GatewayWA

Perth Airport and Freight Access Project

Management Plan

Gateway WA Perth Airport and Freight Access Project

Construction Environmental Management Plan -SEWPaC

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Author:

Name: Amy Elkington — Signature:

Position: Environmental and Sustainability Manager — Date: 15/1/15

Reviewed:

Name: Adrian White — Signature:

Position: Environmental Coordinator — Date: 15/1/15

Approved:

Name: James Gregory — Signature:

Position: A/Alliance Director — Date: 15/1/15

REVISION RECORDING

Rev	Date	By (Initials)	Description of Revision
A	25/01/2013	AE	Draft
B	28/02/2013	AN	Revised with SEWPaC conditions and minor amendments
C	28/03/2013	AN	Revised with Perth Airport comments and minor additions
D	22/05/2013	AN	Revised with SEWPaC comments
E	13/06/2013	AE	Revised with SEWPaC comments for Area 3 and issued for Area 3 approval
F	13/06/2013	AE	Revised with DEC comments Updated to project wide
00	17/07/2013	AE	Revised with DEC and SEWPaC comments and minor amendments
01	30/03/2014	AE	Update as a result of: - Audit findings - Practicalities on site - Changes to internal reporting system
02	16/12/2014	AE	The agreed content of this management plan has not been altered with this revision review. Management Plan put in revision due to the change in Alliance Director as per Certification requirement.
03	13/01/2015	AE	Final amendments to plan as a result of implementation and coordination of reaching practical completion

Contents

1 INTRODUCTION

1.1 Abbreviations and Acronyms

Abbreviation/Acronym	Definition
AMT	Alliance Management Team
CEMP	Construction Environmental Management Plan
DEC	Department of Environment and Conservation
DER	Department of Environment Regulation (formerly DEC)
DPaW	Department of Parks and Wildlife (formerly DEC)
DoE	Department of the Environment (formerly SEWPaC)
DoW	Department of Water
EMS	Environmental Management System
EP Act	State *Environmental Protection Act 1986*
EPBC Act	Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*
Gateway WA	Gateway WA Alliance
ICAM	Incident Cause Analysis Method
ISCA	Infrastructure Sustainability Council of Australia
Main Roads	Main Roads Western Australia
NCR	Non-conformance Report
EPA	Office of the Environmental Protection Authority
RIWI Act	State *Rights in Water and Irrigation Act 1917*
SEWPaC	Department of Sustainability, Environment, Water, Population and Communities
SHEWMS	Safety, Health and Environment Work Method Statement
SWTC	Scope of Works Technical Criteria
TEC	Threatened Ecological Community

1.2 Purpose of This Plan

This Construction Environmental Management Plan (CEMP) has been prepared to describe the planned environmental management for the detailed design and construction phase of this Project in line with the ISO14001. This plan includes:

- Current status of the Project
- Potential environmental impacts of construction activities

- Environmental management objectives
- Detailed management actions or measures to achieve the environmental objectives, as well as monitoring and reporting requirements
- Environmental management responsibilities
- How the environmental management system integrates with the overall Gateway WA system

This CEMP addresses the following environmental issues:

- Vegetation and flora
- Fauna
- Bushfire prevention and response
- Dieback and weed
- Hydrology and wetlands
- Landscaping, topsoil and rehabilitation
- Terrestrial soils – contaminated soils, acid sulfate soils and use of hazardous substances
- Construction noise and vibration
- Construction dust
- Construction waste
- Aboriginal and European Heritage

This management plan shall be reviewed by the Environmental Manager if the Project scope changes significantly. Upon review, the document shall be revised and re-issued where appropriate. In addition, continued improvement of the plan will occur in response to environmental incident management reviews and audit findings during the construction of the Project.

If the change is in relation to a Project scope change which results in an environmental impact outside of that originally approved by DoE, the revised CEMP will be submitted to DoE, DER, and any other regulatory agencies if relevant, in order to obtain approval for that component of work prior to implementation.

1.3 Project Scope

The Gateway WA Perth Airport and Freight Access Project (the 'Project') focuses largely on road upgrades and new construction on the section of Tonkin Highway between Great Eastern and Roe Highways, as well as part of Leach Highway from Orrong Road to Perth Airport. The Project area is located immediately south and west of the existing Perth Airport and includes development within Commonwealth land at the Perth Airport (Appendix A).

The following road and bridge works are proposed as part of the Project:

- Upgrade of Tonkin Highway between Great Eastern Highway and Roe Highway
- Major freeway to freeway interchange at Leach Highway / Tonkin Highway
- A new interchange at Tonkin Highway and Boud Avenue

- Diamond, grade separated interchange at Tonkin Highway / Horrie Miller Drive / Kewdale Road
- Upgraded intersection at Roe Highway / Tonkin Highway
- Intersection upgrade at Leach Highway / Abernethy Road and
- Upgraded and control of access along Leach Highway between Orrong Road and Tonkin Highway.

The design and construction of the Project will be undertaken by the Gateway WA Alliance (Gateway WA) formed between Main Roads Western Australia (Main Roads), GHD, Aecom, BG&E, Leighton Contractors and Georgiou. Gateway WA is responsible for delivery of the Project and compliance with the Project's environmental conditions and associated management measures detailed in this CEMP.

1.3.1 Project Timing

The Project will be constructed over a period of three years from April 2013 to June 2016. The timing of construction is projected to be as follows:

- Areas 4 and 5 –July 2013 to February 2015
- Area 3 – July 2013 to March2015
- Area 2 – July 2013 to July 2015
- Zone 6 – December 2013 to June 2016
- Area 1 – December 2013 to June 2016

1.4 Environmental Approvals

Main Roads referred the Project to the WA Environmental Protection Authority (EPA) for determination under Section 39a (7) of the *Environmental Protection Act 1986.* The Project was determined to not require assessment by EPA. The EPA, however, required that Main Roads sought the relevant permits under Part V of the *Environmental Protection Act, 1986*. Main Roads, in conjunction with Gateway WA, obtained approval from the Department of Environment Regulator (DER – formerly DEC) to clear native vegetation for the purposes of constructing this Project issued under the *Environmental Protection (Clearing Native Vegetation) Regulations 2004.* This document is to be used towards satisfying the relevant clearing permit conditions established for clearing.

The Project was referred by Main Roads to the Commonwealth Department of the Environment (DoE - formerly SEWPaC) under the *Environment Protection and Biodiversity Conservation Act 1999* (*EPBC Act*) in March 2010, as the Project impacts listed threatened species and communities as well as part of the Project taking place on Commonwealth land. DoE confirmed that the Project was a controlled action under the Act and therefore a Public Environmental Report (PER) was required for formal assessment (Gateway Vision 2012). Approval under the EPBC Act was obtained in February 2013.

Both State and Federal approvals are subject to a range of environmental conditions and commitments.

1.5 Environmental Conditions

The project will have a range of impacts on issues of State and Federal significance. The DoE conditions relating to the impacts are summarised below:

Vegetation Clearing – GatewayWA must ensure that:

- No more than 27 ha of core Black Cockatoo foraging habitat is cleared
- No more than 62 plants of the Vulnerable species *Conospermum undulatum* (Wavy-leaved Smokebush) are cleared
- No more than 360 individuals of *Keighery's Macarthuria* in an area not exceeding 0.71 ha within Area 2 are cleared.
- No more than16 ha of wetlands on Commonwealth land are removed or permanently dewatered.
- No more than 9.2 ha of the Infrastructure Only Conservation Zone is cleared.
- Construction does not occur outside of the project footprint.

The maximum impacts on State land allowable under the DER Clearing Permit conditions are:

- Clearing of 40 ha of feeding habitat for Carnaby's cockatoo and forest red-tailed black cockatoo.
- Clearing of 101 potential black cockatoo habitat trees.
- Clearing of 62 *Conospermum undulatum* plants.
- Clearing of 34 ha of wetland vegetation.
- Direct clearing of 3.8 ha of TEC FCT02, 1.7 ha of TEC FCT20a and 1.93 ha of TEC FCT3a.

If any of these conditions are needed to be changed, review and subsequent approval by DoE and/or DER is required prior to implementation.

Approval of plans

A range of plans must be approved by the Minister administering *the EPBC Act* (or a delegate) prior to commencement of construction. Plans are:

- This CEMP
- Rehabilitation Management Plan
- Surface and Groundwater Management Plan (includes dewatering management and a dewatering licence under the *Environment Protection Act*, 1986)
- Community Issues Management Plan (known as the Stakeholder Engagement Management Plan).
- Environmental Offsets Strategy.

2 GOVERNANCE

2.1 Environmental Legislative Requirements

Existing state and federal legislation which the Project is required to adhere to in relation to environmental management is listed in the table below.

Table 1 Commonwealth and State Legislation Relating to Environmental Management

Legislation	Relevance	Specific trigger	Regulatory authority/ Project Requirements
Commonwealth Legislation			
Environment Protection and Biodiversity Conservation Act 1999	Protection of environmental matters of national significance. Impacts on Commonwealth land.	Impacts to Black Cockatoo habitats and populations of Wavy-leaved Smokebush and *Keighery's Macarthuria.* Clearing and earthworks on Perth Airport land.	DoE Approval of the entire project area, with conditions. Development and execution of offset plans.
Airports Act 1996	Outlines requirements for land used for airports, including environmental management.	Project site on Perth Airport land.	Department of Infrastructure and Transport Approval for works on Airport land.
Airports (Environment Protection) Regulations 1997	Regulates environmental standards and states other requirements on airport land.	Project site on Perth Airport land.	Department of Infrastructure and Transport Approval for works on Airport land.
State Legislation			
Aboriginal Heritage Act 1972	Protection of sites of Aboriginal Heritage significance, both known and as yet unknown.	Two within the Project area and additional surrounding registered Aboriginal Heritage Sites. Any newly discovered areas unearthed during construction.	Department of Indigenous Affairs S18 Approval to impact registered sites.
Agriculture and Related Resources Protection Act 1976	Obligations for control, destruction and notification of gazetted noxious plants and animals.	Potential presence and/or introduction of declared plants within the road reserve.	Department of Agriculture and Food Western Australia Management actions (Appendix B)
Bush Fires Act 1954	Outlines prevention, control and extinguishing of bushfires.	Entire Project site.	DER Management actions and Emergency Response Plan

Legislation	Relevance	Specific trigger	Regulatory authority/ Project Requirements
Contaminated Sites Act 2003 and *Contaminated Sites Regulations 2006*	Regulates matters relating to the identification, assessment, recording, management and clean-up of contaminated sites.	Excavation and disturbance of areas containing contaminated material.	DER Conditions of existing contaminated sites. Reporting of potential new contaminated sites. Approval of ASS Management Plan
Environmental Protection Act 1986 Environmental Protection Regulations 1987	Prevention, control and abatement or pollution and conservation protection and enhancement of environment.	Entire Project area.	DER Management actions (Appendix B)
Environmental Protection (Clearing of Native Vegetation) Regulations 2004	Manages the clearing of native vegetation within the state to ensure it is managed appropriately and is not excessive.	All areas of native vegetation, excluding that on Commonwealth land.	DER Permit to clear native vegetation on State land with conditions.
Environmental Protection (Controlled Wastes) Regulations 2004	Manages the transportation and disposal of controlled wastes.	Entire Project including transportation to and from site	DER Management actions (Appendix B). Disposal and transport of Controlled Wastes.
Environmental Protection (Noise) Regulations 1997	Regulates noise emissions within the state to prevent significant impact upon neighbouring communities.	Entire Project area	DER Approval of out of hours noise management (City of Belmont and Shire of Kalamunda).
Environmental Protection (Unauthorised Discharge) Regulations 2004	Prevention of the releasing of contaminants into the environment.	Entire Project area	DER Management actions (Appendix B)
Heritage of Western Australia Act 1990	Provides for and encourages the conservation of places (natural or constructed) which have significance to the cultural heritage of the State.	Entire Project area excluding Commonwealth land	Heritage Council of WA Management actions (Appendix B)

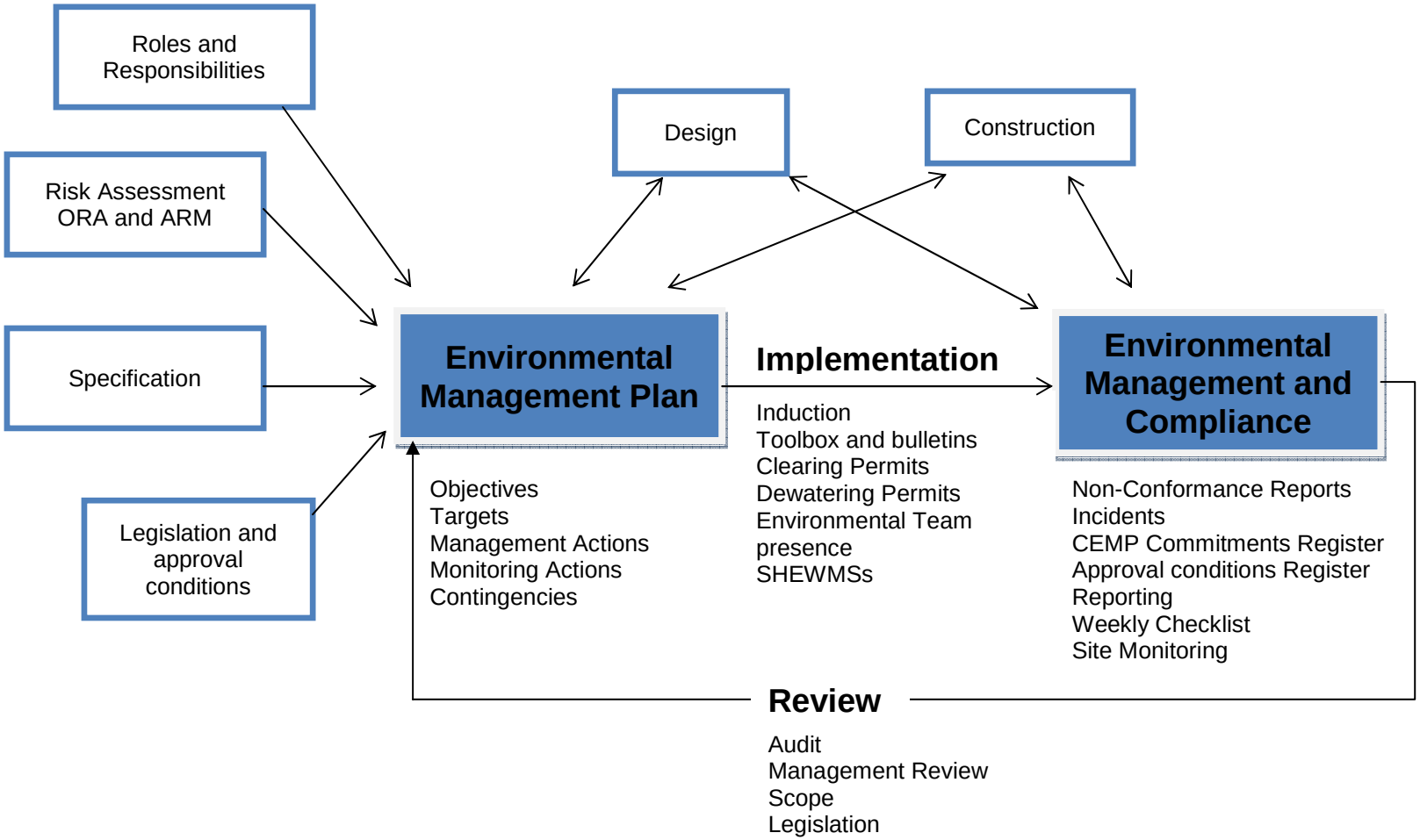
Legislation	Relevance	Specific trigger	Regulatory authority/ Project Requirements
Planning and Development Act 2005	Land use planning and development.	Entire Project area excluding Commonwealth land	Western Australian Planning Commission Approval to develop on land
Soil and Land Conservation Act 1988 (WA)	Deals with the conservation of soil and land resources and the mitigation of the effects of erosion.	Entire Project area excluding Commonwealth land	Commissioner for Soil and Land Conservation Management actions (Appendix B)
Metropolitan Water Supply, Sewerage and Drainage Act 1909	Provides for the establishment and management of water supply, sewerage and drainage infrastructure and protection of water supply.	Works on water and sewage systems excluding that on Commonwealth land.	Water Corporation Department of Water (DoW) Approvals to impact existing systems.
Rights in Water and Irrigation Act 1914 (*RIWI Act*)	Governs water resource management and allocation in Western Australia ensuring water resources are comprehensively and appropriately managed.	Any dewatering and abstraction during construction phase excluding Commonwealth land	DoW Licence to Take groundwater.
Waterways Conservation Act 1976	Management and conservation of water and the related land and environment.	Indirect drainage into surrounding surface water areas excluding Commonwealth land	DoW Agreement of drainage strategy
Wildlife Conservation Act 1950 (WA)	Provides for the conservation and protection of wildlife (flora and fauna). Special provisions and schedules cover protection and management of gazetted rare flora and fauna.	All areas of native vegetation excluding Commonwealth land	DER Permit to Take Fauna from the impact area. Permits to Take and Translocate Rare Flora on State land.

2.1.1 Review Legislation

Legislation changes are reviewed regularly (usually every month) with updates regularly received by the Environmental Team through a subscription to Enviro Law. If changes to the applicable environmental legislation are identified, this plan will be updated to include those changes where appropriate.

2.2 Project Integration of the EMS

The Environmental Management System (EMS) applied by Gateway WA for the design and construction of the Project is summarised within the flowchart on the following page. The components which make up the EMS, are described within this CEMP. The EMS is certified to the requirements of ISO14001:2004.



Environmental Management System applied at Gateway WA

2.3 Environmental Guidelines

Additional environmental guidelines may also apply during the construction and operation of the Project, including:

- ISO 14001:2004 Environmental management systems – Requirements with guidance for use
- Guidelines for the translocation of threatened plants in Australia (1998), Australian Network for Plant Conservation.
- DEC Treatment and management of soils and water in acid sulfate soil landscapes 2011
- DEC Waste Discharge or Pollutant Spill Reporting Guide
- AS Standard 2436-1981 “Guide to Noise Control on Construction, Maintenance and Demolition Sites”
- DEC Landfill Waste Classification and Waste Definitions 1996 (As amended December 2009)
- DEC Contaminated Sites Management Series – Assessment levels for Soil, Sediment and Water, February 2010
- National Water Commission, Minimum Construction Requirements for Water Bores in Australia, February 2012
- Handbook of Environmental Practice for Road Construction and Maintenance Works
- Department of Health Guidelines for the Assessment, Remediation and Management of Asbestos- Contaminated Sites in Western Australia, May 2009
- DEC Guidelines for managing asbestos at construction and demolition waste recycling facilities, December 2012

2.4 Applicable Operating Statements/Policies

2.4.1 Operating Statement (Policies)

- An overall operating statement will be formed, consolidating the Project’s values, codes and policies, including those relating to the environment. A series will be produced detailing Gateway WA’s Project policies.

2.5 Compliance Auditing

Auditing will be undertaken in accordance with the Gateway WA Quality Assurance and Integrated Systems Management Plan [GWA-PW-MNP-QA-0001]. Auditing of the commitments outlined in this management plan shall be undertaken as follows:

- Six-monthly system audits of the EMS, environmental approvals and compliance procedures
- Quarterly on-site CEMP compliance audits
- Audits of key Contractors’ environmental management
- Daily and weekly work area inspections.

Persons responsible for environmental auditing will be suitably qualified.

Where audit finds show environmental management actions not being effective, the

audit may recommend changes to procedures.

It should be noted that this management plan may be audited by DoE or an independent auditor. This audit will cover the implementation of this CEMP, as well as other conditions of the Project approval under the *EPBC Act* and relevant State acts.

3 ORGANISATION AND RESPONSIBILITIES

3.1 Environmental Organisation Chart

The Alliance Director in consultation with the Safety and Systems Support Manager will continue to develop the Gateway WA Organisation Chart depicting lines of responsibility, authority and accountability for Environment.

The organisation chart will be updated as change occurs. If organisational conditions or the organisational structure changes significantly, any impact on the potential to achieve Environmental requirements shall be assessed using the Gateway WA Change Management process.

3.2 Environmental Responsibilities and Authorities

The Alliance Director is responsible for the overall implementation of the environmental management on the Project, including environmental, planning and heritage approvals compliance.

The Strategic Planning and Approvals Manager will be responsible for the coordination of obtaining all relevant environmental, heritage and planning approvals. The Safety and Support Services Manager will be responsible for the coordination of monitoring and confirmation of compliance. It will be the responsibility of these two managers to raise any environmental issues at the Alliance Management Team (AMT) level where applicable.

The Environmental Manager will be responsible for the overall facilitation of the environmental management for the Project. They will manage the environmental team and assist the Safety and Support Services Manager in meeting the requirements of the Project. Additionally they will also take part in the establishment and maintenance of the Project EMS as accredited under the ISO14001.

The environmental team will be responsible for providing education and support to both the design and construction teams in relation to environmental risks and management for the Project. This may involve informal discussions, attendance and presentations at toolbox meetings, input into work methods (through Process Control Plans), SHEWMSs, supply of internal Clearing Permits etc.

Key personnel will be directly responsible for managing environmental issues as defined within their position descriptions. These position descriptions will detail accountability, responsibility and authority for delivery of the Project environmental management. Additionally, key environmental management tasks will be undertaken by key personnel as detailed within Appendix B. Overall, all personnel employed on the Project are responsible for establishing and maintaining a safe work place and protecting the environment.

4 ENVIRONMENTAL PERFORMANCE MANAGEMENT

4.1 Alliance KRAs and KPIs

The Alliance Performance Management Plan provides Alliance Key Result Areas (KRAs) and Key Performance Indicators (KPIs). The major KRA for environment relates to the overall sustainability of the Project and the effectiveness of the decision making for sustainability and the subsequent outcomes. The effectiveness of the sustainability on the Project will be measured through the Infrastructure Sustainability Council of Australia (ISCA) rating tool, which measures a large number of management processes and specific outcomes related to the environment.

4.2 Environmental Objectives and Targets

In order to comply with relevant environmental legislation, approval conditions and the management of impacts to the local environment, Gateway WA has defined a series of objectives, targets and performance indicators for each environmental issue/aspect. These are detailed in the following table.

Table 2 Environmental Objectives and Targets

Objective	Target	Performance Indicators
Vegetation		
Minimise vegetation clearing.	No clearing or disturbance during construction outside pre-defined clearing lines, as outlined in EPBC approved area and State Clearing Permits.	Occurrences of clearing or disturbance exceeding design plans in Incident Report Register. Ongoing construction area inspections and report to assess clearing operations.
Ensure impacts on Threatened and Priority Flora and communities are adequately identified and minimised during construction.	Occurrences of Threatened and Priority Flora species and communities to be clearly identified on detailed design plans and in the field for the duration of the construction works in that area.	Clear indication of recorded Threatened and Priority Flora and communities' locations included on detailed design plans. Clear indication of recorded Threatened and Priority Flora and community locations included in Clearing Permits.
	Areas containing Threatened and Priority Flora species and communities not to be disturbed are clearly delineated in the field for the duration of the construction works in that area.	Presence of delineating fencing or tape around Threatened and Priority Flora and communities non-disturbance areas. Number of reported incidents/NCRs of delineating fencing or tape missing or not installed around Threatened and Priority Flora and communities in areas of non-disturbance.

Objective	Target	Performance Indicators
	No known Threatened species populations or communities outside the approved clearing areas to be disturbed.	Number of reported incidents of disturbance to Threatened and Priority Flora outside of the construction zone.
Fauna		
Ensure impacts on protected fauna – in particular Black Cockatoo and quenda habitat- are adequately identified and minimised during construction.	Impact to protected fauna habitat is minimised. Protected fauna habitat is marked on design drawings and flagged or fenced off during the duration of construction.	Presence of delineating fencing or tape around areas of protected fauna habitat in non-disturbance areas. Number of reported incidents/NCRs of delineating fencing or tape missing or not installed around protected fauna habitat in areas of non-disturbance.
	No damage has occurred to key protected fauna habitat outside of approved clearing areas during construction.	The area of habitat or feeding area damaged, or number of potential nesting trees lost or damaged during construction as recorded in Environmental Incident Reports and Inspections.
	No threatened fauna has been injured or killed.	Fauna encounter records – number of injured or killed as a result of construction activities.
Minimise impact to terrestrial fauna.	Monitor construction clearing activities to rescue injured fauna.	Minimal rescued of fauna, excepting planned relocation.
Dieback and Weeds		
Avoid the spread of dieback from known areas, and its introduction to un-infested areas, as a result of construction works.	No new dieback infestations identified immediately adjacent to the construction area in areas of significance such as conservation zones or TECs	Baseline and post-construction dieback surveys.
Avoid the introduction and spread of weeds as a result of construction works.	No new declared weeds identified within construction areas within 1 year following construction.	Baseline and post-construction weed surveys.
	Less than 10 complaints annually from the public during construction of weed introduction and spread along the road reserve during construction.	Complaints records.
Bushfire Prevention and Response		
Comply with the *Bush Fires Act 1954*	No bushfires as a result of construction works.	Incident records of bushfires.
Hydrology and Wetlands		

Objective	Target	Performance Indicators
Maintain existing surface water hydrology.	No physical damage to wetlands beyond a maximum of 5 m from the edge of earthworks unless no other means of access or required, or for safety reasons.	Occurrence of physical disturbance to wetlands beyond 5 m from the edge of earthworks in Incident Report Register.
	No significant change in wetland groundwater levels, or the period of inundation of adjacent monitored wetlands, which cannot be attributed to rainfall during the construction period. Water levels will be retained within seasonal ranges, +/- 1m during construction.	Comparison of wetland monitoring levels during construction with baseline.
	No evidence of surface water damming against side of highway, during and immediately after construction.	Site monitoring.
Prevent deleterious impacts on surface and groundwater quality.	During construction, no significant change to baseline water quality of adjacent monitored wetlands attributed to construction (parameters provided in the Surface and Groundwater Management Plan). Water quality will be maintained at levels as good as, or better than, baseline.	Comparison of wetland monitoring during construction with baseline.
	No acidification of groundwater or surface water attributed to the construction works.	Monitoring and management in accordance with the Surface & Groundwater Management Plan and Environmental Monitoring Plan.
Prevent spillage of hazardous goods to the adjacent environment, particularly wetlands, during operation.	Detailed design includes roadside drainage with a capacity of 20,000 L in areas adjacent to wetlands or open drains, unless: • There is no change to existing circumstances in terms of pavement area. • Physically the footprint does not permit room for this drainage • Different systems for treatment are more appropriate • Approval is given by the Department of Water	Detailed designs include capacity of 20,000 L in areas adjacent to wetlands or open drains. In areas where this solution is not suitable, appropriate methods are utilised to prevent hazardous goods spilling into the adjacent environment
Landscaping, Revegetation and Topsoil		
Minimise erosion.	No significant erosion alongside the highway during defects period.	Autumn and Spring site inspections.

Objective	Target	Performance Indicators
Re-use/re-establish Threatened or Priority Flora species within the Project revegetation.	Where suitable conditions exist, re-establish *Conospermum undulatum* and other, relevant, threatened species within the project revegetation area.	Number of plants established in Project footprint area.
Additional objectives to be developed within the Landscaping, Revegetation and Topsoil Management Plan.	To be confirmed in the Rehabilitation and Landscape Management Plan.	To be confirmed in the Rehabilitation and Landscape Management Plan.
Soils		
Comply with the *Contaminated Site Act 2003* on State land and the *Airports (Environment Protection) Regulations 1997*, on Commonwealth land.	Compliance with the *Contaminated Site Act 2003* on State land and the *Airports (Environment Protection) Regulations 1997*, on Commonwealth land.	No non-compliance with relevant acts and regulations.
Minimise impacts on the environment, community and personnel upon discovery and remediation of contaminated land.	Early identification of unknown contaminated land. Correct removal and disposal of contaminated soils and groundwater.	No incidents of environmental damage or personnel harm as a result of existing contaminated land.
Comply with the Treatment and management of soils and water in acid sulfate soil landscapes (DEC, 2011).	To be confirmed in Spoil and Waste and Surface and Groundwater Management Plans.	To be confirmed in Spoil and Waste and Surface and Groundwater Management Plans.
Prevent deleterious impacts on the surface and groundwater quality.	To be determined – see Environmental Monitoring Plan.	To be determined – see Environmental Monitoring Plan.
Prevent contamination of surface and groundwater through spills of hydrocarbons and chemicals.	No Level 1 or 2 spills during construction.	Incident Records.
Noise and Vibration		
Comply with the *Environmental Protection (Noise) Regulations 1997.*	Compliance with the *Environmental Protection (Noise) Regulations 1997.*	No non-compliance with the *Environmental Protection (Noise) Regulations 1997.*

Objective	Target	Performance Indicators
Manage vibration so that it complies with industry best practice.	Adjacent buildings are not significantly affected by vibration from construction works. Less than 10 complaints per year in relation to vibration.	Vibration monitoring at target locations does not exceed DIN4150 levels. No evidence of significant vibration impact on buildings and structures as assessed through pre-construction and post-construction property condition reports.
Dust		
Manage dust so that it does not create adverse social impacts or operational impact on the Perth Airport.	No excessive number of complaints received for extreme dust during construction.	No evidence of significant dust impact on adjacent vegetation through opportunistic monitoring. Quantitative dust monitoring results. Complaints register.
Waste Management		
All construction activities are to be carried out with the principles of cleaner production and waste minimisation.	Construction waste will be separated into reusable, recyclable and refuse.	Adherence to sustainability KPI. Waste management records.
	Construction materials selection will consider sustainable sources.	Records of material purchases.
	Construction waste will be disposed of at appropriate licensed landfill facilities.	Asbestos, hazardous and spoil waste disposal records.
Aboriginal and European Heritage		
Comply with the requirements of the *Aboriginal Heritage Act 1972* including those within the Section 18 approval.	Protection of all known Aboriginal Heritage sites outside that which is to be directly impacted. Comply with any heritage approval requirements if an unexpected site is found during construction.	Records of site salvage. Records of site inspections/monitoring.
Consult with the local Aboriginal community regarding the Project.	Maintain communication between Gateway WA and Aboriginal community representatives.	Consultation meeting records.
Comply with the requirements of the *Heritage of Western Australia Act 1972* and the Government Heritage Property Disposal Process.	Comply with any heritage approval requirements if an unexpected site is found during construction.	Obtaining approval from the State Heritage Office.

4.3 Monitoring and Reporting of Performance Targets

Implementation and monitoring of targets and environmental actions will be monitored as outlined within Appendix B. Each of the targets, as detailed above, will be assessed regularly (at least every three months) and formally reported to the Board, by exception.

4.4 Integrated Decision Making, Sustainability and Innovation

The concept of integrated decision making is fundamental to sustainability. The approach and processes are outlined in the Sustainability Management Plan.

The Sustainability Management Plan includes Gateway WA's approach to innovation.

5 INTERFACE MANAGEMENT

5.1 Related Contractual Requirements, Specifications, Systems and Plans

5.1.1 Contractual Requirements and Specifications

The Scope of Works and Technical Criteria (SWTC) outlines the environmental requirement the design and construction of the delivery of the Project must adhere to. The most relevant specifications to the EMS are Environment 204, Clearing 301 and Rehabilitation and Landscape 304.

5.1.2 Systems

- The primary systems to be referred to for information regarding Project management Gateway WA include the local intranet and the Gate Way. The Gate Way system will contain further information regarding project environmental aspects and procedures. Information will be captured through InCite. Refer to the Systems Management Plan for further information.

5.1.3 Plans

- This plan is part of a series of plans which inform and direct construction. Other plans include:
- Environmental Monitoring Plan
- ASS, Dewatering and Construction Water Management Plans
- Surface and Groundwater Management Plan (includes dewatering management)
- Rehabilitation and Landscape Management Plan
- Sustainability Management Plan
- Stakeholder Engagement Management Plan (includes community issues management)
- Operational Environment Management Plan
- Quality and Integrated Systems Management Plan
- Emergency Response Management Plan
- Safety and Health Management Plan
- Traffic Management Plan
- Offset Strategy

6 COMMUNICATIONS

6.1 Hierarchy and Controls

6.1.1 Internal Communications

All on-site personnel will be kept informed of any updates or reminded of key points of this management plan via the following communications where appropriate:

- Toolbox meetings
- Project reports
- Performance assessment reports
- Notice boards
- Access to copy of the CEMP at site office
- Inductions
- Sub-contractor co-ordination meetings
- Internal clearing permit and dewatering permit conditions.

Induction and Training

Site employees and contractors shall receive appropriate training to ensure they understand their responsibilities and are competent to undertaken their work in an acceptable manner. Construction environmental requirements shall be explained to, and discussed with, site personnel during this induction.

On-going training will be provided through toolbox meetings or similar forums. Induction and toolbox attendance shall be recorded.

All site personnel shall receive an environmental induction that addresses the following areas:

- Operating Statement (including environmental policy)
- Environmental Management Plans and related documents
- Legal responsibilities for all personnel
- Incident reporting
- Emergency procedures and responses
- Regulatory requirements relevant to the Project and their obligations as a member of the alliance team
- Potential consequences if procedures are not followed.

Personnel performing tasks that may cause significant environmental impacts must have been inducted as well as have completed necessary training processes and/or have appropriate experience, before undertaking such tasks.

6.1.2 Contractors and Suppliers

Key Contractor and Supplier environmental management requirements will be briefly outlined within the applicable contracts. Additional communications will be done ad-hoc through email. All on-site Contractor personnel will undertake the inductions as detailed within the section above. Delivery drivers from Suppliers will undertake a specific delivery induction.

6.1.3 Liaison with Authorities and Key Stakeholders

Authorities will be liaised with as appropriate during the design and construction phase of the Project. Consultation may include email correspondence, meetings and on-site inspections. The authority and timing will be determined based on numerous factors including:

- Legislative requirements
- Approval requirements
- Authority requirements/requests

Communications with external parties will be in line with the Gateway WA Stakeholder Engagement Management Plan and may include the following where appropriate:

- Correspondence and meetings with applicable regulatory authorities
- Consultation with adjacent landowners and stakeholders
- Management of and responding to complaints or requests.

Significant environmental aspects will be communicated externally if deemed necessary during stakeholder engagement.

6.1.3.1 Airport Controls

The *Airports Act 1996*, requires that all investigation and construction works on Perth Airport land are approved by the Federal Department of Infrastructure and Transport, through the Airport Building Controller. This includes requirements for approval of site specific environmental management plans, where relevant.

Land access and clearing on Perth Airport will be subject to airport Site Access permit approvals, and will be provided to relevant airport personnel. Permits will include sufficient detail for permit applications to be assessed, as well as proposed timeframes for key requirements such as land clearing.

6.1.4 Client Interface

Where applicable the environmental team will liaise with the client either directly or through board meetings. This will be done with the approval of the Alliance Director.

6.1.5 Media and Community Consultation

Any consultation with the media or the community will be undertaken in accordance with the Stakeholder Engagement Management Plan.

As part of this plan, a Project comment/complaints and response system will be implemented during the construction phase to establish and maintain a system of records, documenting all information of complaint handling. Gateway WA will operate a telephone contact line for the purpose of receiving any complaints and comments from members of the community relating to construction activities. For each complaint received, the following information will be recorded:

- Date and time of complaint
- Nature of complaint
- Action to be undertaken by Gateway WA in relation to the complaint, including staff responsible in taking that action
- Potential environmental incident.

Following investigation of the complaint, the complaints register will be updated to include where appropriate:

- A summary of the investigation undertaken
- The action undertaken by the alliance relevant to the complaint
- Weather conditions at the time and place of the event, if relevant to the complaint, and any construction related activities
- If no action was undertaken by the alliance, the reasons for this decision
- Time and date of follow-up contact and resolution with the complainant
- Nature of and outcomes from follow-up contact with the complainant
- Environmental incident report number if relevant.

If the complaint investigation determines that the nature of the complaint justifies its inclusion as an Environmental Incident, it will be acted on without delay in line with the procedure detailed in section 6.4.

Additionally this CEMP, along with the Surface and Groundwater Management Plan, Stakeholder Engagement Management Plan and Rehabilitation and Landscape Management Plans will be published on the Gateway WA website within one month of being approved by DoE.

6.2 Meetings and Minutes

Where appropriate, internal and external meeting minutes will be kept for record purposes.

6.3 Reporting

6.3.1 Performance Reporting

Performance reporting will be applied to produce systematic, comprehensive and informative reports on the results of environmental monitoring and the construction activities of the Project as a whole.

Regular reports will be provided to the Alliance Director, AMT and the Board by the Environmental Manager in relation to compliance with the CEMP through such means as the Monthly Board Report and AMT meetings.

Copies will be provided to key stakeholders such as Perth Airport and the Airport Environment Officer (Department of Infrastructure and Transport), where relevant.

6.3.2 Regulatory Requirements

Within three months of every 12 month anniversary of the commencement of the action, Gateway WA will publish a report on the Project website addressing compliance with each of the conditions of the Project approval under the *EPBC Act,* including implementation of:

- This CEMP
- Stakeholder Engagement Management Plan (includes community issues management)

- Surface and Groundwater Management Plan (includes dewatering management)
- Rehabilitation and Landscape Management Plan

Documentary evidence providing proof of the date of publication and non-compliance with any of the conditionals of the approval must be provided to DoE at the same time as the compliance report is published.

Additional reporting to the appropriate regulatory authorities will be undertaken as required according to the various environmental approval and permit conditions.

6.4 Incident/Crisis Communication

To ensure that all environmental incidents are identified, reported, thoroughly investigated and that, where appropriate, corrective action aimed at preventing recurrences of the incident taking place, Gateway WA has developed a Project wide procedure for the management and notification of such incidents

All environmental incidents will be documented and entered into the electronic Cintellate system to allow incident actions to be monitored and an effective method of follow up occurs on the path to an eventual closing of the action.

Environmental incidents are defined as events that cause or potentially cause harm to the environment, with the level of significance assigned according to the definitions provided in the table below.

Table 3 Environmental incident classification

Class	Nature of incident
3	Minor non-adherence to procedure. Low severity occurrence defined as pollution or degradation with a short term (less than one month) and reversible detrimental effect on the environment and/or community, ie a minor oil spill completely remediated.
2	Moderate breach of procedure. Medium severity defined as pollution or degradation with persistent (greater than three months) but reversible detrimental effect on the environment and/or community.
1	(Serious incident) Extreme breach of procedure that could lead to a breach of environmental approval conditions. High severity event defined as pollution or degradation that has or may have irreversible detrimental effects on the environment and/or community.

All incidents, no matter how insignificant, must be reported and investigated to prevent further incidents from occurring

Investigations must take place as soon as possible after the incident has occurred. All incident investigations are to focus on identifying the causes of the incident so that appropriate remedial and preventative control measures can be identified and implemented.

Incident Cause Analysis Method (ICAM) investigation will be undertaken if an actual or potential Class 1 incident occurs. In the event of an actual or potential Class 2 or 3 incident, a minor investigation only using Gateway WA Incident Investigation Report form will be undertaken. The exception to this is Class 3 if considered by the Environmental Team as minor and uncontrollable (e.g. hydraulic hose blow of less than 2 litres on previously disturbed land).

The depth of the investigation, the composition of the investigation team and the reporting requirements will vary subject to an assessment of the actual and the potential consequences. The level of investigation must be driven by the potential consequences.

On completion of the investigation, the findings and recommendations shall be distributed to the relevant site crews for discussion at a toolbox meeting.

All incidents and the results of the subsequent investigation are to be tabled and reviewed at the next Safety Health and Environment committee meetings.

6.4.1 Incident Reporting

All potential and actual Class 1 and 2 incidents are to be reported to the Environment Team as soon as possible. Class 3 incidents are to be reported within 12 hours of the incident occurring. Additional reporting requirements for Class 1 and 2 actual and potential incidents should occur within the following tables:

Table 4 Actual and Potential Class 1 Incidents

Notification To	Notification By	Time Frame	Reporting Method
Alliance Director	Project Manager	Within 1hr	By phone
Alliance Board Members	Alliance Director	Within 1hr	By phone
General Counsel	Alliance Director	Within 1hr	By phone

Table 5 Actual and Potential Class 2 Incidents

Notification To	Notification By	Time Frame	Reporting Method
Alliance Director	Project Manager	Within 24 hours	By phone and e-mail
Alliance Management Team members	Alliance Director	Within 14 days	Verbally at AMT meetings

Depending on the location of a Class 1 incident the Environmental Manager will also notify the appropriate authorities/land managers, who may include:

- DER
- DoE
- Department of Fire and Emergency Services
- City of Belmont
- Shire of Kalamunda
- Perth Airport
- DoW
- Department of Indigenous Affairs
- Aboriginal community representatives

Appendix B details the relevant authorities requiring notification for specific events.

The relevant representatives of Perth Airport will also be notified if the Class 2 incident is on airport land, or could impact airport operations.

6.5 Environmental Incident Drills

Environmental incident drills will be conducted at least once every six months, with the first undertaken within 6 weeks of construction commencement.

6.6 Non-Conformance Reports

Non-conformance reports are kept to detail deviations from the established processes, including those relating to the EMS. These reports are generated when a deviation has occurred, but has not necessarily resulted in an environmental impact. This is further documented within the Quality Assurance and Integrated Systems Management Plan.

7 RISK AND OPPORTUNITY MANAGEMENT

7.1 Risk Identification and Assessment

7.1.1 Active Risk Manager (ARM)

High level environmental risks will be captured within ARM. These will include those risks for which, although they may have environmental management implemented, the risk remains high or above. This will be done in accordance with the Risk and Opportunity Management Plan.

7.1.2 Operational Risk Identification

Overall Project environmental risks were identified through an Operational Risk Assessment, with the high level risks to be included in ARM.

Task specific risks shall be identified and implemented through the Safety, Health and Environment Work Method Statement (SHEWMS). These SHEWMSs will capture the environmental and safety risks associated with each step of the task, identifying appropriate management actions in order to minimise the risk. These will be reviewed and approved by a member of the Environment team.

7.1.3 Risk Review

A Risk and Opportunity Review Meeting, chaired by the R&O Manager and attended by key stakeholders, will be established with specific responsibility for advising on risk and opportunity related aspects of the project. This meeting is likely to be a standalone meeting usually lasting at least half a day.

The Risk Review Meeting will be held at a frequency of not less than one month to scrutinise all relevant risks and opportunities in order of significance, and to decide on the appropriate action for the mitigation of risks in the most cost-effective manner. The meeting will also review the results of any quantitative risk analyses that have been completed.

Specific Project environmental risks will be reviewed regularly. The review may be triggered by a change in the construction methodologies, legislation requirements or unexpected risks which come to light at a later date. Any additional management, monitoring or reporting requirements shall be implemented through a review of this CEMP.

7.2 Risks and Opportunities

7.2.1 Key Risks and Opportunities for Environment

A risk assessment has been undertaken for the Project. This included a 'brainstorming' risk workshop, using assessment criteria defined in the Risk and Opportunity Management Plan.

The key environment risks identified for the Project include impacts involving:

- Vegetation and flora loss
- Fauna loss
- Bushfire
- Dieback and weed spread
- Hydrology and wetlands
- Terrestrial soils – contaminated soils, acid sulfate soils and use of hazardous substances

- Construction noise and vibration
- Construction dust
- Construction waste
- Aboriginal heritage sites

A series of maps showing environmental constraints ('No Go' areas) and management are provided at Appendix A.

Opportunities for environmental management include:

- Minimisation of vegetation and habitat loss
- Vegetation and topsoil stripping and re-use
- Salvage of vegetative materials
- Rehabilitation
- Fauna relocation
- Weed control
- Use of recycled materials
- Water re-use

8 ENVIRONMENTAL MANAGEMENT CONTROLS

8.1 Planning

Environmental management planning has progressed through requirements of meeting the ISO14001, legislative and approval requirements, as well as endeavoring to achieve best practice, resulting in the minimal impact on the environment.

8.2 Approval Conditions Register

A register of approval conditions will be maintained. This lists all conditions required for compliance with Federal and State approvals for the Project. The approval condition register will be reviewed and updated when new approvals are acquired. Where relevant, approval conditions will also be listed in the environmental management actions table (see below).

8.3 Controls, Monitoring and Contingencies

To ensure the objectives and targets are achieved, management actions which are to be followed during the design and construction of the Project are listed within Appendix B. These tables will be included as Knowledge and/or Tools within the Gate Way system.

Some potential impacts may be relevant to several of the environmental issues/aspects detailed in Appendix B. Where possible, the relevant management actions and monitoring are detailed in one section to prevent unnecessary repetition.

Monitoring requirements are also detailed within Appendix B, and shall be undertaken to assess compliance with the management actions. Where monitoring finds that management measures have not been implemented, remedial actions will be undertaken as per the specified contingencies. Where actions are not found rectified within the agreed time (usually within one week), these actions will be captured by Cintellate. This includes detailing of the action, the person responsible for implementation and the details of the implementation and close out.

Table 6 Process for managing measures which have not been implemented

Type	Definition	Example	Documented
Onsite Action	Minor issue, easily remedied.	Temporary fencing around vegetation needing repair	Weekly Environmental Coordinator Checklist
Cintellate Action	If not undertaken in the very near future, a significant break of an environmental approval may occur.	Installation of flagging around vegetation required	Cintellate
NCR	Significant deviation from CEMP/approval requirements.	Clearing in an area without a GWA Clearing Permit, however area is within project approval limits and most likely granted internal approval if Clearing Permit applied for.	InCite
Incident	Events that cause or potentially cause harm to the environment	Clearing in an area without internal or external approval.	Cintellate

8.3.1 CEMP Commitments Register

Environmental actions and commitments from this CEMP are captured within the CEMP Commitments Register. Similarly all conditions from environmental approvals and permits are captured within the Approval Conditions Register. These registers also provide the basis for monitoring compliance and include references to associated documentary evidence. This evidence may include photographs, attendance registers, weekly environmental checklists etc. The registers will be updated on a regular basis (at least every 3 months).

9 REFERENCES

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Department of Sustainability, Environment, Water, Population and Communities. Approval – Perth Airport and Freight Access Project (Gateway WA), Perth WA (EPBC 2010/5384).

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National Uniform Drillers Licensing Committee, (2012). Minimum Construction Requirements for Water Bores in Australia.

Roadside Conservation Committee, 2005. Handbook of Environmental Practice for Road Construction and Maintenance Works. Government of Western Australia.

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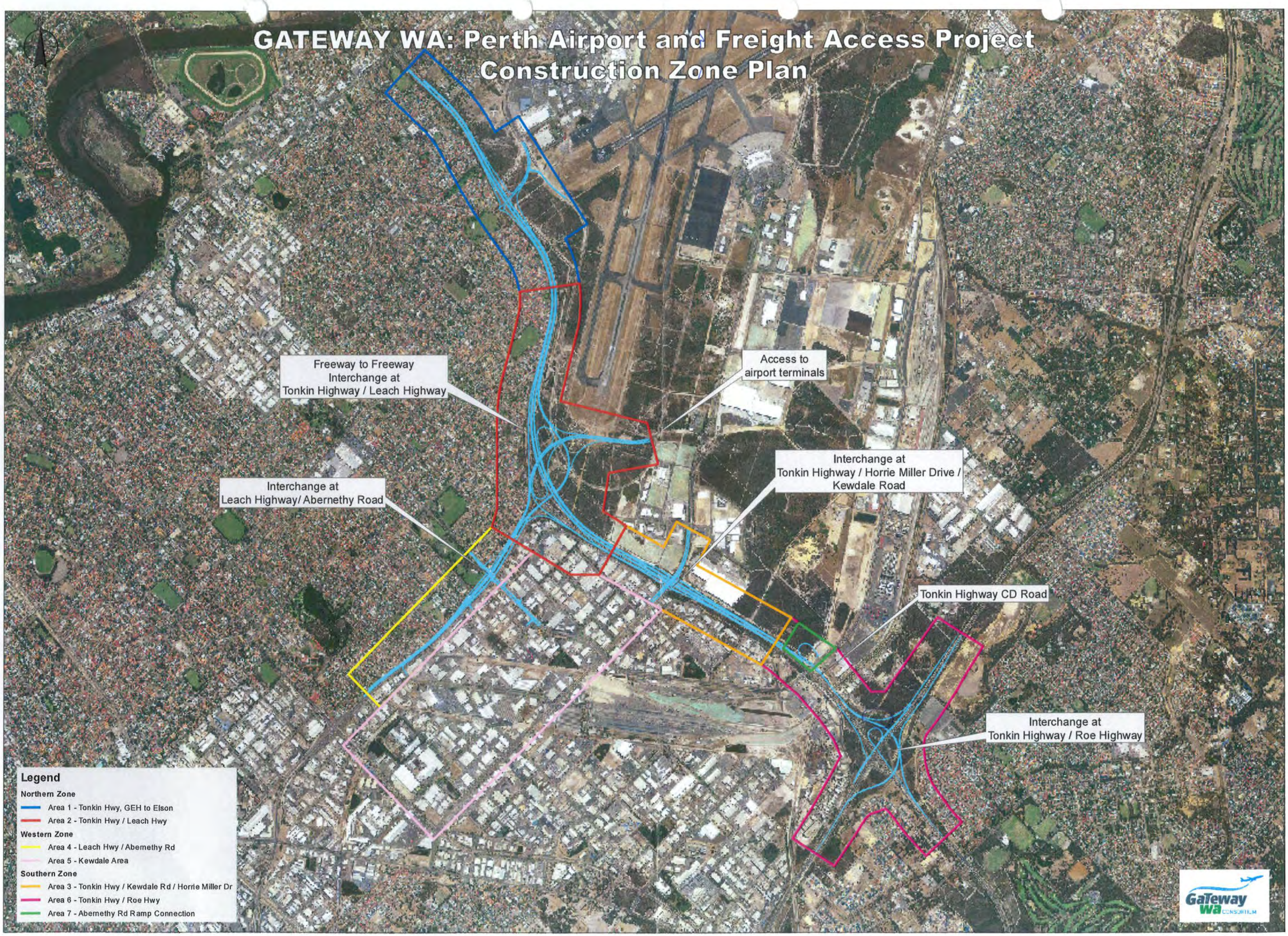
Appendix A: FIGURES

Construction Impact Plan

Environmental Constraints and Management Plans

Temporary Site Facilities Plans

GATEWAY WA: Perth Airport and Freight Access Project
Construction Zone Plan



AREA 1

AREA 2

265250

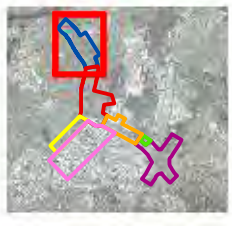
264500

263750

62000

62750

63500



Area 1

0 75 150 225 300

Metres

GDA 1994 Perth Coastal Grid 1994

1:7,500 (A3)

- Bunded Clean Down Point
- Road Design
- Permanent Fauna Fence with Temporary Silt Trap
- Permanent Fence
- Maximum Project Area
- Airport Land

No Go Areas

- Protectable potential breeding trees
- Core black cockatoo feeding habitat

Geomorphic Wetlands

- Resource Enhancement

Environmental Constraints and Managment in Work Areas

WORK AREA 1

GatewayWA

Perth Airport and Freight Access Project

AREA 1

AREA 2

Perth Airport Woodland Swamps

AREA 3

AREA 4

AREA 5

263000

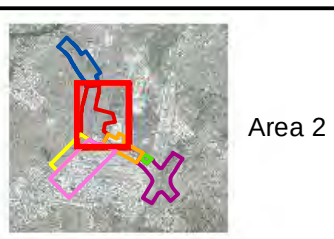
262250

261500

62750

63500

64250



Area 2

0 75 150 225 300

Metres

GDA 1994 Perth Coastal Grid 1994

1:8,000 (A3)

- Bunded Clean Down Point
- Road Design
- Permanent Fauna Fence with Temporary Silt Trap
- Permanent Fence
- Fauna Underpass
- Permanent Fence with temporary silt trap
- Maximum Project Area
- Directory of Important Wetlands
- Airport Land

No Go Areas

- Protectable potential breeding trees
- Rare Flora, Macarthuria keigheryi
- Core black cockatoo feeding habitat
- Runway Swamp

Geomorphic Wetlands

- Conservation
- Resource Enhancement
- IOCZ boundary

Environmental Constraints and Management in Work Areas

WORK AREA 2

GatewayWA

Perth Airport and Freight Access Project

Environmental Constraints and Managment in Work Areas

Work Area 3

DRAFT

Perth Airport Woodland Swamps

AREA 2

AREA 3

AREA 5

AREA 6

AREA 7

261450

260900

260350

63600 64150 64700 65250

0 55 110 165 220 275

Meters

1:5,500 (A3)

GDA 1994 Perth Coastal Grid 1994

LEGEND

- Bunded Clean Down Point
- Rare Flora

GHD Cockatoo Tree Locations

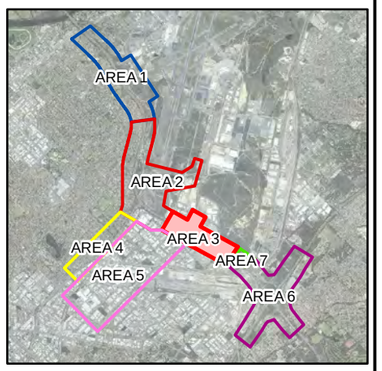
- Potential breeding trees
- Fauna Fence
- Permanent Fence
- Road Design
- Area included in Clearing
- Maximum Project Area
- Directory of Important Wetlands
- Airport Land

No Go Areas

- Core black cockatoo feeding habitat

DEC Geomorphic Wetlands

- Conservation
- Resource Enhancement



GatewayWA

Perth Airport and Freight Access Project

AREA 3

AREA 7

AREA 6

260000

260000

65000

AREA 6

0 100 200 300

Metres

GDA 1994 Perth Coastal Grid 1994

1:7,800 (A3)

Bunded Clean Down Point

Potential breeding trees

Conospermum undulatum

Fence

Permanent fence with temporary silt fence

Temporary fence with temporary silt fence

Airport Land

Maximum Project Area

No Go Areas

Core black cockatoo feeding habitat

Geomorphic Wetlands

Conservation

Resource Enhancement

Environmental Constraints in Work Areas

WORK AREA 6

GatewayWA

Perth Airport and Freight Access Project

Environmental Constraints in Work Areas
WORK AREA 8

GDA 1994 Perth Coastal Grid 1994

0 50 100 200 300

Meters

GDA 1994 Perth Coastal Grid 1994

1:6,563 (A3)

Legend

- Design 85%
- Cockatoo Potential Breeding Trees
- Conospermum undulatum
- Maximum Project Area
- Bush Forever

Fence

- Permanent Fauna Fence with Temporary Silt Trap
- Permanent Fence
- Fauna Underpass
- Permanent Fence with temporary silt trap

Geomorphic Wetlands

- Conservation
- Resource Enhancement

GatewayWA
Perth Airport and Freight Access Project

Temporary Site Facilities

Work Area 1

GDA 1994 Perth Coastal Grid 1994

0 75 150 225 300

Meters

1:8,000 (A3)

LEGEND

Road design

Temporary Site Facilities

- Project Site Office and Parking
- Project Topsoil and Mulch Storage / Laydown Area
- Work Crew Facilities and Parking
- Compound Boundary

GatewayWA

Perth Airport and Freight Access Project

Temporary Site Facilities

Work Area 2

GDA 1994 Perth Coastal Grid 1994

0 60 120 180 240

Meters

1:6,500 (A3)

LEGEND

Road Design

Temporary Site Facilities

- Project Site Office and Parking
- Project Topsoil and Mulch Storage / Laydown Area
- Work Crew Facilities and Parking
- Compound_Boundary

GatewayWA

Perth Airport and Freight Access Project

Temporary Site Facilities
Work Area 3

0 85 170 255 340 425

Meters

1:8,500 (A3)

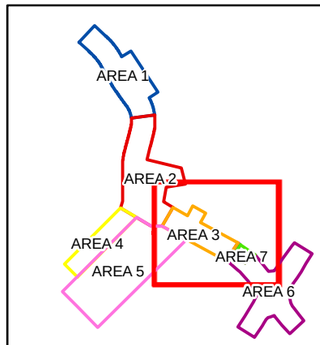
GDA 1994 Perth Coastal Grid 1994

LEGEND

Temporary Road Re-alignment

Temporary Site Facilities

- Project Site Office and Parking
- Work Crew Facilities and Parking
- Area included in Clearing



GatewayWA
Perth Airport and Freight Access Project

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Last Printed: 10/01/13

Temporary Site Facilities

Work Area 6

GDA 1994 Perth Coastal Grid 1994

0 75 150 225 300

Meters

1:7,880 (A3)

LEGEND

Road design

Temporary Site Facilities

- Project Site Office and Parking
- Project Topsoil and Mulch Storage / Laydown Area
- Compound Boundary

GatewayWA

Perth Airport and Freight Access Project

APPENDIX B: ENVIRONMENT MANAGEMENT TABLES

Vegetation and Flora

Background	Vegetation and flora within the project area varies from cleared areas to remnant vegetation of excellent quality. Two threatened flora species (*Conospermum undulatum* and *Macarthuria keigheryi*) exist within the broad project area, within areas of native bushland. Whilst construction of the project will directly impact the vegetation and flora, it can be reduced through re-design and actions undertaken in the field.		
Activity	• Clearing vegetation • Moving around site	**Location**	Entire Site
Overall Objective	• Minimise vegetation clearing • Ensure impacts on Declared Rare and Priority Flora (as listed at the time of construction) are adequately identified and minimised during construction.		
Associated Documents	• Specification 301 Clearing • Rehabilitation and Landscape Management Plan • Environment Monitoring Plan • Rehabilitation Plan – Pioneer Park Offset • Gateway WA Permit to Take Rare Flora (State land only)		

Conospermum undulatum

Macarthuria keigheryi

Management and Mitigation

Timing	Management and Mitigation Actions	Responsibility
Design/Pre-construction	A pre-clearing tree survey will be undertaken to identify any trees with a trunk diameter at breast height of 150mm or greater, close to the clearing boundaries. Locations of these trees will be recorded by a surveyor.	Approvals Manager
Design/Pre-construction	The design will be modified where practicable to minimise the number of trees as well as bandicoot and cockatoo habitat required to be cleared. This may include: • Retaining walls in lieu of batters. • Fences and/or noises on batter edges rather than cadastre boundaries. • Reducing median widths. • Avoiding locating drainage infrastructure such as basins in areas of remnant vegetation. Results of the survey as detailed in the row above as well as previous fauna surveys will be used to assist with these possible modifications.	Design Manager

Induction	The induction program will include relevant vegetation and flora information.	Safety and Support Services Manager
Prior to Clearing	'No-go' maps are provided for each construction zone – attached at Appendix A. These indicate sensitive environmental and heritage areas, in particular the locations of threatened plant species and threatened fauna habitat and conservation zones on Perth Airport.	Environment Manager
Prior to Clearing	The clearing line will be clearly marked onsite by a surveyor in accordance with the design. This line will be checked by a member of the Environment Team (with appropriate experience) prior to the commencement of clearing works to ensure it represents the least, practicable, disturbance.	Project Engineer Environment Manager
Prior to Clearing	An internal Clearing Permit will be approved for each clearing zone by the Environment Manager (or their representative) to ensure the applicable environmental and social aspects of the clearing are considered and managed. The Clearing Permits will ensure that the applicable external approval conditions are complied with.	Site Engineer
Prior to Clearing	Cuttings and seed of *Conospermum undulatum* will be collected prior to the plants being clearing, as per the requirements of the DPaW Permit to Take Rare Flora and the Rehabilitation Plan – Pioneer Park Offset.	Environment Manager
Construction	Clearing will not be undertaken any further than 4 m from the boundary of earthworks unless required for safety reasons, or no other practical means of access to the site is available.	Project Manager
Construction	Mature trees, trees of significance, remnant vegetation and threatened flora and communities will be retained as far as practicable within the approved Project Site boundary and will be clearly marked on site and on clearing plans. No more than 103 ha of native vegetation can be cleared within State land on the Project area.	Project Manager Environment Manager
Construction	Fencing (temporary or otherwise) and/or flagging shall be placed to delineate the project area from retained significant mature trees, populations of threatened flora and fauna habitats, Precinct 5, the Infrastructure Only Conservation Zone and threatened ecological communities. Signage will also be in place on the ground to further notify the workforce that moving beyond the fence line is no allowed. This fence shall be fauna proof, where necessary, and installed prior to, or immediately after, the completion of clearing works in the vicinity and is to be approved by the Environment Manager prior to works continuing.	Supervisor Project Engineer Environment Manager
Construction	Existing or proposed, cleared areas shall be utilised for temporary construction purposes, such as tracks, offices, stockpiling and laydown areas. The indicative locations of temporary facilities are provided at Appendix A.	Construction Manager Project Manager Supervisor
Construction	Vegetation which can be retained will be pruned with a chainsaw in preference to clearing where practicable.	Project Manager
Construction	Plant/machinery used for pushing and heaping operations shall be fitted with root rakes or similar equipment and operated in a manner such that as little soil as possible is removed and heaped with the cleared vegetative material.	Project Engineer
Construction	Trees to be removed shall be felled in a manner that they fall within the approved clearing area.	All personnel
Construction	Cleared vegetation will not be burned on site.	All personnel
Construction	Cleared vegetation suitable for reuse will generally be reduced in size (chipping) and reused within the soft landscaping works.	Construction Manager
Construction	Vehicles and equipment shall not be driven over, or parked on, tree root zones as far as is practicable.	All personnel
Construction	Construction works will be undertaken in accordance with the detailed design plans.	Project and Construction Managers Project and Site Engineers Superintendents and Supervisors
Construction	In the event that previously unrecorded Threatened or Priority plants are identified in the construction zone the following will occur:	All personnel

	• The Environment Manager will be notified immediately; • Work in the immediate area (within 20m of the location of the plants) will be suspended subject to further investigation; • A detailed assessment of the area, and suitable habitat in the vicinity of the impact area, will be undertaken by a qualified and experienced botanist in order to quantify the potential loss of plants; • Design and construction will be re-considered to avoid or minimise loss of plants; • If avoidance is not possible, Gateway WA will apply for a Ministerial 'permit to take' under the Wildlife Conservation Act, WA (where plants occur on State land only) and will implement the requirements of the permit; • Opportunities to preserve, re-use and re-establish plants will be examined, in consultation with the DER.	Environment Manager
Construction	Machinery or vehicles are not to move outside the clearing line, except on existing tracks or designated side tracks.	All personnel
Rehabilitation	Batters shall be covered with topsoil and/or mulched and revegetated unless otherwise determined. Refer to the Rehabilitation and Landscape Management Plan.	Environmental Works Manager
Rehabilitation	At least 15 plants of *Conospermum undulatum* will be established in pots and re-planted in sites with suitable conditions within the project rehabilitation areas. This will occur at the Roe Highway/Tonkin Highway interchange or on Roe Highway. Other plants will be re-established in the Pioneer Park offset area. All plants will be monitored and maintained as per the Rehabilitation and Landscape Management Plan.	Environment Manager Environmental Works Manager

Monitoring Program

Parameter	Location	Frequency	Responsibility
Flagging/temporary fencing surrounding significant trees, TECs and threatened flora populations	Construction area	Weekly during construction	Environmental Manger
Placement of compounds, stockpiles and laydown areas are in suitable locations	Construction area	Weekly during construction	Environment Manager
Clearing lines and temporary fences utilised	Construction area, particularly where clearing is required and areas have been fenced	Weekly during construction	Environment Manager
Minimise clearing footprint where possible	All areas prior to clearing	All areas prior to clearing	Environment Manager
Areas of unauthorised clearing	Construction area	Weekly during construction	Environment Manager
Vegetation condition, assessing: • Tree/plant health by species • Vegetation cover • Weediness index Vegetation condition will be assessed in accordance with the requirements in the Environment Monitoring Plan.	Transects within adjacent TEC in Area 6.	Once prior to construction commencement in Area 6 Bi-annually during construction Annually for five years post construction	Environment Manager Main Roads

Contingencies

Trigger	Action
Clearing or disturbance to vegetation outside approved areas.	1. Investigate cause 2. Review management procedures 3. Increase education amongst all personnel 4. Review use of temporary flagging/fencing to delineate boundaries of project area 5. Rehabilitate areas with native species under the direction of a suitably qualified environmental consultant and as soon as possible after incident in accordance with the Rehabilitation and Landscape Management Plan

	6. Monitor success of rehabilitation
Unauthorised clearing of, or impacts to, *Conospermum undulatum* or *Macarthuria keigheryi.*	1. Investigate cause 2. Review management procedures 3. Notify DER and DoE 4. Agree contingency actions with DER and DoE 7. Rehabilitate areas with native species under the direction of a suitably qualified environmental consultant and as soon as possible after incident 5. Monitor effectiveness of contingency actions
Non-compliance with management and mitigation measures.	1. Investigate cause. 2. Implement contingency actions which may include: - Review management measures practicality or relevance. - Improve training and education for all personnel. 3. Improve and implement increased protective measures as necessary. 4. Monitor the success of these actions.

Fauna

Background

Construction activities may cause accidental death or injury to animals within the project area, particularly during clearing works. Construction activities may also result in loss or segregation of fauna habitat. Fauna likely to be found in the project area include mammals, reptiles and birds. The pictured animals are threatened or otherwise significant and are known to occur within the project area.

Rainbow Bee-eater

Bandicoot / Quenda

Red-tailed Black Cockatoo

Carnaby's Black Cockatoo

Western Swamp Tortoise

Activity	All works, particularly clearing vegetation	**Location**	Entire Site
Overall Objective	• Ensure potential impacts on protected fauna (as listed at the time of construction) are adequately identified and minimised during construction. • Minimise impact to terrestrial fauna.		
Associated Documents	• DPaW Permit to Relocate Fauna		

Management and Mitigation

Timing	Management and Mitigation Actions	Responsibility
Pre-construction	The implementation of fauna underpasses within the design should be considered in relation to fauna movements. If undertaken, strategies to deter inappropriate access (e.g. by motorcyclists) shall be investigated and implemented where feasible. The design will considered strategies to encourage fauna use and discourage predation from feral animals (such as sky lights). A map of the proposed fauna underpass is provided at Appendix A.	Design Manager Environment Manager
Pre-construction	The detailed design shall include fauna exclusion fencing at appropriate locations along the road verge to minimise the risk of fauna entering the road alignment. A map of proposed fauna fencing is attached at Appendix A.	Design Manager Environment Manager

Pre-construction	A ‘no-go’ map is provided for each construction zone – attached at Appendix A. These indicate sensitive environmental areas.	Environment Manager
Pre-construction	A permit to take fauna shall be acquired from DER, outlining the trapping and translocation program to be undertaken prior to clearing works.	Environment Manager
Induction	The induction program will include relevant fauna information.	Safety and Support Services Manager
Prior to Clearing	The clearing area will be searched for fauna, this will include: • Trapping; • Ground searches for fauna; and • Tree hollow inspections, including the use of a cherry picker if required, with the purpose to remove any mammals or birds (including eggs) from the trees prior to clearing. The method of fauna searches will be determined based on previous fauna studies within the area and any observable evidence on site (i.e. tracks, scats, etc.). Captured fauna (including eggs) will either be relocated into the neighbouring vegetation, unless injured or sick, or if neighbouring vegetation is not suitable, at a location agreed with DPaW, or the relevant Local Government Authority.	Environment Manager
Clearing	A suitably qualified Fauna Spotter shall be onsite during all major clearing works to identify fauna within the clearing area and relocate if necessary.	Environment Manager
Clearing	Clearing should be timed, where practicable, to prevent coinciding with the main nesting/breeding seasons of fauna species which occur within the project area – usually Spring – September to December.	Environment Manager Project Manager
Clearing	Clearing should be undertaken from degraded areas towards better quality bushland areas on one front, to provide an opportunity for fauna to move out of the clearing area.	Project Manager Supervisor
Clearing	Machinery should start up at least 10 minutes prior to clearing to potentially ‘scare’ fauna away from the area.	Project Manager Supervisor
Construction	If injured/sick animals are encountered, or eggs are removed from trees, a nominated licenced fauna carer shall be called to care for the animal. The carer may only enter site if escorted by the Site Supervisor. This action is restricted to mammal and avian species, and medium to large reptiles. Alternatively animals may be taken to the local veterinary centre or wildlife centre.	Environment Team Supervisor
Construction	Fauna encountered in the construction area shall be given the chance to move on if there is no threat to the person’s safety in doing so.	All personnel
Construction	Native fauna encounters will be recorded and reported to DPaW.	Environment Manager
Construction	Trenches will not be left open between shifts unless unavoidable. If this is to occur, a ramp should be made within the trench to allow fauna to escape.	Construction Manager Supervisor
Construction	Temporary fencing shall be placed around high use fauna areas, such as cockatoo feeding areas, once clearing has concluded.	Construction Manager Supervisor
Construction	Speed restrictions shall be implemented for all access tracks on site.	Superintendent
Construction	Lighting shall be directed toward the intended target to prevent excessive light spill.	Supervisor
Construction	Lighting that is not required and will not impair operations and/or personnel health and safety shall be switched off.	All personnel
Construction	Control of feral/pest animals shall be undertaken if deemed necessary.	Environment Manager
Construction	Firearms, traps and pets are not to be brought to site, except where pre-clearing fauna trapping is authorised.	All personnel

Monitoring Program			
Parameter	**Location**	**Frequency**	**Responsibility**
Direct impacts to Black Cockatoos and Quenda.	Construction area	Opportunistically during construction	Environment Manager
Presence of trapped fauna in pits, trenches, compounds or any other work area which has the real potential to entrap fauna, and ensure all are checked and cleared.	Construction area	Daily during construction (reported at least weekly)	Superintendent
Flagging and/or fences protecting nesting trees, fauna habitat, and feeding areas are in place.	Construction area	Daily during construction (reported at least weekly) Weekly during construction	Supervisor Environment Manager
Encounters with native fauna are recorded and made available to DPaW.	Construction area	Opportunistically during construction Reported as required through Permit to Take Fauna	Environment Manager
Encounters with pest/feral animals to determine if control is necessary.	Construction area	Opportunistically during construction	Environment Manager

Contingencies	
Trigger	**Action**
Fauna deaths or injuries	1. Investigate cause 2. Contact DoE and/or DPaW if there are impacts on listed threatened species 3. Review management procedures 4. Increase education amongst all personnel 5. Erect fencing to prevent fauna access to active construction areas (if required)
Previously undetected cockatoo nesting trees discovered (actual nesting of a Black Cockatoo)	1. Personnel shall cease work near nesting trees and report to Environment Manager and/or Supervisor 2. Environmental, Project and Design Mangers shall investigate and review potential methods to avoid damaging nesting trees where practicable whilst inhabited. 3. Implement method, which may include limiting impact on the tree whilst breeding, or removal of eggs to a registered carer. 4. Monitor success of management. 5. Report location and actions to DPaW.
Non-compliance with management and mitigation measures	1. Investigate cause. 2. Implement contingency actions which may include: - Review management measures practicality or relevance. - Improve training and education for all personnel. - Improve methods for marking clearing lines. - Install additional temporary fencing or signs. 3. Improve and implement increased protective measures as necessary. 4. Monitor the success of these actions.

Bushfire Prevention and Response			
Background	Bushfires can occur as a result of construction works, specifically: • Vehicle and machinery use near dry vegetation • Undertaking hot works • Smoking and/or disposing of cigarette butts inappropriately. Bushfires become both a safety and environmental concern, and can severely impact vegetation and fauna.		
Activity	All works, particularly those undertaken near dry vegetation, on hot, dry days and/or those involving a source of ignition	**Location**	Entire site, particularly near vegetation
Overall Objective	• Comply with the *Bush Fires Act 1954*		
Associated Documents	• Total Fire Bans (http://www.dfes.wa.gov.au/totalfirebans/Pages/default.aspx) • Harvest Bans (http://www.kalamunda.wa.gov.au)		

Management and Mitigation		
Timing	**Management and Mitigation Actions**	**Responsibility**
Induction	All personnel will be educated on bushfire prevention, including the risk of disposing of cigarette butts on the ground.	Safety and Support Services Manager
Construction	Hot works shall not be undertaken on total fire ban days unless an exemption has been approved by Department of Fire and Emergency Services.	Project Manager
Construction	Clearing operations within the Shire of Kalamunda shall not be undertaken on total harvest ban days unless an exemption has been approved.	Construction Manager
Construction	All activities involving hot works shall have a valid Hot Works permit.	All personnel
Construction	Cigarette bins are to be located frequently throughout site.	Supervisor Site Engineer
Construction	No fires are to be lit at any time.	All personnel
Construction	Fire extinguishers and fire fighting equipment to be available in all site offices.	Construction Manager
Construction	All construction vehicles to have portable fire extinguishers.	Plant Manager All personnel
Construction	Earth moving machinery and water trucks to be on standby during extreme fire danger periods.	Construction Manager
Construction	Procedures shall be developed for dealing with small fires and fires that require external assistance. These procedures shall make up part of the Emergency Response Management Plan and shall be communicated to all working in the project work area.	Safety and Support Services Manager
Monitoring Program		

Parameter	Location	Frequency	Responsibility
Integrity of machinery and vehicles during pre-starts.	Entire Site	Daily for plant / Weekly for vehicles	Alliance Director

Contingencies	
Trigger	**Action**
Bushfire occurs onsite	1. Investigate cause (undertaken by the Alliance or the authorities). 2. If fire was found to have started onsite, review management measures practicality or relevance. 3. Improve training and education for all personnel. 4. Improve and implement increased protective measures as necessary. 5. Monitor the success of these actions. 6. Additionally, investigate possible methods of rehabilitation for the impacted areas.
Non-compliance with management and mitigation measures	1. Investigate cause. 2. Implement contingency actions which may include: - Review management measures practicality or relevance. - Improve training and education for all personnel. 3. Improve and implement increased protective measures as necessary. 4. Monitor the success of these actions.

Dieback and Weed Control			
Background	*Phytophthora cinnamomi* (Dieback) is a soil-borne pathogen that survives and reproduces on a wide range of native plant species. Dieback infestations spread through bushland either: • Naturally through the movement of contaminated soil and possibly water; • Artificially through the movement of contaminated soil on vehicles and the importation of contaminated soil, mulch or fill, and occasionally via foot traffic. Vegetation in the project area is deemed to be mostly infected or unprotectable from infestation. Weeds may have a negative impact on the environment, including impacting the success of the soft landscaping and degradation of adjacent remnant vegetation. With the movement of soil through various methods, weed seeds can easily spread throughout the project area or be introduced from other areas if transported to site. Weed control is therefore necessary to prevent the introduction of new species and the spread of those existing. The Project area is highly altered in most locations, being considered uninterpretable, or unprotectable for dieback in many locations. Significant bushland or habitat areas adjacent to, or likely to remain within, the Project area will be protected through dieback hygiene requirements.		
Activity	All works	**Location**	Entire site
Overall Objective	• Minimise the risk of introduction and spread of dieback as a result of construction works. • Minimise the risk of introduction and spread of weeds as a result of construction works.		
Associated Documents	• Managing Phytophthora Dieback for Local Governments (Dieback Working Group, 2000)		

Management and Mitigation		
Timing	**Management and Mitigation Actions**	**Responsibility**
Induction	The induction shall include information regarding dieback and weed impacts and management actions outlined in this table.	Safety and Support Services Manager
Pre-clearing	The weed status of the project will be assessed prior to clearing commencing. This aims to determine areas of topsoil which can be salvaged for rehabilitation and landscape works.	Environment Manager
Pre-clearing	Weed control shall be undertaken prior to clearing in key areas to control populations of significant weeds, with particular emphasis on areas of high quality vegetation unless otherwise approved by the Environment Manager.	Construction Manager
Construction	All machinery entering the Site must be free of soil and plant debris.	Supervisor Plant Manager
Construction	The number of access points to the project shall be reduced as far as practicable.	Construction Manager
Construction	A Weed and Seed Inspection (see Attachment A) will be in place and apply to all vehicles arriving on site. When on site clean down of all vehicles, machinery, equipment and tools will occur at designated hygiene stations, where relevant. This shall occur in specific areas where it necessary to minimise the risk of dieback and weed spread into areas of adjacent significant vegetation or other significant habitat or species locations. Clean down shall include brushing, gouging, scraping and/or water blasting to remove any compacted soil or plant matter. Once the natural surface is covered , no further dieback and weed wash down will be required, provided vehicles and plant remain within the resurfaced area.	Project Manager Plant Manager Environment Manager
Construction	Hygiene stations shall be provided and utilised at entrances to site or at specific locations when working on the natural ground surface. Hygiene stations will be dry where possible. Indicative locations are provided in Appendix A.	Project Manager
Construction	Soils will only be moved in dry conditions, that being when soils (not dust) do not freely adhere to rubber tyres, tracks, vehicle chassis or wheel arches.	Project Manager

Construction	Imported soils will be absent of weed or dieback. Certification of this will be provided internally by Gateway based on supplier information and/or product testing. Examples of supplier information include management of weed and dieback during the sourcing and stockpiling processes, such as criteria for selection of quarries where soils are sourced., the inclusion of a robust weed control program during stockpiling, and/or whether the material is pasteurised, hence weed seeds and dieback are 'cooked' out. Examples of product testing include analysing samples of the product for any presence of dieback or weed.	Construction Manager Environmental Works Manager
Construction	Topsoil and woodchips taken from site will be re-used as close to the original source as practicable.	Project Manager
Construction	Cleared vegetation or topsoil not suitable for reuse (i.e. weed infested) will be disposed of at an appropriate facility, or buried at least 1 m beneath the eventual surface of the road (in accordance with Main Roads specifications).	Project Manager Supervisor
Construction	Weed control shall be undertaken within the project site every three months or as agreed with the Environment Manager. This shall include, but not limited to: • Laydown areas • Stockpiles • Batters • Unsealed construction areas • Additional areas of weed infestation. Weeds control will not be delayed until immediately prior to soft landscaping works being undertaken.	Project Manager
Construction	Records of the use of herbicides shall be maintained.	Project Manager

Monitoring Program

Parameter	Location	Frequency	Responsibility
Vegetation condition and presence of Dieback	Vegetated areas within project area	Prior to clearing and post construction	Main Roads WA
Presence and extent of declared weeds	Areas of remnant vegetation and soft landscaping within the project area	Post construction	Environment Manager
Complaints from the public of weed introduction and spread along the road reserve.	Entire site	Construction	Relationships Manager

Contingencies

Trigger	Action
Recurrence of complaints from public and observations from site or weed introduction and spread within the project site.	1. From complaints, identify areas of significant weeds and possible source of infestation. 2. Review and revise weed controls. 3. Implement new controls and monitor area for further weed infestations.
Declared plant identified	1. Review treatment program and ensure plant is eradicated during any following weed control event. 2. Continue monitoring.
Non-compliance with management and mitigation measures	1. Investigate cause. 2. Implement contingency actions which may include: - Review management measures practicality or relevance. - Improve training and education for all personnel. 3. Improve and implement increased protective measures as necessary. 4. Monitor the success of these actions.

Hydrology and Wetlands			
Background	There are a number of major constructed drains, as well as mapped wetlands within and surrounding the project area. A significant portion of the area to the east of the existing Tonkin Highway alignment comprises palusplain wetlands which are damplands with a seasonally high water table. Many of these are protected. One wetland of particular importance is Runway Swamp, located directly adjacent to the north of the new Perth Airport access road near the Tonkin/Leach Highway interchange. This is the **only** wetland which has seasonal, surface water. Wetlands in this area rely primarily on groundwater to remain viable. Many of the existing constructed drains and basins in the area intersect natural groundwater levels, and since their construction (mostly in the 1960's and 1970's have had the effect of lowering natural groundwater levels to facilitate development of the airport, as well as low lying roads and industrial land. This drained water forms much of the "base flow" or "summer flow" seen in major drains such as the Southern Main drain. Additionally many sensitive, vegetated areas in the vicinity of the Project may be affected by impacts to the surface and groundwater. Sensitive areas include Conservation Category Wetlands, the Infrastructure Only Conservation Zone (IOCZ), Precinct 5, registered Threatened Ecological Communities (TECs) and threatened flora and fauna habitats. Other sensitive areas on the project, such as threatened flora communities can also be affected by changed surface flows and groundwater levels. Majority of surface water on the western portion of the project has been significantly altered with the urbanisation of the area over time. Little existing remnant wetlands remain, with stormwater either infiltrated at source or piped into local basins within the Kewdale and Belmont areas. Surface water and groundwater levels and quality may potentially be affected by the construction of the project, which may lead to contamination of the neighbouring environment, reduction in groundwater for neighbouring stakeholders to use and a reduction in wetland levels. Despite being lowered by the existing drainage network, groundwater experienced in the project area is typically shallow (1-6 m below ground level), with dewatering works required for some construction activities in low lying areas, or those requiring deeper excavation, including the construction of the Tonkin/Leach Highway interchange. Drainage design has been agreed with the Department of Water and incorporates the principles for management incorporated in the Stormwater Management Manual for Western Australia (Department of Water, 2004-2007). These include the requirement for detention and infiltration of surface water from road runoff for the large majority of rainfall events (1 yr, 1 hour event, up to 16mm of rain) (ref http://www.water.wa.gov.au/PublicationStore/first/84981.pdf - Chapter 9 see Section 3.1). Maps of the major surface flow areas and proposed detention and infiltration basins are provided at Attachment B.		
Activity	All works	**Location**	Entire site
Overall Objective	• Maintain existing surface and groundwater hydrology within the project area and adjacent areas. • Prevent deleterious impacts on surface and groundwater quality. • Prevent spillage of hazardous goods to the adjacent environment, particularly wetlands, during operation.		
Associated Documents	• Main Roads Western Australia (2005), Handbook of Environmental Practice for Road Construction and Maintenance Works • Gateway WA Environmental Monitoring Plan • Gateway WA Surface and Groundwater Management Plan		

Management and Mitigation		
Timing	**Management and Mitigation Actions**	**Responsibility**
Prior to commencement of major construction works	Baseline groundwater information will be collected for the groundwater at nominated wetlands adjacent to the works, and including surface water at Runway Swamp. Baseline information may also be collected at reference sites situated further away from the works. Baseline information will include both water quality and groundwater levels. Basic parameters for monitoring will be: • Major ions; • Nutrients (Nitrogen, Phosphorus); • conductivity and dissolved oxygen. Further details of baseline groundwater water quality and levels are provided in the Surface and Groundwater Management Plan (see below).	Environment Manager

Planning	The highway design will be adjusted within the road reserve to avoid as much area of Conservation and Resource Enhancement Category Wetlands, as well as Runway Swamp, as far as is practicable.	Design Manager
Planning	A Drainage Strategy shall be developed for the Project and approved by the Department of Water prior to construction commencement. This shall be consistent with best practice management as described in the Stormwater Management Manual for Western Australia (Department of Water, 2004-2007). Figures from the approved Drainage Strategy showing the proposed drainage plan are provided at Attachment B.	Design Manager
Planning	Road run-off shall be infiltrated at source wherever possible. Where it cannot be infiltrated at source it will be conveyed to an alternate location within the road reserve where it can be infiltrated by means of landscaped detention/infiltration basins or swales. Provision for storage of the 1 year ARI (Annual Recurrence Interval), 1 hour storm runoff will be made within these structures where practicable to recharge the superficial aquifer and to protect the surrounding environment in case of a major spill through the incorporation of a baffled outlet. In extremely constrained developed areas, where existing road run-off discharges into adjacent Local Government Authority and/or Water Corporation drainage assets, stormwater retention may also be achieved at source through adoption of leaky pits, whilst existing outfall points will be retained and discharge limited to pre-development flow rates or to values agreed with the asset owner. Generally, detailed drainage includes the capacity of retaining 20,000 L in areas adjacent to wetlands in order to prevent contamination of wetlands during a traffic incident involving large volumes of hazardous goods. Pollution treatment devices will be provided upstream of existing direct discharge into the Swan River.	Design Manager
Planning	In cases other than minor road widening works and intersection upgrades where existing conditions are not significantly modified, there shall be no direct discharge of road run-off into permanently protected wetlands (those outside the Project Impact footprint) unless otherwise endorsed by Department of Water. This will be achieved by: • Kerbing or constructing swales; • Draining road run-off to median and roadside swales or detention/infiltration basins; • Installing terminal drainage blocks at end of swales to ensure retention/infiltration prior to overland sheet flow; • Ensuring no direct drainage connection between the median and adjacent wetland areas; Vegetating roadside swales (will slow water flow and provide for biological filtering).	Design Manager
Planning	No more than 16 ha of wetlands will be permanently impacted on Perth Airport land. No more than 34 ha of wetlands will be permanently impacted on State land.	Design Manager Project Manager
Planning	A Surface and Groundwater Management Plan will be developed and implemented. This will include the management and monitoring (quality and groundwater levels) requirements for all dewatering and construction drainage works onsite and shall be approved by the Department of Water. Monitoring requirements will also be provided in the Environmental Monitoring Plan.	Environment Manager
Planning	Erosion controls shall be applied upstream of all permanent discharge points.	Design Manager
Planning	Investigation of the project area will be undertaken to determine where Acid Sulfate Soil management will be needed. Any management plans which are developed shall be approved by DER and implemented during construction.	Environment Manager
Induction	The induction program shall include information regarding the conservation of wetlands, potential impacts to surface and groundwater quality as well as the management actions outlined in this table.	Safety and Support Services Manager
Pre-construction	A ‘no-go’ map is provided for each construction zone. These indicate all sensitive environmental areas and are attached at Appendix A.	Environment Manager
Construction	Dewatering (taking groundwater), including bore abstraction, will be undertaken in accordance with a Licence to Take water as approved by the Department of Water as required under the *Rights in Water and Irrigation Act 1914.*	Environment Manager
Construction	The taking of other water, such as that from nearby evaporation ponds, will only be undertaken on the advice of the Environment Manager.	Construction Manager

Construction	Construction shall be undertaken in accordance with detailed design plans, including: • Installing of fences to minimise risk of accidental impact on all permanently protected (adjacent) wetlands; • Installing erosion/scour control measures; • Minimising native vegetation clearing. Such controls should be installed in conjunction with surrounding drainage works, and should not be installed at a later date, potentially leading to impacts during this period.	Project Manager
Construction	Diversion of any open drains will be avoided during construction wherever possible.	Construction Manager
Construction	Stormwater management shall be designed and implemented wherever relevant on road construction areas, within laydown areas and at offices with the aim to prevent direct run-off into nearby permanently protected wetlands as well as other sensitive areas (Precinct 5, IOCZ, and threatened flora, communities and fauna habitats). Stormwater management will include the use of low bunds, silt fencing, bales or other erosion and siltation prevention equipment where necessary. Major areas of silt traps are shown on the Environmental Constraints and Management figures at Appendix A.	Construction Manager
Construction	Stockpiles which will remain on site for more than a day during May – September and more than five days during October – April, will be bunded where necessary to minimise the amount of run-off entering environmentally sensitive areas. Stockpiles will not be placed on a sealed surface within 15 m of a drainage pit, unless pit protection is in place.	Project Manager
Construction	Wash down bay water will be discharged at least 50 m from Conservation Category or Resource Enhancement wetlands, Precinct 5, IOCZ, areas of threatened flora or communities.	Project Manager Plant Manager
Construction	Wash down of vehicles and plant will not occur except in designated areas such as wash down bays, if available onsite at the time.	Construction Director All personnel
Construction	Wash down of concrete trucks, apart from the truck chute, will not be washed down on site. Concrete water from the chute wash down will be confined onsite and removed once hardened. It will not be released into vegetated areas.	Construction Manager Supervisor
Construction	Existing natural drainage paths and drainage channels will not be unnecessarily blocked or restricted. Any material that is found to block drainage will be removed immediately.	Construction Manager Supervisor
Rehabilitation	Soft landscaping works shall occur as soon as practicable in the sequence of works.	Project Manager Environmental Works Manager

Monitoring Program

Parameter	Location	Frequency	Responsibility
Wetland monitoring Water quality information will be collected from the groundwater at nominated wetlands adjacent to the works, and including surface water at Runway Swamp. Information may also be collected at reference sites situated further away from the works. Information will include both water quality and wetland levels. Parameters for monitoring will be: • Major ions; • Nutrients (Nitrogen, Phosphorus); • pH, conductivity and dissolved oxygen.	Adjacent and possible reference wetlands – see Surface and Groundwater Management Plan and Environmental Monitoring Plan for further information	Prior to construction At least monthly during construction as defined by the Environmental Monitoring Plan At least once at the completion of construction works.	Environment Manager

Evidence of water pooling	Entire site	Opportunistic during construction	Environment Manager
Evidence of physical disturbance of permanently protected wetlands	Interface area between wetlands and construction site	Monthly during construction	Environment Manager
Monitoring as per the ASS Management Plan and Surface and Groundwater Management Plans	As per the ASS and Surface and Groundwater Management Plans	As per the ASS and Surface and Groundwater Management Plans	As per the ASS and Surface and Groundwater Management Plans
Significant run-off from construction areas	Entire site	Weekly during construction Daily (reported at least weekly)	Environment Manager Supervisor

Contingencies	
Trigger	**Action**
Change in wetland water levels compared to baseline levels, not attributed to weather conditions	1. Investigate potential cause of change in water levels. 2. If change is likely a result of project activities, identify possible control measures to remedy (e.g. installation of additional balancing culverts). 3. Monitoring effectiveness of additional control measure.
Change to water quality levels compared to baseline levels	1. Investigate potential cause of change in water quality. 2. If change is likely a result of project activities, identify possible control measures to remedy (e.g. erosion and scour control). 3. Monitor effectiveness of additional control measures.
Non-compliance with management and mitigation measures	1. Investigate cause. 2. Implement contingency actions which may include: - Review management measures practicality or relevance. - Improve training and education for all personnel. 3. Improve and implement increased protective measures as necessary. 4. Monitor the success of these actions.

Rehabilitation			
Background	Disturbed areas within the road reserve which are not stabilised as part of the final design will be rehabilitated with native vegetation (known as 'soft landscaping'). These areas can include, but not limited to, embankments, bunds, medians, verges, adjacent land and intersections. A soft landscaping design will be incorporated within the urban landscaping design, and with further details included within the Revegetation and Landscaping Specification 304 as well as the Rehabilitation and Landscape Management Plan. Soft landscaping provides the benefit of stabilising loose soils which otherwise may erode causing scour issues on embankments, and improving the visual amenity of the overall project.		
Activity	Clearing, rehabilitation	**Location**	Entire site
Overall Objective	• To re-establish suitable native vegetation across the Project area • Minimise wind and water erosion.		
Associated Documents	• Main Roads Western Australia (2005), Handbook of Environmental Practice for Road Construction and Maintenance Works • Specification 304 Revegetation and Landscaping • Rehabilitation and Landscape Management Plan • Rehabilitation Plan – Pioneer Park Offset		

Management and Mitigation		
Timing	**Management and Mitigation Actions**	**Responsibility**
Pre-construction	Develop a Rehabilitation and Landscape Management Plan	Environment Manager
Pre-construction	The soft landscaping design shall include the rehabilitation of interchanges, median and road verges with native species.	Landscape Design Manager
Pre-construction	Avoid establishment of black cockatoo foraging habitat immediately adjacent to the road alignment to minimise the risk of vehicle strike.	Landscape Design Manager
Pre-construction	The design shall consider the use of vegetation as screening along road verges adjacent to residential areas.	Landscape Design Manager
Pre-construction Construction	Undertake soft landscaping in consultation with the community, with special consideration of visual amenity.	Relationships Manager Landscape Design Manager
Construction	Suitable topsoil must be stripped and stockpiled for reuse in revegetation of disturbed areas as soon as practically possible. This topsoil will be signed where necessary whilst stockpiled to avoid contamination.	Project Manager Environmental Works Manager
Construction	Salvaged topsoil must be respread as close as possible to the areas from which it was sourced.	Project Manager Environmental Works Manager
Construction	All suitable native vegetation chipped must be stockpiled for later use in soft landscaping works.	Project Manager
Construction	The Alliance shall consider the salvage of vegetation, including the transplantation of *Macrozamia riedlei, Xanthorrhoea preissii* and *Kingia australis,* during project development (Rehabilitation and Landscape Management Plan).	Environmental Works Manager Environment Manager

Construction	Material from plants of *Conospermum undulatum* that are to be removed during the project will be collected and used for propagation of new plants, as per the requirements of the Rehabilitation Plan – Pioneer Park Offset.	Environment Manager Environmental Works Manager
Construction	Rehabilitation works will be undertaken as soon as practicable, however will be dependent on timing with the winter rain months (May to September).	Environmental Works Manager

Monitoring Program			
Parameter	**Location**	**Frequency**	**Responsibility**
Soil erosion as detailed with the SWTC	Entire site – unsealed areas	Autumn and Spring of each year after practical completion of the Landscaping Works until the end of the Defects Correction Period for the Landscaping Works	Environmental Works Manager Alliance Director
Plant survival	Areas of soft landscaping	As per the Rehabilitation Management Plan	Environmental Works Manager Alliance Director

Contingencies	
Trigger	**Action**
Significant erosion found on site	1. Areas of significant erosion (as defined in the SWTC) will be remediated within three months of assessment. 2. Method of remediation to be determined by the Landscape Manager in accordance with the requirements of the SWTC.
Unsuccessful plant survival	1. Undertake actions as per the Rehabilitation and Landscape Management Plan.
Non-compliance with management and mitigation measures	1. Investigate cause. 2. Implement contingency actions which may include: - Review management measures practicality or relevance. - Improve training and education for all personnel. 3. Improve and implement increased protective measures as necessary. 4. Monitor the success of these actions.

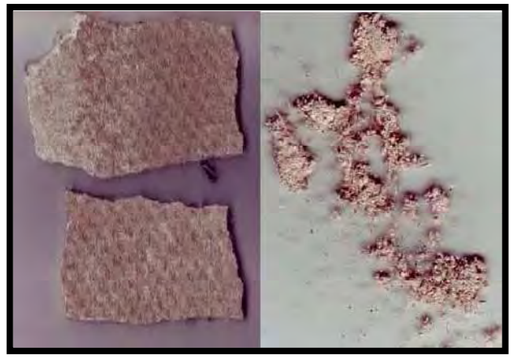
Contaminated Soils, Acid Sulphate Soils and use of Hazardous Substances

Background

As a result of historical use, the possibility exists for contaminated soils to occur within the project site. Given the previous use of the area, the most probable forms of contamination are likely to be as a result of large fuel/oil spills, old underground fuel storage tanks, leach drains or disused asbestos. The disturbance of a contaminated site can pose environmental and human health risks if not managed correctly.

Additionally, the project lies within areas of Acid Sulphate Soils (ASS). ASS are naturally occurring soils, sediments and peats generally found near estuaries and coastal lakes. ASS are benign in their natural state, however when these soils are exposed to air through dewatering or excavation, oxygen reacts with the iron sulphides in the soil. This leads to the production of sulphuric acid which can contaminate soils and water, potentially impacting the surrounding environment, human health and built infrastructure.

Furthermore, during construction works, the potential exists for further contamination to occur through the accidental release of hazardous substances.



Examples of contamination – asbestos, soil contaminated with oil

Example of ASS

Activity	All works, particularly initial earthworks	**Location**	Entire Site

Overall Objective

- Comply with the *Contaminated Site Act 2003*.
- Minimise impacts on the environment, community and personnel upon discovery and remediation of contaminated land.
- Comply with the Treatment and management of soils and water in acid sulfate soil landscapes (DEC, 2011).
- Prevent deleterious impacts on the surface and groundwater quality.
- Prevent contamination of surface and groundwater through spills of hydrocarbons and chemicals.

Associated Documents

- Main Roads Western Australia (2005), Handbook of Environmental Practice for Road Construction and Maintenance Works
- Treatment and management of soils and water in acid sulfate soil landscapes (DEC, 2011)

Management and Mitigation

Timing	Management and Mitigation Actions	Responsibility
Pre-construction	Desktop and site investigations will be undertaken prior to construction commencement to determine any potential and actual contaminated sites within the project boundaries.	Environment Manager
Pre-construction	Undertake an ASS investigation to determine if construction works will impact ASS.	Environment Manager

Pre-construction	If the presence of ASS is identified within the project area, and ASS Management Plan will be developed and implemented during construction. This plan will cover both excavation of ASS and dewatering within ASS areas, and will be approved by DER.	Environment Manager
Pre-construction	If soil or groundwater contamination that may be impacted by the construction works is identified during the investigations, a management strategy will be developed. This shall include an assessment of the risks to the environment and human health, removal of contaminated soils with validation to DER guidelines and appropriate treatment of excavated soils.	Construction Manager Environment Manager
Induction	The induction shall include information of the potential ASS and contamination risks based on the outcomes of these investigations, as well as the management actions presented in this table.	Safety and Support Services Manager
Construction	During intrusive works such as excavations, if visual and or olfactory evidence suggests potential for contamination (e.g. fill material, building rubble, odours, soil staining), works will cease, the site supervisor will be notified, and the material sampled and analysed. Works will commence once the status of the material has been confirmed and corrective actions implemented (if required).	All personnel
Construction	Determination of contamination and requirements for remediation will be undertaken on advice from the Environment Manager. The site of potential contamination will be contained (i.e. bunded) to prevent any spread of contaminates, and will be fenced to prevent any unauthorised access.	Environment Manager Site Engineer
Construction	Asbestos waste from existing structures, and (if encountered) from previously unidentified sources, shall be removed and disposed of by a suitably qualified asbestos removalist contractor.	Construction Manager
Construction	All hydrocarbons, chemicals, pesticides and herbicides on site shall be stored in purpose built containers or tanks in a bunded storage are with adequate capacity to contain spills. They will not be stored within 50 m of a wetland or open drainage line or within 15 m of a drainage pit.	Supervisor All personnel
Construction	Bunds shall be regularly inspected and cleaned.	Supervisor
Construction	Refuelling on site shall be undertaken on a sealed or bunded surface or if practicable, using a catch tray.	All personnel
Construction	No refuelling shall occur within 50 m of any water body (except stationary plant required to be located in proximity to work site). These include the wetlands to the east of the project and open drainage lines.	All personnel
Construction	Vehicles shall not be left unattended when refuelling.	All personnel
Construction	A spill response plan for hydrocarbons and chemicals, including pesticides and herbicides, shall be developed to ensure the spill is contained effectively, cleaned up appropriately and efficiently with approved materials. This shall include the provision and use of spill kits.	Safety and Support Systems Manager
Construction	Any contaminated soil shall be disposed of to an appropriate licenced landfill facility. Records of disposal shall be maintained.	Construction Manager Commercial Manager
Construction	Site security shall be implemented to prevent unauthorised access to storage areas.	Project Manager
Construction	Temporary site toilets will not be placed within 50 m of a wetland or open drain, or within 15 m of a drainage pit.	Supervisor

Monitoring Program

Parameter	**Location**	**Frequency**	**Responsibility**
Storage of hazardous goods.	Entire site	Daily Weekly	Supervisor Environment Manager
Surface water, groundwater and soil quality	To be determined within Environmental Monitoring Plan	To be determined within Environmental Monitoring Plan	Environment Manager

Contingencies	
Trigger	**Action**
Discovery of previously unidentified contaminated area.	1. Cease works and notify Environment Manager. 2. Material sampled and analysed. 3. Implement corrective actions as advised by the Environment Manager. 4. Works are not to recommence until approval is given by the Environment Manager. 5. Notify DER of the discovery and the outcome within one month of discovery.
Spill or leak of hazardous materials during construction	1. If spill enters the environment (including drainage basins offsite) DER Pollution Response will be notified. 2. The cause of a level 1 or 2 spill shall be investigated. 3. An appropriate remedy shall be implemented, possibly including: – repairing defective equipment. – upgrading fuel storage and handling procedures. – remediation of impacted area.
Non-compliance with management and mitigation measures	1. Investigate cause. 2. Implement contingency actions which may include: - Review management measures practicality or relevance. - Improve training and education for all personnel. 3. Improve and implement increased protective measures as necessary. 4. Monitor the success of these actions.

Construction Noise and Vibration			
Background	Noise and vibration emissions are primarily a nuisance for nearby residents surrounding the construction. Noise and vibration emissions can also disturb nearby fauna, impacting their ability to forage near the project site. Vibrations from site can also result in damage to nearby infrastructure. The level of annoyance from noise and vibration is dependent upon the duration, intensity and timing of the construction activities.		
Activity	All works, particularly those which create a lot of noise and those occurring outside regular hours	**Location**	Entire site, particularly near sensitive receptors (residential, bush etc.)
Overall Objective	• Comply with the Environmental Protection (Noise) Regulations 1997 • Manage vibration so that it complies with industry best practice		
Associated Documents	• Construction Noise and Vibration Management Plan		

Management and Mitigation		
Timing	**Management and Mitigation Actions**	**Responsibility**
Induction	Workforce inductions will include education in relation to the minimisation of noise and vibration.	Safety and Support Services Manager
Construction	Select machinery and adopting operational practices that will produce the lowest practical level of noise and vibration. All machinery will be fitted with mufflers.	Project and Construction Managers Project and Site Engineers
Construction	Drum rollers to be oscillating mode by default (i.e. unless it can be shown that vibratory roller will limit vibration at closest building to comply with limits prescribed in DIN 4150).	Construction Manager Superintendent
Construction	Ground vibration in adjoining properties will be managed to minimise nuisance impact and will not exceed limits as prescribed in DIN4150.	Project Manager
Construction	Conduct field trials of vibration propagation using proposed plant and suitably accurate vibration monitoring instruments.	Project Manager
Construction	Construction activities (including materials transport) shall be limited between 0700 and 1900 Monday to Saturday, excluding public holidays (standard work hours) unless an out of hours Construction Noise approval is obtained.	Project Manager
Construction	Where construction activities are required outside of approved operating hours: 1. Prepare Construction Noise Management Plan (CNMP) 2. Obtain approval of NMP from the City of Belmont and/or Shire of Kalamunda. 3. Ensure all nearby residents are notified prior to works, with details of time period of activity and summary of why the activity is required outside of usual hours. 4. Reduce noise emissions as much as practicable, e.g. croakers in place of reverse beepers.	Project Manager
Construction	Property condition surveys will be conducted and reports prepared by an independent qualified assessor for all properties and existing bridges within 50 m of works and with owner consent.	Alliance Director
Construction	A complaints register shall be established and maintained.	Relationships Manager
Construction	Appropriate access routes, staff parking and work area conditions will be determined prior to activity commencing which will minimise noise and vibration impacts on the neighbouring community. These will be specified within Vehicle Movement Plans.	Construction Manager

Construction	Reversing beepers will be used during the hours of 7am to 7pm, Monday to Saturday, excluding public holidays. Alternative, less intrusive, alarms such as croakers will be used during our of hours works (7pm to 7am, Sundays and Public Holidays).	Alliance Director
Construction	Idling of all vehicles and plant is to be kept to a minimum.	All personnel
Construction	Conventional radios are to be kept at a reasonable volume and will need to be turned off immediately if nearby stakeholders complain.	All personnel
Construction	Residents and businesses in proximity to the project area will be advised of the proposed construction work schedule.	Project Manager Relationships Manager
Construction	Acoustic screens (e.g. fences, site offices) shall be used where practicable for equipment that may run on a 24 hour basis near sensitive areas.	Project Manager
Construction	Generators, compressors and other semi-fixed equipment that generates noise shall be located as far as practicable from nearby residences.	Project Manager
Construction	Maintenance schedules shall be followed and pre-start inspections shall be undertaken to ensure that all equipment is in good condition.	Project Manager

Monitoring Program

Parameter	Location	Frequency	Responsibility
Integrity of machinery and vehicles during pre-starts.	Entire Site	Daily for plant / Weekly for vehicles	Alliance Director
Noise levels – if warranted through numerous complaints	Dependent on complaints	Dependent on complaints	Project Manager
Vibration impacts – as required to monitor compliance with limits under DIN4150	Dependent on location of impacted area	No less than monthly and following specific complaints	Environment Manager
Impacts due to excessive vibration on surrounding infrastructure (i.e. pre- and post-construction property condition surveys).	Properties and bridges within 50 m of the construction site	Prior to construction and if warranted post construction	Relationships Manager

Contingencies

Trigger	Action
Non-compliance with management and mitigation measures	1. Investigate cause. 2. Implement contingency actions which may include: - Review management measures practicality or relevance. - Improve training and education for all personnel. 3. Improve and implement increased protective measures as necessary. 4. Monitor the success of these actions.
Target vibration level exceeded at monitoring location	1. Investigate cause 2. Alter conditions if possible 3. Consider replacing machinery where practicable
Complaints received concerning noise or vibration	1. Manage complaints and ensure a rapid response occurs. 2. Undertake noise monitoring if necessary. 3. Rectify impacts due to vibrations as per the SWTC.

Construction Dust			
Background	The primary air quality concern during construction is the potential level of dust generated during the road construction, particularly in very dry conditions. Dust is a nuisance to the environment and has the potential to decrease amenity values. Dust can impact the health of nearby flora, by blocking and damaging stomata therefore rendering the plant unable to perform photosynthesis. Dust can also be a health hazard, causing respiratory problems and dangerously reducing visibility for nearby traffic. The long-term effects from dust are expected to be insignificant, due to the temporary nature of the construction program.		
Activity	All works, particularly those on unsealed surfaces during dry periods	**Location**	Entire site
Overall Objective	• Manage dust so that it does not create adverse social impacts		
Associated Documents	• A Guideline for Managing the Impacts of Dust and Associated Contaminants from Land Development Sites, Contaminated Sites Remediation and Other Related Activities (DEC 2011)		

Management and Mitigation		
Timing	**Management and Mitigation Actions**	**Responsibility**
Induction	Workforce inductions will include education in relation to the minimisation of dust.	Safety and Support Services Manager
Construction	Dust generation shall be controlled / mitigated through appropriate measures where practicable including, but not limited to, hydro mulch, water application through water carts, and chemical dust suppressants. This applies to the entire construction site and includes, but is not limited to haul roads, cleared areas, batters and stockpiles. Particularly in the instance of stockpiles, the use of walls and covers shall be investigated and implemented where deemed necessary.	Supervisor Site Engineer
Construction	Appropriate licences from the Department of Water will be obtained if required to supply water for dust suppression and other construction purposes.	Project Manager
Construction	Existing sealed roads utilised by the Alliance will be cleaned regularly if they become littered with loose material as a result of construction works. This cleaning will be undertaken with a wet vacuum broom truck where necessary to reduce dust emissions.	Supervisor Superintendent
Construction	A complaints register for any issues of concern shall be established.	Relationships Manager
Construction	The extent of cleared and other disturbed areas will be minimised as far as is practicable for construction requirements.	Construction Manager
Construction	When within 5 m of a residential boundary, stockpiles shall be kept to below fence height.	Supervisor
Construction	Generally stockpiles will be kept below 7 m in height.	Supervisor
Construction	If stockpiles are left untouched for greater than 28 days long-term stabilisation methods such as mulch or other stabilisers should be implemented.	Project Engineer Supervisor
Construction	All vehicles carrying dusty loads will be covered through the use of tarpaulins etc. when travelling in areas with sensitive receptors both inside and outside the project area. The only exception to this is Moxy trucks which cannot practicably be covered.	All personnel
Construction	The construction site will be kept clean to minimise dust accumulation within and surrounding the site.	Supervisor
Construction	Soil surfaces will be rehabilitated and/or stabilised to minimise dust lift.	Construction Manager Supervisor
Construction	Maintenance schedules shall be followed and pre-start inspections shall be undertaken to ensure that all equipment is in good condition.	Project Manager All personnel

Construction	If required and practicable, construction material shall be dampened by sprinkling water prior to transportation, especially during dry and windy weather conditions.	Supervisor All personnel

Monitoring Program			
Parameter	**Location**	**Frequency**	**Responsibility**
Evidence of excessive dust lift (visual assessment)	Entire Site	Opportunistically	Supervisor All personnel
Airborne dust concentration (e.g. a 'dust box' to measure dust concentration)	At least 2 locations observed to be sensitive to nuisance dust e.g. runway approach, residential areas, showrooms etc.	Continuous	Environment Manager
Dust on vegetation	Entire Site with particular emphasis on areas of neighbouring vegetation	Weekly	Environment Manager

Contingencies	
Trigger	**Action**
Non-compliance with management and mitigation measures	1. Investigate cause. 2. Implement contingency actions which may include: - Review management measures practicality or relevance. - Improve training and education for all personnel. 3. Improve and implement increased protective measures as necessary. 4. Monitor the success of these actions.
Pre-determined/specified dust concentration exceeded	1. Investigate cause. 2. Implement contingency actions which may include: - Review management measures practicality or relevance. - Improve training and education for all personnel. 3. Improve and implement increased protective measures as necessary. 4. Monitor the success of these actions.
Complaints received concerning dust	1. Manage complaints and ensure a rapid response occurs. 2. Undertake dust monitoring if necessary.

Construction Waste			
Background	The construction of the project will inevitably produce waste products including domestic wastes, unsuitable spoil and materials from demolition. Appropriate reuse, recycle or disposal of these products will be undertaken to minimise the impact on the environment.		
Activity	All works, particularly those involving demolition works and earthworks.	**Location**	Entire site
Overall Objective	• All construction activities are to be carried out with the principles of cleaner production and waste minimisation.		
Associated Documents	• Landfill Waste Classification and Waste Definitions 1996 (DEC 2009)		

Management and Mitigation		
Timing	**Management and Mitigation Actions**	**Responsibility**
Induction	The workforce induction shall outline the requirements for waste minimisation and management practices. All workers will be encouraged to minimise waste production and to make sure that any wastes produced are disposed of appropriately.	Safety and Support Services Manager
Construction	Education will be provided to all personnel on the impacts litter has on the environment.	Environment Manager
Construction	Waste management shall be managed under the strategy of reduce, reuse, recycle. Sending waste to landfill will be avoided as a last-resort option.	Alliance Director
Construction	Suppliers will be requested to minimise packaging of materials delivered to site.	Commercial Manager Project Director
Construction	Waste, such as asphalt profiling, concretes and soils will be re-used where possible on the project or sent to a recycling depot.	Construction Director
Construction	The project site will be kept clean and tidy with litter and waste placed in appropriate disposal / recycle bins.	All personnel
Construction	Litter and recycle bins shall be placed (and regularly emptied) in appropriate areas.	Supervisor
Construction	Waste chemicals shall be disposed of as per the corresponding MSDS sheet.	All personnel
Construction	All waste which cannot be re-used or recycled will be disposed of at an appropriate licenced facility.	Construction Manager

Monitoring Program			
Parameter	**Location**	**Frequency**	**Responsibility**
Presence of litter within and adjacent to the project site which is attributed to construction activities.	Entire Site	Opportunistically and reported weekly Opportunistically and reported weekly	Supervisor Environment Manager
% of waste in each stream (re-use, recycle, landfill)	Entire site as well as project offices	Quarterly	Sustainability Manager
Correct usage of recycle and refuse bins	Entire Site	Opportunistically and reported weekly	Environment Manager

Contingencies

Trigger	Action
Non-compliance with management and mitigation measures	1. Investigate cause. 2. Implement contingency actions which may include: - Review management measures practicality or relevance. - Improve training and education for all personnel. 3. Improve and implement increased protective measures as necessary. 4. Monitor the success of these actions.
Complaints received concerning waste	1. Manage complaints and ensure a rapid response occurs.

Aboriginal and European Heritage			
Background	All Aboriginal and European Heritage are protected by law; as such it cannot be impacted without approval. It is important that where works are undertaken within heritage sites that only the area designed to be impacted is actually impacted. There are two known Aboriginal Heritage Sites near the project area, both occurring east of the Tonkin/Leach Highway interchange. During construction works, the potential exists for previously undiscovered sites to be found.     Examples of Aboriginal Heritage – rock, rock painting, quartz Example of European Heritage – convict road		
Activity	All works, particularly initial earthworks	**Location**	Entire Site, particularly east of the Tonkin/Leach Highway interchange
Overall Objective	• Comply with the requirements of the *Aboriginal Heritage Act 1972* including those within the Section 18 approval. • Minimise impacts on Aboriginal Heritage, both known and unknown. • Liaise with relevant Aboriginal groups when required • Comply with the requirements of the *Heritage of Western Australia Act 1972* and the Government Heritage Property Disposal Process.		
Associated Documents	• Main Roads Western Australia (2005), Handbook of Environmental Practice for Road Construction and Maintenance Works • Section 18 approval to disturb an Aboriginal Heritage Site		

Management and Mitigation		
Timing	**Management and Mitigation Actions**	**Responsibility**
Induction	The induction shall address heritage issues, including location of known sites and staff obligations with regards to the protection of known and unknown Aboriginal Heritage sites and values pursuant to the *Aboriginal Heritage Act 1972.*	Safety and Support Services Manager
Pre-construction	The local Aboriginal community along with the project archaeologist shall be given the opportunity to salvage artefacts from the registered Aboriginal Heritage Site (ID 3993) prior to the commencement of construction in that area.	Environment Manager
Pre-construction Construction	Provide information to the local Aboriginal community outlining the intended design, general construction methods and timing of the road construction. Due consideration will be given to requests made by the Aboriginal people regarding the protection of Aboriginal heritage and the recognition of Aboriginal culture and history.	Relationships Manager Environment Manager
Construction	GWA will endeavour to provide employment and/or work experience to the local Noongar community.	Alliance Director
Construction	Known Aboriginal Heritage sites situated outside or partly outside of the construction footprint shall be clearly identified on clearing permits as ‘no-go’ areas.	Environment Manager

Construction	Aboriginal heritage site boundaries adjacent to the works shall be protected by fencing or flagging signalising no-go, if they occur within the construction works to prevent any unauthorised access.	Project Manager Environment Manager
Construction	Compounds, stockpiles, access tracks, vehicle parking and other project infrastructure will be located away from known Aboriginal Heritage sites.	Supervisor
Construction	A suitably qualified heritage consultant shall be engaged to assist with advice, consultation and investigations of Aboriginal and/or European heritage matters as required.	Environment Manager
Construction	Noongar representatives will be engaged to monitor initial ground disturbing activities in close proximity to, and within, known Aboriginal Heritage sites.	Environment Manager Project Manager
Construction	If objects of potential significance to the Aboriginal community are found during construction in existing Aboriginal Heritage sites, those works will cease immediately within 20 m of the object and action will be undertaken on the advice of the project archaeologist and the Aboriginal community.	All personnel Project Manager
Construction	Should any Aboriginal Heritage objects be identified they shall be salvaged and managed according to advice from the Noongar representatives monitoring the works.	Project Manager
Construction	If suspected skeletal remains are found, works shall cease and the incident reported immediately to the WA Police and DIA. Works will not resume until the Police, DIA and the project archaeologist are satisfied with the management of the remains.	All personnel
Construction	If skeletal remains are an Aboriginal Heritage matter and not a police matter, they will be managed by the community and DIA with advice from the project archaeologist.	Project Manager
Construction	If potential European heritage objects are found during construction works, they shall be salvaged and managed according to advice from a suitably qualified archaeologist and the Environment Manager.	All personnel Environment Manager

Monitoring Program

Parameter	Location	Frequency	Responsibility
Locations of compounds, stockpiles and associated construction materials are outside known Aboriginal Heritage Sites	Entire project	Weekly	Environment Manager
Temporary fencing is erect and in place at adjacent Aboriginal Heritage Sites	Adjacent Aboriginal Heritage Sites	Weekly	Environment Manager
Monitor any unauthorised disturbance of known sites	Adjacent Aboriginal Heritage Sites	Weekly	Environment Manager
Check disturbance is within allowed limits at any new sites found during construction	Dependent upon discovery	As required – dependent upon timing of discovering and agreed management	Environment Manager
Monitor initial ground disturbance in areas of known sites	Aboriginal Heritage Sites	Daily during initial ground disturbance	Environment Manager/Project Heritage Consultant

Contingencies

Trigger	Action
Unauthorised disturbance of Aboriginal or European Heritage Site	1. Investigate cause 2. Notify DAA or State Heritage Office 3. Review management measures 4. Increase education amongst all personnel

Non-compliance with management and mitigation measures	1. Investigate cause. 2. Implement contingency actions which may include: - Review management measures practicality or relevance. - Improve training and education for all personnel. 3. Improve and implement increased protective measures as necessary. 4. Monitor the success of these actions.

Attachment A: Weed Inspection Certificate

Weed Inspection Certificate

FOR PLANT AND MOBILE EQUIPMENT MOVEMENT

PART 1 - TO BE COMPLETED BY THE SENDER OF THE EQUIPMENT

Equipment Number	Equipment description	Current Location	Date Cleaned

I DECLARE THAT THE EQUIPMENT LISTED ABOVE HAS BEEN THOROUGHLY INSPECTED BY MYSELF AND IS FREE OF ALL SOIL, SEEDS AND PLANT MATTER. (NOTE: PLANT AND EQUIPMENT WILL NOT BE ALLOWED TO BE UNLOADED AT SITE IF IT IS NOT CLEAN AND FREE OF WEEDS)

Name: _____

Position: _____

Company: _____

Signature: _____

Date: _____

PART 2 – TO BE COMPLETED BY THE RECEIVER OF THE EQUIPMENT

I DECLARE THAT THE EQUIPMENT LISTED ABOVE HAS BEEN THOROUGHLY INSPECTED BY MYSELF AND IS IN FACT FREE OF ALL SOIL, SEEDS AND PLANT MATTER AND IS THEREFORE SUITABLE FOR ENTRY TO THIS SITE.

Name: _____

Position: _____

Signature: _____

Date: _____

PLEASE PROVIDE A COPY OF THIS FORM TO THE PLANT SUPPORT ENVIRONMENTAL ADVISOR / REPRESENTATIVE AND FILE THE ORIGINAL.

Attachment B: Major Flow Paths - Surface Water

LEGEND:

- DRAINAGE STRUCTURE
- OIL AND SEDIMENT SEPARATOR
- PROPOSED SOUTHERN MAIN DRAIN
- MAJOR FLOW PATH
- DRAINAGE PIPE WITH HEADWALL
- BIORETENTION
- COMPENSATING BASIN
- COMPENSATION STORAGE
- AREA OF LOCAL FLOODING

SCALES 1:2000

0 20m 40 60 80 100 120 140 160 180 200 220 240 260 280 300

A1

FILENAME:G:\61\25876\CADD\ACAD\SKETCHES\DRW\00-SK-DR-0074.dwg

No.	DESCRIPTION	APPROVED & DATE
B	DESIGN UPDATED	18/01/12
A	ISSUED FOR INFORMATION	30/08/11

AMENDMENTS

No.	DESCRIPTION	APPROVED & DATE

AMENDMENTS

METADATA

GROUND SURVEY STANDARD:	-
DATE OF CAPTURE:	-
MAPPING SURVEY STANDARD:	-
DATE OF CAPTURE:	-
MAIN ROADS PROJECT ZONE:	PCG94
HEIGHT DATUM:	AHD

Government of Western Australia
mainroads WESTERN AUSTRALIA
PLANNING AND TECHNICAL SERVICES DIRECTORATE
ROAD AND TRAFFIC ENGINEERING BRANCH
Waterloo Crescent East Perth 6004
Telephone (08) 9323 4111 Fax (08) 9323 4430

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VERIFIED	
DIRECTOR	
APPROVED (MRWA)	
MRWA FILE No.	

GATEWAY WA

PERTH AIRPORT AND FREIGHT ACCESS PROJECT

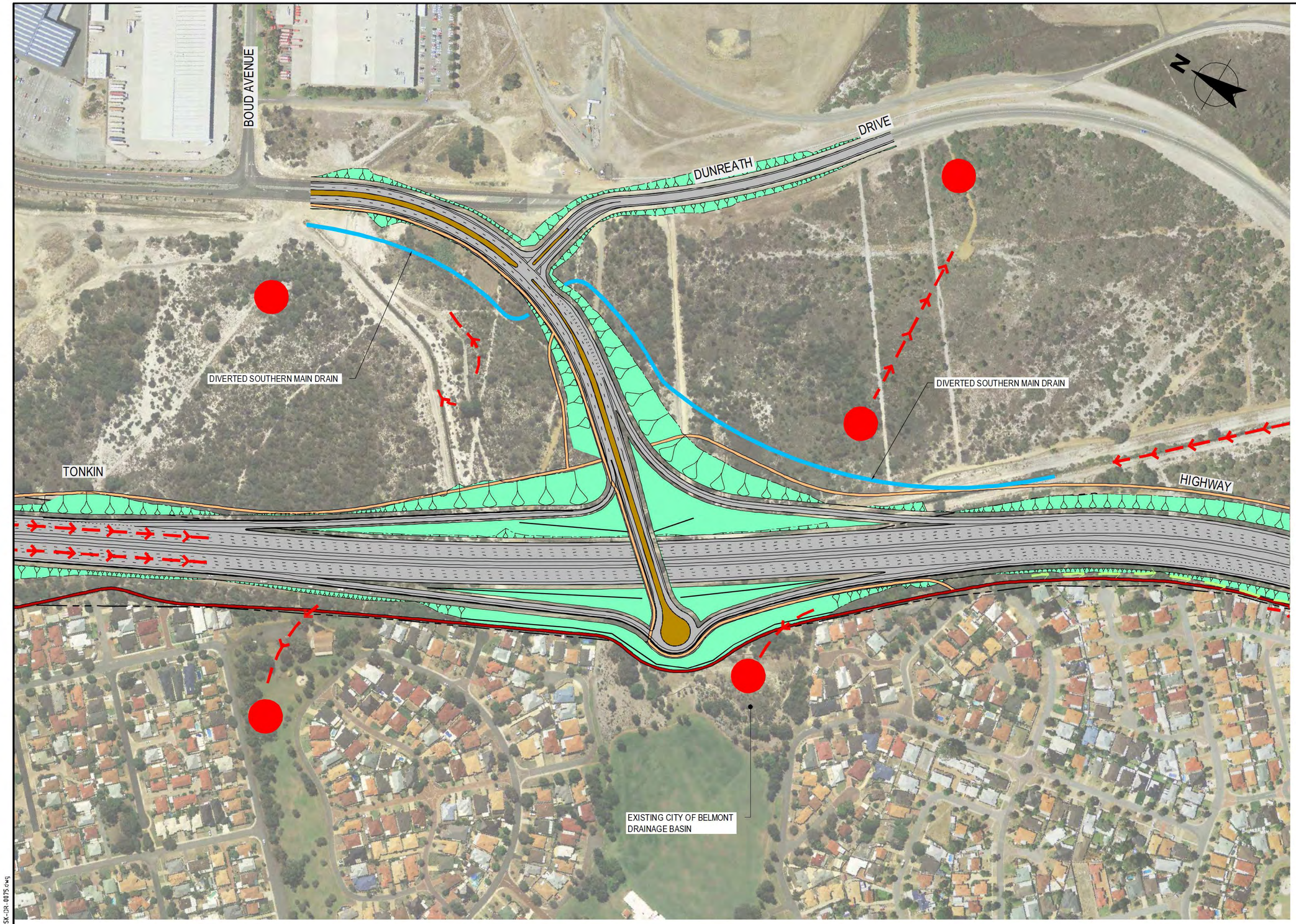
TONKIN HWY (GEH TO BOUD AVE)

MAJOR FLOW PATHS

LOCAL AUTHORITY CITY OF BELMONT / SHIRE OF KALAMUNDA

MRWA DRAWING NUMBER

00-SK-DR-0074 B



LEGEND:

- BIORETENTION SWALE (2m WIDE)
- PROPOSED SOUTHERN MAIN DRAIN
- DRAINAGE PIPE WITH HEADWALL
- BIORETENTION
- COMPENSATIING BASIN
- MAJOR FLOW PATH
- AREA OF LOCAL FLOODING

SCALES 1:2000 (0, 20m, 40, 60, 80, 100, 120, 140, 160, 180, 200, 220, 240, 260, 280, 300)

A1

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METADATA

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DATE OF CAPTURE:	-
MAPPING SURVEY STANDARD:	-
DATE OF CAPTURE:	-
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PLANNING AND TECHNICAL SERVICES DIRECTORATE
ROAD AND TRAFFIC ENGINEERING BRANCH
Waterloo Crescent East Perth 6004
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GATEWAY WA

PERTH AIRPORT AND FREIGHT ACCESS PROJECT

TONKIN HWY/BOUD AVE INTERCHANGE

MAJOR FLOW PATHS

LOCAL AUTHORITY CITY OF BELMONT / SHIRE OF KALAMUNDA

MRWA DRAWING NUMBER

00-SK-DR-0075 B

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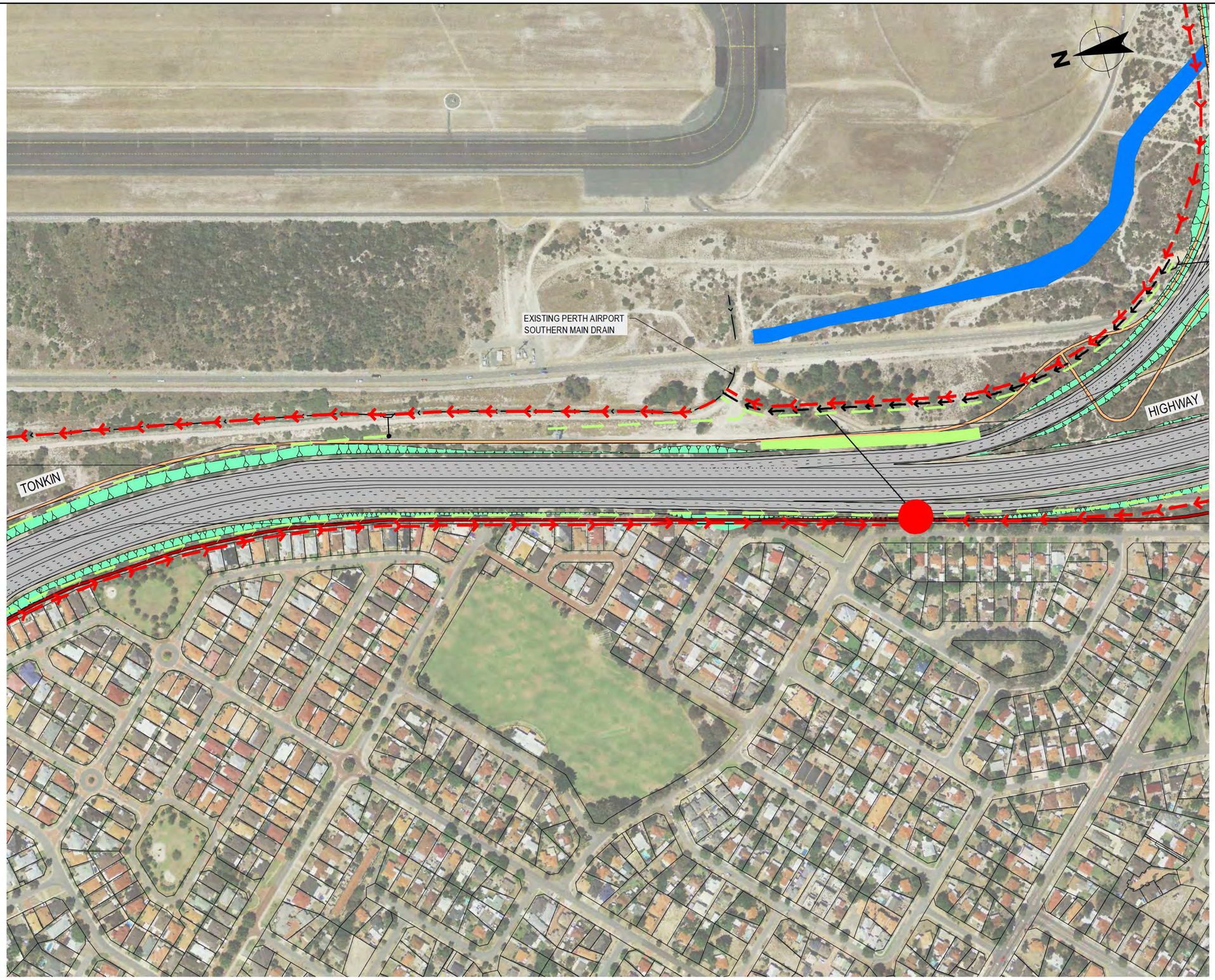

LEGEND:

- EXISTING SOUTHERN MAIN DRAIN
- BIORETENTION SWALE (2m WIDE)
- OPEN DRAIN
- DRAINAGE PIPE WITH HEADWALL
- BIORETENTION
- COMPENSATIING BASIN
- PROPOSED LIVING STREAM (WAC)
- MAJOR FLOW PATH
- AREA OF LOCAL FLOODING

SCALES 1:2000

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A1

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AMENDMENTS

No.	DESCRIPTION	APPROVED & DATE

AMENDMENTS

METADATA

GROUND SURVEY STANDARD: -
DATE OF CAPTURE: -
MAPPING SURVEY STANDARD: -
DATE OF CAPTURE: -
MAIN ROADS PROJECT ZONE: PCG94
HEIGHT DATUM: AHD

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PLANNING AND TECHNICAL SERVICES DIRECTORATE
ROAD AND TRAFFIC ENGINEERING BRANCH
Waterloo Crescent East Perth 6004
Telephone (08) 9323 4111 Fax (08) 9323 4430

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MRWA FILE No.

GATEWAY WA

PERTH AIRPORT AND FREIGHT ACCESS PROJECT

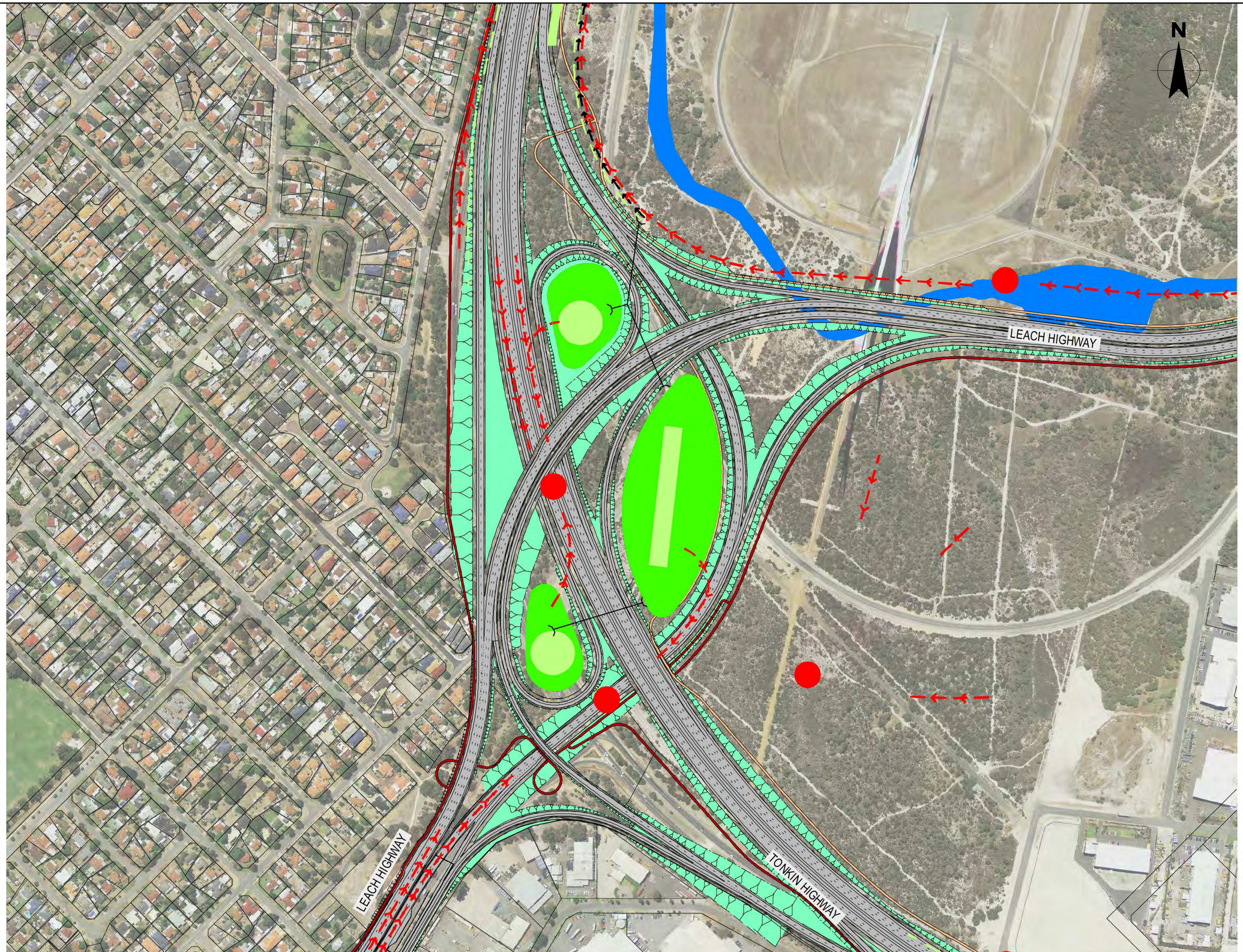
TONKIN HWY (BOUD TO LEACH HWY)

MAJOR FLOW PATHS

LOCAL AUTHORITY CITY OF BELMONT / SHIRE OF KALAMUNDA

MRWA DRAWING NUMBER

00-SK-DR-0076 B



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No.	DESCRIPTION	APPROVED & DATE
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AMENDMENTS

No.	DESCRIPTION	APPROVED & DATE

AMENDMENTS

METADATA

GROUND SURVEY STANDARD:	-
DATE OF CAPTURE:	-
MAPPING SURVEY STANDARD:	-
DATE OF CAPTURE:	-
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HEIGHT DATUM:	AHD

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PLANNING AND TECHNICAL SERVICES DIRECTORATE
ROAD AND TRAFFIC ENGINEERING BRANCH
Waterloo Crescent East Perth 6004
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GATEWAY WA

PERTH AIRPORT AND FREIGHT ACCESS PROJECT

TONKIN HWY/LEACH HWY INTERCHANGE

MAJOR FLOW PATHS

LOCAL AUTHORITY CITY OF BELMONT / SHIRE OF KALAMUNDA

MRWA DRAWING NUMBER

00-SK-DR-0077 B

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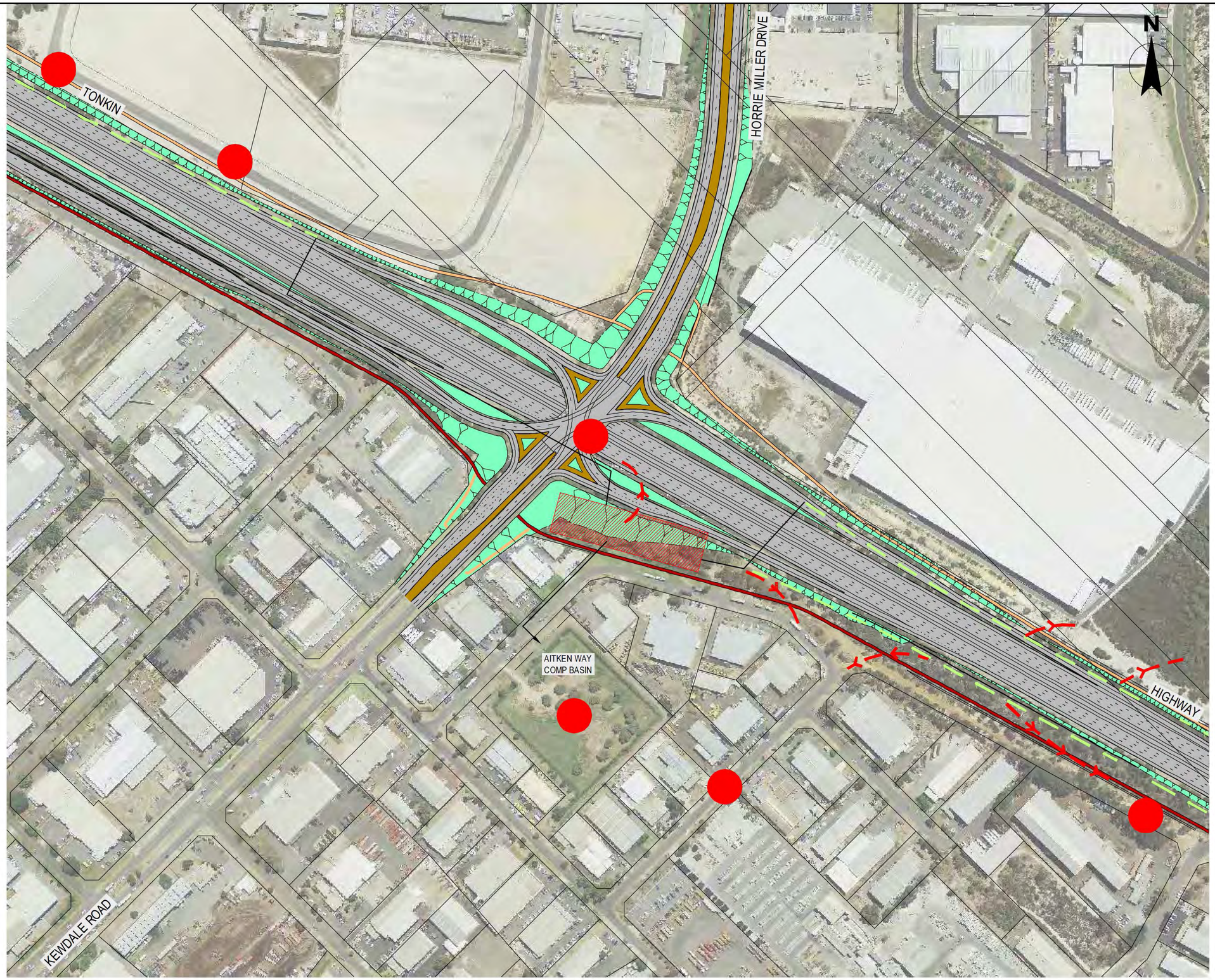

LEGEND:

- BIORETENTION SWALE (0.5m WIDE MIN.)
- OPEN DRAIN
- DRAINAGE PIPE WITH HEADWALL
- BIORETENTION
- COMPENSATIING BASIN
- BASIN - COVERED
- MAJOR FLOW PATH
- AREA OF LOCAL FLOODING

NOTE:

AREAS NOT DRAINED VIA BIORETENTION FACILITIES REQUIRE OIL AND SEDIMENT SEPARATORS AND STORAGE FOR 1 YEAR ARI, 1 HOUR STORM RUN OFF WITHIN PERVIOUS STRUCTURES. IE. DEEPER PITS OR RETENTION STORAGE WITHIN BASIN.

SCALES 1:2000

0 20m 40 60 80 100 120 140 160 180 200 220 240 260 280 300

A1

FILENAME:G:\41\25874\LAD\ACAD\SKETCHES\DR\00-SK-DR-0078.dwg

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AMENDMENTS

No.	DESCRIPTION	APPROVED & DATE

AMENDMENTS

METADATA

GROUND SURVEY STANDARD:	-
DATE OF CAPTURE:	-
MAPPING SURVEY STANDARD:	-
DATE OF CAPTURE:	-
MAIN ROADS PROJECT ZONE:	PCG94
HEIGHT DATUM:	AHD

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PLANNING AND TECHNICAL SERVICES DIRECTORATE
ROAD AND TRAFFIC ENGINEERING BRANCH
Waterloo Crescent East Perth 6004
Telephone (08) 9323 4111 Fax (08) 9323 4430

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GATEWAY WA

PERTH AIRPORT AND FREIGHT ACCESS PROJECT

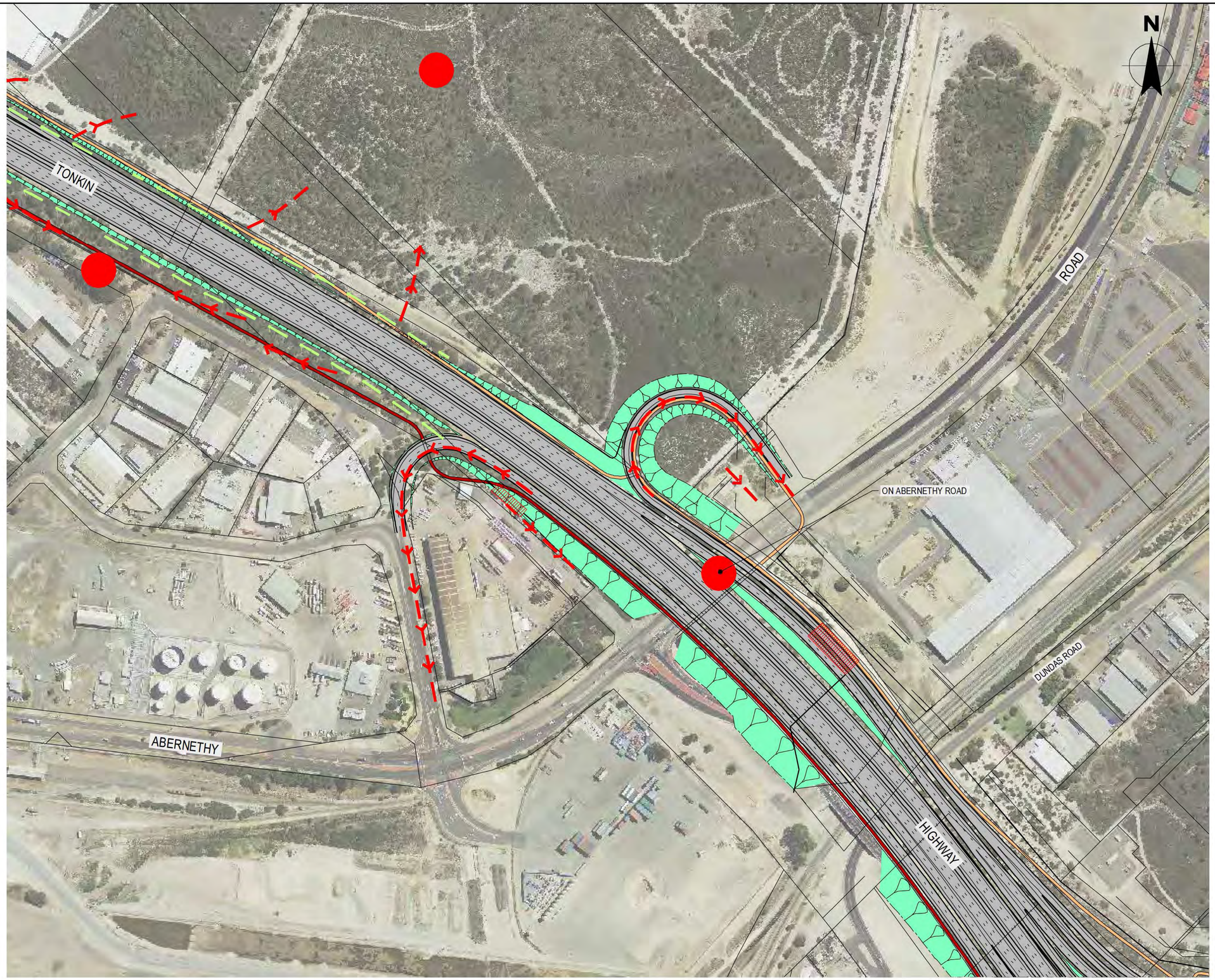
TONKIN/HORRIE MILLER/KEWDALE

MAJOR FLOW PATHS

LOCAL AUTHORITY CITY OF BELMONT / SHIRE OF KALAMUNDA

MRWA DRAWING NUMBER

00-SK-DR-0078 B



LEGEND:

- BIORETENTION SWALE
- OPEN DRAIN
- DRAINAGE PIPE WITH HEADWALL
- BIORETENTION
- COMPENSATIING BASIN
- BASIN - COVERED
- MAJOR FLOW PATH
- AREA OF LOCAL FLOODING

SCALES 1:2000 0 20m 40 60 80 100 120 140 160 180 200 220 240 260 280 300

A1

No.	DESCRIPTION	APPROVED & DATE
B	DESIGN UPDATED	18/01/12
A	ISSUED FOR INFORMATION	30/08/11

AMENDMENTS

No.	DESCRIPTION	APPROVED & DATE

AMENDMENTS

METADATA

GROUND SURVEY STANDARD:	-
DATE OF CAPTURE:	-
MAPPING SURVEY STANDARD:	-
DATE OF CAPTURE:	-
MAIN ROADS PROJECT ZONE:	PCG94
HEIGHT DATUM:	AHD

Government of Western Australia
mainroads WESTERN AUSTRALIA
PLANNNG AND TECHNICAL SERVICES DIRECTORATE
ROAD AND TRAFFIC ENGINEERING BRANCH
Waterloo Crescent East Perth 6004
Telephone (08) 9323 4111 Fax (08) 9323 4430

gatewayvision

DESIGNED/DRAWN	MW / EM
VERIFIED	
DIRECTOR	
APPROVED (MRWA)	
MRWA FILE No.	

GATEWAY WA

PERTH AIRPORT AND FREIGHT ACCESS PROJECT

TONKIN HWY/ABERNETHY RD

MAJOR FLOW PATHS

LOCAL AUTHORITY CITY OF BELMONT / SHIRE OF KALAMUNDA

MRWA DRAWING NUMBER

00-SK-DR-0079 B

FILENAME:G:\61\25876\CAD\LACAD\SKETCHES\DR\00-SK-DR-0079.dwg