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Construction Environmental Management Plan (CEMP)

2020 Duncan-Gordon Downs Road Upgrade

Duncan Road (SLK 80 – 116.04)

Gordon Downs Road (SLK 0 – 52.47)

May 2020

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otherwise. Refer to iRoads for current version.

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1 PURPOSE

This Construction Environmental Management Plan (CEMP) contains Main Roads Western Australia's (Main Roads) requirements for environmental management during 2020 construction of the Duncan Road (SLK 80 – SLK 116.04) and Gordon Downs Road (SLK 0 – 52.47). The project is known as the 'Duncan-Gordon Downs Road 2020 Upgrade, hereafter referred to as the 'Project'.

The CEMP will be used as an on-site reference for Main Roads, people working on behalf of Main Roads, environmental regulators and other parties with an interest in understanding Main Roads approach to environmental management on the Duncan-Gordon Downs Road Upgrade.

2 PROJECT CONTEXT

2.1 Project Description

Project Title: Duncan – Gordon Downs Road Upgrade

Project location(s):

The project is located on Duncan Road SLK 80 to SLK 116.04 and the Gordon Downs Road SLK 0 to SLK 52.47, in the Shire of Halls Creek.

Project purpose / components:

The proposed impact area will include:

- The 88.5km of the 2020 Duncan-Gordon Downs Road Upgrade, with minor realignments at Duncan Road at SLK 85.39-86.04 and 114.26-116.04 and Gordon Downs Road at SLK 34.61-34.98
- The upgrade to the Duncan and Gordon Downs Roads Intersection
- Material Pits
- Offshoot drains, side tracks, turnaround points

2.2 Background

The Duncan and Gordon Downs Roads are both local government roads located in the Shire of Halls Creek. The Duncan Road intersects the Great Northern Highway at Halls Creek town site, and continues east to the Northern Territory border, where it becomes the Buntine Highway. This road is a transport link for Aboriginal communities, pastoral stations and visitors travelling an alternate route to/from the Northern Territory.

Gordon Downs Road intersects Duncan Road at SLK 116 and is the main transport link to Ringer Soak and Northern Minerals' Browns Range Project, a rare earth carbonate mine site, 50 km southeast of Ringer Soak.

2.3 Legislative Context

The Duncan-Gordon Downs Road Upgrade requires approval under a number of legislative instruments:

- *Environmental Protection Act 1986*
- *Biodiversity Conservation Act 2016*
- *Aboriginal Heritage Act 1972*
- *Native Title Act 1993*

2.4 Needs and Expectations of Interested Parties

Stakeholder	Type	Significance	Needs/Expectations	Contact Details
Department of Water and Environmental Regulation (DWER)	State Government	High	Compliance with Environmental Regulations / Legislation	Ryan Mincham DWER, Manager Native Vegetation Regulation ryan.mincham@dwer.wa.gov.au
Shire of Halls Creek	Local Government	High	Principal	Phil Burges Director Infrastructure Assets ph: 9168 9102 dia@hcsaire.wa.gov.au
Kimberley Land Council (KLC)	Native Title	High	Heritage Protection Agreement (HPA)	Douglas D'Antoine Senior Legal Officer ph: 9194 0135 douglas.dantoine@klc.org.au>
Jaru & Tjurbalan People	Traditional Owners	High	Protection of cultural heritage	KLC / EHSIS Kaupa Pitt Ph: 9192 8782 kaupa@kred.org.au
Ringer Soak (Kundat Djaru Community)	Aboriginal Community	High	Community access to Halls Creek	Jeanette Swan Shire of Halls Creek ph: 9168 9132 ceoadmin@hcsaire.wa.gov.au Ringer Soak Community: Sam Rogers (health clinic) Angela Gordon (artist)
Northern Minerals (Browns Range)	Mining	High	Road fit for purpose	Robin Jones Chief Operating Officer ph: 9481 2344 rjones@northernminerals.com.au
Department of Biodiversity, Conservation & Attractions (DBCA)	State Government	Medium	Nearby Ord River Regeneration Reserve (Class A) Tenure, Erosion, sedimentation, weeds [Duncan Rd 44.78-81.21]	Trent Stillman East Kimberley District Manager ph: 9168 4200 trent.stillman@dbca.wa.gov.au
Flora Valley Station / Gordon Downs Station	Pastoral lease	Medium	Lessee for land required for site office, material pits, shire dams and bores. Access to Halls Creek	Station Manager/s Gary Faulks Kate (Tinkey) Townsend ph: 9168 8920 flv@heytesburycattleco.com.au
Ruby Plains / Sturt Creek Stations	Pastoral lease	Low	Access to Halls Creek	Merv Wortley ph: 9168 8519 Australian Outback Beef (Hancock Shanghai CRED JV)

3 ENVIRONMENTAL CONTEXT

The Project occurs within the Ord-Victoria Plains and Tanami Interim Biogeographic Regionalisation for Australia (IBRA) regions. These bioregions are both in Western Australia and the Northern Territory.

The Ord Victoria Plain includes ridges, plateaus and undulating plains, with scattered mesas and buttes. Vegetation comprises mainly eucalypt woodlands over spinifex and annual grasslands. Extensive cattle grazing is the main industry.

The Tanami landscapes are mainly featureless sand plains with small areas of alluvial plains, low ridges and stony rises. Vegetation is predominantly spinifex hummock, grassland with a tall-sparse shrub over storey. The land is mostly Aboriginal freehold, with some pastoral leases (DAWE, not dated).

3.1 Climate and Weather

The region experiences two general seasons, a 'wet' and the 'dry.' The climate is semiarid with a dry, warm monsoonal influence. The wet coincides with the tropical monsoon with precipitation and isolated flooding. The dry coincides with the southern hemisphere winter, where humidity is low and temperature is relatively cool.

Construction in the region typically only occurs during the dry season.

3.2 Flora and Vegetation

3.2.1 Vegetation Types

The survey area is located in the Northern Botanical Province (Beard 1990), within the Ord Victoria Plain Bioregion and Purnululu (OVP01) and South Kimberley Interzone (OVP02) Subregions, and Tanami Bioregion and Tanami Desert Subregion as described by the Interim Biogeographic Regionalisation of Australia (IBRA).

The Purnululu and South Kimberley Interzone Subregions are described as level to gently undulating plains with scattered hills on Cambrian volcanics and Proterozoic sedimentary rocks; vertosols on plains and predominantly skeletal soils on hills. The overall vegetation is grassland with scattered bloodwoods (*Eucalyptus* spp.) and snappy gum (*Eucalyptus brevifolia*) with spinifex and annual grasses. The climate is dry hot tropical, semi-arid with summer rainfall (Graham 2001).

The Tanami Desert Subregion (TAN1) is described as mainly red Quaternary sandplains overlying Permian and Proterozoic strata that are exposed locally as hills and ranges. The sandplains support mixed shrub steppes of *Hakea* spp., desert bloodwoods, *Acacia* spp. and *Grevillea* spp. over soft spinifex (*Triodia pungens*) hummock grasslands. Wattle scrub over soft spinifex (*T. pungens*) hummock grass communities occur on the ranges. Alluvial and lacustrine calcareous deposits occur throughout. In the north they are associated with Sturt Creek drainage, and support ribbon grass (*Chrysopogon* spp.) and Flinders grass (*Iseilema* spp.) short-grasslands often as savannas with river red gum. The climate is arid tropical with summer rain (Graham 2001).

3.2.2 Native Flora

Desktop searches of the NatureMap database identified the presence/potential presence of 12 conservation significant flora taxa within the study area. The desktop searches recorded:

- *Eriachne armitii* (P1)
- *Euphorbia inappendiculata* var. *queenslandica* (P1)
- *Rorippa eustylis* (P1)
- *Trachymene villosa* (P1)
- *Triodia roscida* (P1)
- *Isotropis parviflora* (P2)
- *Atriplex flabelliformis* (P3)
- *Dendrophthoe odontocalyx* (P3)
- *Iotasperma sessilifolium* (P3)
- *Eragrostis confertiflora* (P3)
- *Fimbristylis sieberiana* (P3)
- *Goodenia crenata* (P3)

A review of the vegetation and soil types present in the Project area suggests that the following species are likely to occur:

- *Eriachne armitii* (P1);
- *Euphorbia inappendiculata* var. *queenslandica* (P1);
- *Atriplex flabelliformis* (P3);
- *Eragrostis confertiflora* (P3);
- *Goodenia crenata* (P3);
- *Iotasperma sessilifolium* (P3)

3.3 Native Fauna

A number of conservation significant fauna have historically been recorded within the surrounding environment. Of most importance, are those listed as Threatened under State and Federal legislation:

- Spectacled hare-wallaby (*Largorchestes conspicillatus*)
- Lakeland Downs Mouse (*Leggadina lakedownensis*)
- Greater Bilby (*Macrotis lagotis*) – listed as Vulnerable under the EPBC Act and BC Act
- Gouldian Finch (*Erythrura gouldiae*) – listed as P4 by DBCA
- Grey Falcon (*Falco hypoleucos*) – listed as Vulnerable under the BC Act
- Glossy Ibis (*Plegadis falcinellus*) – listed as Migratory under the EPBC Act and BC Act
- Swinhoe's Snipe (*Gallinago megala*) – listed as Migratory under the EPBC Act and BC Act.

Of these species, the following are most likely to occur:

- Spectacled hare-wallaby;
- Lakeland Downs Mouse;
- Greater Bilby;

3.4 Pests

3.4.1 Feral Animals

The Department of Agriculture, Water and the Environment (DAWE) list the following feral animals occurring in the project area:

Feral pig	<i>Sus scrofa</i>
Fox	<i>Vulpes vulpes</i>
Rabbit	<i>Oryctolagus cuniculus</i>
Wild dog	<i>Canis spp.</i>
Feral cat	<i>Felis cattus</i>
Camel	<i>Camelus dromedaries</i>
Donkey	<i>Equus asinus</i>
Horse	<i>Equus caballus</i>

Cane toads have been previously recorded in the area.

3.4.2 Weeds

DAWE list the following Weeds of National Significance occurring in the project area:

Athel pine	<i>Tamarix aphylla</i>
Bellyache bush	<i>Jatropha gossypifolia</i>
Calotrope	<i>Calotropis procera</i>
Noogoora burr	<i>Xanthium occidentale</i>
Parkinsonia	<i>Parkinsonia aculeata</i>
Sida spp.	

Photos of these weeds are available in the Kimberley Weed Cards in Main Roads Environmental Vehicle Packs or via the Environment Officer.

3.5 Key Environmental Risks

The following items are considered to be key environmental risks to the Project:

- Water quality and land degradation resulting in erosion and sedimentation
- Presence of vegetation that grows in association with minor, non-perennial watercourses
- Accidental, Unauthorised or Over Clearing
- Unauthorised clearing impacting bilby habitat and/or Aboriginal cultural heritage sites
- Introduction and spread of weed species
- Hydrocarbon spills
- Possible presence of PECs and/or Priority flora
- Wildfire

4 LEADERSHIP

4.1 Leadership and Commitment

In this CEMP, 'Top Management' consists of:

- Project Director: Gerry Zoetelief (Regional Manager)
- Delivery Manager: Andrew Murphy
- Project Manager: Silvano Todesco
- Construction Manager: Kym Curtis
- Site Supervisor/s: Darrell Faulkner, Clive Lovell
- Site Engineer: Dylan Pegoraro
- Regional Environment Officer: JJ Rao
- Site Environmental Officer: John Silver
- Safety Officer: Geof Stagbouer

Top Management is responsible for ensuring that the CEMP is resourced and implemented.

4.2 Environmental Policy

Main Roads' Environmental Policy outlines Main Roads' commitment to environmental management principles and objectives that provide the overall intentions and direction of the organisation. The Policy is located under Environment on the Main Roads web site

<https://www.mainroads.wa.gov.au/OurRoads/Environment/Pages/environmentalmanagement.aspx>

A copy of the Environment Policy is provided in Appendix 1.

All Main Roads staff and personnel working on behalf of Main Roads must be aware of the Policy, its purpose and their role in achieving the commitments, including how their work can affect Main Roads' ability to fulfil its compliance obligations.

Main Roads' 10 Principles of Environmental responsibility can be found in Appendix 2.

4.3 Roles and Responsibilities

Role	Responsibility
Martine Scheltema Manager Environment	<ul style="list-style-type: none"> • Overall responsibility for compliance reporting to the DWER and DAWE • Overall responsibility for major environmental incidents
Gerry Zoetelief Regional Manager	<ul style="list-style-type: none"> • Ensuring that the Project Team has the resources to deliver the Project in accordance with the CEMP • Overall responsibility for the Project • Heading the Stakeholder Working Group • Ensuring that the Project Team has the resources to deliver the Project in accordance with the CEMP • Reviewing and endorsing Regulator correspondence on behalf of the Region.
Andrew Murphy Delivery Manager	<ul style="list-style-type: none"> • Ensuring that the Project Manager has the resources to implement the CEMP • Overall responsibility for construction
Silvano Todesco	<ul style="list-style-type: none"> • Implementation of relevant sections of the CEMP

Role	Responsibility
Project Manager	<ul style="list-style-type: none"> Contributing to the development and review of the CEMP Community consultation
Kym Curtis Construction Manager	<ul style="list-style-type: none"> Oversee works supervisors and liaises with Site Environment Officer (EO) to ensure proactive communication with works crew and on ground works remain compliant.
Dylan Pegoraro Site Engineer	<ul style="list-style-type: none"> Assisting with site inspections and audits Maintaining document control Ensuring that non-conformance is recorded and reported within the required time frame
JJ Rao Regional Environment Officer	<ul style="list-style-type: none"> Preparation, review and audit of the CEMP Providing support to the Site EO Providing environmental approvals, permitting and licencing for the Project
John Silver Site Environment Officer	<ul style="list-style-type: none"> Ensuring Implementation of the CEMP Review and updates of the CEMP Reporting of environmental incidents Providing training and inductions to on-ground personnel
Geof Stagbouer Safety Officer	<ul style="list-style-type: none"> Assist Site EO in management and reporting environmental incidents and submitting incident report form when Regional EO is not on site Assist with environmental induction process

5 DEVELOPMENT PLANNING

5.1 Timing and Staging

The Project is expected to commence in June 2020 and run for period of approximately two (2) years.

5.2 Typical Cross Sections and Designs

To be supplied

5.3 Materials

5.3.1 Gravel and Fill Sources

Duncan Road

- SLK 116.04 RHS (Gordon Downs Rd intersection; also referred to as SLK 0.74 on Gordon-Downs Rd)

Gordon Downs Road

- SLK 13.12 RHS
- SLK 35.54 LHS
- SLK 39.85 RHS
- SLK 43.49 LHS
- SLK 50.35 RHS

5.3.2 Aggregate Sources

- Aggregate will be sourced from several material pits managed by the Shire of Halls Creek

- Primary gravel resources are currently located on Duncan Road SLK 116 and Gordon Downs Rd SLK 35.54 and 43.49.

5.3.3 Water Sources

To be confirmed by the Shire of Halls Creek.

5.4 Constructability

5.4.1 Site Office, Laydown, Turnaround and Storage Areas

A mobile site office will be established along the construction front for the life of the Project. The office will be established on Duncan Road SLK 116 (intersection of and Gordon Downs Road) on Flora Valley Station, within existing cleared areas. Main Roads maintains a Project office in Kununurra.

Laydown and storage areas will be located at the site office. Turnarounds will be every 2 km, with mature vegetation preserved where possible

5.4.2 Demarcation and Flagging Protocol

Flagging and demarcation elements related to design will follow the 1994 Survey Guidelines. Specifications for specific environmental flagging requirements are as per Section 7: Environmental Operational Controls for Duncan-Gordon Downs Road Upgrade

6 RISKS AND OPPORTUNITIES

6.1 Emergency Preparedness and Response

The following items were used to identify the Risk and Opportunities related to this CEMP:

- Environmental aspects;
- Compliance obligations;
- Environmental obligations;
- Potential project issues (internal and external).

The following Tables in Section 6.2 and Section 7 identify Risk, Treatment Actions and Operational Controls.

6.2 Environmental Risks and Opportunities

Environmental Factor	Management Requirement	Source	Risks and Opportunities	Risk Rating	Pre-Construction Risk Management Measures & Processes	Residual Rating
<i>Factor</i>	As per various docs	Of requirement	Risk/Opportunities of Project	Initial Risk	Controls pre-CEMP	Residual Risk
Vegetation Management & Clearing	Ensure clearing is minimised and kept within approved boundary	CPS 8654/1 approval, EMP,	Clearing beyond the approved clearing boundary	High	JSEA/SHWM 001 Flora/Vegetation survey for conservation significant species EO to authorise approved clearing GIS file, Bed and Banks Permit Application to DWER	Moderate
	Ensure revegetation is to required standard if required	RMP,	Poor quality revegetation	High	Rehabilitation Plan	Moderate
Fauna	Develop, implement and maintain procedures that protect nominated sites and ensure that all persons undertaking work under the Contract are inducted in the care and handling of threatened flora and fauna sites	Specification 204	Fauna injury or death, staff injury from fauna	High	Staff training and inductions	Low
	Any damage caused (beyond the extent of approvals) during the construction to vegetation, landforms, or fauna habitat will be rehabilitated to the pre-clearing condition.		Indirect fauna	High	Staff training and inductions	Low
	Minimise impacts on areas of vegetation where significant fauna have been recorded or may potentially occur.		Fauna deaths from strikes or direct clearing	High	No night works Speed limits enforced on site Fauna Survey for conservation significant species	Low
	Fauna are not to be fed or intentionally harmed or killed.	EMP	Fauna injury or death	High	Staff training and inductions	Low
Aboriginal Heritage	Demarcate heritage sites for protection where appropriate	EMP	Unauthorised disturbance of an Aboriginal heritage site	Low	Heritage Clearance procedures	Low
	Develop, implement and maintain procedures that protect nominated sites and ensure that all persons undertaking work under the Contract are inducted in the care and handling of aboriginal significant sites.	Aboriginal Heritage Act, EMP	Unauthorised disturbance of an Aboriginal heritage site	Low	Aboriginal Heritage Induction	Low

Environmental Factor	Management Requirement	Source	Risks and Opportunities	Risk Rating	Pre-Construction Risk Management Measures & Processes	Residual Rating
<i>Factor</i>	As per various docs	Of requirement	Risk/Opportunities of Project	Initial Risk	Controls pre-CEMP	Residual Risk
	If the presence of a site of possible Aboriginal significance is discovered, immediately cease work at that location and notify the Superintendent and the Department of Aboriginal Affairs.	Aboriginal Heritage Act, EMP	Unauthorised disturbance of an Aboriginal heritage site	Low	Heritage Clearance procedures Operational Controls	Low
	If the presence of a site of possible Aboriginal significance is discovered, immediately cease work at that location and notify the Superintendent and the Department of Aboriginal Affairs.	Aboriginal Heritage Act, EMP	Unauthorised disturbance of an unknown aboriginal heritage site	Moderate	Heritage Clearance procedures	Low
	Liquid spills, stormwater and runoff materials will be managed to ensure Project activities and drainage do not adversely affect heritage sites or any wetland or water body including creeks, springs, swamps and soaks.	EMP	Unauthorised disturbance of an unknown aboriginal heritage site	High	Identify drainage lines and spill management procedure	High
Hygiene	Develop, implement and maintain processes and procedures to identify and control declared and invasive weed species within the Contract areas.	EMP, Project EMP,	Spread/intensification of weeds	High	Mapping of weed infested areas Revegetation Plan	High
	Prepare and implement a weed control program for nominated weed species for control and disposal.	EMP, Project EMP,	Spread/intensification of weeds	High	Mapping of weed infested areas Revegetation Plan	High
Storage of Oils, Fuels & Hazardous Materials	Develop, implement and maintain processes to identify and correctly store oils, fuels and hazardous materials on site	EMP	Pollution and potential contamination of soil and water	High	Safety Data Sheets, Spill Kits and Procedure	High
Water Quality & Hydrology	Prevent changes to existing hydrological regime	EMP, Project EMP,	Changes to hydrological regime	Moderate	Main Roads Bridge Design Specifications	Moderate
	Develop, implement and maintain processes and procedures to prevent site erosion and sedimentation within and adjacent to the Contract areas.	Specification 204	Erosion of banks and sedimentation of waterways	High	Construction planned for Dry Season Limited scope of work	High
Air Quality	Develop, implement and maintain processes to maintain air quality	EMP	Dust generation	High	Main Roads safety standards Main Roads Complaints procedures	Moderate

Environmental Factor	Management Requirement	Source	Risks and Opportunities	Risk Rating	Pre-Construction Risk Management Measures & Processes	Residual Rating
<i>Factor</i>	As per various docs	Of requirement	Risk/Opportunities of Project	Initial Risk	Controls pre-CEMP	Residual Risk
	Develop, implement and maintain processes to maintain air quality	EMP	Atmospheric pollution	High	Main Roads Vehicles are regularly maintained Main Roads Complaints procedures	Moderate
Noise	Develop, implement and maintain processes to prevent excessive noise exposure to local sensitive receivers	EMP	Noise complaints	Moderate	Main Roads Complaints procedures	Low
Fire	Develop, implement and maintain processes to prevent fire	EMP	Damage to the environment, health and property from fire	Extreme	Emergency Response Plan All vehicles issued with fire extinguishers Training for staff	High

7 RISK MANAGEMENT AND OPERATIONAL CONTROLS

Activity	Environmental Aspect & Impact	Inherent Risk Rating	Objectives & Targets	Obligation Source	Environmental Management Actions, Controls and Contingencies	Hold Points	Who	When	Residual Risk Rating	Monitoring Requirements	Reporting/ Compliance Requirements
<i>Construction Activity or an Action</i>	<i>An aspect of the activity/action and its potential effect on the environment</i>	<i>Risk without any controls during construction</i>	<i>High level Objective and applicable targets to be achieved</i>	<i>Source of compliance requirement</i>	<i>Specific actions to be followed to manage risk of Aspect causing Impact as well as the type of control it falls into. Contingency actions to be followed if still required</i>	<i>Points where Responsible Person must review control implementation</i>	<i>Responsible Person/s (in order of next in charge)</i>	<i>Timing of Controls</i>	<i>Risk after controls placed</i>	<i>Monitoring to assess residual risk/effectiveness of control</i>	<i>Paperwork required to formalise outcomes</i>
Vegetation Management & Clearing											
Clearing for project activities	Clearing causes impacts to flora and fauna beyond works envelope	High	Prevent impacts to flora and fauna beyond approved clearing area No clearing outside approved area	CPS 8654/1 approval Project EMP	Operational Controls <ol style="list-style-type: none"> 1. Project specific environmental awareness induction for all Staff and contract operators. 2. A surveyor will demarcate the clearing footprint using flagging tape with a line of sight. 3. At the pre-start meeting (or equivalent) clear maps of approved clearing distributed to the crew undertaking the clearing works 4. A copy of the PCIA/, PEIA/EMP and RP will be kept on site 5. All vegetation to be cleared will be demarcated on site prior to commencement of activities 6. No burning of cleared vegetation will be permitted. Cleared vegetation will be used for rehabilitation activities Contingencies & Corrective Actions <ol style="list-style-type: none"> 1. Operator to inform PM and EO 2. PM issues a non-conformance notice 3. EO to complete and submit Main Roads Environmental Incident Report, investigate incident. Main Roads will undertake corrective revegetation to damaged areas as soon as practicable	Following pegging for checking by supervisor Following identification of clearing outside of works envelope (if clearing still occurring)	PM Operators Supervisor EO	Pre-start meeting/ toolbox meeting Prior to clearing During clearing	Moderate	Record of induction attendees D19#575570 Clearing supervisor to maintain awareness of clearing progress against approved boundary EO to map clearing area following works	GIS check of GPS unit/peg accuracy EOS Audit Report (if required)
Clearing for project activities	Clearing causes land degradation beyond works envelope	Moderate	Minimise and manage the impact of the project on adjacent vegetation and topsoil No clearing outside approved area	Project EMP Bed and Banks Permit (if required)	Operational Controls <ol style="list-style-type: none"> 1. At the pre-start meeting (or equivalent) clear maps of approved clearing distributed to the crew undertaking the clearing works 2. A copy of the PCIA/, PEIA/EMP and RP will be kept on site 3. All vegetation to be cleared will be demarcated on site prior to commencement of activities 4. No burning of cleared vegetation will be permitted. Cleared vegetation will be used for rehabilitation activities Contingencies & Corrective Actions <ol style="list-style-type: none"> 1. Operator to inform PM and EO 2. PM issues a non-conformance e notice 3. EO to complete and submit Main Roads Environmental Incident Report Form and investigate incident. 4. Main Roads will undertake corrective revegetation to damaged areas as soon as practicable 	Following pegging for checking by supervisor Following identification of clearing outside of works envelope (if clearing still occurring)	PM Operators Supervisor EO	Pre-start meeting/ toolbox meeting Prior to clearing During clearing	Low	Clearing supervisor to maintain awareness of clearing progress against approved boundary EO to map clearing area following works	EOS Audit Report (if required)

Activity	Environmental Aspect & Impact	Inherent Risk Rating	Objectives & Targets	Obligation Source	Environmental Management Actions, Controls and Contingencies	Hold Points	Who	When	Residual Risk Rating	Monitoring Requirements	Reporting/ Compliance Requirements
<i>Construction Activity or an Action</i>	<i>An aspect of the activity/action and its potential effect on the environment</i>	<i>Risk without any controls during construction</i>	<i>High level Objective and applicable targets to be achieved</i>	<i>Source of compliance requirement</i>	<i>Specific actions to be followed to manage risk of Aspect causing Impact as well as the type of control it falls into. Contingency actions to be followed if still required</i>	<i>Points where Responsible Person must review control implementation</i>	<i>Responsible Person/s (in order of next in charge)</i>	<i>Timing of Controls</i>	<i>Risk after controls placed</i>	<i>Monitoring to assess residual risk/effectiveness of control</i>	<i>Paperwork required to formalise outcomes</i>
Vegetation Stockpiling	Stockpiling of cleared vegetation causes spread of weeds and/or disease	Moderate	Prevent the spread of weeds, diseases and pests No weed growth on stockpile	Project EMP	Operational Controls: <ol style="list-style-type: none"> All plant and machinery will be clean and inspected for soil or plant material prior to entry on site. Vehicle movements will be restricted to cleared areas Ensure stockpile is located in appropriate area. Monitor stockpile for weed growth. Contingencies & Corrective Actions <ol style="list-style-type: none"> Control any weed growth by appropriate method (spray, mulch, bury). 	Vehicle hygiene checklist completed	PM Operators Supervisor EO	Prior to new Plant and Machinery arriving on Site	Low	Vehicle Hygiene Checklists filed on Plant Induction Register Supervisor/EO to inspect stockpile for weed growth	Pre-Start Records
Fauna											
Clearing for Project Activities	Clearing of habitat causes fauna deaths	Low	To minimise and manage the impact on the Project on native fauna No avoidable native fauna deaths during construction	Project EMP	Operational Controls <ol style="list-style-type: none"> Pre-clearing surveys for Greater Bilby burrows will be carried out according to DBCA guidelines (see Appendix 6) Construction personnel to walk through area to be cleared to encourage fauna to avoid area Identify trees with potential habitat hollows during walkover Tap large trees with habitat hollows with machinery to encourage any animals within to evacuate Contingencies & Corrective Actions <ol style="list-style-type: none"> In the event that sick, injured or orphaned native wildlife are located on the project site, the EO may be notified The WILDCARE Helpline (08) 9474 9055 will be contacted for assistance or Native Animal Rescue Broome (Chris Mitchell 0407 773 258) if required by the EO 	Death of conservation significant fauna – notify EO	Operator PDM EO	Prior to clearing During clearing	Low	Site walkover prior to clearing Visual monitoring by all on site personnel for presence of fauna on site	In the event that native wildlife are injured or killed, the EO will be notified
Plant & Light Vehicle movement	Native fauna killed by plant, collision with vehicles or interaction with personnel	Low	To minimise and manage the impact on the Project on native fauna No avoidable native fauna deaths during construction	Project EMP	Operational Controls <ol style="list-style-type: none"> No pets, traps or firearms are allowed within the project area Fauna are not to be fed or intentionally harmed or killed Fauna that venture into the work area will be coerced to leave in a manner that does not harm the animal or operator (loud noise, slowly approaching in a vehicle etc) Stop work while the animal is being coerced off site Contact Fauna Handler if required Avoid sensitive breeding periods where possible Contingencies & Corrective Actions <ol style="list-style-type: none"> In the event that sick, injured or orphaned native wildlife are located on the project site, the EO may be notified The WILDCARE Helpline (08) 9474 9055 will be contacted for assistance or Native Animal Rescue Broome (Chris Mitchell 0407 773 258) if required by the EO 	Death of conservation significant fauna – notify EO	Operator PDM EO	Prior to clearing During clearing	Low	Site walkover prior to clearing Visual monitoring by all on site personnel for presence of fauna on site	In the event that native wildlife are injured or killed, the EO will be notified
Aboriginal Heritage											

Activity	Environmental Aspect & Impact	Inherent Risk Rating	Objectives & Targets	Obligation Source	Environmental Management Actions, Controls and Contingencies	Hold Points	Who	When	Residual Risk Rating	Monitoring Requirements	Reporting/ Compliance Requirements
<i>Construction Activity or an Action</i>	<i>An aspect of the activity/action and its potential effect on the environment</i>	<i>Risk without any controls during construction</i>	<i>High level Objective and applicable targets to be achieved</i>	<i>Source of compliance requirement</i>	<i>Specific actions to be followed to manage risk of Aspect causing Impact as well as the type of control it falls into. Contingency actions to be followed if still required</i>	<i>Points where Responsible Person must review control implementation</i>	<i>Responsible Person/s (in order of next in charge)</i>	<i>Timing of Controls</i>	<i>Risk after controls placed</i>	<i>Monitoring to assess residual risk/effectiveness of control</i>	<i>Paperwork required to formalise outcomes</i>
TO BE CONFIRMED											
Hygiene											
Foot Traffic Plant & Light Vehicle movement	Introduction of weeds, pests or disease degrades vegetation condition	High	Minimise and manage the impact of the project on adjacent vegetation and topsoil No declared/invasive weeds introduced into areas adjacent to construction	SOHC CPS8654/1 EP Act 1982	Operational Controls 1. Ensure that vehicles are clean of soil or vegetation prior to entry/exit into/out of the site 2. Ensure no weed affected soil, mulch, fill or other material is brought into cleared areas 3. Restrict movement of machines and other vehicles to the limits of the areas cleared 4. Identify areas that require weed control, and ensure personnel using herbicide are qualified 5. Vehicle washdown areas will not be located upstream of any waterway, and away from sensitive areas Contingencies & Corrective Actions 1. Weed control program to be established if any areas of infestation are found		PDM EO Operators		Moderate	Vehicle Hygiene Inspection checklists Appropriate herbicide training records are available	
Contamination											
Storage of oils, fuels & other hazardous materials	Accidental spill or discharge into waterway and subsequent harm to the environment	High	To maintain the quality of soil, surface water and groundwater No incidents of contamination found Maintain water quality post construction No spills or discharges into waterway	Project EMP	Operational Controls 1. No storage of hazardous materials, fuels or oils within 100m of any watercourse or wetland 2. All hazardous materials fuels or oils storage areas will be bunded. 3. Spill kits will be in place at all storage areas 4. Induction program to make all personnel aware of the appropriate response to spills Contingencies & Corrective Actions 1. Contain spill as best as possible using spill kit 2. Notify PDM and EO 3. PDM/EO will assess spill and determine response (Tox Free to be contacted for disposal/remediation if required). Spill to be contained and removed within 24 hours 4. PDM/EO will complete a Main Roads incident report form 5. DWER will be notified of incident (if significant) and of corrective action taken within 48 hours.		PDM EO Operators		Low		
Earthworks	Unknown pollutants are uncovered or transported into site resulting in potential contamination	Low	To maintain the quality of soil, surface water and groundwater No incidents of contamination found	Project EMP	Operational Controls 1. Only clean/uncontaminated fill or virgin material will be used for the Project Contingencies & Corrective Actions 1. If potential contamination is found, cease works immediately 2. Notify EO. 3. PDM/EO will notify Environment Branch (Operations) and complete incident form. 4. Environment Branch (Operations) will notify DWER (if confirmed to be significant)		PDM EO		Low		

Activity	Environmental Aspect & Impact	Inherent Risk Rating	Objectives & Targets	Obligation Source	Environmental Management Actions, Controls and Contingencies	Hold Points	Who	When	Residual Risk Rating	Monitoring Requirements	Reporting/ Compliance Requirements
<i>Construction Activity or an Action</i>	<i>An aspect of the activity/action and its potential effect on the environment</i>	<i>Risk without any controls during construction</i>	<i>High level Objective and applicable targets to be achieved</i>	<i>Source of compliance requirement</i>	<i>Specific actions to be followed to manage risk of Aspect causing Impact as well as the type of control it falls into. Contingency actions to be followed if still required</i>	<i>Points where Responsible Person must review control implementation</i>	<i>Responsible Person/s (in order of next in charge)</i>	<i>Timing of Controls</i>	<i>Risk after controls placed</i>	<i>Monitoring to assess residual risk/effectiveness of control</i>	<i>Paperwork required to formalise outcomes</i>
Earthworks	Acid Sulfate Soils are encountered during earthworks	High	To prevent acidification of soil as a result of earthworks No incidents of contamination found	Project EMP	Operational Controls <ol style="list-style-type: none"> Follow EMP regarding risk of ASS. Contaminated soil to be disposed of at appropriate landfill site Contingencies & Corrective Actions <ol style="list-style-type: none"> If potential contamination is found, cease works immediately Notify EO. PDM/EO will notify Environment Branch (Operations) and complete incident form. Environment Branch (Operations) will notify DWER (if confirmed to be significant) 		PDM EO		Low		
Water Quality, Surface Drainage and Hydrological Processes											
Plant & Light Vehicle movement	Frequent traffic causes erosion	High	Maintain water quality during and post construction No visible reduction in water quality as a result of project activities	Project EMP Main Roads Specification 204	Operational Controls <ol style="list-style-type: none"> Construction to only occur in dry conditions where possible Access to only occur via designated access point Inspection of river banks within work envelope for stability where work that may destabilise the bank or cause sedimentation was not used (digging, excavation, piling or compaction) within 3m of bank Refuelling/servicing of plant and equipment must not occur within 100m of a watercourse or wetland No on site storage of fuel, oils or other contaminants will occur within 100m of a wetland or watercourse Contingencies & Corrective Actions <ol style="list-style-type: none"> PDM to notify EO Where possible, damage to the riverbank will be remediated to the extent that it is stable Temporary engineered stability controls in areas where inspection identifies significantly reduced bank stability or risk of collapse will be installed EO will report damage to DWER and inform of corrective actions 				Moderate		
Earthworks and scour damage repairs	Changes to hydrological regime causes damage to the drainage system	Moderate	Maintain hydrological regime during and post construction No unintended changes to hydrological regime as a result of project activities	EMP Bed and Banks Permit (if required)	Operational Controls <ol style="list-style-type: none"> Site surfaces will be shaped to allow for natural drainage and to avoid pooling or ponding on site Existing natural drainage paths and channels will not be unnecessarily blocked or restricted Sediment traps and drainage sumps will be utilised where required Contingencies & Corrective Actions <ol style="list-style-type: none"> EO & PDM determine if changes are caused by Main Roads activity EO to investigate if changes have potential to cause large scale environmental degradation or damage to property or human health If so, EO to inform DOWER of potential impacts and proposed remedial/protective works 				Low	It is important to note that fluvial systems in the Kimberley are highly dynamic. Changes to hydrological regime can cause follow on changes downstream until a new equilibrium point is reached. If changes are noted, Main Roads will monitor to determine if damage to property or human health is likely to occur	

Activity	Environmental Aspect & Impact	Inherent Risk Rating	Objectives & Targets	Obligation Source	Environmental Management Actions, Controls and Contingencies	Hold Points	Who	When	Residual Risk Rating	Monitoring Requirements	Reporting/ Compliance Requirements
<i>Construction Activity or an Action</i>	<i>An aspect of the activity/action and its potential effect on the environment</i>	<i>Risk without any controls during construction</i>	<i>High level Objective and applicable targets to be achieved</i>	<i>Source of compliance requirement</i>	<i>Specific actions to be followed to manage risk of Aspect causing Impact as well as the type of control it falls into. Contingency actions to be followed if still required</i>	<i>Points where Responsible Person must review control implementation</i>	<i>Responsible Person/s (in order of next in charge)</i>	<i>Timing of Controls</i>	<i>Risk after controls placed</i>	<i>Monitoring to assess residual risk/effectiveness of control</i>	<i>Paperwork required to formalise outcomes</i>
Scour damage repairs	Water quality decreases cause environmental damage to riparian ecosystem	Low	Maintain water quality post construction No visible reduction in water quality as a result of project activities	EMP Bed and Banks Permit (if required) Main Roads Specification 204	Operational Controls 1. Works to be carried out in dry conditions where practicable 2. During construction there will be no export of sediment offsite 3. Stockpiles will be stabilised to prevent erosion from wind or water Contingencies & Corrective Actions 1. EO & PDM determine if changes are caused by Main Roads activity 2. EO to fill in incident report and notify DWER 3. Corrective actions to stabilise damage to occur next dry season				Low		
Material Stockpiling and Equipment Laydown	Laydown of materials or equipment causes unnecessary damage	Moderate	Maintain water quality post construction No visible reduction in water quality as a result of project activities	Project EMP	Operational Controls 1. Construction to only occur in dry conditions where practicable 2. Material will be stockpiled in the designated stockpiling area 3. No placement of waste material in project area 4. Stockpiles will be stabilised to prevent erosion from wind or water 5. Site surfaces will be shaped to allow for natural drainage and to avoid pooling or ponding on site Contingencies & Corrective Actions 1. Damage caused by inappropriate laydown reported by Supervisor. 2. PM to issue non-compliance notice				Low		
Waste											
Disposal of wastes	Disposal of waste causes pollution or environmental harm	Low	Maintain site amenity pre-, during and post construction No disposal of waste on site	Project EMP	Operational Controls 1. No disposal of waste material on site 2. No burning of waste or vegetation 3. Rubbish to be contained in bins with lids and removed regularly. 4. No materials, equipment, stockpiles or waste will be stored within 20m of any waterway 5. Septic tank/effluent disposal systems to meet requirements of LGA. Contingencies & Corrective Actions 1. Incorrectly disposed of waste removed and correctly disposed of at appropriate landfill site 2. Incident report form to be completed by EO		Supervisor EO PDM		Low		
Air Quality											

Activity	Environmental Aspect & Impact	Inherent Risk Rating	Objectives & Targets	Obligation Source	Environmental Management Actions, Controls and Contingencies	Hold Points	Who	When	Residual Risk Rating	Monitoring Requirements	Reporting/ Compliance Requirements
<i>Construction Activity or an Action</i>	<i>An aspect of the activity/action and its potential effect on the environment</i>	<i>Risk without any controls during construction</i>	<i>High level Objective and applicable targets to be achieved</i>	<i>Source of compliance requirement</i>	<i>Specific actions to be followed to manage risk of Aspect causing Impact as well as the type of control it falls into. Contingency actions to be followed if still required</i>	<i>Points where Responsible Person must review control implementation</i>	<i>Responsible Person/s (in order of next in charge)</i>	<i>Timing of Controls</i>	<i>Risk after controls placed</i>	<i>Monitoring to assess residual risk/effectiveness of control</i>	<i>Paperwork required to formalise outcomes</i>
Transport of fill/materials Bare ground	Dust emissions causing health/safety incident	Moderate	No negative impact to health or safety as a result of reduced air quality No incidents or complaints of impact to health/safety as a result of dust	Project EMP	Operational Controls <ol style="list-style-type: none"> Areas requiring soil stabilisation will be treated as soon as practicable Water tankers to be available to dampen exposed surfaces within construction and laydown areas Adequate signage of works in progress to be posted in visible areas Dust generating activity to be minimised during days with high winds Inform nearby receptors that activities may cause excessive dust Contingencies & Corrective Actions <ol style="list-style-type: none"> Works to cease if excessive dust crosses work boundary or during investigation of a dust complaint. Notify PDM/EO of incident PDM/EO to complete incident report. 		EO PDM		Low	Visual monitoring of excessive dust to be conducted during ground disturbance and construction vehicle activities	
Plant & Light Vehicle movement	Exhaust emissions causing health incident	Moderate	No negative impact to health or safety as a result of reduced air quality No incidents or complaints of impact to health/safety as a result of dust	Project EMP	Operational Controls <ol style="list-style-type: none"> Plant and machinery will be best available and will be required to be maintained in an appropriate working order to minimise emissions Contingencies & Corrective Actions <ol style="list-style-type: none"> Cease work if emission maintenance issues are detected Notify EO EO to complete incident report 		EO PDM		Low	Visual monitoring of excessive emissions to be conducted during ground disturbance and construction vehicle activities	
Fire											

Activity	Environmental Aspect & Impact	Inherent Risk Rating	Objectives & Targets	Obligation Source	Environmental Management Actions, Controls and Contingencies	Hold Points	Who	When	Residual Risk Rating	Monitoring Requirements	Reporting/ Compliance Requirements
<i>Construction Activity or an Action</i>	<i>An aspect of the activity/action and its potential effect on the environment</i>	<i>Risk without any controls during construction</i>	<i>High level Objective and applicable targets to be achieved</i>	<i>Source of compliance requirement</i>	<i>Specific actions to be followed to manage risk of Aspect causing Impact as well as the type of control it falls into. Contingency actions to be followed if still required</i>	<i>Points where Responsible Person must review control implementation</i>	<i>Responsible Person/s (in order of next in charge)</i>	<i>Timing of Controls</i>	<i>Risk after controls placed</i>	<i>Monitoring to assess residual risk/effectiveness of control</i>	<i>Paperwork required to formalise outcomes</i>
Hot Works Plant & Light Vehicle mobilisation	Sparks or residual heat ignites a fire, causing damage to property, environment and human health	High	To minimise the risk of fire No incidents or near misses involving accidental ignitions of fire	Project EMP	Operational Controls <ol style="list-style-type: none"> No fires or smoking permitted on site Hot works permit required for hot works No hot works on days with a 'Catastrophic' fire danger rating Hot works to be minimised on days with 'Severe' fire danger rating No hot works within 10m of vegetation or other combustible material where possible Ensure that following hot works, worked material is not moved to within 1m of combustible material and allowed to cool for 30 minutes Spark arrestors fitted to vehicles, fire extinguishers in all vehicles, and personnel trained in their use A water tanker/fire fighter unit will be on site at all times during project construction and personnel trained in its use. No vehicles operating on metal tracks to work within vegetation on days with a 'Severe' or higher fire danger Regularly inspect vehicle radiators and undercarriages for built up vegetation Contingencies & Corrective Actions <ol style="list-style-type: none"> If safe to do so, attempt to extinguish fire via water truck (brush fires), or fire extinguishers (if fuel fire) If unable to control fire, evacuate all personnel to a safe location Contact PDM/EO and Main Roads and local DFES office (9158 3200) If fire is extinguished, monitor area for 30mins in case of flare ups Updates to be sent to Main Roads and DFES to occur every 30 minutes until fire is extinguished and the 30 minutes monitoring period is concluded, or until control of the fire is handed over to DFES personnel 	Following extinguishing of fire Following transfer of fire control to DFES	Operators PDM EO		Low	If fire is uncontrollable, monitor and update MRWA/DFES every 30 minutes until either fire is extinguished (continue to monitor for another 30 minutes), or control is transferred to DFES If fire is controllable, monitor and update Main Roads/DFES every 30 minutes until fire is extinguished (continue to monitor for another 30 minutes) If fire is extinguished, monitor for at least 30 minutes and update Main Roads/DFES of outcome	
Record Keeping											
Record Keeping	Lack of adequate record keeping causes environmental incidents/issues with regulators	Moderate	Reduce the likelihood of environmental incidents caused by inadequate record keeping No incidents or impact to the environment as a result of inadequate record keeping	SOHC CPS 8654/1 Project EMP	Operational Controls <ol style="list-style-type: none"> Ensure correct shapefile for clearing provided to surveyor/officer pegging the clearing line Record dates clearing occurred Record requirements of approved Revegetation Plan for temporary clearing – if required Record incidents and complaints Contingencies & Corrective Actions <ol style="list-style-type: none"> Rectify record keeping discrepancies as soon as possible. 		EO PDM		Low		
Training											

Activity	Environmental Aspect & Impact	Inherent Risk Rating	Objectives & Targets	Obligation Source	Environmental Management Actions, Controls and Contingencies	Hold Points	Who	When	Residual Risk Rating	Monitoring Requirements	Reporting/ Compliance Requirements
<i>Construction Activity or an Action</i>	<i>An aspect of the activity/action and its potential effect on the environment</i>	<i>Risk without any controls during construction</i>	<i>High level Objective and applicable targets to be achieved</i>	<i>Source of compliance requirement</i>	<i>Specific actions to be followed to manage risk of Aspect causing Impact as well as the type of control it falls into. Contingency actions to be followed if still required</i>	<i>Points where Responsible Person must review control implementation</i>	<i>Responsible Person/s (in order of next in charge)</i>	<i>Timing of Controls</i>	<i>Risk after controls placed</i>	<i>Monitoring to assess residual risk/effectiveness of control</i>	<i>Paperwork required to formalise outcomes</i>
Training for all field staff	Ensure staff are aware of potential environmental risks	High	To ensure all staff have appropriate knowledge of the project's environmental and heritage requirements All staff inducted	Regional EMP Project EMP	Operational Controls 1. Field staff to be inducted. Induction to include environmental policy, key aspects, procedures, ban on pets, firearms, fires, killing fauna, waste management.	Prior to commencement of works on site	EO		Low		Training records

KEY

EO – Environment Officer

CM – Construction Manager

PMD – Project Manager - Delivery

PHO – Principle Heritage Officer

SS – Site Supervisor (Main Roads, reports to PMD)

DFES – Department of Fire and Emergency Service

DWER – Department of water and Environmental Regulation

8 ENVIRONMENTAL SUPPORT

8.1 Resources

The Site Environment Officer for this project is John Silver and is responsible for the following:

- Developing the CEMP;
- Inspecting and authorising the approved clearing boundary before ground disturbance commences;
- Providing environmental training and advice;
- Conducting site inspections to verify compliance with the CEMP;
- Maintaining records as per Main Roads' statutory and internal record keeping requirements.

Main Roads Environment Branch can provide support for:

- Ad-hoc environmental and Aboriginal Heritage approvals;
- Personnel and resources;
- Compliance and Regulatory liaison/advice; and
- Incident follow-up.

8.2 Training and Competency

8.2.1 General Awareness

In accordance with the Main Roads Kimberley Regional EMP, Main Roads will be responsible for ensuring contractors are trained and competent before commencing works.

Personnel carrying out works under this CEMP will be aware of:

- Main Roads Environmental Policy;
- Significant Environmental Risks and potential impacts of their works under the Contract;
- How they contribute to the CEMP and the benefits of improving environmental performance; and
- The implications of not conforming to this CEMP and not fulfilling Main Roads compliance obligations.

The following sections detail the training and competency requirements of the Project.

8.2.2 Site Inductions

Main Roads has developed and detailed a Site Induction training program that includes as a minimum:

- Awareness of the importance of conformance with the environmental policy;
- Awareness of importance of conformance with the approved CEMP;
- Roles and Responsibilities;
- The significant environmental impacts, actual or potential, of work activities associated with the Contract;
- The potential consequences of departure from specified operating procedures; and
- The environmental benefits of improved personal performance.

The Environment Officer will conduct Site-specific environmental induction training for all personnel, the Superintendent and its agents, and all visitors not escorted on Site by inducted

persons. The site induction training will include a verbal test to ensure that inductees have an understanding of the environmental requirements for the Contract/Project.

Details of Site Specific Induction and Training is provided in Induction and Training Packages Table below:

Induction and Training Packages for the Gordon-Duncan Road Upgrade

Induction/Training	For Whom	By Whom	When	TRIM Ref
DUNCAN – GORDON DOWNS ROAD UPGRADE TRAINING RECORDS				
Duncan-Gordon Downs Road Environmental Awareness Training (Bilby, Heritage, Vegetation).	Main Roads Employees and Contractors Shire of Halls Creek Supervisor All contractors operating Dozer, Grader, Digger, Loader	Site Environment Officer	Prior to Works	D20#310205
Annual refresher on Clearing Native Vegetation guidelines	All contractors operating Dozer, Grader, Digger, Loader	Site Environment Officer	Prior to Works	D20#390807
Generic Environmental training as part of the Safety Induction	All other site personnel including visitors	Safety Officer	Prior to Works	D19#965699
Swing Refocus – Return to Work Toolbox (see 9.2.3 below)	All contractors	Construction Manager	Start of Swing	See below

8.2.3 Swing Refocus – Return to Work Toolbox

Toolbox topics will focus on the following Environmental Work Instructions as available on iRoads (see Appendix 6 for an example):

Home>Projects>Environment>Key Documents>Environmental Work Instructions (EWIs)

- Clearing in Potential Bilby Habitat
- Clearing Native Vegetation
- Rehabilitation and Revegetation
- Plant and Vehicle Hygiene
- Environmental Incidents
- Spills Management
- Pests and Feral Animals
- Mulch and Top Soil

8.3 Consultation and Communication

Jeanette Swan (Shire of Halls Creek, Exec Admin) will be the primary contact for Community and Stakeholder project engagement. Main Roads personnel will support Jeanette as required.

9 MEASUREMENT AND PERFORMANCE EVALUATION

9.1 Monitoring, Measurement, Analysis and Evaluation

The Project Manager will ensure the items listed as requiring monitoring in Section 7, *Risk Management and Operational Controls* are completed.

The following methods will be used for measuring, analysing and evaluating:

- Main Roads Direct Managed Works Environmental Inspection and Test Plan (D17#59437)
- Auditing Schedule (if deemed required);
- Material and Usage Report Form;
- Environmental Incident Report Form;
- Environmental Incidents Register; and
- Monthly Environmental Performance Report.

The Criteria to be used to evaluate the Project environmental performance will be the:

- Number of environmental incidents;
- Number of Non Conformances and Improvement Actions;
- Amount of customer complaints.

9.2 Environmental Incident Investigation, Corrective and Preventative Action

The Environment Officer will report and manage all environmental incidents in accordance with Main Roads Environment Incident Management Guideline and using Main Roads Environment Incident Report Form (Appendix 3) located at:

<https://www.mainroads.wa.gov.au/BuildingRoads/Contracting/Pages/ReportingForms.aspx>

9.3 Environmental Audit

The Environment Officer will develop, implement and maintain the Audit Schedule located at D20#____. The Audit Schedule details the frequency, methods, responsibilities, planning requirements and reporting requirements. The audits are to be undertaken by the Environment Officer of the work under the Contract, including any subcontractors, for the duration of the Contract. For each audit conducted, a report will be produced and will detail the scope of the audit; audit questions and audit findings.

9.4 Data Collection

Clearing undertaken under CPS 8654/1 should be reported into Main Roads Environment Online System (EOS), available at <http://environmentonlinesystem.mrwa.wa.gov.au>.

The Site EO is responsible for providing information to the Regional EO, who is responsible for entering data into the EOS system. Environment Branch is responsible for reporting this data to the DWER at the end of the financial year.

9.5 Compliance Reporting

The Site Environment Officer is responsible for maintaining accurate records to satisfy the requirements of the Annual Report.

10 MANAGEMENT REVIEW AND CONTINUAL IMPROVEMENT

The Site Environment Officer will undertake regular site inspections and a 6-monthly review of the CEMP in collaboration with the Project Team. The Site monitoring checklinst can be fopund in Appendix 3

10.1 Site Monitoring Checklist

ENVIRONMENT CHECKLIST	SLK	✓ / X	IMPROVEMENT ACTIONS
Vegetation pre-clearing			
Avoided / minimised / reduced clearing footprint			
Inspect pegs / flags for visibility; GPS accuracy			
Bilby alignment / approval for lot number clearing			
Heritage alignment / approval for lot number			
Vegetation post-clearing			
Inspect disturbance area for compliance			
Hydrocarbons			
General site inspection for spills and leaks			
Located 100m away from waterways			
Waste			
All waste appropriately contained and managed			
Located 20m form waterways			
Weed control			
Disturbed areas inspected for weeds			
Vehicle hygiene checklists completed and saved			
Fire management			
Any high-risk fire hazards identified.			
Hot works procedures being followed			
No prescribed burning / wildfires within work vicinity			
Revegetation and Rehabilitation			
Topsoil storage and management is visibly apparent			
Material Pits suitably rehabilitated to encourage natural recruitment and revegetation.			
Side tracks, Parking bays, lay downs, turn arounds, etc have been suitably rehabilitated to encourage natural recruitment and revegetation.			
Comments:			

Name: _____ Signature: _____ Date: _____

10.2 Improvement Actions and Opportunities

Aspect	Improvement Action	Who	When

Monthly improvement actions/opportunities will be discussed with the Project Manager/team following completion of the Environmental Checklist above. Agreed recommendations will be incorporated at fortnightly return to swing, Refocus toolbox meetings.

10.3 Management Review

Report Compilation & Review	Name and Position	Document Revision	Date
Author:	John Silver Site Environment Officer Jeevarayan (JJ) Rao Environment Officer (Kimberley Region)	Draft v1	May 2020
Reviewer:		Rev 0	
Reviewer:		Rev 1	
Reviewer:		Rev 2	
Reviewer:		Rev 3	

11 DEFINITIONS

Term	Definition
Environment	Surrounds in which an organisation operates, including air, water, land, natural resources, flora, fauna and their relationships.
Environmental Aspect	<p>Element of an organisations activities, products or services that interacts or can interact with the environment.</p> <p>An Environmental Aspect can cause an Environmental Impact. A significant environmental aspect is one that has or can have one or more significant environmental impact.</p>
Environmental Impact	Change to the Environment, whether adverse or beneficial, wholly or partially resulting from an organisation's environmental aspects.
Project	Refers to only the construction activities associated with the Contract works
Risk	Effect of uncertainty. Risk is often expressed in terms of a combination of the consequences of an event (including changes in circumstances) and the associated likelihood (as defined in ISO Guide 73:2009, 3.6.1.1) of occurrence.
Risks and Opportunities	Potential adverse effects (threats) and potential beneficial effects (opportunities).
Top Management	A person or group of people who directs and controls the CEMP at the highest level.

12 REFERENCES AND RELATED DOCUMENTS

Document Number	Description
D17#59437	DIRECT MANAGED WORKS INSPECTION AND TEST PLAN - ENVIRONMENT
11/2923	ENVIRONMENTAL MANAGEMENT SYSTEMS - PROCEDURES - Environmental Conservation - General - Kimberley Region
16/2314	ENVIRONMENTAL MANAGEMENT SYSTEMS - AUDIT - Kimberley Region (Regional Environmental Management Plans)

Document Number	Description

13 APPENDICES

Appendix	Title
Appendix 1	Environmental Policy
Appendix 2	10 Principles of Environmental Responsibility
Appendix 3	Environment Incident Reporting
Appendix 4	Site Environmental Checklist
Appendix 5	Mobile Plant/Vehicle Hygiene Checklist
Appendix 6	Example of Toolbox Meeting – EWI Clearing in Potential Bilby Habitat

Appendix 1: Main Roads Environmental Policy



May 2019

We are committed to protecting and enhancing the environmental, including heritage, and social values in all of our activities, products and services

Intent

All Main Roads staff and others working on Main Roads' behalf will:

- Recognise the importance of the environmental and social values and the broader benefits that these values provide to the community
- Foster strategic relationships with community and other stakeholders to contribute to the management of environmental values
- Facilitate environmental governance of our activities to deliver broad community benefit through the inclusion of environmental requirements in planning, programming, construction and maintenance processes
- Communicate this policy and our environmental performance publicly

Objectives

To ensure we achieve this policy our objectives are to:

- Deliver our services in full compliance with environmental legislation, regulation and policy, and with agreed environmental commitments as a minimum standard
- Manage the environmental impacts of our activities through the hierarchy of 'avoid, minimise, rehabilitate and offset'
- Contribute to a sustainable transport system through the delivery of products and services that minimise environmental impacts, conserve natural resources, minimise the creation and emission of wastes and achieves positive social and economic outcomes
- Implement, maintain and continually improve an effective environmental management system compliant with ISO 14001:2015 across Main Roads activities to enhance our environmental performance



Peter Woronzow
Managing Director of Main Roads

This policy forms part of the Integrated Management System (IMS) and is reviewed every two years or as required to ensure it complies and is relevant to legislative and business obligations.



*We're working for
Western Australia.*

Appendix 2: Main Roads 10 Principles of Environmental Responsibility

10 PRINCIPLES OF ENVIRONMENTAL RESPONSIBILITY

-  **1** Always check the SEA Register prior to any works
- 2** Work within the approved boundaries and only park plant and vehicles in cleared areas 
-  **3** Ensure vehicles arrive on-site clean. Clean down vehicles when moving from a weed infested area to a non-infested area. Report weeds to the EO
- 4** Make plenty of noise and allow fauna in your worksite to disperse. Do not feed, interact, hunt chase, injure or kill wild animals 
-  **5** Be mindful of contamination risks to our water resources. Do not refuel or service plant / vehicles within 50m from a watercourse / wetland / culvert
- 6** If human skeletal material is uncovered, stop work and notify your supervisor or manager immediately 
-  **7** Always leave your work site clean and tidy. Dispose of wastes and cigarette butts responsibly
- 8** Comply with management plans/documents provided 
-  **9** Your behaviour reflects back to Main Roads. There is zero tolerance for inappropriate behaviour
- 10** Contact the Environment Officer if you are unsure 



ENVIRONMENT OFFICERS
John Silver 0427 087 670
JJ Rao 0473 670 861

Appendix 3: Environment Incident Reporting Form

This Form is to be completed for **environmental** incidents when an electronic incident reporting system is unavailable. All fields in the form must be completed. The completed Form must be emailed to: **john.silver2@mainroads.wa.gov.au**

Name and contact details of person reporting the incident	<i>Name</i>		<i>Phone and Email</i>		
Organisation Responsible for Managing the Incident	<i>Insert the Name of the Contractor Organisation, Main Roads or Third Party</i>				
Name of Main Roads person the Incident was reported to	<i>Name</i>		<i>Phone and Email</i>		
Main Roads Workgroup (Where the Incident Occurred)	<i>This is Main Roads Region where the incident occurred, enter N/A if not known.</i>				
Location of Incident:	<input type="checkbox"/> Don Aitken Centre <input type="checkbox"/> Heavy Vehicle Services <input type="checkbox"/> Materials Engineering Branch <input type="checkbox"/> Traffic Operations Centre <input type="checkbox"/> On Road <input type="checkbox"/> Depot <input type="checkbox"/> Regional Office <input type="checkbox"/> Laboratory <input type="checkbox"/> Material Pit <input type="checkbox"/> Road Reserve <input type="checkbox"/> Other <input type="checkbox"/> N/A				
Main Roads Project Manager:		Road Name:			
Project Name:		Road Number:			
Contractor:		Structure Name:			
EOS No.:		Structure Number:			
Date of Incident:		SLK From:			
Date and Time Reported:		SLK To:			
Environmental Incident (Event Sub Type)	<input type="checkbox"/> Spill of hydraulic oil <input type="checkbox"/> Spill of polluting substances other than hydraulic oil <input type="checkbox"/> Spill of primer or seal in runoff after rainfall <input type="checkbox"/> Contamination intercepted (inherited with site and not Asbestos) <input type="checkbox"/> Asbestos containing material intercepted (Natural or man-made) <input type="checkbox"/> Unauthorised third party waste disposal <input type="checkbox"/> Erosion and sedimentation <input type="checkbox"/> Emission of dust / degradation of air quality <input type="checkbox"/> Emission of noise / light / vibration		<input type="checkbox"/> Impact to Aboriginal heritage site <input type="checkbox"/> Impact to Native Title <input type="checkbox"/> Impact to European heritage site <input type="checkbox"/> Impact to Threatened Plants or Ecological Communities <input type="checkbox"/> Fire <input type="checkbox"/> Impact to fauna <input type="checkbox"/> Introduction or spread of weeds, pests or disease <input type="checkbox"/> Unauthorised vegetation clearing <input type="checkbox"/> Non-compliance with approval conditions (possible environmental impacts)		
Description of Event: (Insert Short description, max 100 characters):	<i>Insert the title of the incident (i.e. Hydraulic Oil Spill on Great Northern Highway SLK 260 – XX Project)</i>				
Describe the Event in detail: attach pictures/maps etc. if you have them:	<i>Insert step by step description of the incident (including the immediate actions that were undertaken). Please also note the existing controls located at the site. Outline the environmental approvals and assessment process of the works (if applicable). Outline the contractual governance that the works were delivered under (if applicable). If the incident was a spill indicate approximate volume and advise if the spill was cleaned up. If the incident was clearing of native vegetation advise of the area.</i> Describe the Event in detail: attach associated documents/pictures/maps and/or provide document TRIM numbers if you have them				
<i>See Table 1 – Consequence description</i>					
Actual Consequence	<input type="checkbox"/> Insignificant	<input type="checkbox"/> Minor	<input type="checkbox"/> Moderate	<input type="checkbox"/> Major	<input type="checkbox"/> Catastrophic
<i>See Table 2 and Table 3 for further guidance</i>					
Potential Likelihood	<input type="checkbox"/> Almost Certain	<input type="checkbox"/> Likely	<input type="checkbox"/> Possible	<input type="checkbox"/> Unlikely	<input type="checkbox"/> Rare

Table 1: Qualitative Measures of Consequence					
Level	Rank	Reputation & Trust (Political, Stakeholders and Community)	Business Operations	Environmental	Legal & Compliance
1	INSIGNIFICANT	<ul style="list-style-type: none"> Isolated local community or individual's issue-based concerns. Low profile media attention 	<ul style="list-style-type: none"> Some insignificant delays to business activities. Up to 5% variation in KPI or objective 	<ul style="list-style-type: none"> Low impact to isolated area. Simple or no treatment required. No lasting effect or significance <i>i.e.: Contained oil spill in non-sensitive environment.</i>	<ul style="list-style-type: none"> Guidance required for legal/compliance issues managed through routine procedures. Legal action unlikely.
2	MINOR	<ul style="list-style-type: none"> Local community impacts and concerns. Occasional once off negative media attention. Trust issues raised. 	<ul style="list-style-type: none"> Minor delays to business activities. 5% to 10% variation in KPI or objective. 	<ul style="list-style-type: none"> Contained low impact. Standard treatment. Minor local short-term residual effect. <i>i.e.: Contained oil spills in sensitive environment; Unauthorised clearing (<10ha) of area with low environmental values.</i>	<ul style="list-style-type: none"> Complex legal/ non-compliance issue to be addressed. Legal action and /or public liability claim possible.
3	MODERATE	<ul style="list-style-type: none"> Sectional community impacts and concerns publicly expressed. Increased negative media attention. Loss of confidence and trust by community and stakeholders in Agency processes and capability. Ministerial concern. 	<ul style="list-style-type: none"> Some moderate delays to business activities. 10% - 25% variation in KPI or objective. One or more projects is significantly impaired. 	<ul style="list-style-type: none"> Uncontained impact, able to be rectified in short-medium term. Significant medium term residual effect. <i>i.e.: Uncontained spills causing minor pollution; Unauthorised clearing of area containing moderate environmental values; minor unauthorised impacts to population of threatened flora or fauna; Minor unauthorised damage to an Aboriginal Heritage site.</i>	<ul style="list-style-type: none"> Non-compliance/s with regulation and/ or probity infringements, which may result in some processes repeated. Legal action probable
4	MAJOR	<ul style="list-style-type: none"> Considerable and prolonged community impact and dissatisfaction publicly expressed. Consistent negative media attention. Criticism and loss of confidence/ trust by community and stakeholders in Agency processes and capability. Ministerial intervention 	<ul style="list-style-type: none"> Major delays to activities 25% to 50% variation in KPI or objective. One or more critical programs or projects cannot be delivered. 	<ul style="list-style-type: none"> Extensive hazardous impact requiring long-term rectification. Major medium-term residual effect. <i>i.e.: Unauthorised clearing of area containing significant environmental values; Extensive unauthorised impacts to population of threatened flora or fauna, Major pollution of waterways at local scale; Major unauthorised damage to an Aboriginal Heritage site.</i>	<ul style="list-style-type: none"> Major non-compliance with regulation which may result in termination of a process or imposed penalties. Legal action taken against agency and/ or major public liability claim or potential class action
5	CATASTROPHIC	<ul style="list-style-type: none"> Significant adverse community impacts and condemnation. Extreme negative media attention. Consistent ongoing community loss of confidence and trust in Agency capabilities and intentions. Government intervention 	<ul style="list-style-type: none"> Activities ceased. More than 50% variation in KPI or objective. Multiple critical programs or projects cannot be delivered. 	<ul style="list-style-type: none"> Uncontained hazardous impact requiring major long-term treatment and monitoring. Major long-term residual effect. <i>i.e.: Unauthorised clearing of area containing significant environmental values where the impacts were understood and the impacts were deliberate; Unauthorised eradication of local population of threatened flora or fauna; Extensive pollution of waterways at regional scale, Extensive unauthorised damage to one or more Aboriginal Heritage sites</i>	<ul style="list-style-type: none"> Major non-compliance with legislation and/ or regulation which may result in criminal charges and/ or loss of required accreditation. Significant legal consequences/ class action against Agency.

Table 2: Potential Likelihood Ratings		
Rating	Description	Frequency
Rare	The event may occur only in exceptional circumstances	Less than once every 50 years*
Unlikely	The event could occur at some time	Once every 10-50 years
Possible	The event might occur at some time	Once every 1-10 years
Likely	The event will probably occur in most circumstances	More than once per year
Almost certain	The event is expected to occur in most circumstances	More than once per month

Table 3: Potential Risk Rating					
	Consequence				
Likelihood	Insignificant	Minor	Moderate	Major	Catastrophic
Almost Certain	Low 5	High 10	High 15	Very High 20	Very High 25
Likely	Low 4	Medium 8	High 12	Very High 16	Very High 20
Possible	Low 3	Low 6	Medium 9	High 12	High 15
Unlikely	Low 2	Low 4	Low 6	Medium 8	High 10
Rare	Low 1	Low 2	Low 3	Low 4	Medium 7

Appendix 4: Site Inspection Checklist

ENVIRONMENT CHECKLIST	SLK	✓ / ✗	IMPROVEMENT ACTIONS
Vegetation pre-clearing			
Avoided / minimised / reduced clearing footprint			
Inspect pegs / flags for visibility; GPS accuracy			
Bilby alignment / approval for lot number clearing			
Heritage alignment / approval for lot number			
Vegetation post-clearing			
Inspect disturbance area for compliance			
Hydrocarbons			
General site inspection for spills and leaks			
Located 100m away from waterways			
Waste			
All waste appropriately contained and managed			
Located 20m form waterways			
Weed control			
Disturbed areas inspected for weeds			
Vehicle hygiene checklists completed and saved			
Fire management			
Any high-risk fire hazards identified.			
Hot works procedures being followed			
No prescribed burning / wildfires within work vicinity			
Revegetation and Rehabilitation			
Topsail storage and management is visibly apparent			
Material Pits have been suitably rehabilitated to encourage natural recruitment and revegetation.			
Side tracks, Parking bays, lay downs, turn arounds, etc have been suitably rehabilitated to encourage natural recruitment and revegetation.			
Comments:			
Name:	Signature:	Date:	

Appendix 5: Mobile Plant/Vehicle Hygiene Checklist



Vehicle Hygiene Checklist

Date & Time	
Location of Inspection	
Owner/Operator	
Plant Type/Make/Model	
Registration Number	
Odometer/ Hour Meter Reading	

THE FOLLOWING AREAS HAVE BEEN INSPECTED AND ARE FREE OF ALL SOIL AND PLANT MATERIAL		
Area of Vehicle/Plant	Clean	Not Clean
Inside of the Cabin		
External Surrounds of the Cabin eg vents, gutters, mirrors etc		
Wheels and steering Area		
Tracks Area		
Underside of the vehicle		
Under the Bonnet/Engine Bay		
Blades/Buckets/Drum & Scrapers		
Lights, Bumpers and Accessories eg toolboxes, spare tyres.		
Hydraulics and any attachments eg Arms/booms, Tynes and Rippers, support frames, hydraulic hoses etc.		
Implements eg Top, underside and recesses and crevices.		
OTHER COMMENTS ON HYGIENE OF VEHICLE:		

Is the Vehicle Permitted onsite? Yes No

If not what parts of the vehicle require further cleaning?

Operator		Signature:	
Inspector		Signature:	

Document Owner:

Parent:

Version:

Printed versions of the document are un-controlled.

Page Number:

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Appendix 6: Example of Toolbox Meeting – EWI Clearing in Potential Bilby Habitat



Environment Work Instruction Clearing in Potential Bilby Habitat

The Greater Bilby (*Macrotis lagotis*), is one of the most iconic Australian animals. Bilbies used to occupy most of the Australian landmass, but now only occupy a fraction of that area due to the impact of clearing, foxes, cats (introduced by Europeans) and even road death. Many areas of the Kimberley are still relatively intact, with low levels of cat and fox activity and therefore is one of the last 'strongholds' of the species. The Bilby is considered a Threatened Species, listed as 'Vulnerable' under both State and Commonwealth Law.

POTENTIAL ENVIRONMENTAL RISKS



TABLE 1: STANDARD MANAGEMENT REQUIREMENTS

<p>Pre Works</p> <ul style="list-style-type: none"> ✓ Ensure that a Qualified Person assesses the area to be cleared prior to works. ✓ Pre-Clearing assessment should be carried out within two weeks of the proposed clearing ✓ Pre-Clearing assessments should be carried out using the method described on Page 2 of this EWI ✓ Re-design any non-essential infrastructure (e.g. parking bays, drains or laydown) to avoid any active Bilby areas ✓ Exclusion zones may be implemented, but must be clearly demarcated and communicated <p>During Works</p> <ul style="list-style-type: none"> ✓ All personnel to be familiar with identifying signs of Bilby and report any concerns to the Environment Officer <p>Post Works</p> <ul style="list-style-type: none"> ✓ Report any sightings to the Environment Officer ✓ Qualified persons should provide a written report of the methods used during Pre-Clearing Surveys. <p>Caution - Remember</p> <ul style="list-style-type: none"> 👉 Bilby move around a lot, and may return to a recently cleared area if left 👉 Bilby could die if not removed from their burrows correctly (a State and Federal offence if found guilty of intentionally causing harm/killing a protected species) <p>Related References</p> <ul style="list-style-type: none"> • DBCA Guidelines for Survey of Bilby • Clearing in Potential Bilby Habitat EWI <p>Key Contacts</p> <ul style="list-style-type: none"> • Kimberley Region Environment Officer: JJ Rao (08 9158 4304) 	<p>Burrows</p>  <p>Tracks</p>  <p>Scats</p>  <p>Diggings</p> 
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