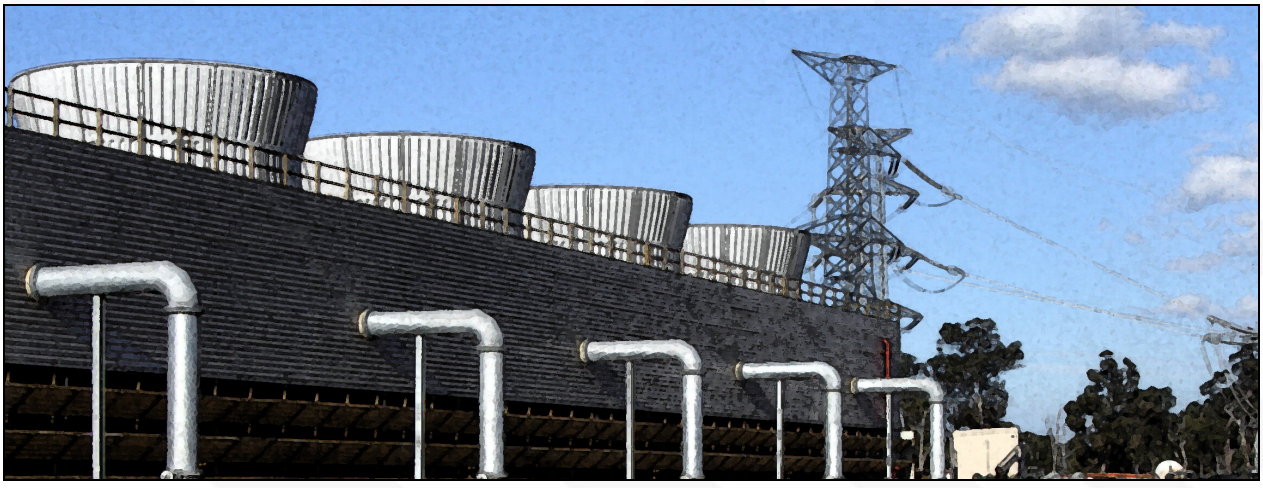
THE GRIFFIN GROUP

strategen

Bluewaters Power Station Phase III and IV Expansion

Construction Environmental Management Plan



Prepared for
Griffin Power 3 Pty Ltd
by Strategen

July 2009

Bluewaters Power Station
Phase III and IV Expansion

Construction Environmental
Management Plan

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July 2009

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Client: Griffin Power 3 Pty Ltd

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BLUEWATERS POWER STATION PHASE III AND IV EXPANSION

CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN

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1. INTRODUCTION

1.1 BACKGROUND

Griffin Power 3 Pty Ltd (Griffin Power) is proposing to expand the Bluewaters Power Station facility at Collie by constructing and operating Bluewaters Phases III and IV (the Proposal). Each phase of the Proposal consists of one 229 MW (gross output) base-load coal-fired generating unit, located within the Coolangatta Estate approximately 4.5 km from the eastern edge of Collie, Western Australia. Bluewaters Phases III and IV will be located adjacent to Bluewaters Phase I and II power stations (each 229 MW) and all four phases of the power station will share infrastructure. A marine outfall and pipeline will be constructed to dispose of cooling blowdown water if other preferred options are not made available. The regional location and power station layout are shown in Figure 1.1 and Figure 1.2 respectively.

The Bluewaters Power Station has been designed for expansion in modular phases in order to grow with the demands of the Western Australian electricity market. It is envisaged that the Bluewaters Phase III and IV expansion will be approved for construction and operation under Part IV of the *Environmental Protection Act 1986* (EP Act) and under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

The Proposal involves a range of potential environmental impacts requiring management to meet the objectives of the approval of the Proposal.

1.2 PURPOSE OF DOCUMENT

This document has been prepared as a compilation of specific management plans to be implemented during the construction phase of the power station expansion. Key management actions from this document form commitments made in the Public Environmental Review, which are expected to be included as conditions in the Ministerial statement to be issued approving implementation of the proposal.

The management plans contained in this Construction Environmental Management Plan apply to various aspects of construction of the Proposal, in terms of the two components: the generator units and the marine outfall. The applicability of each plan to these components is set out in Table 1.1.

Table 1.1 Applicability of management plans to project components

Management Plan	Section No	Power Station Generator Units	Marine Outfall & Pipeline
Flora and Vegetation Management Plan	Section 4	Yes	Yes
Weed and Dieback Management Plan	Section 5	Yes	Yes
Fauna Management Plan	Section 6	Yes	Yes
Waste Management Plan	Section 7	Yes	Yes
Water Management Plan	Section 8	Yes	No
Hazardous Materials Management Plan	Section 9	Yes	No
Fire Management Plan	Section 10	Yes	Yes
Noise Management Plan	Section 11	Yes	Yes
Soil Management Plan	Section 12	No	Yes
Acid Sulphate Soil Management Plan	Section 13	No	Yes
Marine Outfall Construction Management Plan	Section 14	No	Yes
Rehabilitation Management Plan	Section 15	No	Yes
Aboriginal Heritage Site Management Plan	Section 16	Yes	Yes

Figure 1.1 Regional location

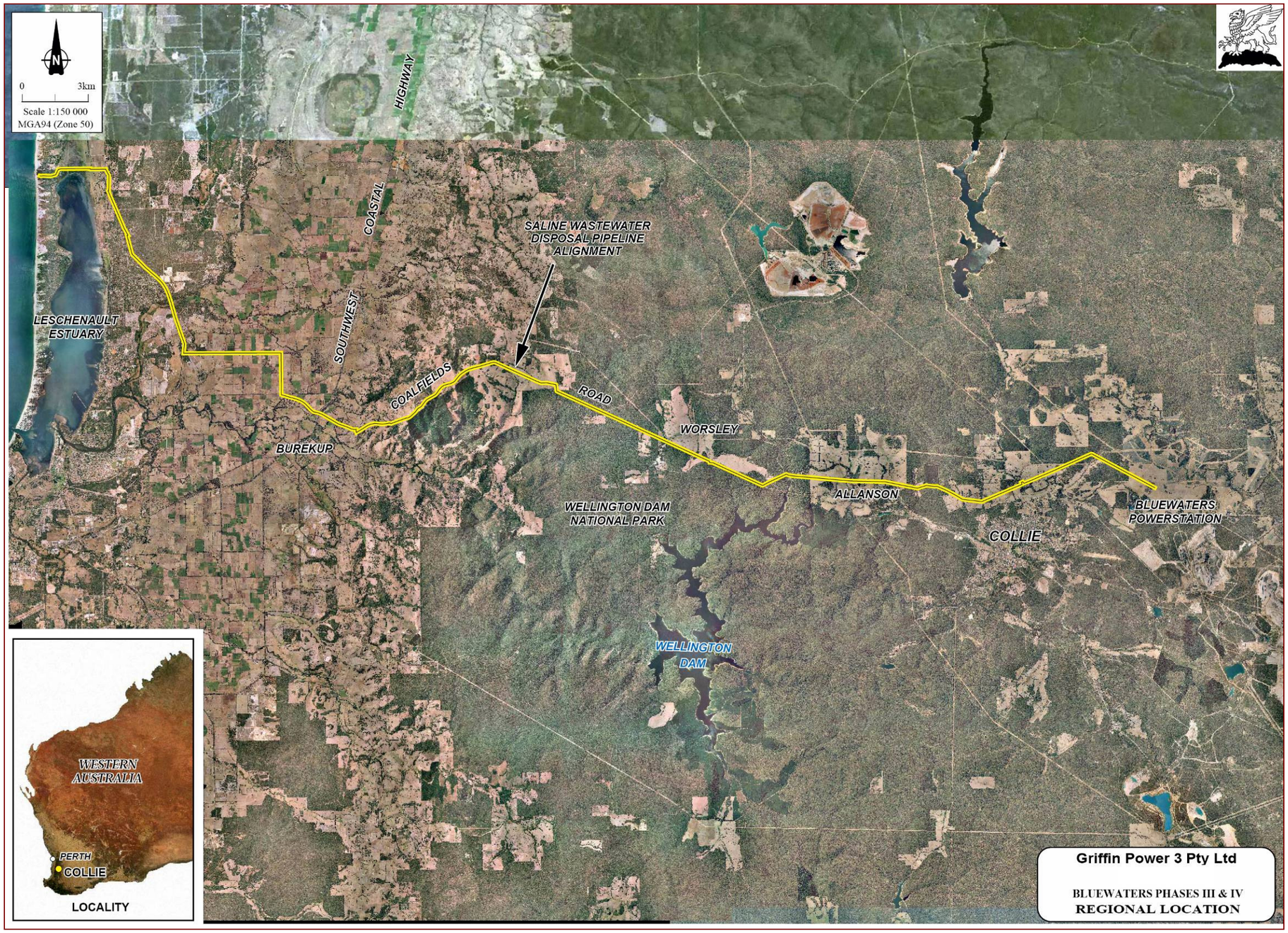
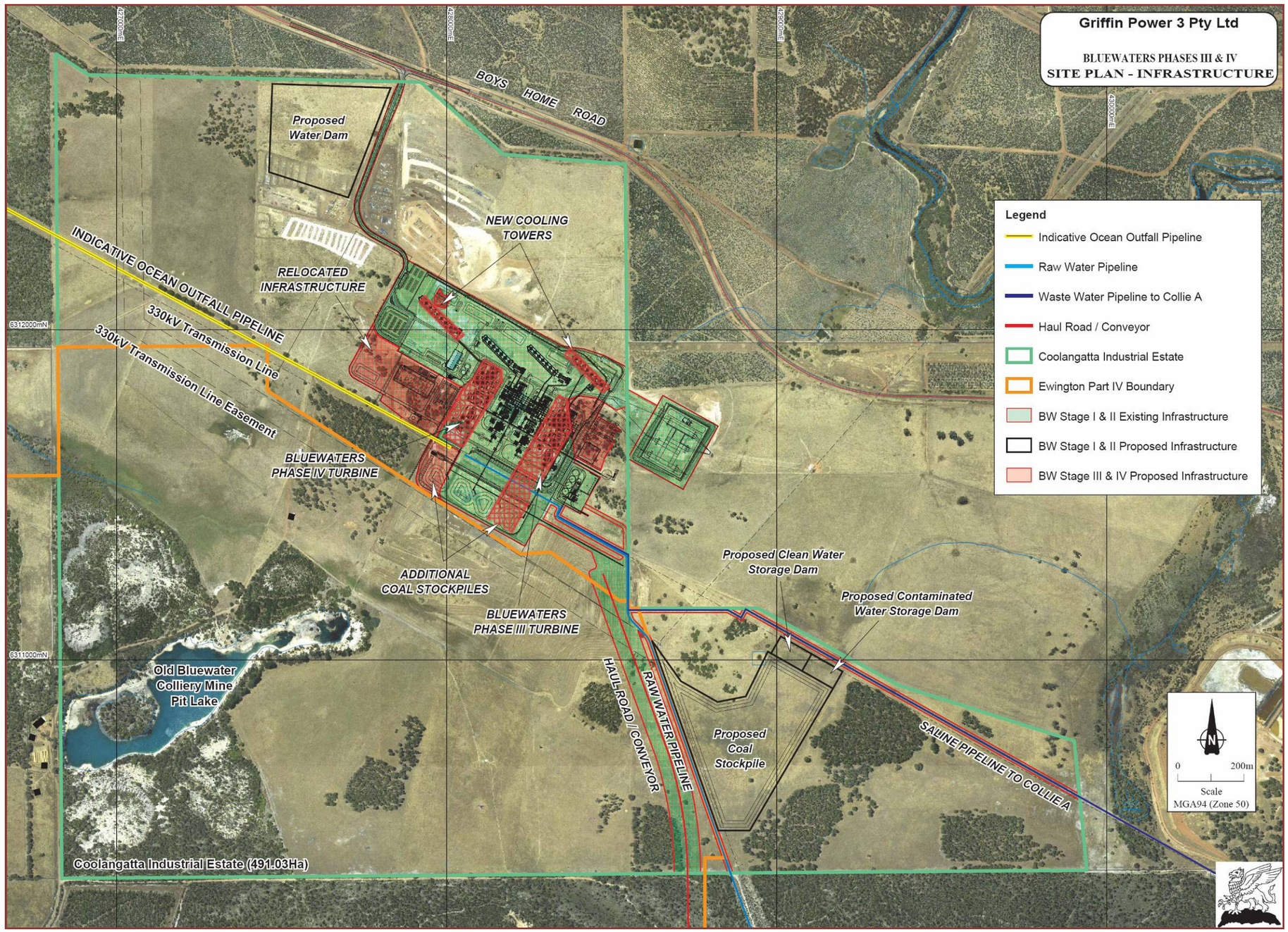


Figure 1.2 Site plan



2. IMPLEMENTATION

2.1 PUBLIC COMPLAINTS

Where any public complaints are received with respect to any environmental issues associated with the operations of the Bluewaters Phase III and IV expansion, they will be managed by Griffin Power. Griffin Power will record and investigate all public complaints and will take all reasonable and practicable measures to avoid further grievances.

All public complaints and the responsive actions made by Griffin Power will be reported in the annual compliance report required under the conditions of the Ministerial Statement.

2.2 TRAINING AND AWARENESS

The Construction Contractor will be responsible for ensuring that environmental training and awareness programs are provided to all construction personnel. Specific attention will be made to incident management and reporting, use of plant and equipment, water management and conservation, dust and noise control, and complaints management.

Construction personnel will be required to participate in an induction program so that an acceptable level of environmental awareness is achieved prior to work commencing. This induction program will be directed to assist in minimising any on-site and off-site environmental problems. The Contractor will maintain a record on site of environmental and cultural/heritage training undertaken for all employees, detailing the type and purpose of the training.

2.3 INCIDENT REPORTING

All environmental hazards or incidents will be recorded in the on-site incident report system, investigated, remediated if necessary and reported as required, including within any required compliance reports.

2.4 ROLES AND RESPONSIBILITIES

The Construction Site Manager will be responsible for implementation and maintenance of this Construction Environmental Management Plan by all personnel working on the site.

The Construction Environmental Representative (CER) will be responsible for implementation of Construction Contractor commitments to meet the requirements under this Construction Environmental Management Plan.

3. REPORTING AND REVIEW

3.1 COMPLIANCE REPORTING

Griffin Power will report on its compliance with the Ministerial Statement and conformance with environmental management plans as required by the conditions in that statement.

Griffin Power will report on compliance with any Environmental Licences in accordance with the conditions attached to those licences.

Unless otherwise specified within this plan, Griffin Power will provide an Environmental Incident Report to the Department of Environment and Conservation (DEC) within seven days of becoming aware of an environmental incident, including details of:

- the date, time and reason for the incident
- the period over which the incident occurred
- the cause, nature and extent of the incident over that period and potential or known environmental consequences
- corrective action taken or planned to mitigate adverse environmental consequences if appropriate
- corrective actions taken or planned to prevent a recurrence of the incident, if appropriate, including a timeline for implementation.

3.2 DOCUMENT REVIEW

Griffin Power will review and revise this management plan:

- on a three-yearly basis
- if there are major changes to the project or its operations
- in response to issues raised by the DEC
- in response to issues raised through the Community Liaison Committee
- in response to any incident which results in a failure to meet to meet any of the commitments of this plan.

Due to the relationship between this management plan and the Ministerial Statement, any changes to the management measures described in the plan must remain consistent with the requirements of the Statement. Additionally, the Audit Branch of the DEC must be notified of any relevant changes to the plan and the audit table for the Statement updated as appropriate.

This Management Plan will be audited and reviewed and a performance assessment conducted in accordance with the conditions of the Ministerial Statement.

4. FLORA AND VEGETATION MANAGEMENT PLAN

This plan applies to construction of the power station generating units and marine outfall pipeline components of the Proposal.

4.1 ENVIRONMENTAL RISKS

Power station site

The majority of the Bluewaters Power Station project area within the Coolangatta Industrial Estate is cleared farmland. 4.27 ha of remnant vegetation will be cleared for the construction of Bluewaters Phases III and IV. The vegetation on site is open forest of *Eucalyptus marginate – Allocasuarina fraseriana* and *Corymbia calophylla* with some *Banksia grandis* and *Persoonia longifolia* over low understorey of shrubs and sedges on shallow sandy gravels over lateritic outcropping. The vegetation is in a degraded condition.

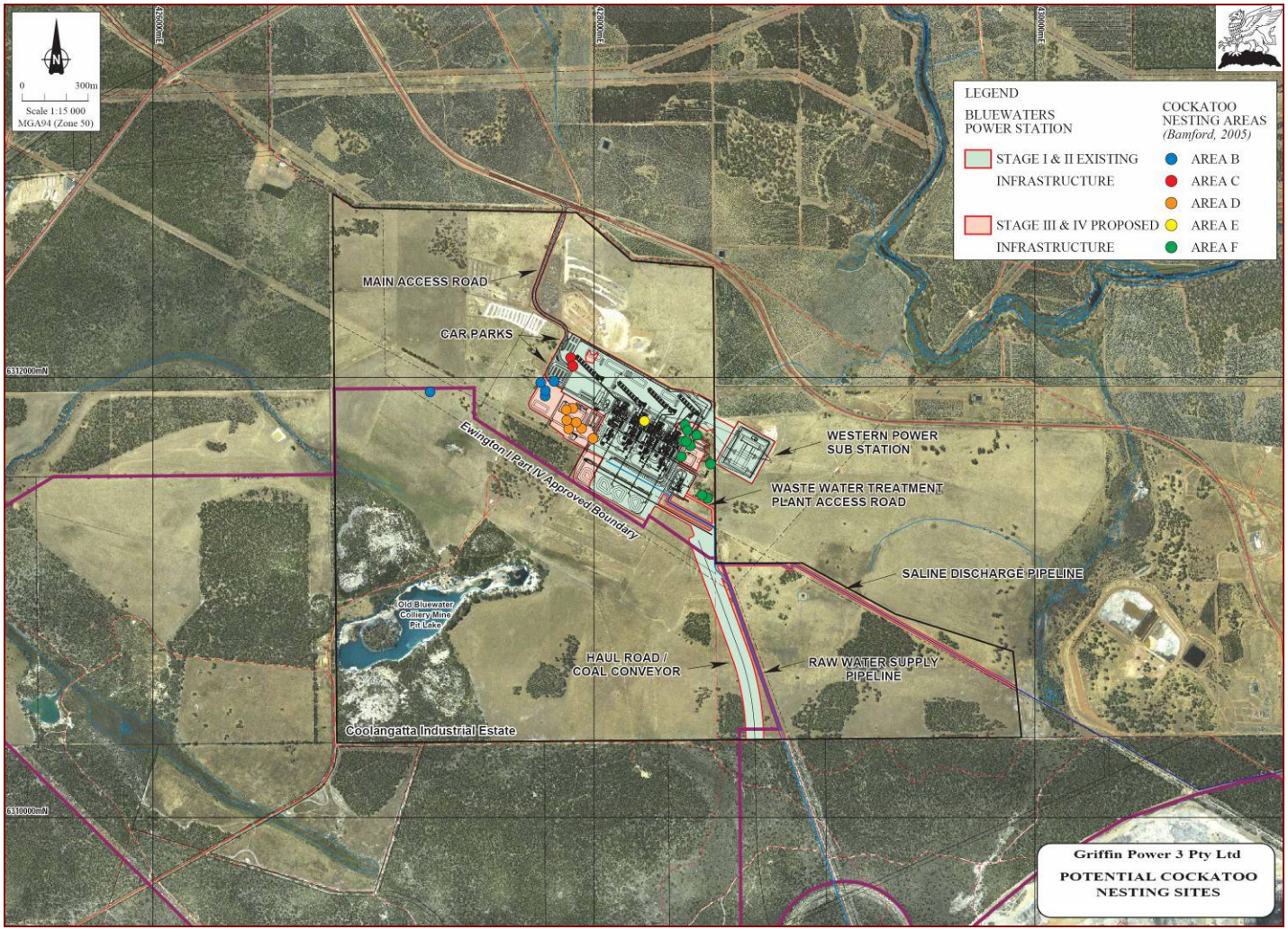
A review of the conservation significance of flora and vegetation (Maunsell 2003) recorded adjacent to the Bluewaters site concluded that no species of threatened flora occur within or adjacent to the Bluewaters site. As the project site has been previously cleared for agriculture, no significant impact to Declared Rare Flora or Priority Flora will occur during development.

No vegetation associations on the Bluewaters site are considered Threatened Ecological Communities (TECs). No TECs or associations of conservation significance were located within the study area (Maunsell 2003).

An inspection of trees on the Bluewaters site was undertaken by Bamford Consulting Ecologists on 22 October 2005 and identified trees that could potentially be used by Black Cockatoos for nesting. The survey found 25 trees that had suitable hollows. Of these, a number are in areas cleared under the clearing permit for the Bluewaters Phases I and II generator units. Ten of the remaining trees with nesting potential are proposed to be cleared during the construction of Bluewaters Phases III and IV Expansion and are shown in Figure 4.1.

Strategen (2009) reported that the 4 ha of vegetation within the Bluewaters property and immediately south of the proposed expansion, contains large trees with potential hollows that may be suitable as breeding habitat for black-cockatoos. The 4 ha of vegetation, previously surveyed by Bamford (2005), to be partially cleared contains approximately 16 large trees with potential hollows, of which ten will be cleared, and the 4 ha area to the south to be conserved contains approximately 22 large trees with potential hollows. Therefore, approximately 74% of the vegetation on the property suitable for black-cockatoos breeding and foraging, will be conserved after construction of the Proposal. Management of this aspect is detailed in the Fauna Management Plan (Section 6).

Figure 4.1 Cockatoo nesting sites



The vegetation to be cleared contains weeds and possibly diseases such as dieback (caused by *Phytophthora cinnamoni*), which if not adequately managed, may be spread into unaffected areas. The highest risk of weed and dieback spread will occur during earthworks, with machinery potentially introducing foreign soil to the site, and transporting soil out of the site. Dieback is widespread in the wider Collie region, although the status of infection in the Bluewaters project site is unknown. Further, stockpiling or burning of the cleared vegetation may increase the fire hazard associated with construction activities. Consequently, effective management of vegetation is required to ensure that the environmental risks are minimised. Machinery should be cleaned of soil and organic matter on entry to and exit from the site in order to minimise the risk of machinery-borne dieback spread. The requirements for this are detailed in the Weed and Dieback Management Plan (Section 5).

Marine outfall pipeline

If constructed, the marine outfall pipeline will largely follow the existing easement, previously cleared for construction of the Verve Energy marine outfall pipeline from the Collie Power Station. No impact on vegetation outside the existing easement is expected as a result of construction of the new outfall pipeline as construction will be confined to the boundaries of the easement over the entire length, with the exception of the portion of the pipeline that crosses through the coastal dune system at the downstream end. Where the pipeline deviates from the easement it will follow an existing cleared track in a generally southerly direction, and then westerly through the coastal dunes. The pipeline alignment traverses a range of vegetation complexes over its length (three within the Collie Basin, five within the Darling Plateau and eight on the Swan Coastal Plain [Mattiske 2008]).

Mattiske (2008) reports that no Declared Rare species (*Wildlife Conservation Act 1950*) or Endangered or Vulnerable plant taxa (*Environment Protection and Biodiversity Conservation Act 1999*) were located during the survey of the pipeline alignment. One Priority flora species was recorded (*Calothamnus rupestris* [Priority 4]) in a small remnant near the road verge on the Darling Scarp. These plants can be avoided by placing the proposed pipeline in the already cleared corridor near this remnant and by minimizing any clearing of remnant vegetation in this area.

Construction through the dunes will be by horizontal directional drilling and will not involve any surface impact or clearing of vegetation. This method is being employed to avoid the construction difficulties associated with working in potentially mobile dunes under sandy conditions, requiring substantial excavation depths (and associated widths) to ensure adequate cover for the pipeline to provide long-term security in the event of movement of the dunes. The vegetation in this area is described as woodland of *Agonis flexuosa* Acacia *rostellifera* over *Phyllanthus calycinus, Acanthocarpus preissii, Hardenbergia comptoniana, Hibbertia cuneiformis, Olearia axillaris, Rhagodia baccata* subsp. *Baccata* and *Spyridium globulosum* on deep coastal sand (Mattiske 2008).

These habitats are not generally suitable as nesting and foraging areas for Black Cockatoos, as there is no presence of *Hakea*, *Grevillea*, *Dryandras*, *Jacksonia* or *Banksias*.

The pipeline route traverses a variety of forestry and farmland areas, containing weeds and potential diseased areas. The management of weeds and dieback along the pipeline route during construction is detailed in the Weed and Dieback Management Plan (Section 5).

Potential Impacts

Due to the highly degraded and non-threatened status of vegetation communities within the proposed project area (including the pipeline corridor), impacts to vegetation are likely to be minimal.

Management of the fire risk associated with stockpiling cleared vegetation is therefore the priority for risk management and is detailed in the Fire Management Plan (Section 10).

4.2 APPLICABLE LEGISLATION

Griffin Power employees and contractors will comply with all Commonwealth and State legislation that applies to the Bluewaters Power Station Phase III and IV Expansion. Legislation relevant to vegetation management is summarised in Table 4.1.

Table 4.1 Relevant legislation for flora and vegetation management

Relevant Legislation	Scope	Administering Body
Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)	Protects matters of national environmental significance, including National Heritage Places.	Department of Environment and Heritage
Environmental Protection Act 1986	Part IV defines the process of referral and assessment of proposals subject to formal assessment under the EP Act. Works Approvals and licences are issued under Part V of the EP Act.	Department of Environment and EPA
Environmental Protection (Clearing of Native Vegetation) Regulations 2004	Under new clearing regulations, clearing native vegetation is prohibited, unless a clearing permit is granted by the Department of Environment, or the clearing is for an exempt purpose. Schedule 6 exemptions include 'proposals that undergo formal impact assessment by the EPA under Part IV of the Act where clearing of native vegetation is done in accordance with the implementation decision or agreement'.	Department of Environment
Conservation and Land Management Act 1984	Protection and management of national, marine, conservation and regional parks, State forests, and timber, nature, and marine nature reserves.	Department of Conservation and Land Management
Wildlife Conservation Act 1950	Protection of rare and endangered flora and fauna.	Department of Conservation and Land Management

4.3 MANAGEMENT PROGRAM

4.3.1 Environmental objectives and key performance criteria

The impacts on vegetation from the construction of the Proposal will be managed to meet the environmental objectives as set out in Table 4.2.

Table 4.2 Environmental objectives and performance indicators for flora and vegetation management

Issue	Environmental Objective	Performance Indicator
Vegetation communities	Maintain the abundance, species diversity, geographic distribution and productivity of vegetation communities.	No disturbance to remnant native vegetation outside approved clearing envelope.
Flora conservation	Protect Declared Rare and Priority Flora, consistent with the provisions of the *Wildlife Conservation Act 1950*.	Compliance with legislation.
Flora conservation	Protect other flora species of conservation or scientific significance (e.g. undescribed taxa, range extensions, outliers)	No disturbance to flora species of conservation or scientific significance outside approved clearing envelope.

4.3.2 Management actions

The management actions to be implemented are set out in Table 4.3.

Table 4.3 Management actions for flora and vegetation

Aspect	Action	Responsibility
General requirements	Vegetation clearing will be kept to the minimum necessary for safe operations. Clearing limits will be marked on all design drawings and pegged in the field prior to any clearing works commencing.	Construction Contractor
	All topsoil will be stripped and stockpiled for rehabilitation of construction areas (see the Rehabilitation Management Plan Section 15).	Construction Contractor
	Inclusion of an environmental management component in the onsite induction program, outlining roles and responsibilities in restricting impacts to flora.	Construction Contractor
	Off-road driving outside the approved construction envelope will be strictly prohibited.	Construction Contractor
Priority flora	The location of the recorded Priority flora near the pipeline corridor will be recorded on the Environmental Line List, flagged in the field as an area of reduced corridor width to minimise clearing, and construction personnel advised to avoid working outside the delineated reduced corridor area.	Griffin Power
Fire	The Fire Management Plan (Section 10) will be implemented to reduce the risk of unplanned fires and provide contingency measures to minimise any associated impacts.	Construction Contractor
Weeds and Dieback	Hygiene measures will be implemented in accordance with the Weed and Dieback Management Plan (Section 5) to ensure that dieback and weed species are not spread as a result of construction activities.	Construction Contractor
Pipeline clear and grade	Prior to ground disturbing activities, the boundaries of the pipeline easement will be clearly delineated on the ground, together with any areas of disturbance outside the easements.	Construction Contractor
	There will not be any disturbance of vegetation outside the delineated areas of disturbance unless authorised by the Minister for the Environment.	Construction Contractor
	Clearing of native vegetation within the pipeline construction corridor will be limited to a width of 20 m, except where it passes through gazetted environmentally sensitive areas where it will not exceed 15 m without the authorisation of the Minister for the Environment.	Construction Contractor
	Clearing will avoid the felling of any habitat trees where possible.	Construction Contractor
	Trimming of branches on vegetation overhanging the corridor will be undertaken in preference to whole tree removal. All habitat trees flagged for either removal or branch trimming within DEC managed estate will require signoff by the local DEC district representative.	Construction Contractor
	Trimming overhanging branches will be undertaken using the 'three-cut' method.	Construction Contractor
	No flora or vegetation outside approved areas will be removed or disturbed.	Construction Contractor
	Cleared vegetation and log debris will be stockpiled along the construction corridor separately from topsoil.	Construction Contractor
	Stockpiles will be located adjacent to where vegetation has been cleared.	Construction Contractor
	Stockpiles will be located so as not to impede vehicles, wildlife, and surface drainage, and avoid damage to adjacent live vegetation.	Construction Contractor
Revegetation of pipeline easement	Stockpiled cleared or trimmed vegetation will be respread evenly across the pipeline construction right-of-way from which it was removed as soon as practicable after the completion of construction works.	Construction Contractor
	Vegetative material including logs and leaf litter will be respread to provide habitat.	Construction Contractor

4.3.3 Monitoring

Monitoring of flora and vegetation impacts should be undertaken as set out in Table 4.4.

Table 4.4 Monitoring program for flora and vegetation management

Parameter(s)	Source	Frequency/timing	Purpose
Clearing zones will be supervised	All approved access ways and construction areas	During initial site preparation works	To ensure that site clearance is restricted to authorised areas only.

4.4 CONTINGENCIES

Actions to be followed as contingency actions in the event of an incident are set out in Table 4.5.

Table 4.5 Contingencies for flora and vegetation management

Trigger	Action	Responsibility
Clearing of native vegetation outside delineated areas	Investigate cause.	Construction Manager
	Implement rehabilitation procedure in consultation with the regional DEC office.	Construction Manager
	Review construction procedures.	Construction Manager
Vegetation not stockpiled in accordance with requirements	Investigate cause and potential resultant impacts.	Construction Manager
	Implement corrective procedure if likely to cause adverse resultant impacts, in consultation with the regional DEC office.	Construction Manager
	Review construction procedures.	Construction Manager

5. WEED AND DIEBACK MANAGEMENT PLAN

This plan applies to construction of the power station generating units and marine outfall pipeline components of the Proposal.

5.1 ENVIRONMENTAL RISKS

Construction activities have the potential to introduce or disperse weeds and diseases such as dieback (*Phytophthora cinnamoni*) to the site. The highest risk of weed and dieback spread will occur during earthworks, with machinery potentially introducing foreign soil to the site, and transporting soil off site.

Power station site

Dieback is widespread in the wider Collie region, although the status of infection in the Bluewaters project site is unknown. Weeds are present at the Bluewaters Power Station site due to historical agricultural activity in the area. Removal of soil and organic matter from machinery prior to exit/entry to the site will minimise the risk of weed and disease spread.

Marine outfall pipeline

Mattiske (2008) reports that a total of 21 introduced (exotic) taxa were recorded within the proposed pipeline route. Three of these introduced species, **Zantedeschia aethiopica* (P1 and P4 - whole State), **Asparagus asparagoides* (P1 - whole State) and **Gomphocarpus fruticosus* (P1 and P4 for Southwest region), are listed as Declared Plant species pursuant to section 37 of the *Agricultural and Related Resources Protection Act 1976* and according to the Western Australian Department of Agriculture and Food[2008].

The highest risk of weed spread will be during the clear and grade and rehabilitation operations as weeds will be contained within the topsoil. As such, machinery associated with these operations will be cleaned down to remove all soil/organic matter when moving into areas of remnant vegetation with condition rated by Mattiske (2008) as Good or better. Removal of topsoil will sufficiently reduce the risk of weed spread during other construction activities.

Dieback can be present within all layers of the soil profile, and as such, clean down will be undertaken during all construction activities. Mattiske (2008) reports that dieback is present in the valley systems within the Collie Basin and the forest and the woodland areas on the Darling Plateau. Therefore, in areas where the proposed alignment passes through State Forest areas it is important that vehicle hygiene measures are maintained. This is more to minimize the risk of additional introductions of dieback as well as introduced species into the remnant vegetation areas. Hygiene measures should also be maintained in the Banksia woodlands on the Swan Coastal Plain.

Areas of surveyed occurrence of dieback and other weed and pest areas will be marked on an Environmental Line List (ELL). Corridor access hygiene points will be marked on the construction alignment sheets.

5.2 APPLICABLE LEGISLATION

Griffin Power employees and contractors will comply with all Commonwealth and State legislation that applies to the Bluewaters Power Station Phase III and IV Expansion. Legislation relevant to vegetation management is summarised in Table 5.1.

Table 5.1 Relevant legislation for weed and dieback management

Relevant Legislation	Scope	Administering Body
Conservation and Land Management Act 1984	Protection and management of national, marine, conservation and regional parks, State forests, and timber, nature, and marine nature reserves.	Department of Conservation and Land Management
Agriculture and Related Resources Protection Act 1976	Provides for the management, control and prevention of certain plants and animals, for the prohibition and regulation of the introduction and spread of certain plants.	Department of Agriculture and Food

5.3 MANAGEMENT PROGRAM

5.3.1 Environmental objectives and key performance criteria

The potential spread of weeds and dieback as a result of construction of the Proposal will be managed to meet the environmental objectives as set out in Table 5.2.

Table 5.2 Environmental objectives and performance indicators for weed and dieback management

Issue	Environmental Objective	Performance Indicator
Weeds and dieback	Manage construction works to minimise disturbance to significant vegetation communities and priority flora, and prevent the spread of weeds and plant pathogens	No major infestation of weeds or dieback introduced to adjacent forest areas as a result of construction activities.

5.3.2 Management actions

The management actions to be implemented are set out in Table 5.3.

Table 5.3 Management actions for weeds and dieback

Aspect	Action	Responsibility
General requirements	All areas of: known disease infestation; known to be disease free; and uninterpretable regarding disease; will be marked on the ELL. Areas of remnant vegetation of condition assessed by Mattiske (2008) as being Good or better will be marked on the ELL.	Griffin Power
	Machinery should be inspected and cleaned of soil and organic matter on entry to and exit from the site in order to minimise the risk of machinery-borne dieback spread. Vehicles that move off the construction site or corridor but will remain on bitumen or hard surfaces do not require clean down prior to exiting the construction site. Similarly, vehicles that move onto the construction site that have not travelled on other than bitumen or hard surfaces do not require clean down.	Construction Contractor

Aspect	Action	Responsibility
Surveying	Distinctive flagging and signage will be used to identify areas of known dieback and weed infestation and those areas known to be weed or dieback free and will remain in place until rehabilitation is complete.	Construction Contractor
Hygiene stations	Pipeline construction corridor access hygiene points will be identified on the ELL and construction alignment sheets and sign posted in the field.	Construction Contractor
	Entry to areas of remnant vegetation identified as being of "Good" condition or better as marked on the ELL with respect to the presence of weeds, will only be through hygiene stations. Exit from areas of identified weed infested areas identified in the ELL will only be through hygiene stations.	Construction Contractor
	Movement between from areas of different classification regarding disease will only be through hygiene stations, with clean down required when moving from uninterpretable to disease free areas, or from identified diseased areas to uninterpretable or disease free areas.	Construction Contractor
	Hygiene stations will be at least 200 m from any watercourses/streams, environmentally sensitive areas and vulnerable areas provided no risk of contamination exists from within the area between the hygiene station and the area to be protected (hygiene buffer area). Where such risk of contamination may exist, the station will be located as far from the area to be protected as will practically ensure no risk of contamination is present from the resulting hygiene buffer area.	Construction Contractor
	Signage will be erected outlining the hygiene management procedure at each station.	Construction Contractor
	All construction machinery, including handheld tools and vehicles will be cleaned down at the hygiene management stations.	Construction Contractor
	Personnel will clean footwear each time they enter or exit a high-risk area.	Construction Contractor
	If weed seeds and/or soil are found attached to vehicles, footwear, clothing and/or equipment, they will be collected in a sealed container and disposed in accordance with the Waste Management Plan (Section 7).	Construction Contractor
	Waste material, including washdown water, will not be disposed of in a manner likely to cause pollution, or spread of weeds or dieback into uninfected or uninfected areas.	Construction Contractor
Drainage	Drainage from dieback or weed infected areas will be designed so that it prevents water draining into dieback or weed free areas.	Construction Contractor
Bedding material	Any pipeline bedding material imported to the site will be certified by the supplier as being free of disease, weeds.	Construction Contractor

5.3.3 Monitoring

Monitoring of weed and dieback management should be undertaken as set out in Table 5.4.

Table 5.4 Monitoring program for weed and dieback management

Parameter(s)	Source	Frequency/timing	Purpose
Stockpiles of topsoil and trench material	All access and construction activities	Daily	To ensure that high-risk weed and/or dieback infected material is stockpiled separately from other material.
Hygiene stations	Identified hygiene stations	Daily	To ensure that all vehicles, construction machinery including handheld tools, and footwear is subject to hygiene management procedures on entering/exiting risk or protected areas.

5.4 CONTINGENCIES

Actions to be followed as contingency actions in the event of an incident are set out in Table 5.5.

Table 5.5 Contingencies for weed and dieback management

Trigger	Action	Responsibility
New infestation of weed(s) identified in areas of conservation value during construction	Identify source of weed infestation.	Construction Contractor
	Undertake weed control immediately (or as appropriate) in consultation with the Department of Agriculture and Food (DAF) and DEC and follow up weed control during Rehabilitation.	Construction Contractor
	Review hygiene management procedures.	Construction Contractor
New infestation of 'high risk' weed(s)	Identify source of weed infestation.	Construction Contractor
	Undertake weed control immediately (or as appropriate) in consultation with the DAF and DEC and follow up weed control during Rehabilitation.	Construction Contractor
	Review hygiene management procedures.	Construction Contractor
Weed and/or dieback infected and non-infected material are not stockpiled separately	Investigate cause of 'contamination'.	Construction Contractor
	Ensure appropriate identification of known areas of dieback and/or environmental weed infestations.	Construction Contractor
	Dispose infected stockpiled material off-site to a suitable disposal location, to be determined in consultation with DEC and DAF, to avoid contaminating non-infected areas.	Construction Contractor
	Source dieback and weed free material suitable for use in backfilling in consultation with DEC and DAF.	Construction Contractor
	Review hygiene management procedures.	Construction Contractor
Reporting	Any breaches of the hygiene management procedures will be reported to DEC and investigated.	Construction Contractor

6. FAUNA MANAGEMENT PLAN

This plan applies to construction of the power station generating units and marine outfall pipeline components of the Proposal.

6.1 ENVIRONMENTAL RISKS

For the purposes of this plan, fauna refers to vertebrate fauna and feral fauna refers to introduced predatory species, such as foxes, cats, etc.

Power station

Construction of the power station generating units will result in the loss of habitat tress potentially used for nesting and/or foraging by Carnaby's Black Cockatoos and Baudin's Black Cockatoos, which are protected by the *Wildlife Conservation Act 1950* (Wildlife Act), and are also listed under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

Habitat trees are considered to be those of sufficient age to form nesting hollows for hollow-nesting birds and mammals, and will be identified through a survey by a zoologist.

No other impact on fauna is expected as a consequence of construction activities on the power station site.

Marine outfall pipeline

Construction of the marine outfall pipeline could potentially affect indigenous and feral fauna in a number of ways, including:

- death/injury of fauna from impact with vehicles
- fragmentation of habitat (temporary)
- loss of habitat (temporary)
- fauna entrapment in trenches excavated to receive the pipeline with potential for stress, and mortality through exposure or increased predation (temporary)
- disturbance of fauna in nearby areas from light, noise and by personnel feeding selected species (temporary).

Given the relatively short period since the corridor was last cleared for construction of the existing pipeline, no habitat trees exist within the pipeline construction corridor.

The existing cleared area over the pipeline will be retained for maintenance purposes.

6.2 APPLICABLE LEGISLATION

Griffin Power employees and contractors will comply with all Commonwealth and State legislation that applies to the Bluewaters Power Station Phase III and IV Expansion. Legislation relevant to vegetation management is summarised in Table 6.1.

Table 6.1 Relevant legislation for fauna management

Relevant Legislation	Scope	Administering Body
Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)	Protects matters of national environmental significance, including National Heritage Places.	Department of Environment and Heritage
Environmental Protection Act 1986	Part IV defines the process of referral and assessment of proposals subject to formal assessment under the EP Act. Works Approvals and licences are issued under Part V of the EP Act.	Department of Environment and EPA
Conservation and Land Management Act 1984	Protection and management of national, marine, conservation and regional parks, State forests, and timber, nature, and marine nature reserves.	Department of Conservation and Land Management
Wildlife Conservation Act 1950	Protection of rare and endangered flora and fauna.	Department of Conservation and Land Management

6.3 MANAGEMENT PROGRAM

6.3.1 Environmental objectives and key performance criteria

The purpose of this plan is to provide for the management of interactions between people/machinery and fauna so that impacts on fauna are minimised, to achieve the environmental objectives for the fauna factor as set out in Table 6.2,

Table 6.2 Environmental objectives and performance indicators for fauna management

Issue	Environmental Objective	Performance Indicator
Fauna habitat	To minimise the temporary and permanent reduction or fragmentation of existing fauna habitat.	No habitat trees, or parts of habitat trees, other than those that materially interfere with construction are to be removed. No vegetation clearing to be undertaken outside approved areas.
	No net loss of nesting habitat for Black Cockatoos.	All identified habitat trees required to be removed are replaced by approved artificial nesting boxes.
Direct fauna impacts	To minimise the direct impacts on fauna through impacts with vehicles, entrapment in construction works, or extraordinary exposure to predators.	Vehicle speeds limited on unformed access tracks and construction worksite. Pipeline trenches to be open for a limited period of time. Achievement of fauna inspection and clearing requirements. Adherence to injured animal protocol.

6.3.2 Management actions

The management actions to be implemented are set out in Table 6.3. The prescribed fauna inspection and clearing management actions associated with the trenches, including time limits on trench openings, do not apply to "bell holes[1]" left open at valve pit installation points, etc., which would be managed in the same fashion as any point excavations associated with maintenance of the existing pipeline facility. Trenches that are not left open overnight are not required to be inspected and cleared.

Table 6.3 Management actions for fauna

Aspect	Action	Responsibility
Euthanasia	A euthanasia procedure will be prepared to the requirements of the DEC.	Construction Contractor
Vehicle movement	Vehicle speeds will not exceed 60 km/h in the construction corridor or 5 km/hr in active construction areas.	Construction Contractor
	Vehicle drivers and construction personnel will arrange translocation (by authorised handlers) of fauna observed in construction area.	Construction Contractor
Habitat trees	A survey of the vegetation proposed to be cleared on the power station site will be surveyed during the 2008/2009 summer period (nesting season) to confirm the presence or otherwise of nesting and/or foraging habitat for Black Cockatoos.	Griffin Power
	Significant habitat trees of sufficient age to form nesting hollows for hollow-nesting birds and mammals will be marked by the fauna handling team in consultation with DEC regional staff, prior to clearing. Marked trees will not be felled except where they materially interfere with construction of the power station expansion or pipeline, or are a safety concern. All habitat trees identified for felling within DEC managed estate will require signoff by the local DEC district representative.	Construction Contractor
	Fauna handlers to inspect habitat trees for fauna immediately prior to felling and will be present during felling to translocate fauna as required.	Construction Contractor
	Prune habitat trees that overhang construction areas, rather than remove them, where practical.	Construction Contractor
	Any confirmed habitat trees to be impacted will be replaced by installation of artificial nesting boxes in appropriate nearby unaffected vegetated areas. This will be implemented through an expansion of the current nesting box replacement program associated with the adjacent Ewington mine development.	Construction Contractor
	Artificial nesting sites will be provided to a standard and in locations established in consultation with the DEC.	Construction Contractor
Pipe and trench inspections and fauna clearing	Pipes will be inspected prior to joining or welding and observed fauna removed by fauna handlers.	Construction Contractor
	Welded or joined pipeline sections will be capped at end of shifts to prevent fauna entry.	Construction Contractor
	Fauna shelters/refuges (eg: cardboard boxes, hessian bags, commercial egg cartons) will be placed in open trenches at intervals not exceeding 100 m unless alternative arrangements are agreed with DEC.	Construction Contractor
	Trench plugs and fauna exit ramps will be installed at both ends of trenches at intervals not exceeding 1200 m and ramp slopes are not to exceed 45° unless alternative arrangements are agreed to with DEC.	Construction Contractor

[1] Bell holes are constructed where pipe strings are joined, at valves, at major bends, at inlets for testing, at facilities crossings, and where ends are tied into the pump station at the power station site and marine outfall. Bell holes are usually benched and have ramped access points that enable personnel to enter the trench but also provide points for entrapped wildlife to leave the trench. Bell holes will generally be regularly spaced along the pipeline.

Aspect	Action	Responsibility
	Trenches left open overnight will be inspected and cleared by fauna handling teams by 5 hrs after sunrise.	Construction Contractor
	Trench inspections procedures will ensure inspection of the entire base of the trench, with attention to evidence of burrowing reptiles, and inspection of all shelters/refuges.	Construction Contractor
	Open trench lengths will not exceed lengths capable of being practically inspected and cleared in accordance with this plan by the available fauna teams at any time.	Construction Contractor
	In all conservation areas and in vegetated bushland areas, trenches will not be left open during construction breaks that exceed three days duration.	Construction Contractor
	Trench will be inspected by construction contractor and cleared by a fauna handler half an hour prior to backfilling.	Construction Contractor
	The open trench in the immediate vicinity of the pipe to be lowered-in will be checked for fauna prior to lowering in.	Construction Contractor
Wet trenches	Daily checks of Bureau of Meteorology weather forecasts will be undertaken. In the advent of an adverse weather forecast, the contingency action (Section 6.4) will be implemented.	Construction Contractor
	The occurrence of water in trenches will be managed by taking action to avoid the development of any individual water bodies longer than 100 m in length[2].	Construction Contractor
	Where a trench contains water and is not dewatered, the trench will not remain open for longer than 7 days, except within wetlands and environmentally sensitive areas where it will not remain open for longer than 48 hours.	Construction Contractor
Records	Records will be kept of all trench open locations, all inspections and fauna interactions, including species identification and actions taken. Copies of all daily and weekly records required under Table 6.4 will be passed to Griffin Power weekly, within three days of the end of the relevant week.	Construction Contractor

6.3.3 Monitoring

Monitoring of fauna interactions should be undertaken as set out in Table 6.4.

Table 6.4 Monitoring program for fauna management

Parameter(s)	Source	Frequency/timing	Purpose
Trench open lengths and locations (trench start and end locations by KP points).	All open trenches.	Daily	To demonstrate compliance with time limits on open trenches.
Vehicle interactions.	All access and construction roads.	As occurs	To record incidences of vehicular contact with fauna.
Habitat tree removal.	All access and construction roads.	During clear and grade	To record removal of fauna habitat.
Fauna entrapment incidents and actions taken.	Pipes prior to joining or welding. Open trenches.	Daily	To record fauna entrapment and clearing incidents.

[2] Use of soil "islands" or floating refuges would be an acceptable method of managing water body lengths in situations where dewatering of the trench is not to be undertaken.

Parameter(s)	Source	Frequency/timing	Purpose
Reports on fauna inspections, interactions, mortalities, opportunistic sightings and all actions taken.	All construction areas.	Weekly	To advise DEC.

6.4 CONTINGENCIES

Actions to be followed as contingency actions in the event of an incident are set out in Table 6.5.

Table 6.5 Contingencies for fauna management

Trigger	Action	Responsibility
Weather forecast indicating rainfall sufficient to cause substantial flooding of trench and drowning of entrapped fauna	Backfill all lengths of trench with potential to be flooded, with trench inspection and fauna clearing undertaken immediately prior to backfilling. The decision on whether the trench should be backfilled will be undertaken in consultation with the local regional office of the DEC.	Construction Contractor
High levels of mortality (in excess of threshold to be determined)	Advise DEC as soon as practically possible in order to determine a possible cause and implement appropriate and timely contingency measures. Response measures will include modifications to escape structures/shelters and clearance arrangements.	Construction Contractor
Death of any *Wildlife Conservation Act 1950* or EPBC Act listed species	Advise DEC regional staff as soon as practically possible.	Construction Contractor
Injured animals	Injured animals will be reported to the fauna team in the first instance and assessed to determine whether translocation, transfer to wildlife carer or euthanasia is the required action, and that action will be implemented. If the injured fauna is of conservation significance, the regional DEC office will be advised.	All drivers

6.5 FAUNA TEAMS

Fauna inspection and handling will only be undertaken by teams of a minimum of two people. At least one person in each team must be able to demonstrate experience to the requirements of the DEC in the following:

- fauna identification, capture and handling (including venomous snakes)
- identification of tracks, scats, burrows and nests of conservation significant species (i.e. mulgara or malleefowl)
- assessing injured fauna for suitability for release, rehabilitation or euthanasia
- familiarity with the ecology of the species that may be encountered in order to be able to appropriately translocation fauna encountered.
- interacting with venomous snakes.

The fauna team should have access to an experienced zoologist or veterinarian for consultation on fauna handling matters and to perform euthanasia and fauna vouchering as required.

Basic fauna handling training is to be provided to all other members of the fauna handling team who do not possess the above experience. The fauna handling training will be developed in consultation with the DEC. This training is to be provided before the team members are employed in fauna inspection or clearing activities.

Fauna handlers will be equipped with a hoop-bag for capturing animals, a snake jigger, and means of inspecting fauna shelters without the need to enter the trench.

Fauna handling will only be undertaken by an experienced member of any fauna team, or under the direct supervision of an experienced fauna handler.

6.6 CAPTURE, TRANSLOCATION AND RELEASE

Where animals are to be captured for immediate translocation, this will be done in a manner that will minimise stress and risk of injury to both the animal and the handler. Translocation will be immediate to suitable habitat at a suitable distance from the disturbance, on advice from an experienced zoologist.

There may be a trade-off between distance from disturbance (and, therefore, chance of re-encounter) and habitat or species requirements (and, therefore, species' survival). For small species, species with small home ranges, or species that have reasonably specific habitat requirements, this may mean that the optimum release point is near the point of disturbance. For example, species from rocky habitats need to be released in rocky habitats even if these lie only 20 – 30 m from the pipeline route.

For large species, species with broad home ranges, or species that have broad/general habitat requirements, the release point could be over 100 m from the pipeline route. In uniform habitat, practicality may determine the appropriate release distance. A suitably experienced zoologist with a sound working knowledge of fauna ecology and requirements will be responsible for the management of this process. They will also be responsible for deciding if an injured animal should be released, treated, or euthanased.

7. WASTE MANAGEMENT PLAN

This plan applies to construction of the power station generating units and marine outfall pipeline components of the Proposal.

This plan has been prepared to ensure that all waste materials generated during construction of the Bluewaters Power Station Phase III and IV Expansion are responsibly handled, stored and disposed of to maximise resource recovery and minimise the potential for contamination.

7.1 ENVIRONMENTAL RISKS

Waste generated from the construction of the Bluewaters Phase III and IV Expansion is likely to include:

- scrap metal
- general building rubbish
- waste soil from excavations
- waste concrete
- waste oils and solvents
- general office waste/rubbish
- packaging wastes
- controlled wastes, including on-site sewage and used tyres.

If not managed effectively, the on-site storage and use and disposal of construction wastes have the potential to result in the following impacts:

1. Wind-blown litter from the site may affect amenity and hygiene of the local area in the absence of appropriate housekeeping practices.
2. Localised contamination of surficial soil on the Bluewaters Phase III and IV Expansion construction site and pipeline corridor.
3. Potential contamination of natural drainage features or surface water in the vicinity of the project area and pipeline corridor, including downstream environmental impacts if not contained.
4. Inefficient consumption of waste materials that could otherwise be re-used or recycled to minimise net waste generated.

7.2 APPLICABLE LEGISLATION

Griffin Power employees and contractors will comply with all Commonwealth and State legislation that applies to the Bluewaters Power Station Phase III and IV Expansion. Legislation relevant to waste management is summarised in Table 7.1.

Table 7.1 Relevant legislation for waste management

Relevant Legislation	Scope	Administering Body
Environmental Protection Act 1986	Part IV defines the process of referral and assessment of proposals subject to formal assessment under the EP Act. Works Approvals and Licences are issued under Part V of the EP Act.	DEC and EPA
Environmental Protection Regulations 1987	Part III - General control of pollution (administration, works approval, licensing & registration of prescribed premises); Part VI - Disposal of tyres.	DEC
Environmental Protection (Rural Landfill) Regulations 2002	Applicable to the construction and management of registered Putrescible Landfill Sites with a design capacity of more than 20 but less than 5000 tonnes per year (i.e. prescribed premises category 89).	DEC and EPA
Environmental Protection (Controlled Waste) Regulations 2004	Obligations relating to the transportation and disposal of 'controlled' (generally hazardous) wastes. Controlled wastes listed in Schedule 1 of the Regulations.	DEC and EPA
Environmental Protection (Unauthorised Discharges) Regulations 2004	Defines materials that must not be burnt or discharged into the environment.	DEC and EPA
Waterways Conservation Act 1976	Conservation and management of waters and the associated land and environment.	Department of Water
Litter Act 1979	Defines actions legally considered as littering and associated penalties	Keep Australia Beautiful Council
Health Act 1911	Regulates the use of apparatus for the treatment and disposal of sewage	Department of Health, and local authority
Health (Treatment of Sewage and Disposal of Effluent and Liquid Waste) Regulations 1974	Applicable to the construction or installation of apparatus for the treatment of sewage and disposal procedures	Department of Health, and local authority

7.3 MANAGEMENT PROGRAM

7.3.1 Environmental objectives and key performance criteria

Waste from the construction of the Proposal will be managed to meet the environmental objectives as set out in Table 7.2.

Table 7.2 Environmental objectives and performance indicators for waste management

Issue	Environmental Objective	Performance Indicator
Contamination	Manage all wastes so as to minimise potential contamination to the receiving environment.	Compliance with all legislation and regulatory requirements for waste management.
Waste minimisation	Maximise reduction, recycling and reuse of waste materials.	Volume of construction wastes generated, recycled and/or re-used.

7.3.2 Management actions

During the construction phase, the Contractor will be responsible to ensure that responsible disposal and minimisation of waste is carried out. All personnel will be advised of the waste management and disposal procedures outlined below during the site induction and prior to commencing work.

The management actions to be implemented are set out in Table 7.3.

Table 7.3 Management actions for waste

Aspect	Action	Responsibility
Records	The Construction Contractor will maintain a record on site of the types and quantities and destinations of all waste material taken off-site during construction (see Table 7.4).	Construction Contractor
Waste storage	Where practicable, timber, scrap-metal, bricks and other major recyclable wastes will be segregated and stored in safe, secure areas away from drains, prior to re-use or collection by recycling contractors. Construction wastes that are not suitable for reuse but can be recycled will be temporarily stored on-site in dedicated and secure skips prior to reuse.	Construction Contractor
Waste minimisation	Construction waste that requires disposal will be minimised by accurately calculating materials brought to the site and limiting materials packaging where appropriate.	Construction Contractor
Recycling	Waste paper and cardboard will be collected and prepared for removal by a paper recycler.	Construction Contractor
Non-recyclable wastes	Non-recyclable wastes (Class I, II) will be transported by licensed contractor to the local landfill site at Collie. Any Class III-IV waste will be transported offsite to an appropriate waste management facility by a licensed contractor. Regulated wastes will not be sent for disposal at any facility without prior written consent from the facility operator.	Construction Contractor
Waste oils	Waste oils will be stored in a suitable bunded facility (which complies with Australian Standard 1940), prior to collection by a licensed waste contractor for recycling.	Construction Contractor
Sewage	Sewage generated during construction will be handled by an on-site package treatment plant or approved portable toilet facilities in the case of the pipeline and outfall construction. Approval will be sought for the package treatment plant from the local Shire and will meet the requirements of the *Health Act 1911*. Waste from portable toilet facilities will be disposed of by a licensed contractor.	Construction Contractor
Controlled wastes	Any controlled waste that may be generated during construction works will be handled and transported in accordance with the Environmental Protection (Controlled Waste) Regulations 2004.	Construction Contractor
Hazardous materials	Loading and unloading of potentially hazardous materials will only be undertaken in designated areas in a manner that minimizes potential for spillage or loss. Prior to hazardous materials arriving on site users will be trained in contingency actions and spill clean-up protocols as necessary. Bulk transfers of fuels and/or chemicals on-site will be supervised (see Hazardous Materials Management Plan (Section 9).	Construction Contractor
Storm water	Storm water management requirements are defined in the Water Management Plan (Section 8)	Construction Contractor

7.3.3 Monitoring

Monitoring of waste management should be undertaken as set out in Table 7.4.

Table 7.4 Monitoring program for waste management

Parameter(s)	Source	Frequency	Purpose
Waste storage and handling	Waste storage containers	Daily	To confirm all wastes are handled, segregated and stored in dedicated areas.
All wastes removed from the site, recording: • date and time • quantity • type of waste removed • details of waste transporter and/or disposal/recycling operator • intended treatment/disposal destination of waste.	Waste manifest	All waste movements	To enable a review of management practices for effectiveness in maximising re-use/recycle of materials where practicable.

7.4 CONTINGENCIES

Actions to be followed as contingency actions in the event of an incident are set out in Table 7.5.

Table 7.5 Contingencies for waste management

Trigger	Action	Responsibility
Any non-compliant incidents of site waste management practices, including unauthorised removal of wastes from the premises	Investigate cause.	Construction Contractor
	Report to the Site Manager Griffin Power, including actions taken to rectify the situation.	Construction Contractor
	Determine and implement any remedial action in consultation with the DEC.	Construction Contractor
	Review waste management procedures	Construction Contractor
	All incidents will be reported to the appropriate authorities.	Griffin Power

8. WATER MANAGEMENT PLAN

This plan only applies to construction of the power station generating units component of the Proposal.

8.1 ENVIRONMENTAL RISKS

Surface water

Construction activities may increase surface water and sediment run-off to nearby rivers and/or wetlands. There is also a possibility that water could be contaminated with chemicals/hydrocarbons used during construction and flow off-site and enter the local surface drainage.

Wastewater discharges from the Bluewaters Power Station site, along with hazardous or contaminating materials used during its construction or operation, could represent a potential threat to the quality of the regional surface water resources.

Indirect loss of vegetation may occur due to an interruption of existing surface water flows. There are no major drainage channels that occur within the Bluewaters Power Station site and impacts on surface hydrology are likely to be restricted to sheet flow movement. Possible impacts on vegetation related to changes in sheet flow are as follows:

- ponding of water resulting in flooding of vegetation
- drainage shadow effects (construction may result in drainage shadow on the lower slope of the area)
- scour and erosion.

Groundwater

There will be no substantial use of groundwater during construction. Water will be used mainly during operations and would be used in the cooling process and the disposal of saline water via the saline water pipeline, resulting in an increase in the net export of water from the system. This is discussed in the Operations Environmental Management Plan for the project.

The construction of the Bluewaters Power Station Phase III and IV Expansion has the potential to affect the quality of groundwater in the following ways:

- run-off from cleared areas
- contamination from hydrocarbons and other chemicals used on site.

8.2 APPLICABLE LEGISLATION

Griffin Power, its employees and contractors will comply with all Commonwealth and State legislation that applies to the Bluewaters Power Station Phase III and IV Expansion. Legislation relevant to management of water is summarised in Table 8.1.

Table 8.1 Relevant legislation for water management

Relevant Legislation	Scope	Administering Body
Environmental Protection Act 1986	Part IV defines the process of referral and assessment of proposals subject to formal assessment under the EP Act. Works Approvals and licences are issued under Part V of the EP Act.	Department of Environment and Conservation and Environmental Protection Authority
Waterways Conservation Act 1976	Conservation and management of waters and the associated land and environment.	Department of Water
Rights in Water and Irrigation Act 1914	Regulates water issues with respect to water supply.	Department of Water
Country Areas Water Supply Act 1947	Regulates supply of water to country areas.	Department of Water

In addition, the following guidelines were used:

- Department of Environment (Feb 2004) – Stormwater Management Manual for Western Australia
- State Water Quality Management Strategy (2001).

8.3 MANAGEMENT PROGRAM

8.3.1 Environmental objectives and key performance criteria

The potential water resource impacts resulting from the construction of the Proposal will be managed to meet the environmental objectives as set out in Table 8.2.

Table 8.2 Environmental objectives and performance indicators for water management

Issue	Environmental Objective	Performance Indicator
Water quality	Maintain or improve the quality of surface water and groundwater to ensure that existing and potential users are not adversely affected.	No adverse change to surface water quality as a result of construction activities.
Environmental values	Maintain the integrity, functions and environmental values of rivers, creeks, wetlands and estuaries.	No adverse change to water dependent environmental values as a result of construction activities.
Water quantity	Maintain sufficient quantity of surface and groundwater so that existing users are protected.	No adverse change to water availability to existing surface and groundwater users as a result of construction activities.
Water use	Minimise water consumption and maximising reuse.	Minimum water demand from natural sources, consistent with efficient construction.

8.3.2 Management actions

Storm water will be treated within the development site using a treatment train approach. The following sections describe the proposed planning and structural management practices and the context for use at this site.

The laydown area for construction materials will occur adjacent to the construction site. The laydown area lies on a ridge. Currently the area and its surrounds are generally cleared, grassed paddocks. While an access road will be constructed through the site, there will be no other earthworks carried out to prepare the laydown area. Preparation will comprise mowing of the paddock grasses to maintain soil coverage and to minimise fire risk. Runoff from the site will flow overland to the paddocks surrounding the laydown area on three sides. The paddocks will act as riffles, to slow flow and to filter sediments and other pollutants.

The runoff rate from the laydown area will increase marginally due to the reduction in grass density and some compaction of the natural soils from construction traffic. However, buffering of runoff from the site, through the perimeter riffles in the surrounding paddocks is expected to mitigate any changes to flows entering downstream watercourses.

Management Practices developed to control surface water at Bluewaters is considered to be consistent with the approaches fostered by the Department of Water) and outlined in the "*Stormwater Management Manual for Western Australia*" (Department of Environment 2004).

The management actions to be implemented are set out in Table 8.3.

Table 8.3 Management actions for water

Aspect	Action	Responsibility
Site design	The site will be designed to ensure that potential contaminants are not released into local surface water or groundwater.	Construction Contractor
	Earth worked areas will be graded to promote uniform runoff from the finished surface.	Construction Contractor
	As soon as practicable after completion of earthworks, any exposed disturbed areas will be stabilised or rehabilitated to minimise erosion, management may include the following; • batters and verges may be stabilised with seed/mulch or with matting • steeper sections of drains and swales may require drain blocks, riprap, fixed matting or revetment works for stabilisation.	Construction Contractor
	Runoff from the exposed earthworks will be collected and stored in shallow perimeter swale drains to facilitate sedimentation. Hay bales, which provide an effective filter medium for trapping sediments, may be used as temporary drain blocks in the steeper swales.	Construction Contractor
	Perimeter drains will be linked to one or more detention swales for further treatment prior to discharging water from site.	Construction Contractor
	Discharge points will be located to coincide with natural watercourses or with valley landforms where a natural watercourse could be expected.	Construction Contractor
	Excess water must pass through an oil trap prior too discharging off site. Any oily water collected by the trap will be pumped into a tanker and removed from site to an appropriate authorised, oily waste, disposal site.	Construction Contractor
	Where possible, excess treated water will be discharged as sheet flow across the undisturbed paddocks to the south and north of the power station site.	Construction Contractor
Washdown water	On-site washdown will be restricted to designated areas separated from the stormwater disposal system.	Construction Contractor
	Washdown water and water used in dust suppression will be collected and passed through sediment traps and oil separation systems, prior to transfer to settling ponds.	Construction Contractor
	Water will be conserved by eliminating leaks, minimising wash water used and turning off taps after use wherever possible	Construction Contractor

Aspect	Action	Responsibility
Runoff	Runoff from bulk fuel storage and fuel loading areas will be captured and treated. Fuel storage areas will be bunded in accordance with Australian Standard 1940. All rainfall runoff will be recovered and directed through an oil/water separator prior to appropriate disposal.	Construction Contractor
	Fuel unloading and loading areas will be sealed and graded to capture runoff. Runoff from this area will be directed also to an oil/water separator. Treated water from the oil/water separator will be appropriately disposed of.	Construction Contractor
	Where possible, road pavements will be unkerbed or flush kerbed to promote uniform runoff to the verge or adjacent perimeter swales.	Construction Contractor
	Where barrier or semi-mountable kerbing is required for traffic control and safety reasons, kerb breaks will be used to allow runoff to pass to the verge or swale. Runoff from pavements will generally flow across the verge, with infiltration excess collecting in detention swales running alongside the pavement areas.	Construction Contractor
	Runoff from coal stockpiles is expected to contain sediments but little else in terms of pollutants. Management for runoff from the stockpiles will be treated the same as for road pavements.	Construction Contractor
Hazardous materials	All potentially hazardous materials will be managed in accordance with the Hazardous Materials Management Plan (Section 9).	Construction Contractor
Training	All construction personnel will be trained in appropriate handling and storage requirements and spill clean-up requirements. This will be implemented via employee and contractor site inductions and ongoing awareness training.	Construction Contractor

8.3.3 Monitoring

Monitoring of water resource impacts should be undertaken as set out in Table 8.4.

Table 8.4 Monitoring program for water management

Parameter(s)	Source	Frequency/timing	Purpose
Groundwater levels.	Local monitoring bores.	Bi-annual (April and October).	To observe impacts on local groundwater levels.
Groundwater Quality: pH, EC and temperature TDS, TSS, DO, Na, K, Mg, Ca, Cl, SO_4, SiO_2, oil & grease, Al, Cd, Co, Cr, Cu, Fe, Pb, Mn, Ni and Zn.			To observe impacts on local groundwater quality.
Stream Flow Quality: pH, EC, temperature, TDS, TSS, DO, Na, K, Mg, Ca, Cl, SO_4, SiO_2, oil & grease, Al, Cd, Co, Cr, Cu, Fe, Pb, Mn, Ni and Zn,	Groundwater discharge zones: local tributaries to Collie River East Branch.		To observe impacts on local surface water levels.
All monitoring data. Interpreted impacts of the power station on the groundwater resources and downstream environments. Forecasts of future impacts and issues.	Annual Environmental Reporting.	Annual.	Preparation of reviews in the Griffin Power Annual Environmental Report that detail the operational and technical aspects of the impacts of construction on the local water resources.

8.4 CONTINGENCIES

Actions to be followed as contingency actions in the event of an incident are set out in Table 8.5.

Table 8.5 Contingencies for water management

Trigger	Action	Responsibility
Unexpected adverse change to local surface water quality, water dependent environmental values or water availability to existing surface and groundwater users.	Advise Department of Water (DoW) and DEC regional offices within 24 hours of becoming aware of change.	Construction Manager
	Investigate cause.	Construction Manager
	If cause relates to Bluewaters Power Station construction activities: • develop and implement remedial measures in consultation with DoW and DEC regional offices, where practical to do so. • revise construction procedures to avoid further impacts.	Construction Manager
	If cause does not relate to Bluewaters Power Station construction activities, advise Department of Water and Department of Environmental Conservation regional offices.	Construction Manager

9. HAZARDOUS MATERIALS MANAGEMENT PLAN

This plan applies to construction of the power station generating units component of the Proposal.

This Plan has been prepared to ensure that construction of the Bluewaters Power Station Phase III and IV Expansion is undertaken in a responsible manner, to ensure that oils, chemicals and other hazardous materials to be used or stored on-site are effectively managed to minimise potential for contamination.

9.1 ENVIRONMENTAL RISKS

Limited quantities of chemicals will be stored on site for use during the construction of the Bluewaters Power Station Phase III and IV Expansion. These substances will include:

- some fuels including distillate – storage of up to 10,000 L
- oil and greases – in containers of 20 or 200 L capacity
- paints and degreasers – typically in 5 or 10 L drums
- solvents - in 5 or 10 L drums.

A range of chemicals will be utilised on-site during pre-commissioning and boiler chemical cleaning.

If not managed effectively, the on-site storage and use of chemicals, hydrocarbons or other hazardous materials has the potential to result in the following impacts:

1. Leaks and spills of chemicals/hydrocarbons may result in localised contamination of surficial soil on the power station construction site.
2. Potential contamination of natural drainage features or surface water in the vicinity of the project area, including downstream environmental impacts if not contained.
3. A vessel rupture or spill potentially could create flammable or toxic hazards, which poses both a safety and environmental risk.

9.2 APPLICABLE LEGISLATION

Griffin Power, its employees and contractors will comply with all Commonwealth and State legislation that applies to the Bluewaters p Power Station Phase III and IV Expansion. Legislation relevant to management of spills and hazardous materials is summarised in Table 9.1.

Table 9.1 Relevant legislation for hazardous materials management

Relevant Legislation	Scope	Administering Body
Dangerous Goods Safety Act 2004 and regulations	Regulates the manufacture, use and storage of dangerous goods.	Department of Consumer and Employment Protection
Environmental Protection Act 1986	Part IV defines the process of referral and assessment of proposals subject to formal assessment under the EP Act. Works Approvals and licences are issued under Part V of the EP Act.	Department of Environment and Conservation and Environmental Protection Authority

Relevant Legislation	Scope	Administering Body
Environmental Protection (Controlled Waste) Regulations, 2004	Regulates the transport of controlled wastes that may cause environmental or health risks. Controlled Waste is defined as all liquid waste, and any waste that cannot be disposed as a Class I, II or III landfill site. Controlled Waste also includes asbestos, clinical or related waste, tyres and waste that has been immobilised or encapsulated.	Department of Environment and Conservation
Waterways Conservation Act 1976	Conservation and management of waters and the associated land and environment.	Department of Water

Other relevant standards and guidelines include:

- Australian Standard 1940 – 1993 for the Storage and Handling of Flammable and Combustible Liquids
- Australian Standard 3780-1994 for the Storage and Handling of Corrosive Substances
- DoIR (DoCEP) Guidance Note S301 "Storage of Dangerous Goods Licensing and Exemptions"
- DoIR (DoCEP) Guidance Note S305 "Storage of Dangerous Goods – General Requirements for Premises Exempt from Licensing"
- Australian Code of Practice for the Transport of Dangerous Goods by Road and Rail (Advisory Committee on the Transport of Dangerous Goods 1998).

9.3 MANAGEMENT PROGRAM

9.3.1 Environmental objectives and key performance criteria

Hazardous materials associated with the construction of the Proposal will be managed to meet the environmental objectives as set out in Table 9.2.

Table 9.2 Environmental objectives and performance indicators for hazardous materials management

Issue	Environmental Objective	Performance Indicator
Compliance with standards and legislation	To store, handle and transport dangerous goods in accordance with dangerous goods legislation and Australian Standards.	Compliance with all relevant legislation and industry standards.
Best practice control	To achieve best-practice environmental control of the prevention and management of spills and release of hazardous materials.	No significant spillage of chemicals, hydrocarbons or other hazardous materials to occur during construction.
Spill management	To manage the purchase, transport, storage and disposal of chemicals and oil and prevent the uncontrolled release of chemicals or oil to the environment.	Number of spills recorded during construction phase.

9.3.2 Management actions

The management actions to be implemented are set out in Table 9.3.

Table 9.3 Management actions for hazardous materials

Aspect	Action	Responsibility
Storage and containment	Potentially contaminating materials will be stored in accordance with relevant regulatory requirements and standards. These substances will be stored in a manner that minimises the likelihood of release to the environment. Dangerous Goods that are stored may require to be licensed by the Dangerous Goods Safety Branch of DoCEP (a dangerous Goods Licence issued after an application illustrates that proposal will meet Australian Standards (AS) and Regulatory requirements).	Construction Contractor
	Hazardous materials will be transported, stored and handled according to WorkSafe regulations	Construction Contractor
	Corrosive materials will be stored and handled in accordance with Dangerous Goods Regulations	Construction Contractor
	Large quantities of chemicals and hydrocarbons will be stored to meet the requirements of AS 1940, which will include the following; • chemicals and hydrocarbons will be located in bunded compounds so at least 100% of the capacity of the largest tank plus at least 10% of the second largest tank is contained • chemicals stored in drums will be bunded to contain at least 25% of the maximum stored quantity of chemicals • areas will be designated to store hazardous materials, and any runoff will be designed to control flow away from those areas • waste chemicals and hydrocarbons will be stored in appropriate compounds prior to removal from site for recycling by approved contractors.	Construction Contractor
MSDS and records	Material Safety Data Sheets (MSDS) will be kept in a register at the site office along with a copy located near the chemical storage facility. Records will be kept on existing inventory, storage location, personnel training and disposal of waste for any hazardous materials used on site	Construction Contractor
	A manifest will be kept by the Construction Contractor on current inventory (including storage location, volumes, types of chemicals and receipt date), personnel training and disposal of waste for all hazardous materials used on site. These records will be reviewed regularly.	Construction Contractor
Spill response	Mobile spill kits will be available on-site to ensure a rapid response in the event of a hydrocarbon or chemical spill.	Construction Contractor
	All relevant construction personnel will be trained in appropriate handling and spill clean-up requirements.	Construction Contractor
	Containment of any spillages or leakage will be a priority, and spills will be cleaned up immediately by the Contractor.	Construction Contractor
	An emergency response plan will be prepared and implemented to enable a rapid response in the event of a significant spill or loss of potentially contaminating material.	Construction Contractor

Aspect	Action	Responsibility
	Should an incident occur that results in the uncontrolled release of potentially contaminating substances, or breach of regulatory standards and/or industry standards in relation to chemical and oil management, the following corrective actions will be undertaken as appropriate: 1. Contain and clean up spill material immediately and remediate. Contaminated material will be appropriately disposed of in accordance with regulatory and local Shire requirements. 2. All incidents and near misses involving dangerous goods will be reported to Griffin Power within 12 hours, who will notify the regulatory authorities as required. 3. Inspect bunds and carry out necessary repairs to ensure they are maintained in good working condition, and bund plugs are secure. Inspections will be routinely undertaken on a regular (daily) basis. 4. Regular Inspections will be carried out to ensure all chemicals and hazardous materials are located in appropriately bunded or approved storage areas. Any non compliance will be reported to Griffin Power within 12 hours, who will notify regulatory authorities if required.	Construction Contractor

9.3.3 Monitoring

Monitoring of hazardous materials management should be undertaken as set out in Table 9.4.

Table 9.4 Monitoring program for hazardous materials management

Parameter(s)	Source	Frequency/timing	Purpose
Hazardous material storage	Bulk and packaged chemical containers, bunded areas and waste oil storage areas.	Weekly	To ensure compliance with regulatory requirements.
Soil and surface water samples	Affected soil and water	In the event of a major spill with potential for off-site contamination.	To assess potential impacts of spill.

9.4 CONTINGENCIES

Actions to be followed as contingency actions in the event of an incident are set out in Table 9.5.

Table 9.5 Contingencies for hazardous materials management

Trigger	Action	Responsibility
Spill occurs	Implement spill response management actions as set out in Table 9.3 (Spill response).	Construction Contractor
	Monitor soil and surface water in accordance with contingency plan if spill has potential for off-site contamination.	Construction Contractor
	Investigate cause of spill.	Construction Contractor
	Revise hazardous material storage and handling procedures.	Construction Contractor

10. FIRE MANAGEMENT PLAN

This plan applies to construction of the power station generating units and marine outfall pipeline components of the Proposal.

10.1 ENVIRONMENTAL RISKS

The construction and operation of the Bluewaters Power Station Phase III and IV Expansion presents a minimal fire risk to the State forest, south of the site and adjacent to the marine outfall pipeline alignment.

10.2 APPLICABLE LEGISLATION

Griffin Power employees and contractors will comply with all Commonwealth and State legislation that applies to the Bluewaters Power Station Phase III and IV Expansion. Legislation relevant to fire management is summarised in Table 10.1.

Table 10.1 Relevant legislation for fire management

Relevant Legislation	Scope	Administering Body
Bush Fires Act 1954	Management of fire safety	Local Government Authority

10.3 MANAGEMENT PROGRAM

10.3.1 Environmental objectives and key performance criteria

Uncontrolled fire impacts from the construction of the Proposal will be managed to meet the environmental objectives as set out in Table 10.2.

Table 10.2 Environmental objectives and performance indicators for fire management

Issue	Environmental Objective	Performance Indicator
Prevent fires	To prevent fires occurring as a result of construction activities.	No construction related fires.

10.3.2 Management actions

The management actions to be implemented are set out in Table 10.3.

Table 10.3 Management actions for fire

Aspect	Action	Responsibility
Hot work	All hot work, cutting, grinding and welding must only commence after Hot Work Permit approval has been obtained.	Construction Contractor
Firebreaks	Maintenance of a firebreak around the property boundary.	Construction Contractor
Fire fighting	Ensuring sufficient water supply for firewater purposes. Water can be readily sourced from the Ewington mine void.	Construction Contractor
	All vehicles associated with the pipeline construction will be fitted with dry chemical extinguishers (light vehicles with 1 kg units, trucks etc., with 9 kg units). All extinguishers will be tagged by an approved inspector prior to mobilisation.	Construction Contractor
	Fast attack vehicles will be provided and used in accordance with FESA requirements.	Construction Contractor
	Access to pump, hose and associated fire fighting equipment will be available at all times.	Construction Contractor
	A water cart (approx 4000-5000 litre capacity) with fire fighting capacity will be available for use within each pipeline spread.	Construction Contractor
	The service truck will be fitted with both a 9 kg foam extinguisher and a 9 kg chemical extinguisher.	Construction Contractor
Liaison	Liaison with FESA to confirm emergency response procedures in the event of a fire.	Construction Contractor

10.3.3 Monitoring

Monitoring of fire management should be undertaken as set out in Table 10.4.

Table 10.4 Monitoring program for fire management

Parameter(s)	Source	Frequency	Purpose
Occurrence of fires as a result of construction activities	Active construction areas.	As occurs	To determine if management measures are appropriate to prevent fires occurring as a result of construction activities.
Inspection	Active construction areas.	Opportunistic	To determine if management measures are appropriate to prevent fires occurring as a result of construction activities.

10.4 CONTINGENCIES

Actions to be followed as contingency actions in the event of an incident are set out in Table 10.5.

Table 10.5 Contingencies for fire management

Trigger	Action	Responsibility
Localised (small) fire incident	Extinguish fire. Determine the activity that caused the fire incident. Review fire management procedures and implement additional management measures as necessary to prevent another fire occurring.	Construction Contractor
Significant fire incident	Extinguish fire. Determine the activity that caused the fire incident. Review the fire management procedures and implement additional management measures as necessary to prevent another fire occurring. Advise stakeholders such as FESA, landholders and DEC.	Construction Contractor

11. NOISE MANAGEMENT PLAN

This Plan has been prepared to minimise noise emissions and comply with the Environmental Protection (Noise) Regulations 1997 during construction of the Bluewaters Power Station Phase III and IV Expansion.

11.1 ENVIRONMENTAL RISKS

Noise in the project area originates from coal mining and handling activities and from the nearby Collie Power Station (approximately 3 km to the east-south east from the Bluewaters Power Station site). The closest noise sensitive residence to the power station site is approximately 3 km to the north. The nearest residential location at the eastern edge of the Collie townsite is approximately 4 km to the south-west. The power station is located within the proposed Coolangatta Industrial Estate.

Typical ambient noise levels in the vicinity of the Bluewaters project area have been recorded to be highly variable. Monitoring undertaken at the corner of Williams-Collie Road, approximately 3 km north of the Bluewaters Project area , in early 2005 showed background noise levels to be generally in the range of 25 to 55 dB(A) (HSA 2005).

Noise sources from the construction activities include the following:

- civil works involving earth moving machinery and compaction equipment;
- cranes and other construction machinery;
- power tools and compressors;
- vehicle movements;
- pile driving;
- plant commissioning; and
- other construction activities.

The assigned noise levels in the Environmental Protection (Noise) Regulations 1997 (Noise Regulations) do not apply to construction activities carried out between 0700 and 1900 hours on any day except Sunday and public holidays provided:

- construction work is carried out in accordance with Section 6 of the Australian Standard 2436-1981 “Guide to Noise Control on Construction, Maintenance and Demolition Sites”
- the equipment used is the quietest reasonably available.

Power station

Noise generated during construction of the power station is not expected to have a significant impact on surrounding land uses due to the distance to the nearest receptors from the site.

The primary source of noise on the power station site will originate from pile driving, which will be required for a period of approximately 18 weeks. The intended operating hours for the construction project are Monday to Saturday – 0700 and 1900 hours. If construction is required to extend outside these hours, the local community will be informed and the Construction Contractor will prepare a noise management plan for approval by the relevant Local Government Authority.

Vibration is likely to originate during the construction phase through the use of compaction equipment and pile driving. However, given the distance between the site and the closest sensitive residence (3 km) it is unlikely that vibration will be a significant issue. Griffin Energy is not aware of any specific complaints relating to vibration during construction of the Bluewaters Power Station Phases I and II.

Noise will be noticeable to some highly mobile fauna species such as macropods and birds. For the majority of species it will act as a local deterrent in the immediate vicinity of the site.

Marine outfall pipeline

Some impacts on nearby receptors may be experienced by construction of the marine outfall pipeline. Noise emissions from the construction corridor will vary depending on the activity being undertaken (e.g. blasting, clearing and grading), with the duration that noise and vibration affect any one location limited by the progressive movement of the active construction areas (≈3 to 6 km per day.

Construction activities may result in minor increases in traffic noise on roads near the pipeline corridor, and may cause localised temporary disruption to fauna in areas adjacent to the corridor. However, increased noise emissions will be temporary and it is unlikely that the behaviour of fauna will be disrupted in the long term. Construction activities may also result in noise impacts on neighbouring residences.

The intended operating hours for the construction project are Monday to Saturday – 0700 and 1900 hours. If construction is required to extend outside these hours, the local community will be informed and the Construction Contractor will prepare a noise management plan for approval by the relevant Local Government Authority.

Vibration may result from blasting, compaction, excavation and the movement of equipment within the corridor, with blasting and compaction likely to result in the greatest potential for impact. Significant levels of vibration have the potential to damage buildings adjacent to the pipeline corridor. As with noise, vibration may result in localised temporary disruption to fauna in areas adjacent to the corridor disturb fauna, although the increased emissions will be temporary and as such it is unlikely to result in long-term disruption to the behaviour of fauna. Blasting for construction of the marine outfall may have significant impact on marine mammals (discussed in the Marine Outfall Construction Management Plan [Section 14]).

Vibration due to compaction of the backfilled trench is unlikely to be a significant issue as the required compaction will be achieved through the driving of rubber wheeled vehicles along the trench in favour of plate and other vibratory based compactors. Vibration impacts from the movement of heavy vehicles along the corridor will be managed through the operating hour limitations proposed to manage noise emissions, as vibration is unlikely to 'travel' as far as noise emissions.

Consequently, specific management is required to ensure compliance with relevant legislation, and to minimise the potential for noise and vibration associated with construction activities affecting residences adjacent to the corridor.

11.2 APPLICABLE LEGISLATION

Griffin Power employees and contractors will comply with all Commonwealth and State legislation that applies to the Bluewaters Power Station Phase III and IV Expansion. Legislation relevant to noise management is summarised in Table 10.1.

Table 11.1 Relevant legislation for noise management

Relevant Legislation	Scope	Administering Body
Environmental Protection Act 1986	Part IV defines the process of referral and assessment of proposals subject to formal assessment under the EP Act. Works Approvals and licences are issued under Part V of the EP Act.	Department of Environment and Conservation
Environmental Protection (Noise) Regulations 1997	The Environmental Protection (Noise) Regulations 1997 stipulate the allowable noise levels at any noise sensitive premises from other premises. Noise from construction works is covered by regulation 13 of the Environmental .Protection. (Noise) Regulations 1997.	Department of Environment and Local Government

11.3 MANAGEMENT PROGRAM

11.3.1 Environmental objectives and key performance criteria

Noise emissions from the construction of the Proposal will be managed to meet the environmental objectives as set out in Table 11.2.

Table 11.2 Environmental objectives and performance indicators for noise management

Issue	Environmental Objective	Performance Indicator
Compliance	Ensure that noise impacts emanating from construction activities comply with statutory requirements and acceptable (and appropriate) standards (e.g. Environmental Protection (Noise) Regulations 1997).	Compliance with all relevant legislation.
Noise impacts	Ensure that noise emissions during construction do not adversely affect the amenity of nearby residents.	No noise complaints associated with construction of the Proposal.
Vibration impacts	Ensure that vibration impacts resulting from construction activities for the Bluewaters development are acceptable.	No vibration complaints associated with construction of the Proposal.

11.3.2 Management actions

The management actions to be implemented are set out in Table 11.3. Management of blasting impacts on marine mammals is set out in the Marine Outfall Construction Management Plan (Section 14).

Table 11.3 Management actions for noise

Aspect	Action	Responsibility
Work scheduling	Schedule activities to avoid construction activities near residences being carried out: • on Sundays and public holidays • after 1900 and before 0700 hours on any other day unless the construction activities can comply with the assigned levels in the Environmental Protection (Noise) Regulations 1997 (Noise Regulations) or are managed in accordance with an approved Noise Management Plan.	Construction Contractor
Communications	Residents in proximity to construction works will be advised of the proposed working schedule.	Construction Contractor
Equipment	All construction equipment will be regularly inspected and maintained in good working condition.	Construction Contractor
Standards	Construction work will be carried out in accordance with Section 6 of the Australian Standard 2436-1981 "Guide to Noise Control on Construction, Maintenance and Demolition Sites".	Construction Contractor
Blasting	Blasting will only be carried out during daylight hours. Marine blasting will be in accordance with the Marine Outfall Construction Management Plan (Section 14).	Construction Contractor

11.3.3 Monitoring

Monitoring of noise emission impacts should be undertaken as set out in Table 11.4.

Table 11.4 Monitoring program for noise management

Parameter(s)	Source	Frequency/timing	Purpose
Noise performance	Complaints register.	As complaints are received.	To provide a record of all noise complaints and associated follow up actions and outcomes.

11.4 CONTINGENCIES

Actions to be followed as contingency actions in the event of an incident are set out in Table 11.5.

Table 11.5 Contingencies for noise management

Trigger	Action	Responsibility
Receipt of public complaint regarding noise or vibration.	Investigate operations and activities to identify likely source of noise problem.	Construction Contractor
	If complaints are justified: • initiate corrective action if impact likely to continue if no action taken. • review construction procedures and modify to avoid future incidents	Construction Contractor
	Advise complainant of outcome of investigation and any follow up actions.	Construction Contractor
	Record incident in complaints register.	Construction Contractor
In the event of an incident or failure to comply with statutory or guideline noise criteria, one or more of the following corrective actions will be undertaken by the construction contractor.	Investigate operations and activities to identify likely source of noise problem.	Construction Contractor
	Measure sound power and pressure levels emitted from the equipment identified as the likely cause of the problem, and review possible mitigation techniques.	Construction Contractor
	Adopt or implement effective noise mitigation strategies, and report corrective action to Griffin Power.	Construction Contractor
	Record incident in complaints register.	Construction Contractor

12. SOIL MANAGEMENT PLAN

This plan only applies to the marine outfall pipeline construction component of the Proposal.

12.1 ENVIRONMENTAL RISKS

Topsoil is an important resource in easement rehabilitation as it provides nutrients, biomass and productivity for vegetation and contains a significant seed bank. Inappropriate soil management increases the risk of erosion, sedimentation, and mixing of the soil profiles, potentially resulting in environmental impacts on surrounding vegetation, waterbodies and residents.

Topsoil performs a vital role in rehabilitation processes, and the loss or contamination of topsoil (with subsoil) may reduce the success of rehabilitation efforts.

12.2 MANAGEMENT PROGRAM

12.2.1 Environmental objectives and key performance criteria

Potential soils impacts from the construction of the Proposal will be managed to meet the environmental objectives as set out in Table 13.3.

Table 12.1 Environmental objectives and performance indicators for soil management

Issue	Environmental Objective	Performance Indicator
Topsoil	Minimise change to soil profile from excavation activities.	No evidence of subsoil on surface (as detected by colour and texture) within construction corridor following backfill. No visual evidence of soil compaction following backfill and rehabilitation (e.g. hard soil, local water pooling).
Erosion	Prevent occurrence of soil erosion during and following construction.	The extent of soil erosion within the construction corridor during and within two years following construction is consistent with surrounding land. No visible soil erosion from construction corridor during or within three years following construction.

12.2.2 Management actions

The management actions to be implemented are set out in Table 13.4.

Table 12.2 Management actions for soil

Aspect	Action	Responsibility
Topsoil	The top 100-150 mm of topsoil will be removed from: • all areas to be subjected to excavation • all areas where spoil from excavations is to be stored • all areas where soil inversion or loss of topsoil is likely as a result of any activities associated with construction.	Construction Contractor
	Topsoil, including leaf litter will be stockpiled to one or either side of the corridor with breaks provided in the stockpiles to allow water and stock movement.	Construction Contractor
	The topsoil will be stockpiled in a manner so that it can be easily returned to the construction corridor during reinstatement.	Construction Contractor
	Graded topsoil will be stockpiled separately from cleared stockpiled ground cover vegetation and other excavated material (e.g. trench spoil, padding material, etc).	Construction Contractor
Beach sand	Beach or foredune sand excavated above high water will be stockpiled and protected from wind erosion and used to backfill trench across beach.	Construction Contractor
Stockpiles	Trench spoil (backfill soil) will be stockpiled separately from topsoil.	Construction Contractor
	Trench spoil stockpiles will be located immediately adjacent to the area from which soil was removed, except in major watercourses where trench spoil stockpiles may be located out of the watercourse, but as close as practically possible to the watercourse without impacting riparian vegetation	Construction Contractor
	Topsoil stockpiles will not be located where they have the potential to contribute to sedimentation of land or surface water.	Construction Contractor
	Stockpiles will be stored away from watercourse banks to reduce the impact on bank vegetation.	Construction Contractor
	Bank spoil will be stored to the side of the corridor and away from the riparian vegetation on the top of the riverbanks so as to minimise the disturbance to the riverbanks.	Construction Contractor
	Where possible, river overburden (sand) stockpiles will be located in open areas within the riverbed so as not to disturb existing riverbed vegetation. If this is not possible, it will be stockpiled away from stream banks, beds and riparian zones.	Construction Contractor
	Overburden (other than river overburden) will be stockpiled away from stream banks, beds and riparian zones.	Construction Contractor
	Stockpiles will not be graded across property boundaries. A break in the windrow will be maintained at property boundaries.	Construction Contractor
Erosion	Temporary and/or permanent soil erosion berms, drains and sediment barriers will be installed, where required, for erosion protection.	Construction Contractor
	Design of erosion and sediment control measures will consider site conditions such as wind, rainfall frequency and intensity, soil type, infiltration rates, gradient, catchment area, vegetation cover and condition.	Construction Contractor
Padding	Where practicable, pipeline padding material will be reclaimed from trench spoil.	Construction Contractor
	Imported pipeline padding material will be certified weed and disease free.	Construction Contractor
	Topsoil will not be used as backfill or padding.	Construction Contractor
	As much rock material as possible will be returned to the trench, without threatening the integrity of the pipe.	Construction Contractor
Rehabilitation	In the event that excavation (bell holes) or a drilling platform is required, topsoil will be cleared from the site and stockpiled separately from subsoil to allow the subsequent backfilling of soil in the correct horizons.	Construction Contractor

12.2.3 Monitoring

Monitoring of soil management should be undertaken as set out in Table 13.7.

Table 12.3 Monitoring program for soil management

Parameter(s)	Source	Frequency	Purpose
Erosion	Active construction areas	Opportune	Ensure that erosion control measures are effective.
Stockpiles	Stockpiles	Opportune	Ensure that separation of soil profiles is being observed. Ensure stockpiles are not impeding access to property or fauna.

12.3 CONTINGENCIES

Actions to be followed as contingency actions in the event of an incident are set out in Table 13.8.

Table 12.4 Contingencies

12.3.1 Contingency actions for soil management

Trigger	Action	Responsibility
Erosion	Investigate cause.	Construction Contractor
	Implement remedial action.	Construction Contractor

13. ACID SULPHATE SOIL MANAGEMENT PLAN

This plan only applies to the marine outfall pipeline construction component of the Proposal.

13.1 ENVIRONMENTAL RISKS

Acid sulphate soil is the common name for soil that contains iron sulphide or sulphide oxidation products. When acid sulphate soils (ASS) are exposed to air and water, the iron sulphides can oxidise to produce sulphuric acid, iron precipitates and groundwater with elevated concentrations of dissolved metals such as aluminium, iron and arsenic. Although these materials are typically benign when undisturbed in their natural environment, the dewatering, excavation and/or stockpiling of acid sulphate soils that lies below the naturally occurring watertable may promote the occurrence of these adverse environmental impacts.

Construction of the marine outfall pipeline will result in the excavation and dewatering of soils and could potentially result in the oxidation of ASS along the portions of the length of the pipeline. No ASS issues are expected to be related to the construction of the generator units at the Power Station site.

A desktop assessment (PB 2008) was undertaken to identify the potential areas where ASS were likely to be encountered during construction activities. The potential for occurrence of ASS within the proposed excavation footprint was assessed through the use of key indicators such as geology, wetlands, depth to groundwater and vegetation, and classified as HIGH (almost certain), MEDIUM (likely), MED-LOW (possible in isolated circumstances), and LOW (unlikely). The results of the desktop assessment are summarised in Table 13.1.

Table 13.1 Summary ASS sampling and analysis plan

ASS Risk Ranking	Km Length	No. Proposed Soil Bores	No. Proposed Monitor Bores	No. Proposed Field Tests	No. Proposed SPOCAS Analysis
Swan Coastal Plain					
LOW	3	0	0	0	0
MEDIUM to LOW	3	0	0	0	0
MEDIUM	3	6	1	66	12
HIGH	14	140	7	1540	308
Darling Plateau					
LOW	21	0	0	0	0
MEDIUM to LOW	11	0	0	0	0
MEDIUM	7	14	3	154	26
HIGH	1	10	1	110	22

13.2 APPLICABLE LEGISLATION

Griffin Power employees and contractors will comply with all Commonwealth and State legislation that applies to the Bluewaters Power Station Phase III and IV Expansion. Legislation relevant to ASS management is summarised in Table 10.1.

Table 13.2 Relevant legislation for ASS management

Relevant Legislation	Scope	Administering Body
Environmental Protection Act 1986	Part V includes provisions relating to the prevention of pollution and environmental harm. Acid generation could cause pollution and environmental harm.	Department of Environment and Conservation

13.3 MANAGEMENT PROGRAM

13.3.1 Environmental objectives and key performance criteria

Potential acid sulphate soils impacts from the construction of the Proposal will be managed to meet the environmental objectives as set out in Table 13.3.

Table 13.3 Environmental objectives and performance indicators for ASS management

Issue	Environmental Objective	Performance Indicator
Acidification and release of metals	To ensure that there are no adverse impacts to sensitive receptors as a result of the excavation and stockpiling of acid sulphate soils.	Groundwater and surface water quality near the pipeline is not degraded as a result of soil disturbance activities. No visual acid sulphate soil oxidation impacts result from the stockpiling of acid sulphate soils.

13.3.2 Management actions

The management actions to be implemented are set out in Table 13.4.

Table 13.4 Management actions for ASS

Aspect	Action	Responsibility
Acid Sulphate Soil Surveys	Pre-construction acid sulphate soil surveys will be undertaken in accordance with the methodology set out Section 13.3.3. Results will be included in the Environmental Line List (ELL) and specific management plans developed for handling soils in these areas.	Griffin Power
	No excavation or dewatering operations will commence on the pipeline until the pre–construction field survey is complete, site-specific management plans are approved by DEC and the ELL has been updated with the results of the survey.	Construction Contractor
	Acid sulphate soils will be managed in accordance with both this protocol and the DEC approved site-specific acid sulphate soil and dewatering management plans.	Construction Contractor
	Soils in the Low to Medium risk areas will be in-field tested at the time of excavation for field pH (pH_F) and field pH after oxidation with hydrogen peroxide (pH_{FOX}) at a rate of 1 sample per 200 m^3 of soil excavated.	Construction Contractor
Soil Treatment	Soils excavated from the LOW risk areas do not require active treatment or management.	Construction Contractor

Aspect	Action	Responsibility
	Soils excavated from the Low to Medium risk areas do not require active treatment or management unless in-field testing indicates that pH_F<4 and pH_{FOX}<3. If pH_F<4 and pH_{FOX}<3 then the soils will be: • underlain by a 0.1 m guard layer of aglime or equivalent before being re-emplaced in the trench, or • uniformly treated with sufficient neutralising agent using an alternative method approved by the DEC.	Construction Contractor
	Soils within the Medium and High risk areas that are confirmed to be potentially acid generating as evidenced by a sulphide content: for coarse sandy soils (clay content <5%) of 0.03%S, for sandy loam to light clay (clay content <40%) of 0.06%S and for clayey soils with clay content >40% of 0.1%S will, in the case of dry soils be uniformly treated with sufficient neutralising agent using an approved treatment method. Approved treatment methods include either of the following: 1. Prior to excavation of the trench, a layer of neutralising agent (aglime or lime sands) will be laid along the trench line, within the width of the expected excavation. The thickness of the neutralising layer will be based on the laboratory defined %S concentration with a 1.5 safety factor. Excavation of the trench will result in a blended stockpile. The blended stockpile should then all be placed into the trench during backfilling. 2. The excavated soil stockpile will be uniformly covered with the neutralising agent (aglime or lime sands) immediately upon excavation from the trench. The thickness of the neutralising layer will be based on the laboratory defined %S concentration with a 1.5 safety factor. The stockpile and covering layer should then all be placed into the trench during backfilling to result in a blended backfill. The amount of neutralising agent at any location will be based on the laboratory defined %S concentration with a 1.5 safety factor as set out in the ELL.	Construction Contractor
	Clays excavated from within the Medium and High risk areas that exhibit a sulphide content >0.03%S and <0.1%S will not require active treatment or management unless visual signs of sulphide oxidation arise during the stockpiling period.	Construction Contractor
Dewater treatment	Dewatering product from trenches will be treated prior to disposal as set out in the ELL.	Construction Contractor
Record Keeping	Records will be kept of the source, type and volume of neutralising agent supplied for the project. The Effective Neutralising Value (ENV) of the neutralising agent will be provided by the supplier and kept on record.	Construction Contractor
	Records will be kept of daily excavation lengths, neutralising rates and areas, and stockpile inspections.	Construction Contractor

NOTE: The above management actions only apply to acid sulphate soils that occur below the natural watertable.

13.3.3 Field investigation methodology

An investigation methodology based on the risk classification of acid sulphate soils being present along the pipeline route has been proposed as follows:

LOW: Site walkover at time of development. Where ground truthing indicates a deviation from the predicted occurrence, field analysis of pH_F and pH_{FOX} (pH after oxidation) at a rate of 1:200 m^3 to be undertaken at the time of investigation.

LOW TO MEDIUM: Site walkover and minor field pH testing at time of development. Field analysis of pH_F and pH_{FOX} (pH after oxidation) at a rate of 1:200 m^3 of excavated soil to be undertaken at the time of investigation.

MEDIUM: Soil bores to be installed at a frequency of 1 soil bore per 200 m. Field analysis of pH_F and pH_{FOX} (pH after oxidation) at 0.25 m intervals to be undertaken at the time of investigation. The highest risk soil sample from each bore to be sent for laboratory analysis for the Suspension Peroxide Oxidation Combined Acidity and Sulphur (SPOCAS) suite and 1 in every ten bores to be laboratory analysed for SPOCAS at 0.5 m intervals through the bore profile.

HIGH: Soil bores to be installed at a frequency of 1 soil bore per 100 m or one bore per area, whichever is greater. Field analysis of pH_F and pH_{FOX} (pH after oxidation) at 0.25 m intervals to be undertaken at the time of investigation. The highest risk soil sample from each bore to be sent for laboratory analysis for SPOCAS and 1 in every 5 bores or a minimum of 1 bore per area to be laboratory analysed for SPOCAS at 0.5 m intervals through the bore profile.

Table 13.5 summarises the proposed soil and groundwater sample and analysis plan for the pipeline along the Swan Coastal Plain. A soil bore depth of 2.5 m has been assumed for all bores; however, soil bores will be installed to 1 m below the proposed depth of pipeline excavation of 1.25 m.

Groundwater monitor wells will be installed to a depth of 5 m at 2 km intervals in those areas where groundwater is encountered.

Table 13.5 Summary sampling and analysis plan – Swan Coastal Plain

ASS Risk Ranking	No. Kilometres	No. Proposed Soil Bores	No. Proposed Monitor Wells	No. Proposed Field Tests[a]	No. Proposed SPOCAS Analysis
LOW	3	0	0	0	0
MEDIUM to LOW	3	0	0	0	0
MEDIUM	3	6	1	66	12
HIGH	14	140	7	1540	308

[a] Field tests to be conducted at time of excavation

Table 13.6 summarises the proposed soil and groundwater sample and analysis plan for KP21 to KP63. A soil bore depth of 2.5 m has been assumed for all bores; however, soil bores will be installed to 1 m below the proposed depth of pipeline excavation of 1.25 m.

Groundwater monitor wells will be installed to a depth of 5 m at 2 km intervals in those areas where groundwater is encountered.

Table 13.6 Summary sampling and analysis plan – Darling Scarp and Darling Plateau

ASS Risk Ranking	No. Kilometres	No. Proposed Soil Wells	No. Proposed Monitor Wells	No. Proposed Field Tests[a]	No. Proposed SPOCAS Analysis
LOW	21	0	0	0	0
MEDIUM to LOW	9	0	0	0	0
MEDIUM	9	18	4	198	30
HIGH	1	10	1	110	22

[a] Field tests to be conducted at time of excavation

13.3.4 Monitoring

Monitoring of ASS management should be undertaken as set out in Table 13.7.

Table 13.7 Monitoring program for ASS management

Parameter(s)	Source	Frequency/timing	Purpose
Sulphide oxidation	Stockpiles.	Daily.	To confirm that sulphide oxidation does not occur as a result of stockpiling activities.
pH_F and pH_{FOX}	MED-LOW risk areas.	1 sample per 200 m^3 of soil excavated.	To confirm that acid sulphate soils are not present.

13.3.5 Recording

Records will be kept of all areas where active acid sulphate soil management occurs. Records to be kept will include (where practicable): date, location (KP), datum (WGS84 or similar), volumes of neutralising agent used, volume of soil treated, soil type and photographic evidence of the soil management process to confirm adherence to the protocol. Results of any field testing and stockpile inspections undertaken will be recorded.

13.4 CONTINGENCIES

Actions to be followed as contingency actions in the event of an incident are set out in Table 13.8.

Table 13.8 Contingencies for ASS management

Trigger	Action	Responsibility
Unexpected soils	If any soil types are encountered in the Medium or High risk areas during the excavation works that are not representative of the material sampled during the acid sulphate soil investigation, these soils will be treated as acid generating and neutralised by layering with a neutralising material (aglime or lime sands) at 0.5 m intervals upon re-emplacement in the trench. The thickness of the neutralising layers will be 0.05 m/layer.	Construction Contractor
Unquantified Neutralising Agent	If the ENV of the neutralising agent is not provided by the supplier, 1 sample for every 500 m^3 of neutralising agent will be collected and analysed for Calcium Carbonate Equivalence by a NATA accredited laboratory to determine the ENV of the material.	Construction Contractor

14. MARINE OUTFALL CONSTRUCTION MANAGEMENT PLAN

This plan only applies to the marine outfall construction component of the Proposal.

The marine outfall is planned to be constructed by utilising a horizontal directional drilling technique through the coastal dunes system between Leschenault Inlet and the ocean beach and a temporary construction groyne across the beach to 3.5 m depth contour (using local limestone). The groyne would be removed at the end of the construction phase and the beach reinstated to natural condition. The outfall to the 4 m depth contour would be installed by excavating a trench in the groyne and installing the pipeline in the trench using excavators. The long section of the outfall would be chosen so that it was buried at least 2 m below the beach on the shore and buried to the 4 m depth contour, mounted on concrete blocks to avoid abrading on the seafloor during storms.

The HDPE pipeline will be welded into strings about 150 m long at a launching site (probably in Bunbury Harbour) and towed by a workboat to the outfall site floating on the ocean surface. The pipe strings will be lowered into the slots in the blocks and secured in position. Successive pipe strings will be joined by bolted flanged joints.

While the offshore pipeline is being installed, the air removal structure would be installed between the end of the dune borehole pipe and the outfall pipeline. The air removal structure would comprise a buried HDPE pipe of about 1 m diameter, with an air removal manifold. The structure would be buried well below the sand and encased in concrete.

After the outfall has been installed, tested and commissioned, the temporary groyne and beach access track would be removed. This can be done to the extent that the location of the new outfall is not visible and the beach is reinstated to the natural condition. The dune near the air removal structure would be planted with local indigenous plants to resist erosion.

14.1 ENVIRONMENTAL RISKS

Potential impacts identified as requiring management during marine construction are:

- smothering of marine flora and fauna with sediment from marine construction
- reduction of light to the seafloor due to suspended sediment from marine construction
- covering of seagrass with the concrete supports possibly resulting in loss of seagrass and habitat.

Disturbance to public access to the shore and adjacent waters will occur during construction of the outfall structure.

The major impact to marine mammals during the construction stage is likely to be noise. As it is not anticipated that any blasting or pile driving will be required to take place this risk is lessened. Other impacts may relate to turbidity, boats in the water and new objects placed on the seabed.

For large cetaceans, there may be some displacement from the immediate area of the pipeline if the area is being used as a calving area or migratory column. This would be unlikely to impact the recovery of the population. The area may provide feeding opportunities for small cetaceans with expected increase in fish life associated with installation of marine pipelines (Oceanica 2008).

14.2 APPLICABLE LEGISLATION

Griffin Power employees and contractors will comply with all Commonwealth and State legislation that applies to the Bluewaters Power Station Phase III and IV Expansion. Legislation relevant to management of construction of the marine outfall is summarised in Table 6.1.

Table 14.1 Relevant legislation for fauna management

Relevant Legislation	Scope	Administering Body
Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)	Protects matters of national environmental significance, including protected marine species.	Department of Environment and Heritage
Environmental Protection Act 1986	Part IV defines the process of referral and assessment of proposals subject to formal assessment under the EP Act.	Department of Environment and EPA
Wildlife Conservation Act 1950	Protection of rare and endangered flora and fauna.	Department of Conservation and Land Management

14.3 MANAGEMENT PROGRAM

14.3.1 Environmental objectives and key performance criteria

Impacts from the construction of the marine outfall component of the Proposal will be managed to meet the environmental objectives as set out in Table 14.2.

Table 14.2 Environmental objectives and performance indicators for marine outfall construction management

Issue	Environmental Objective	Performance Indicator
Biodiversity	To maintain the biodiversity within the geographical area and to ensure that any unavoidable impacts upon marine flora and fauna are minimised	Performance indicators used during construction may include seagrass health and turbidity. Criteria used to assess environmental performance during construction include the ANZECC/ARMCANZ guidelines (ANZECC/ARMCANZ 2000) and the Cockburn Sound State Environmental Policy (Government of Western Australia 2005).
Recreational access	To ensure that existing and planned recreational uses of the environment are not compromised	Conformance to *EPA Guidance No. 33: Environmental: guidance for planning and development.*

14.3.2 Management actions

The management actions to be implemented are set out in Table 14.3.

Table 14.3 Management actions for marine outfall construction

Aspect	Action	Responsibility
Seagrass	Construction will not occur during the autumn or winter months to minimise shading impacts on seagrass.	Construction Contractor
	Disturbance to the seabed will be restricted to the minimum width required for trenching and temporary storage of trench spoil.	Construction Contractor
	Trench spoil is to be replaced in the trench following laying of the outfall pipeline.	Construction Contractor
	Turbidity is to be continuously monitored during construction of the marine outfall, at sites to be determined. If turbidity exceeds a level (yet to be determined [this may be a percentage above a reference site or a fixed value]) then construction will be halted until the turbidity returns below the relevant level.	Construction Contractor
General	No fuel transfers will be undertaken on the beach or in the ocean.	Construction Contractor
Marine mammals and blasting	Construction will not occur during spring months to minimise impact on migrating and calving whales.	Construction Contractor
	If geotechnical investigations indicate that hard material is present that require blasting then a Blast Management Plan will be developed in consultation with the DEC and local government authority. The Blast Management Plan will include a prescribed distance beyond which no significant effect would be experienced by marine mammals, if present.	Construction Contractor
	Monitor presence of marine mammals if blasting is to be carried out and cease blasting if mammals present within prescribed distance of blast site either immediately prior to or during blasting operations.	Construction Contractor
Recreational access	Griffin Power will determine current recreational uses at the site and review potential impacts to existing recreational uses, including access to the coast and other recreational areas. Griffin Power will consult with relevant management agencies and user groups to assist with the evaluation of management strategies to mitigate impacts.	
	Construction activities that restrict beach access will be staged where practicable and/or alternative access will be provided. There will be ongoing management of vehicles in local dune system on-site.	Construction Contractor

14.3.3 Monitoring

Monitoring of construction of the marine outfall should be undertaken as set out in Table 14.4.

Table 14.4 Monitoring program for marine outfall construction management

Parameter(s)	Source	Frequency/timing	Purpose
Video of seabed condition	Marine alignment of outfall.	Before, immediately after and 12 months after construction.	To record scale of impact of outfall construction
Turbidity	Sites to be determined adjacent to the pipeline and diffuser.	Continuously during construction.	To provide warning of potential impact on seagrass.
Presence of marine mammals	Within prescribed distance of blast site.	Immediately prior to and during any blasting operations.	To provide warning of presence of mammals that may be affected by blasting.

14.4 CONTINGENCIES

Actions to be followed as contingency actions in the event of an incident are set out in Table 14.5.

Table 14.5 Contingencies for marine outfall construction management

Trigger	Action	Responsibility
Turbidity exceeds predetermined level	Construction will be halted until the turbidity returns below the relevant level.	Construction Contractor
Marine mammals located within 500 m of blasting zone immediately prior to or during blasting	Cease blasting operations until mammals cleared from the area	Construction Contractor

15. REHABILITATION MANAGEMENT PLAN

This plan only applies to the marine outfall pipeline construction component of the Proposal.

Reinstatement of the marine outfall pipeline construction corridor is the final phase of this project component.

The pipeline alignment traverses many areas of remnant vegetation that are currently used by landowners as firebreaks, stock routes and vehicle access tracks. Consequently, the quality of regrowth on the easement in many of these areas is variable. This plan aims to re-establish the land condition to that prior to construction, to the most practical extent.

15.1 ENVIRONMENTAL RISKS

The final phase of the construction program project is Reinstatement, which involves:

- removing construction materials from the construction corridor (e.g. skids, palettes, survey pegs, flagging, etc)
- shaping the land surface to match the existing contours, including compacting material back into side cuts
- ploughing or ripping of any compacted areas
- construction of final sediment and erosion controls
- respread topsoil and cleared vegetation/brush across the construction corridor.

Effective rehabilitation will minimise the risk of introducing weed species, minimise disturbance of fauna through re-establishing habitat and stabilising disturbed areas; reducing the potential for erosion and sedimentation of surrounding water bodies.

Vegetation removed from the construction corridor will be respread to aid in sediment and erosion control, retain moisture and to aid establishment of seeds/seedlings and revegetation of the construction corridor. Active rehabilitation (seeding) in remnant vegetation will only be conducted on areas that do not respond to the initial rehabilitation treatment.

Griffin Power will finalise rehabilitation objectives on private land, with the concerned landowner prior to ground disturbing activities. These objectives and specific environmental management requirements will be added to the Landowner Line List (LLL) and Environmental Line list (ELL) as required.

15.2 APPLICABLE LEGISLATION

There is no specific legislation applying to rehabilitation, other than the requirements of the Ministerial Statement.

15.3 MANAGEMENT PROGRAM

15.3.1 Environmental objectives and key performance criteria

Rehabilitation of disturbed areas resulting from the construction of the marine outfall pipeline will be managed to meet the environmental objectives as set out in Table 15.1.

Table 15.1 Environmental objectives and performance indicators for rehabilitation

Issue	Environmental Objective	Performance Indicator
Vegetation	To re-establish vegetation and associated habitat areas to the condition that it was in prior to disturbance or better.	Achievement of the completion criteria set out in Table 15.4.
Soil	To control sediment and erosion.	Achievement of the completion criteria set out in Table 15.4.

15.3.2 Management actions

The management actions to be implemented are set out in Table 15.2.

Table 15.2 Management actions for rehabilitation

Aspect	Action	Responsibility
ELL & LLL	Areas requiring rehabilitation other than spreading of vegetation and re-seeding will be entered onto the Environmental Line List (ELL) or Landowner Line List (LLL) as appropriate.	Griffin Power
Clean-up	All waste materials (e.g. bags, pegs, skids, pillows) and equipment will be removed from the construction areas once backfilling and tie-ins are completed.	Construction Contractor
	All flagging and bunting installed for other than environmental or safety reasons will be removed from the construction areas once backfilling and tie-ins are completed.	Construction Contractor
	Small amounts of rocks and stones generated by the construction process will be distributed evenly over the easement. Where larger volumes of such material have been produced, consideration will be given to its removal from site.	Construction Contractor
Infrastructure	All temporary gates will be removed (unless required for operational reasons) and the fence reinstated to at least as good has the pre-construction condition. Gates removed from the fence line will be returned.	Construction Contractor
	Any infrastructure disturbed during construction will be restored to the landholder's satisfaction.	Construction Contractor
	Public roads and tracks used during construction will be returned to their pre-construction state, or to a condition agreed to with the landholder.	Construction Contractor
	All fences that were cut and replaced by gates during construction will be repaired to at least the equivalent pre-construction condition, unless permanent gates or other arrangements are agreed to with the landholder.	Construction Contractor
Ripping	Areas subject to high traffic movements during construction such that soil compaction may result, will be ripped to a depth of 30 cm prior to respreading topsoil.	Construction Contractor
Topsoil	Topsoil spreading will be managed in accordance with the Soil Management Plan (Section 12) and with the completion criteria set out in Table 15.4.	Construction Contractor and/or Griffin Power

Aspect	Action	Responsibility
Vegetation	Vegetation spreading will be managed in accordance with the Flora and Vegetation Management Plan (Section 3) and with the completion criteria set out in Table 15.4.	Construction Contractor and/or Griffin Power
Erosion	Erosion will be managed in accordance with the Soil Management Plan (Section 12) and with the completion criteria set out in Table 15.4.	Construction Contractor and/or Griffin Power
	If the construction works result in subsequent erosion of watercourses, reasonable remedial action will be taken if requested by the DoW. This would require that the erosion is demonstrably attributable to the construction work or an associated activity by Griffin Power.	Construction Contractor and/or Griffin Power
Weeds, pathogens, pests	Weed and disease management will be managed in accordance with the Weed and Dieback Management Plan (Section 5) and with the completion criteria set out in Table 15.4.	Construction Contractor and/or Griffin Power
Beach and dune restoration	The beach profile and surface will be reinstated to match the contours adjacent to the excavated area and debris (including boulders, loose rock and litter) on the section of beach and surf zone impacted by construction activities will be removed.	Construction Contractor
	Physical breaches in the foredune barrier will be closed to reduce risk of new blowout formations and to reduce access	Construction Contractor
	The dune near the air removal structure will be planted with local indigenous plants to resist erosion.	Construction Contractor

15.3.3 Monitoring

Monitoring of rehabilitation outcomes should be undertaken as set out in Table 15.3 and as described in the text following that table.

Table 15.3 Monitoring program for rehabilitation

Parameter(s)	Source	Frequency/timing	Purpose
Native species abundance and, distribution within the construction corridor	Records of visual and photo point monitoring.	Prior to clear and grade and 12 months after rehabilitation.	To establish achievement of objectives regarding meeting of rehabilitation criteria (see Table 15.4).
Weed species richness and cover to facilitate management of weed issues.	Quadrant and photo-point monitoring of rehabilitation in areas of remnant vegetation.	Prior to clear and grade and 12 months after rehabilitation.	To establish achievement of objectives regarding meeting of rehabilitation criteria (see Table 15.4).
Erosion	Records of visual and photo point monitoring.	Prior to clear and grade and 12 months after rehabilitation.	To establish achievement of objectives regarding meeting of rehabilitation criteria (see Table 15.4).
Landowner satisfaction	Records of visual and photo point monitoring and discussion with landowners.	Prior to clear and grade and 12 months after rehabilitation.	To establishment of agreed landowner rehabilitation requirements.

Photo point monitoring will be conducted to monitor rehabilitation progress, with two photographs taken at each point – one in each direction along the corridor. At a minimum, two photo-points will be undertaken with spacing of no greater than 500 m. The distance between photo-points will vary along the alignment in order to capture the different landscapes and terrain traversed. In areas of conservation value, photo point monitoring will be at 200 m intervals. The coordinates of all photo points will be recorded, with monitoring sites located in nearby control areas (with similar vegetation) and in the rehabilitated areas of the pipeline easement.

Table 15.4 Rehabilitation completion criteria

Aspect	Objective	Criteria	Assessment Method
Construction	To ensure that the key commitments implemented during the construction phase will assist in maximising the recovery of the native flora and vegetation on the pipeline easement.	100% compliance with the Weed and Dieback Management Plan (Section 5).	Audit during the operation.
		100% compliance with the dieback hygiene protocol.	Audit during the operation.
		Vegetation and topsoil is cleared and stored in compliance with the Flora and Vegetation Management Plan (Section 4) and the Soil Management Plan (Section 12)	Audit during the operation.
		Significant plant species are protected in accordance with the Flora and Vegetation Management Plan (Section 4).	Audit during the operation.
Decommissioning	To ensure that all visual disturbances are removed by prompt remedial action to the greatest extent practicable.	All equipment, materials and litter are removed from the area of disturbance.	Visual inspection of the area of disturbance.
Erosion	To reinstate the land to provide suitable conditions for natural re-colonisation of native vegetation and support natural surface water movement.	Re-instatement of natural contours to pre-disturbance conditions.	Visual inspection of area of disturbance.
		No active erosion rills in excess of the surrounding land.	GPS record and physical measurement of any points of erosion.
		In erosion prone areas within the construction corridor, individual bare patches must not exceed 10 m in length, and the cumulative sum of bare patches must not exceed 10% of the total area of each consecutive 100 m length of easement after 12 and 24 months.	Visual assessment. Note this criterion does not apply in areas that were previously bare.
Weeds	To facilitate the establishment of native plant species, where native vegetation has been removed during the construction process.	Minimise the spread and intensification of weed infestations through vehicle hygiene protocols.	Visual inspection of the area of disturbance, with backing from photographs, baseline surveys and rehabilitation monitoring datasets.
		The foliage cover of declared and environmental weeds within disturbed areas should be similar to vegetation immediately adjacent to the area of disturbance after 12 and 24 months.	Visual inspection of the area of disturbance, with backing from photographs, baseline surveys and rehabilitation monitoring datasets.
Flora and Vegetation (where native vegetation has been removed during the construction process)	To facilitate the establishment of native plant species, where native vegetation has been removed during the construction process.	A minimum of 1 native plant per square metre when averaged over the entire area rehabilitated at 12 months. A minimum of 2 native plants per square metre when averaged over the entire area rehabilitated at 24 months.	Visual inspection of the area of disturbance, with backing from photographs, baseline surveys and rehabilitation monitoring datasets.
		Percentage foliage cover of native species indigenous to each plant community is greater that or equal to 40% of foliage cover in vegetation immediately adjacent to the area of disturbance after 24 months (excluding pipeline access track).	Visual inspection of the area of disturbance, with backing from photographs, baseline surveys and rehabilitation monitoring datasets.
		Species Richness of greater than or equal to 50% (unless negotiated otherwise with DEC) in vegetation immediately adjacent to the area of disturbance after 24 months.	Visual inspection of the area of disturbance, with backing from photographs, baseline surveys and rehabilitation monitoring datasets.

The access for vehicles in the future near the pipeline is critical for on going maintenance and or operational activities along the pipeline. Therefore, parts of the easement will remain disturbed as a result of the need for an access track.

Monitoring will be conducted annually in spring until the rehabilitated areas have regenerategd to a stable condition, to the satisfaction of DEC.

After completion, the entire construction corridor will be reviewed for bare areas and weed infestations. Once the rehabilitation programme is complete, this monitoring will be captured in the ongoing operational management of the pipeline.

Propagule augmentation may be necessary to achieve completion criteria.

Rehabilitation immediately following completion of construction will be the responsibility of the Construction Contractor. Subsequent monitoring and completion of this rehabilitation will be the responsibility of either Griffin Power or the Construction Contractor, depending on the conditions agreed in the construction contract.

While best endeavours will be made to achieve these Completion Criteria there may be some exclusions in the event that uncharacteristic seasonal weather conditions prevail. This will be taken into consideration in relation to the Completion Criteria. In the event of areas not meeting Completion Criteria, joint site reviews will be undertaken to determine appropriate remedial action, if required, to DEC requirements.

15.4 CONTINGENCIES

Actions to be followed as contingency actions in the event of an incident are set out in Table 15.5.

Table 15.5 Contingencies for rehabilitation

Trigger	Action	Responsibility
Monitoring indicates that the Table 15.4 criteria are not being met after 12 months.	Remedial action will be discussed with DEC. Remedial action within failed areas may include active reinstatement such as ripping, seeding or active weed control. In the event that reseeding is required, DEC will be invited to participate in the reseeding process (e.g. identify suitable seed lists, witness reseeding activities).	Construction Contractor and/or Griffin Power

16. ABORIGINAL HERITAGE SITE MANAGEMENT PLAN

This plan applies to construction of the power station generating units and marine outfall pipeline components of the Proposal.

16.1 RISKS

Construction activities that physically disturb the land surface or subsurface profile (e.g. clear and grade, trenching), may unearth and/or destroy Aboriginal artefacts or skeletal remains and may also have the potential to disturb known Aboriginal sites adjacent to construction areas identified for protection. Consequently, specific management is required to minimise the risk of construction activities detrimentally affecting or destroying heritage sites and to ensure compliance with relevant legislation.

16.2 APPLICABLE LEGISLATION

Aboriginal Heritage Act 1972.

16.3 MANAGEMENT PROGRAM

16.3.1 Environmental objectives and key performance criteria

Aboriginal heritage will be managed to meet the objectives as set out in Table 15.1.

Table 16.1 Objectives and performance indicators for Aboriginal heritage

Issue	Environmental Objective	Performance Indicator
Known (recorded) Aboriginal heritage sites	To avoid disturbance to Aboriginal heritage sites identified for protection near the pipeline corridor.	No disturbance to Aboriginal heritage sites identified for protection.
New (unrecorded) Aboriginal heritage sites	To manage new Aboriginal heritage sites/artefacts uncovered or identified during construction in accordance with the requirements of the *Aboriginal Heritage Act 1972.*	All new Aboriginal heritage sites managed in accordance with the Aboriginal Heritage Act 1972.

16.3.2 Management actions

The management actions to be implemented are set out in Table 15.2.

Table 16.2 Management actions for Aboriginal heritage

Aspect	Action	Responsibility
General requirements	The induction program will involve an Aboriginal Heritage component to ensure all personnel are aware of obligations under the *Aboriginal Heritage Act 1972*, and the requirements for the protection of known Aboriginal heritage sites and are directed to avoid any disturbance to the sites.	Construction Contractor
	The induction program will ensure personnel are informed of the possibility of encountering new sites and what may constitute a site/artefact.	Construction Contractor
	Erosion control measures will be installed as required to protect sites near the pipeline corridor.	Construction Contractor
Survey and Fencing	Heritage sites near construction activities identified for protection will be clearly flagged and/or fenced.	Construction Contractor
Clear and grade	Qualified site heritage monitors and archaeologists (issued with a section 16 permit) will be onsite to monitor clear and grade activities for areas designated in the ELL (e.g. areas considered to have a high potential to contain additional surface or sub-surface archaeological material).	Construction Contractor
Trenching and excavation	Qualified site heritage monitors and archaeologists (issued with a section 16 permit) will be onsite to monitor trenching activities for areas designated in the ELL (e.g. areas considered to have a high potential to contain additional surface or sub-surface archaeological material).	Construction Contractor
Clean-up and rehabilitation	All flagging and fencing used to identify and protect heritage sites (if any) will be removed. Erosion control measures not required post-construction (if installed) will be removed.	Construction Contractor

16.3.3 Monitoring

Monitoring should be undertaken as set out in Table 15.3 and as described in the text following that table.

Table 16.3 Monitoring program for rehabilitation

Parameter(s)	Source	Frequency/timing	Purpose
New (unrecorded) Aboriginal heritage sites, artefacts or skeletal remains.	During preparation of power station site, pipeline clear and grade and trenching.	All active construction areas.	To ensure no new heritage sites or artefacts (e.g. currently unrecorded sites) are disturbed or destroyed by construction activities in contravention of the *Aboriginal Heritage Act 1972*.

16.4 CONTINGENCIES

Actions to be followed as contingency actions in the event of an incident are set out in Table 15.5.

Table 16.4 Contingencies for rehabilitation

Trigger	Action	Responsibility
Previously unrecorded Aboriginal heritage site/artefact is uncovered or identified	Immediately cease construction operations within 30 m of the potential heritage site.	Construction Contractor
	Establish a 30 m buffer around the potential heritage site, outside which work may continue.	Construction Contractor
	Notify Griffin Power appointed archaeologist and the Department of Indigenous Affairs (DIA) (if not already present). The police and State Coroner will be contacted in the instance of the discovery of skeletal remains. If it is determined the remains are Aboriginal, the Commonwealth Minister for Aboriginal Affairs will be notified (legal requirement under the *Aboriginal and Torres Strait Islander Heritage Protection Act 1984* – Section 20(1).	Construction Contractor
	The authenticity of the site or material will be determined using appropriate methods, in consultation with all relevant stakeholders, and suitable mitigative/management measures, once agreed upon by all stakeholders, will be implemented as soon as practicable. Where disturbance to the site cannot be avoided, consent to disturb the site will be obtained under Section 18 of the *Aboriginal Heritage Act 1972*. Where disturbance to the site can be avoided (i.e. through reduced working widths), actions may include compiling a detailed site record, collection of the cultural material or protection of the site (e.g. fencing).	Construction Contractor
	Complete and forward an Incident Report to the appropriate person(s).	Construction Contractor
Disturbance of an existing Aboriginal heritage site identified for protection	Immediately cease all work in the area of the heritage site	Construction Contractor
	Investigate the cause of disturbance	Construction Contractor
	Implement actions to prevent disturbance from reoccurring (e.g. fencing site or re-informing workforce).	Construction Contractor
	If necessary, consult with relevant stakeholders (e.g. DIA) to determine actions required to restore the site to its original condition.	Construction Contractor
	Complete and forward an Incident Report to the appropriate person(s).	Construction Contractor

16.4.1 Recording

All new Aboriginal heritage sites or disturbances to sites identified for protection, will be recorded in accordance with the Incident Reporting procedures and a report prepared and submitted to the DIA within seven days of the discovery/disturbance incident. The report will outline the nature of the discovery, the extent and significance of any disturbance, and any mitigation/management measures implemented.

17. REFERENCES

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