



OAKAJEE PORT & RAIL



OPR Quarry and Port Services Road– Native Vegetation Clearing Permit Supporting Report

March 2011



4.7	PRINCIPLE 7	29
4.8	PRINCIPLE 8	29
4.9	PRINCIPLE 9	30
4.10	PRINCIPLE 10	30
5	ENVIRONMENTAL MANAGEMENT	31
5.1	CLEARING STRATEGY	31
5.1.1	Objectives	31
5.1.2	Management Procedure	31
5.2	SURFACE WATER AND GROUNDWATER	31
5.2.1	Objectives	31
5.2.2	Management Procedure	32
5.3	FLORA AND VEGETATION	32
5.3.1	Objectives	32
5.3.2	Management Procedures	32
5.4	FAUNA	33
5.4.1	Objectives	33
5.4.2	Management Procedures	33
5.5	REHABILITATION	33
5.5.1	Objectives	33
5.5.2	Management Procedures	34
6	CONCLUSION	35
7	REFERENCES	36

FIGURES

Figure 1	Proposed NVCP Application Overview Map	3
Figure 2	Proposed NVCP Application Area	4
Figure 3	Beard and Burns (1976) Regional Vegetation Mapping	7
Figure 4	Vegetation Associations mapped by <i>ecologia</i> (2010)	8
Figure 5	Priority Flora	11
Figure 6	Nature Reserves	12
Figure 7	Floodway (River) Crossing 1 – General Arrangement (DGA 0001 B)	15
Figure 8	Floodway (River) Crossing 2 – General Arrangement (DGA 0002 B)	16
Figure 9	Floodway Crossing Details (DDR 0001 B)	17
Figure 10	Floodway Crossing Details (DDR 0003 B)	18

TABLES

Table 1	Vegetation Condition Scale (Keighery, 1994)	6
Table 2	Area of Beard and Burns (1976) vegetation units to be cleared within the NVCP area compared against the extent within the Geraldton Sandplains Bioregion	20
Table 3	Proposed Impact to <i>ecologia</i> (2010) Vegetation Associations	23

PHOTOGRAPHS

Photograph 1	Vegetation Condition at River crossing 1 (<i>ecologia</i> 2010b)	28
Photograph 2	Vegetation Condition at River crossing 2 (<i>ecologia</i> 2010b)	28

1 INTRODUCTION

1.1 PURPOSE OF THIS DOCUMENT

The purpose of this document is to provide the Department of Environment and Conservation (DEC) with details of:

- proposed clearing activities to be located within the Oakajee Industrial Estate (OIE) buffer for the development of a quarry, Port Services Road and supporting infrastructure (for example, laydown areas, access roads, visual screening bunds), to allow development and operation of the proposed quarry.
- the existing environmental values of the locality;
- management actions to be implemented by Oakajee Port and Rail Pty Ltd (OPR) to ensure significant environmental values are managed appropriately and impacts are minimised or avoided; and
- assessment of the proposed clearing against the 10 Clearing Principles as defined in Schedule 5 of the *Environmental Protection Act 1986* (EP Act).

1.2 BACKGROUND AND SCOPE

OPR proposes to construct a quarry that will provide source materials, via a Port Services Road, to develop the breakwater for a new deepwater port, approved under Ministerial Statement 469 (MS469). The Oakajee Deepwater Port (ODP) has been the subject of an Environmental Impact Assessment (EIA) process, approved via MS469 in February 1998.

The proposed clearing activities will be located within the OIE buffer for the development of a quarry and a Port Services Road, which will provide access between the deepwater port and the proposed quarry. Clearing will be required for the development of supporting infrastructure, for example, laydown areas, access roads, visual screening bunds. A total of approximately 4.5 ha of mostly degraded native vegetation, and a number of paddock trees / paddock vegetation will be cleared within a total NVCP application area of approximately 455 ha (**Figure 2**).

OPR is also proposing a Terrestrial Port materials handling facility, which will be located adjacent to the ODP. The Terrestrial Port facilities will be linked to iron ore mine sites, located east of Geraldton, via an open-access railway. The Rail and Terrestrial Port proposals have been referred to the Environmental Protection Authority (EPA) and are currently the subject of separate, but parallel, Public Environmental Review (PER) processes.

The quarry and supporting infrastructure (Port Services Road, laydown areas, visual bunds etc) are integral to the port works, and are not considered within or related to the Terrestrial Port or Rail proposals (currently under Part IV of the EP Act assessment). This NVCP application is for the development of a quarry (and ancillary infrastructure) to obtain materials to construct the already approved Oakajee deepwater port (MS469) and a Port Services Road, which will be used to transport materials from the quarry to the port.

The EPA has previously assessed two proponent referrals for a hard rock quarry (1.65 million tonnes (MT)), referred on 9th December 1997) and a limestone quarry (2 MT, referred on 22 September 1997), which were assessed via an 'informal review with public advice'. The two quarries were to be located within more vegetated areas, in close proximity to the Port Services Road and quarry location outlined within this application and included a northern haul road alignment to provide access between the quarry(s) and Terrestrial Port. The northern haul road described in the previous referrals crossed the Oakajee River at two locations, that is, one crossing near the northern branch



OAKAJEE QUARRY AND PORT SERVICES ROAD NVCP

of the Oakajee River and one crossing near the Terrestrial Port area as described within MS469. Similarly, the Port Services Road outlined in this application, which will service the quarry and the Terrestrial Port, will cross the Oakajee River in two locations (**Figure 1**).

The previous proposal for a hard rock quarry (1.65 MT) would involve clearing of up to 5 ha of scattered patches of vegetation, which would include a small portion of fringe vegetation at the river crossing (Welker Environmental Consultancy, 1997). The proposed limestone quarry (2MT) would require removal of sparse vegetation over an area of up to 40 ha (Welker Environmental Consultancy, 1997b). The EPA concluded potential environmental impacts from each of the previously referred quarries could be adequately managed through alternative approval processes not related to Part IV of the EP Act.

Unlike the two previously referred quarry applications, this NVCP application area will be located on predominantly cleared agricultural land and therefore will have minimal disturbance to native and remnant vegetation and avoids impacts to matters of national environmental significance (NES).

2 EXISTING ENVIRONMENT

2.1 VEGETATION

Although the quarry and Port Services Road are not related to or contained within the Terrestrial Port Proposal (or Rail Proposal), flora and vegetation surveys conducted as part of the Terrestrial Port PER (both regional and subregional) covers the area subject to this NVCP application. As such, the Terrestrial Port flora and vegetation survey results are applicable for the purpose of this NVCP application. The extent of the Terrestrial Port survey area is depicted in **Figure 1** and **Figure 2**.

2.1.1 Regional Vegetation Units

A systematic survey of native vegetation was undertaken in the 1970s, which described vegetation systems in Western Australia. The Geraldton area was mapped at 1:250,000 scale by Beard and Burns (1976), with the dataset being converted to a digital form by Department of Agriculture and Food Western Australia (DAFWA) (2006). This vegetation unit dataset has been used to determine the significance of vegetation at the Geraldton Sandplains Bioregion (regional) scale and to support the more detailed information available at the subregional level. The NVCP application area lies within an area of coastal vegetation known as the Greenough System.

The Greenough vegetation system is characterised by a coastal limestone belt extending from Kalbarri to Dongara. The limestone belt varies in width, elevation and in topography. The limestone belt forms several extensive, shore-parallel ridges along the entire length of the coast in the region and outcrops at the coast as tall sea cliffs north of Oakajee near Horrocks Beach. It includes abrupt rocky ridges, more gentle soil-covered areas, alluvial flats and lagoons. On the seaward side, the limestone is covered with a mantle of recent, poorly consolidated or still mobile dune sands (Beard and Burns, 1976).

Three main Beard and Burns (1976) regional vegetation types were mapped within the NVCP application area (**Figure 3**):

- Jam scrub (*Acacia acuminata*) with York Gum (*Eucalyptus loxophleba*) (Vegetation Unit 35);
- *Banksia* woodland and Acacia scrub (Vegetation Unit 359); and
- *Acacia ligulata* open shrub (Vegetation Unit 440).

The south western most point of the Port Services Road encroaches on Beard vegetation type 129 (Sparsely vegetated drift sand) as outlined in **Figure 3**; however, aerial photography indicates that there is no vegetation present in this location. In addition, at a local scale this area has been mapped as disturbed agricultural land (*ecologia*, 2010). As such, vegetation unit 129 is not discussed further within this NVCP application.

Two of the units mapped in the NVCP application area; 35 and 359, have been identified as vulnerable, that is, having greater than 10% but less than 30% of their pre-European extents remaining within the Bioregion (EPA, 2000 and WAPC, 2010).

2.1.2 Subregional Vegetation Associations

The NVCP application area is located within the OIE buffer, which was surveyed by *ecologia* Environment (*ecologia*) for conservation significant flora and vegetation as part of the Terrestrial Port PER. Vegetation condition was assessed using the scale produced by Keighery (1994) as outlined in **Table 1** below.

Table 1 Vegetation Condition Scale (Keighery, 1994)

Condition Scale	Characteristics
Pristine (1)	Pristine or nearly so, with no obvious signs of disturbance.
Excellent (2)	Vegetation structure intact, disturbance affecting individual species and weeds are non-aggressive species.
Very Good (3)	Vegetation structure altered; obvious signs of disturbance. For example; disturbance to vegetation structure caused by repeated fires, the presence of some more aggressive weeds, dieback, logging and grazing.
Good (4)	Vegetation structure significantly altered by very obvious signs of multiple disturbances. Retains basic vegetation structure or ability to regenerate it. For example; disturbance to vegetation structure caused by very frequent fires, the presence of some very aggressive weeds at high density, partial clearing, dieback and grazing.
Degraded (5)	Basic vegetation structure severely impacted by disturbance. Scope for some regeneration but not to a state approaching good condition without intensive management. For example; disturbance to vegetation structure caused by very frequent fires, the presence of very aggressive weeds, partial clearing, dieback and grazing.
Completely Degraded	The structure of the vegetation is no longer intact and the area is completely or almost completely without native species. These areas are often described as "parkland cleared" with the flora comprising weed or crop species with isolated native trees or shrubs.

In addition to the *ecologia* (2010) survey, the Geraldton Vegetation and Flora Survey (GRFVS) (WAPC, 2010) provides vegetation mapping over an area of 40,737 ha surrounding Geraldton, which also covers the area subject to this NVCP application. The survey area extended from Coronation Beach Road in the north, to Devlin Pool in the south and east to the foothills of the Moresby Range focusing on that area experiencing the most development pressure in the Geraldton Region. The resultant mapping was conducted at a similar scale to the 4743 ha survey area mapped by *ecologia* (2010) for the wider Terrestrial Port Proposal.

The boundaries of vegetation associations mapped by the GRFVS and by *ecologia* (2010) are relatively consistent. However, due to the higher scale of resolution of vegetation mapping completed by *ecologia* (2010), some associations identified within the GRFVS correlate to more than one association identified by *ecologia* (2010). In particular, *ecologia* (2010) vegetation associations 3, 4, 5, 11, 12 and 13 were determined to be related to either one or both of the GRFVS associations 10 and 12. For the purpose of impact assessment within this NVCP application and the Terrestrial Port PER, these six *ecologia* (2010) associations were combined and treated as one, whilst GRFVS associations 10 and 12 were combined to form a corresponding GRFVS association.

ecologia (2010) determined the following, concerning vegetation within the NVCP application area:

- No Threatened Ecological Communities (TECs) or Priority Ecological Community (PECs) occur in the NVCP application area.
- Four native vegetation associations have been mapped by *ecologia* (2010) in the NVCP application area (**Figure 4**), including association 5, 6, 7 and 9. Some paddock vegetation, that is, scattered/isolated paddock trees is situated within cleared agricultural land (*ecologia* association 16 (2010)), will be impacted by clearing within the NVCP application area **Figure 3**).
- Of these associations, 7 and 9 appear to be relatively restricted within the GRFVS area (WAPC, 2010).
- More than 99% of the NVCP application area is disturbed agricultural land (*ecologia* association 16). i.e. 100% of the vegetation (approximately 4.5 ha) contained within the NVCP application area (approximately 455 ha) will be impacted.

2.2 FLORA

A total of 329 vascular flora taxa (excluding 43 species of introduced flora) across 74 families were recorded during the two surveys conducted within the wider Terrestrial Port survey area, which were conducted in August 2006 and March 2009 (*ecologia*, 2010). No species of Declared Rare Flora (DRF) were identified within the area subject to this NVCP application or the wider Terrestrial Port survey area (**Figure 5**) (*ecologia*, 2010).

On-ground surveys have recorded 15 conservation significant flora species within the wider Terrestrial Port survey area (**Figure 5**), including 11 Priority Flora species and 4 additional Priority Flora species recorded by others (*ecologia*, 2010). However, of the 15 conservation significant flora recorded within the wider Terrestrial Port survey area, only one Priority 3 flora species is located within the NVCP application, that is, *Acanthocarpus parviflorus* (*ecologia*, 2010) (**Figure 5**).

This Priority 3 Flora is located in the western portion of the Port Services Road alignment, just north of the Oakajee River at approximately 263,721.459 m E and 6,837,141.298 m N.

2.3 NATURE RESERVES

No nature reserves adjoin the area subject to this NVCP application. The closest nature reserves are Oakajee Nature Reserve located approximately 1.5 km to the east of the NVCP application area and Howatharra Nature Reserve, which is located approximately 2.5 km to the south east (**Figure 6**). Reserve 16200 is situated approximately 1.5 km to the south east of the NVCP application area.

2.4 FAUNA

ecologia (2010a) conducted fauna surveys as part of the Terrestrial Port PER. The survey recorded the following species within the wider Terrestrial Port survey area:

Vertebrate Fauna

- 18 mammal species (ten native and eight introduced mammals);
- 78 bird species (76 native and two introduced);
- 35 reptile species; and
- two amphibian species.

Of the vertebrate species listed above, none were recorded within the NVCP application area.

Invertebrate Fauna

- 4 species identified as Short Range Endemics (SREs) (3 millipedes, 1 isopod) – all three millipedes are new to science;
- 3 species identified as new to science, considered possible SREs (2 spiders, one snail);
- 6 species of unknown SRE status (3 isopods, 3 spiders); and
- 22 species considered not to be SREs.

Five records of subterranean invertebrate fauna were recorded within the NVCP application area, however these are not considered within the application as clearing will not result a significant change to subterranean habitat.

No conservation significant fauna were recorded within the NVCP application area. The conservation significant fauna recorded within the wider Terrestrial Port survey area consisted of predominantly bird species (OPR, 2010).

The five main habitat types recorded during the survey for the wider Terrestrial Port area included, coastal dunes, limestone associations, sandplain, riverine and lateritic hills and breakaways. Of these

five main habitat types the following habitat types and corresponding *ecologia* (2010) associations occur within the NVCP application area:

- Limestone Associations (corresponds to *ecologia* (2010) mapped association 5);
- Sandplain (corresponds to *ecologia* (2010) mapped associations 6 and 9);
- Riverine Vegetation (corresponds to *ecologia* (2010) mapped association 7); and
- Lateritic Hills and Breakaways (corresponds to *ecologia* (2010) mapped association 8).

A large portion of the NVCP application area consists of cleared farmland (*ecologia* (2010) association 16), which is very common in the region and is considered to have limited value as fauna habitat (OPR, 2010).

It is likely that the vegetated areas subject to this NVCP application support a range of reptile and invertebrate species, but unlikely to support larger mammals or a diverse bird population.

2.5 GEOLOGY AND SOILS

The NVCP application area is situated within metamorphic rocks comprising granulite, gneiss and quartzite. A distinctive feature attributed to these rocks is the occurrence of abrasive minerals quartz and pink garnet. In situ weathering of the rock mass has resulted in an undulating rockhead, both with depth and laterally.

WAPC (2009) indicates that the Oakajee and Buller Rivers may pose a moderate to high risk in terms of Acid Sulfate Soil (ASS) generation. Apart from the Port Services Road, the NVCP application area proposes no infrastructure within close proximity to these watercourses. All other locations within the Terrestrial Port PER survey area are mapped having an extremely low risk of ASS occurrence as the survey area generally comprises coastal limestone and overlying podsolised sand/eolionite with leached quartz sands. Podsolised sand may contain some acidity however, underlying limestone and dune sands have a neutralising capacity.

2.6 SIGNIFICANT AREAS OR OTHER LAND FEATURES

There are no DEC Environmentally Sensitive Areas, Ramsar Wetlands, or Department of Water (DoW) Public Drinking Water Source Areas within the NVCP application area.

The most significant ecological linkage is that of the Moresby Range and coastal dune linkage (to the east of the Terrestrial Port survey area). The vegetation of the Moresby Range is highly fragmented but includes species-rich mallee and heath and scrub assemblages that are somewhat floristically similar to that of the remnant vegetation in the eastern parts of the Terrestrial Port survey area. However, the Oakajee River is the only surface water feature or watercourse visible within proximity to the NVCP application area and its riparian vegetation forms the most obvious ecological linkage between the intact coastal habitats and the diverse habitats of the Moresby Range to the east.

2.7 ABORIGINAL HERITAGE

A search of the Department of Indigenous Affairs (DIA) Register (DIA, 2009), indicates that there are presently 42 Aboriginal heritage sites within the vicinity of the NVCP application area area that have been registered with the DIA under the *Aboriginal Heritage Act 1972*. These include the Oakajee and Buller Rivers, which are known to have mythological associations to local Aboriginal people. It is possible that unregistered sites of Aboriginal heritage also exist.

There are also several sites of non-indigenous heritage located within the OIE buffer.

The NVCP application area area is situated within the boundaries of the Naaguja, Amangu and Mullewa Wadjari native title claims. OPR has been consulting with these groups in relation to heritage issues since 2008.

3 DESCRIPTION OF ACTIVITIES

Clearing activities will commence in the 4th quarter of 2011 and will be completed in the 2nd quarter 2012. The two river crossings, associated with the Port Services Road, will be established as a priority.

3.1 ACCESS

Wherever possible existing access tracks will be used to access sites. Should additional access tracks be required, where possible, they will be developed on already cleared agricultural land to avoid clearing of native vegetation. Note: more than 99% of the NVCP application area is situated on cleared agricultural land i.e. 100% of the vegetation (approximately 4.5 ha) contained within the NVCP application area (approximately 455 ha) will be impacted.

3.2 LAND TENURE

The NVCP application area is located at:

- Lot 170 Coronation Beach Road, Howatharra;
- Lot 69 North West Coastal Highway (NWCH), Howatharra; and
- Lot 70 NWCH, Howatharra.

The Western Australian Land Authority (LandCorp) owns all of the above addresses.

On 20 March 2009 the State of Western Australia and OPR entered into a State Development Agreement (SDA). This SDA provided OPR exclusive rights to build the Oakajee deepwater port and railway line. The future port area, including the Port Services Road, will occur on land owned in freehold by LandCorp.

At this stage it is intended OPR will access the land subject to this NVCP application via licence and lease agreements with LandCorp. Going forward, certain areas of this land could be vested in the Geraldton Port Authority (GPA) as port land. LandCorp has provided written authority, allowing OPR to apply for this NVCP (Appendix 1).

3.3 CLEARING METHODS

Ground disturbance and clearing of native vegetation will be required to construct the river crossings across the Oakajee River and to remove sparse pockets of vegetation situated within the remainder of the NVCP application area. This clearing will allow for the construction of the quarry, quarry laydown (and ancillary infrastructure) and Port Services Road alignment.

Removal of native vegetation will be via a bull dozer/front end loader and topsoil will typically be pushed to one side of the site and used for rehabilitation of unused areas. Trees will be removed via dozer and used around the site for revegetation where possible. OPR will ensure a qualified Environmental Advisor is present on site prior to and during clearing to ensure clearing is conducted in accordance with this NVCP application. Clearing methods are discussed further in **Section 5.1**.

3.4 RIVER CROSSING CONSTRUCTION

DoW confirmed, via correspondence dated 7 January 2011, that OPR is exempt from obtaining a bed and banks permit under the *Rights in Water and Irrigation Act 1914* (RiWI Act) for works associated with the Oakajee River. As such, the construction of two river crossings and the widening of existing tracks, along drainage lines associated with the Oakajee River, have been included within this NVCP application.

3.4.1 Port Services Road Crossings

The construction of the Port Services Road occurs predominantly on previously disturbed agriculture land; however, clearing of native vegetation and disturbance to the bed and banks of the Oakajee River, is required for the construction of the two river crossings/floodways. The Port Services Road is required to provide access from Coronation Beach Road to the adjacent quarry and from the quarry to the Terrestrial Port facilities. The two river crossings associated with the Port Services Road will require the clearing of approximately 0.9 ha of riparian vegetation.

The Oakajee River is ephemeral, flowing for limited periods after heavy rain. Consequently, the construction of the Port Services Road and river crossings will commence in the 4th quarter 2011 and will be completed in the 1st quarter 2012. The two river crossings will be established as a priority and during periods of no flow. A more specific construction sequence for culverts will include:

- Clearing minimum footprint required for culvert installation.
- Compact stream invert and top up with imported sand fill as pipe bedding.
- Shape apron areas and place blinding concrete as required, place apron reinforcement and headwall starters.
- Place rubber ring flush joint reinforced concrete pipes.
- Cast aprons, wingwall and headwall footing strips.
- Place headwall and wingwall reinforcement.
- Cast headwalls and wingwalls.
- Backfill between and over pipes with stabilised sand fill.
- Place reinforcement for floodway slab, cast floodway slab.
- Shape and finish approach stream channel earthworks if required.
- Place scour protection Reno mattresses.

Culvert and river crossing design is depicted in **Figure 7** to **Figure 10**. River Crossing 1 is located at Lot 54 North West Coastal Highway, Geraldton, whilst River Crossing 2 is located at Lot 2249 North West Coastal Highway, Geraldton. The coordinates for each crossing are as follows:

- River Crossing 1: Easting: 266373, Northing: 6838793, MGA 50
- River Crossing 2: Easting: 263770, Northing: 6836366, MGA 50

3.4.2 Temporary Access Tracks

Existing access tracks that cross drainage lines, located to the east and south east of the quarry pit, will be used to access cleared agricultural land to the south and east. The access tracks will be constructed as part of early works (commencing the last quarter of 2011) and are intended to be temporary, used solely during the construction period of the quarry (approximately 3 to 4 months), to construct the visual screening bunds.

The existing access tracks were chosen to minimise clearing and disturbance to remnant vegetation. The temporary tracks are expected to be used by 40-50 tonne dump trucks, with one way traffic through creek crossings and two way traffic outside creek crossings. Some widening of the existing tracks and crossings will occur; however, there will be no disturbance to surrounding remnant vegetation.