alba](#)		
Great Egret, White Egret [59541]		Species or species habitat may occur within area
[Ardea ibis](#)		
Cattle Egret [59542]		Species or species habitat may occur within area
[Rostratula benghalensis s. lat.](#)		
Painted Snipe [889]	Vulnerable*	Species or species habitat may occur within area

Other Matters Protected by the EPBC Act

Commonwealth Lands [Resource Information]

The Commonwealth area listed below may indicate the presence of Commonwealth land in this vicinity. Due to the unreliability of the data source, all proposals should be checked as to whether it impacts on a Commonwealth area, before making a definitive decision. Contact the State or Territory government land department for further information.

Name
Defence - GIN GIN SATELLITE AIRFIELD
Defence - MUCHEA ARMAMENT RANGE

Commonwealth Heritage Places [Resource Information]

Name	State	Status
Natural		
[Muchea / Pearce Air Weapons Range](#)	WA	Indicative Place

Listed Marine Species [Resource Information]

* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.

Name	Threatened	Type of Presence
Birds		
Apus pacificus Fork-tailed Swift [678]		Species or species habitat may occur within area
Ardea alba Great Egret, White Egret [59541]		Species or species habitat may occur within area
Ardea ibis Cattle Egret [59542]		Species or species habitat may occur within area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat likely to occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area
Rostratula benghalensis s. lat. Painted Snipe [889]	Vulnerable*	Species or species habitat may occur within area

Extra Information

Places on the RNE [Resource Information]

Note that not all Indigenous sites may be listed.

Name	State	Status
Natural		
Muchea / Pearce Air Weapons Range	WA	Indicative Place
Ridges Management Priority Area	WA	Indicative Place
Ridges Management Priority Area and State Forest No 65	WA	Indicative Place
Wabling Management Priority Area	WA	Indicative Place
Wanneroo Wetlands Eastern Chain	WA	Indicative Place
Yanchep National Park	WA	Registered
Yeal - Gnangara Area	WA	Registered

State and Territory Reserves [Resource Information]

Name	State
Yanchep	WA
Yeal	WA

Invasive Species [Resource Information]

Weeds reported here are the 20 species of national significance (WoNS), along with other introduced plants that are considered by the States and Territories to pose a particularly significant threat to biodiversity. The following feral animals are reported: Goat, Red Fox, Cat, Rabbit, Pig, Water Buffalo and Cane Toad. Maps from Landscape Health Project, National Land and Water Resouces Audit,

Name	Status	Type of Presence
Mammals		
Felis catus Cat, House Cat, Domestic Cat [19]		Species or species habitat likely to occur within area
Oryctolagus cuniculus Rabbit, European Rabbit [128]		Species or species habitat likely to occur

Name	Status	Type of Presence
		within area
Sus scrofa Pig [6]		Species or species habitat likely to occur within area
Vulpes vulpes Red Fox, Fox [18]		Species or species habitat likely to occur within area
Plants		
Asparagus asparagoides Bridal Creeper, Bridal Veil Creeper, Smilax, Florist's Smilax, Smilax Asparagus [22473]		Species or species habitat likely to occur within area
Brachiaria mutica Para Grass [5879]		Species or species habitat may occur within area
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Lantana camara Lantana, Common Lantana, Kamara Lantana, Large-leaf Lantana, Pink Flowered Lantana, Red Flowered Lantana, Red-Flowered Sage, White Sage, Wild Sage [10892]		Species or species habitat likely to occur within area
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-State Herbarium of South Australia
-Northern Territory Herbarium
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-Australian National Herbarium, Atherton and Canberra
-University of New England
-Ocean Biogeographic Information System
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-State Forests of NSW

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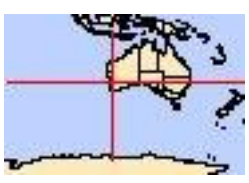
This map may contain data which are ©Commonwealth of Australia (Geoscience Australia), ©PSMA 2010

Coordinates

Buffer: 10.0Km



Summary

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World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Areas:	None
Threatened Ecological Communities:	2
Threatened Species:	17
Migratory Species:	9

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Commonwealth Lands:	2
Commonwealth Heritage Places:	1
Listed Marine Species:	7
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have

Place on the RNE:	10
State and Territory Reserves:	3
Regional Forest Agreements:	None
Invasive Species:	16
Nationally Important Wetlands:	None

Details

Matters of National Environmental Significance

Threatened Ecological Communities [Resource Information]

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Name	Status	Type of Presence
Aquatic Root Mat Community in Caves of the Swan Coastal Plain	Endangered	Community known to occur within area
Sedgelands in Holocene dune swales of the	Endangered	Community known to

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Name	Status	Type of Presence
southern Swan Coastal Plain		occur within area

Threatened Species [Resource Information]

Name	Status	Type of Presence
BIRDS		
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat likely to occur within area
Calyptorhynchus banksii naso Forest Red-tailed Black-Cockatoo [67034]	Vulnerable	Species or species habitat may occur within area
Calyptorhynchus latirostris Carnaby's Black-Cockatoo, Short-billed Black-Cockatoo [59523]	Endangered	Breeding likely to occur within area
Leipoa ocellata Malleefowl [934]	Vulnerable	Species or species habitat may occur within area
Rostratula australis Australian Painted Snipe [77037]	Vulnerable	Species or species habitat may occur within area
Sternula nereis nereis Fairy Tern (Australian) [82950]	Vulnerable	Species or species habitat may occur within area
INSECTS		
Synemon gratiosa Graceful Sun Moth [66757]	Endangered	Species or species habitat likely to occur within area
MAMMALS		
Dasyurus geoffroii Chuditch, Western Quoll [330]	Vulnerable	Species or species habitat likely to occur within area
PLANTS		
Andersonia gracilis Slender Andersonia [14470]	Endangered	Species or species habitat may occur within area
Centrolepis caespitosa [6393]	Endangered	Species or species habitat may occur within area
Chamelaucium sp. Gingin (N.G.Marchant s.n. 4/11/1988) Gingin Wax [64649]	Endangered	Species or species habitat may occur within area
Darwinia foetida Muchea Bell [83190]	Critically Endangered	Species or species habitat likely to occur within area
Epiblema grandiflorum var. cyaneum Baby Blue Orchid, Blue Babe-in-the-cradle Orchid [67182]	Endangered	Species or species habitat may occur within area
Eucalyptus argutifolia Yanchep Mallee, Wabling Hill Mallee [24263]	Vulnerable	Species or species habitat likely to occur within area
Grevillea curviloba subsp. curviloba Curved-leaf Grevillea [64908]	Endangered	Species or species habitat likely to occur within area

Name	Status	Type of Presence
Grevillea curviloba subsp. incurva		
Narrow curved-leaf Grevillea [64909]	Endangered	Species or species habitat may occur within area
Lepidosperma rostratum		
Beaked Lepidosperma [14152]	Endangered	Species or species habitat likely to occur within area

Migratory Species [Resource Information]

* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.

Name	Threatened	Type of Presence
Migratory Marine Birds		
Apus pacificus		
Fork-tailed Swift [678]		Species or species habitat may occur within area
Ardea alba		
Great Egret, White Egret [59541]		Species or species habitat may occur within area
Ardea ibis		
Cattle Egret [59542]		Species or species habitat may occur within area
Migratory Terrestrial Species		
Haliaeetus leucogaster		
White-bellied Sea-Eagle [943]		Species or species habitat likely to occur within area
Leipoa ocellata		
Malleefowl [934]	Vulnerable	Species or species habitat may occur within area
Merops ornatus		
Rainbow Bee-eater [670]		Species or species habitat may occur within area
Migratory Wetlands Species		
Ardea alba		
Great Egret, White Egret [59541]		Species or species habitat may occur within area
Ardea ibis		
Cattle Egret [59542]		Species or species habitat may occur within area
Rostratula benghalensis s. lat.		
Painted Snipe [889]	Vulnerable*	Species or species habitat may occur within area

Other Matters Protected by the EPBC Act

Commonwealth Lands [Resource Information]

The Commonwealth area listed below may indicate the presence of Commonwealth land in this vicinity. Due to the unreliability of the data source, all proposals should be checked as to whether it impacts on a Commonwealth area, before making a definitive decision. Contact the State or Territory government land department for further information.

Name
Commonwealth Land - Defence - MUCHEA ARMAMENT RANGE

Commonwealth Heritage Places [Resource Information]

Name	State	Status
Natural		
Muchea / Pearce Air Weapons Range	WA	Indicative Place

Listed Marine Species [Resource Information]

* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.

Name	Threatened	Type of Presence

Name	Threatened	Type of Presence
Birds		
Apus pacificus Fork-tailed Swift [678]		Species or species habitat may occur within area
Ardea alba Great Egret, White Egret [59541]		Species or species habitat may occur within area
Ardea ibis Cattle Egret [59542]		Species or species habitat may occur within area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat likely to occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area
Rostratula benghalensis s. lat. Painted Snipe [889]	Vulnerable*	Species or species habitat may occur within area
Sterna dougallii Roseate Tern [817]		Foraging, feeding or related behaviour likely to occur within area

Extra Information

Places on the RNE [Resource Information]

Note that not all Indigenous sites may be listed.

Name	State	Status
Natural		
Muchea / Pearce Air Weapons Range	WA	Indicative Place
Ridges Management Priority Area	WA	Indicative Place
Ridges Management Priority Area and State Forest No 65	WA	Indicative Place
Wanneroo Wetlands Eastern Chain	WA	Indicative Place
Neerabup National Park	WA	Registered
Nowergup Lake Fauna Reserve	WA	Registered
Yanchep National Park	WA	Registered
Yeal - Gnangara Area	WA	Registered
Indigenous		
Doogarch Site	WA	Indicative Place
Orchestra Shell Cave	WA	Registered

State and Territory Reserves [Resource Information]

Name	State
Neerabup	WA
Neerabup	WA
Yanchep	WA

Invasive Species [Resource Information]

Weeds reported here are the 20 species of national significance (WoNS), along with other introduced plants that are considered by the States and Territories to pose a particularly significant threat to biodiversity. The following feral animals are reported: Goat, Red Fox, Cat, Rabbit, Pig, Water Buffalo and Cane Toad. Maps from Landscape Health Project, National Land and Water Resouces Audit,

Name	Status	Type of Presence
Mammals		

Name	Status	Type of Presence
Felis catus Cat, House Cat, Domestic Cat [19]		Species or species habitat likely to occur within area
Oryctolagus cuniculus Rabbit, European Rabbit [128]		Species or species habitat likely to occur within area
Vulpes vulpes Red Fox, Fox [18]		Species or species habitat likely to occur within area
Plants		
Asparagus asparagoides Bridal Creeper, Bridal Veil Creeper, Smilax, Florist's Smilax, Smilax Asparagus [22473]		Species or species habitat likely to occur within area
Brachiaria mutica Para Grass [5879]		Species or species habitat may occur within area
Cenchrus ciliaris Buffel-grass, Black Buffel-grass [20213]		Species or species habitat may occur within area
Chrysanthemoides monilifera Bitou Bush, Boneseed [18983]		Species or species habitat may occur within area
Genista sp. X Genista monspessulana Broom [67538]		Species or species habitat may occur within area
Lantana camara Lantana, Common Lantana, Kamara Lantana, Large-leaf Lantana, Pink Flowered Lantana, Red Flowered Lantana, Red-Flowered Sage, White Sage, Wild Sage [10892]		Species or species habitat likely to occur within area
Lycium ferocissimum African Boxthorn, Boxthorn [19235]		Species or species habitat may occur within area
Olea europaea Olive, Common Olive [9160]		Species or species habitat may occur within area
Pinus radiata Radiata Pine Monterey Pine, Insignis Pine, Wilding Pine [20780]		Species or species habitat may occur within area
Rubus fruticosus aggregate Blackberry, European Blackberry [68406]		Species or species habitat likely to occur within area
Salix spp. except S.babylonica, S.x calodendron & S.x reichardtiji Willows except Weeping Willow, Pussy Willow and Sterile Pussy Willow [68497]		Species or species habitat likely to occur within area
Salvinia molesta Salvinia, Giant Salvinia, Aquarium Watermoss, Kariba Weed [13665]		Species or species habitat likely to occur within area
Tamarix aphylla Athel Pine, Athel Tree, Tamarisk, Athel Tamarisk, Athel Tamarix, Desert Tamarisk, Flowering Cypress, Salt Cedar [16018]		Species or species habitat likely to occur within area

Coordinates

-31.59903 115.7811

Caveat

The information presented in this report has been provided by a range of data sources as acknowledged at the end of the report.

This report is designed to assist in identifying the locations of places which may be relevant in determining obligations under the Environment Protection and Biodiversity Conservation Act 1999. It holds mapped locations of World Heritage and Register of National Estate properties, Wetlands of International Importance, Commonwealth and State/Territory reserves, listed threatened, migratory and marine species and listed threatened ecological communities. Mapping of Commonwealth land is not complete at this stage. Maps have been collated from a range of sources at various

Not all species listed under the EPBC Act have been mapped (see below) and therefore a report is a general guide only. Where available data supports mapping, the type of presence that can be determined from the data is indicated in general terms. People using this information in making a referral may need to consider the qualifications below and may need to seek and consider other

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Only selected species covered by the following provisions of the EPBC Act have been mapped:

- migratory and
- marine

The following species and ecological communities have not been mapped and do not appear in reports produced from this database:

- threatened species listed as extinct or considered as vagrants
- some species and ecological communities that have only recently been listed
- some terrestrial species that overfly the Commonwealth marine area
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The following groups have been mapped, but may not cover the complete distribution of the species:

- non-threatened seabirds which have only been mapped for recorded breeding sites
- seals which have only been mapped for breeding sites near the Australian continent

Such breeding sites may be important for the protection of the Commonwealth Marine environment.

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

-Department of Environment, Climate Change and Water, New South Wales
-Department of Sustainability and Environment, Victoria
-Department of Primary Industries, Parks, Water and Environment, Tasmania
-Department of Environment and Natural Resources, South Australia
-Parks and Wildlife Service NT, NT Dept of Natural Resources, Environment and the Arts
-Environmental and Resource Management, Queensland
-Department of Environment and Conservation, Western Australia
-Department of the Environment, Climate Change, Energy and Water
-Birds Australia
-Australian Bird and Bat Banding Scheme
-Australian National Wildlife Collection
-Natural history museums of Australia
-Museum Victoria
-Australian Museum
-SA Museum
-Queensland Museum
-Online Zoological Collections of Australian Museums
-Queensland Herbarium
-National Herbarium of NSW
-Royal Botanic Gardens and National Herbarium of Victoria
-Tasmanian Herbarium
-State Herbarium of South Australia
-Northern Territory Herbarium
-Western Australian Herbarium
-Australian National Herbarium, Atherton and Canberra

-University of New England
-Ocean Biogeographic Information System
-Australian Government, Department of Defence
-State Forests of NSW
-Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the Contact Us page.

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Australian Government

Department of Sustainability, Environment, Water, Population and Communities

EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected.

Information on the coverage of this report and qualifications on data supporting this report are contained in the caveat at the end of the report.

Information about the EPBC Act including significance guidelines, forms and application process details can be found at http://www.environment.gov.au/epbc/assessmentsapprovals/index.html

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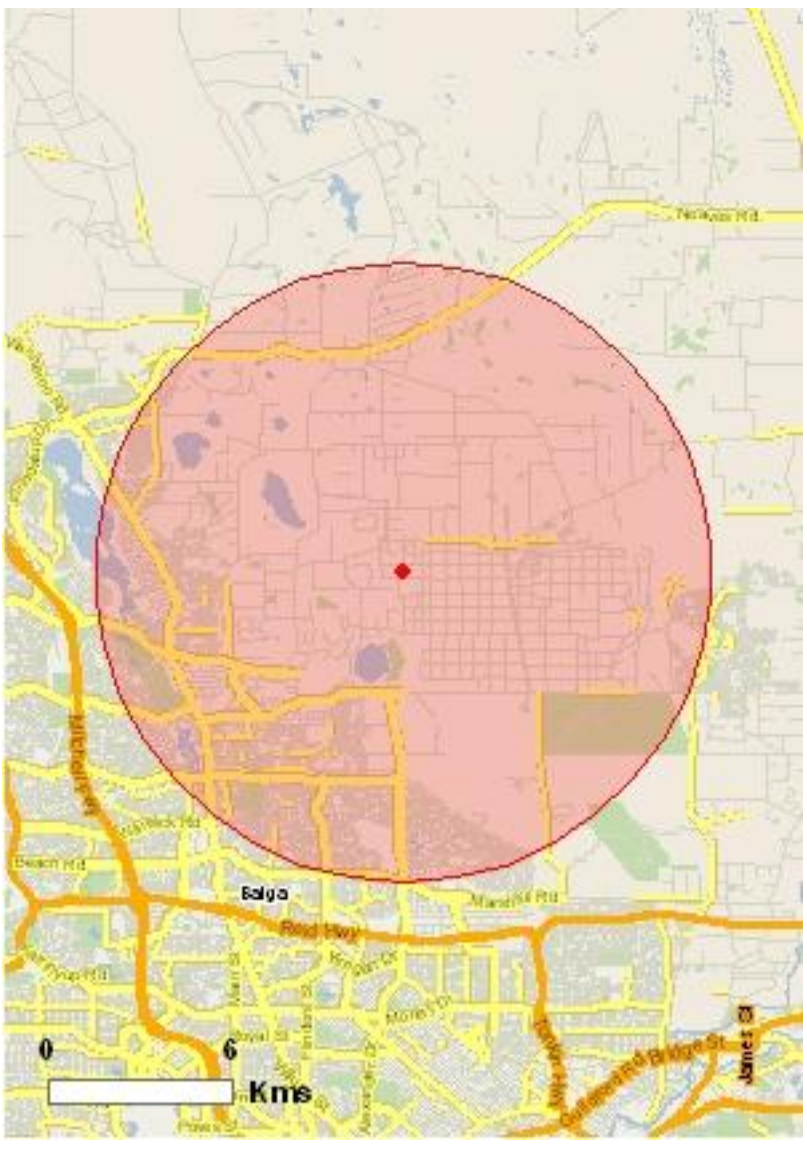

Coordinates

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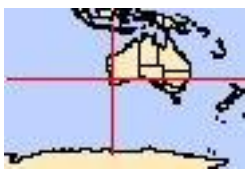

Summary

Matters of National Environment Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the Administrative Guidelines on Significance - see http://www.environment.gov.au/epbc/assessmentsapprovals/guidelines/index.html

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Areas:	None
Threatened Ecological Communities:	1
Threatened Species:	19
Migratory Species:	12

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place and the heritage values of a place on the Register of the National Estate. Information on the new heritage laws can be found at http://www.environment.gov.au/heritage/index.html

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

A permit may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species. Information on EPBC Act permit requirements and application forms can be found at http://www.environment.gov.

Commonwealth Lands:	1
Commonwealth Heritage Places:	None
Listed Marine Species:	13
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have

Place on the RNE:	10
State and Territory Reserves:	5
Regional Forest Agreements:	None
Invasive Species:	16
Nationally Important Wetlands:	1

Details

Matters of National Environmental Significance

Threatened Ecological Communities [Resource Information]

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Name	Status	Type of Presence
Assemblages of plants and invertebrate animals of tumulus (organic mound) springs of the Swan Coastal Plain	Endangered	Community known to occur within area

Threatened Species		[Resource Information]
Name	Status	Type of Presence
BIRDS		
Calyptorhynchus banksii naso		
Forest Red-tailed Black-Cockatoo [67034]	Vulnerable	Species or species habitat may occur within area
Calyptorhynchus latirostris		
Carnaby's Black-Cockatoo, Short-billed Black-Cockatoo [59523]	Endangered	Species or species habitat likely to occur within area
Leipoa ocellata		
Malleefowl [934]	Vulnerable	Species or species habitat may occur within area
Rostratula australis		
Australian Painted Snipe [77037]	Vulnerable	Species or species habitat may occur within area
Sternula nereis nereis		
Fairy Tern (Australian) [82950]	Vulnerable	Species or species habitat may occur within area
INSECTS		
Synemon gratiosa		
Graceful Sun Moth [66757]	Endangered	Species or species habitat likely to occur within area
MAMMALS		
Dasyurus geoffroii		
Chuditch, Western Quoll [330]	Vulnerable	Species or species habitat likely to occur within area
PLANTS		
Andersonia gracilis		
Slender Andersonia [14470]	Endangered	Species or species habitat likely to occur within area
Centrolepis caespitosa		
[6393]	Endangered	Species or species habitat likely to occur within area
Chamelaucium sp. Gingin (N.G.Marchant s.n. 4/11/1988)		
Gingin Wax [64649]	Endangered	Species or species habitat may occur within area
Darwinia foetida		
Muchea Bell [83190]	Critically Endangered	Species or species habitat likely to occur within area
Epiblema grandiflorum var. cyaneum		
Baby Blue Orchid, Blue Babe-in-the-cradle Orchid [67182]	Endangered	Species or species habitat may occur within area
Grevillea curviloba subsp. curviloba		
Curved-leaf Grevillea [64908]	Endangered	Species or species habitat likely to occur within area
Grevillea curviloba subsp. incurva		
Narrow curved-leaf Grevillea [64909]	Endangered	Species or species habitat likely to occur within area
Hydatella dioica		
One-sexed Hydatella [4898]	Endangered	Species or species habitat likely to occur within area
Lepidosperma rostratum		
Beaked Lepidosperma [14152]	Endangered	Species or species habitat likely to occur within area
Thelymitra manginii K.Dixon & Batty ms.		
[67443]	Endangered	Species or species habitat likely to occur

Name	Status	Type of Presence
		within area
Thelymitra stellata		
Star Sun-orchid [7060]	Endangered	Species or species habitat likely to occur within area
Villarsia calthifolia		
Mountain Villarsia [10886]	Endangered	Species or species habitat likely to occur within area

Migratory Species [Resource Information]

* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.

Name	Threatened	Type of Presence
Migratory Marine Birds		
Apus pacificus		
Fork-tailed Swift [678]		Species or species habitat may occur within area
Ardea alba		
Great Egret, White Egret [59541]		Species or species habitat may occur within area
Ardea ibis		
Cattle Egret [59542]		Species or species habitat may occur within area
Migratory Terrestrial Species		
Haliaeetus leucogaster		
White-bellied Sea-Eagle [943]		Species or species habitat likely to occur within area
Leipoa ocellata		
Malleefowl [934]	Vulnerable	Species or species habitat may occur within area
Merops ornatus		
Rainbow Bee-eater [670]		Species or species habitat may occur within area
Migratory Wetlands Species		
Ardea alba		
Great Egret, White Egret [59541]		Species or species habitat may occur within area
Ardea ibis		
Cattle Egret [59542]		Species or species habitat may occur within area
Calidris acuminata		
Sharp-tailed Sandpiper [874]		Species or species habitat known to occur within area
Calidris ruficollis		
Red-necked Stint [860]		Species or species habitat known to occur within area
Rostratula benghalensis s. lat.		
Painted Snipe [889]	Vulnerable*	Species or species habitat may occur within area
Tringa glareola		
Wood Sandpiper [829]		Species or species habitat known to occur within area

Other Matters Protected by the EPBC Act

Commonwealth Lands [Resource Information]

The Commonwealth area listed below may indicate the presence of Commonwealth land in this vicinity. Due to the unreliability of the data source, all proposals should be checked as to whether it impacts on a Commonwealth area, before making a definitive decision. Contact the State or Territory government land department for further information.

Name
Commonwealth Land -

Listed Marine Species [Resource Information]

* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.

Name	Threatened	Type of Presence
Birds		
Apus pacificus Fork-tailed Swift [678]		Species or species habitat may occur within area
Ardea alba Great Egret, White Egret [59541]		Species or species habitat may occur within area
Ardea ibis Cattle Egret [59542]		Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat known to occur within area
Calidris ruficollis Red-necked Stint [860]		Species or species habitat known to occur within area
Calidris subminuta Long-toed Stint [861]		Species or species habitat known to occur within area
Charadrius ruficapillus Red-capped Plover [881]		Species or species habitat known to occur within area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat likely to occur within area
Himantopus himantopus Black-winged Stilt [870]		Species or species habitat known to occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area
Recurvirostra novaehollandiae Red-necked Avocet [871]		Species or species habitat known to occur within area
Rostratula benghalensis s. lat. Painted Snipe [889]	Vulnerable*	Species or species habitat may occur within area
Tringa glareola Wood Sandpiper [829]		Species or species habitat known to occur within area

Extra Information

Places on the RNE [Resource Information]

Note that not all Indigenous sites may be listed.

Name	State	Status
Natural		
Koondoola Open Space	WA	Indicative Place
Wanneroo Wetlands Eastern Chain	WA	Indicative Place
Ellenbrook National Estate Area	WA	Registered
Jandabup Lake Nature Reserve	WA	Registered
Lake Joondalup Reserves	WA	Registered
Melaleuca Park	WA	Registered
Reserve 20091 (1978 Boundary)	WA	Registered
Indigenous		
Wanneroo Scarred Tree	WA	Registered
Historic		
Luisini Winery Group	WA	Identified through State processes
Cockman House	WA	Registered

State and Territory Reserves [Resource Information]

Name	State
Jandabup	WA
Lake Joondalup	WA
Unnamed WA46756	WA
Unnamed WA46920	WA
UnnamedW A46926	WA

Invasive Species [Resource Information]

Weeds reported here are the 20 species of national significance (WoNS), along with other introduced plants that are considered by the States and Territories to pose a particularly significant threat to biodiversity. The following feral animals are reported: Goat, Red Fox, Cat, Rabbit, Pig, Water Buffalo and Cane Toad. Maps from Landscape Health Project, National Land and Water Resouces Audit,

Name	Status	Type of Presence
Mammals		
Felis catus Cat, House Cat, Domestic Cat [19]		Species or species habitat likely to occur within area
Oryctolagus cuniculus Rabbit, European Rabbit [128]		Species or species habitat likely to occur within area
Vulpes vulpes Red Fox, Fox [18]		Species or species habitat likely to occur within area
Plants		
Asparagus asparagoides Bridal Creeper, Bridal Veil Creeper, Smilax, Florist's Smilax, Smilax Asparagus [22473]		Species or species habitat likely to occur within area
Brachiaria mutica Para Grass [5879]		Species or species habitat may occur within area
Cenchrus ciliaris Buffel-grass, Black Buffel-grass [20213]		Species or species habitat may occur within area
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Lantana camara Lantana, Common Lantana, Kamara Lantana, Large-leaf Lantana, Pink Flowered Lantana, Red Flowered Lantana, Red-Flowered Sage, White Sage, Wild Sage [10892]		Species or species habitat likely to occur within area

Name	Status	Type of Presence
Lycium ferocissimum African Boxthorn, Boxthorn [19235]		Species or species habitat may occur within area
Olea europaea Olive, Common Olive [9160]		Species or species habitat may occur within area
Pinus radiata Radiata Pine Monterey Pine, Insignis Pine, Wilding Pine [20780]		Species or species habitat may occur within area
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Salix spp. except S.babylonica, S.x calodendron & S.x reichardtiji Willows except Weeping Willow, Pussy Willow and Sterile Pussy Willow [68497]		Species or species habitat likely to occur within area
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Tamarix aphylla Athel Pine, Athel Tree, Tamarisk, Athel Tamarisk, Athel Tamarix, Desert Tamarisk, Flowering Cypress, Salt Cedar [16018]		Species or species habitat likely to occur within area

Nationally Important Wetlands	[Resource Information]
Name	State
Joondalup Lake	WA

Coordinates

-31.76 115.87806

Caveat

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-Environmental and Resource Management, Queensland
-Department of Environment and Conservation, Western Australia
-Department of the Environment, Climate Change, Energy and Water
-Birds Australia
-Australian Bird and Bat Banding Scheme
-Australian National Wildlife Collection
-Natural history museums of Australia
-Museum Victoria
-Australian Museum
-SA Museum
-Queensland Museum
-Online Zoological Collections of Australian Museums
-Queensland Herbarium
-National Herbarium of NSW
-Royal Botanic Gardens and National Herbarium of Victoria
-Tasmanian Herbarium
-State Herbarium of South Australia
-Northern Territory Herbarium
-Western Australian Herbarium
-Australian National Herbarium, Atherton and Canberra
-University of New England
-Ocean Biogeographic Information System
-Australian Government, Department of Defence
-State Forests of NSW
-Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the Contact Us page.

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APPENDIX 2

NatureMap Search Results

NatureMap
Mapping Western Australia's biodiversity

NatureMap Species Report

Created By Guest user on 13/03/2012

Current Names Only	Yes
Core Datasets Only	Yes
Method	'By Circle'
Centre	115°42' 06" E,31°27' 17" S
Buffer	10km
Group By	Species Group

Species Group	Species	Records
Amphibian	5	235
Bird	67	354
Bryopsid (Moss)	7	11
Dicotyledon	417	1722
Fungus	2	2
Gymnosperm	3	4
Invertebrate	1	12
Lichen	11	12
Mammal	7	10
Monocotyledon	165	552
Pteridophyte (Fern)	1	1
Reptile	28	101
TOTAL	**714**	**3016**

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
Amphibian					
1.	25410	*Heleioporus eyrei (Moaning Frog)*			
2.	25415	*Limnodynastes dorsalis (Western Banjo Frog)*			
3.	25378	*Litoria adelaidensis (Slender Tree Frog)*			
4.	25388	*Litoria moorei (Motorbike Frog)*			
5.	25420	*Myobatrachus gouldii (Turtle Frog)*			
Bird					
6.	24260	*Acanthiza apicalis (Broad-tailed Thornbill)*			
7.	24261	*Acanthiza chrysorrhoa (Yellow-rumped Thornbill)*			
8.	24262	*Acanthiza inornata (Western Thornbill)*			
9.	24560	*Acanthorhynchus superciliosus (Western Spinebill)*			
10.	25536	*Accipiter fasciatus (Brown Goshawk)*			
11.	24312	*Anas gracilis (Grey Teal)*			
12.	24313	*Anas platyrhynchos (Mallard)*			
13.	24316	*Anas superciliosa (Pacific Black Duck)*			
14.	24561	*Anthochaera carunculata (Red Wattlebird)*			
15.	24562	*Anthochaera lunulata (Western Little Wattlebird)*			
16.	24599	*Anthus australis subsp. australis*			
17.	25566	*Artamus cinereus (Black-faced Woodswallow)*			
18.	24318	*Aythya australis (Hardhead)*			
19.	24319	*Biziura lobata (Musk Duck)*			
20.	25598	*Cacomantis flabelliformis (Fan-tailed Cuckoo)*			
21.	24734	*Calyptorhynchus latirostris (Carnaby's Cockatoo)*		T	
22.	24321	*Chenonetta jubata (Australian Wood Duck)*			
23.	24288	*Circus approximans (Swamp Harrier)*			
24.	25675	*Colluricincla harmonica (Grey Shrike-thrush)*			
25.	25568	*Coracina novaehollandiae (Black-faced Cuckoo-shrike)*			
26.	25592	*Corvus coronoides (Australian Raven)*			
27.	25595	*Cracticus tibicen (Australian Magpie)*			
28.	25596	*Cracticus torquatus (Grey Butcherbird)*			
29.	24322	*Cygnus atratus (Black Swan)*			
30.	30901	*Dacelo novaeguineae (Laughing Kookaburra)*			
31.	25607	*Dicaeum hirundinaceum (Mistletoebird)*			
32.	25621	*Falco berigora (Brown Falcon)*			
33.	25623	*Falco longipennis (Australian Hobby)*			
34.	25727	*Fulica atra (Eurasian Coot)*			
35.	25530	*Gerygone fusca (Western Gerygone)*			
36.	24443	*Grallina cyanoleuca (Magpie-lark)*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
37.	24295	*Haliastur sphenurus (Whistling Kite)*			
38.	25734	*Himantopus himantopus (Black-winged Stilt)*			
39.	24491	*Hirundo neoxena (Welcome Swallow)*			
40.	24367	*Lalage tricolor (White-winged Triller)*			
41.	24581	*Lichenostomus virescens (Singing Honeyeater)*			
42.	25661	*Lichmera indistincta (Brown Honeyeater)*			
43.	24582	*Lichmera indistincta subsp. indistincta*			
44.	24690	*Macronectes giganteus (Southern Giant Petrel)*		T	
45.	25651	*Malurus lamberti (Variegated Fairy-wren)*			
46.	24544	*Malurus lamberti subsp. assimilis*			
47.	25652	*Malurus leucopterus (White-winged Fairy-wren)*			
48.	25654	*Malurus splendens (Splendid Fairy-wren)*			
49.	25758	*Megalurus gramineus (Little Grassbird)*			
50.	24598	*Merops ornatus (Rainbow Bee-eater)*			
51.	25680	*Pachycephala rufiventris (Rufous Whistler)*			
52.	25681	*Pardalotus punctatus (Spotted Pardalote)*			
53.	25682	*Pardalotus striatus (Striated Pardalote)*			
54.	24648	*Pelecanus conspicillatus (Australian Pelican)*			
55.	24659	*Petroica goodenovii (Red-capped Robin)*			
56.	24667	*Phalacrocorax sulcirostris (Little Black Cormorant)*			
57.	24409	*Phaps chalcoptera (Common Bronzewing)*			
58.	24596	*Phylidonyris novaehollandiae (New Holland Honeyeater)*			
59.	24841	*Platalea flavipes (Yellow-billed Spoonbill)*			
60.	25720	*Platycercus icterotis (Western Rosella)*			
61.	25731	*Porphyrio porphyrio (Purple Swamphen)*			
62.	24702	*Pterodroma brevirostris (Kerguelen Petrel)*			
63.	25614	*Rhipidura leucophrys (Willie Wagtail)*			
64.	25534	*Sericornis frontalis (White-browed Scrubwren)*			
65.	24279	*Sericornis frontalis subsp. maculatus*			
66.	30948	*Smicrornis brevirostris (Weebill)*			
67.	24522	*Sterna bergii (Crested Tern)*			
68.	25705	*Tachybaptus novaehollandiae (Australasian Grebe)*			
69.	24331	*Tadorna tadornoides (Australian Shelduck)*			
70.	24844	*Threskiornis molucca (Australian White Ibis)*			
71.	25549	*Todiramphus sanctus (Sacred Kingfisher)*			
72.	25765	*Zosterops lateralis (Grey-breasted White-eye)*			
Bryopsid (Moss)					
73.	32315	*Barbula calycina*			
74.	32331	*Bryum lanatum*			
75.	32338	*Campylopus introflexus*	Y		
76.	32345	*Didymodon australasiae*			
77.	32370	*Funaria hygrometrica*			
78.	32380	*Gemmabryum pachythecum*			
79.	32450	*Trichostomum eckelianum*			
Dicotyledon					
80.	15430	*Acacia alata var. tetrantha*			
81.	15470	*Acacia barbinervis subsp. borealis*			
82.	3237	*Acacia benthamii*		P2	
83.	3374	*Acacia huegelii*			
84.	3408	*Acacia lasiocalyx (Silver Wattle)*			
85.	11611	*Acacia lasiocarpa var. lasiocarpa*			
86.	3502	*Acacia pulchella (Prickly Moses)*			
87.	15481	*Acacia pulchella var. glaberrima*			
88.	15482	*Acacia pulchella var. goadbyi*			
89.	3525	*Acacia rostellifera (Summer-scented Wattle)*			
90.	3527	*Acacia saligna (Orange Wattle)*			
91.	30032	*Acacia saligna subsp. saligna*			
92.	3541	*Acacia sessilis*			
93.	3557	*Acacia stenoptera (Narrow Winged Wattle)*			
94.	3584	*Acacia truncata*			
95.	3602	*Acacia willdenowiana (Grass Wattle)*			
96.	3604	*Acacia xanthina (White-stemmed Wattle)*			
97.	1775	*Adenanthos cygnorum (Common Woollybush)*			
98.	11837	*Adenanthos cygnorum subsp. cygnorum (Common Woollybush)*			
99.	1728	*Allocasuarina fraseriana (Sheoak)*			
100.	1732	*Allocasuarina humilis (Dwarf Sheoak)*			
101.	4906	*Alyogyne huegelii (Lilac Hibiscus)*			
102.	15458	*Alyogyne huegelii var. huegelii*			
103.	6311	*Andersonia heterophylla*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
104.	6314	*Andersonia lehmanniana*			
105.	11725	*Anthocercis ilicifolia subsp. ilicifolia*			
106.	6949	*Anthocercis littorea (Yellow Tailflower)*			
107.	3688	*Aotus gracillima*			
108.	3692	*Aotus procumbens*			
109.	12040	*Apium prostratum var. prostratum (Sea Celery)*			
110.	7851	*Asteridea pulverulenta (Common Bristle Daisy)*			
111.	6331	*Astroloma microcalyx (Native Cranberry)*			
112.	6334	*Astroloma pallidum (Kick Bush)*			
113.	5365	*Baeckea robusta*			
114.	34161	*Baeckea sp. Limestone (N. Gibson & M.N. Lyons 1425)*			
115.	1800	*Banksia attenuata (Slender Banksia)*			
116.	32580	*Banksia dallanneyi var. dallanneyi*			
117.	1819	*Banksia grandis (Bull Banksia)*			
118.	1822	*Banksia ilicifolia (Holly-leaved Banksia)*			
119.	1830	*Banksia littoralis (Swamp Banksia)*			
120.	1834	*Banksia menziesii (Firewood Banksia)*			
121.	32202	*Banksia nivea (Honeypot Dryandra)*			
122.	1842	*Banksia prionotes (Acorn Banksia)*			
123.	32077	*Banksia sessilis var. cygnorum*			
124.	15037	*Bartsia trixago*	Y		
125.	5382	*Beaufortia elegans*			
126.	4594	*Beyeria cinerea*			
127.	25788	*Billardiera fraseri (Elegant Pronaya)*			
128.	7856	*Blennospora drummondii*			
129.	4437	*Boronia purdieana (Winter Boronia)*			
130.	17665	*Boronia purdieana subsp. purdieana*			
131.	4438	*Boronia ramosa*			
132.	11381	*Boronia ramosa subsp. anethifolia*			
133.	3710	*Bossiaea eriocarpa (Common Brown Pea)*			
134.	7867	*Brachyscome bellidioides*			
135.	7878	*Brachyscome iberidifolia*			
136.	3000	*Brassica tournefortii (Mediterranean Turnip)*	Y		
137.	2845	*Calandrinia brevipedata (Short-stalked Purslane)*			
138.	2848	*Calandrinia corrigioloides (Strap Purslane)*			
139.	2854	*Calandrinia granulifera (Pygmy Purslane)*			
140.	2856	*Calandrinia liniflora (Parakeelya)*			
141.	5411	*Calothamnus hirsutus*			
142.	5426	*Calothamnus quadrifidus (One-sided Bottlebrush)*			
143.	35816	*Calothamnus quadrifidus subsp. quadrifidus*			
144.	5429	*Calothamnus sanguineus (Silky-leaved Blood flower)*			
145.	5439	*Calytrix angulata (Yellow Starflower)*			
146.	5458	*Calytrix flavescens (Summer Starflower)*			
147.	5460	*Calytrix fraseri (Pink Summer Calytrix)*			
148.	5476	*Calytrix sapphirina*			
149.	7909	*Carduus pycnocephalus (Slender Thistle)*	Y		
150.	2795	*Carpobrotus edulis (Hottentot Fig)*	Y		
151.	2798	*Carpobrotus virescens (Coastal Pigface)*			
152.	2951	*Cassytha flava (Dodder Laurel)*			
153.	2952	*Cassytha glabella (Tangled Dodder Laurel)*			
154.	2956	*Cassytha pomiformis (Dodder Laurel)*			
155.	2957	*Cassytha racemosa (Dodder Laurel)*			
156.	7916	*Centaurea melitensis (Maltese Cockspur)*	Y		
157.	6542	*Centaurium tenuiflorum*	Y		
158.	6214	*Centella asiatica*			
159.	13119	*Cerastium balearicum*	Y		
160.	2889	*Cerastium glomeratum (Mouse Ear Chickweed)*	Y		
161.	5498	*Chamelaucium uncinatum (Geraldton Wax)*			
162.	7937	*Cirsium vulgare (Spear Thistle)*	Y		
163.	10804	*Clematis linearifolia*			
164.	4550	*Comesperma calymega (Blue-spike Milkwort)*			
165.	4552	*Comesperma confertum*			
166.	4555	*Comesperma integerrimum*			
167.	4566	*Comesperma volubile (Love Creeper)*			
168.	15607	*Conospermum acerosum subsp. acerosum*			
169.	15513	*Conospermum boreale subsp. boreale*			
170.	15041	*Conospermum canaliculatum*			
171.	15516	*Conospermum canaliculatum subsp. canaliculatum*			
172.	1876	*Conospermum incurvum (Plume Smokebush)*			
173.	1882	*Conospermum stoechadis (Common Smokebush)*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
174.	1885	*Conospermum triplinervium (Tree Smokebush)*			
175.	6347	*Conostephium minus (Pink-tipped Pearl flower)*			
176.	6348	*Conostephium pendulum (Pearl Flower)*			
177.	6349	*Conostephium preissii*			
178.	7939	*Conyza bonariensis (Flaxleaf Fleabane)*	Y		
179.	20074	*Conyza sumatrensis*	Y		
180.	3137	*Crassula colorata (Dense Stonecrop)*			
181.	11563	*Crassula colorata var. colorata*			
182.	11349	*Crassula decumbens var. decumbens*			
183.	4802	*Cryptandra mutila*			
184.	4809	*Cryptandra pungens*			
185.	4810	*Cryptandra scoparia*			
186.	7454	*Dampiera linearis (Common Dampiera)*			
187.	6218	*Daucus glochidiatus (Australian Carrot)*			
188.	3805	*Daviesia decurrens (Prickly Bitter-pea)*			
189.	19747	*Daviesia decurrens subsp. decurrens*			
190.	3807	*Daviesia divaricata (Marno)*			
191.	18560	*Daviesia divaricata subsp. divaricata*			
192.	3815	*Daviesia horrida (Prickly Bitter-pea)*			
193.	3832	*Daviesia physodes*			
194.	3833	*Daviesia podophylla*			
195.	3837	*Daviesia quadrilatera*			
196.	4453	*Diplolaena angustifolia (Yanchep Rose)*			
197.	4746	*Diplopeltis huegelii*			
198.	18541	*Diplopeltis huegelii subsp. huegelii*			
199.	7054	*Dischisma arenarium*	Y		
200.	7961	*Dittrichia graveolens (Stinkwort)*	Y		
201.	4754	*Dodonaea aptera (Coast Hop-bush)*			
202.	3092	*Drosera bulbosa (Red-leaved Sundew)*			
203.	13381	*Drosera citrina*			
204.	3095	*Drosera erythrorhiza (Red Ink Sundew)*			
205.	3098	*Drosera glanduligera (Pimpernel Sundew)*			
206.	3106	*Drosera macrantha (Bridal Rainbow)*			
207.	14298	*Drosera macrantha subsp. macrantha*			
208.	11853	*Drosera menziesii subsp. menziesii*			
209.	13216	*Drosera menziesii subsp. penicillaris*			
210.	3114	*Drosera nitidula (Shining Sundew)*			
211.	3117	*Drosera paleacea (Dwarf Sundew)*			
212.	13188	*Drosera paleacea subsp. paleacea*			
213.	3118	*Drosera pallida (Pale Rainbow)*			
214.	11570	*Epilobium billardiereanum subsp. billardiereanum (Smooth Willow Herb)*			
215.	13949	*Eremaea asterocarpa*			
216.	13950	*Eremaea asterocarpa subsp. asterocarpa*			
217.	5537	*Eremaea beaufortioides*			
218.	5541	*Eremaea pauciflora*			
219.	14104	*Eremaea pauciflora var. pauciflora*			
220.	7215	*Eremophila glabra (Tar Bush)*			
221.	17175	*Eremophila glabra subsp. albicans*			
222.	4332	*Erodium botrys (Long Storksbill)*	Y		
223.	4333	*Erodium cicutarium (Common Storksbill)*	Y		
224.	4335	*Erodium cygnorum (Blue Heronsbill)*			
225.	6219	*Eryngium pinnatifidum (Blue Devils)*			
226.	13091	*Eucalyptus argutifolia (Wabling Hill Mallee)*		T	
227.	5615	*Eucalyptus decipiens*			
228.	13536	*Eucalyptus decipiens subsp. decipiens*			
229.	5649	*Eucalyptus foecunda (Narrow-leaved Red Mallee)*			
230.	5708	*Eucalyptus marginata (Jarrah)*			
231.	13547	*Eucalyptus marginata subsp. marginata (Jarrah)*			
232.	13541	*Eucalyptus petrensis*			
233.	5763	*Eucalyptus rudis (Flooded Gum)*			
234.	13511	*Eucalyptus rudis subsp. rudis*			
235.	5790	*Eucalyptus todtiana (Coastal Blackbutt)*			
236.	15137	*Euchiton sphaericus*			
237.	10765	*Exocarpos sparteus (Broom Ballart)*			
238.	2801	*Galenia pubescens (Coastal Galenia)*	Y		
239.	7976	*Galinsoga parviflora (Potato Weed)*	Y		
240.	7323	*Galium murale (Small Goosegrass)*	Y		
241.	20483	*Gastrolobium linearifolium*			
242.	4339	*Geranium molle (Dove's Foot Cranesbill)*	Y		
243.	4340	*Geranium retrorsum*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
244.	3945	*Gompholobium aristatum*			
245.	3948	*Gompholobium capitatum*			
246.	10909	*Gompholobium confertum*			
247.	29267	*Gompholobium muticum*			
248.	11083	*Gompholobium scabrum*			
249.	3956	*Gompholobium shuttleworthii*			
250.	3957	*Gompholobium tomentosum (Hairy Yellow Pea)*			
251.	6161	*Gonocarpus pithyoides*			
252.	37500	*Grammatotheca bergiana var. bergiana*	Y		
253.	15813	*Grevillea evanescens*		P1	
254.	15839	*Grevillea preissii subsp. preissii*			
255.	12824	*Grevillea vestita subsp. vestita*			
256.	2784	*Gyrostemon ramulosus (Corkybark)*			
257.	2146	*Hakea costata (Ribbed Hakea)*			
258.	2175	*Hakea lissocarpha (Honey Bush)*			
259.	2197	*Hakea prostrata (Harsh Hakea)*			
260.	2203	*Hakea ruscifolia (Candle Hakea)*			
261.	2214	*Hakea trifurcata (Two-leaf Hakea)*			
262.	6175	*Haloragis hamata*			
263.	3961	*Hardenbergia comptoniana (Native Wisteria)*			
264.	29594	*Helichrysum luteoalbum (Jersey Cudweed)*			
265.	8027	*Helichrysum macranthum*			
266.	3016	*Heliophila pusilla*	Y		
267.	16934	*Hemiandra glabra subsp. glabra*			
268.	6839	*Hemiandra pungens (Snakebush)*			
269.	38320	*Hemiandra sp. Jurien (B.J. Conn & M.E. Tozer BJC 3885)*			
270.	6871	*Hemigenia sericea (Silky Hemigenia)*			
271.	5112	*Hibbertia aurea*			
272.	5116	*Hibbertia crassifolia*			
273.	5133	*Hibbertia helianthemoides*		P3	
274.	5134	*Hibbertia huegelii*			
275.	5135	*Hibbertia hypericoides (Yellow Buttercups)*			
276.	5162	*Hibbertia racemosa (Stalked Guinea Flower)*			
277.	11461	*Hibbertia spicata subsp. leptotheca*		P3	
278.	5173	*Hibbertia subvaginata*			
279.	6222	*Homalosciadium homalocarpum*			
280.	3966	*Hovea pungens (Devil's Pins)*			
281.	3968	*Hovea trisperma (Common Hovea)*			
282.	12741	*Hyalosperma cotula*			
283.	5216	*Hybanthus calycinus (Wild Violet)*			
284.	6224	*Hydrocotyle blepharocarpa*			
285.	6226	*Hydrocotyle callicarpa (Small Pennywort)*			
286.	6229	*Hydrocotyle diantha*			
287.	6232	*Hydrocotyle hispidula*			
288.	11546	*Hydrocotyle pilifera var. glabrata*			
289.	5817	*Hypocalymma angustifolium (White Myrtle)*			
290.	31431	*Hypocalymma sp. Nambung (R. Spjut & R. Smith s.n. 22/09/1992)*			
291.	8086	*Hypochaeris glabra (Smooth Catsear)*	Y		
292.	7396	*Isotoma hypocrateriformis (Woodbridge Poison)*			
293.	3992	*Isotropis cuneifolia (Granny Bonnets)*			
294.	19700	*Isotropis cuneifolia subsp. cuneifolia*			
295.	14783	*Jacksonia calcicola*			
296.	4012	*Jacksonia furcellata (Grey Stinkwood)*			
297.	4029	*Jacksonia sternbergiana (Stinkwood)*			
298.	4044	*Kennedia prostrata (Scarlet Runner)*			
299.	5832	*Kunzea ericifolia (Spearwood)*			
300.	15498	*Kunzea glabrescens (Spearwood)*			
301.	18585	*Lagenophora huegelii*			
302.	5036	*Lasiopetalum lineare*		P3	
303.	5038	*Lasiopetalum membranaceum*		P3	
304.	7574	*Lechenaultia floribunda (Free-flowering Leschenaultia)*			
305.	7580	*Lechenaultia linarioides (Yellow Leschenaultia)*			
306.	3042	*Lepidium pseudotasmanicum*		P4	
307.	3044	*Lepidium rotundum (Veined Peppercress)*			
308.	2344	*Leptomeria empetriformis*			
309.	5850	*Leptospermum laevigatum (Coast Teatree)*	Y		
310.	5857	*Leptospermum spinescens*			
311.	6374	*Leucopogon conostephioides*			
312.	6425	*Leucopogon oxycedrus*			
313.	6427	*Leucopogon parviflorus (Coast Beard-heath)*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
314.	6434	*Leucopogon polymorphus*			
315.	6436	*Leucopogon propinquus*			
316.	6440	*Leucopogon racemulosus*			
317.	19579	*Leucopogon sp. Murdoch (M. Hislop 1037)*			
318.	30799	*Leucopogon sp. Perth coastal (A.S. George 17305)*		P1	
319.	19460	*Leucopogon sp. Yanchep (M. Hislop 1986)*		P3	
320.	6445	*Leucopogon squarrosus*			
321.	7676	*Levenhookia pusilla (Midget Stylewort)*			
322.	7677	*Levenhookia stipitata (Common Stylewort)*			
323.	9289	*Lobelia anceps (Angled Lobelia)*			
324.	7403	*Lobelia heterophylla (Wing-seeded Lobelia)*			
325.	7408	*Lobelia tenuior (Slender Lobelia)*			
326.	6515	*Logania vaginalis (White Spray)*			
327.	36375	*Lysimachia arvensis (Pimpernel)*	Y		
328.	6456	*Lysinema ciliatum (Curry Flower)*			
329.	6458	*Lysinema elegans*			
330.	34736	*Lysinema pentapetalum*			
331.	5281	*Lythrum hyssopifolia (Lesser Loosestrife)*	Y		
332.	34676	*Meionectes brownii (Swamp Raspwort)*			
333.	5920	*Melaleuca huegelii (Chenille Honeymyrtle)*			
334.	13271	*Melaleuca huegelii subsp. huegelii*			
335.	18394	*Melaleuca parviceps*			
336.	5952	*Melaleuca preissiana (Moonah)*			
337.	18598	*Melaleuca systena*			
338.	5983	*Melaleuca trichophylla*			
339.	4085	*Melilotus indicus*	Y		
340.	8105	*Millotia myosotidifolia*			
341.	8106	*Millotia tenuifolia (Soft Millotia)*			
342.	16693	*Minuartia mediterranea*	Y		
343.	4100	*Mirbelia spinosa*			
344.	2412	*Muehlenbeckia adpressa (Climbing Lignum)*			
345.	2415	*Muehlenbeckia polybotrya*			
346.	7289	*Myoporum caprarioides (Slender Myoporum)*			
347.	7295	*Myoporum tetrandrum (Boobialla)*			
348.	2401	*Nuytsia floribunda (Christmas Tree)*			
349.	6139	*Oenothera glazioviana (Evening Primrose)*	Y		
350.	2365	*Olax benthamiana*			
351.	8127	*Olearia axillaris (Coastal Daisybush)*			
352.	8149	*Olearia rudis (Rough Daisybush)*			
353.	7348	*Opercularia hispidula (Hispid Stinkweed)*			
354.	18255	*Opercularia vaginata (Dog Weed)*			
355.	7122	*Orobanche minor (Lesser Broomrape)*	Y		
356.	30375	*Oxalis exilis*			
357.	4355	*Oxalis perennans*			
358.	12643	*Ozothamnus cordatus*			
359.	7089	*Parentucellia latifolia (Common Bartsia)*	Y		
360.	7090	*Parentucellia viscosa (Sticky Bartsia)*	Y		
361.	1762	*Parietaria debilis (Pellitory)*			
362.	4343	*Pelargonium capitatum (Rose Pelargonium)*	Y		
363.	4346	*Pelargonium littorale*			
364.	17149	*Pelargonium littorale subsp. littorale*			
365.	6006	*Pericalymma ellipticum (Swamp Teatree)*			
366.	13911	*Persicaria decipiens*			
367.	2258	*Persoonia comata*			
368.	20368	*Petrophile axillaris*			
369.	2286	*Petrophile brevifolia*			
370.	2299	*Petrophile linearis (Pixie Mops)*			
371.	2301	*Petrophile macrostachya*			
372.	2308	*Petrophile seminuda*			
373.	2309	*Petrophile serruriae*			
374.	19825	*Petrorhagia dubia*	Y		
375.	18355	*Petroselinum crispum (Parsley)*	Y		
376.	18529	*Philotheca spicata (Pepper and Salt)*			
377.	18197	*Phyla nodiflora*	Y		
378.	6734	*Phyla nodiflora var. nodiflora*	Y		
379.	16177	*Phyllangium paradoxum*			
380.	4675	*Phyllanthus calycinus (False Boronia)*			
381.	6983	*Physalis peruviana (Cape Gooseberry)*	Y		
382.	5232	*Pimelea argentea (Silvery Leaved Pimelea)*			
383.	5237	*Pimelea calcicola*			

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384.	5244	*Pimelea floribunda*			
385.	5268	*Pimelea sulphurea (Yellow Banjine)*			
386.	8163	*Pithocarpa corymbulosa (Corymbose Pithocarpa)*		P3	
387.	8165	*Pithocarpa pulchella (Beautiful Pithocarpa)*			
388.	18353	*Pithocarpa pulchella var. pulchella*			
389.	8175	*Podolepis gracilis (Slender Podolepis)*			
390.	8177	*Podolepis lessonii*			
391.	8182	*Podotheca angustifolia (Sticky Longheads)*			
392.	8183	*Podotheca chrysantha (Yellow Podotheca)*			
393.	8184	*Podotheca gnaphalioides (Golden Long-heads)*			
394.	4688	*Poranthera drummondii*			
395.	4689	*Poranthera ericoides (Heath Poranthera)*			
396.	4691	*Poranthera microphylla (Small Poranthera)*			
397.	4155	*Psoralea pinnata (African Scurfpea)*	Y		
398.	2718	*Ptilotus drummondii (Narrowleaf Mulla Mulla)*			
399.	11260	*Ptilotus drummondii var. drummondii (Pussytail)*			
400.	2742	*Ptilotus manglesii (Pom Poms)*			
401.	2751	*Ptilotus polystachyus (Prince of Wales Feather)*			
402.	11364	*Ptilotus stirlingii var. stirlingii*			
403.	4181	*Pultenaea reticulata*			
404.	8195	*Quinetia urvillei*			
405.	2932	*Ranunculus colonorum (Common Buttercup)*			
406.	6014	*Regelia inops*			
407.	2578	*Rhagodia baccata (Berry Saltbush)*			
408.	11341	*Rhagodia baccata subsp. baccata*			
409.	13300	*Rhodanthe citrina*			
410.	15035	*Rhodanthe corymbosa*			
411.	2433	*Rumex crispus (Curled Dock)*	Y		
412.	6483	*Samolus junceus*			
413.	7368	*Scabiosa atropurpurea (Purple Pincushion)*	Y		
414.	7603	*Scaevola canescens (Grey Scaevola)*			
415.	7614	*Scaevola globulifera*			
416.	7626	*Scaevola nitida (Shining Fanflower)*			
417.	13181	*Scaevola repens var. angustifolia*			
418.	13182	*Scaevola repens var. repens*			
419.	7647	*Scaevola thesioides*			
420.	13152	*Scaevola thesioides subsp. thesioides*			
421.	6033	*Scholtzia involucrata (Spiked Scholtzia)*			
422.	8203	*Senecio diaschides*	Y		
423.	15678	*Senecio hispidulus var. hispidulus*			
424.	20663	*Senecio multicaulis subsp. multicaulis*			
425.	25884	*Senecio pinnatifolius var. latilobus*			
426.	8218	*Senecio ramosissimus (Auricled Groundsel)*			
427.	8220	*Senecio vulgaris (Common Groundsel)*	Y		
428.	8225	*Siloxerus humifusus (Procumbent Siloxerus)*			
429.	7020	*Solanum linnaeanum*	Y		
430.	7022	*Solanum nigrum (Black Berry Nightshade)*	Y		
431.	7037	*Solanum symonii*			
432.	8231	*Sonchus oleraceus (Common Sowthistle)*	Y		
433.	2914	*Spergularia diandra (Lesser Sand Spurry)*	Y		
434.	20348	*Sphaerolobium calcicola*		P3	
435.	17551	*Sphaerolobium drummondii*			
436.	4207	*Sphaerolobium medium*			
437.	4828	*Spyridium globulosum (Basket Bush)*			
438.	4713	*Stachystemon axillaris (Leafy Stachystemon)*			
439.	4733	*Stackhousia monogyna*			
440.	2918	*Stellaria media (Chickweed)*	Y		
441.	15066	*Stenanthemum notiale subsp. chamelum*			
442.	19403	*Stenopetalum gracile*			
443.	2316	*Stirlingia latifolia (Blueboy)*			
444.	7679	*Stylidium adpressum (Trigger-on-stilts)*			
445.	30278	*Stylidium androsaceum*			
446.	25831	*Stylidium araeophyllum*			
447.	7693	*Stylidium brunonianum (Pink Fountain Triggerplant)*			
448.	7694	*Stylidium bulbiferum (Circus Triggerplant)*			
449.	7696	*Stylidium calcaratum (Book Triggerplant)*			
450.	7708	*Stylidium crassifolium (Thick-leaved Triggerplant)*			
451.	7709	*Stylidium crossocephalum (Posy Triggerplant)*			
452.	7710	*Stylidium cygnorum*			
453.	7716	*Stylidium diuroides (Donkey Triggerplant)*			

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454.	11808	*Stylidium diuroides subsp. diuroides*			
455.	25801	*Stylidium hesperium*			
456.	7745	*Stylidium junceum (Reed Triggerplant)*			
457.	13127	*Stylidium maritimum*		P3	
458.	25829	*Stylidium neurophyllum*			
459.	7774	*Stylidium piliferum (Common Butterfly Triggerplant)*			
460.	7785	*Stylidium repens (Matted Triggerplant)*			
461.	20521	*Stylidium rigidulum*			
462.	25806	*Stylidium scariosum*			
463.	7798	*Stylidium schoenoides (Cow Kicks)*			
464.	17510	*Stylidium sp. Kalbarri (A. Carr 145)*			
465.	2324	*Synaphea petiolaris (Synaphea)*			
466.	2329	*Synaphea spinulosa*			
467.	15532	*Synaphea spinulosa subsp. spinulosa*			
468.	4256	*Templetonia retusa (Cockies Tongues)*			
469.	2791	*Tersonia cyathiflora (Button Creeper)*			
470.	5105	*Thomasia triphylla*			
471.	6266	*Trachymene coerulea (Blue Lace Flower)*			
472.	19041	*Trachymene coerulea subsp. coerulea*			
473.	6280	*Trachymene pilosa (Native Parsnip)*			
474.	4291	*Trifolium arvense (Hare's Foot Clover)*	Y		
475.	17542	*Trifolium arvense var. arvense*	Y		
476.	4292	*Trifolium campestre (Hop Clover)*	Y		
477.	17763	*Trifolium campestre var. campestre (Hop Clover)*	Y		
478.	4295	*Trifolium dubium (Suckling Clover)*	Y		
479.	4737	*Tripterococcus brunonis (Winged Stackhousia)*			
480.	11665	*Trymalium ledifolium var. ledifolium*			
481.	8254	*Urospermum picroides (False Hawkbit)*	Y		
482.	8255	*Ursinia anthemoides (Ursinia)*	Y		
483.	38388	*Ursinia anthemoides subsp. anthemoides*	Y		
484.	7107	*Verbascum virgatum (Twiggy Mullein)*	Y		
485.	7109	*Veronica calycina (Cup Speedwell)*			
486.	7666	*Verreauxia reinwardtii (Common Verreauxia)*			
487.	6101	*Verticordia nitens (Morrison Featherflower)*			
488.	11474	*Vicia sativa subsp. nigra*	Y		
489.	4325	*Viminaria juncea (Swishbush)*			
490.	7384	*Wahlenbergia capensis (Cape Bluebell)*	Y		
491.	7389	*Wahlenbergia preissii*			
492.	13331	*Waitzia acuminata var. acuminata*			
493.	8282	*Waitzia suaveolens (Fragrant Waitzia)*			
494.	13332	*Waitzia suaveolens var. flava*			
495.	13333	*Waitzia suaveolens var. suaveolens*			
496.	6289	*Xanthosia huegelii*			
Fungus					
497.	18195	*Amanita carneiphylla*		P2	
498.	38830	*Psilocybe coprophila*			
Gymnosperm					
499.	85	*Macrozamia riedlei (Zamia)*			
500.	87	*Pinus pinaster (Pinaster Pine)*	Y		
501.	88	*Pinus radiata (Radiata Pine)*	Y		
Invertebrate					
502.	33992	*Synemon gratiosa (Graceful Sunmoth)*		T	
Lichen					
503.	27598	*Buellia dissa*			
504.	27602	*Buellia georgei*			
505.	27607	*Buellia pruinosa*			
506.	31099	*Caloplaca kantvilasii*			
507.	27722	*Diploschistes ocellatus*			
508.	27754	*Fulgensia subbracteata*			
509.	27793	*Lecania sylvestris*		P2	Y
510.	27815	*Lecanora sphaerospora*			
511.	27986	*Placynthium nigrum*		P3	
512.	28000	*Psora decipiens*			
513.	28049	*Rinodina bischoffii*		P2	Y
Mammal					
514.	24186	*Chalinolobus gouldii (Gould's Wattled Bat)*			
515.	24153	*Isoodon obesulus subsp. fusciventer (Quenda)*		P5	
516.	24133	*Macropus irma (Western Brush Wallaby)*			

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				P4	
517.	24223	*Mus musculus (House Mouse)*			
518.	24042	*Mustela putorius (European Polecat)*			
519.	24243	*Rattus fuscipes (Western Bush Rat)*			
520.	24206	*Vespadelus regulus (Southern Forest Bat)*			
Monocotyledon					
521.	1208	*Acanthocarpus preissii*			
522.	1505	*Agave americana (Century Plant)*	Y		
523.	184	*Aira caryophyllea (Silvery Hairgrass)*	Y		
524.	185	*Aira cupaniana (Silvery Hairgrass)*	Y		
525.	1056	*Alexgeorgea nitens*			
526.	1374	*Allium ampeloprasum*	Y		
527.	198	*Amphipogon laguroides*			
528.	200	*Amphipogon turbinatus*			
529.	1409	*Anigozanthos humilis (Catspaw)*			
530.	11434	*Anigozanthos humilis subsp. humilis*			
531.	1364	*Asphodelus fistulosus (Onion Weed)*	Y		
532.	17234	*Austrostipa compressa*			
533.	740	*Baumea arthrophylla*			
534.	741	*Baumea articulata (Jointed Rush)*			
535.	743	*Baumea juncea (Bare Twigrush)*			
536.	745	*Baumea preissii*			
537.	15837	*Baumea preissii subsp. laxa*			
538.	748	*Baumea vaginalis (Sheath Twigrush)*			
539.	244	*Briza maxima (Blowfly Grass)*	Y		
540.	245	*Briza minor (Shivery Grass)*	Y		
541.	247	*Bromus arenarius (Sand Brome)*			
542.	249	*Bromus diandrus (Great Brome)*	Y		
543.	250	*Bromus hordeaceus (Soft Brome)*	Y		
544.	12770	*Burchardia congesta*			
545.	15330	*Caladenia arenicola*			
546.	1592	*Caladenia flava (Cowslip Orchid)*			
547.	15348	*Caladenia flava subsp. flava*			
548.	15352	*Caladenia georgei*			
549.	1599	*Caladenia latifolia (Pink Fairy Orchid)*			
550.	15358	*Caladenia longicauda subsp. albella*			
551.	15360	*Caladenia longicauda subsp. borealis*			
552.	15377	*Caladenia reptans subsp. reptans*			
553.	1213	*Calectasia cyanea (Blue Tinsel Lily)*		T	
554.	19309	*Calectasia narragara*			
555.	753	*Carex appressa (Tall Sedge)*			
556.	1162	*Cartonema philydroides*			
557.	760	*Caustis dioica*			
558.	1121	*Centrolepis aristata (Pointed Centrolepis)*			
559.	1125	*Centrolepis drummondiana*			
560.	1418	*Conostylis aculeata (Prickly Conostylis)*			
561.	11826	*Conostylis aculeata subsp. aculeata*			
562.	11552	*Conostylis aculeata subsp. bromelioides*			
563.	11513	*Conostylis aculeata subsp. cygnorum*			
564.	1423	*Conostylis aurea (Golden Conostylis)*			
565.	1425	*Conostylis bracteata*		P3	
566.	1427	*Conostylis candicans (Grey Cottonhead)*			
567.	1436	*Conostylis juncea*			
568.	1443	*Conostylis pauciflora (Dawesville Conostylis)*			
569.	11388	*Conostylis pauciflora subsp. euryrhipis*		P4	
570.	11657	*Conostylis pauciflora subsp. pauciflora*		P4	
571.	1454	*Conostylis setigera (Bristly Cottonhead)*			
572.	11597	*Conostylis setigera subsp. setigera*			
573.	11543	*Conostylis teretifolia subsp. planescens*			
574.	11870	*Conostylis teretifolia subsp. teretifolia*			
575.	1285	*Corynotheca micrantha (Sand Lily)*			
576.	15114	*Cyanicula gemmata*			
577.	283	*Cynodon dactylon (Couch)*	Y		
578.	810	*Cyperus rotundus (Nut Grass)*	Y		
579.	816	*Cyperus tenuiflorus (Scaly Sedge)*	Y		
580.	10916	*Cyrtostylis huegelii*			
581.	10964	*Cyrtostylis robusta*			
582.	1218	*Dasypogon bromeliifolius (Pineapple Bush)*			
583.	17663	*Desmocladus asper*			
584.	17691	*Desmocladus fasciculatus*			

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585.	1259	*Dianella revoluta (Blueberry Lily)*			
586.	11636	*Dianella revoluta var. divaricata*			
587.	306	*Dichelachne crinita (Longhair Plumegrass)*			
588.	1287	*Dichopogon capillipes*			
589.	1635	*Diuris longifolia (Common Donkey Orchid)*			
590.	1639	*Drakaea elastica (Glossy-leaved Hammer Orchid)*		T	
591.	1643	*Elythranthera brunonis (Purple Enamel Orchid)*			
592.	1644	*Elythranthera emarginata (Pink Enamel Orchid)*			
593.	376	*Eragrostis curvula (African Lovegrass)*	Y		
594.	1646	*Eriochilus dilatatus (White Bunny Orchid)*			
595.	20216	*Ficinia nodosa (Knotted Club Rush)*			
596.	907	*Gahnia trifida (Coast Saw-sedge)*			
597.	1520	*Gladiolus caryophyllaceus (Wild Gladiolus)*	Y		
598.	1468	*Haemodorum laxum*			
599.	1470	*Haemodorum paniculatum (Mardja)*			
600.	1475	*Haemodorum spicatum (Mardja)*			
601.	1293	*Hensmania turbinata*			
602.	444	*Holcus lanatus (Yorkshire Fog)*	Y		
603.	1070	*Hypolaena exsulca*			
604.	20200	*Isolepis cernua var. setiformis*			
605.	917	*Isolepis marginata (Coarse Club-rush)*	Y		
606.	20019	*Lachnagrostis filiformis*			
607.	1307	*Laxmannia ramosa (Branching Lily)*			
608.	1308	*Laxmannia sessiliflora (Nodding Lily)*			
609.	11464	*Laxmannia sessiliflora subsp. australis*			
610.	1075	*Lepidobolus preissianus*			
611.	18074	*Lepidobolus preissianus subsp. preissianus*			
612.	925	*Lepidosperma angustatum*			
613.	932	*Lepidosperma effusum (Spreading Sword-sedge)*			
614.	936	*Lepidosperma leptostachyum*			
615.	937	*Lepidosperma longitudinale (Pithy Sword-sedge)*			
616.	940	*Lepidosperma pubisquameum*			
617.	36060	*Lepidosperma sp. Coastal Dunes (R.J. Cranfield 9963)*			
618.	945	*Lepidosperma squamatum*			
619.	1653	*Leporella fimbriata (Hare Orchid)*			
620.	15418	*Leptoceras menziesii*			
621.	1223	*Lomandra caespitosa (Tufted Mat Rush)*			
622.	1228	*Lomandra hermaphrodita*			
623.	1231	*Lomandra maritima*			
624.	1234	*Lomandra nigricans*			
625.	1239	*Lomandra preissii*			
626.	1243	*Lomandra sericea (Silky Mat Rush)*			
627.	1246	*Lomandra suaveolens*			
628.	1097	*Lyginia barbata*			
629.	18049	*Lyginia imberbis*			
630.	955	*Mesomelaena pseudostygia*			
631.	485	*Microlaena stipoides (Weeping Grass)*			
632.	34158	*Microtis alboviridis*			
633.	19179	*Moraea flaccida (One-leaf Cape Tulip)*	Y		
634.	11749	*Orthrosanthus laxus var. laxus (Morning Iris)*			
635.	1550	*Patersonia occidentalis (Purple Flag)*			
636.	30472	*Patersonia occidentalis var. occidentalis*			
637.	40423	*Pentameris airoides (False Hairgrass)*	Y		
638.	20460	*Pheladenia deformis*			
639.	1478	*Phlebocarya ciliata*			
640.	573	*Poa drummondiana (Knotted Poa)*			
641.	578	*Poa porphyroclados*			
642.	582	*Polypogon monspeliensis (Annual Beardgrass)*	Y		
643.	1668	*Prasophyllum brownii*			
644.	1680	*Prasophyllum parvifolium (Autumn Leek Orchid)*			
645.	17267	*Pterostylis brevisepala*			
646.	11118	*Pterostylis pyramidalis (Snail Orchid)*			
647.	1693	*Pterostylis recurva (Jug Orchid)*			
648.	12217	*Pterostylis sanguinea*			
649.	1698	*Pterostylis vittata (Banded Greenhood)*			
650.	16367	*Pyrorchis nigricans (Red beaks)*			
651.	11544	*Romulea rosea var. australis (Guildford Grass)*	Y		
652.	10970	*Rostraria cristata*	Y		
653.	969	*Schoenoplectus validus (Lake Club-rush)*			
654.	982	*Schoenus clandestinus*			

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655.	984	*Schoenus curvifolius*			
656.	992	*Schoenus grandiflorus (Large Flowered Bogrush)*			
657.	998	*Schoenus latitans*			
658.	1007	*Schoenus pedicellatus*			
659.	1312	*Sowerbaea laxiflora (Purple Tassels)*			
660.	1260	*Stypandra glauca (Blind Grass)*			
661.	1036	*Tetraria octandra*			
662.	1705	*Thelymitra crinita (Blue Lady Orchid)*			
663.	1708	*Thelymitra fuscolutea (Leopard Orchid)*			
664.	1319	*Thysanotus arenarius*			
665.	1338	*Thysanotus manglesianus (Fringed Lily)*			
666.	1343	*Thysanotus patersonii*			
667.	1348	*Thysanotus rectantherus*			
668.	1351	*Thysanotus sparteus*			
669.	1357	*Thysanotus thyrsoideus*			
670.	1358	*Thysanotus triandrus*			
671.	1361	*Tricoryne elatior (Yellow Autumn Lily)*			
672.	1363	*Tricoryne tenella*			
673.	11301	*Tricostularia neesii var. elatior*			
674.	12048	*Tricostularia neesii var. neesii*			
675.	33276	*Triglochin isingiana*			
676.	152	*Triglochin trichophora*			
677.	99	*Typha orientalis (Bulrush)*	Y		
678.	716	*Urochloa mutica*	Y		
679.	722	*Vulpia bromoides (Squirrel Tail Fescue)*	Y		
680.	724	*Vulpia myuros (Rat's Tail Fescue)*	Y		
681.	33101	*Vulpia myuros forma myuros*	Y		
682.	1394	*Wurmbea dioica (Early Nancy)*			
683.	1398	*Wurmbea monantha*			
684.	1401	*Wurmbea pygmaea*			
685.	1256	*Xanthorrhoea preissii (Grass tree)*			

Pteridophyte (Fern)

686.	57	*Pteridium esculentum (Bracken)*			

Reptile

687.	25011	*Acritoscincus trilineatum*			
688.	24991	*Aprasia repens*			
689.	25245	*Brachyurophis semifasciata*			
690.	24980	*Christinus marmoratus (Marbled Gecko)*			
691.	24918	*Crenadactylus ocellatus subsp. ocellatus*			
692.	30893	*Cryptoblepharus buchananii*			
693.	30899	*Ctenophorus adelaidensis (Southern Heath Dragons)*			
694.	25027	*Ctenotus australis*			
695.	25039	*Ctenotus fallens*			
696.	30905	*Delma concinna subsp. concinna*			
697.	24999	*Delma grayii*			
698.	25296	*Demansia psammophis subsp. reticulata*			
699.	25100	*Egernia napoleonis*			
700.	25119	*Hemiergis quadrilineata*			
701.	25133	*Lerista elegans*			
702.	25148	*Lerista lineopunctulata*			
703.	25165	*Lerista praepedita*			
704.	25005	*Lialis burtonis*			
705.	25184	*Menetia greyii*			
706.	25191	*Morethia lineoocellata*			
707.	25192	*Morethia obscura*			
708.	25253	*Parasuta gouldii*			
709.	25259	*Pseudonaja affinis subsp. affinis (Dugite)*			
710.	25271	*Ramphotyphlops australis*			
711.	25266	*Simoselaps bertholdi (Jan's Banded Snake)*			
712.	24942	*Strophurus spinigerus subsp. spinigerus*			
713.	25207	*Tiliqua rugosa subsp. rugosa*			
714.	25218	*Varanus gouldii (Bungarra or Sand Monitor)*			

Conservation Codes
T - Rare or likely to become extinct
X - Presumed extinct
IA - Protected under international agreement
S - Other specially protected fauna
1 - Priority 1
2 - Priority 2
3 - Priority 3
4 - Priority 4
5 - Priority 5

Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area

[1] For NatureMap's purposes, species flagged as endemic are those whose records are wholely contained within the search area. Note that only those records complying with the search criterion are included in the calculation. For example, if you limit records to those from a specific datasource, only records from that datasource are used to determine if a species is restricted to the query area.

NatureMap
Mapping Western Australia's biodiversity

NatureMap Species Report

Created By Guest user on 13/03/2012

Current Names Only Yes
Core Datasets Only Yes
Method 'By Circle'
Centre 115°46' 59" E,31°30' 57" S
Buffer 10km
Group By Species Group

Species Group	Species	Records
Alga	1	2
Amphibian	6	36
Bird	26	54
Dicotyledon	291	1087
Fungus	1	1
Gymnosperm	2	7
Mammal	1	3
Monocotyledon	106	384
Pteridophyte (Fern)	1	1
Reptile	16	48
Water Mould	1	3
TOTAL	**452**	**1626**

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
Alga					
1.	26946	*Hormophysa cuneiformis*			
Amphibian					
2.	25400	*Crinia insignifera (Squelching Froglet)*			
3.	25410	*Heleioporus eyrei (Moaning Frog)*			
4.	25415	*Limnodynastes dorsalis (Western Banjo Frog)*			
5.	25420	*Myobatrachus gouldii (Turtle Frog)*			
6.	25426	*Neobatrachus pelobatoides (Humming Frog)*			
7.	25433	*Pseudophryne guentheri (Crawling Toadlet)*			
Bird					
8.	24260	*Acanthiza apicalis (Broad-tailed Thornbill)*			
9.	24262	*Acanthiza inornata (Western Thornbill)*			
10.	24560	*Acanthorhynchus superciliosus (Western Spinebill)*			
11.	24561	*Anthochaera carunculata (Red Wattlebird)*			
12.	24562	*Anthochaera lunulata (Western Little Wattlebird)*			
13.	25566	*Artamus cinereus (Black-faced Woodswallow)*			
14.	24734	*Calyptorhynchus latirostris (Carnaby's Cockatoo)*		T	
15.	25675	*Colluricincla harmonica (Grey Shrike-thrush)*			
16.	25568	*Coracina novaehollandiae (Black-faced Cuckoo-shrike)*			
17.	25592	*Corvus coronoides (Australian Raven)*			
18.	25595	*Cracticus tibicen (Australian Magpie)*			
19.	25596	*Cracticus torquatus (Grey Butcherbird)*			
20.	30901	*Dacelo novaeguineae (Laughing Kookaburra)*			
21.	25621	*Falco berigora (Brown Falcon)*			
22.	25530	*Gerygone fusca (Western Gerygone)*			
23.	24491	*Hirundo neoxena (Welcome Swallow)*			
24.	24581	*Lichenostomus virescens (Singing Honeyeater)*			
25.	25661	*Lichmera indistincta (Brown Honeyeater)*			
26.	25652	*Malurus leucopterus (White-winged Fairy-wren)*			
27.	25654	*Malurus splendens (Splendid Fairy-wren)*			
28.	24583	*Manorina flavigula (Yellow-throated Miner)*			
29.	25680	*Pachycephala rufiventris (Rufous Whistler)*			
30.	24409	*Phaps chalcoptera (Common Bronzewing)*			
31.	24596	*Phylidonyris novaehollandiae (New Holland Honeyeater)*			
32.	30948	*Smicrornis brevirostris (Weebill)*			
33.	25765	*Zosterops lateralis (Grey-breasted White-eye)*			
Dicotyledon					

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
34.	15470	*Acacia barbinervis subsp. borealis*			
35.	3262	*Acacia cochlearis (Rigid Wattle)*			
36.	3282	*Acacia cyclops (Coastal Wattle)*			
37.	3374	*Acacia huegelii*			
38.	3408	*Acacia lasiocalyx (Silver Wattle)*			
39.	11611	*Acacia lasiocarpa var. lasiocarpa*			
40.	3502	*Acacia pulchella (Prickly Moses)*			
41.	3527	*Acacia saligna (Orange Wattle)*			
42.	3557	*Acacia stenoptera (Narrow Winged Wattle)*			
43.	3584	*Acacia truncata*			
44.	1775	*Adenanthos cygnorum (Common Woollybush)*			
45.	11336	*Adenanthos cygnorum subsp. chamaephyton*		P3	
46.	1728	*Allocasuarina fraseriana (Sheoak)*			
47.	1732	*Allocasuarina humilis (Dwarf Sheoak)*			
48.	6311	*Andersonia heterophylla*			
49.	6314	*Andersonia lehmanniana*			
50.	3688	*Aotus gracillima*			
51.	3692	*Aotus procumbens*			
52.	7851	*Asteridea pulverulenta (Common Bristle Daisy)*			
53.	6331	*Astroloma microcalyx (Native Cranberry)*			
54.	6334	*Astroloma pallidum (Kick Bush)*			
55.	6339	*Astroloma xerophyllum*			
56.	5365	*Baeckea robusta*			
57.	34161	*Baeckea sp. Limestone (N. Gibson & M.N. Lyons 1425)*			
58.	1800	*Banksia attenuata (Slender Banksia)*			
59.	32580	*Banksia dallanneyi var. dallanneyi*			
60.	1819	*Banksia grandis (Bull Banksia)*			
61.	1822	*Banksia ilicifolia (Holly-leaved Banksia)*			
62.	1834	*Banksia menziesii (Firewood Banksia)*			
63.	32077	*Banksia sessilis var. cygnorum*			
64.	5382	*Beaufortia elegans*			
65.	4594	*Beyeria cinerea*			
66.	25788	*Billardiera fraseri (Elegant Pronaya)*			
67.	4438	*Boronia ramosa*			
68.	3710	*Bossiaea eriocarpa (Common Brown Pea)*			
69.	7878	*Brachyscome iberidifolia*			
70.	2856	*Calandrinia liniflora (Parakeelya)*			
71.	5411	*Calothamnus hirsutus*			
72.	5426	*Calothamnus quadrifidus (One-sided Bottlebrush)*			
73.	35816	*Calothamnus quadrifidus subsp. quadrifidus*			
74.	5429	*Calothamnus sanguineus (Silky-leaved Blood flower)*			
75.	5458	*Calytrix flavescens (Summer Starflower)*			
76.	5460	*Calytrix fraseri (Pink Summer Calytrix)*			
77.	5476	*Calytrix sapphirina*			
78.	2798	*Carpobrotus virescens (Coastal Pigface)*			
79.	2951	*Cassytha flava (Dodder Laurel)*			
80.	2952	*Cassytha glabella (Tangled Dodder Laurel)*			
81.	2956	*Cassytha pomiformis (Dodder Laurel)*			
82.	2957	*Cassytha racemosa (Dodder Laurel)*			
83.	11799	*Cassytha racemosa forma racemosa*			
84.	6539	*Centaurium erythraea (Common Centaury)*	Y		
85.	13119	*Cerastium balearicum*	Y		
86.	2889	*Cerastium glomeratum (Mouse Ear Chickweed)*	Y		
87.	6543	*Cicendia filiformis (Slender Cicendia)*	Y		
88.	7937	*Cirsium vulgare (Spear Thistle)*	Y		
89.	4550	*Comesperma calymega (Blue-spike Milkwort)*			
90.	4552	*Comesperma confertum*			
91.	1857	*Conospermum acerosum (Needle-leaved Smokebush)*			
92.	15607	*Conospermum acerosum subsp. acerosum*			
93.	15513	*Conospermum boreale subsp. boreale*			
94.	15041	*Conospermum canaliculatum*			
95.	15516	*Conospermum canaliculatum subsp. canaliculatum*			
96.	1876	*Conospermum incurvum (Plume Smokebush)*			
97.	1882	*Conospermum stoechadis (Common Smokebush)*			
98.	15611	*Conospermum stoechadis subsp. stoechadis (Common Smokebush)*			
99.	15521	*Conospermum unilaterale*			
100.	6347	*Conostephium minus (Pink-tipped Pearl flower)*			
101.	6348	*Conostephium pendulum (Pearl Flower)*			
102.	6349	*Conostephium preissii*			
103.	7939	*Conyza bonariensis (Flaxleaf Fleabane)*	Y		

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
104.	20074	*Conyza sumatrensis*	Y		
105.	11221	*Crassula alata var. alata*	Y		
106.	17701	*Crassula closiana*			
107.	3137	*Crassula colorata (Dense Stonecrop)*			
108.	4802	*Cryptandra mutila*			
109.	4809	*Cryptandra pungens*			
110.	4810	*Cryptandra scoparia*			
111.	7454	*Dampiera linearis (Common Dampiera)*			
112.	6218	*Daucus glochidiatus (Australian Carrot)*			
113.	3807	*Daviesia divaricata (Marno)*			
114.	16585	*Daviesia nudiflora subsp. nudiflora*			
115.	3832	*Daviesia physodes*			
116.	3833	*Daviesia podophylla*			
117.	3837	*Daviesia quadrilatera*			
118.	3845	*Daviesia triflora*			
119.	4453	*Diplolaena angustifolia (Yanchep Rose)*			
120.	4746	*Diplopeltis huegelii*			
121.	18541	*Diplopeltis huegelii subsp. huegelii*			
122.	7054	*Dischisma arenarium*	Y		
123.	4754	*Dodonaea aptera (Coast Hop-bush)*			
124.	3092	*Drosera bulbosa (Red-leaved Sundew)*			
125.	3095	*Drosera erythrorhiza (Red Ink Sundew)*			
126.	3098	*Drosera glanduligera (Pimpernel Sundew)*			
127.	3106	*Drosera macrantha (Bridal Rainbow)*			
128.	11853	*Drosera menziesii subsp. menziesii*			
129.	13216	*Drosera menziesii subsp. penicillaris*			
130.	11768	*Drosera neesii subsp. neesii*			
131.	3114	*Drosera nitidula (Shining Sundew)*			
132.	3117	*Drosera paleacea (Dwarf Sundew)*			
133.	3118	*Drosera pallida (Pale Rainbow)*			
134.	3119	*Drosera parvula (Small Sundew)*			
135.	13949	*Eremaea asterocarpa*			
136.	13950	*Eremaea asterocarpa subsp. asterocarpa*			
137.	5541	*Eremaea pauciflora*			
138.	5542	*Eremaea purpurea*			
139.	7215	*Eremophila glabra (Tar Bush)*			
140.	17175	*Eremophila glabra subsp. albicans*			
141.	4332	*Erodium botrys (Long Storksbill)*	Y		
142.	4333	*Erodium cicutarium (Common Storksbill)*	Y		
143.	13091	*Eucalyptus argutifolia (Wabling Hill Mallee)*		T	
144.	5615	*Eucalyptus decipiens*			
145.	5649	*Eucalyptus foecunda (Narrow-leaved Red Mallee)*			
146.	5659	*Eucalyptus gomphocephala (Tuart)*			
147.	5708	*Eucalyptus marginata (Jarrah)*			
148.	13547	*Eucalyptus marginata subsp. marginata (Jarrah)*			
149.	5763	*Eucalyptus rudis (Flooded Gum)*			
150.	5790	*Eucalyptus todtiana (Coastal Blackbutt)*			
151.	10765	*Exocarpos sparteus (Broom Ballart)*			
152.	7323	*Galium murale (Small Goosegrass)*	Y		
153.	4340	*Geranium retrorsum*			
154.	7991	*Gnephosis drummondii*			
155.	3945	*Gompholobium aristatum*			
156.	3948	*Gompholobium capitatum*			
157.	10909	*Gompholobium confertum*			
158.	29267	*Gompholobium muticum*			
159.	11083	*Gompholobium scabrum*			
160.	3957	*Gompholobium tomentosum (Hairy Yellow Pea)*			
161.	6161	*Gonocarpus pithyoides*			
162.	15839	*Grevillea preissii subsp. preissii*			
163.	2146	*Hakea costata (Ribbed Hakea)*			
164.	2175	*Hakea lissocarpha (Honey Bush)*			
165.	2197	*Hakea prostrata (Harsh Hakea)*			
166.	2203	*Hakea ruscifolia (Candle Hakea)*			
167.	2214	*Hakea trifurcata (Two-leaf Hakea)*			
168.	2216	*Hakea varia (Variable-leaved Hakea)*			
169.	6175	*Haloragis hamata*			
170.	3961	*Hardenbergia comptoniana (Native Wisteria)*			
171.	3016	*Heliophila pusilla*	Y		
172.	16934	*Hemiandra glabra subsp. glabra*			
173.	6839	*Hemiandra pungens (Snakebush)*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
174.	5112	*Hibbertia aurea*			
175.	5116	*Hibbertia crassifolia*			
176.	5134	*Hibbertia huegelii*			
177.	5135	*Hibbertia hypericoides (Yellow Buttercups)*			
178.	5162	*Hibbertia racemosa (Stalked Guinea Flower)*			
179.	5173	*Hibbertia subvaginata*			
180.	6222	*Homalosciadium homalocarpum*			
181.	3966	*Hovea pungens (Devil's Pins)*			
182.	3968	*Hovea trisperma (Common Hovea)*			
183.	12741	*Hyalosperma cotula*			
184.	12742	*Hyalosperma demissum*			
185.	5216	*Hybanthus calycinus (Wild Violet)*			
186.	6224	*Hydrocotyle blepharocarpa*			
187.	6226	*Hydrocotyle callicarpa (Small Pennywort)*			
188.	6232	*Hydrocotyle hispidula*			
189.	11546	*Hydrocotyle pilifera var. glabrata*			
190.	8086	*Hypochaeris glabra (Smooth Catsear)*	Y		
191.	3992	*Isotropis cuneifolia (Granny Bonnets)*			
192.	4012	*Jacksonia furcellata (Grey Stinkwood)*			
193.	4029	*Jacksonia sternbergiana (Stinkwood)*			
194.	4044	*Kennedia prostrata (Scarlet Runner)*			
195.	5832	*Kunzea ericifolia (Spearwood)*			
196.	15498	*Kunzea glabrescens (Spearwood)*			
197.	18585	*Lagenophora huegelii*			
198.	5036	*Lasiopetalum lineare*		P3	
199.	5038	*Lasiopetalum membranaceum*		P3	
200.	7572	*Lechenaultia expansa*			
201.	7574	*Lechenaultia floribunda (Free-flowering Leschenaultia)*			
202.	3044	*Lepidium rotundum (Veined Peppercress)*			
203.	2344	*Leptomeria empetriformis*			
204.	2350	*Leptomeria pauciflora (Sparse-flowered Currant Bush)*			
205.	2352	*Leptomeria preissiana*			
206.	5857	*Leptospermum spinescens*			
207.	6374	*Leucopogon conostephioides*			
208.	6425	*Leucopogon oxycedrus*			
209.	6427	*Leucopogon parviflorus (Coast Beard-heath)*			
210.	6434	*Leucopogon polymorphus*			
211.	6436	*Leucopogon propinquus*			
212.	6440	*Leucopogon racemulosus*			
213.	19460	*Leucopogon sp. Yanchep (M. Hislop 1986)*		P3	
214.	7676	*Levenhookia pusilla (Midget Stylewort)*			
215.	7408	*Lobelia tenuior (Slender Lobelia)*			
216.	36375	*Lysimachia arvensis (Pimpernel)*	Y		
217.	6456	*Lysinema ciliatum (Curry Flower)*			
218.	34736	*Lysinema pentapetalum*			
219.	2839	*Macarthuria australis*			
220.	5920	*Melaleuca huegelii (Chenille Honeymyrtle)*			
221.	13271	*Melaleuca huegelii subsp. huegelii*			
222.	5952	*Melaleuca preissiana (Moonah)*			
223.	18598	*Melaleuca systena*			
224.	5983	*Melaleuca trichophylla*			
225.	8105	*Millotia myosotidifolia*			
226.	8106	*Millotia tenuifolia (Soft Millotia)*			
227.	16693	*Minuartia mediterranea*	Y		
228.	4100	*Mirbelia spinosa*			
229.	4666	*Monotaxis occidentalis*			
230.	7289	*Myoporum caprarioides (Slender Myoporum)*			
231.	2401	*Nuytsia floribunda (Christmas Tree)*			
232.	2365	*Olax benthamiana*			
233.	7089	*Parentucellia latifolia (Common Bartsia)*	Y		
234.	12670	*Parietaria cardiostegia*			
235.	1762	*Parietaria debilis (Pellitory)*			
236.	4343	*Pelargonium capitatum (Rose Pelargonium)*	Y		
237.	4346	*Pelargonium littorale*			
238.	6006	*Pericalymma ellipticum (Swamp Teatree)*			
239.	2258	*Persoonia comata*			
240.	20368	*Petrophile axillaris*			
241.	2299	*Petrophile linearis (Pixie Mops)*			
242.	2301	*Petrophile macrostachya*			
243.	2306	*Petrophile rigida*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
244.	2308	*Petrophile seminuda*			
245.	2309	*Petrophile serruriae*			
246.	18529	*Philotheca spicata (Pepper and Salt)*			
247.	6734	*Phyla nodiflora var. nodiflora*	Y		
248.	4675	*Phyllanthus calycinus (False Boronia)*			
249.	5244	*Pimelea floribunda*			
250.	5268	*Pimelea sulphurea (Yellow Banjine)*			
251.	8163	*Pithocarpa corymbulosa (Corymbose Pithocarpa)*		P3	
252.	8165	*Pithocarpa pulchella (Beautiful Pithocarpa)*			
253.	6801	*Pityrodia bartlingii (Woolly Dragon)*			
254.	8175	*Podolepis gracilis (Slender Podolepis)*			
255.	8177	*Podolepis lessonii*			
256.	8182	*Podotheca angustifolia (Sticky Longheads)*			
257.	8183	*Podotheca chrysantha (Yellow Podotheca)*			
258.	8184	*Podotheca gnaphalioides (Golden Long-heads)*			
259.	4689	*Poranthera ericoides (Heath Poranthera)*			
260.	4691	*Poranthera microphylla (Small Poranthera)*			
261.	11775	*Ptilotus humilis subsp. humilis*			
262.	4181	*Pultenaea reticulata*			
263.	8195	*Quinetia urvillei*			
264.	6012	*Regelia ciliata*			
265.	6014	*Regelia inops*			
266.	2578	*Rhagodia baccata (Berry Saltbush)*			
267.	15035	*Rhodanthe corymbosa*			
268.	2906	*Sagina apetala (Annual Pearlwort)*	Y		
269.	7626	*Scaevola nitida (Shining Fanflower)*			
270.	13182	*Scaevola repens var. repens*			
271.	7647	*Scaevola thesioides*			
272.	6033	*Scholtzia involucrata (Spiked Scholtzia)*			
273.	8203	*Senecio diaschides*	Y		
274.	2909	*Silene gallica (French Catchfly)*	Y		
275.	8225	*Siloxerus humifusus (Procumbent Siloxerus)*			
276.	8231	*Sonchus oleraceus (Common Sowthistle)*	Y		
277.	17551	*Sphaerolobium drummondii*			
278.	4713	*Stachystemon axillaris (Leafy Stachystemon)*			
279.	4733	*Stackhousia monogyna*			
280.	2918	*Stellaria media (Chickweed)*	Y		
281.	15066	*Stenanthemum notiale subsp. chamelum*			
282.	19403	*Stenopetalum gracile*			
283.	2316	*Stirlingia latifolia (Blueboy)*			
284.	7679	*Stylidium adpressum (Trigger-on-stilts)*			
285.	30278	*Stylidium androsaceum*			
286.	25831	*Stylidium araeophyllum*			
287.	30276	*Stylidium bicolor*			
288.	7693	*Stylidium brunonianum (Pink Fountain Triggerplant)*			
289.	7694	*Stylidium bulbiferum (Circus Triggerplant)*			
290.	7696	*Stylidium calcaratum (Book Triggerplant)*			
291.	7708	*Stylidium crassifolium (Thick-leaved Triggerplant)*			
292.	7709	*Stylidium crossocephalum (Posy Triggerplant)*			
293.	7710	*Stylidium cygnorum*			
294.	7716	*Stylidium diuroides (Donkey Triggerplant)*			
295.	11808	*Stylidium diuroides subsp. diuroides*			
296.	7745	*Stylidium junceum (Reed Triggerplant)*			
297.	13127	*Stylidium maritimum*		P3	
298.	25829	*Stylidium neurophyllum*			
299.	7774	*Stylidium piliferum (Common Butterfly Triggerplant)*			
300.	7785	*Stylidium repens (Matted Triggerplant)*			
301.	25806	*Stylidium scariosum*			
302.	7798	*Stylidium schoenoides (Cow Kicks)*			
303.	25830	*Stylidium sp. Darling Range (H. Bowler 371)*			
304.	2329	*Synaphea spinulosa*			
305.	15532	*Synaphea spinulosa subsp. spinulosa*			
306.	4256	*Templetonia retusa (Cockies Tongues)*			
307.	5105	*Thomasia triphylla*			
308.	6280	*Trachymene pilosa (Native Parsnip)*			
309.	17763	*Trifolium campestre var. campestre (Hop Clover)*	Y		
310.	4295	*Trifolium dubium (Suckling Clover)*	Y		
311.	4737	*Tripterococcus brunonis (Winged Stackhousia)*			
312.	11665	*Trymalium ledifolium var. ledifolium*			
313.	8255	*Ursinia anthemoides (Ursinia)*	Y		

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314.	38388	*Ursinia anthemoides subsp. anthemoides*	Y		
315.	7665	*Velleia trinervis*			
316.	7666	*Verreauxia reinwardtii (Common Verreauxia)*			
317.	12411	*Verticordia densiflora var. cespitosa*			
318.	6101	*Verticordia nitens (Morrison Featherflower)*			
319.	7384	*Wahlenbergia capensis (Cape Bluebell)*	Y		
320.	7389	*Wahlenbergia preissii*			
321.	13331	*Waitzia acuminata var. acuminata*			
322.	8282	*Waitzia suaveolens (Fragrant Waitzia)*			
323.	13333	*Waitzia suaveolens var. suaveolens*			
324.	6289	*Xanthosia huegelii*			
Fungus					
325.	18195	*Amanita carneiphylla*		P2	
Gymnosperm					
326.	85	*Macrozamia riedlei (Zamia)*			
327.	88	*Pinus radiata (Radiata Pine)*	Y		
Mammal					
328.	24167	*Tarsipes rostratus (Honey Possum)*			
Monocotyledon					
329.	1208	*Acanthocarpus preissii*			
330.	1505	*Agave americana (Century Plant)*	Y		
331.	184	*Aira caryophyllea (Silvery Hairgrass)*	Y		
332.	1056	*Alexgeorgea nitens*			
333.	198	*Amphipogon laguroides*			
334.	200	*Amphipogon turbinatus*			
335.	1409	*Anigozanthos humilis (Catspaw)*			
336.	231	*Avellinia michelii*	Y		
337.	743	*Baumea juncea (Bare Twigrush)*			
338.	748	*Baumea vaginalis (Sheath Twigrush)*			
339.	244	*Briza maxima (Blowfly Grass)*	Y		
340.	245	*Briza minor (Shivery Grass)*	Y		
341.	15330	*Caladenia arenicola*			
342.	1592	*Caladenia flava (Cowslip Orchid)*			
343.	15348	*Caladenia flava subsp. flava*			
344.	15360	*Caladenia longicauda subsp. borealis*			
345.	1605	*Caladenia marginata (White Fairy Orchid)*			
346.	1213	*Calectasia cyanea (Blue Tinsel Lily)*		T	
347.	760	*Caustis dioica*			
348.	1121	*Centrolepis aristata (Pointed Centrolepis)*			
349.	13122	*Centrolepis cephaloformis subsp. cephaloformis*			
350.	1125	*Centrolepis drummondiana*			
351.	1280	*Chamaescilla corymbosa (Blue Squill)*			
352.	17833	*Chordifex microcodon*			
353.	1418	*Conostylis aculeata (Prickly Conostylis)*			
354.	11513	*Conostylis aculeata subsp. cygnorum*			
355.	1423	*Conostylis aurea (Golden Conostylis)*			
356.	1427	*Conostylis candicans (Grey Cottonhead)*			
357.	12027	*Conostylis candicans subsp. calcicola*			
358.	1436	*Conostylis juncea*			
359.	1443	*Conostylis pauciflora (Dawesville Conostylis)*			
360.	11388	*Conostylis pauciflora subsp. euryrhipis*		P4	
361.	1454	*Conostylis setigera (Bristly Cottonhead)*			
362.	1285	*Corynotheca micrantha (Sand Lily)*			
363.	10916	*Cyrtostylis huegelii*			
364.	1218	*Dasypogon bromeliifolius (Pineapple Bush)*			
365.	17663	*Desmocladus asper*			
366.	17691	*Desmocladus fasciculatus*			
367.	1259	*Dianella revoluta (Blueberry Lily)*			
368.	306	*Dichelachne crinita (Longhair Plumegrass)*			
369.	1635	*Diuris longifolia (Common Donkey Orchid)*			
370.	1643	*Elythranthera brunonis (Purple Enamel Orchid)*			
371.	1646	*Eriochilus dilatatus (White Bunny Orchid)*			
372.	1520	*Gladiolus caryophyllaceus (Wild Gladiolus)*	Y		
373.	1468	*Haemodorum laxum*			
374.	1470	*Haemodorum paniculatum (Mardja)*			
375.	1293	*Hensmania turbinata*			
376.	1070	*Hypolaena exsulca*			
377.	917	*Isolepis marginata (Coarse Club-rush)*	Y		

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
378.	19955	*Lachnagrostis plebeia*			
379.	1308	*Laxmannia sessiliflora (Nodding Lily)*			
380.	1075	*Lepidobolus preissianus*			
381.	925	*Lepidosperma angustatum*			
382.	936	*Lepidosperma leptostachyum*			
383.	36060	*Lepidosperma sp. Coastal Dunes (R.J. Cranfield 9963)*			
384.	945	*Lepidosperma squamatum*			
385.	1653	*Leporella fimbriata (Hare Orchid)*			
386.	15418	*Leptoceras menziesii*			
387.	1223	*Lomandra caespitosa (Tufted Mat Rush)*			
388.	1228	*Lomandra hermaphrodita*			
389.	1231	*Lomandra maritima*			
390.	1239	*Lomandra preissii*			
391.	1243	*Lomandra sericea (Silky Mat Rush)*			
392.	1246	*Lomandra suaveolens*			
393.	1097	*Lyginia barbata*			
394.	18049	*Lyginia imberbis*			
395.	955	*Mesomelaena pseudostygia*			
396.	485	*Microlaena stipoides (Weeping Grass)*			
397.	1537	*Orthrosanthus laxus (Morning Iris)*			
398.	11749	*Orthrosanthus laxus var. laxus (Morning Iris)*			
399.	1550	*Patersonia occidentalis (Purple Flag)*			
400.	1478	*Phlebocarya ciliata*			
401.	573	*Poa drummondiana (Knotted Poa)*			
402.	17267	*Pterostylis brevisepala*			
403.	11118	*Pterostylis pyramidalis (Snail Orchid)*			
404.	1693	*Pterostylis recurva (Jug Orchid)*			
405.	12217	*Pterostylis sanguinea*			
406.	18645	*Pterostylis sp. limestone (B.J. Keighery & G.J. Keighery 65)*			
407.	1698	*Pterostylis vittata (Banded Greenhood)*			
408.	978	*Schoenus brevisetis*			
409.	979	*Schoenus caespititius*			
410.	982	*Schoenus clandestinus*			
411.	984	*Schoenus curvifolius*			
412.	1002	*Schoenus nanus (Tiny Bog Rush)*			
413.	1312	*Sowerbaea laxiflora (Purple Tassels)*			
414.	1036	*Tetraria octandra*			
415.	10856	*Thelymitra benthamiana (Cinnamon Sun Orchid)*			
416.	1705	*Thelymitra crinita (Blue Lady Orchid)*			
417.	1319	*Thysanotus arenarius*			
418.	1343	*Thysanotus patersonii*			
419.	1351	*Thysanotus sparteus*			
420.	1357	*Thysanotus thyrsoideus*			
421.	1358	*Thysanotus triandrus*			
422.	1481	*Tribonanthes australis*			
423.	1361	*Tricoryne elatior (Yellow Autumn Lily)*			
424.	1363	*Tricoryne tenella*			
425.	11301	*Tricostularia neesii var. elatior*			
426.	12048	*Tricostularia neesii var. neesii*			
427.	18587	*Triglochin nana*			
428.	152	*Triglochin trichophora*			
429.	722	*Vulpia bromoides (Squirrel Tail Fescue)*	Y		
430.	724	*Vulpia myuros (Rat's Tail Fescue)*	Y		
431.	33101	*Vulpia myuros forma myuros*	Y		
432.	1394	*Wurmbea dioica (Early Nancy)*			
433.	1398	*Wurmbea monantha*			
434.	1256	*Xanthorrhoea preissii (Grass tree)*			

Pteridophyte (Fern)

435.	57	*Pteridium esculentum (Bracken)*			

Reptile

436.	25241	*Antaresia stimsoni subsp. stimsoni*			
437.	25245	*Brachyurophis semifasciata*			
438.	30893	*Cryptoblepharus buchananii*			
439.	30899	*Ctenophorus adelaidensis (Southern Heath Dragons)*			
440.	25027	*Ctenotus australis*			
441.	25039	*Ctenotus fallens*			
442.	25100	*Egernia napoleonis*			
443.	25133	*Lerista elegans*			
444.	25165	*Lerista praepedita*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
445.	25005	*Lialis burtonis*			
446.	25184	*Menetia greyii*			
447.	25191	*Morethia lineoocellata*			
448.	25253	*Parasuta gouldii*			
449.	25259	*Pseudonaja affinis subsp. affinis (Dugite)*			
450.	25271	*Ramphotyphlops australis*			
451.	25285	*Ramphotyphlops pinguis*			

Water Mould

452.		*Phytophthora cinnamomi*			

Conservation Codes
T - Rare or likely to become extinct
X - Presumed extinct
IA - Protected under international agreement
S - Other specially protected fauna
1 - Priority 1
2 - Priority 2
3 - Priority 3
4 - Priority 4
5 - Priority 5

[1] For NatureMap's purposes, species flagged as endemic are those whose records are wholely contained within the search area. Note that only those records complying with the search criterion are included in the calculation. For example, if you limit records to those from a specific datasource, only records from that datasource are used to determine if a species is restricted to the query area.

NatureMap
Mapping Western Australia's biodiversity

NatureMap Species Report

Created By Guest user on 13/03/2012

Current Names Only	Yes
Core Datasets Only	Yes
Method	'By Circle'
Centre	115°46' 51" E,31°35' 56" S
Buffer	10km
Group By	Species Group

Species Group	Species	Records
Alga	3	4
Amphibian	4	17
Bird	96	1220
Dicotyledon	281	733
Gymnosperm	1	6
Invertebrate	4	75
Mammal	11	23
Monocotyledon	130	361
Reptile	32	92
Slime Mould	2	2
Water Mould	1	8
TOTAL	**565**	**2541**

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
Alga					
1.	26731	*Cystoseira trinodis*			
2.	27392	*Dictyota dichotoma var. intricata*			
3.	26946	*Hormophysa cuneiformis*			
Amphibian					
4.	25400	*Crinia insignifera (Squelching Froglet)*			
5.	25410	*Heleioporus eyrei (Moaning Frog)*			
6.	25415	*Limnodynastes dorsalis (Western Banjo Frog)*			
7.	25433	*Pseudophryne guentheri (Crawling Toadlet)*			
Bird					
8.	24559	*Acanthagenys rufogularis (Spiny-cheeked Honeyeater)*			
9.	24260	*Acanthiza apicalis (Broad-tailed Thornbill)*			
10.	24261	*Acanthiza chrysorrhoa (Yellow-rumped Thornbill)*			
11.	24262	*Acanthiza inornata (Western Thornbill)*			
12.	24560	*Acanthorhynchus superciliosus (Western Spinebill)*			
13.	25535	*Accipiter cirrocephalus (Collared Sparrowhawk)*			
14.	25536	*Accipiter fasciatus (Brown Goshawk)*			
15.	25755	*Acrocephalus australis (Australian Reed Warbler)*			
16.	24312	*Anas gracilis (Grey Teal)*			
17.	24315	*Anas rhynchotis (Australasian Shoveler)*			
18.	24316	*Anas superciliosa (Pacific Black Duck)*			
19.	24561	*Anthochaera carunculata (Red Wattlebird)*			
20.	24562	*Anthochaera lunulata (Western Little Wattlebird)*			
21.	24285	*Aquila audax (Wedge-tailed Eagle)*			
22.	24341	*Ardea pacifica (White-necked Heron)*			
23.	25566	*Artamus cinereus (Black-faced Woodswallow)*			
24.	24353	*Artamus cyanopterus (Dusky Woodswallow)*			
25.	24318	*Aythya australis (Hardhead)*			
26.	24319	*Biziura lobata (Musk Duck)*			
27.	25714	*Cacatua pastinator (Western Long-billed Corella)*			
28.	25716	*Cacatua sanguinea (Little Corella)*			
29.	24729	*Cacatua tenuirostris (Eastern Long-billed Corella)*			
30.	25598	*Cacomantis flabelliformis (Fan-tailed Cuckoo)*			
31.	25717	*Calyptorhynchus banksii (Red-tailed Black-Cockatoo)*			
32.	24734	*Calyptorhynchus latirostris (Carnaby's Cockatoo)*		T	
33.	25625	*Carduelis carduelis (Goldfinch)*			
34.	24377	*Charadrius ruficapillus (Red-capped Plover)*			
35.	24321	*Chenonetta jubata (Australian Wood Duck)*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
36.	24288	*Circus approximans (Swamp Harrier)*			
37.	24289	*Circus assimilis (Spotted Harrier)*			
38.	25675	*Colluricincla harmonica (Grey Shrike-thrush)*			
39.	24399	*Columba livia (Domestic Pigeon)*			
40.	25568	*Coracina novaehollandiae (Black-faced Cuckoo-shrike)*			
41.	25592	*Corvus coronoides (Australian Raven)*			
42.	24420	*Cracticus nigrogularis (Pied Butcherbird)*			
43.	25595	*Cracticus tibicen (Australian Magpie)*			
44.	25596	*Cracticus torquatus (Grey Butcherbird)*			
45.	24322	*Cygnus atratus (Black Swan)*			
46.	30901	*Dacelo novaeguineae (Laughing Kookaburra)*			
47.	25673	*Daphoenositta chrysoptera (Varied Sittella)*			
48.	25607	*Dicaeum hirundinaceum (Mistletoebird)*			
49.	24652	*Eopsaltria georgiana (White-breasted Robin)*			
50.	25622	*Falco cenchroides (Australian Kestrel)*			
51.	25623	*Falco longipennis (Australian Hobby)*			
52.	25727	*Fulica atra (Eurasian Coot)*			
53.	25729	*Gallinula tenebrosa (Dusky Moorhen)*			
54.	25530	*Gerygone fusca (Western Gerygone)*			
55.	24735	*Glossopsitta porphyrocephala (Purple-crowned Lorikeet)*			
56.	24443	*Grallina cyanoleuca (Magpie-lark)*			
57.	24295	*Haliastur sphenurus (Whistling Kite)*			
58.	24689	*Halobaena caerulea (Blue Petrel)*			
59.	25734	*Himantopus himantopus (Black-winged Stilt)*			
60.	24491	*Hirundo neoxena (Welcome Swallow)*			
61.	24577	*Lichenostomus ornatus (Yellow-plumed Honeyeater)*			
62.	24581	*Lichenostomus virescens (Singing Honeyeater)*			
63.	25661	*Lichmera indistincta (Brown Honeyeater)*			
64.	25651	*Malurus lamberti (Variegated Fairy-wren)*			
65.	25652	*Malurus leucopterus (White-winged Fairy-wren)*			
66.	25654	*Malurus splendens (Splendid Fairy-wren)*			
67.	24583	*Manorina flavigula (Yellow-throated Miner)*			
68.	24598	*Merops ornatus (Rainbow Bee-eater)*			
69.	24738	*Neophema elegans (Elegant Parrot)*			
70.	25748	*Ninox novaeseelandiae (Boobook Owl)*			
71.	25564	*Nycticorax caledonicus (Rufous Night Heron)*			
72.	24407	*Ocyphaps lophotes (Crested Pigeon)*			
73.	24328	*Oxyura australis (Blue-billed Duck)*			
74.	25679	*Pachycephala pectoralis (Golden Whistler)*			
75.	25680	*Pachycephala rufiventris (Rufous Whistler)*			
76.	25681	*Pardalotus punctatus (Spotted Pardalote)*			
77.	25682	*Pardalotus striatus (Striated Pardalote)*			
78.	24648	*Pelecanus conspicillatus (Australian Pelican)*			
79.	24659	*Petroica goodenovii (Red-capped Robin)*			
80.	25697	*Phalacrocorax carbo (Great Cormorant)*			
81.	24667	*Phalacrocorax sulcirostris (Little Black Cormorant)*			
82.	24409	*Phaps chalcoptera (Common Bronzewing)*			
83.	24596	*Phylidonyris novaehollandiae (New Holland Honeyeater)*			
84.	24841	*Platalea flavipes (Yellow-billed Spoonbill)*			
85.	25720	*Platycercus icterotis (Western Rosella)*			
86.	25703	*Podargus strigoides (Tawny Frogmouth)*			
87.	25704	*Podiceps cristatus (Great Crested Grebe)*			
88.	24681	*Poliocephalus poliocephalus (Hoary-headed Grebe)*			
89.	25722	*Polytelis anthopeplus (Regent Parrot)*			
90.	25731	*Porphyrio porphyrio (Purple Swamphen)*			
91.	25614	*Rhipidura leucophrys (Willie Wagtail)*			
92.	25534	*Sericornis frontalis (White-browed Scrubwren)*			
93.	30948	*Smicrornis brevirostris (Weebill)*			
94.	25597	*Strepera versicolor (Grey Currawong)*			
95.	25589	*Streptopelia chinensis (Spotted Turtle-Dove)*			
96.	25590	*Streptopelia senegalensis (Laughing Turtle-Dove)*			
97.	25705	*Tachybaptus novaehollandiae (Australasian Grebe)*			
98.	24331	*Tadorna tadornoides (Australian Shelduck)*			
99.	24844	*Threskiornis molucca (Australian White Ibis)*			
100.	24845	*Threskiornis spinicollis (Straw-necked Ibis)*			
101.	25549	*Todiramphus sanctus (Sacred Kingfisher)*			
102.	25723	*Trichoglossus haematodus (Rainbow Lorikeet)*			
103.	25765	*Zosterops lateralis (Grey-breasted White-eye)*			

Dicotyledon

104.	15470	*Acacia barbinervis subsp. borealis*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
105.	3237	*Acacia benthamii*		P2	
106.	3262	*Acacia cochlearis (Rigid Wattle)*			
107.	3282	*Acacia cyclops (Coastal Wattle)*			
108.	3408	*Acacia lasiocalyx (Silver Wattle)*			
109.	11611	*Acacia lasiocarpa var. lasiocarpa*			
110.	3502	*Acacia pulchella (Prickly Moses)*			
111.	15482	*Acacia pulchella var. goadbyi*			
112.	3525	*Acacia rostellifera (Summer-scented Wattle)*			
113.	30032	*Acacia saligna subsp. saligna*			
114.	3557	*Acacia stenoptera (Narrow Winged Wattle)*			
115.	3584	*Acacia truncata*			
116.	6205	*Actinotus leucocephalus (Flannel Flower)*			
117.	1775	*Adenanthos cygnorum (Common Woollybush)*			
118.	11336	*Adenanthos cygnorum subsp. chamaephyton*		P3	
119.	1728	*Allocasuarina fraseriana (Sheoak)*			
120.	1732	*Allocasuarina humilis (Dwarf Sheoak)*			
121.	2668	*Amaranthus powellii (Powell's Amaranth)*	Y		
122.	2671	*Amaranthus viridis (Green Amaranth)*	Y		
123.	6311	*Andersonia heterophylla*			
124.	6314	*Andersonia lehmanniana*			
125.	12724	*Anthotium junciforme*			
126.	20283	*Astartea scoparia*			
127.	7851	*Asteridea pulverulenta (Common Bristle Daisy)*			
128.	6331	*Astroloma microcalyx (Native Cranberry)*			
129.	6334	*Astroloma pallidum (Kick Bush)*			
130.	34161	*Baeckea sp. Limestone (N. Gibson & M.N. Lyons 1425)*			
131.	1800	*Banksia attenuata (Slender Banksia)*			
132.	1819	*Banksia grandis (Bull Banksia)*			
133.	1822	*Banksia ilicifolia (Holly-leaved Banksia)*			
134.	1834	*Banksia menziesii (Firewood Banksia)*			
135.	5382	*Beaufortia elegans*			
136.	11564	*Boronia ramosa subsp. ramosa*			
137.	3710	*Bossiaea eriocarpa (Common Brown Pea)*			
138.	7878	*Brachyscome iberidifolia*			
139.	11187	*Brassica barrelieri subsp. oxyrrhina (Smooth-stem Turnip)*	Y		
140.	3000	*Brassica tournefortii (Mediterranean Turnip)*	Y		
141.	2856	*Calandrinia liniflora (Parakeelya)*			
142.	5415	*Calothamnus lateralis*			
143.	5426	*Calothamnus quadrifidus (One-sided Bottlebrush)*			
144.	35816	*Calothamnus quadrifidus subsp. quadrifidus*			
145.	5429	*Calothamnus sanguineus (Silky-leaved Blood flower)*			
146.	5458	*Calytrix flavescens (Summer Starflower)*			
147.	5460	*Calytrix fraseri (Pink Summer Calytrix)*			
148.	2798	*Carpobrotus virescens (Coastal Pigface)*			
149.	2952	*Cassytha glabella (Tangled Dodder Laurel)*			
150.	2957	*Cassytha racemosa (Dodder Laurel)*			
151.	11799	*Cassytha racemosa forma racemosa*			
152.	6539	*Centaurium erythraea (Common Centaury)*	Y		
153.	2889	*Cerastium glomeratum (Mouse Ear Chickweed)*	Y		
154.	2483	*Chenopodium album (Fat Hen)*	Y		
155.	6543	*Cicendia filiformis (Slender Cicendia)*	Y		
156.	4550	*Comesperma calymega (Blue-spike Milkwort)*			
157.	4552	*Comesperma confertum*			
158.	4554	*Comesperma flavum*			
159.	1857	*Conospermum acerosum (Needle-leaved Smokebush)*			
160.	15607	*Conospermum acerosum subsp. acerosum*			
161.	1876	*Conospermum incurvum (Plume Smokebush)*			
162.	1882	*Conospermum stoechadis (Common Smokebush)*			
163.	15611	*Conospermum stoechadis subsp. stoechadis (Common Smokebush)*			
164.	1885	*Conospermum triplinervium (Tree Smokebush)*			
165.	15521	*Conospermum unilaterale*			
166.	6347	*Conostephium minus (Pink-tipped Pearl flower)*			
167.	6348	*Conostephium pendulum (Pearl Flower)*			
168.	20074	*Conyza sumatrensis*	Y		
169.	17104	*Corymbia calophylla (Marri)*			
170.	17926	*Craspedia arenicola*			
171.	11221	*Crassula alata var. alata*	Y		
172.	17701	*Crassula closiana*			
173.	3137	*Crassula colorata (Dense Stonecrop)*			
174.	13527	*Croninia kingiana*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
175.	4802	*Cryptandra mutila*			
176.	4809	*Cryptandra pungens*			
177.	11021	*Cuscuta planiflora*	Y		
178.	7454	*Dampiera linearis (Common Dampiera)*			
179.	6218	*Daucus glochidiatus (Australian Carrot)*			
180.	3793	*Daviesia angulata*			
181.	3805	*Daviesia decurrens (Prickly Bitter-pea)*			
182.	3807	*Daviesia divaricata (Marno)*			
183.	16585	*Daviesia nudiflora subsp. nudiflora*			
184.	3832	*Daviesia physodes*			
185.	3845	*Daviesia triflora*			
186.	4453	*Diplolaena angustifolia (Yanchep Rose)*			
187.	4746	*Diplopeltis huegelii*			
188.	3095	*Drosera erythrorhiza (Red Ink Sundew)*			
189.	3098	*Drosera glanduligera (Pimpernel Sundew)*			
190.	3106	*Drosera macrantha (Bridal Rainbow)*			
191.	13216	*Drosera menziesii subsp. penicillaris*			
192.	3117	*Drosera paleacea (Dwarf Sundew)*			
193.	3118	*Drosera pallida (Pale Rainbow)*			
194.	31233	*Drosera patens*			
195.	30712	*Drosera x sidjamesii*		P1	
196.	6132	*Epilobium ciliatum*	Y		
197.	6133	*Epilobium hirtigerum (Hairy Willow Herb)*			
198.	13950	*Eremaea asterocarpa subsp. asterocarpa*			
199.	5541	*Eremaea pauciflora*			
200.	5542	*Eremaea purpurea*			
201.	17175	*Eremophila glabra subsp. albicans*			
202.	4332	*Erodium botrys (Long Storksbill)*	Y		
203.	4333	*Erodium cicutarium (Common Storksbill)*	Y		
204.	13091	*Eucalyptus argutifolia (Wabling Hill Mallee)*		T	
205.	5615	*Eucalyptus decipiens*			
206.	13536	*Eucalyptus decipiens subsp. decipiens*			
207.	5628	*Eucalyptus drummondii (Drummond's Gum)*			
208.	5649	*Eucalyptus foecunda (Narrow-leaved Red Mallee)*			
209.	5659	*Eucalyptus gomphocephala (Tuart)*			
210.	20808	*Eucalyptus petiolaris*	Y		
211.	13541	*Eucalyptus petrensis*			
212.	5763	*Eucalyptus rudis (Flooded Gum)*			
213.	13511	*Eucalyptus rudis subsp. rudis*			
214.	10765	*Exocarpos sparteus (Broom Ballart)*			
215.	7976	*Galinsoga parviflora (Potato Weed)*	Y		
216.	7323	*Galium murale (Small Goosegrass)*	Y		
217.	20473	*Gastrolobium ebracteolatum*			
218.	6143	*Glischrocaryon aureum (Common Popflower)*			
219.	7991	*Gnephosis drummondii*			
220.	8005	*Gnephosis uniflora*			
221.	3945	*Gompholobium aristatum*			
222.	10909	*Gompholobium confertum*			
223.	11083	*Gompholobium scabrum*			
224.	3957	*Gompholobium tomentosum (Hairy Yellow Pea)*			
225.	6161	*Gonocarpus pithyoides*			
226.	19286	*Goodenia pulchella subsp. Coastal Plain A (M. Hislop 634)*			
227.	15839	*Grevillea preissii subsp. preissii*			
228.	2119	*Grevillea vestita*			
229.	2784	*Gyrostemon ramulosus (Corkybark)*			
230.	2146	*Hakea costata (Ribbed Hakea)*			
231.	2175	*Hakea lissocarpha (Honey Bush)*			
232.	2197	*Hakea prostrata (Harsh Hakea)*			
233.	2203	*Hakea ruscifolia (Candle Hakea)*			
234.	2214	*Hakea trifurcata (Two-leaf Hakea)*			
235.	2216	*Hakea varia (Variable-leaved Hakea)*			
236.	3961	*Hardenbergia comptoniana (Native Wisteria)*			
237.	3016	*Heliophila pusilla*	Y		
238.	16934	*Hemiandra glabra subsp. glabra*			
239.	6838	*Hemiandra linearis (Speckled Snakebush)*			
240.	6839	*Hemiandra pungens (Snakebush)*			
241.	5112	*Hibbertia aurea*			
242.	5133	*Hibbertia helianthemoides*		P3	
243.	5134	*Hibbertia huegelii*			
244.	5135	*Hibbertia hypericoides (Yellow Buttercups)*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
245.	5162	*Hibbertia racemosa (Stalked Guinea Flower)*			
246.	11461	*Hibbertia spicata subsp. leptotheca*		P3	
247.	5173	*Hibbertia subvaginata*			
248.	6222	*Homalosciadium homalocarpum*			
249.	3966	*Hovea pungens (Devil's Pins)*			
250.	3968	*Hovea trisperma (Common Hovea)*			
251.	12741	*Hyalosperma cotula*			
252.	12742	*Hyalosperma demissum*			
253.	5216	*Hybanthus calycinus (Wild Violet)*			
254.	6226	*Hydrocotyle callicarpa (Small Pennywort)*			
255.	6232	*Hydrocotyle hispidula*			
256.	8086	*Hypochaeris glabra (Smooth Catsear)*	Y		
257.	14783	*Jacksonia calcicola*			
258.	4012	*Jacksonia furcellata (Grey Stinkwood)*			
259.	4027	*Jacksonia sericea (Waldjumi)*		P4	
260.	4029	*Jacksonia sternbergiana (Stinkwood)*			
261.	4044	*Kennedia prostrata (Scarlet Runner)*			
262.	5832	*Kunzea ericifolia (Spearwood)*			
263.	7572	*Lechenaultia expansa*			
264.	7574	*Lechenaultia floribunda (Free-flowering Leschenaultia)*			
265.	7580	*Lechenaultia linarioides (Yellow Leschenaultia)*			
266.	2344	*Leptomeria empetriformis*			
267.	2352	*Leptomeria preissiana*			
268.	5847	*Leptospermum erubescens (Roadside Teatree)*			
269.	6425	*Leucopogon oxycedrus*			
270.	6427	*Leucopogon parviflorus (Coast Beard-heath)*			
271.	6434	*Leucopogon polymorphus*			
272.	6436	*Leucopogon propinquus*			
273.	6440	*Leucopogon racemulosus*			
274.	19460	*Leucopogon sp. Yanchep (M. Hislop 1986)*		P3	
275.	6445	*Leucopogon squarrosus*			
276.	7676	*Levenhookia pusilla (Midget Stylewort)*			
277.	7677	*Levenhookia stipitata (Common Stylewort)*			
278.	7408	*Lobelia tenuior (Slender Lobelia)*			
279.	4066	*Lupinus cosentinii*	Y		
280.	6456	*Lysinema ciliatum (Curry Flower)*			
281.	34736	*Lysinema pentapetalum*			
282.	2838	*Macarthuria apetala*			
283.	2839	*Macarthuria australis*			
284.	5920	*Melaleuca huegelii (Chenille Honeymyrtle)*			
285.	13271	*Melaleuca huegelii subsp. huegelii*			
286.	5952	*Melaleuca preissiana (Moonah)*			
287.	33022	*Melaleuca sp. Wanneroo (G.J. Keighery 16705)*		P1	Y
288.	18598	*Melaleuca systena*			
289.	5978	*Melaleuca teretifolia (Banbar)*			
290.	5983	*Melaleuca trichophylla*			
291.	5986	*Melaleuca urceolaris*			
292.	8105	*Millotia myosotidifolia*			
293.	8106	*Millotia tenuifolia (Soft Millotia)*			
294.	4666	*Monotaxis occidentalis*			
295.	6192	*Myriophyllum drummondii*			
296.	2401	*Nuytsia floribunda (Christmas Tree)*			
297.	18255	*Opercularia vaginata (Dog Weed)*			
298.	36177	*Ornduffia albiflora*			
299.	4356	*Oxalis pes-caprae (Soursob)*	Y		
300.	12643	*Ozothamnus cordatus*			
301.	7089	*Parentucellia latifolia (Common Bartsia)*	Y		
302.	12670	*Parietaria cardiostegia*			
303.	4343	*Pelargonium capitatum (Rose Pelargonium)*	Y		
304.	2258	*Persoonia comata*			
305.	2273	*Persoonia saccata (Snottygobble)*			
306.	20368	*Petrophile axillaris*			
307.	2299	*Petrophile linearis (Pixie Mops)*			
308.	2301	*Petrophile macrostachya*			
309.	2308	*Petrophile seminuda*			
310.	2309	*Petrophile serruriae*			
311.	4675	*Phyllanthus calycinus (False Boronia)*			
312.	2793	*Phytolacca octandra (Red Ink Plant)*	Y		
313.	5237	*Pimelea calcicola*			
314.	5243	*Pimelea ferruginea*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
315.	18117	*Pimelea rosea subsp. rosea*			
316.	5268	*Pimelea sulphurea (Yellow Banjine)*			
317.	8163	*Pithocarpa corymbulosa (Corymbose Pithocarpa)*		P3	
318.	4524	*Platytheca galioides*			
319.	8175	*Podolepis gracilis (Slender Podolepis)*			
320.	8177	*Podolepis lessonii*			
321.	8182	*Podotheca angustifolia (Sticky Longheads)*			
322.	8183	*Podotheca chrysantha (Yellow Podotheca)*			
323.	8184	*Podotheca gnaphalioides (Golden Long-heads)*			
324.	4691	*Poranthera microphylla (Small Poranthera)*			
325.	11775	*Ptilotus humilis subsp. humilis*			
326.	2751	*Ptilotus polystachyus (Prince of Wales Feather)*			
327.	8195	*Quinetia urvillei*			
328.	6012	*Regelia ciliata*			
329.	6014	*Regelia inops*			
330.	2578	*Rhagodia baccata (Berry Saltbush)*			
331.	15035	*Rhodanthe corymbosa*			
332.	13312	*Rhodanthe pyrethrum*			
333.	2906	*Sagina apetala (Annual Pearlwort)*	Y		
334.	13182	*Scaevola repens var. repens*			
335.	13152	*Scaevola thesioides subsp. thesioides*			
336.	2909	*Silene gallica (French Catchfly)*	Y		
337.	2910	*Silene nocturna (Mediterranean Catchfly)*	Y		
338.	8225	*Siloxerus humifusus (Procumbent Siloxerus)*			
339.	6988	*Solanum americanum (Glossy Nightshade)*	Y		
340.	8231	*Sonchus oleraceus (Common Sowthistle)*	Y		
341.	4207	*Sphaerolobium medium*			
342.	4828	*Spyridium globulosum (Basket Bush)*			
343.	4733	*Stackhousia monogyna*			
344.	2918	*Stellaria media (Chickweed)*	Y		
345.	19704	*Stenanthemum sublineare*		P2	
346.	3080	*Stenopetalum robustum*			
347.	2316	*Stirlingia latifolia (Blueboy)*			
348.	7693	*Stylidium brunonianum (Pink Fountain Triggerplant)*			
349.	7696	*Stylidium calcaratum (Book Triggerplant)*			
350.	7709	*Stylidium crossocephalum (Posy Triggerplant)*			
351.	7717	*Stylidium divaricatum (Daddy-long-legs)*			
352.	7745	*Stylidium junceum (Reed Triggerplant)*			
353.	7756	*Stylidium longitubum (Jumping Jacks)*		P3	
354.	13127	*Stylidium maritimum*		P3	
355.	7774	*Stylidium piliferum (Common Butterfly Triggerplant)*			
356.	7785	*Stylidium repens (Matted Triggerplant)*			
357.	20521	*Stylidium rigidulum*			
358.	7798	*Stylidium schoenoides (Cow Kicks)*			
359.	7806	*Stylidium utricularioides (Pink Fan Triggerplant)*			
360.	2329	*Synaphea spinulosa*			
361.	15532	*Synaphea spinulosa subsp. spinulosa*			
362.	4256	*Templetonia retusa (Cockies Tongues)*			
363.	5105	*Thomasia triphylla*			
364.	6280	*Trachymene pilosa (Native Parsnip)*			
365.	4292	*Trifolium campestre (Hop Clover)*	Y		
366.	4295	*Trifolium dubium (Suckling Clover)*	Y		
367.	4297	*Trifolium glomeratum (Cluster Clover)*	Y		
368.	4309	*Trifolium scabrum (Rough Clover)*	Y		
369.	16998	*Tripterococcus paniculatus*		P4	
370.	1141	*Trithuria submersa*			
371.	11665	*Trymalium ledifolium var. ledifolium*			
372.	8254	*Urospermum picroides (False Hawkbit)*	Y		
373.	8255	*Ursinia anthemoides (Ursinia)*	Y		
374.	38388	*Ursinia anthemoides subsp. anthemoides*	Y		
375.	7153	*Utricularia tenella*			
376.	7157	*Utricularia violacea (Violet Bladderwort)*			
377.	7665	*Velleia trinervis*			
378.	15432	*Verticordia densiflora var. densiflora*			
379.	11474	*Vicia sativa subsp. nigra*	Y		
380.	4325	*Viminaria juncea (Swishbush)*			
381.	7389	*Wahlenbergia preissii*			
382.	8282	*Waitzia suaveolens (Fragrant Waitzia)*			
383.	13333	*Waitzia suaveolens var. suaveolens*			
384.	6289	*Xanthosia huegelii*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
Gymnosperm					
385.	85	*Macrozamia riedlei (Zamia)*			
Invertebrate					
386.	33973	*Austrosaga spinifer (cricket)*		P3	
387.	33977	*Hylaeus globuliferus (bee)*		P3	
388.	33992	*Synemon gratiosa (Graceful Sunmoth)*		T	
389.	34113	*Westralunio carteri*		P4	
Mammal					
390.	24161	*Bettongia lesueur subsp. graii (Boodie)*			
391.	24162	*Bettongia penicillata subsp. ogilbyi (Woylie)*		T	
392.	24251	*Bos taurus (European Cattle)*			
393.	24092	*Dasyurus geoffroii (Chuditch)*		T	
394.	24041	*Felis catus (Cat)*			
395.	24153	*Isoodon obesulus subsp. fusciventer (Quenda)*		P5	
396.	24132	*Macropus fuliginosus (Western Grey Kangaroo)*			
397.	24133	*Macropus irma (Western Brush Wallaby)*		P4	
398.	24142	*Petrogale lateralis subsp. lateralis (Black-flanked Rock-wallaby)*		T	
399.	24243	*Rattus fuscipes (Western Bush Rat)*			
400.	24167	*Tarsipes rostratus (Honey Possum)*			
Monocotyledon					
401.	1208	*Acanthocarpus preissii*			
402.	184	*Aira caryophyllea (Silvery Hairgrass)*	Y		
403.	1056	*Alexgeorgea nitens*			
404.	200	*Amphipogon turbinatus*			
405.	1409	*Anigozanthos humilis (Catspaw)*			
406.	17234	*Austrostipa compressa*			
407.	17240	*Austrostipa flavescens*			
408.	231	*Avellinia michelii*	Y		
409.	233	*Avena barbata (Bearded Oat)*	Y		
410.	234	*Avena fatua (Wild Oat)*	Y		
411.	740	*Baumea arthrophylla*			
412.	743	*Baumea juncea (Bare Twigrush)*			
413.	748	*Baumea vaginalis (Sheath Twigrush)*			
414.	244	*Briza maxima (Blowfly Grass)*	Y		
415.	245	*Briza minor (Shivery Grass)*	Y		
416.	249	*Bromus diandrus (Great Brome)*	Y		
417.	1276	*Caesia micrantha (Pale Grass-lily)*			
418.	11038	*Caladenia bicalliata*			
419.	1592	*Caladenia flava (Cowslip Orchid)*			
420.	15348	*Caladenia flava subsp. flava*			
421.	1595	*Caladenia hirta (Sugar Candy Orchid)*			
422.	1599	*Caladenia latifolia (Pink Fairy Orchid)*			
423.	1605	*Caladenia marginata (White Fairy Orchid)*			
424.	1213	*Calectasia cyanea (Blue Tinsel Lily)*		T	
425.	29103	*Calectasia sp. Pinjar (C. Tauss 557)*		P1	
426.	1121	*Centrolepis aristata (Pointed Centrolepis)*			
427.	13122	*Centrolepis cephaloformis subsp. cephaloformis*			
428.	1125	*Centrolepis drummondiana*			
429.	1131	*Centrolepis inconspicua*			
430.	1132	*Centrolepis mutica*			
431.	1134	*Centrolepis polygyna (Wiry Centrolepis)*			
432.	1280	*Chamaescilla corymbosa (Blue Squill)*			
433.	17833	*Chordifex microcodon*			
434.	1418	*Conostylis aculeata (Prickly Conostylis)*			
435.	1423	*Conostylis aurea (Golden Conostylis)*			
436.	1427	*Conostylis candicans (Grey Cottonhead)*			
437.	12027	*Conostylis candicans subsp. calcicola*			
438.	1436	*Conostylis juncea*			
439.	1443	*Conostylis pauciflora (Dawesville Conostylis)*			
440.	1454	*Conostylis setigera (Bristly Cottonhead)*			
441.	1285	*Corynotheca micrantha (Sand Lily)*			
442.	10916	*Cyrtostylis huegelii*			
443.	1218	*Dasypogon bromeliifolius (Pineapple Bush)*			
444.	17663	*Desmocladus asper*			
445.	299	*Deyeuxia quadriseta (Reed Bentgrass)*			
446.	1259	*Dianella revoluta (Blueberry Lily)*			
447.	1287	*Dichopogon capillipes*			
448.	19649	*Disa bracteata*	Y		

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
449.	15406	*Drakaea gracilis*			
450.	347	*Ehrharta calycina (Perennial Veldt Grass)*	Y		
451.	349	*Ehrharta longiflora (Annual Veldt Grass)*	Y		
452.	1643	*Elythranthera brunonis (Purple Enamel Orchid)*			
453.	1645	*Epiblema grandiflorum (Babe-in-a-cradle)*			
454.	376	*Eragrostis curvula (African Lovegrass)*	Y		
455.	1646	*Eriochilus dilatatus (White Bunny Orchid)*			
456.	1520	*Gladiolus caryophyllaceus (Wild Gladiolus)*	Y		
457.	1468	*Haemodorum laxum*			
458.	439	*Hemarthria uncinata (Matgrass)*			
459.	1293	*Hensmania turbinata*			
460.	445	*Holcus setiger (Annual Fog)*	Y		
461.	1070	*Hypolaena exsulca*			
462.	910	*Isolepis cernua (Nodding Club-rush)*			
463.	917	*Isolepis marginata (Coarse Club-rush)*	Y		
464.	16091	*Lachenalia bulbifera*	Y		
465.	20019	*Lachnagrostis filiformis*			
466.	19955	*Lachnagrostis plebeia*			
467.	467	*Lagurus ovatus (Hare's Tail Grass)*	Y		
468.	28342	*Landoltia punctata (Thin Duckweed)*			
469.	11911	*Laxmannia ramosa subsp. ramosa*			
470.	1075	*Lepidobolus preissianus*			
471.	925	*Lepidosperma angustatum*			
472.	944	*Lepidosperma scabrum*			
473.	36060	*Lepidosperma sp. Coastal Dunes (R.J. Cranfield 9963)*			
474.	945	*Lepidosperma squamatum*			
475.	946	*Lepidosperma striatum*			
476.	1653	*Leporella fimbriata (Hare Orchid)*			
477.	1090	*Lepyrodia muirii*			
478.	1223	*Lomandra caespitosa (Tufted Mat Rush)*			
479.	1228	*Lomandra hermaphrodita*			
480.	1231	*Lomandra maritima*			
481.	14542	*Lomandra micrantha subsp. micrantha*			
482.	1239	*Lomandra preissii*			
483.	1243	*Lomandra sericea (Silky Mat Rush)*			
484.	1246	*Lomandra suaveolens*			
485.	1097	*Lyginia barbata*			
486.	17694	*Meeboldina scariosa*			
487.	955	*Mesomelaena pseudostygia*			
488.	485	*Microlaena stipoides (Weeping Grass)*			
489.	15419	*Microtis media subsp. media*			
490.	1537	*Orthrosanthus laxus (Morning Iris)*			
491.	1667	*Paracaleana nigrita (Flying Duck Orchid)*			
492.	1550	*Patersonia occidentalis (Purple Flag)*			
493.	1478	*Phlebocarya ciliata*			
494.	573	*Poa drummondiana (Knotted Poa)*			
495.	578	*Poa porphyroclados*			
496.	17267	*Pterostylis brevisepala*			
497.	1693	*Pterostylis recurva (Jug Orchid)*			
498.	12217	*Pterostylis sanguinea*			
499.	18645	*Pterostylis sp. limestone (B.J. Keighery & G.J. Keighery 65)*			
500.	18658	*Pterostylis sp. short sepals (W. Jackson BJ259)*			
501.	1698	*Pterostylis vittata (Banded Greenhood)*			
502.	1556	*Romulea rosea (Guildford Grass)*	Y		
503.	973	*Schoenus asperocarpus (Poison Sedge)*			
504.	978	*Schoenus brevisetis*			
505.	979	*Schoenus caespititius*			
506.	982	*Schoenus clandestinus*			
507.	984	*Schoenus curvifolius*			
508.	985	*Schoenus discifer*			
509.	992	*Schoenus grandiflorus (Large Flowered Bogrush)*			
510.	997	*Schoenus lanatus (Woolly Bog-rush)*			
511.	1002	*Schoenus nanus (Tiny Bog Rush)*			
512.	1006	*Schoenus odontocarpus*			
513.	1018	*Schoenus subfascicularis*			
514.	1023	*Schoenus tenellus*			
515.	1312	*Sowerbaea laxiflora (Purple Tassels)*			
516.	1558	*Sparaxis bulbifera*	Y		
517.	1260	*Stypandra glauca (Blind Grass)*			
518.	1036	*Tetraria octandra*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
519.	10856	*Thelymitra benthamiana (Cinnamon Sun Orchid)*			
520.	1339	*Thysanotus multiflorus (Many-flowered Fringe Lily)*			
521.	1343	*Thysanotus patersonii*			
522.	1351	*Thysanotus sparteus*			
523.	1357	*Thysanotus thyrsoideus*			
524.	1361	*Tricoryne elatior (Yellow Autumn Lily)*			
525.	1363	*Tricoryne tenella*			
526.	18587	*Triglochin nana*			
527.	152	*Triglochin trichophora*			
528.	722	*Vulpia bromoides (Squirrel Tail Fescue)*	Y		
529.	724	*Vulpia myuros (Rat's Tail Fescue)*	Y		
530.	1256	*Xanthorrhoea preissii (Grass tree)*			

Reptile

531.	25011	*Acritoscincus trilineatum*			
532.	25241	*Antaresia stimsoni subsp. stimsoni*			
533.	24991	*Aprasia repens*			
534.	25333	*Brachyurophis fasciolata subsp. fasciolata*			
535.	25245	*Brachyurophis semifasciata*			
536.	25337	*Chelodina oblonga (Oblong Turtle)*			
537.	24980	*Christinus marmoratus (Marbled Gecko)*			
538.	30893	*Cryptoblepharus buchananii*			
539.	30899	*Ctenophorus adelaidensis (Southern Heath Dragons)*			
540.	25027	*Ctenotus australis*			
541.	25039	*Ctenotus fallens*			
542.	25087	*Cyclodomorphus celatus*			
543.	25296	*Demansia psammophis subsp. reticulata*			
544.	24939	*Diplodactylus polyophthalmus*			
545.	25100	*Egernia napoleonis*			
546.	25119	*Hemiergis quadrilineata*			
547.	25133	*Lerista elegans*			
548.	25165	*Lerista praepedita*			
549.	25005	*Lialis burtonis*			
550.	25184	*Menetia greyii*			
551.	25240	*Morelia spilota subsp. imbricata (Carpet Python)*		S	
552.	25191	*Morethia lineoocellata*			
553.	25192	*Morethia obscura*			
554.	25248	*Neelaps bimaculatus (Black-naped Snake)*			
555.	25252	*Notechis scutatus (Tiger Snake)*			
556.	25253	*Parasuta gouldii*			
557.	24907	*Pogona minor subsp. minor*			
558.	25259	*Pseudonaja affinis subsp. affinis (Dugite)*			
559.	25271	*Ramphotyphlops australis*			
560.	25285	*Ramphotyphlops pinguis*			
561.	25266	*Simoselaps bertholdi (Jan's Banded Snake)*			
562.	25227	*Varanus tristis subsp. tristis (Racehorse Monitor)*			

Slime Mould

563.	39079	*Physarum viride*			
564.	39094	*Trichia affinis*			

Water Mould

565.		*Phytophthora cinnamomi*			

Conservation Codes
T - Rare or likely to become extinct
X - Presumed extinct
IA - Protected under international agreement
S - Other specially protected fauna
1 - Priority 1
2 - Priority 2
3 - Priority 3
4 - Priority 4
5 - Priority 5

[1] For NatureMap's purposes, species flagged as endemic are those whose records are wholely contained within the search area. Note that only those records complying with the search criterion are included in the calculation. For example, if you limit records to those from a specific datasource, only records from that datasource are used to determine if a species is restricted to the query area.

NatureMap
Mapping Western Australia's biodiversity

NatureMap Species Report

Created By Guest user on 13/03/2012

Current Names Only	Yes
Core Datasets Only	Yes
Method	'By Circle'
Centre	115°52' 41" E,31°45' 36" S
Buffer	10km
Group By	Species Group

Species Group	Species	Records
Amphibian	10	172
Bird	149	5148
Bryopsid (Moss)	14	22
Dicotyledon	447	1891
Fungus	6	8
Gymnosperm	3	4
Invertebrate	3	25
Mammal	22	96
Monocotyledon	224	846
Pteridophyte (Fern)	1	1
Reptile	69	495
Slime Mould	13	19
Water Mould	1	32
TOTAL	**962**	**8759**

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
Amphibian					
1.	25398	*Crinia georgiana (Quacking Frog)*			
2.	25399	*Crinia glauerti (Clicking Frog)*			
3.	25400	*Crinia insignifera (Squelching Froglet)*			
4.	25408	*Heleioporus albopunctatus (Western Spotted Frog)*			
5.	25410	*Heleioporus eyrei (Moaning Frog)*			
6.	25415	*Limnodynastes dorsalis (Western Banjo Frog)*			
7.	25378	*Litoria adelaidensis (Slender Tree Frog)*			
8.	25388	*Litoria moorei (Motorbike Frog)*			
9.	25420	*Myobatrachus gouldii (Turtle Frog)*			
10.	25433	*Pseudophryne guentheri (Crawling Toadlet)*			
Bird					
11.	24559	*Acanthagenys rufogularis (Spiny-cheeked Honeyeater)*			
12.	24260	*Acanthiza apicalis (Broad-tailed Thornbill)*			
13.	24261	*Acanthiza chrysorrhoa (Yellow-rumped Thornbill)*			
14.	24262	*Acanthiza inornata (Western Thornbill)*			
15.	24560	*Acanthorhynchus superciliosus (Western Spinebill)*			
16.	25535	*Accipiter cirrocephalus (Collared Sparrowhawk)*			
17.	24281	*Accipiter cirrocephalus subsp. cirrocephalus*			
18.	25536	*Accipiter fasciatus (Brown Goshawk)*			
19.	25755	*Acrocephalus australis (Australian Reed Warbler)*			
20.	24312	*Anas gracilis (Grey Teal)*			
21.	24313	*Anas platyrhynchos (Mallard)*			
22.	24315	*Anas rhynchotis (Australasian Shoveler)*			
23.	24316	*Anas superciliosa (Pacific Black Duck)*			
24.	24561	*Anthochaera carunculata (Red Wattlebird)*			
25.	24562	*Anthochaera lunulata (Western Little Wattlebird)*			
26.	24285	*Aquila audax (Wedge-tailed Eagle)*			
27.	25558	*Ardea ibis (Cattle Egret)*			
28.	24338	*Ardea ibis subsp. coromanda*			
29.	24341	*Ardea pacifica (White-necked Heron)*			
30.	25566	*Artamus cinereus (Black-faced Woodswallow)*			
31.	24353	*Artamus cyanopterus (Dusky Woodswallow)*			
32.	24318	*Aythya australis (Hardhead)*			
33.	24319	*Biziura lobata (Musk Duck)*			
34.	24345	*Botaurus poiciloptilus (Australasian Bittern)*		T	
35.	25713	*Cacatua galerita (Sulphur-crested Cockatoo)*			

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36.	25714	*Cacatua pastinator (Western Long-billed Corella)*			
37.	25716	*Cacatua sanguinea (Little Corella)*			
38.	24729	*Cacatua tenuirostris (Eastern Long-billed Corella)*			
39.	25598	*Cacomantis flabelliformis (Fan-tailed Cuckoo)*			
40.	24427	*Cacomantis flabelliformis subsp. flabelliformis*			
41.	24788	*Calidris ruficollis (Red-necked Stint)*			
42.	24733	*Calyptorhynchus baudinii (Baudin's Cockatoo)*		T	
43.	24734	*Calyptorhynchus latirostris (Carnaby's Cockatoo)*		T	
44.	24377	*Charadrius ruficapillus (Red-capped Plover)*			
45.	24321	*Chenonetta jubata (Australian Wood Duck)*			
46.	24432	*Chrysococcyx lucidus subsp. plagosus*			
47.	24288	*Circus approximans (Swamp Harrier)*			
48.	24289	*Circus assimilis (Spotted Harrier)*			
49.	24774	*Cladorhynchus leucocephalus (Banded Stilt)*			
50.	24396	*Climacteris rufa (Rufous Treecreeper)*			
51.	25675	*Colluricincla harmonica (Grey Shrike-thrush)*			
52.	24613	*Colluricincla harmonica subsp. rufiventris*			
53.	24399	*Columba livia (Domestic Pigeon)*			
54.	25568	*Coracina novaehollandiae (Black-faced Cuckoo-shrike)*			
55.	24416	*Corvus bennetti (Little Crow)*			
56.	25592	*Corvus coronoides (Australian Raven)*			
57.	24671	*Coturnix pectoralis (Stubble Quail)*			
58.	24420	*Cracticus nigrogularis (Pied Butcherbird)*			
59.	25595	*Cracticus tibicen (Australian Magpie)*			
60.	25596	*Cracticus torquatus (Grey Butcherbird)*			
61.	24435	*Cuculus pallidus (Pallid Cuckoo)*			
62.	24322	*Cygnus atratus (Black Swan)*			
63.	30901	*Dacelo novaeguineae (Laughing Kookaburra)*			
64.	25673	*Daphoenositta chrysoptera (Varied Sittella)*			
65.	24325	*Dendrocygna eytoni (Plumed Whistling Duck)*			
66.	25607	*Dicaeum hirundinaceum (Mistletoebird)*			
67.	24290	*Elanus caeruleus subsp. axillaris (Australian Black-shouldered Kite)*			
68.	24567	*Epthianura albifrons (White-fronted Chat)*			
69.	25621	*Falco berigora (Brown Falcon)*			
70.	25622	*Falco cenchroides (Australian Kestrel)*			
71.	24472	*Falco cenchroides subsp. cenchroides*			
72.	25623	*Falco longipennis (Australian Hobby)*			
73.	25624	*Falco peregrinus (Peregrine Falcon)*		S	
74.	24475	*Falco peregrinus subsp. macropus*		S	
75.	24616	*Falcunculus frontatus subsp. leucogaster*		P4	
76.	25727	*Fulica atra (Eurasian Coot)*			
77.	25729	*Gallinula tenebrosa (Dusky Moorhen)*			
78.	24763	*Gallinula tenebrosa subsp. tenebrosa*			
79.	25530	*Gerygone fusca (Western Gerygone)*			
80.	24443	*Grallina cyanoleuca (Magpie-lark)*			
81.	24293	*Haliaeetus leucogaster (White-bellied Sea-Eagle)*			
82.	24295	*Haliastur sphenurus (Whistling Kite)*			
83.	24689	*Halobaena caerulea (Blue Petrel)*			
84.	25734	*Himantopus himantopus (Black-winged Stilt)*			
85.	24491	*Hirundo neoxena (Welcome Swallow)*			
86.	25563	*Ixobrychus minutus (Little Bittern)*		P4	
87.	24577	*Lichenostomus ornatus (Yellow-plumed Honeyeater)*			
88.	24581	*Lichenostomus virescens (Singing Honeyeater)*			
89.	25661	*Lichmera indistincta (Brown Honeyeater)*			
90.	24690	*Macronectes giganteus (Southern Giant Petrel)*		T	
91.	24326	*Malacorhynchus membranaceus (Pink-eared Duck)*			
92.	25651	*Malurus lamberti (Variegated Fairy-wren)*			
93.	25652	*Malurus leucopterus (White-winged Fairy-wren)*			
94.	25654	*Malurus splendens (Splendid Fairy-wren)*			
95.	24583	*Manorina flavigula (Yellow-throated Miner)*			
96.	25758	*Megalurus gramineus (Little Grassbird)*			
97.	25663	*Melithreptus brevirostris (Brown-headed Honeyeater)*			
98.	24598	*Merops ornatus (Rainbow Bee-eater)*			
99.	25610	*Myiagra inquieta (Restless Flycatcher)*			
100.	24738	*Neophema elegans (Elegant Parrot)*			
101.	25747	*Ninox connivens (Barking Owl)*			
102.	25748	*Ninox novaeseelandiae (Boobook Owl)*			
103.	25564	*Nycticorax caledonicus (Rufous Night Heron)*			
104.	24407	*Ocyphaps lophotes (Crested Pigeon)*			
105.	24328	*Oxyura australis (Blue-billed Duck)*			

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106.	25679	*Pachycephala pectoralis (Golden Whistler)*			
107.	24623	*Pachycephala pectoralis subsp. fuliginosa*			
108.	25680	*Pachycephala rufiventris (Rufous Whistler)*			
109.	24624	*Pachycephala rufiventris subsp. rufiventris*			
110.	24693	*Pachyptila desolata (Antarctic Prion)*			
111.	25681	*Pardalotus punctatus (Spotted Pardalote)*			
112.	25682	*Pardalotus striatus (Striated Pardalote)*			
113.	25687	*Passer domesticus (House Sparrow)*			
114.	24641	*Passer domesticus subsp. domesticus*			Y
115.	24648	*Pelecanus conspicillatus (Australian Pelican)*			
116.	24659	*Petroica goodenovii (Red-capped Robin)*			
117.	24660	*Petroica multicolor subsp. campbelli*			
118.	25697	*Phalacrocorax carbo (Great Cormorant)*			
119.	24667	*Phalacrocorax sulcirostris (Little Black Cormorant)*			
120.	25699	*Phalacrocorax varius (Pied Cormorant)*			
121.	24409	*Phaps chalcoptera (Common Bronzewing)*			
122.	24596	*Phylidonyris novaehollandiae (New Holland Honeyeater)*			
123.	24841	*Platalea flavipes (Yellow-billed Spoonbill)*			
124.	25720	*Platycercus icterotis (Western Rosella)*			
125.	24747	*Platycercus spurius (Red-capped Parrot)*			
126.	24843	*Plegadis falcinellus (Glossy Ibis)*			
127.	25703	*Podargus strigoides (Tawny Frogmouth)*			
128.	24679	*Podargus strigoides subsp. brachypterus*			
129.	25704	*Podiceps cristatus (Great Crested Grebe)*			
130.	24681	*Poliocephalus poliocephalus (Hoary-headed Grebe)*			
131.	25731	*Porphyrio porphyrio (Purple Swamphen)*			
132.	24767	*Porphyrio porphyrio subsp. bellus*			
133.	24769	*Porzana fluminea (Australian Spotted Crake)*			
134.	25732	*Porzana pusilla (Baillon's Crake)*			
135.	24771	*Porzana tabuensis (Spotless Crake)*			
136.	24776	*Recurvirostra novaehollandiae (Red-necked Avocet)*			
137.	25613	*Rhipidura fuliginosa (Grey Fantail)*			
138.	25614	*Rhipidura leucophrys (Willie Wagtail)*			
139.	24454	*Rhipidura leucophrys subsp. leucophrys*			
140.	25534	*Sericornis frontalis (White-browed Scrubwren)*			
141.	30948	*Smicrornis brevirostris (Weebill)*			
142.	24530	*Sterna nereis subsp. nereis*			
143.	25597	*Strepera versicolor (Grey Currawong)*			
144.	25589	*Streptopelia chinensis (Spotted Turtle-Dove)*			
145.	25590	*Streptopelia senegalensis (Laughing Turtle-Dove)*			
146.	25705	*Tachybaptus novaehollandiae (Australasian Grebe)*			
147.	24331	*Tadorna tadornoides (Australian Shelduck)*			
148.	24844	*Threskiornis molucca (Australian White Ibis)*			
149.	24845	*Threskiornis spinicollis (Straw-necked Ibis)*			
150.	25549	*Todiramphus sanctus (Sacred Kingfisher)*			
151.	25723	*Trichoglossus haematodus (Rainbow Lorikeet)*			
152.	24806	*Tringa glareola (Wood Sandpiper)*			
153.	24808	*Tringa nebularia (Common Greenshank)*			
154.	24809	*Tringa stagnatilis (Marsh Sandpiper)*			
155.	24851	*Turnix velox (Little Button-quail)*			
156.	24855	*Tyto novaehollandiae subsp. novaehollandiae (Masked Owl (southern subsp))*		P3	
157.	24386	*Vanellus tricolor (Banded Lapwing)*			
158.	25765	*Zosterops lateralis (Grey-breasted White-eye)*			
159.	24856	*Zosterops lateralis subsp. gouldi*			
Bryopsid (Moss)					
160.	32315	*Barbula calycina*			
161.	32331	*Bryum lanatum*			
162.	32338	*Campylopus introflexus*	Y		
163.	32462	*Ceratodon purpureus subsp. convolutus*			
164.	32351	*Eccremidium pulchellum*			
165.	32369	*Fissidens tenellus*			
166.	32380	*Gemmabryum pachythecum*			
167.	32381	*Gemmabryum preissianum*			
168.	32480	*Racopilum cuspidigerum var. convolutaceum*			
169.	32425	*Rosulabryum billarderi*			
170.	32437	*Syntrichia antarctica*			
171.	32438	*Syntrichia pagorum*			
172.	32450	*Trichostomum eckelianum*			
173.	36218	*Zygodon menziesii*			

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Dicotyledon					
174.	15466	*Acacia applanata*			
175.	15470	*Acacia barbinervis subsp. borealis*			
176.	3237	*Acacia benthamii*		P2	
177.	3374	*Acacia huegelii*			
178.	18217	*Acacia iteaphylla*	Y		
179.	11611	*Acacia lasiocarpa var. lasiocarpa*			
180.	15721	*Acacia lasiocarpa var. sedifolia*			
181.	17861	*Acacia longifolia*	Y		
182.	3502	*Acacia pulchella (Prickly Moses)*			
183.	15481	*Acacia pulchella var. glaberrima*			
184.	15483	*Acacia pulchella var. pulchella*			
185.	3525	*Acacia rostellifera (Summer-scented Wattle)*			
186.	30032	*Acacia saligna subsp. saligna*			
187.	3541	*Acacia sessilis*			
188.	3557	*Acacia stenoptera (Narrow Winged Wattle)*			
189.	3602	*Acacia willdenowiana (Grass Wattle)*			
190.	6203	*Actinotus glomeratus*			
191.	1775	*Adenanthos cygnorum (Common Woollybush)*			
192.	11837	*Adenanthos cygnorum subsp. cygnorum (Common Woollybush)*			
193.	1791	*Adenanthos obovatus (Basket Flower)*			
194.	1728	*Allocasuarina fraseriana (Sheoak)*			
195.	1732	*Allocasuarina humilis (Dwarf Sheoak)*			
196.	2652	*Alternanthera nodiflora (Common Joyweed)*			
197.	2653	*Alternanthera pungens (Khaki Weed)*	Y		
198.	15458	*Alyogyne huegelii var. huegelii*			
199.	6565	*Alyxia buxifolia (Dysentery Bush)*			
200.	25840	*Amaranthus blitum*	Y		
201.	4585	*Amperea ericoides*			
202.	6311	*Andersonia heterophylla*			
203.	6314	*Andersonia lehmanniana*			
204.	11471	*Andersonia lehmanniana subsp. lehmanniana*			
205.	12323	*Aotus diffusa*			
206.	3688	*Aotus gracillima*			
207.	3692	*Aotus procumbens*			
208.	7838	*Arctotheca calendula (Cape Weed)*	Y		
209.	5330	*Astartea fascicularis*			
210.	20283	*Astartea scoparia*			
211.	7851	*Asteridea pulverulenta (Common Bristle Daisy)*			
212.	6323	*Astroloma ciliatum (Candle Cranberry)*			
213.	6334	*Astroloma pallidum (Kick Bush)*			
214.	6339	*Astroloma xerophyllum*			
215.	36441	*Babingtonia camphorosmae (Camphor Myrtle)*			
216.	34161	*Baeckea sp. Limestone (N. Gibson & M.N. Lyons 1425)*			
217.	32682	*Banksia armata var. armata*			
218.	1800	*Banksia attenuata (Slender Banksia)*			
219.	32580	*Banksia dallanneyi var. dallanneyi*			
220.	1822	*Banksia ilicifolia (Holly-leaved Banksia)*			
221.	1830	*Banksia littoralis (Swamp Banksia)*			
222.	1834	*Banksia menziesii (Firewood Banksia)*			
223.	32077	*Banksia sessilis var. cygnorum*			
224.	5382	*Beaufortia elegans*			
225.	25788	*Billardiera fraseri (Elegant Pronaya)*			
226.	4437	*Boronia purdieana (Winter Boronia)*			
227.	17665	*Boronia purdieana subsp. purdieana*			
228.	4438	*Boronia ramosa*			
229.	11381	*Boronia ramosa subsp. anethifolia*			
230.	11564	*Boronia ramosa subsp. ramosa*			
231.	3710	*Bossiaea eriocarpa (Common Brown Pea)*			
232.	6341	*Brachyloma preissii (Globe Heath)*			
233.	30142	*Brachyloma preissii subsp. obtusifolium*			
234.	7867	*Brachyscome bellidioides*			
235.	7878	*Brachyscome iberidifolia*			
236.	7883	*Brachyscome pusilla*			
237.	11187	*Brassica barrelieri subsp. oxyrrhina (Smooth-stem Turnip)*	Y		
238.	2993	*Brassica fruticulosa (Twiggy Turnip)*	Y		
239.	3000	*Brassica tournefortii (Mediterranean Turnip)*	Y		
240.	2848	*Calandrinia corrigioloides (Strap Purslane)*			
241.	2854	*Calandrinia granulifera (Pygmy Purslane)*			
242.	2856	*Calandrinia liniflora (Parakeelya)*			

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243.	10861	*Callistachys lanceolata (Wonnich)*			
244.	5415	*Calothamnus lateralis*			
245.	35816	*Calothamnus quadrifidus subsp. quadrifidus*			
246.	5429	*Calothamnus sanguineus (Silky-leaved Blood flower)*			
247.	5439	*Calytrix angulata (Yellow Starflower)*			
248.	5458	*Calytrix flavescens (Summer Starflower)*			
249.	5460	*Calytrix fraseri (Pink Summer Calytrix)*			
250.	5476	*Calytrix sapphirina*			
251.	18555	*Cardamine sp. Jandakot (P. Luff s.n. 4/7/1969)*	Y		
252.	2951	*Cassytha flava (Dodder Laurel)*			
253.	2952	*Cassytha glabella (Tangled Dodder Laurel)*			
254.	11211	*Cassytha glabella forma dispar*			
255.	2956	*Cassytha pomiformis (Dodder Laurel)*			
256.	11799	*Cassytha racemosa forma racemosa*			
257.	7916	*Centaurea melitensis (Maltese Cockspur)*	Y		
258.	6539	*Centaurium erythraea (Common Centaury)*	Y		
259.	6214	*Centella asiatica*			
260.	7366	*Centranthus macrosiphon*	Y		
261.	5498	*Chamelaucium uncinatum (Geraldton Wax)*			
262.	2491	*Chenopodium macrospermum*	Y		
263.	7925	*Chondrilla juncea (Skeleton Weed)*	Y		
264.	6543	*Cicendia filiformis (Slender Cicendia)*	Y		
265.	2929	*Clematis pubescens (Common Clematis)*			
266.	4550	*Comesperma calymega (Blue-spike Milkwort)*			
267.	4554	*Comesperma flavum*			
268.	4564	*Comesperma virgatum (Milkwort)*			
269.	15607	*Conospermum acerosum subsp. acerosum*			
270.	15516	*Conospermum canaliculatum subsp. canaliculatum*			
271.	1876	*Conospermum incurvum (Plume Smokebush)*			
272.	1882	*Conospermum stoechadis (Common Smokebush)*			
273.	15520	*Conospermum stoechadis subsp. sclerophyllum*			
274.	15611	*Conospermum stoechadis subsp. stoechadis (Common Smokebush)*			
275.	6347	*Conostephium minus (Pink-tipped Pearl flower)*			
276.	6348	*Conostephium pendulum (Pearl Flower)*			
277.	6349	*Conostephium preissii*			
278.	7941	*Conyza parva*	Y		
279.	2891	*Corrigiola litoralis (Strapwort)*	Y		
280.	7945	*Cotula coronopifolia (Waterbuttons)*	Y		
281.	7947	*Cotula turbinata (Funnel Weed)*	Y		
282.	17701	*Crassula closiana*			
283.	3137	*Crassula colorata (Dense Stonecrop)*			
284.	11563	*Crassula colorata var. colorata*			
285.	3140	*Crassula glomerata*	Y		
286.	15706	*Crassula natans var. minus*	Y		
287.	13527	*Croninia kingiana*			
288.	4809	*Cryptandra pungens*			
289.	11021	*Cuscuta planiflora*	Y		
290.	19625	*Cymbalaria muralis subsp. muralis*	Y		
291.	7454	*Dampiera linearis (Common Dampiera)*			
292.	7485	*Dampiera triloba*		P1	
293.	3807	*Daviesia divaricata (Marno)*			
294.	18560	*Daviesia divaricata subsp. divaricata*			
295.	3824	*Daviesia nudiflora*			
296.	16585	*Daviesia nudiflora subsp. nudiflora*			
297.	3831	*Daviesia pedunculata*			
298.	3832	*Daviesia physodes*			
299.	3845	*Daviesia triflora*			
300.	18307	*Dimorphotheca ecklonis*	Y		
301.	4453	*Diplolaena angustifolia (Yanchep Rose)*			
302.	7054	*Dischisma arenarium*	Y		
303.	7055	*Dischisma capitatum (Woolly-headed Dischisma)*	Y		
304.	3095	*Drosera erythrorhiza (Red Ink Sundew)*			
305.	13217	*Drosera erythrorhiza subsp. erythrorhiza*			
306.	3098	*Drosera glanduligera (Pimpernel Sundew)*			
307.	3106	*Drosera macrantha (Bridal Rainbow)*			
308.	14298	*Drosera macrantha subsp. macrantha*			
309.	11853	*Drosera menziesii subsp. menziesii*			
310.	13216	*Drosera menziesii subsp. penicillaris*			
311.	3116	*Drosera omissa (Bright Sundew)*			
312.	3117	*Drosera paleacea (Dwarf Sundew)*			

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313.	13188	*Drosera paleacea subsp. paleacea*			
314.	3118	*Drosera pallida (Pale Rainbow)*			
315.	3119	*Drosera parvula (Small Sundew)*			
316.	31233	*Drosera patens*			
317.	3124	*Drosera pulchella (Pretty Sundew)*			
318.	30712	*Drosera x sidjamesii*		P1	
319.	2501	*Dysphania glomulifera*			
320.	2409	*Emex australis (Doublegee)*	Y		
321.	6132	*Epilobium ciliatum*	Y		
322.	6133	*Epilobium hirtigerum (Hairy Willow Herb)*			
323.	14289	*Epilobium tetragonum subsp. tetragonum*	Y		
324.	13949	*Eremaea asterocarpa*			
325.	5540	*Eremaea fimbriata*			
326.	5541	*Eremaea pauciflora*			
327.	14104	*Eremaea pauciflora var. pauciflora*			
328.	5542	*Eremaea purpurea*			
329.	4332	*Erodium botrys (Long Storksbill)*	Y		
330.	4333	*Erodium cicutarium (Common Storksbill)*	Y		
331.	6219	*Eryngium pinnatifidum (Blue Devils)*			
332.	5616	*Eucalyptus decurva (Slender Mallee)*			
333.	5708	*Eucalyptus marginata (Jarrah)*			
334.	13547	*Eucalyptus marginata subsp. marginata (Jarrah)*			
335.	5763	*Eucalyptus rudis (Flooded Gum)*			
336.	5790	*Eucalyptus todtiana (Coastal Blackbutt)*			
337.	3872	*Euchilopsis linearis (Swamp Pea)*			
338.	4638	*Euphorbia peplus (Petty Spurge)*	Y		
339.	4648	*Euphorbia terracina (Geraldton Carnation Weed)*	Y		
340.	3880	*Eutaxia virgata*			
341.	10765	*Exocarpos sparteus (Broom Ballart)*			
342.	1747	*Ficus carica (Common Fig)*	Y		
343.	6221	*Foeniculum vulgare (Fennel)*	Y		
344.	2969	*Fumaria capreolata (Whiteflower Fumitory)*	Y		
345.	11571	*Galenia pubescens var. pubescens*	Y		
346.	7976	*Galinsoga parviflora (Potato Weed)*	Y		
347.	20346	*Gamochaeta coarctata*	Y		
348.	20475	*Gastrolobium capitatum*			
349.	20473	*Gastrolobium ebracteolatum*			
350.	20483	*Gastrolobium linearifolium*			
351.	16311	*Gazania linearis*	Y		
352.	7991	*Gnephosis drummondii*			
353.	6587	*Gomphocarpus fruticosus (Narrowleaf Cottonbush)*	Y		
354.	10909	*Gompholobium confertum*			
355.	3950	*Gompholobium knightianum*			
356.	11083	*Gompholobium scabrum*			
357.	3957	*Gompholobium tomentosum (Hairy Yellow Pea)*			
358.	6150	*Gonocarpus diffusus*			
359.	6161	*Gonocarpus pithyoides*			
360.	12551	*Goodenia micrantha*			
361.	7538	*Goodenia pulchella*			
362.	14408	*Grevillea curviloba subsp. curviloba*		T	
363.	2032	*Grevillea leucopteris (White Plume Grevillea)*			
364.	8836	*Grevillea obtusifolia (Obtuse Leaved Grevillea)*			
365.	12824	*Grevillea vestita subsp. vestita*			
366.	2146	*Hakea costata (Ribbed Hakea)*			
367.	2175	*Hakea lissocarpha (Honey Bush)*			
368.	2197	*Hakea prostrata (Harsh Hakea)*			
369.	2203	*Hakea ruscifolia (Candle Hakea)*			
370.	2214	*Hakea trifurcata (Two-leaf Hakea)*			
371.	3961	*Hardenbergia comptoniana (Native Wisteria)*			
372.	28253	*Hedypnois rhagadioloides subsp. cretica*	Y		
373.	3016	*Heliophila pusilla*	Y		
374.	8084	*Helminthotheca echioides*	Y		
375.	16934	*Hemiandra glabra subsp. glabra*			
376.	6836	*Hemiandra incana*			
377.	6838	*Hemiandra linearis (Speckled Snakebush)*			
378.	6839	*Hemiandra pungens (Snakebush)*			
379.	5112	*Hibbertia aurea*			
380.	5116	*Hibbertia crassifolia*			
381.	5133	*Hibbertia helianthemoides*		P3	
382.	5134	*Hibbertia huegelii*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
383.	5135	*Hibbertia hypericoides (Yellow Buttercups)*			
384.	5153	*Hibbertia pachyrrhiza*			
385.	5154	*Hibbertia perfoliata*			
386.	5162	*Hibbertia racemosa (Stalked Guinea Flower)*			
387.	20034	*Hibbertia sp. Gnangara (J.R. Wheeler 2329)*			
388.	5172	*Hibbertia stellaris (Orange Stars)*			
389.	5173	*Hibbertia subvaginata*			
390.	6222	*Homalosciadium homalocarpum*			
391.	3966	*Hovea pungens (Devil's Pins)*			
392.	3968	*Hovea trisperma (Common Hovea)*			
393.	12859	*Hovea trisperma var. trisperma*			
394.	18296	*Humulus lupulus*	Y		
395.	12741	*Hyalosperma cotula*			
396.	5216	*Hybanthus calycinus (Wild Violet)*			
397.	5817	*Hypocalymma angustifolium (White Myrtle)*			
398.	35070	*Hypocalymma angustifolium subsp. Swan Coastal Plain (G.J. Keighery 16777)*			
399.	5825	*Hypocalymma robustum (Swan River Myrtle)*			
400.	8086	*Hypochaeris glabra (Smooth Catsear)*	Y		
401.	6620	*Ipomoea cairica (Coast Morning Glory)*	Y		
402.	3992	*Isotropis cuneifolia (Granny Bonnets)*			
403.	19700	*Isotropis cuneifolia subsp. cuneifolia*			
404.	8092	*Ixiolaena viscosa (Sticky Ixiolaena)*			
405.	14783	*Jacksonia calcicola*			
406.	4010	*Jacksonia floribunda (Holly Pea)*			
407.	4012	*Jacksonia furcellata (Grey Stinkwood)*			
408.	4027	*Jacksonia sericea (Waldjumi)*		P4	
409.	4029	*Jacksonia sternbergiana (Stinkwood)*			
410.	4044	*Kennedia prostrata (Scarlet Runner)*			
411.	5832	*Kunzea ericifolia (Spearwood)*			
412.	15498	*Kunzea glabrescens (Spearwood)*			
413.	18585	*Lagenophora huegelii*			
414.	4052	*Latrobea tenella*			
415.	7568	*Lechenaultia biloba (Blue Leschenaultia)*			
416.	7574	*Lechenaultia floribunda (Free-flowering Leschenaultia)*			
417.	6880	*Leonotis leonurus (Lion's Ear)*	Y		
418.	2344	*Leptomeria empetriformis*			
419.	2350	*Leptomeria pauciflora (Sparse-flowered Currant Bush)*			
420.	5850	*Leptospermum laevigatum (Coast Teatree)*	Y		
421.	5857	*Leptospermum spinescens*			
422.	19821	*Lessertia frutescens*	Y		
423.	6360	*Leucopogon australis (Spiked Beard-heath)*			
424.	6374	*Leucopogon conostephioides*			
425.	6405	*Leucopogon insularis*			
426.	6420	*Leucopogon oldfieldii*			
427.	6425	*Leucopogon oxycedrus*			
428.	6427	*Leucopogon parviflorus (Coast Beard-heath)*			
429.	6434	*Leucopogon polymorphus*			
430.	6436	*Leucopogon propinquus*			
431.	19579	*Leucopogon sp. Murdoch (M. Hislop 1037)*			
432.	6445	*Leucopogon squarrosus*			
433.	7676	*Levenhookia pusilla (Midget Stylewort)*			
434.	7677	*Levenhookia stipitata (Common Stylewort)*			
435.	6489	*Limonium sinuatum (Perennial Sea Lavender)*	Y		
436.	7075	*Linaria maroccana*	Y		
437.	4364	*Linum usitatissimum (Flax)*	Y		
438.	36160	*Liparophyllum capitatum*			
439.	7402	*Lobelia gibbosa (Tall Lobelia)*			
440.	7407	*Lobelia rhytidosperma (Wrinked-seeded Lobelia)*			
441.	7408	*Lobelia tenuior (Slender Lobelia)*			
442.	3048	*Lobularia maritima (Sweet Alyssum)*	Y		
443.	4059	*Lotus angustissimus (Narrowleaf Trefoil)*	Y		
444.	8564	*Lotus subbiflorus*	Y		
445.	6456	*Lysinema ciliatum (Curry Flower)*			
446.	6458	*Lysinema elegans*			
447.	34736	*Lysinema pentapetalum*			
448.	5281	*Lythrum hyssopifolia (Lesser Loosestrife)*	Y		
449.	2838	*Macarthuria apetala*			
450.	2839	*Macarthuria australis*			
451.	34676	*Meionectes brownii (Swamp Raspwort)*			
452.	5926	*Melaleuca lateritia (Robin Redbreast Bush)*			

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453.	5952	*Melaleuca preissiana (Moonah)*			
454.	5959	*Melaleuca rhaphiophylla (Swamp Paperbark)*			
455.	5964	*Melaleuca seriata*			
456.	18598	*Melaleuca systena*			
457.	5983	*Melaleuca trichophylla*			
458.	8105	*Millotia myosotidifolia*			
459.	8106	*Millotia tenuifolia (Soft Millotia)*			
460.	4100	*Mirbelia spinosa*			
461.	29418	*Monoculus monstrosus*	Y		
462.	4662	*Monotaxis grandiflora (Diamond of the Desert)*			
463.	19585	*Monotaxis grandiflora var. grandiflora*			
464.	4666	*Monotaxis occidentalis*			
465.	2415	*Muehlenbeckia polybotrya*			
466.	6199	*Myriophyllum tillaeoides*			
467.	2401	*Nuytsia floribunda (Christmas Tree)*			
468.	6138	*Oenothera drummondii (Beach Evening Primrose)*	Y		
469.	35416	*Oenothera lindheimeri*	Y		
470.	6142	*Oenothera stricta (Common Evening Primrose)*	Y		
471.	8133	*Olearia elaeophila*			
472.	32716	*Olearia lehmanniana*			
473.	8149	*Olearia rudis (Rough Daisybush)*			
474.	18255	*Opercularia vaginata (Dog Weed)*			
475.	36177	*Ornduffia albiflora*			
476.	4114	*Ornithopus pinnatus (Slender Serradella)*	Y		
477.	7122	*Orobanche minor (Lesser Broomrape)*	Y		
478.	4356	*Oxalis pes-caprae (Soursob)*	Y		
479.	4358	*Oxalis purpurea (Largeflower Wood Sorrel)*	Y		
480.	17114	*Paraserianthes lophantha subsp. lophantha*			
481.	4343	*Pelargonium capitatum (Rose Pelargonium)*	Y		
482.	6006	*Pericalymma ellipticum (Swamp Teatree)*			
483.	16477	*Pericalymma ellipticum var. ellipticum*			
484.	13911	*Persicaria decipiens*			
485.	16984	*Persicaria lapathifolia*	Y		
486.	2258	*Persoonia comata*			
487.	2273	*Persoonia saccata (Snottygobble)*			
488.	20368	*Petrophile axillaris*			
489.	2286	*Petrophile brevifolia*			
490.	2299	*Petrophile linearis (Pixie Mops)*			
491.	2301	*Petrophile macrostachya*			
492.	19825	*Petrorhagia dubia*	Y		
493.	18529	*Philotheca spicata (Pepper and Salt)*			
494.	16825	*Phyllangium divergens*			
495.	16177	*Phyllangium paradoxum*			
496.	17794	*Phyllanthus tenellus*	Y		
497.	2793	*Phytolacca octandra (Red Ink Plant)*	Y		
498.	6011	*Pileanthus peduncularis (Coppercups)*			
499.	5232	*Pimelea argentea (Silvery Leaved Pimelea)*			
500.	5237	*Pimelea calcicola*			
501.	5244	*Pimelea floribunda*			
502.	5254	*Pimelea leucantha*			
503.	5268	*Pimelea sulphurea (Yellow Banjine)*			
504.	8165	*Pithocarpa pulchella (Beautiful Pithocarpa)*			
505.	18352	*Pithocarpa pulchella var. melanostigma*			
506.	18353	*Pithocarpa pulchella var. pulchella*			
507.	6800	*Pityrodia axillaris (Native Foxglove)*		T	
508.	6801	*Pityrodia bartlingii (Woolly Dragon)*			
509.	7299	*Plantago debilis*			
510.	7304	*Plantago major (Greater Plantain)*	Y		
511.	6249	*Platysace compressa (Tapeworm Plant)*			
512.	4524	*Platytheca galioides*			
513.	8172	*Podolepis canescens*			
514.	8175	*Podolepis gracilis (Slender Podolepis)*			
515.	8182	*Podotheca angustifolia (Sticky Longheads)*			
516.	8183	*Podotheca chrysantha (Yellow Podotheca)*			
517.	8184	*Podotheca gnaphalioides (Golden Long-heads)*			
518.	4689	*Poranthera ericoides (Heath Poranthera)*			
519.	4691	*Poranthera microphylla (Small Poranthera)*			
520.	13255	*Pterochaeta paniculata*			
521.	11260	*Ptilotus drummondii var. drummondii (Pussytail)*			
522.	2742	*Ptilotus manglesii (Pom Poms)*			

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523.	2751	*Ptilotus polystachyus (Prince of Wales Feather)*			
524.	15856	*Ptilotus sericostachyus subsp. sericostachyus*			
525.	4181	*Pultenaea reticulata*			
526.	8195	*Quinetia urvillei*			
527.	3061	*Raphanus raphanistrum (Wild Radish)*	Y		
528.	6012	*Regelia ciliata*			
529.	6014	*Regelia inops*			
530.	18547	*Rhadinothamnus anceps*			
531.	13300	*Rhodanthe citrina*			
532.	4695	*Ricinocarpos glaucus*			
533.	19942	*Ricinocarpos undulatus*			
534.	6929	*Salvia verbenaca (Wild Sage)*	Y		
535.	7368	*Scabiosa atropurpurea (Purple Pincushion)*	Y		
536.	7614	*Scaevola globulifera*			
537.	13181	*Scaevola repens var. angustifolia*			
538.	13182	*Scaevola repens var. repens*			
539.	13152	*Scaevola thesioides subsp. thesioides*			
540.	6033	*Scholtzia involucrata (Spiked Scholtzia)*			
541.	8208	*Senecio hispidulus (Hispid Fireweed)*			
542.	25884	*Senecio pinnatifolius var. latilobus*			
543.	2909	*Silene gallica (French Catchfly)*	Y		
544.	15972	*Silene gallica var. gallica*	Y		
545.	2910	*Silene nocturna (Mediterranean Catchfly)*	Y		
546.	8224	*Siloxerus filifolius*			
547.	8225	*Siloxerus humifusus (Procumbent Siloxerus)*			
548.	7022	*Solanum nigrum (Black Berry Nightshade)*	Y		
549.	7037	*Solanum symonii*			
550.	8231	*Sonchus oleraceus (Common Sowthistle)*	Y		
551.	4713	*Stachystemon axillaris (Leafy Stachystemon)*			
552.	20666	*Stachystemon sp. Keysbrook (R. Archer 17/11/99)*		P1	
553.	4733	*Stackhousia monogyna*			
554.	2918	*Stellaria media (Chickweed)*	Y		
555.	15066	*Stenanthemum notiale subsp. chamelum*			
556.	19403	*Stenopetalum gracile*			
557.	2316	*Stirlingia latifolia (Blueboy)*			
558.	7679	*Stylidium adpressum (Trigger-on-stilts)*			
559.	30278	*Stylidium androsaceum*			
560.	25831	*Stylidium araeophyllum*			
561.	7693	*Stylidium brunonianum (Pink Fountain Triggerplant)*			
562.	7694	*Stylidium bulbiferum (Circus Triggerplant)*			
563.	7696	*Stylidium calcaratum (Book Triggerplant)*			
564.	7699	*Stylidium carnosum (Fleshy-leaved Triggerplant)*			
565.	7709	*Stylidium crossocephalum (Posy Triggerplant)*			
566.	7710	*Stylidium cygnorum*			
567.	7713	*Stylidium dichotomum (Pins-and-needles)*			
568.	7716	*Stylidium diuroides (Donkey Triggerplant)*			
569.	11808	*Stylidium diuroides subsp. diuroides*			
570.	7717	*Stylidium divaricatum (Daddy-long-legs)*			
571.	7745	*Stylidium junceum (Reed Triggerplant)*			
572.	25829	*Stylidium neurophyllum*			
573.	7774	*Stylidium piliferum (Common Butterfly Triggerplant)*			
574.	7785	*Stylidium repens (Matted Triggerplant)*			
575.	20521	*Stylidium rigidulum*			
576.	25806	*Stylidium scariosum*			
577.	7798	*Stylidium schoenoides (Cow Kicks)*			
578.	20603	*Stylidium trudgenii*		P3	
579.	7806	*Stylidium utricularioides (Pink Fan Triggerplant)*			
580.	2329	*Synaphea spinulosa*			
581.	15532	*Synaphea spinulosa subsp. spinulosa*			
582.	20135	*Taxandria linearifolia*			
583.	4256	*Templetonia retusa (Cockies Tongues)*			
584.	2791	*Tersonia cyathiflora (Button Creeper)*			
585.	2824	*Tetragonia tetragonoides (New Zealand Spinach)*			
586.	4535	*Tetratheca hirsuta (Black Eyed Susan)*			
587.	6064	*Thryptomene racemulosa*			
588.	6280	*Trachymene pilosa (Native Parsnip)*			
589.	4383	*Tribulus terrestris (Caltrop)*	Y		
590.	17542	*Trifolium arvense var. arvense*	Y		
591.	4292	*Trifolium campestre (Hop Clover)*	Y		
592.	4298	*Trifolium hirtum (Rose Clover)*	Y		

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593.	14738	*Trifolium resupinatum var. resupinatum*	Y		
594.	4737	*Tripterococcus brunonis (Winged Stackhousia)*			
595.	11665	*Trymalium ledifolium var. ledifolium*			
596.	8255	*Ursinia anthemoides (Ursinia)*	Y		
597.	38388	*Ursinia anthemoides subsp. anthemoides*	Y		
598.	7125	*Utricularia australis*			
599.	7131	*Utricularia dichotoma (Fairy Aprons)*			
600.	12493	*Utricularia gibba*			
601.	7138	*Utricularia inaequalis*			
602.	7158	*Utricularia volubilis (Twining Bladderwort)*			
603.	8257	*Vellereophyton dealbatum (White Cudweed)*	Y		
604.	15725	*Verbesina encelioides*	Y		
605.	7666	*Verreauxia reinwardtii (Common Verreauxia)*			
606.	15432	*Verticordia densiflora var. densiflora*			
607.	6077	*Verticordia drummondii (Drummond's Featherflower)*			
608.	12422	*Verticordia eriocephala (Common Cauliflower)*			
609.	14714	*Verticordia lindleyi subsp. lindleyi*		P4	
610.	6101	*Verticordia nitens (Morrison Featherflower)*			
611.	6103	*Verticordia ovalifolia*			
612.	11474	*Vicia sativa subsp. nigra*	Y		
613.	4325	*Viminaria juncea (Swishbush)*			
614.	7384	*Wahlenbergia capensis (Cape Bluebell)*	Y		
615.	7388	*Wahlenbergia multicaulis*			
616.	7389	*Wahlenbergia preissii*			
617.	8282	*Waitzia suaveolens (Fragrant Waitzia)*			
618.	13333	*Waitzia suaveolens var. suaveolens*			
619.	6289	*Xanthosia huegelii*			
620.	2331	*Xylomelum occidentale (Woody Pear)*			
Fungus					
621.	38756	*Amanita umbrinella*			
622.	38780	*Crepidotus eucalyptorum*			
623.	38791	*Hebeloma crustuliniforme*			
624.	38830	*Psilocybe coprophila*			
625.	38836	*Russula erumpens*			
626.	38840	*Stereum hirsutum*			
Gymnosperm					
627.	96	*Callitris preissii (Rottnest Island Pine)*			
628.	18119	*Macrozamia fraseri*			
629.	85	*Macrozamia riedlei (Zamia)*			
Invertebrate					
630.	33977	*Hylaeus globuliferus (bee)*		P3	
631.	33982	*Leioproctus contrarius (bee)*		P3	
632.	33992	*Synemon gratiosa (Graceful Sunmoth)*		T	
Mammal					
633.	24086	*Cercartetus concinnus (Western Pygmy-possum)*			
634.	24092	*Dasyurus geoffroii (Chuditch)*		T	
635.	24041	*Felis catus (Cat)*			
636.	24215	*Hydromys chrysogaster (Water-rat)*		P4	
637.	24153	*Isoodon obesulus subsp. fusciventer (Quenda)*		P5	
638.	24132	*Macropus fuliginosus (Western Grey Kangaroo)*			
639.	24133	*Macropus irma (Western Brush Wallaby)*		P4	
640.	24223	*Mus musculus (House Mouse)*			
641.	24095	*Ningaui timealeyi (Pilbara Ningaui)*			
642.	24194	*Nyctophilus geoffroyi (Lesser Long-eared Bat)*			
643.	24101	*Planigale ingrami (Long-tailed Planigale)*			
644.	24102	*Planigale maculata (Common Planigale)*			
645.	24230	*Pseudomys albocinereus (Ash-grey Mouse)*			
646.	24234	*Pseudomys delicatulus (Delicate Mouse)*			
647.	24235	*Pseudomys desertor (Desert Mouse)*			
648.	24245	*Rattus rattus (Black Rat)*			
649.	24116	*Sminthopsis macroura (Stripe-faced Dunnart)*			
650.	24207	*Tachyglossus aculeatus (Echidna)*			
651.	24167	*Tarsipes rostratus (Honey Possum)*			
652.	25521	*Trichosurus vulpecula (Common Brushtail Possum)*			
653.	24158	*Trichosurus vulpecula subsp. vulpecula (Common Brushtail Possum)*			
654.	24206	*Vespadelus regulus (Southern Forest Bat)*			
Monocotyledon					
655.	184	*Aira caryophyllea (Silvery Hairgrass)*			

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			Y		
656.	185	*Aira cupaniana (Silvery Hairgrass)*	Y		
657.	187	*Aira praecox (Early Hairgrass)*	Y		
658.	1056	*Alexgeorgea nitens*			
659.	194	*Amphipogon amphipogonoides*			
660.	20184	*Amphipogon laguroides subsp. laguroides*			
661.	200	*Amphipogon turbinatus*			
662.	1409	*Anigozanthos humilis (Catspaw)*			
663.	11434	*Anigozanthos humilis subsp. humilis*			
664.	1411	*Anigozanthos manglesii (Mangles Kangaroo Paw)*			
665.	11261	*Anigozanthos manglesii subsp. manglesii*			
666.	1117	*Aphelia cyperoides*			
667.	1264	*Arnocrinum preissii*			
668.	8779	*Asparagus asparagoides (Bridal Creeper)*	Y		
669.	1364	*Asphodelus fistulosus (Onion Weed)*	Y		
670.	17234	*Austrostipa compressa*			
671.	17240	*Austrostipa flavescens*			
672.	17241	*Austrostipa hemipogon*			
673.	233	*Avena barbata (Bearded Oat)*	Y		
674.	234	*Avena fatua (Wild Oat)*	Y		
675.	18279	*Babiana angustifolia*	Y		
676.	741	*Baumea articulata (Jointed Rush)*			
677.	15837	*Baumea preissii subsp. laxa*			
678.	15836	*Baumea preissii subsp. preissii*			
679.	747	*Baumea rubiginosa*			
680.	1417	*Blancoa canescens (Winter Bell)*			
681.	749	*Bolboschoenus caldwellii (Marsh Club-rush)*			
682.	8661	*Brachypodium distachyon (False Brome)*	Y		
683.	244	*Briza maxima (Blowfly Grass)*	Y		
684.	245	*Briza minor (Shivery Grass)*	Y		
685.	249	*Bromus diandrus (Great Brome)*	Y		
686.	1383	*Burchardia bairdiae*			
687.	12770	*Burchardia congesta*			
688.	1385	*Burchardia multiflora (Dwarf Burchardia)*			
689.	1277	*Caesia occidentalis*			
690.	15330	*Caladenia arenicola*			
691.	1592	*Caladenia flava (Cowslip Orchid)*			
692.	15348	*Caladenia flava subsp. flava*			
693.	1596	*Caladenia huegelii (Grand Spider Orchid)*		T	
694.	15358	*Caladenia longicauda subsp. albella*			
695.	15361	*Caladenia longicauda subsp. calcigena*			
696.	1605	*Caladenia marginata (White Fairy Orchid)*			
697.	15503	*Caladenia paludosa*			
698.	15377	*Caladenia reptans subsp. reptans*			
699.	18019	*Caladenia vulgata*			
700.	1213	*Calectasia cyanea (Blue Tinsel Lily)*		T	
701.	19309	*Calectasia narragara*			
702.	29103	*Calectasia sp. Pinjar (C. Tauss 557)*		P1	
703.	753	*Carex appressa (Tall Sedge)*			
704.	754	*Carex divisa (Divided Sedge)*	Y		
705.	755	*Carex fascicularis (Tassel Sedge)*			
706.	1162	*Cartonema philydroides*			
707.	13685	*Catapodium rigidum (Rigid Fescue)*	Y		
708.	1121	*Centrolepis aristata (Pointed Centrolepis)*			
709.	1125	*Centrolepis drummondiana*			
710.	1131	*Centrolepis inconspicua*			
711.	1133	*Centrolepis pilosa*			
712.	17685	*Chaetanthus aristatus*			
713.	1280	*Chamaescilla corymbosa (Blue Squill)*			
714.	11299	*Chamaescilla corymbosa var. corymbosa*			
715.	1513	*Chasmanthe floribunda (African Cornflag)*	Y		
716.	17833	*Chordifex microcodon*			
717.	17706	*Chordifex sinuosus*			
718.	1418	*Conostylis aculeata (Prickly Conostylis)*			
719.	11826	*Conostylis aculeata subsp. aculeata*			
720.	11552	*Conostylis aculeata subsp. bromelioides*			
721.	11513	*Conostylis aculeata subsp. cygnorum*			
722.	1420	*Conostylis androstemma (Trumpets)*			
723.	1423	*Conostylis aurea (Golden Conostylis)*			
724.	11438	*Conostylis candicans subsp. candicans*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
725.	1436	*Conostylis juncea*			
726.	1454	*Conostylis setigera (Bristly Cottonhead)*			
727.	11597	*Conostylis setigera subsp. setigera*			
728.	11870	*Conostylis teretifolia subsp. teretifolia*			
729.	277	*Cortaderia selloana (Pampas Grass)*	Y		
730.	1285	*Corynotheca micrantha (Sand Lily)*			
731.	11283	*Corynotheca micrantha var. micrantha*			
732.	769	*Cyathochaeta clandestina*			
733.	16245	*Cyathochaeta teretifolia*		P3	
734.	792	*Cyperus eragrostis (Umbrella Sedge)*	Y		
735.	806	*Cyperus polystachyos (Bunchy Sedge)*	Y		
736.	816	*Cyperus tenuiflorus (Scaly Sedge)*	Y		
737.	10916	*Cyrtostylis huegelii*			
738.	1218	*Dasypogon bromeliifolius (Pineapple Bush)*			
739.	17663	*Desmocladus asper*			
740.	17691	*Desmocladus fasciculatus*			
741.	16595	*Desmocladus flexuosus*			
742.	299	*Deyeuxia quadriseta (Reed Bentgrass)*			
743.	1259	*Dianella revoluta (Blueberry Lily)*			
744.	17838	*Dielsia stenostachya*			
745.	19649	*Disa bracteata*	Y		
746.	11049	*Diuris corymbosa*			
747.	1635	*Diuris longifolia (Common Donkey Orchid)*			
748.	12939	*Diuris magnifica*			
749.	11485	*Ehrharta brevifolia var. cuspidata*	Y		
750.	347	*Ehrharta calycina (Perennial Veldt Grass)*	Y		
751.	1643	*Elythranthera brunonis (Purple Enamel Orchid)*			
752.	17495	*Epiblema grandiflorum var. grandiflorum*			
753.	376	*Eragrostis curvula (African Lovegrass)*	Y		
754.	15410	*Eriochilus dilatatus subsp. dilatatus*			
755.	15412	*Eriochilus dilatatus subsp. multiflorus*			
756.	18392	*Freesia alba x leichtlinii*	Y		
757.	1520	*Gladiolus caryophyllaceus (Wild Gladiolus)*	Y		
758.	1468	*Haemodorum laxum*			
759.	1475	*Haemodorum spicatum (Mardja)*			
760.	1293	*Hensmania turbinata*			
761.	452	*Hyparrhenia hirta (Tambookie Grass)*	Y		
762.	1070	*Hypolaena exsulca*			
763.	17622	*Hypolaena robusta*		P4	
764.	910	*Isolepis cernua (Nodding Club-rush)*			
765.	20200	*Isolepis cernua var. setiformis*			
766.	912	*Isolepis cyperoides*			
767.	917	*Isolepis marginata (Coarse Club-rush)*	Y		
768.	919	*Isolepis oldfieldiana*			
769.	921	*Isolepis producta*			
770.	1295	*Johnsonia acaulis*			
771.	1298	*Johnsonia pubescens (Pipe Lily)*			
772.	8328	*Juncus amabilis*			
773.	1188	*Juncus pallidus (Pale Rush)*			
774.	16091	*Lachenalia bulbifera*	Y		
775.	1370	*Lachenalia reflexa*	Y		
776.	20019	*Lachnagrostis filiformis*			
777.	467	*Lagurus ovatus (Hare's Tail Grass)*	Y		
778.	1307	*Laxmannia ramosa (Branching Lily)*			
779.	11911	*Laxmannia ramosa subsp. ramosa*			
780.	1308	*Laxmannia sessiliflora (Nodding Lily)*			
781.	11464	*Laxmannia sessiliflora subsp. australis*			
782.	1309	*Laxmannia squarrosa*			
783.	18074	*Lepidobolus preissianus subsp. preissianus*			
784.	925	*Lepidosperma angustatum*			
785.	937	*Lepidosperma longitudinale (Pithy Sword-sedge)*			
786.	940	*Lepidosperma pubisquameum*			
787.	944	*Lepidosperma scabrum*			
788.	36060	*Lepidosperma sp. Coastal Dunes (R.J. Cranfield 9963)*			
789.	945	*Lepidosperma squamatum*			
790.	946	*Lepidosperma striatum*			
791.	1653	*Leporella fimbriata (Hare Orchid)*			
792.	1088	*Lepyrodia macra (Large Scale Rush)*			
793.	1090	*Lepyrodia muirii*			
794.	11073	*Lolium x hybridum*	Y		

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
795.	1223	*Lomandra caespitosa (Tufted Mat Rush)*			
796.	1228	*Lomandra hermaphrodita*			
797.	14542	*Lomandra micrantha subsp. micrantha*			
798.	1234	*Lomandra nigricans*			
799.	1236	*Lomandra odora (Tiered Matrush)*			
800.	1239	*Lomandra preissii*			
801.	1243	*Lomandra sericea (Silky Mat Rush)*			
802.	1246	*Lomandra suaveolens*			
803.	1097	*Lyginia barbata*			
804.	18049	*Lyginia imberbis*			
805.	17694	*Meeboldina scariosa*			
806.	17843	*Meeboldina tephrina*			
807.	953	*Mesomelaena graciliceps*			
808.	955	*Mesomelaena pseudostygia*			
809.	485	*Microlaena stipoides (Weeping Grass)*			
810.	1658	*Microtis atrata (Swamp Mignonette Orchid)*			
811.	10954	*Microtis media (Tall Mignonette Orchid)*			
812.	15419	*Microtis media subsp. media*			
813.	19179	*Moraea flaccida (One-leaf Cape Tulip)*	Y		
814.	19180	*Moraea miniata (Two-leaf Cape Tulip)*	Y		
815.	1495	*Narcissus tazetta (Jonquil)*	Y		
816.	11749	*Orthrosanthus laxus var. laxus (Morning Iris)*			
817.	527	*Paspalum dilatatum*	Y		
818.	532	*Paspalum urvillei (Vasey Grass)*	Y		
819.	1546	*Patersonia juncea (Rush Leaved Patersonia)*			
820.	1550	*Patersonia occidentalis (Purple Flag)*			
821.	30472	*Patersonia occidentalis var. occidentalis*			
822.	40423	*Pentameris airoides (False Hairgrass)*	Y		
823.	40424	*Pentameris airoides subsp. airoides*	Y		
824.	40422	*Pentameris pallida*	Y		
825.	20460	*Pheladenia deformis*			
826.	1478	*Phlebocarya ciliata*			
827.	582	*Polypogon monspeliensis (Annual Beardgrass)*	Y		
828.	122	*Posidonia angustifolia*			
829.	1672	*Prasophyllum fimbria (Fringed Leek Orchid)*			
830.	1676	*Prasophyllum hians (Yawning Leek Orchid)*			
831.	1680	*Prasophyllum parvifolium (Autumn Leek Orchid)*			
832.	15426	*Pterostylis aspera*			
833.	1686	*Pterostylis barbata (Bird Orchid)*			
834.	17267	*Pterostylis brevisepala*			
835.	1693	*Pterostylis recurva (Jug Orchid)*			
836.	12217	*Pterostylis sanguinea*			
837.	19342	*Pterostylis sp. clubbed snail orchid (R. Davis 8088)*			
838.	18658	*Pterostylis sp. short sepals (W. Jackson BJ259)*			
839.	1698	*Pterostylis vittata (Banded Greenhood)*			
840.	16367	*Pyrorchis nigricans (Red beaks)*			
841.	1554	*Romulea flava*	Y		
842.	14485	*Romulea flava var. minor*	Y		
843.	11544	*Romulea rosea var. australis (Guildford Grass)*	Y		
844.	40425	*Rytidosperma caespitosum*			
845.	969	*Schoenoplectus validus (Lake Club-rush)*			
846.	978	*Schoenus brevisetis*			
847.	979	*Schoenus caespititius*			
848.	984	*Schoenus curvifolius*			
849.	986	*Schoenus efoliatus*			
850.	992	*Schoenus grandiflorus (Large Flowered Bogrush)*			
851.	17606	*Schoenus griffinianus*		P3	
852.	1002	*Schoenus nanus (Tiny Bog Rush)*			
853.	17614	*Schoenus plumosus*			
854.	1018	*Schoenus subfascicularis*			
855.	17409	*Schoenus variicellae*			
856.	1312	*Sowerbaea laxiflora (Purple Tassels)*			
857.	1560	*Sparaxis pillansii (Harlequin Flower)*	Y		
858.	1036	*Tetraria octandra*			
859.	35581	*Tetraria sp. Chandala (G.J. Keighery 17055)*		P2	
860.	1702	*Thelymitra campanulata (Shirt Orchid)*			
861.	1708	*Thelymitra fuscolutea (Leopard Orchid)*			
862.	1717	*Thelymitra variegata (Queen of Sheba)*		P3	
863.	1318	*Thysanotus arbuscula*			
864.	1338	*Thysanotus manglesianus (Fringed Lily)*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
865.	1339	*Thysanotus multiflorus (Many-flowered Fringe Lily)*			
866.	1351	*Thysanotus sparteus*			
867.	1357	*Thysanotus thyrsoideus*			
868.	1358	*Thysanotus triandrus*			
869.	1481	*Tribonanthes australis*			
870.	1361	*Tricoryne elatior (Yellow Autumn Lily)*			
871.	1363	*Tricoryne tenella*			
872.	98	*Typha domingensis (Bulrush)*			
873.	99	*Typha orientalis (Bulrush)*	Y		
874.	724	*Vulpia myuros (Rat's Tail Fescue)*	Y		
875.	1401	*Wurmbea pygmaea*			
876.	14544	*Xanthorrhoea brunonis subsp. brunonis*			
877.	1256	*Xanthorrhoea preissii (Grass tree)*			
878.	1049	*Zantedeschia aethiopica (Arum Lily)*	Y		
Pteridophyte (Fern)					
879.	57	*Pteridium esculentum (Bracken)*			
Reptile					
880.	25011	*Acritoscincus trilineatum*			
881.	24991	*Aprasia repens*			
882.	25245	*Brachyurophis semifasciata*			
883.	25015	*Carlia munda*			
884.	25337	*Chelodina oblonga (Oblong Turtle)*			
885.	24980	*Christinus marmoratus (Marbled Gecko)*			
886.	24918	*Crenadactylus ocellatus subsp. ocellatus*			
887.	30893	*Cryptoblepharus buchananii*			
888.	30899	*Ctenophorus adelaidensis (Southern Heath Dragons)*			
889.	25458	*Ctenophorus caudicinctus (Ring-tailed Dragon)*			
890.	25027	*Ctenotus australis*			
891.	25039	*Ctenotus fallens*			
892.	25040	*Ctenotus gemmula*			
893.	25047	*Ctenotus impar*			
894.	25073	*Ctenotus saxatilis (Rock Ctenotus)*			
895.	25087	*Cyclodomorphus celatus*			
896.	24999	*Delma grayii*			
897.	25002	*Delma pax*			
898.	25295	*Demansia psammophis subsp. cupreiceps*			
899.	25296	*Demansia psammophis subsp. reticulata*			
900.	24929	*Diplodactylus granariensis subsp. granariensis*			
901.	24939	*Diplodactylus polyophthalmus*			
902.	24944	*Diplodactylus savagei*			
903.	24899	*Diporiphora valens*			
904.	25251	*Echiopsis curta (Bardick)*			
905.	25100	*Egernia napoleonis*			
906.	25250	*Elapognathus coronatus (Crowned Snake)*			
907.	24959	*Gehyra variegata*			
908.	25115	*Hemiergis initialis subsp. initialis*			
909.	25119	*Hemiergis quadrilineata*			
910.	24961	*Heteronotia binoei (Bynoe's Gecko)*			
911.	25133	*Lerista elegans*			
912.	30929	*Lerista jacksoni*			
913.	25148	*Lerista lineopunctulata*			
914.	25165	*Lerista praepedita*			
915.	25005	*Lialis burtonis*			
916.	30937	*Lucasium alboguttatus*			
917.	30933	*Lucasium stenodactylum*			
918.	30934	*Lucasium wombeyi*			
919.	25184	*Menetia greyii*			
920.	25191	*Morethia lineoocellata*			
921.	25192	*Morethia obscura*			
922.	25495	*Morethia ruficauda*			
923.	25248	*Neelaps bimaculatus (Black-naped Snake)*			
924.	25249	*Neelaps calonotos (Black-striped Snake)*		P3	
925.	30941	*Nephrurus milii (Barking Gecko)*			
926.	25252	*Notechis scutatus (Tiger Snake)*			
927.	25499	*Notoscincus ornatus*			
928.	25253	*Parasuta gouldii*			
929.	25255	*Parasuta nigriceps*			
930.	25509	*Pletholax gracilis (Keeled Legless Lizard)*			
931.	25007	*Pletholax gracilis subsp. gracilis*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
932.	25510	*Pogona minor*			
933.	24907	*Pogona minor subsp. minor*			
934.	25259	*Pseudonaja affinis subsp. affinis (Dugite)*			
935.	25008	*Pygopus lepidopodus (Common Scaly Foot)*			
936.	25271	*Ramphotyphlops australis*			
937.	25279	*Ramphotyphlops hamatus*			
938.	25288	*Ramphotyphlops waitii*			
939.	24982	*Rhynchoedura ornata (Beaked Gecko)*			
940.	25266	*Simoselaps bertholdi (Jan's Banded Snake)*			
941.	25518	*Strophurus spinigerus*			
942.	24942	*Strophurus spinigerus subsp. spinigerus*			
943.	25203	*Tiliqua occipitalis (Western Bluetongue)*			
944.	25519	*Tiliqua rugosa*			
945.	25207	*Tiliqua rugosa subsp. rugosa*			
946.	25218	*Varanus gouldii (Bungarra or Sand Monitor)*			
947.	25225	*Varanus rosenbergi (Heath Monitor)*			
948.	25227	*Varanus tristis subsp. tristis (Racehorse Monitor)*			
Slime Mould					
949.	38967	*Arcyria incarnata*			
950.	38969	*Arcyria minuta*			
951.	38971	*Arcyria occidentalis*			Y
952.	38978	*Badhamia panicea*			
953.	38998	*Craterium minutum*			
954.	38999	*Cribraria argillacea*			Y
955.	39020	*Didymium difforme*			
956.	39057	*Perichaena corticalis*			
957.	39058	*Perichaena depressa*			
958.	39059	*Perichaena vermicularis*			
959.	39077	*Physarum straminipes*			Y
960.	39094	*Trichia affinis*			
961.	39098	*Trichia favoginea*			
Water Mould					
962.		*Phytophthora cinnamomi*			

Conservation Codes
T - Rare or likely to become extinct
X - Presumed extinct
IA - Protected under international agreement
S - Other specially protected fauna
1 - Priority 1
2 - Priority 2
3 - Priority 3
4 - Priority 4
5 - Priority 5

[1] For NatureMap's purposes, species flagged as endemic are those whose records are wholely contained within the search area. Note that only those records complying with the search criterion are included in the calculation. For example, if you limit records to those from a specific datasource, only records from that datasource are used to determine if a species is restricted to the query area.

APPENDIX 3

Aboriginal Heritage Search Results

Search Criteria

1 sites in a search box. The box is formed by these diagonally opposed corner points:

MGA Zone 50	
Northing	Easting
6513704	372349
6524612	381840

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Copyright

Legend

Restriction

N	No restriction
M	Male access only
F	Female access

Access

C	Closed
O	Open
V	Vulnerable

Coordinate Accuracy

Accuracy is shown as a code in brackets following the site coordinates.

[Reliable]	The spatial information recorded in the site file is deemed to be reliable, due to methods of capture.
[Unreliable]	The spatial information recorded in the site file is deemed to be unreliable due to errors of spatial data capture and/or quality of spatial information reported.

Status

L - Lodged		ACMC Decision Made
Information lodged, awaiting assessment	→	R - Registered Site I - Insufficient information S - Stored Data

Spatial Accuracy

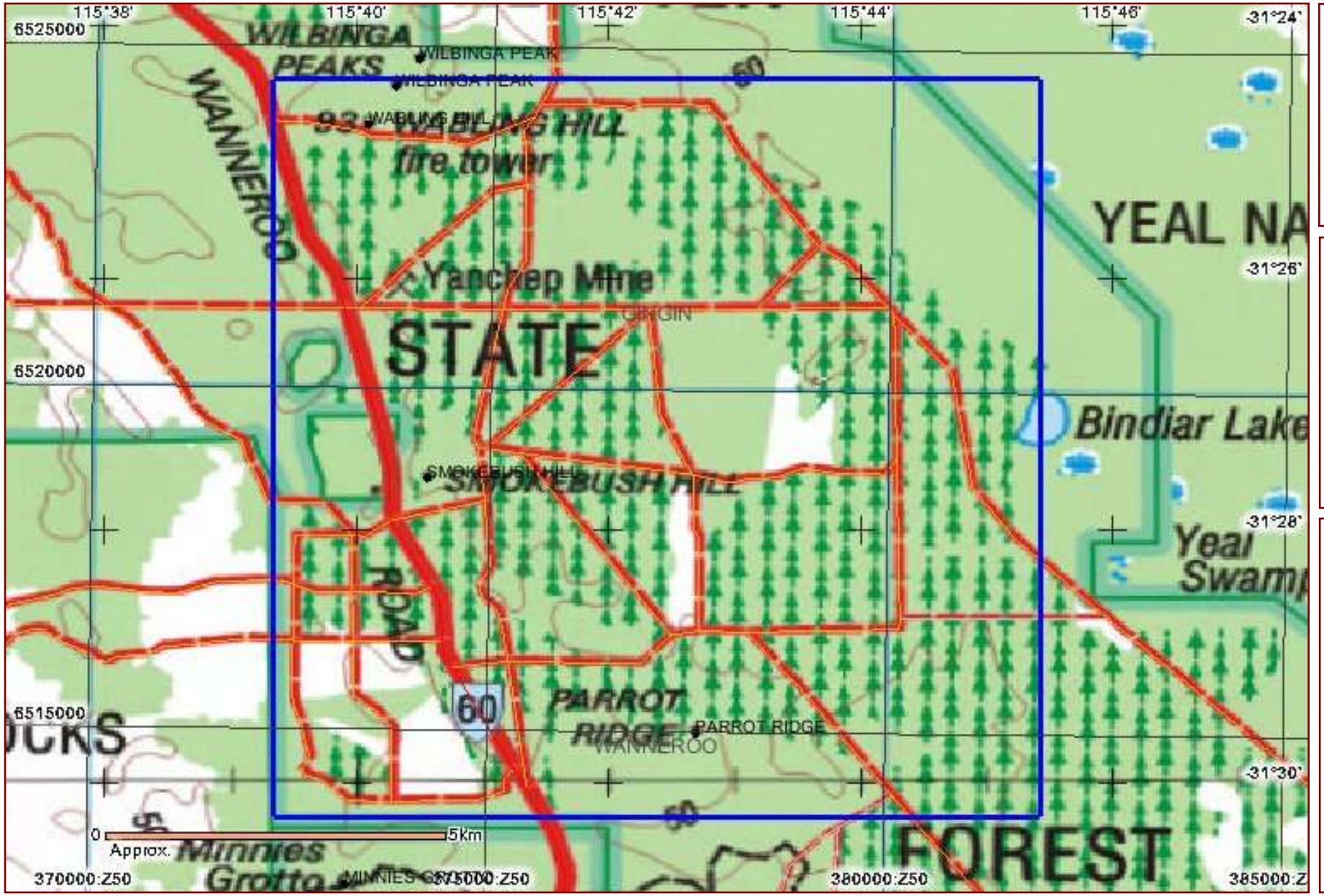
Index coordinates are indicative locations and may not necessarily represent the centre of sites, especially for sites with an access code “closed” or “vulnerable”. Map coordinates (Lat/Long) and (Easting/Northing) are based on the GDA 94 datum. The Easting / Northing map grid can be across one or more zones. The zone is indicated for each Easting on the map, i.e. '5000000:Z50' means Easting=5000000, Zone=50.

Sites Shown on Maps

Site boundaries may not appear on maps at low zoom levels

List of Registered Aboriginal Sites with Map

No results



Legend

Selected Heritage Sites

Registered Sites

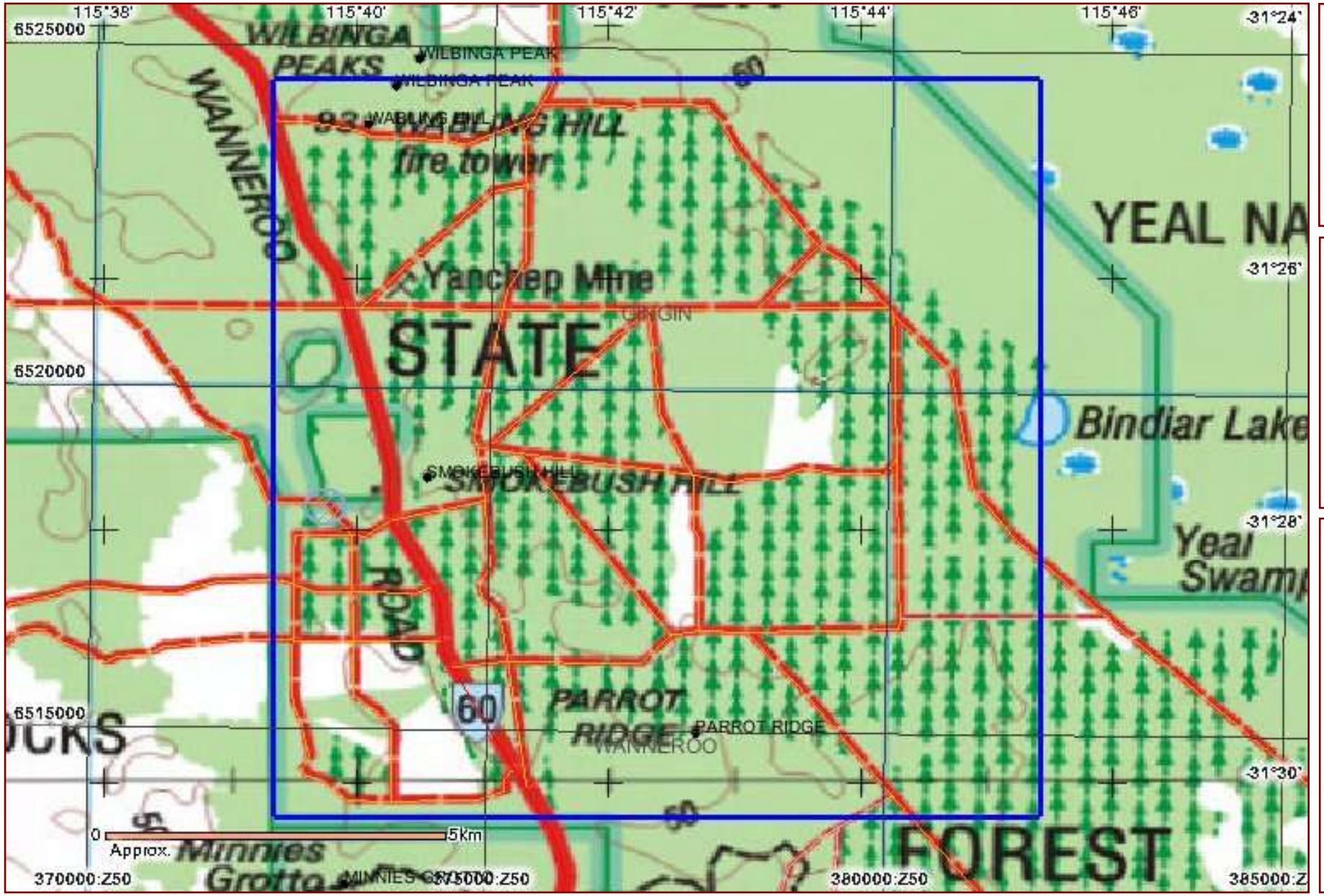
Town

Map Area

Search Area

List of 1 Other Heritage Places with Map

Site ID	Status	Access	Restriction	Site Name	Site Type	Additional Info	Informants	Coordinates	Site No.
3574	I	O	N	Smokebush Waterhole.	Artefacts / Scatter	Camp, Water Source	*Registered Informant names available from DIA.	372939mE 6518249mN Zone 50 [Reliable]	S02379



Legend

Selected Heritage Sites

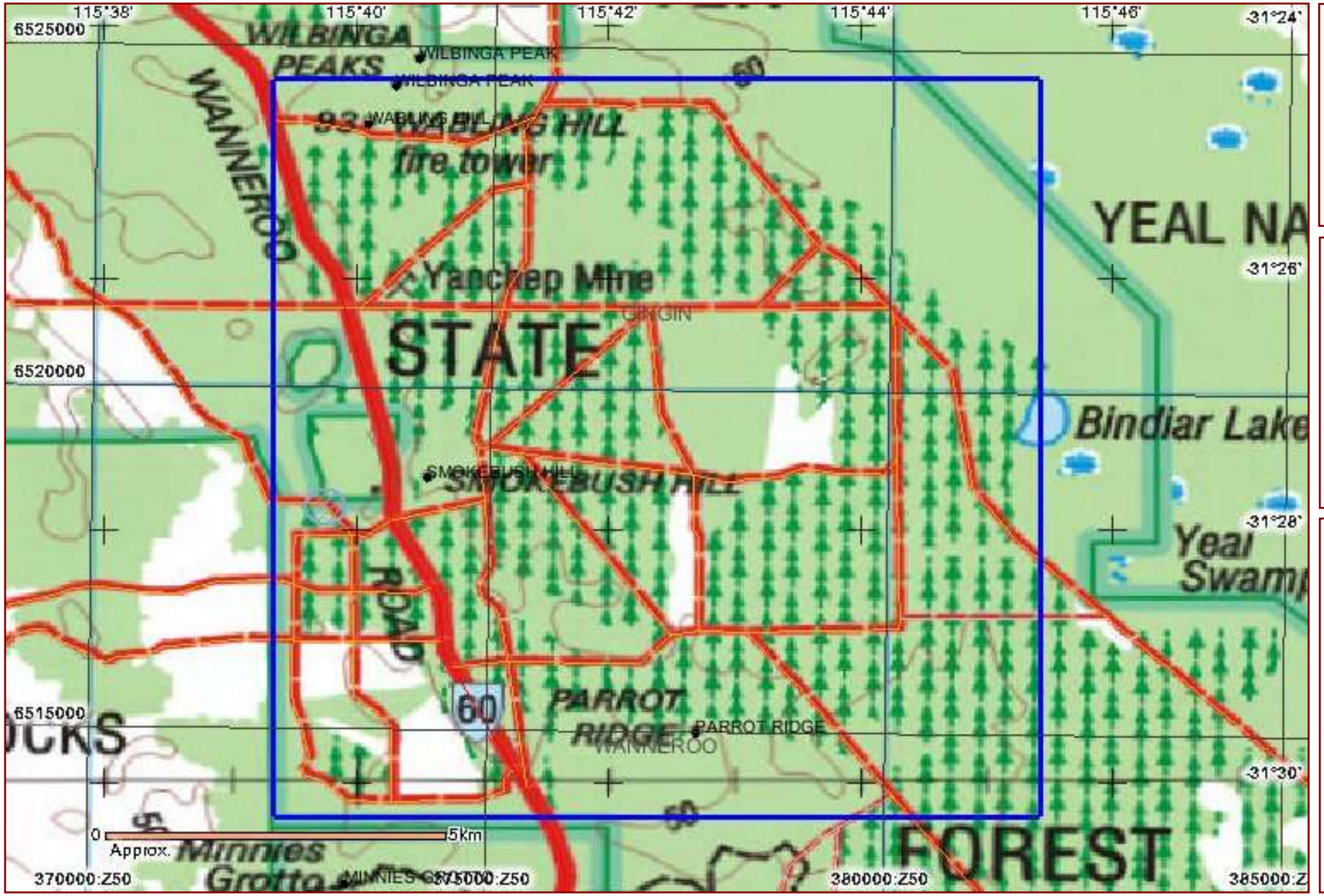
Other Heritage Places

Town

Map Area

Search Area

Map Showing Registered Aboriginal Sites and Other Heritage Places



Legend

Selected Heritage Sites

- Registered Sites
- Other Heritage Places
- Town
- Map Area
- Search Area

Aboriginal Heritage Inquiry System

Aboriginal Sites Database

Search Criteria

0 sites in a search box. The box is formed by these diagonally opposed corner points:

MGA Zone 50	
Northing	Easting
6509460	381294
6517467	389526

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Sites Shown on Maps

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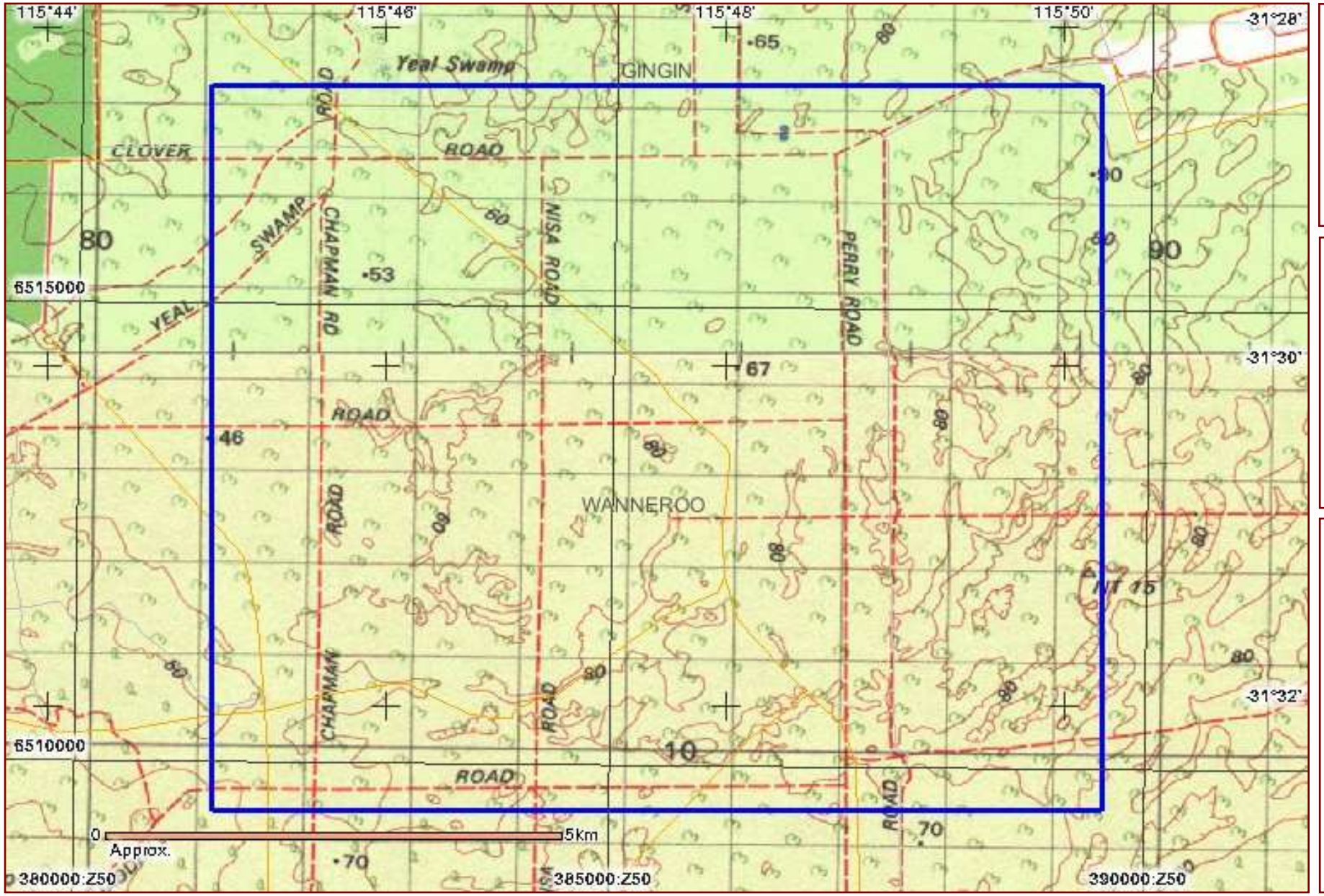
List of Registered Aboriginal Sites with Map

No results

Aboriginal Heritage Inquiry System

Aboriginal Sites Database



Legend

Selected Heritage Sites

Registered Sites

Town

Map Area

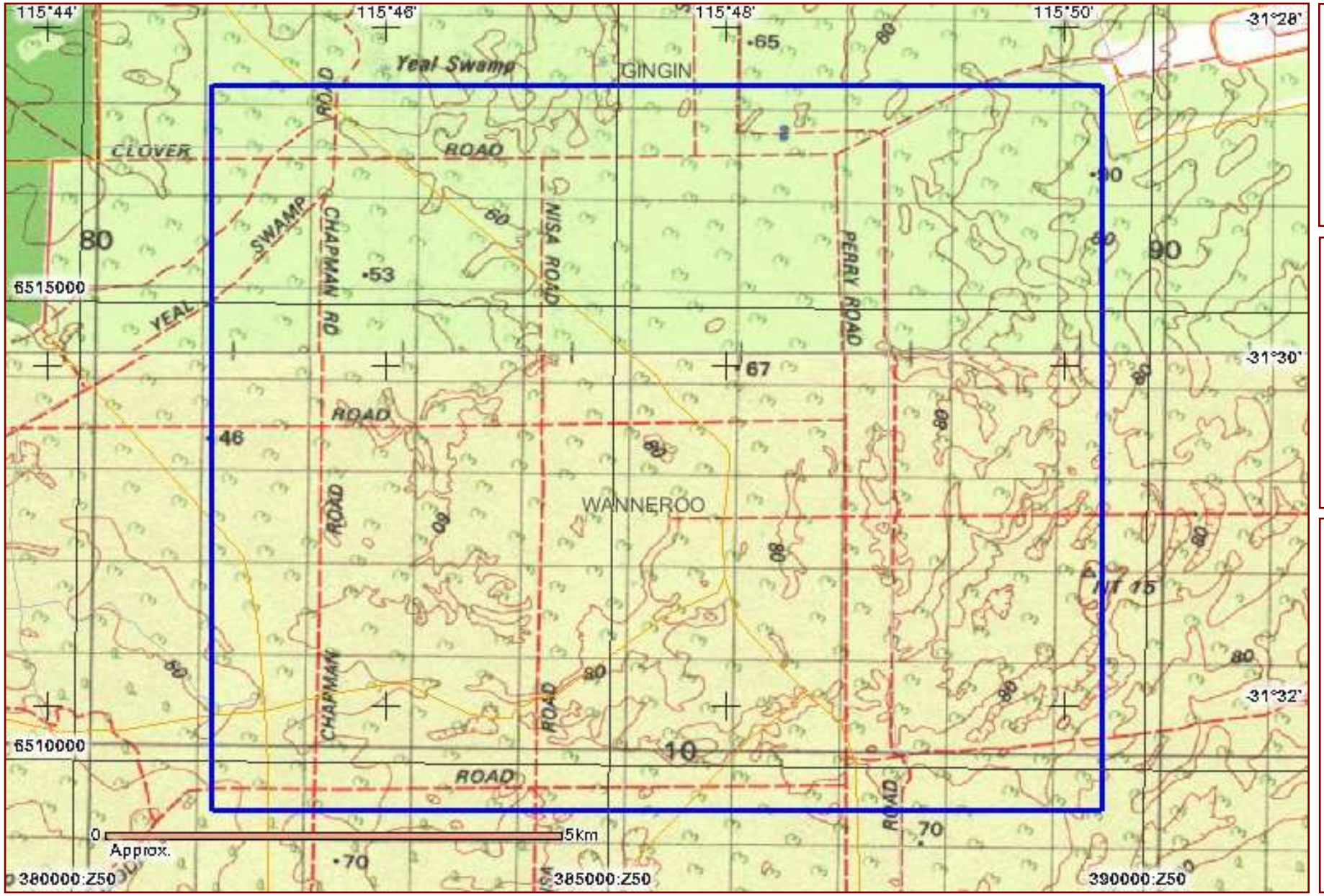
Search Area

List of Other Heritage Places with Map

No results

Aboriginal Heritage Inquiry System

Aboriginal Sites Database



Legend

Selected Heritage Sites

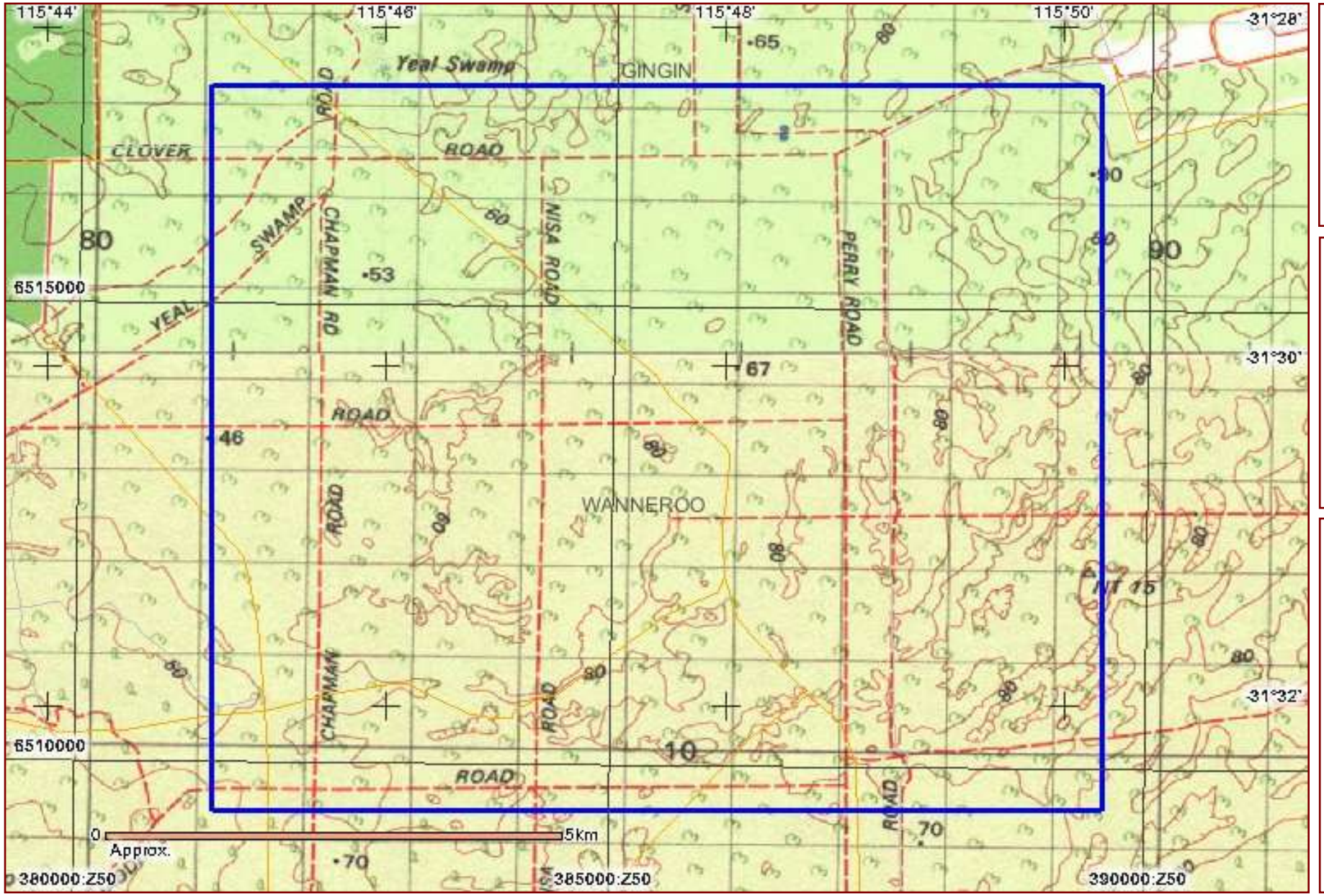
Other Heritage Places

Town

Map Area

Search Area

Map Showing Registered Aboriginal Sites and Other Heritage Places



Legend

Selected Heritage Sites

- Registered Sites
- Other Heritage Places
- Town
- Map Area
- Search Area

Search Criteria

4 sites in a search box. The box is formed by these diagonally opposed corner points:

MGA Zone 50	
Northing	Easting
6496445	379096
6507240	392904

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Legend

Restriction

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F	Female access

Access

C	Closed
O	Open
V	Vulnerable

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Status

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Information lodged, awaiting assessment	→	R - Registered Site I - Insufficient information S - Stored Data

Spatial Accuracy

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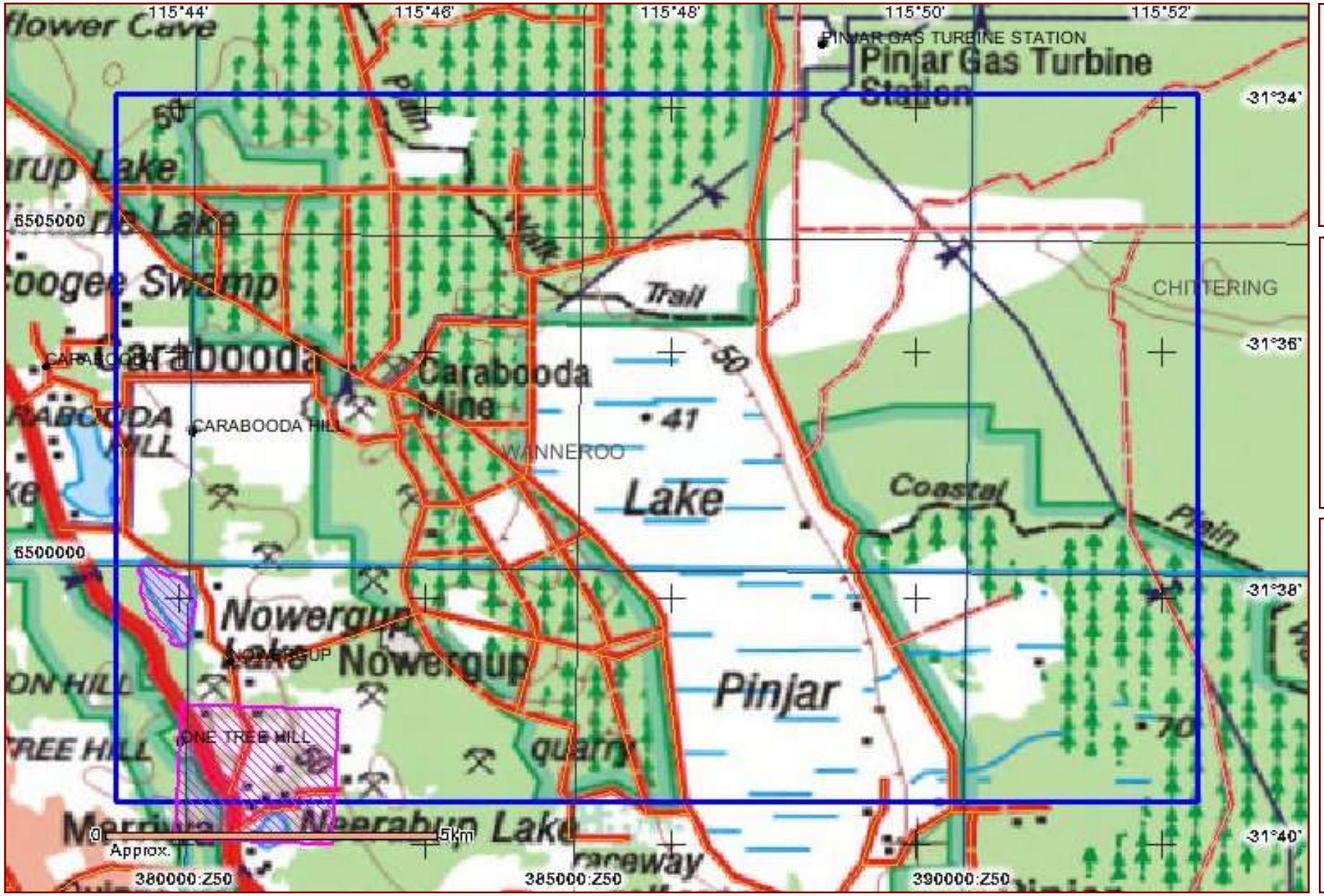
Sites Shown on Maps

Site boundaries may not appear on maps at low zoom levels

List of 2 Registered Aboriginal Sites with Map

Site ID	Status	Access	Restriction	Site Name	Site Type	Additional Info	Informants	Coordinates	Site No.
4404	R	C	N	Orchestra Shell Cave.	Engraving, Artefacts / Scatter	Archeological Deposit, [Other: PA 19, NE], [BP Dating: 6500BP to 1730BP]	*Registered Informant names available from DIA.	Not available for closed sites	S00051
17450	R	O	N	Nowergup Lake	Mythological		*Registered Informant names available from DIA.	379733mE 6499450mN Zone 50 [Reliable]	



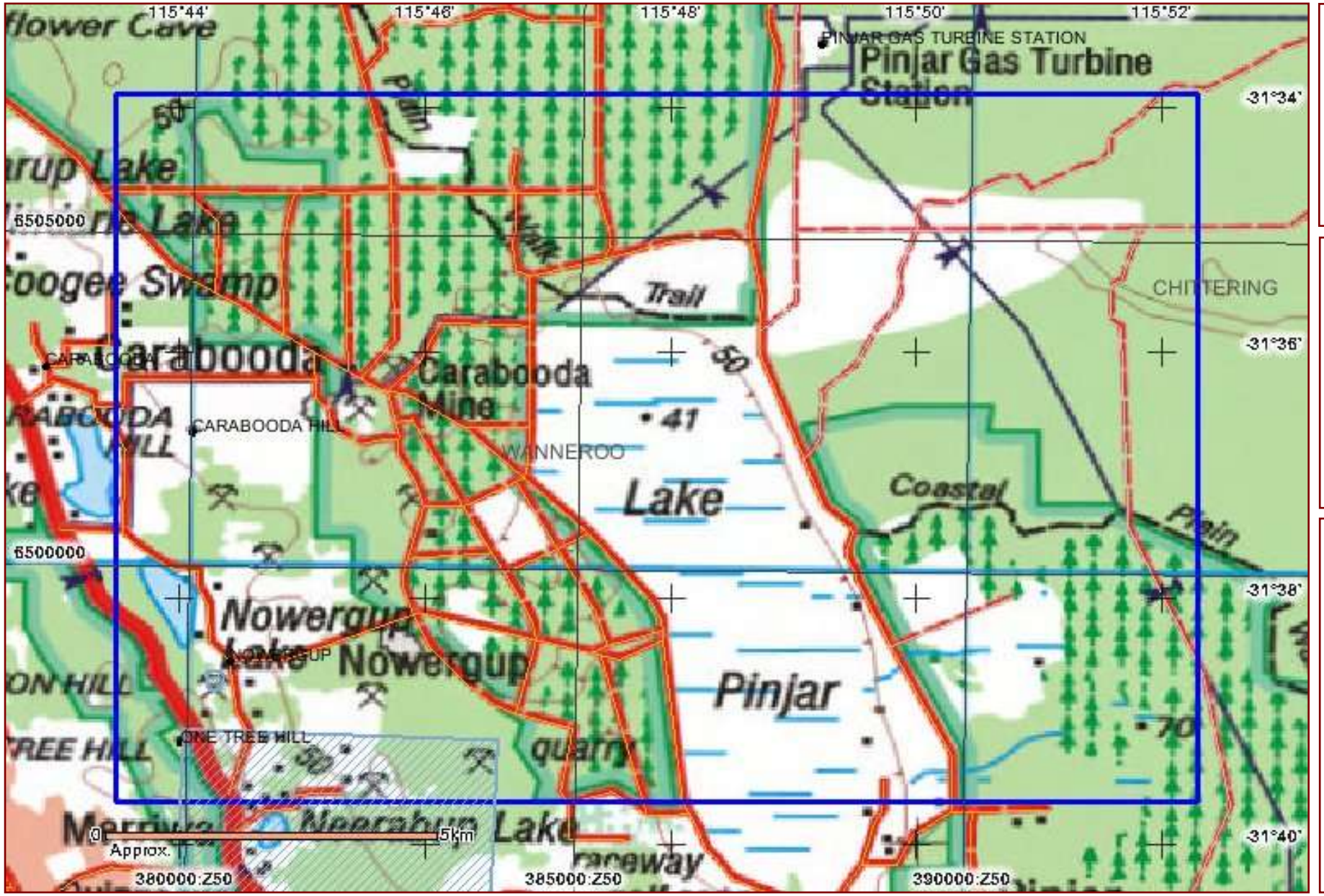
Legend

Selected Heritage Sites

- Registered Sites
- Town
- Map Area
- Search Area

List of 2 Other Heritage Places with Map

Site ID	Status	Access	Restriction	Site Name	Site Type	Additional Info	Informants	Coordinates	Site No.
3366	I	O	N	Dunstan'S Quarry.	Artefacts / Scatter	Camp		380352mE 6498281mN Zone 50 [Unreliable]	S00158
3693	I	C	N	Lake Neerabup.		Named Place	*Registered Informant names available from DIA.	Not available for closed sites	S02255



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Selected Heritage Sites

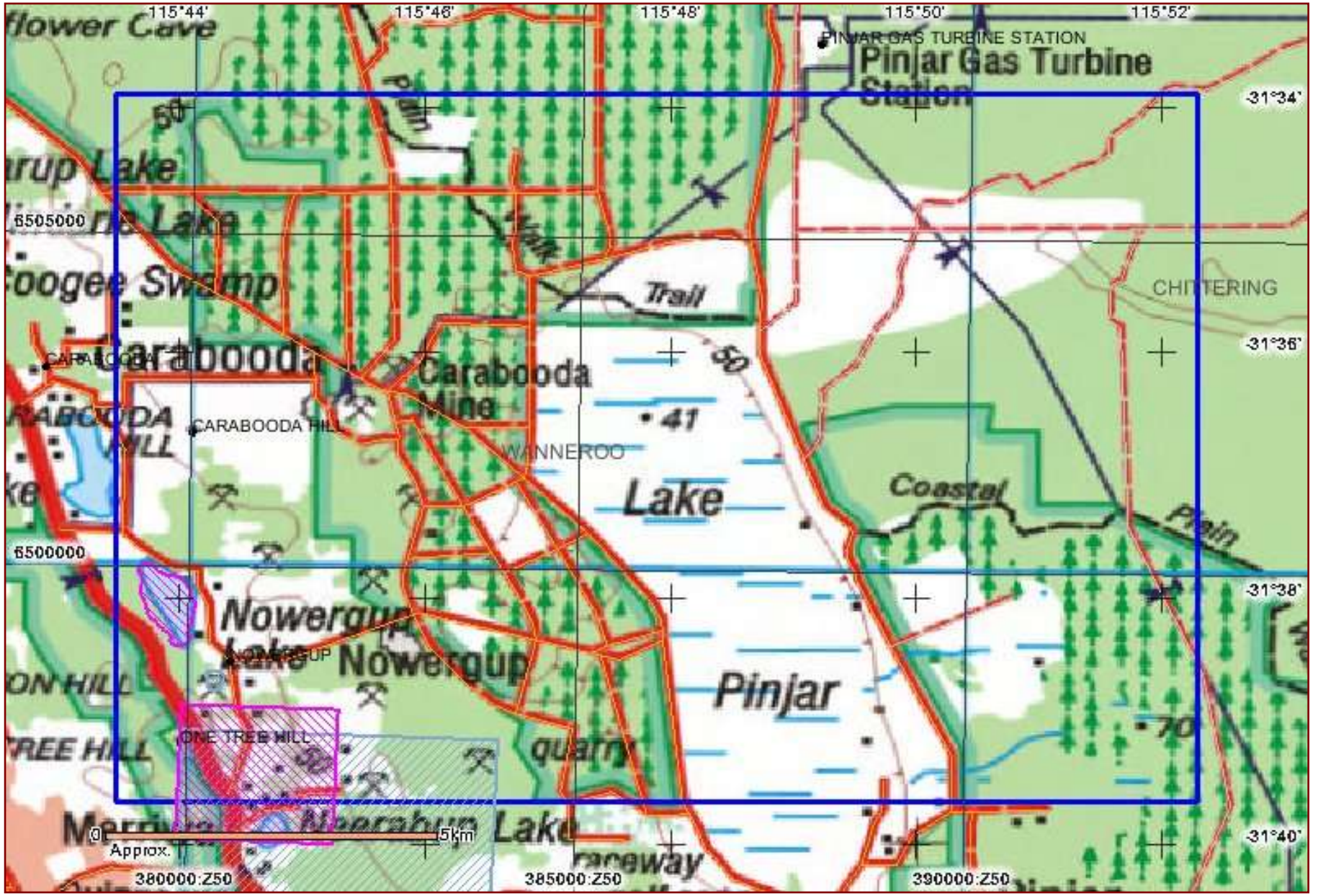
Other Heritage Places

Town

Map Area

Search Area

Map Showing Registered Aboriginal Sites and Other Heritage Places



Legend

Selected Heritage Sites

- Registered Sites
- Other Heritage Places
- Town
- Map Area
- Search Area

Aboriginal Heritage Inquiry System

Aboriginal Sites Database

Search Criteria

0 sites in a search box. The box is formed by these diagonally opposed corner points:

MGA Zone 50	
Northing	Easting
6483427	391990
6486704	393737

Disclaimer

Aboriginal sites exist that are not recorded on the Register of Aboriginal Sites, and some registered sites may no longer exist. Consultation with Aboriginal communities is on-going to identify additional sites. The AHA protects all Aboriginal sites in Western Australia whether or not they are registered.

Copyright

Legend

Restriction

N	No restriction
M	Male access only
F	Female access

Access

C	Closed
O	Open
V	Vulnerable

Coordinate Accuracy

Accuracy is shown as a code in brackets following the site coordinates.

[Reliable]	The spatial information recorded in the site file is deemed to be reliable, due to methods of capture.
[Unreliable]	The spatial information recorded in the site file is deemed to be unreliable due to errors of spatial data capture and/or quality of spatial information reported.

Status

L - Lodged		ACMC Decision Made
Information lodged, awaiting assessment	→	R - Registered Site I - Insufficient information S - Stored Data

Spatial Accuracy

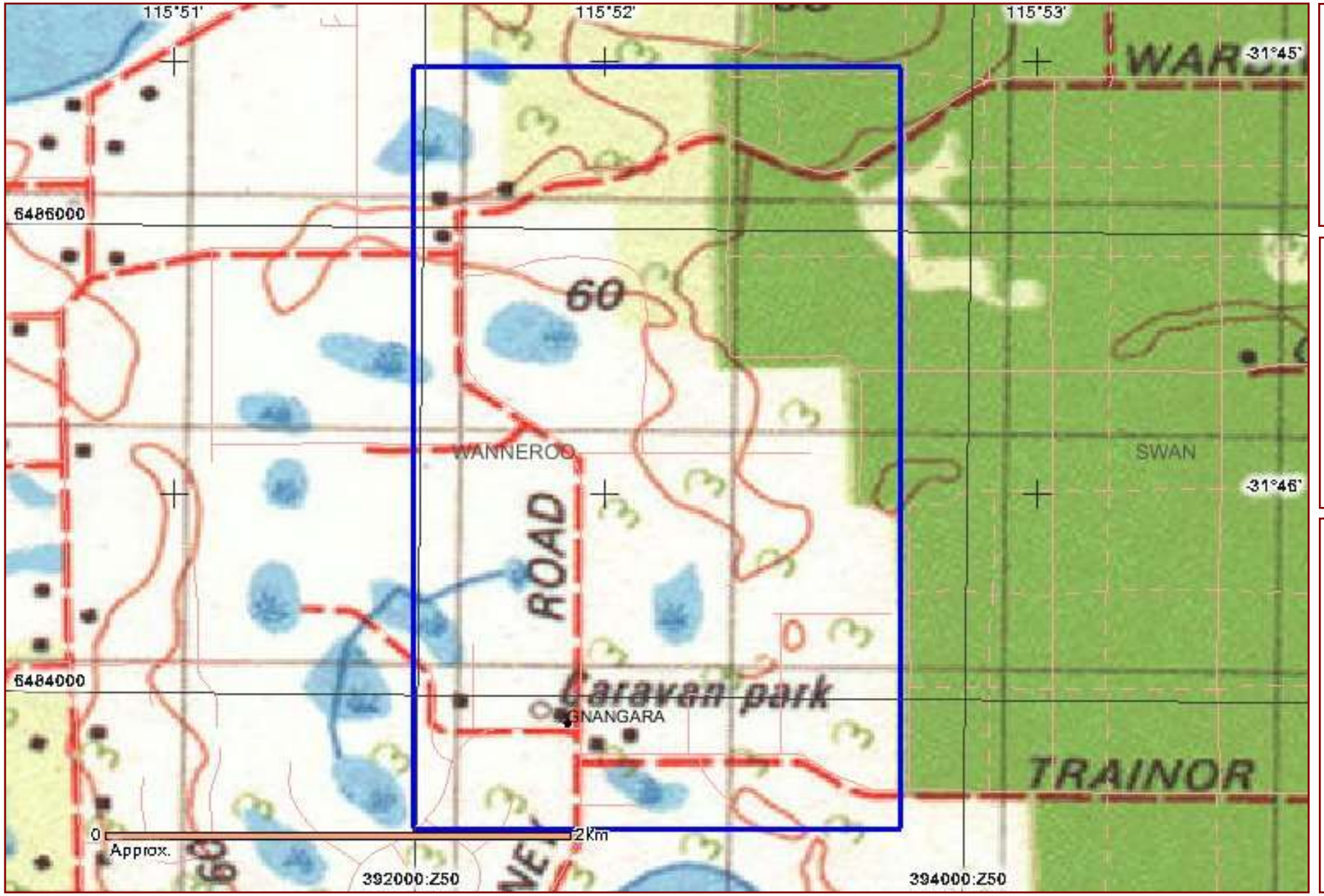
Index coordinates are indicative locations and may not necessarily represent the centre of sites, especially for sites with an access code “closed” or “vulnerable”. Map coordinates (Lat/Long) and (Easting/Northing) are based on the GDA 94 datum. The Easting / Northing map grid can be across one or more zones. The zone is indicated for each Easting on the map, i.e. '5000000:Z50' means Easting=5000000, Zone=50.

Sites Shown on Maps

Site boundaries may not appear on maps at low zoom levels

List of Registered Aboriginal Sites with Map

No results



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Selected Heritage Sites

Registered Sites

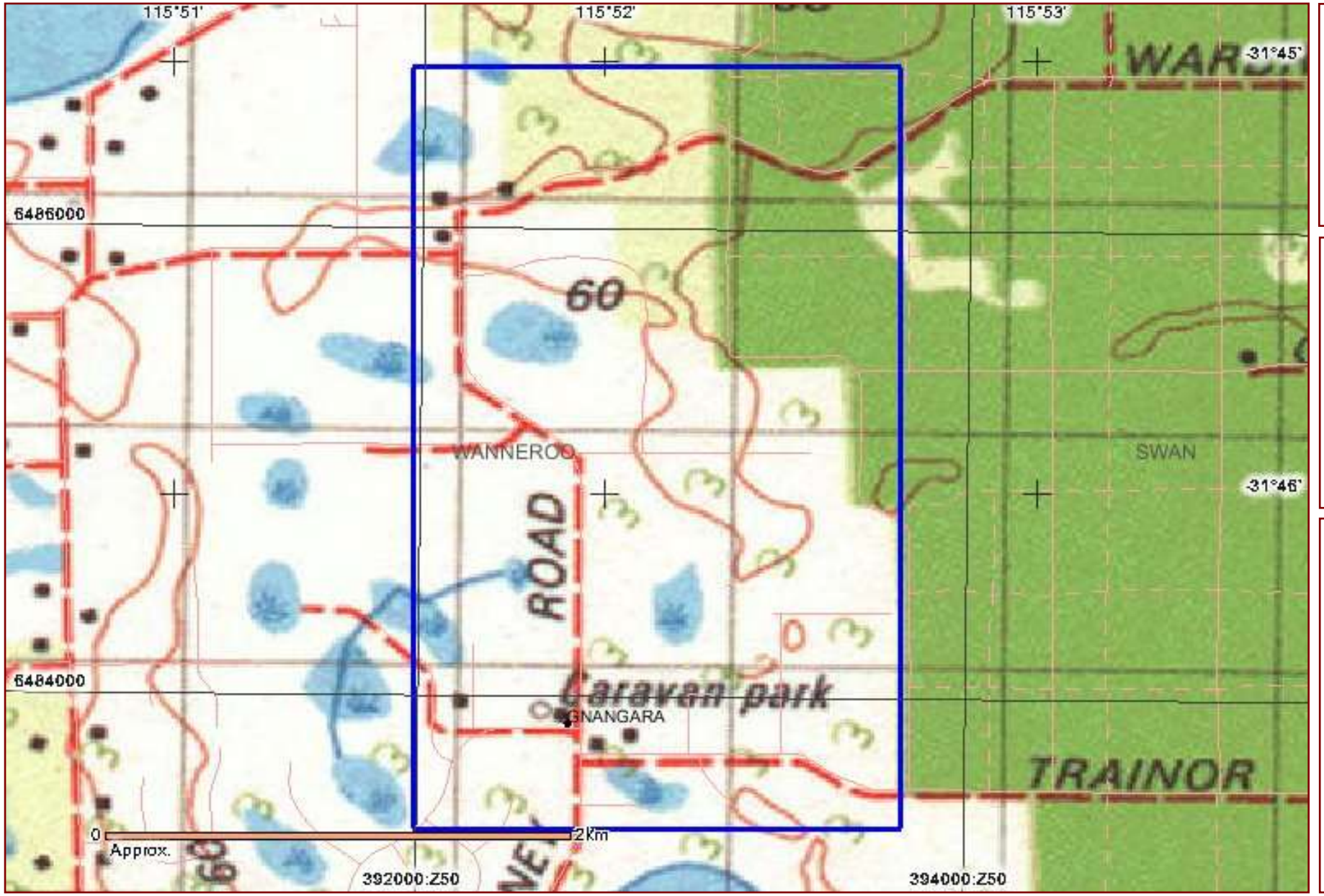
Town

Map Area

Search Area

List of Other Heritage Places with Map

No results



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Selected Heritage Sites

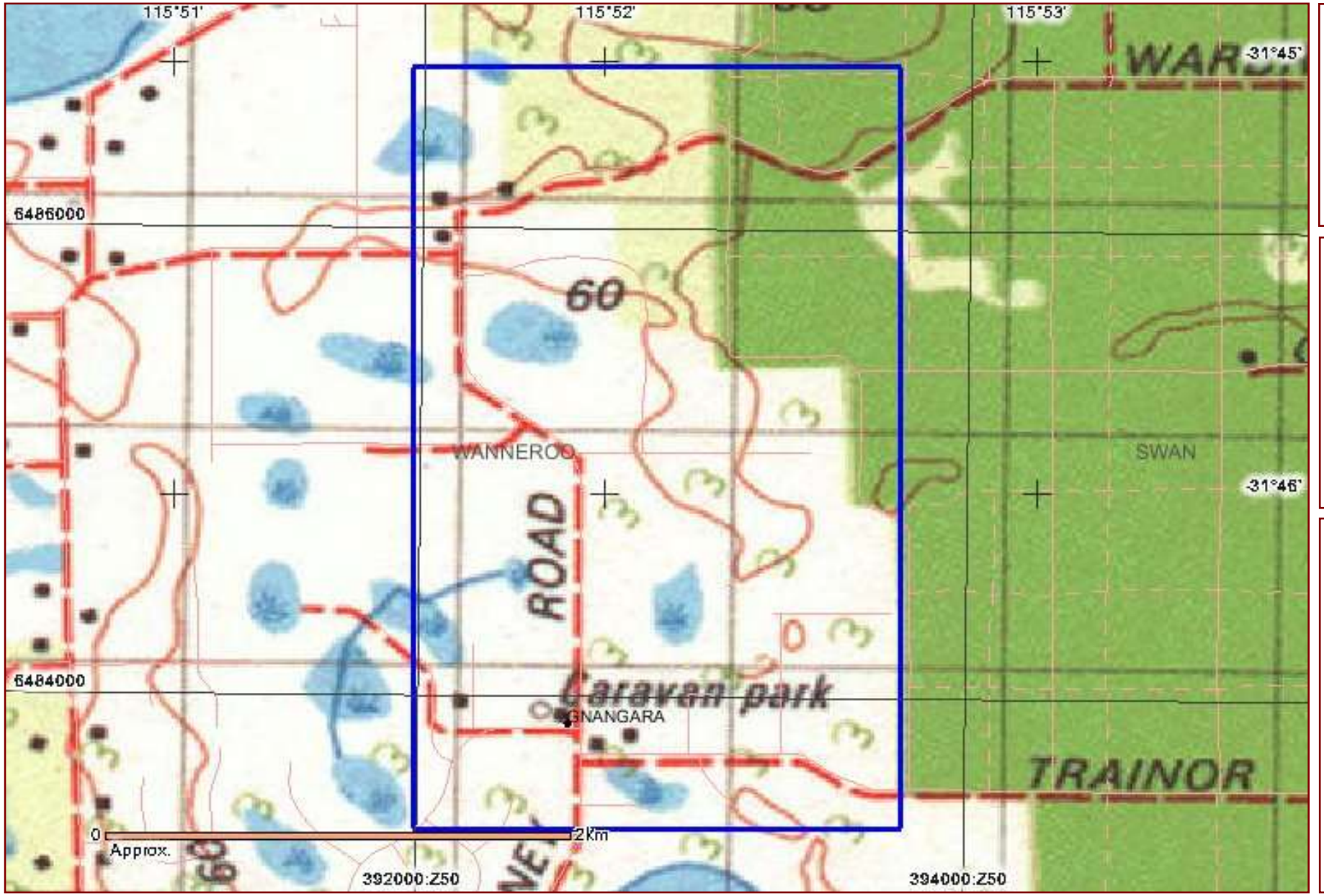
Other Heritage Places

Town

Map Area

Search Area

Map Showing Registered Aboriginal Sites and Other Heritage Places



Legend

Selected Heritage Sites

- Registered Sites
- Other Heritage Places
- Town
- Map Area
- Search Area

RPS

APPENDIX 4

Banksia Seed Farm Rocla Quarry Products

Banksia Seed Farm

1.0 INTRODUCTION

Rocla proposes to construct Western Australia's first production seed farm for Banksia species required for the company's restoration work on the Perth Swan Coastal Plain. The farms will be located as part of Rocla's new operations within this environmental assessment and will underpin bio-diverse restoration works Rocla is undertaking and at future sand operations in the Gnangara Pine Plantation.

The seed farms will leverage the $6 million that Rocla has expended in Banksia woodland restoration research in the past 20 years.

Considering the reduction of Banksia species, as a result of land clearing, seed will become short in supply. Where Banksia seed was once purchased by the kilogram, now seed is often sold per seed with costs up to $3 per seed making large scale restoration expensive and problematic. Banksia woodlands are progressively removed through urban development and climate change limits seed production. Combined with this, the removal of 20,000 hectares (ha) of the Gnangara Pine Plantation will have negative impact on the foraging and feeding capacity of Carnaby's Black Cockatoo.

Rocla's intention to develop seed farms will secure Banksia seed for long-term future use in the Gnangara Pine Plantation for restoration and post-mining works, and will be the first of its type in Australia to address native seed supply through the use of innovative native seed farming. Importantly, the farm will underpin seed security for restoration of Banksia species important to sustaining Carnaby's Black Cockatoo.

Preliminary cost calculations estimate the establishment of a 100 ha farm to be approximately $4 million, with ongoing management to cost approximately $1.5 million per year, with a total cost in the first five years of operation of $11.5 million.

2.0 BANKSIA – ORIGINS, DISTRIBUTION AND BIOLOGY

2.1 Origin

Banksias have evolved over the last 40 to 50 million years. There are about 76 species in Australia and nearby islands.

In 1770 Joseph Banks and Daniel Solander collected, classified and named the first Banksia on the east coast of Australia at Botany Bay. Approximately 21 years later the first Banksias from Western Australia were collected near Albany.

2.2 Distribution

The widest range of Banksia species (58) occurs in the south-west of Western Australia but there are 14 species restricted to the east coast and Tasmania. A few grow in the tropics of northern Australia, northern islands and parts of Papua New Guinea.

Banksias are mainly restricted to coastal areas with reasonable rain. However, there are several species which grow with little rain and are drought tolerant in desert areas. *Banksia elderiana* grows in the Great Victoria Desert as well as between Narembeen, Lake King and Peak Charles.

2.3 Biology

This evergreen woody perennial can be a large tree or a small prostrate shrub. New vegetative growth has a wide range of forms and colours compared to that of mature leaves.

The *Banksia* genus is part of the Protea-ceae family which includes *Grevillea, Adenanthos, Persoonia* and also the South African *Protea*.

Banksias have a specialised proteoid root system in the wild. The root system is highly branched and has large numbers of root hairs. The large surface area of the roots improves the efficiency of nutrient absorption in infertile soils. Under more fertile conditions the roots may lose their proteoid nature.

The flower and fruit (nut) are of interest. The inflorescence has a woody axis running up the centre and there are often thousands of individual flowers spiraling over the spike.

Banksia seeds develop from the remnant bracts and the woody follicles (seed valves) produced by the fertilised ovary. Only a few of the thousands of flowers produce seed.

2.4 Banksia Seed Requirements

Three years ago Rocla began investigating the viability of a Banksia seed production farm to facilitate our restoration at mine sites as native seed became more difficult to source in the future.

There has been a rapid reduction in Banksia woodland surrounding the Perth Metropolitan Region as urban development continues to clear bushland. Due to this the availability of Banksia seed harvested in Western Australia is declining.

Requirements for bushland restoration and requirements for creating foraging habitat for Carnaby's Black Cockatoo (a commonwealth protected species) are becoming a legislative and regulatory requirement on all urban development and mining projects within the Perth Metropolitan Region.

Additionally, there are significant environmental issues confronting the community in Perth along the Swan Coastal Plain, including the requirement to revegetate 12,000 ha of pine plantation back to Banksia woodland and providing foraging habitat for Carnaby's Black Cockatoo. This restoration project requires 120 tonne of Banksia seed at a cost of $60 – $80 million. The 12,000 ha of Pines are being removed to protect the Gnangara Water Mound, which has been severely affected by draw from human consumption and the pine plantations. By removing the pines it is anticipated that the water table will rise due to increased infiltration from future rainfall.

Unfortunately, due to the reasons outlined above, there is currently not enough seed on the Swan Coastal Plain to complete this project. The State Government Agency – Department of Environment and Conservation are currently considering ways to address this problem which could cost at least $500 million to fully restore the Gnangara Pine Plantation to native Banksia woodland.

In the past 3 years the cost of Banksia seed used for rehabilitation has increased by over 100% and it is anticipated this trend will continue into the future as supply cannot meet demand because of the reductions in available Banksia woodland for seed collection.

2.5 Rocla's Current Expertise in Banksia Woodland Restoration

Rocla has been committed to sustainable development and restoration of Banksia woodlands; Rocla along with Botanic Gardens and Parks Authority (BGPA) were recognised for the development of rehabilitation techniques for the successful restoration of the biodiverse Banksia woodland at Rocla's sand quarries.

This recognition resulted in Rocla and BGPA being awarded the states most prestigious environmental award "The Golden Gecko" in 2008.

Rocla has invested many years of work in this project and the main benefit is the marked improvements in the survival rates of species. Rocla are continuing to find different techniques to gain a greater variety of species survival.

The 20 year long research program has resulted in techniques for increasing germination and seedling establishment including smoke application, seed coatings and best practice for topsoil management.

With little knowledge at the onset of the project on how to restore Banksia woodland, which is an iconic plant community to the Perth area, Rocla and BGPA began investigating how the Banksia woodland ecosystem operates, together with restoration principles.

The first year returned very little success in terms of returning plants to site, with only one or two species represented in post-restoration sites out of a potential 150-200 species that typically occur in a Banksia woodland.

Rocla began a research program to look at the topsoil seed bank; the topsoil is an important source of returning plants to a post-mine restoration site.

At the time, there was little understanding about the Banksia woodland seed bank, so that was the first step in the research program. Rocla had to gain an understanding as to what was in that seed bank and how the seeds were distributed through the seed bank to gain benchmark data on species return.

The research program also investigated if there were seeds in the topsoil seed bank, then what sort of restoration principles were needed to improve seedling recruitment and, ultimately, plant survival.

Within Rocla's first restoration site, there were two species represented out of a potential 150-200 species and plant numbers were quite low with about one plant per five square metres. Now, restoration activities are returning more than 100 species to sites.

Rocla is now using these findings when planning mining operations in order to improve rehabilitation success and the seed farm is an important requirement for the future.

3.0 BANKSIA SPECIES AND VARIETIES

The two key species required for seed, and those that are likely to be in short supply for Rocla's restoration projects in the near future, are *Banksia attenuata* and *Banksia menziesii*. These are key foraging species for Carnaby's Black Cockatoo. Other species will also be required and will be planted for seed as required.

3.1 *Banksia menziesii* (Firewood Banksia)

B.menziesii originates from areas between the Murchison River and Pinjarra. It prefers deep sands and can grown into a tree up to 10 m tall.

There is of range of colours available, from yellow to red, and flowers are 10-12 cm long by 7-8 cm wide. This species has a lignotuber.

3.2 *Banksia attenuata* (Candle Banksia)

B.attenuata is found from Fitzgerald River to Kalbarri in Western Australia. It has mainly been bush-picked, with only a few cultivated plants. It grows from 2 to 10 m in height.

The slender cylindrical flowers are an intense sulphur yellow and are 5 to 26 cm in length and up to 5cm in diameter.

4.0 BANKSIA ESTABLISHMENT

Banksias grow well in deep, well-drained, slightly acidic sand, sometimes overlying limestone or gravel lenses. Highly alkaline soils are best avoided for most species. Site selection for successful Banksia seed production is therefore important.

The following criteria need to be addressed before considering a Banksia farm.

4.1 Identifying suitable soil types

Banksias will grow on a variety of soil types from sands to sands over clay.

Sandy soils from deep white-grey sands to the yellow sands found in the Gnangara Pine Plantations are suitable. Land that becomes waterlogged in winter is not suitable and therefore will not be considered.

4.2 Site Security

As the farm will be part of the sand extraction operations, security of the site will be part of the operational footprint.

4.3 Weed identification and control strategies

The weed burden in harvested pine plantation locations is significant, and will need to be brought under control prior to planting.

Therefore weed control must start well before planting, especially for broad-leaf weed infestations. The same applies to sorrel, capeweed and oxalis. Flat weeds such as wild turnip and doublegee cannot be controlled in a single year. However, their effect on new plantings can be greatly reduced.

Weed control options available once the crop is established are:

- Careful applications of knockdown herbicides, targeted only at the weeds;
- Hand weeding around the plants or in-row mulching.

4.4 Planting densities and planting design

No research has been conducted to determine the optimum planting design for Banksia species. It is anticipated that single rows will be planted, with species in each section of the farm grouped together.

Determining factors will be:

- Species size at maturity;
- Irrigation or non irrigation production;
- Mechanical harvesting;
- Topography; and
- Vehicle access.

4.5 Plant bed preparation

Preparation of the plant bed will be required.

The following points need to occur:

- Cultivation of the plant beds;
- Non cultivation of inter rows;
- Ripping;
- Mounding;
- Mulching; and
- Windbreaks.

5.0 PRUNING BANKSIA

Pruning will be a management practice used for cultural improvement and productivity.

6.0 IRRIGATION OF BANKSIA

Many Banksia species in the wild are able to utilise surface soil moisture and groundwater at depth. They utilise surface water when it rains and they also develop extensive tap roots that can extract water from up to 7 m to survive summer dry spells.

On the deep Bassendean sands located within the Gnangara Pine Plantation, where Rocla's future mining and seed farms will operate, Banksias will require irrigation, particularly if there has not been adequate rain to affect recharge of the water aquifer.

Although Banksias can tolerate low levels of water supply of prolonged drying periods, this will compromise the seed production. Therefore, Rocla will utilise existing approved water licences or apply to the Department of Water for additional licences to enable irrigation of the farm to occur.

7.0 FERTILISERS FOR BANKSIA PRODUCTION

Although there is limited information on the fertiliser requirements, Banksias appear to respond well to balanced fertilisers applied at moderate rates from research completed by Rocla and BGPA. Having a suitable fertiliser program could be critical to producing plentiful seed production.

8.0 DISEASES

Banksias are subject to a number of diseases including Phytophthora or Dieback. Many of these diseases can be controlled through good management practices and use of pesticides.

To minimise the risk of introducing or spreading diseases, disease free plants will be secured and quarantine measures implemented. These include fencing the site and using foot and vehicle wash down areas. In addition, soil movement will be prevented from surrounding areas into the site.

The use of lime to a depth of 10 cm on roadways is also thought to be an effective control, as many organisms cannot survive in the raised pH environment. Rocla intends to use best practice to minimise risk to the seed farm.

Plants showing early disease symptoms will be treated with appropriate fungicides.

9.0 GNANGARA WATER MOUND

Most of Rocla's proposed sand extraction operations are located on the Gnangara Water Mound, which supplies critical water to the city of Perth. The majority of the mound is comprised of Priority 1 or Priority 2 water resource areas.

Rocla has identified four suitable locations, one within each of the Mining Tenements (M70/1306, E70/3275, E70/3275 and E70/3279) where the seed farms will be located (refer to Attachments 1-5). These identified locations are not within the Priority water source areas and as a result should not affect the integrity of the mound.

10.0 SITE LOCATIONS

The intention is to create a seed farm approximately 100 ha in size across the four sand extraction operations (M70/1306, E70/3275, E70/3275 and E70/3279). Each will be in close proximity to sand extraction operations for security purposes and to minimise overhead costs. The intention is for these farms to be located off the Gnangara Water Mound.

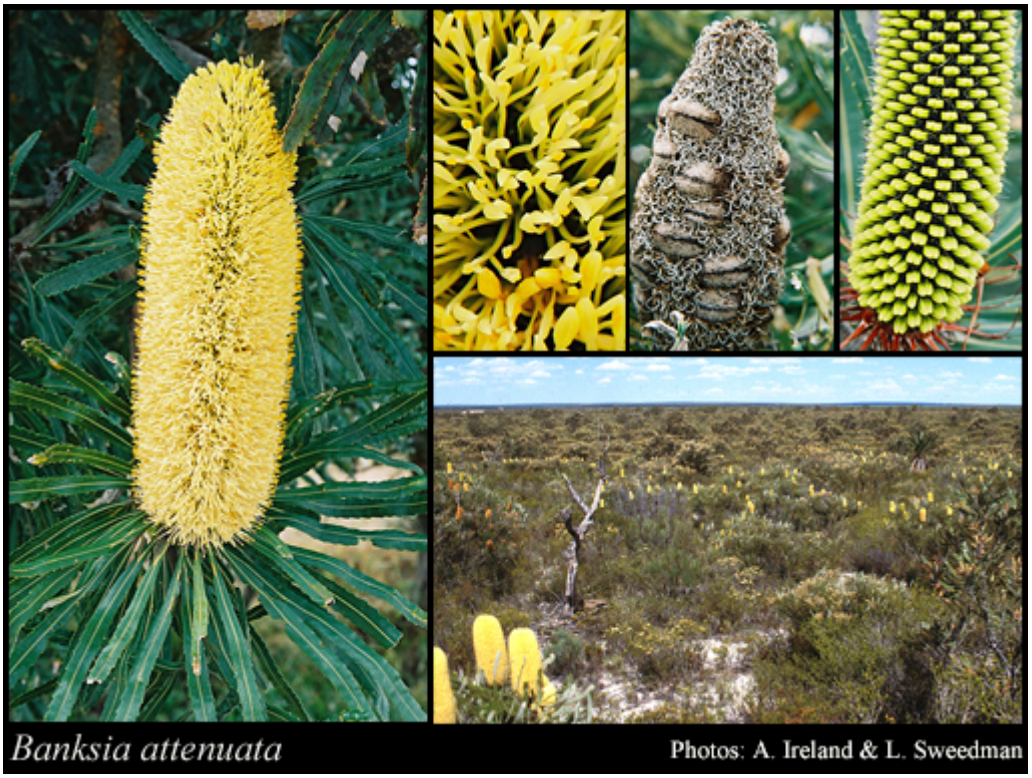
11.0 PHOTOS

11.1 Banksia Woodland

Banksia woodland plant communities are among the most biodiverse woodland types in Australia.

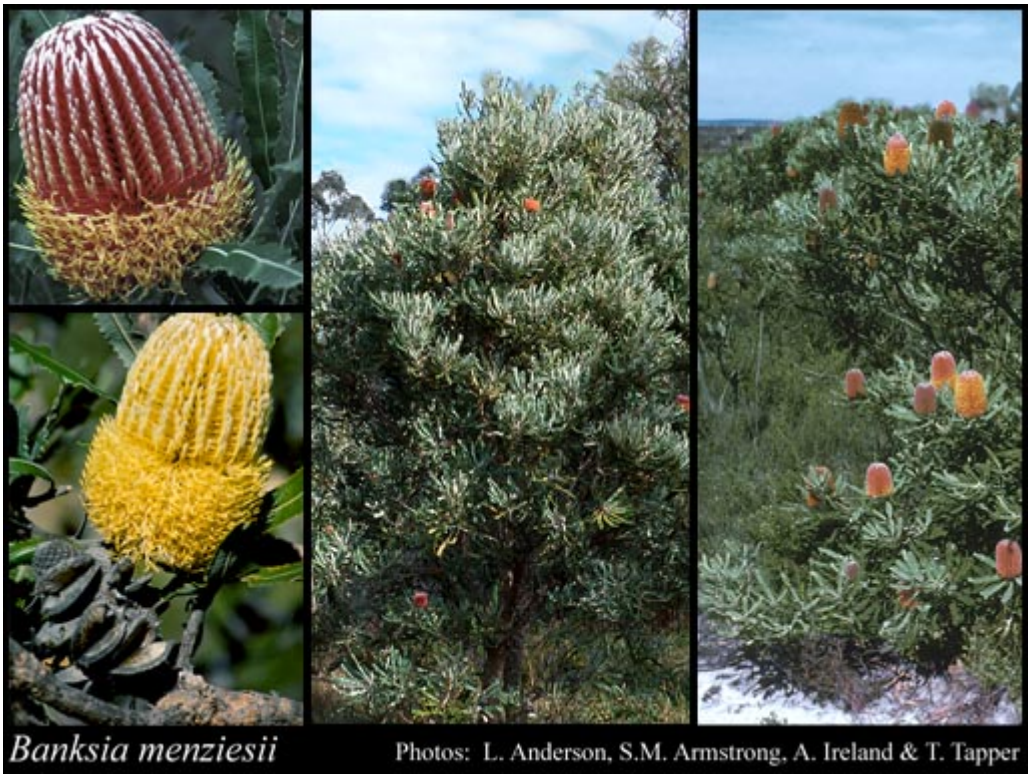
The woodlands have developed on deeply weathered and leached sands that form the basis of major sand extraction for silica products and building sands.

11.2 *Banksia attenuata*



(Photo source: Florabase, 2012)

11.3 *Banksia menziesii*



(Photo source: Florabase, 2012)

12.0 REFERENCES

The Banksia Production Manual, Department of Agriculture and Food, Bulletin No. 4710, ISSN:1833-7236 April 2007

Protection Area P1
Protection Area P2
Protection Area P3
State Forest 65
Tenements
Supplied: 7th November, 2012

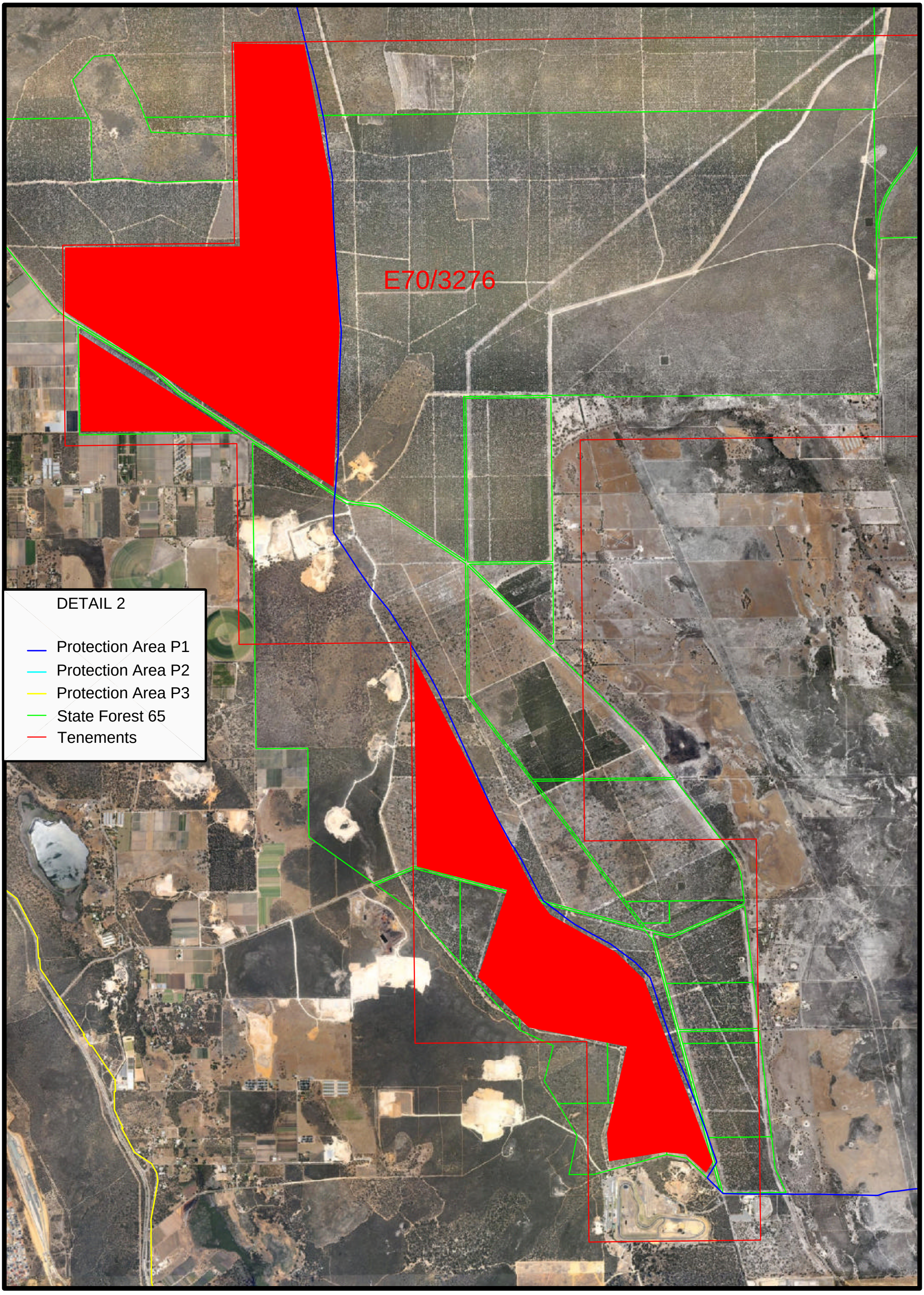
E70/3279
E70/3275
E70/3276
M70/1306
4
3
2
1

P70/975

P70/974

DETAIL 1

- Protection Area P1
- Protection Area P2
- Protection Area P3
- State Forest 65
- Tenements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Protection Area P2
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State Forest 65
Tenements


E70/3275
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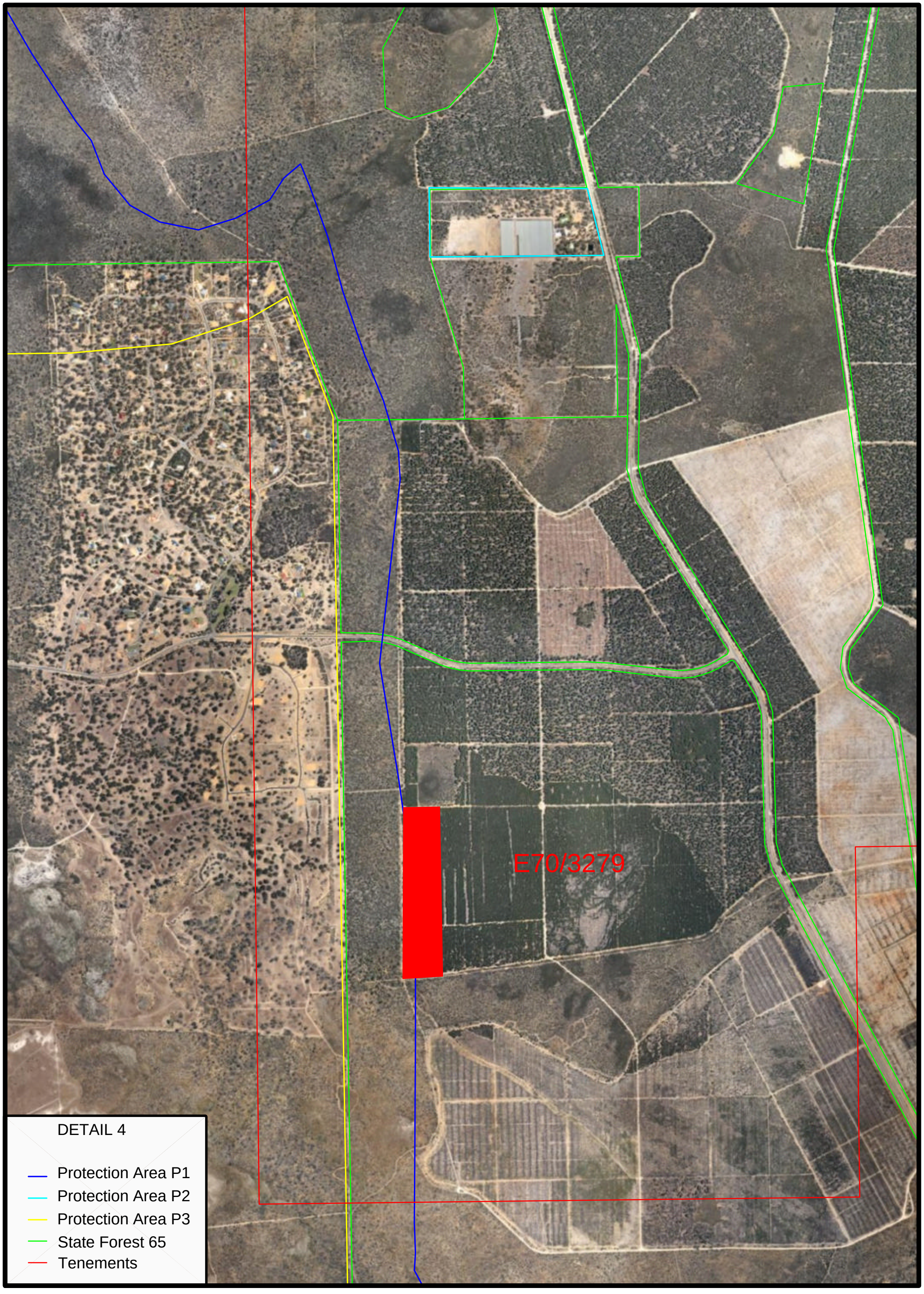
Protection Area P2
Protection Area P3
State Forest 65
Tenements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State Forest 65
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