PLAN

Woleebee Creek to Glebe Weir Pipeline Project

Construction Environmental Management Plan

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MURPHY PIPE & CIVIL

INNOVATION IN ACTION

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Developed By:			
Name: Matthew Barrett	Position: Environmental Coordinator		
Signature:	Date: 28/3/2013		
Reviewed By:			
Name:	Position:	Signature:	Date:
Barry Heverin	Project Manager		
Final Approval			
Name: Barry Heverin	Position: Project Manager		
Signature:	Date: 28/3/2013		

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0	6/02/2012	Original Issue	N McCabe	D Crooks
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5	28/03/2013	Revised Issue – Incorporated DSEWPaC comments.	M Barrett	B Heverin

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Amendments must be identified by the revision number and a vertical line in the margin.

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1. Introduction

This Construction Environmental Management Plan (CEMP) has been developed by Murphy Pipe and Civil Group Pty Ltd (MPC) for the construction phase of the SunWater (Woleebee Creek to Glebe Weir (W2G)) Project. In summary, the construction activity applicable involves the installation of approximately 120km of MSCL pipeline through a 30m wide corridor in order to allow the transport of treated Coal Seam Gas (CSG) water from the QGC treatment plant at Woleebee Creek to the Glebe Weir located on the Dawson River. Construction will involve the construction of the pipeline and all associated infrastructure including a High Lift pump station, Low Lift pump station and an outlet structure into the Glebe Weir.

This CEMP is specific to MPC's operations occurring within the Western Downs Regional Council and Banana Shire Council areas. This area crosses multiple ecosystem and vegetative community types, often classed as sensitive and as a result presents numerous environmental challenges, which all require extensive and detailed environmental mitigation measures.

This CEMP describes the environmental protocols and management strategies to be considered and implemented to ensure that MPC establishes and maintains best practice controls to manage potential environmental impacts and, wherever practicable, realise opportunities for enhanced environmental outcomes.

These environmental management strategies and mitigation measures have been established to meet the requirements of all applicable Industry guidelines, standards, legislative requirements, EPBC approval conditions, Administering Authority conditions, Licenses/Approvals Coordinator General conditions, Environmental Impact Statement (EIS) requirements and all other SunWater requirements to achieve best practice environmental management and realise opportunities for enhanced environmental outcomes. This CEMP will ensure that all employees, contractors and sub-contractors understand and comply with these requirements for the project and that the environmental risks are properly managed. The document is intended to be used as an overarching document and is further structured to address the key environmental aspects encountered during the life of the work activities being controlled for the duration of the construction project.

2. Purpose

- Provide an overview of the Environmental Management System (EMS)
- Describe the applicable CEMP structure
- Describe the review and preparation process
- Describe the applicable environmental, legislative, approval and regulatory requirements
- Describe the policy detailing the commitment to comply with the requirements and continually improve the effectiveness of the EMS
- Prescribe strategic objectives, targets, key performance indicators (KPIs) and challenges
- Describe the organisational structure, responsibilities, authority and lines of communication as related to environmental management
- Describe the applicable work activities/scope of works
- Describe the environmental management measures and strategies applicable to both specific work activities and general management aspects that will be implemented throughout the life of the prescribed construction activities under MPC operation
- Describe how the project will develop, implement and monitor all environmental related processes and aspects on the project in relation to the construction works, scheduling and programming
- Describe the risk assessment process relating to the applicable environmental aspects

- Describe the internal and external communication process
- Describe contractor and subcontractor management
- Describes the competency, training, awareness and induction processes for personnel
- Describe the checking, measurement, monitoring and analysis tools
- Describe the internal and external auditing process
- Describe the processes to manage incidents, emergencies
- Describe the process to manage NCR's and associated corrective and preventive actions
- Describe the EMS Documents and Records
- Outline and describe the reporting regime
- Outline the management improvement and review process.

3. Scope

This Plan is applicable to all Murphy Pipe and Civil construction activities occurring within the Western Downs Regional Council area and Banana Shire Council area specific to the SunWater Project.

4. Abbreviations

ANZECC	Australian and New Zealand Environmental Conservation Council
APIA	Australian Pipeline Industry Association
AS/NZS	Australian Standard/New Zealand Standard
ASS	Acid Sulphate Soil
CAR	Corrective Action Required
CGC	Coordinator Generals Conditions
CH	Cultural Heritage
CSG	Coal Seam Gas
DAFF	Department of Agriculture, Fisheries and Forestry
DEHP	Department of Environment and Heritage Protection
DSEWPaC	Department of Sustainability, Environment, Water, Population and Communities
EAP	Execution Approvals Package
ECP	Environmental Control Plan
CEMP	Environmental Management Plan
EMS	Environmental Management System
EP	Environment Protection Act
EPBC	Environment Protection and Biodiversity Conservation
EIS	Environmental Impact Statement
GDA	Ground Disturbance Approval
GEEM	Greenhouse, Energy and Emissions Management
GHG	Greenhouse Gas
HSSE	Health, Safety, Security and Environment

ISO	International Standard
JHA	Job Hazard Analysis
KPI	Key Performance Indicators
LAR	Land Access Rules
MPC	Murphy Pipe and Civil Group Pty Ltd
MSCL	Mild Steel Cement Lined
NATA	National Association of Testing Authorities
NCA	Nature Conservation Act
NCR's	Non Conformance Report
NGER	National Greenhouse and Energy Reporting Act 2007
OFI	Opportunity for Improvement
OHSE	Occupation, Health, Safety and Environment
PPE	Protective Equipment
ROW	Right of Way
SAI	Standards Australia
SDS	Safety Data Sheet
SEIS	Supplementary Environmental Impact Statement
SKM	Sinclair Knight Merz
SWMS	Safe Work Method Statement
W2G	Woleebee Creek to Glebe Weir

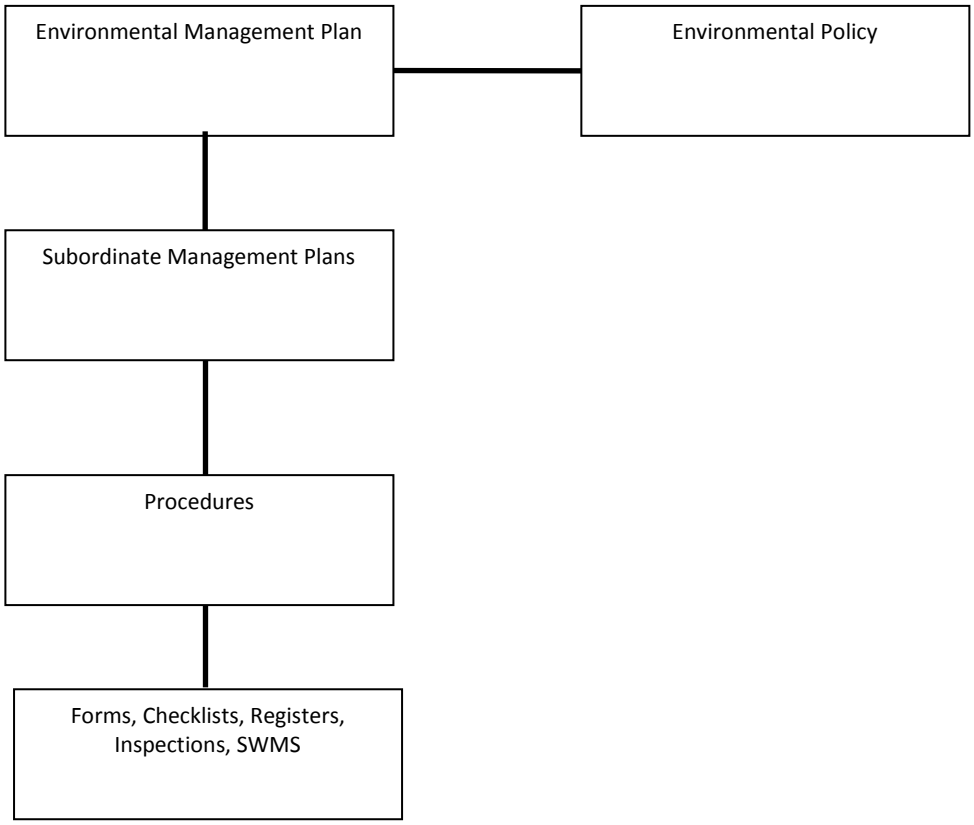
5. Structure

The CEMP is structured as an overarching document that further encompasses the structure highlighted within MPC's Integrated Management System (IMS) Manual. Respective subordinate environmental documentation includes:

- An Environmental Policy
- Subordinate Management Plans
- Procedures
- Forms, Checklists, Registers, Inspections and SWMS.

This documentation highlighted above is available for inspection and assessment upon request. Currently, this CEMP encompasses all environmental aspects and associated management measures but these will be transitioned into individual Subordinate Environmental Management Plans where each Plan will address an individual environmental aspect.

The environmental management documentation structure is further outlined below.



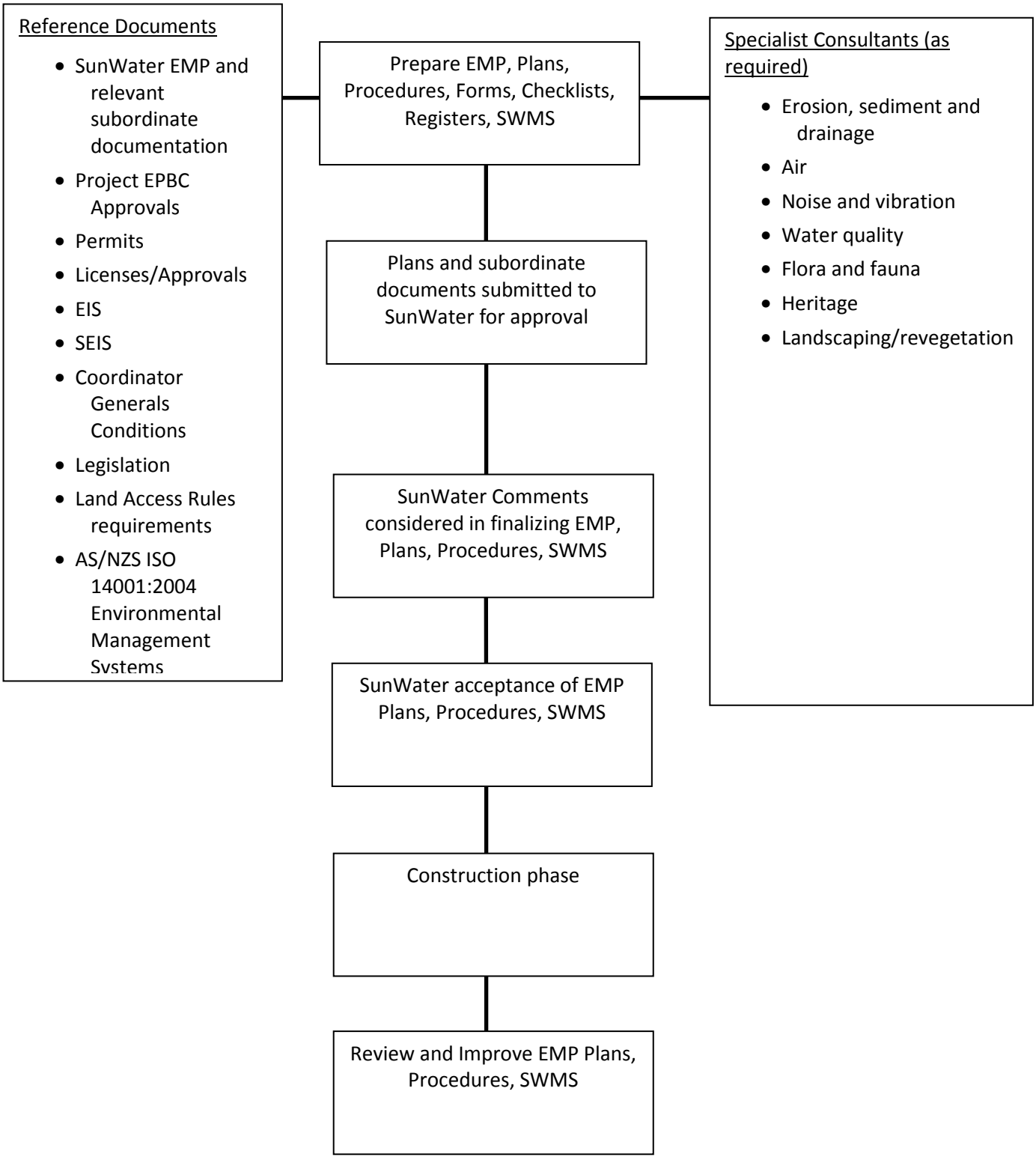
6. Review

This plan will be reviewed and updated regularly to take into account:

- Relevant changes to environmental conditions or generally accepted environmental management practices
- Relevant scope or boundary changes
- Inclusion of additional information not currently available at the time of development of this CEMP
- New or previously unidentified environmental risks are identified
- Information from the project monitoring and surveillance methods indicate that current control measures require amendments to be effective
- Relevant changes to environmental legislation that are relevant to the project
- Deficiencies and Non-conformances' are noted through audits undertaken to determine compliance with Project and contractual requirements
- Relevant SunWater requirements including suggestions and comments
- Requests made by a relevant environmental regulator
- Ongoing continual improvement.

The CEMP will be initially reviewed on an annual basis for the life of the project, from when the document is initially created, and if changes are made then the updated version will be submitted to DSEWPaC for approval.

7. Preparation and Review Process



8. Project Requirements

8.1 Environmental Requirements

MPC is committed to construct the pipeline in a manner that conforms to the contractual and approval requirements and to all relevant regulatory and legislative requirements. The following key references were considered in the preparation of the CEMP:

- AS/NZS ISO 14001:2004 Environmental Management Systems – Requirements with guidance for use
- Australian Pipeline Industry Association – Code of Environmental Practice Onshore Pipelines March 2009
- Woleebee Creek to Glebe Weir Pipeline Preliminary Documentation
- Appendix C – EPBC Act Protected Areas Search Results
- Appendix D - Woleebee Creek to Glebe Weir Flora Technical Report (Cardno Chenoweth 2012)
- Appendix E - Woleebee Creek to Glebe Weir Terrestrial Fauna Assessment (Ecological Survey and Management 2012)
- Appendix G - Glebe Weir CSG Water Quality Assessment (Sinclair Knight Merz (SKM) 2012)
- Appendix M – Woleebee Creek to Glebe Weir Soil and Geology Report (SKM 2012)
- SunWater Requirements
- Reference Documents
- Legislative Requirements.

8.2 Legislative Requirements

MPC understands the importance of compliance with all legislative requirements. This includes ensuring that all contractors and subcontractors also comply with requirements.

The process used to ensure compliance includes the use of OHSE Legal register and all environmental employees having access to relevant state Environmental Protection Authority websites. The Group HSSE Manager is responsible for development, implementation and ongoing management of MPC's OHSE Legal register. The Project OHSE staff will have access to the legal register for the duration of the project.

The register will identify principle act/s, supporting regulation/s, subordinate acts and regulations (where applicable), Australian Standards and Codes of Practice which govern the technical, safety and environmental compliance obligations for the project. Each of the documents referenced in the OHSE Legal register and associated obligations will be monitored and changes communicated in the OHSE legal Change register (see below section 3.1.3) to the relevant personnel with plans and procedures amended where required The below tables provides a summary of all relevant Commonwealth and Queensland legislation applicable to MPC activities on the project.

Related Documents
OHSE Legal Register

8.2.1 Commonwealth Legislation

The table below lists the principal Commonwealth Legislation and the Government Agency responsible for administering each Act, applicable to the MPC activities on the Project.

Table 1: Commonwealth Legislation List

Legislation	Government Agency
Clean Energy Act 2012	Clean Energy Regulator
Environment Protection & Biodiversity Conservation Act 1999	Department of Environment, Water, Heritage and the Arts (DEWHA)
Native Title Act 1993	National Native Title Tribunal (NNTT)
National Greenhouse and Energy Reporting Act 2007	Clean Energy Regulator
Quarantine Act 1908	Australian Quarantine and Inspection Service (AQIS)
Radio Communication Act 1992	Australian Communications and Media Authority (ACMA)
Telecommunications Act 1997	Australian Communications and Media Authority (ACMA)

8.2.2 State Legislation

The table below lists the principal Queensland Legislation and the Government Agency responsible for administering each Act, applicable to the MPC activities on the project

Table 2: State Legislation Table

Legislation	Government Agency
Aboriginal Cultural Heritage Act 2003	Department of Environment and Heritage Protection (DEHP)
Agricultural Chemicals Distribution Control Act 1966	Department of Environment and Heritage Protection (DEHP)
Animal Care and Protection Act 2001	Department of Environment and Heritage Protection (DEHP)
Building Act 1975	Local Government
Electricity Act 1994	Powerlink/Department of Agriculture, Fisheries and Forestry (DAFF)
Environment Protection Act 1994	Department of Environment and Heritage Protection (DEHP)
Explosives Act 1999	Department of Agriculture, Fisheries and Forestry (DAFF)
Fisheries Act 1994	Department of Agriculture, Fisheries and Forestry (DAFF)
Forestry Act 1959	Department of Agriculture, Fisheries and Forestry (DAFF)
Land Act 1994	Relevant Department responsible for land type
Land Protection (Pest and Stock Route Management) Act 2002	Department of Agriculture, Fisheries and Forestry (DAFF)

Legislation	Government Agency
Local Government Act 1993	Local Government
Mineral Resources Act 1989	Department of Agriculture, Fisheries and Forestry (DAFF)
Native Title (Queensland) Act 1993	Department of Environment and Heritage Protection (DEHP)
Nature Conservation Act 1992	Department of Environment and Heritage Protection (DEHP)
Pest Management Act 2001	Department of Agriculture, Fisheries and Forestry (DAFF)
Petroleum Act 1923	Department of Mines and Safety
Petroleum and Gas (Production and Safety) Act 2004	Department of Mines and Safety
Plant Protection Act 1989	Department of Agriculture, Fisheries and Forestry (DAFF)
Plumbing and Drainage Act 2002	Local Government
Public Health Act 2005	Queensland Health/Local Government
Queensland Heritage Act 1992	Department of Agriculture, Fisheries and Forestry (DAFF)
Soil Conservation Act 1986	Department of Environment and Heritage Protection (DEHP)
State Development & Public Works Organization Act 1971	Coordinator General – Department of Infrastructure and Planning
Strategic Cropping Land Act 2011	Department of Agriculture, Fisheries and Forestry (DAFF)
Sustainable Planning Act 2009	Relevant Department responsible for land type
Transport Infrastructure Act 1994	Queensland Department of Transport and Main Roads (DTMR)
Vegetation Management Act 1999	Department of Environment and Heritage Protection (DEHP)
Waste Reduction and Recycling Act 2011	Department of Environment and Heritage Protection (DEHP)
Water Act 2000	Department of Environment and Heritage Protection (DEHP)
Water Supply (Safety and Reliability) Act 2008	Department of Environment and Heritage Protection (DEHP)
Wild Rivers Act 2005	Department of Environment and Heritage Protection (DEHP)

8.2.3 Changes / Updates to ISO Standards, Legislation and Industry Standards

A combination of both SAI Global and Enviro Law will be used as the primary tools to monitor any amendments, changes or updates to the ISO series, legislative documents (including relevant policies) and relevant Industry Standards. Registered accounts will be set-up to include the relevant OHSE Personnel details and email addresses which will allow for an automatically generated email to

be issued from LAWLEX detailing the change or update to the relevant standard and or legislative document. The relevant piece of legislation and or standard will then be reviewed by the Project HSSE Manager and included within the OHSE Legal Change Register with associated comments. If the change has impact to the current business activities or scope of works, the change will be formerly communicated to the respective site personnel and included into the relevant plans and or/procedures where required.

Related Documents
OHSE Legal Change Register

8.3 Approval Requirements

8.3.1 SunWater Approvals

SunWater have highlighted the following environmental Government Authority Approvals that will need to be acquired prior to construction commencement:

Table 1: SunWater Approvals

ID	Government Authority Approval	Issuing Government Authority
1	Approval by the Commonwealth Minister of SEWPAC of a controlled action under the EPBC Act (assessment on preliminary documentation)	DSEWPAC
2	Works regulation under the SDPWO Act, if required	DSDIP
3	Beneficial use approval under the Waste Reduction and Recycling Act 2011	DEHP
4	Multiple-entity recycled water management plan under the Water Supply (Safety and Reliability) Act 2008	DEWS
5	Amendments to the Resource Operations Plan under the Water Act	DNRM
6	Water licence under the Water Act	DNRM
7	Development permit under the SDPWO Act for material change of use of premises within the Surat Basin Infrastructure Corridor State Development Area	DSDIP
8	Development permit under the SPA and EP Act for material change of use of premises where all or part of the premises is on the environmental management register or contaminated land register, if required	DEHP
9	Development permit under the SPA and Vegetation Management Act for operational work for clearing native vegetation	DNRM
10	Clearing notification under the Vegetation Management Act	DNRM
11	Clearing permit to take protected plants under the NC Act	DEHP
12	Development permit under the SPA and Water Act for operational work involving taking or interfering with water, if required in relation to the outlet works/infrastructure or	DEHP

ID	Government Authority Approval	Issuing Government Authority
	extracting construction water	
13	Development permit under the SPA and the Fisheries Act for operational work that is the constructing or raising of waterway barrier works	DAFF
14	Riverine protection permit under the Water Act	DNRM
15	Road corridor permit under the Transport Infrastructure Act	DTMR
16	Traffic Control Permit, if required	DTMR
17	Permanent road closure at balancing storage site	DTMR
18	Temporary road closure – road licence, if required	DNRM and/or Local Council
19	Local government approval under Local Law for the prescribed activity of alteration or improvement to local government controlled areas and roads, if required	Local Council
20	Local government approval under Local Law for the prescribed activity of undertaking regulated activities on local government controlled areas and roads – depositing of goods or materials, if required	Local Council
21	Local government approval under Local Law for the prescribed activity of carrying out works on a road, or interfering with a road or its operation	Local Council
22	Development permit under the SPA for reconfiguring a lot under the Land Title Act 1994 (Queensland) for a long term lease (greater than 10 years), if required	Local Council

8.3.2 Murphy Pipe and Civil Approvals

The following environmental Government Authority Approvals will need to be acquired prior to construction commencement:

Table 2: Murphy Pipe and Civil Approvals

ID	Government Authority Approval	Issuing Government Authority
1	Development permit under the SPA and the EP Act for making a material change of use of premises for ERA 8 (Chemical Storage), if required	DEHP or Local Council
2	Development Permit under the SPA and the EP Act for making a material change of use for ERA 14 (Electricity Generation), if required	DEHP
3	Development Permit under the SPA and the EP Act for ERA 15 (Fuel Burning), if required	DEHP
4	Development permit under the SPA and the EP Act for ERA 17 (Abrasive Blasting – mobile and temporary) or compliance with relevant code of environmental compliance if applicable, if required	Local Council
5	Development permit under the SPA and the Environmental Protection Act for a material change of use of premises for ERA 43 for concrete batching works, if required	Local Council

ID	Government Authority Approval	Issuing Government Authority
6	Sales permit for quarry materials under the Forestry Act, if required	DNRM
7	Quarry material allocation notice under the Water Act	DNRM
8	Development permit under the SPA and the EP Act for material change of use of premises for ERA 16 (Extractive and screening activities) or compliance with relevant code of environmental compliance if applicable	DEHP
9	Development permit under the SPA and the Water Act to take quarry material from a watercourse or lake, if required	DNRM
10	Development permit for material change of use of premises for "Extractive industry" under planning scheme, if required	Local Council
11	Development permit under the SPA and the planning scheme for operational work, if required	Local Council
12	Damage mitigation permit where an animal breeding place is identified and where an activity will tamper with an animal breeding place under the NC Act, if required	DEHP
13	Disposal permit for removing or disposing of contaminated soil under the Environmental Protection Act, if required	DEHP
14	Development permit under the SPA and Water Act for operational work involving taking or interfering with water, if required in any instance except in relation to the outlet works/infrastructure and extracting construction water (for example, where required in association with necessary dewatering)	DNRM
15	Prepare and submit notice of self-assessment in relation to operational work for temporary/minor waterway barrier works under the SPA and the Fisheries Act, if required	DAFF and/or local fisheries council
16	ERA Registration Certificates Registration of Chapter 4 activities under the Environmental Protection Act is required. This will be applicable for all approved ERAs undertaken by the contractor and all ERAs undertaken by the contractor in accordance with a code of environmental compliance	DEHP
17	Building approval and/or self-assessment under the SPA and/or Building Act 1975 (Qld), if required	Local Council

9. Environmental Policy

Environmental Policy

Murphy Pipe and Civil Group is committed to the principles of innovative and effective environmental management and ecological sustainability and seeks to demonstrate this at all times, where practicable, through the implementation of:

- Environmentally sound construction planning, practices and design
- Energy efficiency evaluation and implementation
- Environmental impact reduction practices
- Use of recycled products or products that are from sustainable sources or those that have a recycled content
- Workplace waste minimisation and recycling practices
- Prevention or minimisation of pollution

Our commitment will be demonstrated through a risk management process and implementation of environmental management plans, which seek to identify potential environmental hazards, assess the risks and implement control measures, to prevent incidents from occurring.

As an industry leader for delivering innovative solutions for the construction and resources sectors, Murphy Pipe and Civil Group ensures compliance with relevant environmental laws and the implementation of environmentally conscious work practices. As an integral part of Murphy Pipe and Civil Group's strategy we are committed to reducing the environmental impacts associated with our work practices through thorough planning and allocation of adequate resources.

We will continue to communicate and develop our environmental practices, responsibilities, impacts and awareness through ongoing consultation with all stakeholders including regulatory bodies.

Murphy Pipe and Civil Group has set the following corporate objectives:

- To apply a system which forms a practical basis for Murphy Pipe and Civil Group to reach its environmental management objectives and meets the requirements of ISO AS/NZS 14001.2004
- To maintain certification to that standard; and
- To periodically review compliance and progress against environmental objectives and make improvements when practicable

All workers, including management, are responsible and accountable for complying with this Environmental Policy, associated management plans and procedures, to ensure the effective management of potential environmental impacts at Murphy Pipe and Civil Group workplaces. This is achieved through the provision of appropriate information and adequate training in all environmental matters, all workers will be informed of their respective roles and responsibilities for environmental management and understand the importance of compliance with this policy.

Jim Campbell Murphy Pipe & Civil Managing Director
24 January 2012

10. Environmental Objectives and Targets

MPC Management will set objectives and targets that have measurable performance indicators. This can be used as a basis for environmental performance evaluation. When establishing environmental objectives and targets certain key factors shall be taken into consideration.

These include but are not limited to:

- Compliance with all legal and SunWater requirements
- Compliance with relevant approval, permit and license requirements
- Identified significant environmental aspects
- Available technological options
- Financial implications and business requirements associated with identified objectives and targets
- Consistency with organisational policies and commitments.

Once environmental objectives and targets have been determined, Management Programs are established and implemented to ensure that they are achieved. To ensure that the objectives and targets are achieved performance is continually monitored through audits, inspections and reporting. Continual improvement will be achieved through the monitoring and review of project and company performance.

MPC will overall:

- Minimise the impact of its business activities, products and services on the environment and surrounding communities
- Endeavour to realise opportunities for enhanced environmental outcomes
- Promote and create an environmentally sustainable business.

10.1 Objectives

The key MPC Environmental Objectives for the project are:

- Meet all contractual obligations to SunWater and all regulatory, legislative, industry standard and guideline requirements subscribed, relating to the specific environmental aspects
- Meet all relevant approval, permit and license requirements
- Establish and maintain a certified EMS which is effective and meets ISO AS/NZ 14001:2004 standard requirements; ensure environmentally sound construction planning, acquisition, design and construction of all related activities through adequate resourcing to ensure work activities do not present a risk to the environment
- Promote practices, systems, values and behaviours that contribute towards responsible environmental practices, sustainability and reduced environmental impact
- Minimise, where under our control, the production of pollutants and prevent the release of pollution to the environment from all related construction activities;
- To ensure that effective and appropriate procedures are developed and implemented that identify and document potential environmental hazards, risks and aspects and in turn implementing control measures to minimise or prevent environmental incidents and non-compliances from occurring associated with the site works
- Prescribe effective environmental management strategies pertaining to aspects and risks relating to land and soil; erosion, sediment and drainage; contaminated land; riverine; wetlands/gilgai's; water; noise and vibration; air quality; historical heritage; fauna; vegetation; livestock; rehabilitation & revegetation; pest and weed; bushfire; fuel, chemical and dangerous goods; waste; and greenhouse gas energy and emissions management

- Communicate and develop environmental training an awareness that will enable all employees and contractors to undertake their work in an environmentally friendly manner and increase environmental awareness
- Actively communicate to all project employees, subcontractors and suppliers the environmental management requirements and hold them accountable for their actions accordingly
- Maintain effective communication and liaison with relevant stakeholders, government bodies and the general community regarding effective environmental strategies
- Provide expert advice and guidance to the Project Managers and Supervisors regarding environmental management in all aspects of the works
- Achieve best practice environmental management on the project as assessed by internal/external audit, compliance checks, inspections and reviews which will ultimately ensure continual improvement to the CEMP and ultimately MPC's EMS.
- Implement strategies and initiatives to minimise greenhouse gas emissions and energy production/consumption levels
- Contribute towards implementing appropriate waste management protocols through the principals of reduce, reuse, recycle and appropriate disposal to increase overall sustainability
- Recognise and celebrate initiatives and performance by those who make a positive contribution to the environment.

A summary of work activity specific objectives and general aspect objectives relating to environment are outlined below within Section 13 – Construction Activity Specific Environmental Management Measures and Section 14 – General Project Environmental Management Measures.

10.2 Targets

The environmental targets/Key Performance Indicators (KPI's) for the Project are further described below.

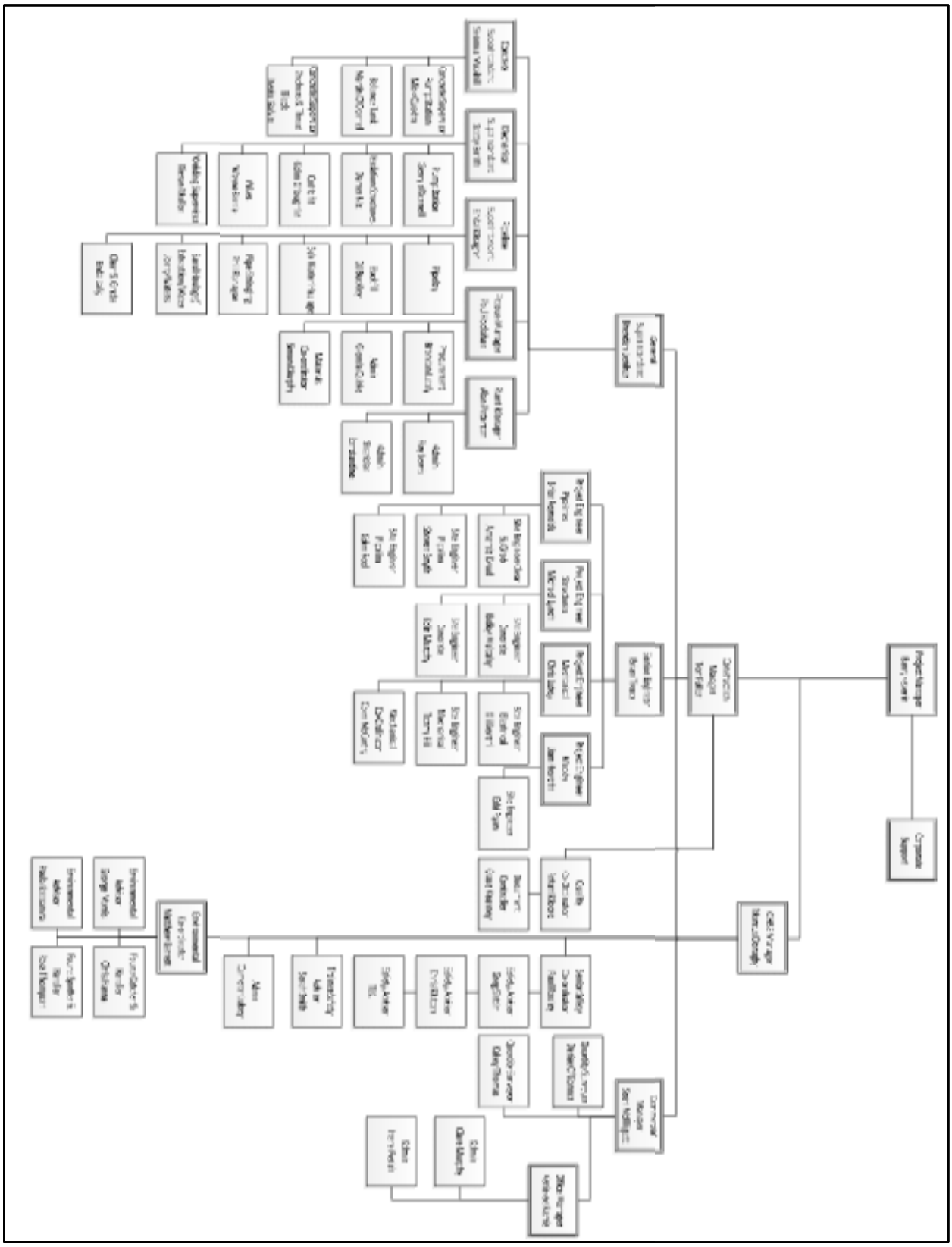
Table 1: Environmental KPI's

Activity – Lead Indicators	Frequency/Target	Responsible Person
Senior Management Tours/Audits	Monthly	Group HSSE Manager
OHSE Committee Meetings (if elected)	Monthly	HSSE Manager and OHSE Coordinator
Project Management OHSE Meetings	Weekly	HSSE Manager and Project Manager
Toolbox Meetings conducted as per the schedule	Weekly	OHSE Coordinator
Prestart Meetings	Daily	Supervisors
Audits conducted as per the schedule	Monthly	Group HSSE Manager
Inspection checklists conducted as per the schedule	Weekly	OHSE Coordinator
Inspection checklists and audit results issued to SunWater	Within 10 days after each inspection/audit	HSSE Manager
OHSE Work Observations/Hazard Observations	30 per month	HSSE Manager and OHSE Coordinator
Environmental themes/toolboxes delivered and erected on site	Monthly	HSSE Manager and OHSE Coordinator
SWMS & JHA Reviews	5% per month of total	OHSE Coordinator
Incident Investigation Reporting and Notification	Immediately - Within	HSSE Manager

Activity – Lead Indicators	Frequency/Target	Responsible Person
	12 hours	
Incident Investigations Complete	Low/Medium closed out within 2 Working Days High closed out within 3 Working Days	HSSE Manager, OHS Coordinator & Project Manager
Environmental Alerts are developed and erected on site	Within 7 days of investigation being finalized	HSSE Manager
High to Extreme Incident occurrences	Zero	HSSE Manager and Project Manager
NCR's arising from 3rd party auditors	Zero	HSSE Manager and Project Manager
CAR's/NCR's/OFI's actions arising from inspections, audits and non conformance reports are closed out within allocated timeframes	100%	HSSE Manager and Project Manager
Environmental breaches or infringements received from regulatory bodies	Zero	HSSE Manager and Project Manager
Compliance to applicable approval/license/permit conditions	100%	HSSE Manager
Compliance to prescribed monitoring, sampling and testing requirements	100%	HSSE Manager
Competencies compliance	100%	HSSE Manager and OHS Coordinator
OHSE Reporting	Weekly/Monthly	HSSE Manager and OHSE Coordinator
Greenhouse Gas, Energy and Emissions Management Reporting	Monthly	HSSE Manager and OHSE Coordinator

11. Management Organisation, Responsibilities and Authorities

11.1 Murphy Pipe and Civil Project Structure Organisation



11.2 Overall Responsibilities

11.2.1 MPC Employees

All MPC employees are responsible and accountable for co-operating with the Environmental Policy, Plans/Procedures and associated documents to ensure that the workplaces occupied by Murphy Pipe and Civil as far as is reasonably practicable, minimises the adverse effects on the environment.

All staff members have a responsibility for their own environmental performance and compliance with the "General Environmental Duty" as described in section 319 and 320, chapter 7 of the Environmental Protection Act 1994 (EP Act):

- A person must not carry out any activity that causes, or is likely to cause, environmental harm unless the person takes all reasonable and practicable measures to prevent or minimise the harm
- If you become aware of serious or material environmental harm being caused or threatened by an activity or omission you are involved in or you have observed others causing you have a duty to report that harm to management who will in turn notify affected employers/owners/occupiers where appropriate in addition to notifying the administering authority (DSEWPaC/DEHP/DAFF).

In particular all employees are required to:

- Undertake all activities in accordance with the agreed management plans, procedures and work method statements
- Ensure that they are aware of the contact person regarding environmental matters
- Report any activity that has resulted in, or has the potential to result in an environmental incident
- Ensure that they attend the environmental training provided.

11.2.2 Position Descriptions

Position descriptions including definitions of responsibility have been developed for MPC staff. Detailed Position Descriptions are maintained by the Human Resources department and relevant Managers.

11.2.3 Contractors, Sub-Contractors and Suppliers

All Contractors and Sub-Contractors engaged to perform work on Murphy Pipe and Civil premises or any other location are required to comply with legislation, and as part of their contract or any other agreement, to comply with the Environmental project requirements and MPC Policy and associated Plans/procedures as well as legislation to ensure that the workplaces occupied as far as is reasonably practicable, minimises the adverse effects on the environment.

Contractors, subcontractors and suppliers are required to:

- Ensure adequate resourcing is available to achieve the desired Environmental outcomes
- Communicate the importance of Environmental excellence to the project's success
- Encourage a positive environmental culture by promotion and commitment
- All environmental aspects and impacts can be identified, assessed, managed and controlled
- All employees including contractors and subcontractors have the right and responsibility to stop or refuse work situations that may cause harm to the environment
- All employees must be trained and competent in the tasks they are expected to perform
- Teamwork is essential in achieving environmental excellence
- Frequent involvement in environmental activities such as risk assessments, audits, meetings etc by all levels of project management

- Reinforcement and recognition of positive environmental behaviour, initiatives or outcomes
- Timely and appropriate responses to circumstances requiring environmental improvement
- Compliance with all statutory acts, regulations and codes of practice
- Implementation of project contractual requirements and the requirements of own key practices and work methods
- Including OHSE as an agenda item for all contractor management meetings
- Providing Murphy Pipe and Civil with documentary evidence that their OHSE system and safe working practices conform to and are equal to or exceed the standards set by Murphy Pipe and Civil.

11.3 Project Organisation Specific Core Responsibilities

All project personnel shall be accountable for ensuring they fulfill their responsibilities through actively participating in the prescribed activities for their position. The following identifies the Environmental responsibilities of key personnel for the project.

11.3.1 Project Manager

The Project Manager has overall authority in the matters affecting the implementation and operations of the project. The Project Manager reports to the Operations Manager of Murphy Pipe and Civil on all aspects of the project. The Project Manager is responsible for:

- Ensuring that any design under the control of Murphy Pipe and Civil or its contractors/ Sub contractors has included environmental considerations during final design, fabrication, installation, construction and commissioning
- Promote Environmental philosophies
- Responsible for ensuring the development and effective implementation of the Project CEMP, including the provision of adequate resources to give effect to obligations imposed by the CEMP
- Ensure that measures are in place to control environmental impact at all project worksites
- Ensure that communications are adequate to advise all stakeholders of risks or concerns as they are identified
- Responsible for achievement of the Project OHSE objectives and targets
- Ensure timely action is taken to alleviate identified Project risks
- Demonstrate active support for, and commitments to OHSE by participating in various initiatives
- Ensure that line management take ownership of elements and controls listed in the Environmental Management Plan
- Where possible participate in audits and inspections and ensure corrective actions are closed out within given timeframes
- Ensure that all environmental incidents are reported; investigated and corrective actions implemented, and participate in investigations as required
- Reporting concerns regarding the implementation of OHSE management system to the Project HSSE Manager.

11.3.2 Project HSSE Manager

The HSSE Manager is responsible for the maintenance and implementation of the Safety and Environmental Management Systems on the project. The HSSE Manager reports to the Project Manager of Murphy Pipe and Civil on all aspects of Safety and the Environment in relation to the project. The HSSE Manager is responsible for:

- Assisting the Project team in achieving the goals for the Project
- Providing OHSE management throughout all phases and elements of the Project

- Communicating OHSE goals and requirements and facilitate the development of performance targets and their achievement
- Establishing the Project Environmental Management System Plans and Procedures
- Ensuring that adequately skilled resources are available to provide input into environmental aspects of project planning and execution
- Establishing and monitoring Murphy Pipe and Civil and project OHSE statistics and Key Performance Indicators (KPI)
- Carrying out regular inspections of work areas to ensure compliance with legislative requirements and the Environmental Management Plan
- Developing and maintaining professional relationship with regulatory bodies
- Examining environmental problems and recommend solutions to the appropriate manager
- Ensure investigations are conducted of all appropriate site environmental incidents. Survey, evaluate, investigate and gather information & data as required
- Ensuring that adequate environmental training for all Murphy Pipe and Civil and contractors/ subcontractor personnel is provided and maintained
- Developing an effective communications program between all project interfaces
- Monitoring the Environmental records onsite and that they meet regulatory body requirements
- Facilitating appropriate audits and reviews that ensure that all Murphy Pipe and Civil and contractors/ subcontractor personnel are in compliance with Project policies, procedures and practices.

11.3.3 Construction Manager

The Construction Manager has authority for Environmental control implementation on the project and assists the Project Manager in ensuring compliance. The Construction Manager reports to the Project Manager on all aspects of the project. The Construction Manager is responsible for:

- Being familiar with applicable environmental regulations and requirements of the projects OHSE documents
- Ensuring that all site personnel and contractors conform to project Environmental requirements
- Ensuring effective OHSE coordination and cooperation with Subcontractors
- Participate in audits and inspections to measure the effectiveness of the IMS Management system and assure requirements are being effectively communicated throughout the workforce
- Participate in incident investigations as required.

11.3.4 Superintendent

The Superintendent is responsible for directing and coordinating the project labour force through supervisors (including subcontractors) in the daily execution of work as per the project requirements and directed by the Project Manager. The Superintendent is to ensure that the work is conducted in an environmentally sensitive manner that maximizes productivity without compromising Safety, Environmental and Quality requirements. The Superintendent reports to the Construction Manager and is responsible for:

- The control of Employees
- Ensuring compliance with Health, Safety and Environmental requirements
- Conducting formal and or informal inspections of the workplace for the purpose of discovering unsatisfactory conditions or practices
- Ensuring that activities comply with the Contract Specification and the Safety, environmental and quality requirements of the Contract as directed by Project Manager.

11.3.5 Environmental Coordinator

The Environmental Coordinator is responsible for the maintenance of the Environmental Management System and compliance with legislation on the project. The Environmental Coordinator reports to the Project HSSE Manager on all aspects of Environmental management in relation to the project.

The Environmental Coordinator is responsible for:

- Participate in the maintaining, reviewing, implementation and improvement of the Environmental Management Plan
- Ensure an effective environmental management system is established, implemented and maintained in accordance with contractual, legislative and AS/NZS requirements
- Maintaining, monitoring and auditing the EMS and environmental control measures in place
- Assist the Project team in achieving the targets for the Project
- Communicate environmental goals and requirements
- Communicate progress of management systems and any changes
- Assist in developing procedures for MPC to ensure compliance with relevant standards and legislation
- Carry out regular inspections of work areas in accordance with the schedule to ensure compliance with legislative requirements and the Environmental Management Plan
- Examine environmental problems and recommend solutions to appropriate manager
- Assist and or conduct investigations of all site environmental incidents. Survey, evaluate, investigate and gather information and data as required
- Ensure that adequate environmental training for all MPC and contractor personnel is provided and maintained and continues for the duration of the project
- Co-ordinate the formal environmental assessment process
- Maintain environmental records that may be required to meet regulatory body requirements
- Assist in audits to ensure all Murphy Pipe and Civil and contractors/ subcontractor personnel work activities are in compliance with legislation, approval requirements, project policies, procedures and practices and ensure that corrective actions are implemented
- Participate in the development and regular review of the Project Risk Assessment
- Participate in training and induction program ensuring that all staff understand management systems and have access through this process
- Develop and monitor waste materials management
- Participate in and track outcomes of project risk assessment, hazard observations and any other project or SunWater supplied environmental assessments as required
- Maintain an effective communications program between all project interfaces
- Attend and participate in all relevant project and OHSE meetings
- Coordinate all environmental incident investigations as necessary and ensure that corrective actions have been implemented
- Communicate project specific environmental statistics and performance in relation to Key Performance indicators (KPI)
- Provide environmental advice and support to all employees and contractors/subcontractors to achieve OHSE compliance and excellence
- Reporting regularly on the performance of the environmental management system.

11.3.6 Environmental Advisor

The Environmental Advisor is responsible for assisting the Environmental Coordinator with maintenance of the Environmental Management Systems and compliance with legislation on the

project. The Environmental Advisor will report to the Environmental Coordinator on all aspects of Environment in relation to the project. The Environmental Advisor is responsible for:

- Participating in the implementation and improvement of the Environmental Management Plans
- Ensure an effective environmental management system is implemented and maintained in accordance with contractual, legislative and AS/NZS requirements
- Maintaining, monitoring and auditing the EMS and environmental control measures in place
- Communicate environmental goals and requirements
- Communicate progress of management systems and any changes
- Assist in maintaining the Environmental systems on the project
- Assist in developing procedures for MPC to ensure compliance with relevant standards and legislation
- Carry out regular inspections of work areas in accordance with the schedule to ensure compliance with legislative requirements and the Environmental Management Plan
- Examine environmental problems and recommend solutions to appropriate manager
- Assist and or conduct investigations of all site environmental incidents. Survey, evaluate, investigate and gather information and data as required
- Maintain environmental records that may be required to meet regulatory body requirements
- Assist in the Project Risk Assessment
- Participate in training and induction program ensuring that all staff understand management systems and have access through this process
- Monitor waste materials management
- Participate in and track outcomes of project risk assessment, hazard observations and any other project or public safety assessments as required
- Maintain an effective communications program between all project interfaces
- Attend and participate (when required) in all relevant project and OHSE meetings;
- Provide environmental advice and support to all employees and contractors/subcontractors to achieve environmental compliance and excellence.

11.3.7 Site Supervisors

The Supervisors are responsible for directing and coordinating the project labour force (including subcontractors) in the daily execution of work as per the project requirements and directed by the Superintendant. They are to ensure that the work is conducted in a safe manner that maximises productivity without compromising safety, environmental and quality requirements. The Supervisor reports to the Superintendant and is responsible for:

- Have a sound understanding of Environmental requirements;
- Have a sound understanding of their responsibility;
- Ensure that all onsite personnel have been provided with the required site specific training, trained in roles and responsibilities and are competent to perform duties allocated prior to commencing any work activity;
- Promote and encourage all site personnel to be proactive in the management of environmental issues;
- Participate in workplace inspections and audits as required;
- Maintain a strong workplace environmental communication process to ensure all personnel are kept well informed about any workplace issues that may affect them;
- Ensure that all work activities are carried out in accordance with this Environmental management plan and supporting procedures;
- Ensure that environmental aspects and impacts are identified, risks assessed and control measures planned and implemented in consultation with relevant employees;

- Ensure that environmentally acceptable working methods and practices are implemented; and
- Participate in environmental incident investigations as required.

12. Scope of Construction Work / Construction Activities

Outlining the activities and processes undertaken by MPC is a crucial component in assessing both the general and significant environmental impacts of each activity. The scope of work of the SunWater project is broad and shall consist of the following individual itemized component activities:

- Conduct and facilitate pipeline construction HAZID prior to commencement of construction work
- Mobilisation of all required equipment/plant for the execution of work
- Mobilisation of construction personnel to site
- Lay down area construction/clear and grade
- Pipe supply/haulage
- Transportation of Mild Steel Cement Lined (MSCL) pipe from the lay down area to work site
- Sand and gravel Extraction and screening
- Final Construction survey and set-out. Verification of pegged location
- Installation of security fencing, cattle fencing, gates and grids
- Right of Way (ROW) areas clear and grade
- Pipe stringing
- Trenching
- Pipe Jointing/Welding
- Supply and installation of bedding
- Pipe lay
- Construction of surge tanks and standpipes
- Lower-in and Tie-ins
- Sand compaction and RoW spoil Backfill
- Pipe Cleaning
- Water Supply
- Hydrostatic testing
- Dewatering
- Installation of fibre optic cable
- ROW reinstatement and rehabilitation
- Civil works for above ground pipe work
- Construction of Balance tank and all associated civil works
- Construction of pump station on the pipeline alignment (Woleebee Creek end) and all associated civil works
- Construction of discharge outlet structure (culver) at Glebe Weir end and all associated civil works
- Supply and installation of permanent gates and fences (where required)
- As-built survey and data
- Demobilisation of all equipment and personnel
- Remedial works (if required)

Although the above list represents a comprehensive list of all itemised work activities, the work scope will be represented by the following key work activities, as further outlined within the *Australian Pipeline Industry Association – Code of Environmental Practice Onshore Pipelines March 2009* construction methodology framework:

- Pipeline Construction
    - Clearing and Grading
    - Pipe Stringing
    - Pipe Welding
    - Trenching
    - Pipe Laying
    - Backfilling
    - Pipeline Testing and Commissioning
    - Reinstatement and Rehabilitation.
- Other Pipeline Installation Techniques
    - Boring
- Laydown Yard and Work Site Storage Areas
- Borrow Pits

These construction activities have the potential to impact on the surrounding environment if not managed appropriately. These potential environmental impacts will be managed through a combination of tools including:

- Plans, Programs, Procedures
- Standard Operating Procedures and Safe Work Method Statements
- Checklists, Forms and Registers
- Weekly inspections and audits
- Risk assessments.

The above mentioned tools will highlight and monitor the applicable environmental management measures, namely:

- Construction Activity Specific Environmental Management Measures
- General Project Environmental Management Measures.

13. Construction Activity Specific Environmental Management Measures

13.1 Pipeline Construction

13.1.1 Clearing and Grading

Clearing and grading of the pipeline construction area involves the removal of topsoil and in some instances subsoil as well as the removal of grasses, shrubs, trees, logs and other obstacles in order to provide access for pipeline construction. The aim during clearing and grading is to avoid and minimise the impact and disturbance to the natural landform, vegetation and habitat communities and in turn reduce soil erosion, drainage and sedimentation impacts.

Table 2: Clearing and Grading

Clearing and Grading - Environmental Management

Clearing and Grading - Environmental Management	
Impacts	• Soil erosion and sediment release to land or water • Removal, fragmentation and destruction of vegetation and floristic communities • Degradation of soil structure through soil mixing, compaction and topsoil loss • Disturbance to problematic soils, dispersive soils, contaminated soils or acid sulphate soils • Removal, fragmentation and destruction of fauna habitat and injury to fauna • Increased potential for feral animal movement and pest species • Increased potential for the spread of weeds and pest species to invade the area; • Disturbance and impact to historical and cultural heritage sites • Increased dust emissions • Potential impacts to visual amenity • Potential impacts to landholders and the community • Potential impacts to rehabilitation
Objectives	• To minimise impacts to relating to soil erosion, sedimentation and drainage to land and water • To minimise disturbance to flora and vegetation communities • To minimise soil degradation and prevention of soil mixing • To minimise disturbance on problematic soils • To minimise disturbance to fauna habitat and native fauna • To minimise impacts to historical and cultural heritage sites • To prevent the establishment or spread of weeds and pests • To minimise dust emissions • To minimise impacts to visual amenity • To minimise impacts to landholders and the community • To re-salvage cleared vegetation and reuse during rehabilitation • To optimize rehabilitation success
Clearing	
Management Measures	• Vegetation clearance is minimised as far as possible (trimming branches, retention of mature trees) • Authorized clearing areas are clearly marked and delineated prior to clearing • ROW does not exceed the approved ROW width specified by SunWater specifications • The ROW corridor width is minimised in sensitive areas and at watercourse crossings in accordance with SunWater specifications • Clearing areas at and within watercourses and wetlands (gilgai's)will be delayed, where practicable, until construction of the crossing is imminent and all planning and construction methods are confirmed – Refer Section 14.1.4 Riverine/Watercourse Management and 14.1.5 Wetland/Gilgai Management

Clearing and Grading - Environmental Management	
	• All felled vegetation is placed within the approved construction footprint and does not encroach outside of these areas unless approval is granted • Any additional temporary work spaces required outside of the ROW are approved in accordance with SunWater prior to disturbance activities • Weeds and Declared plants are managed in accordance with Section 14.1.14 Pest and Weed Management • Vehicles, machinery and equipment are certified clean prior to entry to the project and prior to entry to the RoW in accordance with landowner requirements and in areas of known or potential high weed/declared plant risk. Refer to the Pest and Weed Management Plan • Heritage areas or sites are to be retained and preserved on the ROW and clearly marked with flagging or marker tape prior to clearing to enable relocation or collection by heritage monitors/archaeologists -– Refer 14.1.09 Historical Heritage Management • Protected vegetation (mature trees, Type A plants, plants requiring clearing permits) that has significant natural or amenity value are to be retained and preserved with flagging or marker tape – Refer 14.1.10 Vegetation Management • The OHSE department is contacted and assessment made if vegetation or heritage value marked for retention is required to be cleared • A licensed fauna spotter and/or environmental representative is utilized during all habitat vegetation clearing to relocate any fauna, nests or hollows and flush any fauna from the immediate area • Minimal disturbance to roots and soil within drip zones of vegetation to be retained • All felled woody vegetation is stockpiled separately on the edge of the corridor in a manner that facilitates re-spreading or re-salvaging, does not impede vehicle, livestock or wildlife movements, and avoids damage to adjacent live vegetation and fences • All felled woody vegetation is stockpiled outside of watercourses and areas of surface water flows • Mulching is to be avoided wherever possible. However, if mulching is to occur based on specific landholder requirements, conditions described above for felled vegetation are to be adhered • Machine and truck turning and working areas are identified prior, and located within pre-disturbed areas where possible and only designated access tracks are used • Temporary fencing to be installed adjacent to open excavations and trenches in accordance with SunWater and Landholder requirements in order to restrict and/or prevent any livestock movement within these areas
Grading	
Management Measures	• All graded spoil is placed within the construction area and does not encroach off site • Graded soil is stockpiled separately from other materials including timber/logs/trees etc and where it can be readily recovered for re-spreading and where loss through wind, or water erosion is minimised - Refer 14.1.1 Land and soil Management

Clearing and Grading - Environmental Management	
	• Graded soil is segregated into topsoil layer and subsoil layer • Potential contaminated soils are segregated and stockpiled separately to the ROW spoil to prevent soil mixing with appropriate bunding placed around the stockpiles • Topsoil stockpiles are maintained at a height of equal to or less than 2m • Where appropriate, containment devices or structures will be used to preserve stockpiled soils – protected by silt fences • Graded soil will not be stockpiled where it has the potential to result in sedimentation of land or surface water including but not limited to drainage lines and watercourses • Stockpiled soil will not impede the movement of stock and vehicles across the pipeline construction area and will be breached in appropriate locations to allow vehicular, stock and wildlife access – vehicular movement of vehicles over stockpiles and wind rows is prohibited • Construction materials are not placed over stockpiles • Soil and surface stability is to be maintained at all times and graded to original landform profile and condition • Grading works at and within watercourses will be delayed, where practicable, until construction of the crossing is imminent and all planning and construction methods are confirmed • Erosion, sediment and drainage controls will be installed and maintained where required throughout the corridor and in areas of high risk potential (creek crossings and low points etc). Controls include the use of but are not limited to silt fencing, silt socks, straw bales, cocoi logs, sand bags, booms, rock checks, contour berms/windrows, rumble grids, silt curtains and drainage channels/gullies. Refer section 14.1.2 – Erosion, Sediment and Drainage Management • Contour berms are established throughout the corridor where appropriate and in accordance with SunWater specifications to prevent erosion and to divert overland flow off the ROW Dust control measures shall be carried out to ensure dust levels are kept to a minimum – watering of construction sites and access roads for dust suppression will be required on an as required basis, using water from approved locations and ensuring it is meets the project water quality criteria – Refer 14.1.18 Air Quality (Dust) Management • Vehicles, machinery and equipment are certified clean on entry prior to preparing the ROW in accordance with the Pest and Weed Management Plan • Heritage areas or sites are to be retained and preserved on the ROW and clearly marked with flagging or marker tape prior to clearing to enable relocation or collection by heritage monitors/archaeologists • The OHSE department is contacted and assessment made if vegetation or heritage value marked for retention is required to be cleared • Temporary fencing to be installed adjacent to open excavations and trenches in accordance with SunWater and Landholder requirements in order to restrict and/or prevent any livestock movement within these areas

13.1.2 Stringing

Following clear and grade activities, pipe materials are delivered to site. Pipe stringing involves the delivery of pipe to the pipeline construction area in preparation for welding. The aim during pipe stringing is to conduct the work activity in a safe and responsible manner with minimal disturbance to the landowner or impact on the environment.

Table 3: Pipe Stringing

Stringing - Environmental Management	
Impacts	• Dust and noise emissions resulting from pipe transport • Temporary obstruction to other land users • Disturbance and impedance to landholder access, fauna and livestock movements • Inappropriate management of waste materials
Objectives	• To minimise noise and dust related impacts on the environment • To minimise disruption to landholders, the community and third parties • To minimise disturbance on native fauna and livestock • To manage waste materials appropriately
Management Measures	• Pipe transport routes are determined and approved in consultation with SunWater, landholders and relevant government authorities • The pipe and other equipment is stored in designated and approved areas within the construction area • Scheduling of deliveries during daylight hours (6am – 6pm) to minimise dust and noise related impacts. Where works are proposed to be performed outside of these normal construction hours, approval will be required from the Project Manager • Pipe stringing will not impede the movement of fauna, stock and vehicles across the pipeline construction area and will have gaps in place in appropriate locations to allow vehicular, stock and wildlife access – vehicular movement of vehicles over pipes is prohibited • All pipe delivery packaging is removed from the ROW daily and recycled and reused wherever possible, otherwise disposed of appropriately to minimise debris and rubbish • Daily surveillance of the placed pipe along the RoW and the removal of wildlife by a licensed fauna handler where appropriate

13.1.3 Welding

Following pipe stringing, welding into continuous lengths (known as pipe strings) occurs. The surface at the joint where welding occurred is then cleaned and coated with a tape wrapping, plastic sleeve or protective coating to inhibit corrosion. The aim during pipe welding is to conduct the work activity in a safe and responsible manner with minimal disturbance to the landowner or impact on the environment.

Table 4: Welding

Welding - Environmental Management	
Impacts	• Noise emissions from welding • Potential fire hazard associated with construction welding and grinding • Inappropriate management of waste materials
Objectives	• To minimise noise emissions to the environment and local landholders and community • To minimise the risk of bushfire ignition associated with construction activities • To manage waste materials appropriately
Management Measures	• Implementation of suitable control measures to minimise fire risk (i.e. water cart, fire extinguishers, and welding on exposed ground) • Any abrasive blasting activities that constitute an ERA will be licensed and have appropriate control measures in place • All associated consumables including cleaning solvents and dangerous goods are minimised and suitably stored and disposed • All associated waste materials (sand bags, wooden pipe skids, welding stubs, metal shavings) are recycled and reused wherever possible, otherwise disposed appropriately to minimise debris and rubbish in accordance with section 14.1.17 – Waste Management • Fire extinguishers and a water cart are located in close location to welding activities in the instance of fire ignition

13.1.4 Trenching

Trenching of the pipeline construction area involves the excavation of the pipeline trench where the pipe is to be installed. The aim during any trenching activity is to protect topsoil quality and to limit the disruption to landholders, domestic stock and native fauna.

Table 5: Trenching the Pipeline

Trenching - Environmental Management	
Impacts	• Soil erosion and sediment release to land or water • Degradation of soil structure through soil mixing, compaction and topsoil loss • Disturbance of problematic soils, dispersive soils, contaminated soils or acid sulphate soils • Potential for livestock and wildlife in entering the trench • Disturbance and impact to sub – surface historical and cultural heritage sites • Potential impacts to landholders and the community
Objectives	• To minimise impacts relating to soil erosion, sedimentation and drainage to land and water • To minimise soil degradation and prevention of soil mixing • To minimise disturbance on problematic soils • To minimise adverse effects on native fauna and livestock • To minimise impacts to historical and cultural heritage sites • To minimise impacts to landholders and the community

Trenching - Environmental Management	
Management Measures	• Trench spoil (sub soils) is stockpiled separately to topsoil and vegetation • All excavated material is placed within the construction area and does not encroach off site • Contaminated e soils are segregated and stockpiled separately to the trench spoil to prevent soil mixing with appropriate bunding placed around the stockpiles – Refer Contaminated Land Management – sections 14.1.3 • Topsoil stockpiles are maintained at a height of equal to or less than 2m • Where appropriate, containment devices or structures will be used to preserve stockpiled soils – protected by silt fences, berms etc; • Trenched soil will not be stockpiled where it has the potential to result in sedimentation of land or surface water including but not limited to drainage lines and watercourses • Stockpiled soil will not impede the movement of stock and vehicles across the pipeline construction area and will be breached in appropriate locations to allow vehicular, stock and wildlife access – vehicular movement of vehicles over stockpiles and wind rows is prohibited • Erosion within the trench will be prevented by utilizing trench plugs at appropriate intervals. Trench plugs will also permit the movement of livestock and wildlife across the open trench • Measures described below will be implemented to prevent fauna entrapment within the pipeline trench/excavation including: o Minimise the period of time the trench is open wherever practicable, particularly in fauna habitat areas o Trench plugs will be constructed at appropriate intervals and where slopes are less than 45 degrees to provide exit ramps for fauna o Fauna escape ramps are installed at appropriate intervals along the length of the open trench to assist fauna to leave the trench o Hessian sacks, ramped gangplanks or similar are installed to create ladders to enable fauna to exit the trench o Shelter material (i.e. hessian sacks) installed for any fauna that does become trapped within the trench to minimise heat stress etc • Stocked paddocks have temporary or electric fencing installed adjacent to open excavations and trenches in accordance with SunWater and Landholder requirements in order to restrict and/or prevent any livestock movement within these areas • Un-stocked paddocks have high visibility bunding or temporary fencing installed adjacent to open excavations and trenches in accordance with SunWater and Landholder requirements in order to restrict and/or prevent any livestock movement within these areas • Daily trench/excavation inspections are undertaken with fauna removal by a suitably experienced and qualified person and recorded on a register with relevant details • Heritage artifacts or discoveries are to be retained and preserved if uncovered during trenching and an OHSE representative contacted

Trenching - Environmental Management	
	immediately

13.1.5 Pipe Laying

The aim during pipe laying work activity is to limit the disruption to landholders, domestic stock and native fauna.

Table 6: Pipe Laying

Pipe Laying - Environmental Management	
Impacts	• Management of potentially contaminated trench water discharge • Soil erosion and sediment release to land or water • Potential for livestock and wildlife in entering the trench • Potential impacts to landholders and the community
Objectives	• To minimise impacts relating to soil erosion, sedimentation and drainage to land and water • To minimise adverse effects on native fauna and livestock • To minimise impacts to landholders and the community
Management Measures	• Trench dewatering is undertaken in consultation with an Environmental Coordinator/Advisor and water tested and appropriate discharge options adopted – If discharge is to occur, discharge should meet the relevant project water quality criteria, ANZECC and DEHP criteria and be passed through appropriate sediment controls • Dewatering from trenches along the ROW (as a result of rainfall etc) is to never occur directly into a watercourse or be discharged to the adjacent ROW where water is able to or has the potential to flow into a watercourse All dewatering activities are to have suitable erosion and sediment control measures in place • Water that does not meet stipulated criteria is contained and treated on site or removed off site for treatment/disposal at a licensed waste facility • Trench inspections are undertaken prior to pipe laying/backfill with fauna removal by a suitably experienced and qualified person and recorded on a register with relevant details

13.1.6 Backfilling

Following pipe laying, excavators are used to backfill the soil into the previously excavated trench. The aim during the backfilling work activity is to limit the disruption to landholders, domestic stock and native fauna.

Table 7: Backfilling of Trenches

Backfilling - Environmental Management	
Impacts	• Potential for livestock and wildlife in entering the trench • Potential impacts to landholders and the community
Objectives	• To minimise adverse effects on native fauna and livestock

	• To minimise impacts to landholders and the community
Management Measures	• Period of time between trenching and backfilling is minimised to prevent trench collapse and entry of fauna and livestock • Trench breakers are installed in accordance with SunWater design specifications and compaction of backfilled soils are used to prevent erosion along backfilled trench and assist in natural surface water movement/flows along the trench • Backfilled soils are compacted to a level consistent with surrounding soils. A gentle crown may be left over the trench line to allow for future settlement of soils and subsidence

13.1.7 Pipeline Testing and Commissioning

Hydro-testing involves the pressure testing of pipelines with water, or another suitable test medium to verify pipeline strength and to detect leaks. The aim during hydro testing is to minimise waste generated, utilize approved and appropriate water and reduce impacts on landholders/community during hydro-testing of the pipeline system.

Table 8: Pipeline Testing and Commissioning

Pipeline Testing and Commissioning - Environmental Management	
Impacts	• Modification of water quality • Wastewater management • Temporary deprivation of water resources • Use of chemical additives • Soil contamination, erosion and sedimentation resulting from hydro-test water discharge • Potential impacts to landholders and the community
Objectives	• To minimise water use • To reuse hydro-testing water wherever possible • To prevent use of chemical additives • To minimise impacts on soil and water • To minimise impacts to landholders and the community
Management Measures	• Hydro-testing is in accordance with the Hydrostatic Testing Water Management Procedure • Water source location used for testing is to be confirmed by the OHSE Department and sourced from an approved location in consultation with SunWater and landholders • Hydro test water to be used is to the sampled by the Environmental Coordinator/Advisor and tested by a NATA laboratory as required • Water quality is to conform to water quality parameters stipulated for the project and results confirmed acceptable prior to use • Untested water or water which falls outside the above parameters shall not be released into the environment or utilized for testing • The use of chemical additives will be minimised wherever possible however if deemed necessary will be approved by the OHSE Department and dosing quantities used will be as per those recommended by the supply companies

Pipeline Testing and Commissioning - Environmental Management	
	• Test water will be used for multiple sections where possible • Hydro testing water should be reused wherever possible and discharges should only occur if the water quality is assessed by the OHSE Department as acceptable and discharge locations confirmed and approved (approved dams, ponds, dewatering locations etc) to minimise risk to sensitive vegetation and receptors • Sediment and erosion control measures are in place during approved release • No release of hydro-test water within a reasonable distance from a water body • OHSE Department and SunWater must be notified if there is any spill or release of hydro-testing water to a water body

13.1.8 Reinstatement and Rehabilitation

Reinstatement and rehabilitation are the final major stages in pipeline construction. The aim during reinstatement and rehabilitation is to restore the land to a stable condition and as close to its pre-disturbed state as possible including the re-vegetation of the disturbed area with species identical or similar to those endemic to the area.

Table 9: Restoration of Vegetation

Reinstatement and Rehabilitation - Environmental Management	
Impacts	• Inadequate permanent soil stability reinstatement resulting in erosion and sediment release • Soil mixing and placement of soil layers varying from standard landscape • Poor restoration techniques and altered landscape • Poor vegetation cover and rehabilitation success • Spread of weeds and pest species through the area • Poor visual impact and amenity • Potential impacts to landholders and the community
Objectives	• To minimise impacts relating to soil erosion, sedimentation and drainage to land and water • To minimise soil degradation and prevention of soil mixing • To minimise modification to drainage patterns and achieve a landscape similar or identical to the pre-disturbed condition • To restore and enhance the environment, including wildlife habitat • To establish the construction area with vegetation species identical to the endemic species within the area • To prevent the establishment or spread of weeds and pests • To minimise impacts on visual amenity; • To minimise impacts to landholders and the community
Reinstatement	
Management Measures	• The ROW is cleaned up and reinstated as soon as possible following completion of construction activities. • Vehicles, machinery and equipment are certified clean on entry prior

Reinstatement and Rehabilitation - Environmental Management	
	to reinstatement and rehabilitation activities in accordance with the Pest and Weed Management Plan • All waste materials, flagging tape, rubbish and general waste is removed • Pipeline construction areas are re-profiled to the surrounding landform and to original contours, re-establishing surface drainage lines and other land features • Rehabilitated pipeline construction areas/trenches must: o Be a stable landform o Exhibit no subsidence or erosion gullies o Be re-profiled or reshaped to a level consistent with surrounding soils o Be re-profiled or reshaped to original contours and surface drainage lines o Be visually consistent with the surrounding land features • Segregated topsoil stockpiles (topsoil, subsoil) and seed stock are re-spread over the graded surfaces in an even layer to match the natural soil horizons throughout the area and assist natural regeneration. Minor surface roughness with minor undulations encouraged when spreading topsoil to trap water and seed • Although highly unlikely, any imported topsoil is of an appropriate quality and weed free and only used with landholder approval. Topsoil must be certified by the supplier and documentation kept on file with OHSE Department • Erosion and sediment control measures are installed where necessary with existing controls reinstated to a condition at least equal to the pre-existing state to prevent erosion • ROW is reinstated to allow overland flow to continue with minimal scour – contour banks/berms may be required to divert water off the ROW • Contour berms are established throughout the corridor where appropriate and in accordance with SunWater specifications to prevent erosion and to divert overland flow off the ROW Compaction relief is undertaken where required by scarifying soils along the contours. Rip lines may be required in flat to low gradients to prevent rilling • Subsoil displaced by the pipe, and not utilized, are stockpiled in locations approved by landholder or SunWater for use during operations • Fences, gates or other barriers are installed where appropriate and where approved by the Landholder or SunWater team to minimise unauthorized easement access • Reinstatement and rehabilitation are the final major stages in pipeline construction. SunWater will reinstate and rehabilitate the land to a stable condition and to its pre-disturbed state, including the re-vegetation of the disturbed area with species identical to those endemic to the area or identical to those impacted during project activities

Reinstatement and Rehabilitation - Environmental Management	
Rehabilitation	
Management Measures	• Ensure that all seeding and re-vegetation is undertaken in accordance with SunWater specifications and approved drawings • Seeding and planting in accordance with SunWater specifications after reinstatement and taking advantage of the most appropriate season where possible. • Seed and planting mixtures are preferably formulated to match floristic and vegetative species endemic to the local area/adjacent to the pipeline to aid in natural reestablishment of vegetative and habitat features • Specific creek crossing reseeding and planting specifications are to be considered • Where applied, seed and panting treatments are evenly dispersed over the subject area, in accordance with the specifications • Reapplication of seed and planting treatments will be undertaken in areas where poor germination results • On steep slopes and banks adjacent to creek crossings, over seeding/over planting is to be implemented and distributed heavily • Replacement of timber and rocks as habitat structural elements on the pipeline construction area • Retention and re-spreading of previously cleared stockpiled vegetation or mulch (where used) on the edge of the ROW or distribution over the construction area to aid in habitat potential and enhance regeneration potential

13.2 Other Pipeline Installation Techniques

13.2.1 Boring

Boring is commonly applied in construction to install pipelines beneath infrastructure such as roads, railways, buried utilities and in some circumstances, for watercourse crossings. The boring technique involves the drilling of short distances from below ground within an enlarged trench area, or bell hole, located within the pipeline construction area in order to accommodate all construction activities. Bell holes are required on each side of the boring activity. Environmental management measures are focused on erosion, sediment and drainage controls as well as appropriate fauna management and waste management. Boring activities are to be managed in accordance with the environmental management measures described for the trenching work activity (Refer section 13.1.4 – Trenching).

13.3 Laydown Yard and Work Site Storage Areas

Laydown yards and work site storage areas are required to store pipe, equipment and materials utilized for pipe construction related activities. The aim during construction of laydown yards is to manage waste appropriately, store hazardous and dangerous goods effectively and minimise erosion, sediment and drainage issues.

Table 10: Laydown Yard and Storage Area

Laydown yards and work site storage areas - Environmental Management	
Impacts	• Inadequate erosion, sedimentation and drainage controls resulting in movement of spoil and sediment off site • Dust and noise emissions resulting from laydown yard activities • Poor storage of waste • Poor storage of fuels, hazardous and dangerous goods • Poor visual impact and amenity • Potential impacts to landholders and the community
Objectives	• To minimise impacts to relating to soil erosion, sedimentation and drainage to land and water • To minimise dust and noise impacts • To manage waste effectively • To store hazardous and dangerous goods effectively • To minimise impacts to visual amenity • To minimise impacts to landholders and the community
Management Measures	• With regards to initial clearing and grading of laydown yards, environmental management measures outlined within section 13.1.1 – Clearing and Grading are to be implemented • Trees and tall shrubs are to remain on site, where practicable and infrastructure arranged to avoid them • Site specific erosion and sediment control drawings/sketches are to be generated where possible • Stockpiles are to be positioned in approved areas and may be seeded if exposed for long periods of time in accordance with section 13.1.8 – Reinstatement and rehabilitation • Appropriate erosion and sediment controls around stockpiles including silt fencing • Appropriate constructed drains to assist in clean water diversion off site • All sand and borrow pit material used to construct the hard stand surface are to be sourced from an approved location and meet all relevant permitting/licensing requirements • Appropriate waste management protocols as per section 14.1.17 Waste Management and in relation to off cut pipes and wrappings/delivery packaging • Storage and handling of fuels and chemicals are to comply with relevant Australian standards and as per management measures outlined within section 14.1.16 Fuel, Chemical and Dangerous Goods Management • Dust control measures shall be carried out to ensure dust levels are kept to a minimum – watering of the area and access roads for dust

Laydown yards and work site storage areas - Environmental Management	
	suppression will be required on an as required basis, using water from approved locations and ensuring it is meets the project water quality criteria • Noise and Vibration measures in accordance with section 14.1.7 Noise and Vibration Management

13.4 Borrow Pits

Borrow pits/quarries may be required during pipeline construction to source soft earth or sand for pipeline padding during trench backfilling and for laydown yards, hard stands and work sites. The aim during material extraction from borrow pits is to minimise disruption to surrounding landholders, community and fauna and flora communities.

Table 11: Borrow Pit Requirements

Borrow Pits - Environmental Management	
Impacts	• Inadequate erosion, sedimentation and drainage controls resulting in movement of spoil and sediment off site • Dust and noise emissions resulting from borrow pit material excavation and transport • Disturbance to fauna and flora habitats • Disturbance to heritage sites • Poor visual impact and amenity • Potential impacts to landholders and the community
Objectives	• To minimise impacts to relating to soil erosion, sedimentation and drainage to land and water • To minimise disturbance to flora and vegetation communities • To minimise disturbance to fauna habitat and native fauna • To minimise impacts to historical and cultural heritage sites • To minimise dust and noise impacts • To minimise impacts to visual amenity • To minimise impacts to landholders and the community
Management Measures	• Borrow pit material is sourced from existing licensed sites (commercial or council operated sites) otherwise if new sources are required appropriate permits/licenses will be required prior to site work commencing • If material is to be sourced from a new borrow pit the following controls are required: o Borrow pit operations to comply with the requirements of relevant licensing and approvals o Material and vegetation is stockpiled separately within an approved location at the borrow pit o Historical heritage and Vegetation management is in accordance with section 14.1.8 and 14.1.9 respectively o Appropriate erosion and sediment controls (silt fencing) at the borrow pit facility and around stockpiles where appropriate o Dust control measures shall be carried out to ensure dust levels are kept

	to a minimum – watering of the area and access roads for dust suppression will be required on an as required basis, using water from approved locations and ensuring it is meets the project water quality criteria. • Noise and Vibration measures in accordance with section 14.1.7 Noise and Vibration Management

14. General Project Environmental Management Aspects and Management Measures

Within all work activities described above there are specific environmental control measures applicable as discussed; however there are further general environmental measures applicable throughout all work activities and construction phases of the project for each different environmental aspect. Environmental aspects applicable during the construction phase include:

- Land & Soil Management;
- Erosion, Sediment and Drainage Management;
- Contaminated Land Management;
- Riverine/Watercourse Management;
- Wetland/Gilgai Management;
- Surface Water Management;
- Noise and Vibration Management;
- Air Quality Management;
- Historical Heritage Management;
- Vegetation Management;
- Fauna (Wildlife) Management;
- Livestock Management;
- Rehabilitation/Revegetation Management;
- Pest and Weed Management;
- Bushfire Management;
- Fuel, Chemical and Dangerous Goods Management;
- Waste Management; and
- Greenhouse, Energy and Emissions Management.

The environmental management measures applicable for each aspect are outlined below.

14.1 Environmental Management Measures

14.1.1 Land and Soil Management

Construction works undertaken will need to be managed to minimise any impacts to land and soil. MPC will construct the pipeline in a manner to minimise the impact of construction related activities to preserve the land type and soil properties of the immediate area through the environmental management measures outlined below.

Table 12: Land and Soil Management

Land and Soil - Environmental Management	
Impacts	• Loss of topsoil and subsoils • Impact on agricultural cropping land and soil productivity • Reduced potential for rehabilitation success
Objectives	• To minimise soil loss and degradation • To minimise impact to agricultural cropping land, soil productivity and increase rehabilitation and agricultural potential through appropriate land management practices
Management Measures	• The area of disturbance is minimised (wherever possible) within the active construction area to minimise land degradation The maximum period that mainline trench excavation will remain open for will be up to 15 days. The period for which the soil is left exposed to erosion will be minimised where possible. • All stockpiled spoil is placed within the construction area and does not encroach off site • Soils are stockpiled in a manner that preserves their biological and chemical properties • Topsoil to be preserved and stockpiled for the minimal practical time before it is reused during rehabilitation to minimise loss of biota and soil • Graded soils are stockpiled separately from other materials including timber/logs/trees etc and where they can be readily recovered for re-spreading/rehabilitation and where loss through wind, or water erosion is minimised • Soil horizons are segregated respectively during excavation, storage and backfilling (e.g. Segregation of topsoil layer and subsoil layer)

14.1.2 Erosion, Sediment and Drainage Management

Construction works undertaken will need to be managed to minimise any potential erosion, drainage and siltation impacts on the surrounding environment. MPC will construct the pipeline in a manner to minimise the impact of construction related soil erosion, drainage and erosion on surrounding natural, sensitive areas and catchments through the environmental management measures outlined below.

Table 13: Erosion, Sediment and Drainage Management

Erosion, Sediment and Drainage - Environmental Management	
Impacts	• Loss of topsoil and subsoils • Soil erosion and sediment release to land or water increasing turbidity and nutrients • Impact on agricultural cropping land • Reduced potential for rehabilitation success
Objectives	• To minimise soil loss and degradation • To prevent sediment and nutrient release off site and adverse impacts on water quality • To minimise impact to agricultural cropping land and increase rehabilitation and agricultural potential through appropriate land management practices
Management Measures	• The maximum period that mainline trench excavation will remain open for will be up to 15 days. The period for which the soil is left exposed to erosion will be minimised where possible. • Minimizing exposure of dispersive, sodic subsoil materials • Site vehicles, machinery and equipment will be restricted to the defined roadways and designated access tracks to prevent the unnecessary destabilization of surfaces • Minimal to no work undertaken during periods of rain to prevent soil degradation and movement of soil off site • Sediment control measures are installed and maintained including but not limited to silt fences, silt socks, cocoi logs, straw bales, bunds and sediment traps/pits to trap and retain sediment and prevent soil transportation and deposition off site • Bunding for vehicle/equipment shakedown and wash down areas • Rumble grids are to be installed where required at entry/exit points to minimise and prevent soil from being tracked onto public roads • Any debris or material that is tracked onto a public road is required to be cleaned using a sweeper or similar device • Erosion control measures are installed and maintained but not limited to management of stockpile size, erosion control blankets/mats, geofabric / geobinders, re-vegetation and seeding to essentially create a cover over the exposed surfaces and prevent and reduce soil erosion • Cleared topsoil and vegetation is to be located away from hazardous areas including waterways, drainage lines and areas of surface water flow • Determined and designated stockpiles are to have silt fencing placed around them to contain silt and prevent washouts. Consideration will be given to access for construction/maintenance during the installation of the

Erosion, Sediment and Drainage - Environmental Management	
	controls • Topsoil stockpiles are maintained at a height of equal to or less than 2m • Drainage control measures are installed and maintained but not limited to diversion drains/channels and swales lined with rock, grass, plastic or geo-fabric; batter drains, contour berms/windrows, rock check dams, sand bags and pipe culverts over access points/causeways to prevent and reduce soil erosion and manage the movement of "clean" and "dirty" water through the site • Contour berms are established throughout the corridor where appropriate and in accordance with SunWater specifications to prevent erosion and to divert overland flow off the ROW. Frequent routine erosion, sediment and drainage inspections particularly following rainfall to ensure controls remain effective and are repaired as required.

14.1.3 Contaminated Land Management

MPC will construct the pipeline in a manner to prevent new areas of contamination and manage existing areas of contaminated land through the environmental management measures outlined below.

Table 14: Contaminated Land Management

Contaminated Land - Environmental Management	
Impacts	• Impacts to land and water through contaminated soil leaching resulting in altered ecosystems • Impacts on native fauna and flora resulting in death • Inappropriate treatment and disposal • Reduced potential for rehabilitation success • Impacts on livestock, agricultural land and landowners
Objectives	• To minimise impacts to land and water through contaminated land exposure • To minimise impacts to native fauna and vegetation • To appropriately treat and/or dispose of contaminated soils appropriately • To minimise impacts to final rehabilitation success • To minimise impacts to livestock, agricultural land and landowners
Management Measures	<u>Prevention of New areas of contamination</u> • Storage, handling and transport of fuels, chemicals and dangerous goods in accordance with Section 14.1.16 – Fuels, Chemicals and Dangerous Goods Management • All areas designated for the storage and handling of fuels, chemicals and hazardous materials will be located as far away from sensitive receptors (including residences and sensitive ecosystems and water bodies) as practical, will have a compacted base and be surrounded by an adequately sized containment structure (bunded areas, spill tray). Where practical chemical storage areas are to be covered to prevent the

	mobilisation of contaminants and contamination of rainfall runoff. • All stationery equipment that contain unprotected fuel lines, hoses or connections (i.e. generators) will be adequately bunded to prevent spillages to land • All fuel and chemical storage areas will be designed, constructed and maintained in accordance with AS1940 - Storage and Handling of Flammable and Combustible Liquids. • All dangerous goods, chemicals and fuels are removed from the construction area following each shift and returned to an appropriate contained storage facility area • All equipment will be maintained in accordance with manufactures instructions and kept in good working order with all leaks repaired prior to arrival on site and when detected. All major equipment and vehicles will be inspected prior to commencement of site works each day to ensure that appropriate levels of maintenance are conducted and that there are no leaks that may result in contamination of the project area • Refueling operations will be performed away from watercourses or other environmentally sensitive areas where practicable. Spill cleanup kits will be available within the immediate work area and all staff involved with refueling should be trained appropriately • In the event of a spill or release of a hazardous contaminant, the projects HSSE Manager will be notified immediately and will be responsible for co-coordinating the containment, reporting, and remediation and all offsite disposal of contaminated material. Any areas of contamination resulting from spills or releases of contaminants will be fully remediated and rectified. Depending on the type, volume and concentration of contamination a remediation and validation strategy will be developed for each individual spill or release that will ensure that appropriate remediation strategies are implemented. Soil sampling will further be undertaken where deemed necessary in consultation with the Licensed Waste Transporter and/or DEHP • Any fill imported to site will be certified free of contaminants prior to placement on site. To ensure that this condition is met, all fill is to be either sourced from a licensed quarry facility (with appropriate certification) or sampled by a suitably qualified person to provide certification that the material is clean and suitable for unrestricted use. • Storage of all waste types generated within appropriately designed and contained storage facilities (i.e. bins with lids). Wastes will be segregated and removed off site for recycling or disposal at licensed facilities as required. No on site disposal of wastes is to occur. <u>Management of existing areas of contamination</u> • If any contaminated soil is confirmed throughout the construction area, obtaining a disposal permit from DEHP prior to the removal of contaminated soil from land that is recorded on the EMR or CLR and complying to all conditions of the permit <u>Management of new, previously unknown or registered areas of contamination</u>

	• Notification to the HSSE Manager and completion of incident reporting process • Restriction of access to the potential contaminated site and immediate stop work of any activities that may result in human health impacts or environmental harm within the identified area until authorisation to continue work is granted by the HSSE Manager • Notification to SunWater and liaison with DEHP if required • Obtaining a disposal permit from DEHP prior to the removal of contaminated soil from land
Related Documents	• Chemical Spills Procedure

14.1.4 Riverine/Watercourse Management

Construction works undertaken will need to be managed to minimise any potential impacts to nearby watercourses. MPC will construct the pipeline in a manner to minimise the impact of construction related activities to watercourses and catchments through the environmental management measures outlined below.

Table 15: Riverine and Watercourse Management

Riverine/Watercourse - Environmental Management	
Impacts	• Soil erosion and sediment release to water increasing turbidity and nutrients • Bank degradation • Impacts on water flow rates and regimes • Impacts on aquatic flora and fauna
Objectives	• To prevent sediment and nutrient release off site and adverse impacts on water quality • To maintain water quality, water flow rates and regimes • To minimise disturbance to the immediate watercourse and bank stability • To minimise impacts on aquatic flora and fauna
Management Measures	• Endeavour to utilize existing crossings, dry crossing areas, open areas and pre-disturbed areas in consultation with SunWater to avoid significant disturbance to the banks and bed of the watercourse • Clearing areas at and within watercourses will be delayed, where practicable, until construction of the crossing is imminent and all planning and construction methods are confirmed • Minimise vehicular movements at the creek crossing and utilize pre-existing access tracks and roads • Watercourse crossing to be completed promptly and the extent and duration of bare surface exposure minimised to minimise impacts • Minimize The ROW corridor width is minimised at watercourse crossings in accordance with SunWater specifications– disturbance to the bed and banks are not to be any greater than the minimum area necessary for the purpose of the significant disturbance • Any pipeline works occurring within a watercourse are to meet all

Riverine/Watercourse - Environmental Management	
	relevant project license/permit requirements and DEHP applicable guidelines regarding works within a watercourse • All pipeline construction activities regarding placement of temporary causeways, access tracks, culverts and barriers within a watercourse are to be in accordance with applicable DAFF self assessable code requirements • Barrier material must be suitable for placement within the watercourse profile (sand bags, pre cast concrete and steel barriers etc) and placement of excavated spoil must not be used as barrier material • Installation of adequate temporary sediment and drainage controls including but not limited to silt fencing, booms, rock checks berms/windrows and silt socks during all construction activities to minimise topsoil loss and turbidity • Installation of silt curtains/sediment traps during all works within a water course containing water • Regular water quality monitoring undertaken at the watercourse crossing during all construction works • Where practically possible, trees must be cut at or near ground level to retain the root mass in the ground to minimise bank disturbance and erosion • Construction works are to scheduled and timed to coincide with periods of minor rainfall and during dry or low flow periods wherever possible • Construction works are not to result in impoundment of water or significant interference with the flow of water • No construction activities to occur during flooding events at the immediate watercourse crossing • All felled woody vegetation or mulch is to be moved away and stockpiled outside of watercourses and areas of surface water flows • All excavated and stripped spoil material is to be segregated, moved away and stockpiled at a reasonable distance outside of the watercourse bed and banks • The section between two barriers must be kept free of water to minimise stress and mortality to any fish present • Pumps used during dewatering are to be adequately screened to prevent fish being sucked up • Any dewatering is to occur through silt controls and a fauna spotter may be required to relocate any aquatic fauna during this draining activity • All machinery are to be fueled, serviced and maintained outside the outer banks of the watercourse to ensure any resultant contaminants cannot be released into any waters • Frequent routine inspections are undertaken to monitor construction activities and if any sediment plumes are detected outside contained areas, excavation and filing is to cease and the sediment traps rectified before activities recommence • Temporary access crossings constructed are to be removed following construction completion • Following completion of all construction activities, commence reinstatement and rehabilitation immediately

Riverine/Watercourse - Environmental Management	
	• Excavated material must be re-spread evenly within the bed and banks of the watercourse • Progressive stabilisation and reinstatement of the disturbed bed and bank are to be returned to original or better condition and must occur as soon as possible following completion of work activities • Installation of permanent sediment controls and installation of contour berms as well as effective rehabilitation of disturbed areas with seeding/planting of native species endemic to the immediate area as per requirements advised by SunWater.
Related Documents	• All watercourse crossings identified during the initial walkthrough are recorded on the Environmental Site Walkthrough Checklist Form • All creek crossing/watercourse works and associated details are recorded within the Creek Crossings Register

Furthermore, to reduce the construction footprint of waterway pipeline crossings, the construction corridor will be reduced to 20m for the following watercourses:

Watercourse	Property Location	Approximate Chainage (km)	Concrete encasement locations (Chainage)	Tenure
WANDOAN CREEK (Within lot)	Lot 1 on RP123884	16411.8	16450.0	Freehold
WOLEEBEE CREEK (Boundary)	Adj. to Lot 49 on FT826 (North)	27848.3	27887.0 35020.0 35080.0	Leasehold
	Within Grosmont road reserve			State resource
	Adj. to Lot 50 on FT573 (south)			Freehold
JUANDAH CREEK (Boundary)	Adj. to Lot 2 on RP170076 (North)	35330.3	35306.0	Freehold
	Within Leichhardt Highway road reserve			State resource
	Adj. to Lot 112 on FT825 (south)			Freehold
ROCHE CREEK (Within Lot)	Lot 60 on FT904	44142.4	44192.0 44835.0	Freehold
BULLOCK CREEK (Within Lot)	Lot 28 on FT313	59977.1	59996.0	Freehold
BUNGABAN CREEK (Boundary)	Lot 19 on FT1028 (South)	66807.1	66804.0	Freehold
	Lot 2 on FT880 (North)			Freehold

Watercourse	Property Location	Approximate Chainage (km)	Concrete encasement locations (Chainage)	Tenure
COCKATOO CREEK (pipeline crossing) (Boundary)	Lot 1 on SP186438 (South)	88209.7	88211.0	Leasehold – Lease from the State GHPL 40/1605
	Lot 4 on SP191511 (North)			Leasehold – Lease from the State GHPL 40/1761
PRICE CREEK 1 (Boundary)	Lot 3 on FT733 (South)	109382.4	104600.0 109591.0 112784.0	Leasehold – Lease from the State GHPL 40/1791
	Nathan Road Reserve			State resource
	Lot 2 FT734 (North)			Freehold
PRICE CREEK 2 (Boundary)	Lot 2 on FT734 (E)	109479.0		Freehold
	Nathan Road			State resource
	Lot 3 on FT733 (W)			Leasehold – Lease from the State GHPL 40/1791
COCKATOO CREEK (Boundary) (Outlet Structure)	Lot 14 on FT1 (East)	118873.8	-	Freehold
	Lot 5 on SP236971 (West)			Leasehold – Lease from the State No. 714044088

14.1.5 Wetland/Gilgai Management

Construction works undertaken will need to be managed to minimise any potential impacts to nearby gilgais/wetlands. MPC will construct the pipeline in a manner to minimise the impact of construction related activities to gilgai's through the environmental management measures outlined below.

Table 16: Wetland Management

Wetland/Gilgai - Environmental Management	
Impacts	• Soil erosion and sediment release to water increasing turbidity and nutrients • Impacts on aquatic flora and fauna
Objectives	• To prevent sediment and nutrient release off site and adverse impacts on water quality • To maintain water quality regimes • To minimise disturbance to the wetland area • To minimise impacts on aquatic flora and fauna
Management Measures	• Minimise crossing gilgai's/wetlands where possible • The ROW corridor width is minimised at in accordance with SunWater specifications. Construction works within aquatic habitats will preferably occur during the dry season when the majority of the habitats will be dry and their value reduced • Clearing areas at and within gilgais/wetlands will be delayed, where practicable, until construction of the crossing is imminent and all planning and construction methods are confirmed • Installation of adequate temporary sediment and drainage controls within close proximity to disturbance of gilgais where assessed appropriate • A fauna spotter must be present during all stages of gilgai disturbance and management, particularly during disturbance to gilgais containing water where dewatering is required. This will allow for adequate capture and relocation of fauna to neighboring gilgais outside of the construction corridor • Appropriate water management strategies where water is present within the gilgai's. i.e. - During dewatering; clean water from the impacted melon hole may be discharged to an adjacent melon hole (following water quality monitoring of both melon holes to suggest water quality uniformity) in consultation with aquatic fauna spotter, otherwise dewatering of sediment laden water must be discharged to land through sediment controls and not directly into an alternate melon hole • Pumps used during dewatering are to be adequately screened with appropriate mesh sizing to prevent fish being sucked up • During removal of mud within a gilgai, the mud is to be placed within the ROW and a fauna spotter/catcher allowed to sift through and relocate any trapped and submerged fauna

14.1.6 Surface Water Management

Construction works undertaken will need to be managed to minimise any potential surface water impacts on the surrounding environment. MPC will construct the pipeline in a manner to minimise the impact of construction related water runoff on surrounding sensitive areas and catchments and the usage of water for construction activities is considered acceptable for use through the environmental management measures outlined below.

Table 17: Surface Water Management

Surface Water - Environmental Management	
Impacts	• Soil erosion and sediment release to land or water • Water pollution from inappropriate placement and management of materials, equipment and waste • Transfer of sediments, nutrients and pollutants to waterways by overland flow • Altered water flow regimes • Impact on aquatic flora and fauna as a result of altered water quality or quantity • Unsuitable water due to contamination or elevated levels above criteria
Objectives	• To prevent sediment and nutrient release off site and adverse impacts on water quality • To manage water appropriately that is used and produced • To manage surface water flows and to minimise potential adverse impacts associated with altered flow regimes • To regularly monitor water sources for acceptability and compliance • To minimise impacts to aquatic flora and fauna
Management Measures	• The implementation of water quality monitoring programs where appropriate and in accordance with project license/permit requirements • Dust suppression water, hydro-testing water and other construction water sources are to be sourced from approved sources in consultation with SunWater and landholders and tested in the field and by a NATA laboratory (where required) prior to using the source. Water quality is to meet project license/permit requirements • Re-use of construction water wherever possible and storage at approved locations • The use of chemical additives and supplements to improve water quality will be minimised wherever possible however if deemed necessary will be approved by the OHSE Department and dosing quantities used will be as per those recommended by the supply companies • Water discharges should only occur if the water quality is assessed by the OHSE Department as acceptable following water testing and discharge locations confirmed and approved (approved dams, ponds, dewatering locations etc) • Untested water or water which falls outside the stipulated parameters shall not be used or released into the environment and must be collected and if applicable disposed at an appropriate location or

Surface Water - Environmental Management	
	licensed waste facility • No release or dewatering of water, waste and/or contaminants directly or indirectly released to nearby drainage lines, flow lines, watercourses or gilgai's - no visible plume, slick, oil, grease, scum or litter present as a result of construction activities • Discharged water is required to be passed through suitable erosion and sediment controls
Related Documents	• All associated water quality monitoring requirements are recorded on the Surface Water Monitoring Form and respective Surface Water Monitoring Register and Drinking Water Quality Register

14.1.7 Noise and Vibration Management

The noise emissions associated with the proposed works will result in an increase in noise and vibration levels above that of the natural background levels. Murphy Pipe and Civil will construct the pipeline in a manner to minimise the impact of construction related noise and vibrations on surrounding residences and industry through the environmental management measures outlined below.

Table 18: Noise and Vibration Management

Noise and Vibration - Environmental Management	
Impacts	• Disturbance to sensitive receptors and the community • Disturbance to livestock and wildlife
Objectives	• To minimise operation noise and vibration impacts on adjacent residents and community • To minimise operation noise and vibration impacts on wildlife and stock
Management Measures	• Pipeline construction activities are generated between normal construction hours (6am – 6pm). Where works are proposed to be performed outside of these normal construction hours, approval will be required from the Project Manager • Schedule high noise intensive activities so that they are not conducted near sensitive receptors on a public holiday, Saturday afternoon (12pm) or Sunday • An adequate community notice of any scheduled, atypical noise events are developed, distributed and communicated with SunWater and local residents to notify potential noisy works and agree to scheduled work activities • Scheduling of works during periods that are less likely to result in noise nuisance where practical • Noise complaints are recorded and adequately monitored, investigated and addressed • The implementation of noise monitoring programs where appropriate and in accordance with project license/permit requirements • Stockpile sites, lay down area works and noisy generating equipment are located a sufficient distance from residences/sensitive receptors • Selection of appropriate vehicular access points to the pipeline corridor • Loading and unloading of goods and materials is to take place away from

Noise and Vibration - Environmental Management	
	sensitive areas • The quietest plant and equipment that can economically undertake the work should be selected, where possible • Equipment is fitted with noise control devices where possible (mufflers, silencers and screens etc) • Equipment and vehicles used during works are to be adequately maintained and serviced to ensure that noise and vibration levels associated with operation are minimal • Truck exhaust brakes be kept to a minimum on site • Adherence to signed speed limits and slowing down near sensitive receptors

14.1.8 Air Quality (Dust) Management

Construction works will need to be managed to minimise dust and air quality impacts as a result of pipeline construction. Murphy Pipe and Civil aims to complete the installation of the pipeline in a manner to maintain ambient air quality of the local area through the environmental management measures outlined below.

Table 19: Air Quality (Dust) Management

Air Quality - Environmental Management	
Impacts	• Generation of increased dust levels • Generation of emissions release from vehicle and machinery exhausts • Disturbance to sensitive receptors and the community
Objectives	• To minimise dust impacts to the atmosphere • To minimise emissions impacts to the atmosphere • To minimise dust impacts on adjacent residents and community
Management Measures	• Release of dust and particulate matter does not cause a nuisance at any sensitive place • Dust complaints are recorded and adequately monitored, investigated and addressed • Minimise vehicle movements in sensitive areas and during windy hot conditions • Compaction of areas prone to producing dusty conditions, where deemed necessary. • Dust suppression - Watering of ROW, construction sites and access roads are carried out on a regular basis • Reducing and maintaining speeds in accordance with signage displayed • Wetting down any soil load prior to transport • Having any loads covered with a tarpaulin or similar material for the duration of transport • Clearing of spillages from side rails, tail gates and draw bars of vehicles prior to and after delivery • Maintaining clean roadways wherever possible, particular at entry/exit points • Placement of exposed soil stockpiles as far as practicable from sensitive

	receptors where practical

14.1.9 Historical Heritage Management

Construction works undertaken will need to be managed to minimise potential impacts on historical heritage values. MPC aims to complete the installation of the pipeline in a manner to reduce impact on historical heritage areas and discoveries through the environmental management measures outlined below.

Table 20: Management of Historical Areas

Historical Heritage - Environmental Management	
Impacts	• Disturbance to or destruction of heritage sites, values or items
Objectives	• To minimise and avoid impacts on heritage sites near or within the construction easement • To implement an effective communication protocol and consultation program with heritage groups
Management Measures	• All cultural heritage management protocols are in accordance with the *Cultural Heritage Act 2003* • Local indigenous, heritage groups and/or archaeologists (where required) are present during the initial walkthrough of the proposed construction corridor to identify any heritage artifacts, finds and areas of significance • Notification via written notice to SunWater 21 days prior to proposed ground disturbance activity to allow cultural heritage monitor representation • No vegetation clearing, grading or trenching is to occur within the construction corridor without first obtaining the relevant Ground Disturbance Approval (GDA) and commencement notice • Authorised clearing areas are clearly marked and delineated prior to clearing • Heritage areas, artifact, fossils, antiques, and sites identified are to be retained and preserved on the construction corridor and are clearly marked with flagging, marker tape and/or fencing and signage prior to clearing to enable relocation to areas outside of the pipeline corridor by heritage monitors/archaeologists. Artifacts include but are not limited to flint stones, bottle dumps, human remains, scar trees, fire places and any other item representing historical or cultural significance • Any fenced off areas are strictly not entered or disturbed unless permission is granted by the OHSE Department • Realignment of the construction corridor and avoidance around heritage sites and artifacts where possible • Any additional workspaces or alignment changes require additional heritage and/or archaeology monitoring and clearance • Local indigenous and heritage group monitors are required on site in areas that have not already received prior clearance (prior to construction) due to access restrictions or the ground cover preventing the initial inspection from occurring

	• Local indigenous and heritage group monitors are given an opportunity to be present during clearing and grading in order to allow monitoring and inspection of all disturbance activities along the pipeline corridor • All previous and newly identified artifacts, finds and heritage sites are to not disturbed, handled, damaged or removed and the respective heritage monitors contacted to allow relocation prior to further construction works occurring within the immediate area of the discovery – re-scheduling of works at this area until such a time that CH clearance has been granted • All construction crew will be educated on historical heritage management and awareness detailing the standard operating procedures, protocols and related practices that apply to the site in relation to CH management including the retention or relevant records indicating completion of this training
Related Documents	• All heritage finds identified during the initial walkthrough are recorded on the Environmental Site Walkthrough Checklist Form • All inspections are associated finds are recorded on the Cultural Heritage Activities Form and Cultural Heritage Register

14.1.10 Vegetation Management

Construction activities undertaken will need to be managed to minimise potential impacts to vegetation and floristic communities. Murphy Pipe and Civil aims to complete the installation of the pipeline in a manner to reduce impact on native vegetation and floristic communities through the environmental management measures outlined below.

Table 21: Vegetation Management

Vegetation - Environmental Management	
Impacts	• Disturbance to vegetation and floristic communities • Potential impacts to visual amenity
Objectives	• To minimise the extent of vegetation clearing within the construction footprint • To minimise impacts on vegetation and floristic communities • To minimise the impacts on and provide protection to identified protected and significant flora species/communities • To enhance visual amenity
Management Measures	• Ground Disturbance Approval in place prior to any vegetation clearing works • Authorised clearing areas are clearly marked and delineated on construction/survey drawings • Authorised clearing areas are clearly marked and delineated with tape and/or pegs in the field prior to clearing • ROW does not exceed the approved ROW width specified by SunWater specifications • The ROW corridor width is minimised in sensitive areas and at watercourse crossings in accordance with SunWater specifications • Vegetation outside the footprint of the ROW is strictly not to be cleared without appropriate approvals or permits in place • Vegetation clearance is minimised as far as possible (trimming branches, retention of mature trees) in preference to the removal of entire trees

- Avoid disturbing and clearing of large/mature trees or species wherever practicable
- Protected vegetation (Restricted Type A plants, plants requiring clearing permits under NCA/EPBC) that have significant natural or amenity value are to be retained and preserved with flagging or marker tape.

The EPBC listed threatened plant species Homopholis belsonii (Belson's panic grass) has been identified at 7 locations both within and outside the current RoW alignment. All of the seven locations will be clearly marked to ensure that they are avoided during construction. The locations of this species is further detailed below:

***H Belsonii* - Location number**	**Chainage (km)**	**Location in relation to ROW (within or outside)**	**GPS coordinates**		**Property Description**
			Latitudes	**Longitudes**	
1	19.60	within	-26.144894	149.8 2963 9	**Bundi Road**, between Lot 44 FT495 and Lot 16 FT1012
2	19.61	outside	-26.144804	149.829972	
3	31.04	within	-26.078271	149.889458	**Q Road** between Lot 49 FT826 and Lot 111 FT487
4	31.41	outside	-26.078308	149.893298	
5	31.91	outside	-26.078107	149.893573	
6	31.99	outside	-26.078100	149.893631	
7	32.09	outside	-26.078080	149.893726	

Figure 2: Homopholis belsonii (Belson's panic grass)

Details of the single Nature Conservation Act listed threatened plant species is listed in the table below. Plants will translocated as per the specific management measures listed below.

	Status	GPS coordinates (eastings)	Northings	Property description
Desmodium Macrocarpum x 5 protected plants 	Near threatened	208716 208719.4 205716.74 208689.44 208682.85	7143637 7143632.87 7143626.94 7143582.78 7143575.15	Lot 2 FT880

Specific management measures for *Desmodium Macrocarpum*

- Identification of a suitable translocation site as close as possible to the known location of D. macrocarpum, to increase the success of translocation through matching of soil type, aspect, drainage and surrounding vegetation is compatible with the current location of the species;
- Preparation of the receiving site, involving excavation of four suitably sized trenches. These should be approximately 1.5m x1.5m length and width, and 0.5m depth. Length and width will be further defined by the machinery blade used to lift the plants, however as large a section as possible will be taken to minimise root disturbance and to translocate microhabitat features with the plants. Any weeds should be removed from a 2m radius around the receiving sites;
- Preparation of plants to be moved, by watering thoroughly and minor pruning of the plants to reduce water loss after translocation. Each plant will be tagged with an aluminium tag that uniquely identifies the plant;
- Careful excavation of each of the five plants by an experienced operator, ensuring that the blade picks up an intact section of soil and that D. macrocarpum plant roots are not damaged;
- Placement of the entire earth sod containing the D. macrocarpum plants and all attached vegetation, woody debris and soil into the prepared trenches;
- Backfilling of soil to meet edges of translocated sods;
- Fencing to exclude vehicles and stock erected immediately;
- Watering of plants weekly for the first month, then as required for the following three months;
- Monitoring of plants weekly for the first month after translocation and fortnightly for the following two months. Removal of weeds from within 2m of the plants as required;

Figure 3: Photo of *Desmodium macrocarpum* found on site.

Figure 4: Location of *Desmodium macrocarpum* within the ROW

- The OHSE department is contacted and assessment made if vegetation marked for retention is required to be cleared
- Type A restricted plants are retained otherwise require relocation off the construction corridor by a suitably qualified person (Arborist)
- Vegetation species requiring clearing permits under the NCA/EPBC shall not be disturbed until permits are in place and authority to clear these species is approved
- Realignment of the construction corridor around large mature trees, significant flora and protected flora wherever possible. Realignment to favor low impact areas that are already pre-disturbed and that represent least concern ecosystem/vegetative community types

	• All realignments outside of the originally approved corridor are delineated and an additional walkthrough completed by relevant environmental, botanist and heritage representatives including final approved by SunWater prior to works proceeding • Any additional temporary work spaces/storage spaces or access tracks required outside of the standard ROW are approved in accordance with SunWater and the Landowner prior to disturbance activities • All felled vegetation is retained, salvaged and placed within the construction area for reuse during rehabilitation. Felled vegetation should not encroach off site or impede vehicle, stock or wildlife movements • Minimal disturbance to roots and soil within drip zones of vegetation to be retained • All construction crew will be educated on vegetation/flora management standard operating procedures, protocols and related practices that apply to the site
Related Documents	• All significant vegetation identified during the initial walkthrough are recorded on the Environmental Site Walkthrough Checklist Form • All significant flora are recorded on the Significant Flora Register

14.1.11 Fauna (Wildlife) Management

Construction activities undertaken will need to be managed to minimise potential impacts to native fauna. MPC aims to complete the installation of the pipeline in a manner to reduce impact on native fauna and fauna habitat through the environmental management measures outlined below.

Table 22: Wildlife Management

Fauna (Wildlife) – Environmental Management	
Impacts	• Disturbance to fauna habitat • Potential injury or death of native fauna
Objectives	• To minimise impacts on fauna habitat • To minimise potential injury or death to fauna • To minimise impact to sensitive and protected fauna habitats
Management Measures	• All habitat areas and features (hollow bearing trees/logs, nests etc) and any other ecologically sensitive areas that must not be cleared or damaged will be identified and clearly marked with construction tape • All habitat features are marked in the field with spray paint and flagging tape and will only be cleared in the presence of a licensed fauna spotter/catcher (licensed under DEHP rehabilitation permit) present • A licensed fauna spotter/catcher will be employed on site at all times during the construction phase and will inspect all habitat areas prior to vegetation clearing and will capture and relocate any fauna, nests or hollows and flush any fauna (in consultation with the Environmental Coordinator and DEHP) within the immediate area to adjacent habitat • Any potential significant species known or likely to be present within the immediate area are managed in accordance with site specific significant species management plans for listed threatened species – Refer to Appendix D – Significant Species Management Plans for EPBC Listed Species extracted from *"Woleebee Creek to Glebe Weir Pipeline Terrestrial Fauna Assessment_SunWater April 2012"* prepared by

Fauna (Wildlife) – Environmental Management	
	Ecological Survey and Management Consultants • Obtaining relevant DEHP approvals under the NCA regarding Tampering with the Breeding Place of a Protected Animal Species • Protected fauna habitat ecosystems and essential habitat area and associated buffers are identified and excluded from work activities, otherwise the construction corridor realigned or necessary permits/approvals obtained in accordance with DEHP • Construction works within aquatic habitats will preferably occur during the dry season when the majority of the habitats will be dry and their value reduced • Construction activities will be restricted between dusk and dawn to minimise disturbance impacts to listed threatened species in adjacent habitats • Habitat trees are felled in manner that maximizes the chances of survival for any fauna remaining within the tree hollows and other habitat features • Hollow logs and other habitat features are to be gently pushed to the edge of the corridor and reutilized as habitat • All felled vegetation is stockpiled along the edge of the easement where feasible and utilized as habitat during rehabilitation • Placement of soil & vegetation stockpiles and pipe strings will not impede the movement of fauna across the pipeline construction area and will have gaps in place in appropriate locations to allow wildlife access • Daily surveillance of the placed pipe along the RoW and the removal of wildlife within the pipe by a licensed DEHP fauna handler where appropriate • Measures described below will be implemented to prevent fauna entrapment within pipeline trenches including: o Minimise the period of time the trench is open wherever practicable, particularly in fauna habitat areas to reduce impact potential on native fauna o Trench plugs will be constructed at appropriate intervals and where slopes are less than 45 degrees to provide exit ramps for fauna and movement across the corridor o Fauna escape ramps are installed at appropriate intervals along the length of the open trench to assist fauna to leave the trench o Branches, hessian sacks, ramped gangplanks or similar are installed to create ladders to enable fauna to exit the trench when trenches are open overnight o Shelter material (i.e. hessian sacks) installed for any fauna that does become trapped within the trench to minimise heat stress etc o Daily trench/excavation inspections are undertaken by a OHSE representative o Open trenches have barrier protection (fences etc) in place to exclude fauna • All fauna handling and relocations throughout the construction corridor

Fauna (Wildlife) – Environmental Management	
	are only performed by a qualified DEHP fauna spotter/catcher • Care will be taken by all personnel to prevent injury or death to any fauna on site • All injured fauna will be immediately removed and taken to an appropriately qualified Veterinary Surgeon or Wildfire Care Group. • Store equipment to minimise the potential for fauna to be trapped in equipment or confined spaces • Maintain work areas free from food scraps to prevent scavenging animals entering • Reduce speed and adhere to speed signage along the corridor • Hunting equipment, traps and fishing is prohibited • Gathering and collection of native fauna is prohibited • All construction crew will be educated on fauna management standard operating procedures, protocols and related practices that apply to the site
Related Documents	• All fauna habitat potential identified during the initial walkthrough are recorded on the Environmental Site Walkthrough Checklist Form • All fauna recorded during the trenching inspection are recorded on the Fauna Inspection (Trenching) Form • All fauna observed/caught/sighted/injured/killed are recorded on the Fauna Register

14.1.12 Livestock Management

Construction activities undertaken will need to be managed to minimise potential impacts to livestock and farming located throughout the corridor. Murphy Pipe and Civil aims to complete the installation of the pipeline in a manner to reduce impact on livestock through the environmental management measures outlined below.

Table 23: Livestock Management

Livestock - Environmental Management	
Impacts	• Disturbance to livestock • Potential injury, death or sickness of livestock
Objectives	• To minimise impacts on fauna habitat • To minimise potential injury or death to fauna
Management Measures	• Care is undertake at all times whilst working in close proximity to livestock • Giving way to livestock at all times and minimizing speed when passing livestock • Livestock are not fed, handled or disturbed in any form • No toxic edible material is to be used and instead is to be replaced with biodegradable/non toxic materials – biodegradable flagging tape • Ensuring pre-existing livestock access points and crossings are not altered in any form during construction works, unless authority has been given by the land owner • All gates and or fences are maintained in accordance with the land

	owner requirements • Property fences and gates are installed, maintained and reinstated to a condition equal or better than the pre-existing condition. • Works are not undertaken outside of the ROW or in pasture areas that have not yet been approved • All vehicles and or machinery adhere strictly to the agreed access points and boundary limits • The landowner and SunWater are immediately notified regarding any injured or dead livestock • Stocked paddocks have temporary or electric fencing installed adjacent to open excavations and trenches in accordance with SunWater and Landholder requirements in order to restrict and/or prevent any livestock movement within these areas • Un-stocked paddocks have high visibility bunting or temporary fencing installed adjacent to open excavations and trenches in accordance with SunWater and Landholder requirements in order to restrict and/or prevent any livestock movement within these areas

14.1.13 Rehabilitation/Revegetation Management

Construction activities undertaken will need to be managed to minimise impacts to final reinstatement and rehabilitation. Murphy Pipe and Civil aims to complete the installation of the pipeline and ensure effective rehabilitation and re-vegetation of the immediate area through the environmental management measures outlined within Section 13.1.8 (Reinstatement and Rehabilitation).

14.1.14 Pest and Weed Management

Construction activities undertaken will need to be managed to minimise pest and weed contamination. MPC aims to prevent the spread and introduction of weed and pest species through the environmental management measures outlined below.

Table 24: Pest and Weed Management

Pest and Weed - Environmental Management	
Impacts	• Competition from weed species and loss of agricultural land and native vegetation • Loss of biodiversity and impacts on native fauna • Displacement of other species either through predation or utilisation of scare resources • Reduction in agricultural productivity • Impacts to sensitive environments adjacent to weed infected areas • Loss of visual amenity • Impacts on local communities and landholders
Objectives	• To prevent the introduction and/or spread of weeds and pests • To promptly identify areas requiring weed control • To eliminate infestations of noxious weed species • To effectively control weed species and pests • To avoid impacts on primary industries • To adhere to all landholder weed and pest control requirements

Pest and Weed - Environmental Management	
Management Measures	• Initial preliminary surveys are conducted by the OHSE Department prior to any construction works and weed and pest species abundance and distribution are identified, recorded and eradication techniques identified in order to manage infestations and control outbreaks • Regular and ongoing inspections, monitoring and auditing of the construction corridor to identify and assess weed and pest prevalence until monitoring deems rehabilitation successful. • All declared plants, weeds and pests present within the immediate ROW are managed in accordance with the *Land Protection (Pest and Stock Route Management) Act* 2002, *Vegetation Management Act* 1999, SunWater, landowner and Local Council requirements as well as DAFF requirements • All sightings of declared plants and pests are reported to the OHSE Department and updated within the Declared Plant & Weed Register and Fauna Register • Declared plants and weed infestations present within the construction corridor are to be flagged and are to be removed and destroyed prior to construction through chemical or mechanical control - if mechanical removal is decided the weeds are to be separated from green waste and securely transported with a cover (to not spread seed) to a separate skip bin prior to destruction at a landfill • Declared plants may also be controlled using herbicide treatment. All chemical spraying is to be approved by the OHSE department and in consultation with landowner and SunWater. Those using herbicide on site will be licensed (Specialist subcontractor) for herbicide use under the *Agricultural Chemicals Distribution Act* (1966) and will be in possession of manufacturer's application instructions, safety advice and material safety data sheet. Only herbicides registered and approved by the Environmental Coordinator will be used within the construction corridor • Where new small weed infestations are detected during construction works, weeds will be removed and destroyed as soon as practicable (considering the recommended treatment methods and timing) either using herbicides or mechanical measures in manners that do not harm the local ecology and ensure that re-infestation does not occur • Where stripped topsoils are stockpiled to be used as planting media, they shall be monitored for weed growth and treated with herbicide as necessary, ensuring they are weed free prior to use • Transportation of soil along the construction corridor and between sites should be avoided where practicable to avoid translocation of weeds, particularly in known weed infestation areas and high risk areas otherwise measures put in place to minimise weed/seed spread • Secure and cover loads that are suspected to contain weed seeds and plant material • All chemicals associated with weed control will be appropriately stored and bunded in compliance with Section 14.1.15 – Fuel, Chemical and Dangerous Goods Management • Herbicide will not be used within close proximity to the banks of watercourses and drainage lines if deemed poisonous or incompatible with freshwater habitats

Pest and Weed - Environmental Management	
	• Vehicles, machinery, equipment and applicable materials are regularly washed/blowed down to remove all soil and organic material and certified clean prior to entry to the construction corridor and upon completion of work. Washdowns are to target both the external and internal components of the vehicles/machinery with all organic and soil material removed. Certification and documentation is to be completed by a trained and competent weed and seed inspector following wash downs. The following movement protocol is to be followed: o All vehicles, machinery and plant that are initially entering into any construction zone are washed down and cleaned and are free of soil and plant material with a new weed and seed declaration issued o All vehicles and machinery entering into a property from a different geographical region or distant location will require a washdown and a new and current Weed and Seed Declaration specific to the property they are entering o All vehicles and machinery entering into a property or between properties will need to comply with the specific landholder weed and seed requirements/requests o Vehicles that drive on designated bitumen roads, sealed roads, access tracks or well maintained roads are considered clean and do not require wash down o Any vehicles, machinery and equipment working within high risk areas and areas outside of the construction corridor are washed down and cleaned at the next wash down facility o Subsequent re-certification, verification and issue of new declaration certifications throughout the construction corridor where required and in accordance with the Pest and Weed Management Plan • Restricting access of vehicles and personnel to areas of known noxious weed/declared plant infestation – Vehicles and Personnel entering these areas may need to be re-washed • Ensure clothing and footwear are free of mud and seeds before entering vehicles • All weed and seed declarations are completed, remain current and made readily available by request to SunWater and/or DAFF • Wash downs are recorded within the Vehicle Wash Down Log and updated into the Weed Hygiene Register – Transport of Contaminated Things section • Sufficient wash down facilities are located throughout the construction corridor and are constructed and operational prior to works occurring • Setup of wash down facilities as close as possible to known areas of infestation to reduce the risk of spreading infected material • All washdowns are to occur at an approved location/facility and be bunded to capture and contain all waste water, sediment and potential seeds/plant material • Random inspections are conducted by trained employees who have undertaken the Weed and Seed training, in conjunction with the OHSE Department to ensure wash downs are completed correctly and equipment/machinery are decontaminated and washed down with

Pest and Weed - Environmental Management	
	documentation being adequately and correctly completed • Although highly unlikely, any imported topsoil is certified weed free by the supplier and accompanied with relevant documentation • Any imported rehabilitation material including hydromulch material is certified weed free by the supplier and accompanied with relevant documentation • Any material being supplied or delivered between sites or to facilities OR sold by Suppliers is updated in the Weed Hygiene Register – Sale and Supply of Things section • Where possible eliminate an increase in feral pest movements and feeding grounds by ensuring sites are tidy and no rubbish or food scraps are present, bins have lids • Undertake regular pest spraying by a licensed pest contractor at laydown yard and work site office crib huts. Spraying will occur as required as indicated by monthly inspections and continue until these control measures are deemed successful, but not less frequently then every 3 months. • Pest spraying will be undertaken by experienced personnel with Commercial Operator Licenses obtained under the Queensland *Agricultural Chemicals Distribution Control Act* (1966). • Any chemical controls used eliminate mosquito larval habitats will be labeled for the intended use and selected based on their ability to be non-toxic to other species, and have no adverse impact on the surrounding environment. • Vehicles, machinery, equipment and materials sourced from a or have come in contact with a fire ant declared area are washed down and provide clean down certification prior to mobilization to site in accordance with the suppliers DEEDI Approved Fire Ant Management Plan • Where possible eliminate mosquito larval habitats (e.g. ponded water in tyres, containers) or manage to render the habitats unsuitable for larval development (e.g. through use of biological or chemical controls) • All construction crew will be educated on weed/wash down management and awareness including the retention or relevant records indicating completion of this training
Related Documents	• All declared plants and weeds identified during the initial walkthrough are recorded on the Environmental Site Walkthrough Checklist Form • All declared plants and weeds and recorded on the Declared Plant and Weed Register • All Pest animals and recorded on the Fauna Register • All vehicle wash downs and supply/movement of materials are recorded on the Weed Hygiene Register • Vehicle and machinery wash downs are recorded on the relevant Vehicle and Machinery Wash Down Log Form

14.1.15 Bushfire Management

Construction activities undertaken will need to be managed to minimise potential fire ignition. Murphy Pipe and MPC with dry hot conditions as a result of construction related activities through the environmental management measures outlined below.

Table 25: Bushfire Management

Bushfire - Environmental Management	
Impacts	• Damage to or loss of vegetation and floristic communities • Damage to or loss of fauna and associated habitat • Damage to agricultural production • Potential danger to surrounding sensitive receptors and landowner infrastructure
Objectives	• To minimise the risk of fire ignition • To prevent the spread of fire in the event of ignition • To provide adequate response in the event of ignition • To protect vegetation and floristic communities • To protect fauna and associated habitat • To endeavour to protect surrounding receptors and landowner infrastructure
Management Measures	• Consultation with local regulatory authorities/fire department as required and adherence to relevant local and State Fire Protection Regulations • Open fires are banned • Implementation of mitigation measures during high – extreme risk fire danger periods in consultation and in accordance with the relevant Local and State Fire Protection Department • Unnecessary build up of flammable material in working areas is prevented • Any mulch or vegetative stockpiling should be kept to a manageable size and kept away from fence and vegetation boundaries. Stockpile size to be kept small, monitored and continuously turned over (mulch stockpiles) to prevent steaming and subsequent fire ignition • Flammable materials (mulch, vegetation) are moved away from the immediate vicinity of field equipment or other potential fire ignition sources that may pose a potential fire hazard • Flammable and combustible liquids are to be stored in accordance with section 9.1.15 – Fuel, Chemical and Dangerous Goods Management • Machinery and vehicles are not parked in areas of flammable material and vegetation (not parked over shrubs, tall grass etc) • Regular maintenance and inspection of machinery and vehicles to minimise fire risk • Areas around buildings and vehicles are to be regularly checked to ensure that combustible materials such as grass and debris do not build up in critical areas where ignition could occur • Smoking is prohibited in all offices, lunchrooms, vehicles (including hired vehicles) and enclosed toilet facilities. Cigarette butts are not to be thrown at all into any area and are to be collected and disposed

Bushfire - Environmental Management	
	appropriately (i.e. cigarette bins) • Water trucks (also used for dust suppression) are available for use as fire trucks in high risk fire ignition areas • All vehicles and machinery are equipped with a portable fire extinguisher • Storage of appropriate firefighting equipment at all work and camp sites that is adequately inspected and maintained • Fire extinguishers, water cart, fire resistant tarpaulins or mats are available in high risk areas and for the welding crew and that additional precautions and controls are implemented by the welding/grinding crew when required • Emergency response plan and posters include details of local contacts for firefighting assistance • All construction crew will be educated on bushfire management and awareness detailing fire prevention and safety, responsibilities and be trained in the use of firefighting equipment including the retention or relevant records indicating completion of this training

14.1.16 Fuel, Chemical and Dangerous Goods Management

Construction activities undertaken will need to be managed to minimise inadequate storage and handling of fuels and chemicals including spillages to land or water. MPC aims to prevent fuel and chemical spillages and contamination to the environment through the environmental management measures outlined below.

Table 26: Chemical Management

Fuel, Chemical and Dangerous Goods - Environmental Management	
Impacts	• Inappropriate storage and handling resulting in fire ignition and combustion • Contamination of soil and water as a result of inadequate storage
Objectives	• To minimise and prevent spillages of chemicals and fuels • To prevent contamination of soil and water • To store and handle chemicals, fuels and dangerous goods in accordance with applicable guidelines
Management Measures	• Development Approval for ERA No.8 – Chemical Storage is obtained where bulk storage of fuels and chemicals exceed the threshold quantities requiring approval and licensing. All conditions stipulated within the respective DA are to be adhered to at all times • All fuel, oil and chemicals are stored, separated, handled and signed as required by the Flammable and Combustible Liquids regulations and AS1940 – The storage and handling of flammable and combustible liquids • All dangerous goods will be stored, managed and handled in accordance with the Dangerous Goods Safety Management Act 2001 the Dangerous Goods Safety Management Regulations 2001 • Transportation of dangerous goods is in accordance with the regulations and with AS1678, AS2809 and AS2931 • Minimum practicable volume of chemicals should be stored on site and

Fuel, Chemical and Dangerous Goods - Environmental Management	
	chemical use minimised where practicable • SDS's are kept onsite and are available at all times for all hazardous and dangerous materials • All chemicals, dangerous goods and associated designated storage locations will be located away from traffic areas and be approved by the OHSE department prior to use • All dangerous goods, fuels and chemical storage areas are to be located as far away as practicable from: o sensitive receptors (including residences, sensitive ecosystems and water bodies) o drainage lines and stormwater flow paths o potential sources of ignition and work activities capable of generating heat or sparks (e.g. grinding, abrasive blasting) • Stormwater and associated runoff is to be prevented from entering into designated chemical storage areas • Chemical storage areas will have a compacted base, be surrounded by an adequately sized containment structure (bunded areas, spill tray) and be covered by a roof structure or within an enclosed covered area to contain spillages and minimise the potential for infiltration and contamination of rain water. Storage outside of these areas is prohibited • All bunds or containment systems are to be constructed from compounds that are impervious to the materials stored within • All containment systems must be designed to minimise rainfall collection within the system • Bunds are to be designed as follows where no relevant Australian Standard is available for chemical/fuel storage: o Storage tanks must be bunded so that the capacity and construction of the bund is sufficient to contain at least 100% of a single storage tank or 100% of the largest storage tank plus 10% of the second largest storage tank in multiple storage areas o Drum storage must be bunded so that the capacity and construction of the bund is sufficient to contain at least 25% of the maximum design storage volume within the bund • All chemical and fuel containers containing decanting taps are placed over suitably sized spill trays to contain any drips from the taps during decanting activities • All drums and containers are to be stored in an upright position and have tight fitting lids to prevent spillages and entry of contaminates • At the completion of each shift, all residual stocks of chemicals and hazardous materials will be removed from the construction corridor and returned to the designated approved storage area • Prescribed placarding, Hazchem cards and fire extinguishers will be provided in areas where storage of chemicals is occurring and emergency response procedures in place at all times • Bulk storage tanks (i.e. diesel) setup for refueling at a fixed location are to be approved by the OHSE Department, setup away from sensitive receptors and further meet all requirements of the Dangerous Goods Safety Management Act 2001 and AS1940 – The storage and handling of

Fuel, Chemical and Dangerous Goods - Environmental Management	
	flammable and combustible liquids • Adequate measures will be incorporated to capture potential spills from fuels/oils when refueling/servicing vehicles and machinery at fixed and mobile locations (e.g. containment structures - drip trays, bunding at refueling points etc) • All fuel gun nozzles or devices used during refueling are to be adequately designed to ensure spillages are minimised and prevented (i.e. Adjustment of fuel gun pressure, holster designed for fuel gun) • All storage and handling of fuels and chemicals including refueling and servicing does not occur within drainage lines/flow paths or near watercourses and other environmentally sensitive areas with a minimum distance of 50 being adopted from these features • Personnel involved in refueling of machinery and vehicles are adequately trained in refueling procedures • All waste chemicals (oils, paints, thinners, solvents) will be collected in covered drums/containers and stored in an approved bunded area pending collection for recycling otherwise disposed by a licensed waste contractor to a licensed waste facility in accordance with Government Authorities and local Council requirements • All spills of dangerous goods, fuels and chemicals are contained and absorbed immediately using spill kit materials (ecosweep, absorbent pads, booms, sandbags) or localised earthen soil for small and large spills respectively • All spills of dangerous goods, fuels and chemicals are rendered harmless following containment and collected for treatment and disposal by a licensed waste transporter to a designated facility; including cleaning materials, absorbents and contaminated soils. Any areas of contamination resulting from spills or releases of contaminants will be fully remediated and rectified. Flow paths into drains/watercourses are cut off when responding to a spill by utilising bunds, sand bags, booms etc • Adequate supply of spill kits containing absorbent material, containment material and PPE are available onsite when storing any hazardous chemicals and fuels. • Spill kits are to be restocked immediately following use • Spill kits will include clean-up materials that are compatible with the different classes of dangerous goods stored and suitable for spills on land and water • All construction crew will be educated on spill response and awareness detailing spill prevention and safety, responsibilities and be trained in the use of spill kit equipment including the retention or relevant records indicating completion of this training

14.1.17 Waste Management

Construction activities undertaken will need to be managed to minimise construction waste produced and manage waste streams effectively, including disposal options and prevent impact to the surrounding environment. Murphy Pipe and Civil aims to minimise waste generation and maximise reuse and recycling of construction waste products through the environmental management measures outlined below.

Table 27: Waste Management

Waste - Environmental Management	
Impacts	• Contamination of soil and water • Excessive waste production and inappropriate disposal • Adverse effects on native vegetation and fauna • Reduction of visual amenity • Inefficient use of resources
Objectives	• To avoid the contamination of soil and water • To minimise waste production and dispose of waste appropriately • To minimise effects on flora, fauna and the surrounding environment • To minimise visual impacts • To maximize the efficiency of resource use
Management Measures	• Waste management follows the below hierarchy: o Waste avoidance (elimination and substitution) o Waste reduction o Waste reuse o Waste recycling o Waste treatment o Waste disposal • Waste is reduced at the source wherever possible • Reuse of excess materials wherever possible • All waste material is not to be left or buried on the pipeline construction easement • The immediate construction site will be kept free of litter and waste and adequate sized refuse containers or skip bins are available on each worksite (lids contained if appropriate to minimise access to the bins by animals) • All construction and laydown areas are to be maintained in an orderly and hygienic standard • Bins or skips will be used as temporary storage for waste generated and collection of these wastes will be periodic and are dependent on levels of waste generation • Waste storage areas are to be approved by the OHSE department, sign posted and potentially bunded and located away from sensitive receptors/areas, drainage lines and watercourses • Segregating of waste types dependent on disposal, treatment and recycling options – segregating of waste types (general construction, green, recycling and regulated) and salvaging reusable and recyclable waste (timber, pallets, drums, steel, scrap materials) and placement into respective collection bins wherever possible • Correct collection and transportation of general refuse waste and standard liquid wastes to local council approved disposal sites/landfills by a licensed operator • All waste water, muds and fluids (potholing water/drilling fluids etc) resulting from construction activities are contained and adequately bunded prior to disposal, remediation or reuse at an approved location

	or waste facility where required • Cement or concrete water in solution, slurry or liquid form is contained in a pit or receptacle whereby it cannot be released to waters • Collection and removal of regulated waste (oil, chemicals, sewerage, brine solution, septic waste, oily water, asbestos, filter cake, ASS, Contaminated soil etc) is transported for recycling, reuse, treatment or disposal at approved licensed facilities by a licensed regulated waste contractor in accordance with the Environment Protection Regulation 2008 • Regulated waste storage areas are to be suitable designed to adequately contain any spills or leaks • Contaminated soil is to be placed into a skip bin lined with plastic sheeting and disposal by a licensed regulated waste contractor. (A contaminated soil disposal permit, issued by DEHP will be required prior to any disposal of contaminated soil sourced from existing areas or new areas of contamination as identified on CLM and EMR) • Declared plants and weeds are to be placed into a plastic lined skip bin and buried as landfill at a licensed waste facility • All general and regulated waste records including general tip dockets and waste tracking certificates are retained from waste disposal activities by the OHSE Department for waste tracking purposes • Burning of waste is prohibited at all times • Purchasing suppliers in bulk containers to minimise packaging generated • All employees are instructed in project waste management practices.
Related Documents	• All regulated and trackable waste streams are recorded on the Regulated/Trackable Waste Register

14.1.18 Greenhouse Gas, Energy and Emissions Management

Construction activities undertaken will need to be managed to minimise GHG emissions to the surrounding environment. Murphy Pipe and Civil aims to minimise GHG emissions, energy consumption and production and maximise overall sustainability practices through the environmental management measures outlined below.

Table 28: Greenhouse Gas, Energy and Emissions Management

Greenhouse Gas, Energy and Emissions - Environmental Management	
Impacts	• Increased GHG emissions, energy consumption and production levels • Reduced business sustainability
Objectives	• Regularly tracking and reporting of GHG emissions, energy consumption and production in accordance with *NGER Act 2007* • Reduce GHG emissions, energy consumption and production levels • Increase energy efficiency
Management Measures	• Reviewing vehicle, machinery and equipment emission specifications during procurement and preferably selecting those that are more economical and have reduced GHG emission specifications • Machinery is fitted with appropriate exhaust systems and devices. Maintenance department to ensure that the devices are maintained and in good working order

	• Machinery, vehicles and plant are not left to idle for continuous periods of time when unattended/not in use or deemed unnecessary • No smoke is generated through enforcement of no burning policy • Ensuring lights, air conditioner systems and electrical appliances are turned off wherever possible upon completion of each shift • Reducing lighting operating hours • Optimize AC temperature set points • Ensure all doors are closed and sealed whilst AC system is in operation • Installation of roof ventilators or whirly birds • Replacing light globes with an alternative type • Reducing waste disposal streams and increasing waste recycling/segregation and reuse practices • Re-using and recycling water for alternate applications • All construction crew will be trained and educated on sustainability practices and methods to reduce GHG emissions and energy consumption
Related Documents	• All GEEM reporting is in accordance with the Greenhouse, Energy and Emissions Management Reporting Procedure • All GEEM data is recorded on the Project GEEM Reporting Spreadsheet

15. Risk Assessment

The risk assessment Process (Refer to MPC Risk Management Procedure) - recognition of environmental aspects and the assessment of environmental impacts will be an ongoing process used by MPC to identify and control hazards associated with each phase and activity on the project. Risk assessment is an evaluation of the potential for a hazard to cause unwanted negative consequences. It is based on the likelihood of the hazard occurring and severity of the consequences. The Risk Assessment Process shall be used for all risk assessments conducted by MPC in accordance with all SunWater, legislative and statutory requirements applicable to the project.

The risk management process is a method that can be dealt with in six key steps:

- Identification of scope of work activity and construction methodology
- Identification of the environmental aspects of the activity or process
- Identification of the environmental impacts
- Evaluation of the significance of identified impacts – Risk Rating (Consequence and Likelihood)
- Identification and implementation of adequate management measures/controls to minimise impact
- Continual review and monitoring of controls to ensure effectiveness in minimising impact.

MPC will firstly assess each project specific construction activity and the applicable environmental aspect/risk and impacts apparent and then determine the overall risk rating by assessing the consequence and likelihood of environmental harm (Risk Matrix framework described below) based

on the existing controls that are in place. Following assessment of all site specific construction activities, overall generic environmental aspects will be assessed and the overall risk rating and impacts determined by assessing the consequence and likelihood of environmental harm based on the existing controls that are in place. The consequence and likelihood of the environmental aspect/hazard should be undertaken based on worse case scenarios due to failure of existing controls. The risk rating will allocate a numerical value of between 1 and 25 to each impact under normal/abnormal and emergency situations (based upon likelihood and consequence ratings). Additional or improved control measures will then be put in place following review of the existing controls and a further risk assessment analysis undertaken with a new risk rating assigned.

This comprehensive risk assessment approach detailing associated work activities and environmental aspects will be recorded within the following documentation:

- Project HAZID Register
- HAZID Assessment
- Environmental Impacts and Aspects Register
- Safe Work Method Statements (SWMS)
- Job Analysis Review (JHA)

These documents listed above will be utilised to ensure the most suitable and advanced controls are highlighted and implemented (Aligned with the management strategies and control measures highlighted within this CEMP) to ensure minimum environmental impact as a result of construction activities. These documents will be reviewed by all levels of management and feedback or input inserted when required.

Regardless of the risk assessment process documentation used, personnel shall determine control measures (single or in combination) that will be implemented to eliminate or reduce risks by applying the hierarchy of control. The hierarchy of control refers to the systematic strategy used to control exposure. The controls are ranked in order of the effectiveness:

- Elimination
- Substitution
- Isolation
- Engineering control
- Administrative process
- Personal Protective Equipment (PPE)

An evaluation of the effectiveness of the risk management process shall be conducted and recorded every month, or after an incident, by members of the project team and led by the Project HSSE Manager (or HSSE Coordinator in the absence of a Project HSSE Manager). The Project HSSE Monthly Report, HAZID, SWMS, JHA, Incident Investigation Reports and any other relevant information shall be used to drive the evaluation. Where improvements in the process have been determined these shall be communicated to the Group HSSE Manager for consideration.

15.1 Risk Assessment Tools

15.1.1 Project HAZID Register

A formal Project Hazard register will be completed prior to commencement of the project and issued to SUNWATER for review and approval prior to commencing work. This Hazard register will systematically identify all environmental risks to ensure the project specific risks identified through SUNWATER, approval/license and local community requirements are identified, assessed, controlled and documented specifically address known key risk areas.

15.1.2 HAZID Assessment

Prior to commencement of each project phase, when the project scope of work changes or new hazards are introduced MPC will ensure that a formal HAZID workshop is conducted. The HAZID workshop shall be performed in advance of the planned activities in order to allow sufficient time for evaluation of the hazards so that adequate controls can be documented and implemented with minimum cost and impact to the schedule. For this process to be effective it shall only be conducted by personnel competent in the use of MPC's Hazard Identification Risk Assessment and Control process (HIRAC). Competent persons are those that have completed the "HIRAC" training element in accordance with the MPC Training Standards Matrix and Training Procedure. As a minimum the HAZID team shall consist of a team leader (HSSE Manager/ OHSE Coordinator), engineers, and personnel relevant to task (Supervisor), Project and Construction Manager. SUNWATER representatives shall also be invited to participate. The team leader will be responsible for organising and leading the process, ensuring that the following is completed:

- Duration and location of the HAZID workshop is identified;
- Scope of work is clear and sub-divided into individual activities/steps; and
- All reference documents are available for review before and during HAZID.

The HAZID shall be documented on the HAZID Assessment form and include all actions that require closure. All actions shall be directed to the appropriate person and it will be the HSSE Managers responsibility to ensure all actions are closed out prior to activity commencing. All additional hazards and controls that are documented during the HAZID must be transferred to the Project Hazard register.

15.1.3 Environmental Impacts and Aspects Register

The Environmental Impacts and Aspects Register will be an overarching Group level document outlining all associated activities, environmental aspects, impacts, risk assessment and control measures applicable to all MPC construction activities.

15.1.4 Safe Work Method Statements

The HSSE Manager, OHS Coordinator, project personnel and project management will develop the Safe Work Method Statements, utilizing the information from the Project Hazard register and any individual HAZID assessments and outcomes of the consultation process to educate all personnel on the Risk assessment approach and the environmental methods/techniques that need to be implemented to reduce environmental impact/harm.

15.1.5 Job Hazard Analysis and Step Back Take 5

The process of using Job Hazard Analysis will be an ongoing process used by MPC. Teams of people involved in the job or task will conduct Job Hazard Analysis (JHA's). The hazards identified during the JHA process shall be assessed using the risk management matrix. It is expected that all routine jobs/tasks will be analysed in this way. A JHA will be developed weekly by all workers in the crew, reviewed and amended daily. The JHA that is developed shall be available for review by all personnel including visitors to site. All personnel and visitors will be required to review the JHA and sign at the start of each shift or on arrival to site (whichever comes first.)

The JHA is an administrative measure, which is reliant on the work group having good knowledge and understanding of the activity and the risk assessment process. Where required work groups may need to draw on expert advice to assist in the assessment of risks and identification of appropriate risk control strategies. The intent of the process is to encourage workers to take the time to think about their task, identify potential hazards and the controls that are necessary to reduce the

environmental risk. Any non-routine tasks or activities are not excluded from this process but can also be assessed using the Step Back Take 5 process.

Documentation includes:

Reference Title
Project Hazard register
HAZID Assessment
Environmental Impacts and Aspects Register
Safe Work Method Statements
JHA
Step Back Take 5
Risk Management Procedure
Management Review procedure

The Risk Matrix framework is highlighted below.

Risk Matrix

							Likelihood				
							1	2	3	4	5
							Rare - The event may occur only in exceptional circumstances. No reported occurrence in industry. Rare exposure to hazard. Very low probability of damage. requires multiple system failures.	**Unlikely** - The event is not likely to occur. No known occurrence in industry. Infrequent exposure to hazard. Low probability of damage.	**Possible** - The event might occur at some time. History of single occurrence. Regular or occasional exposure to hazard. Moderate probability of damage.	**Likely** - The event will probably occur in most circumstances. Known history of occurrence. Frequent exposure to hazard. High probability of damage.	**Almost certain** - The event is expected in most circumstances. Common occurrence at site. Constant exposure to hazard. Very high probability of damage
			Injury / illness	**Environmental Impact**	**Reputation**	**Economic/ Damage**					
Consequence	**5**	**Catastrophic**	Fatality	Serious off-site impact, significant redemption required	International media coverage	> $1 mill	**Moderate 5**	**Moderate 10**	**High 15**	**Extreme 20**	**Extreme 25**
	4	**Major**	Serious with permanent disablement	Significant off-site impact, some redemption required	National media coverage	$250k – $1 mill	**Low 4**	**Moderate 8**	**High 12**	**Extreme 16**	**Extreme 20**
	3	**Moderate**	Serious injury / illness	Release significantly above reportable limit or some local impact	Regional media coverage	$50k – $250k	**Low 3**	**Moderate 6**	**Moderate 9**	**High 12**	**High 15**
	2	**Minor**	Medical treatment	Release above reportable limit or minor impact	Local media coverage	$10k –$50k	**Low 2**	**Low 4**	**Moderate 6**	**Moderate 8**	**Moderate 10**
	1	**Insignificant**	First Aid	Small release contained onsite and no impact	No media coverage	< $10k	**Low 1**	**Low 2**	**Low 3**	**Low 4**	**Medium 5**

16. Communication

MPC are committed to ensuring the environmental aspects and EMS are:

- Effectively communicated among the various levels and functions of the organisation
- Receiving, documenting and responding to relevant communication from external interested parties.

Effective communication between MPC management, internal employees and external parties (SunWater, Regulatory Authorities, Subcontractors, and Suppliers) is critical to the effective implementation and maintenance of the environmental management system.

The format of general communication (internal and external) to provide documents or direction advice or similar will be in accordance with the Archiving of Company Documents. This Records Management Plan is designed to ensure the maintenance of proper records. Written communication and submissions to external parties shall be distributed and filed in accordance with the Records Management Plan.

16.1 Internal Communications

Internal communication is an integral component of the environmental management system. Regular communication between MPC employees and reporting of the effectiveness of environmental management measures assists MPC to achieve ongoing improvement in environmental performance.

Communication between MPC staff and management in relation to environmental performance is through:

- Inductions
- Training in the environmental management system, procedures and policies
- Regular team meetings (held weekly), with accompanying minutes
- Regular management meetings (held weekly), with accompanying minutes
- Committees
- Lessons Learnt Meeting
- Project Kick Off Meeting
- Toolbox/ Meetings
- Prestart Meetings
- Supervisor Meetings
- HAZID Workshop
- Alerts
- Notice boards
- Formal memos and notices detailing relevant changes to procedures, methods and documentation
- Email notification.

Table 29: Project Internal Communications

Communication Channel	Typical Attendees	Minimum Frequency	Purpose
OHSE Alert	All workers on project including subcontractors	As Required	To inform all workers about environmental issues as identified through hazard observations, near misses and incidents. To inform all workers of positive environmental outcomes.

Communication Channel	Typical Attendees	Minimum Frequency	Purpose
HSE Notice	All workers on project including subcontractors	As Required	To inform all workers about environmental issues as identified through hazard observations, near misses and incidents. To inform all workers of positive environmental outcomes.
OHSE Committee	- Project Manager - Construction Manager - HSSE Manager (or delegate) - Health and Safety Committee Chairperson Elected Health and Safety representatives	Monthly	Review environmental arrangements for the site. Promote environmental awareness on site. Recommend environmental initiatives.
Project OHSE Meeting	- Project Manager - Construction Manager - HSSE Manager (or delegate) - Health and Safety Committee Chairperson	Weekly	Provide forum to discuss environmental issues
OHSE Department Meeting	HSSE Manager OHS Coordinator OHS Advisor OHS Administrator	Weekly	Provide forum for discussion of environmental issues Discuss progress, performance and outstanding tasks
Supervisor Meeting	Project Manager Construction Manager Supervisors HSSE Manager/ Coordinator	Weekly	Provide forum for discussion of environmental issues Promote environmental awareness Discuss changes in environmental legislation, documentation and SUNWATER requirements
HAZID Workshop	Project Manager Construction Manager HSSE Manager/ Coordinator Engineer Supervisor Subject matter expert (if required) SUNWATER Representatives	Post Contract award, before starting new task or if scope of work changes and before contractor/subcontractor starts onsite	Complete risk assessment, develop and implement controls.
Project Kick off Meeting	Project Manager Construction Manager HSSE Manager/ Coordinator Engineers Supervisors Contractors/	Prior to MPC mobilizing or prior to contractor/subcontractor mobilizing to MPC site	Validate MPC are aligned with SUNWATER requirements Validate that contractor or Subcontractor's are aligned with Murphy Pipe and Civil

Communication Channel	Typical Attendees	Minimum Frequency	Purpose
	Subcontractors SUNWATER Representatives		
Project Safety Refocus	- Project Manager - Construction Manager - HSSE Manager (or delegate) - Supervisor - All project personnel	Quarterly	Refocus on environment and contribute to improving environment in the field.
Lessons Learnt	Project Manager Construction Manager HSSE Manager/ Coordinator Senior Engineer Superintendant Subject matter expert (if required)	At the end of project	Identify positive and negative issues that have affected environmental Performance on the project.
Tool Box Meetings	- Project Manager - Construction Manager - HSSE Manager (or delegate) - Supervisor - all project workers	Weekly	Provide forum for discussion of environmental issues Promote environmental awareness Discuss specific environment topics
Pre Start Meetings	- Supervisor - Work team members (all project workers)	Daily	Provide forum for discussion of environmental issues Discuss specific environmental topics

16.1.1 OHSE Alert

An OHSE Alert will be used to notify project personnel of:

- Negative environmental outcomes; and
- Incidents including near misses that have occurred on the project or similar projects and the corrective actions that are required to ensure similar incidents don't reoccur.

16.1.2 HSE Notices

A HSE notice will be used to notify project personnel of:

- Positive or negative environmental outcomes;
- Hazards or project activities or conditions that have the potential to affect the environment or cause environmental harm; and
- Incidents including near misses that have occurred on the project and the corrective actions that are required to ensure similar incidents don't reoccur.

16.1.3 Pre Start Meetings

A Daily Supervisor Prestart will be developed daily by the OHSE Department and relevant information documented to be discussed the following day by the Supervisor. Personnel will attend pre start meetings

prior to the commencement of each shift. The content of the meeting will vary but will at a minimum address the scope of work to be undertaken, the hazards and control measures associated with the work and any changes to procedures or emergency response arrangements.

All personnel who attend the pre start meeting will be required to sign an attendance sheet. During the prestart workers will review and sign on to relevant Permits to Work and the Job Hazard Analysis (JHA).

The OHSE Department will attend daily pre start meetings held by each work crew at random to provide input and ensure that meetings are effective and run correctly.

16.1.4 Toolbox Talks

Toolbox talks will be held weekly and be themed to address a environmental moment, current environmental issues, environmental topic according to schedule and training requirements. Unscheduled toolboxes talks/stop and consider sessions will be held when required to discuss unforeseen events or circumstances. In all cases toolbox talks will be minuted and all workers attending are required to sign an attendance sheet.

16.1.5 OHSE Committee Meetings

OHSE representatives and committees will be established in accordance with legislative requirements. All committee meetings will be minuted and all action items arising from the meetings recorded. The status of the action items will be followed up at subsequent meetings and closed out as appropriate.

The environmental Representatives will be made known to the entire workforce through the posters on all notice boards, crib rooms etc. An invitation to attend OHSE Committee meeting will be extended to SunWater HSSE team members.

16.1.6 Project OHSE Meetings

Project OHSE Meetings will be held and involve the Construction Manager, HSSE Manager (or delegate) and the Environment Committee Chairperson. These meetings will address but not limited to:

- Current OHSE statistics and performance;
- Review findings of all high potential incidents;
- Status of all OHSE related regulatory submissions or notifications;
- Areas of concern and associated improvement plans; and
- Information from other OHSE related meetings including those with SunWater.

16.1.7 OHSE Department Meetings

OHSE Department Meetings will be held and involve all personnel in the OHSE Department for the project. These meetings will address but not limited to:

- Current OHSE statistics and performance;
- Review findings of all incidents;
- Status of all OHSE related regulatory submissions or notifications;
- Areas of concern and associated improvement plans;
- Information from other OHSE related meetings including those with SunWater; and
- Current department performance in relation to KPI's, objectives and targets.

16.1.8 Supervisor Meeting

Supervisor Meetings will be held weekly and will address but not limited to:

- Current OHSE performance;

- All incidents including outstanding corrective actions;
- Hazard Observations that have been raised during the week;
- Areas of concern and associated improvement plans; and
- Information from other OHSE related meetings including those with SunWater.

16.1.9 HAZID Workshop

HAZID workshops will be held post contract award, if new tasks are identified, scope of work changes and or if a subcontractor/contractor is going to commence work on the project. The purpose of the HAZID workshop is to conduct a comprehensive HAZID assessment in a workshop forum to identify all hazards associated with the activities and the controls that will be implemented to eliminate or reduce the likelihood of an incident occurring.

16.1.10 Project Kick Off Meeting

Project kick off meeting shall be completed with SunWater prior to mobilization and once project has commenced MPC will use the same process with contractors or subcontractors prior to their mobilization. This meeting will validate that MPC and SunWater are aligned on the effective management and implementation of all HSSE Objectives, management plans and relevant procedures. This same process will be used to ensure any contractor or subcontractor understands MPC requirements and all relevant documentation and systems are in place to safely execute the work on the project.

16.1.11 Project Environment Refocus

MPC will ensure that quarterly environmental refocus sessions are held with the entire workforce. The purpose of these sessions are to remove the work force from their primary place of work and allow time for them to refocus on environment and contribute to improving environmental management in the field. The refocus will be interactive and encourage participation from the work force. These safety refocus sessions will include but not be limited to the following:

- environmental performance on the project for that period;
- Provide information and awareness relating to the monthly MPC Topic and any SunWater specified topics;
- Industry experts and guest motivational speakers (where applicable);
- Communication of significant incident findings; and
- Introduction of new OHSE programs.

16.1.12 Lessons Learnt

Lessons learnt will be held at the end of the project at a minimum and identify positive and negative issues that have affected the environmental Performance on the project. This forum will be documented and a report developed for review by all corporate managers and directors.

16.1.13 Project Incentive Program

Monthly in consultation with the Project Manager, HSSE Manager, Superintendant and Supervisors an employee will be selected in recognition for his/her environmental standards and performance on the project. The guiding principles for this incentive program are:

- Recognize and reinforce safe environment behaviour
- Focus more on leading than lagging indicators
- Be divorced from scheduling and productivity programs
- Be supported and financed by corporate management
- Capitalize on social reinforcement
- Award individual or teams.

Documentation includes:

Reference Title
OHSE Consultation Procedure
Tool Box Meeting Minutes
OHSE Meeting Minutes
Supervisors Daily Pre-Start Meeting
OHSE Alert/Notice Template
HAZID Template

16.2 External Communications

16.2.1 SunWater/Stakeholder and Subcontractor/Supplier Communications

Any incidents and major issues will be communicated with SunWater, and any other regulatory bodies or Stakeholders via the Project Manager, unless otherwise instructed or agreed. Communication may be in various forms, but will be documented at all times. Some forms of communications are:

- Meeting minutes
- Reports
- Email notifications - written or electronic correspondence
- Formal Letters.

The Project HSSE Manager shall advise the supplier and/or subcontractor through the Project Manager of any formal changes to any EMS documentation that directly affects the supplier and/or sub-contractor. This includes revised plans, procedures, instructions and forms that directly affect the supplier/subcontractor's operations with regard to the project.

17. Contractor and Subcontractor Management

MPC are committed to ensuring that all contractors and subcontractors comply with all project specific environmental conditions and management measures to ensure uniformity across the project between both MPC and subcontractor personnel. All Contractors and Sub-Contractors engaged to perform work on Murphy Pipe and Civil premises or any other location are required to comply with legislation, and as part of their contract or any other agreement, to comply with the Environmental project requirements and MPC Policy and associated Plans/procedures as well as legislation to ensure that the workplaces occupied as far as is reasonably practicable, minimises the adverse effects on the environment.

17.1 Subcontractor Evaluation

Contractors and subcontractors will be selected through a pre-qualification, evaluation, selection and approval process in accordance with the Subcontract Management Procedure. This process will be based on the scope of work and the level of risk and involve contractors and subcontractors completing a Subcontractor Evaluation form which shall be reviewed by relevant department managers and contractor or subcontractor selected. The evaluation process will include a review of subcontractors Environment Plans, Risk Registers, SWMS, JHA's etc.

After contractor or subcontractor is selected and contract/ agreement is awarded MPC Project Manager and HSSE Manager will organize an initial 'kick off meeting' to confirm contractual requirements and a HAZID workshop to assess all environmental hazards relevant to the scope of work and update the Project Hazard register. All interface between the contractor or subcontractor and MPC will be managed by the Project Manager.

17.2 Subcontractor Documentation Review

Prior to undertaking the Subcontractor environmental documentation review (Plans, Procedures, Risk registers, SWMS etc) the Project HSSE Manager or nominated MPC representative will review the MPC Project Hazard register and advise the Subcontractor of any non typical work activities and areas of high risk identified within the Project scope, and shall issue the Subcontractor a copy of the Project Environmental Management Plan and the Project Hazard register (which address all MPC and SunWater requirements). Additionally, any other environmental information which is relevant to the Subcontractors scope of work – including information on other project activities which may affect the subcontractors – shall be provided to/or requested from the subcontractor. Records of the supply of the Environmental Management Plan and other relevant information shall be recorded using the Document Transmittal form. Whenever the Environmental Management Plan or other information is revised, the Project HSSE Manager shall ensure that all relevant subcontractors are issued with an updated copy of the affected document and are informed of the changes within the document.

Prior to allowing any subcontractor to commence work on an MPC Project or Site, the MPC Project HSSE Manager shall be responsible for reviewing the Subcontractors Environmental Management Plan and risk registers, SWMS's/JHA's etc to determine if the criteria and management strategies specified in the supplied documents etc are project specific and fulfill the project requirements.

Documentation includes:

Reference Title
Subcontractor Evaluation
Subcontractor Evaluation Checklist
Subcontractor SWMS review Checklist
Subcontractor Management Procedure

18. Competence, Training and Awareness

MPC are committed to ensuring that all employees, subcontractors and suppliers are aware of the:

- Importance of conformity with the environmental policy and procedures with the requirements of the EMS
- The significant environmental aspects and related actual or potential impacts associated with the maintenance works and services, including the environmental benefits of improved personal performance
- Their roles and responsibilities in achieving conformity with the requirements of the environmental management system
- The potential consequences from departing from specified procedures.

18.1 Training and Awareness

18.1.1 Inductions

All personnel including MPC employees and subcontractors will be required to attend a compulsory MPC General Induction (Online), Project Induction, Site Induction and SunWater Induction before commencing any work on the project. The induction process will include:

- MPC General Induction (Online Induction) – All personnel employed by MPC including must complete the MPC General Induction. This will include specific functions as outlined below:
    - All persons that carry out the activities are aware of all relevant commitments to environmental management
    - Any relevant environmental objectives and targets, so that all staff are aware of the relevant performance objectives and can work towards these
    - Control procedures to be implemented for routine operations for day to day activities to minimise likelihood of environmental harm, however occasioned or caused
    - Contingency plans and emergency procedures to be implemented for non-routine situations to deal with foreseeable risks and hazards including corrective responses to prevent and mitigate environmental harm (including any necessary site rehabilitation)
    - Organisational structure and responsibility to ensure that roles, responsibilities and authorities are appropriately defined to manage environmental issues effectively
    - Effective communication to ensure two-way communication on environmental matters between operational staff and higher management
    - Monitoring of the release of contaminants into the environment including procedures, methods, record keeping and notification of results
    - Conducting assessment of the environmental impact of any release of contaminants into the environment
    - Waste prevention, treatment and disposal
    - A program for continuous improvement.

The induction will be documented, competency based and assessed online. Upon successful completion of the Induction, the results and a record of attendance will be stored online.

- Project Induction - All personnel employed by MPC including subcontractors must complete the Project Induction. Inductions must be delivered to site personnel prior to their commencement of work on the Construction site. The environmental component of the induction will be developed for the project by the OHSE Department and will include the key environmental aspects and controls for the project. This will include specific functions as outlined below:
    - Environmental significance on the project and project background;
    - General environmental duty and duty to notify;
    - Current Environment Acts, Regulations, Australian Standards, Codes of Practice and other documentation relevant to project personnel and the location of these documents;

- Conditions of environmental licenses/permits/approvals;
- Environment Policy;
- Environmental aspects and management measures/protocols;
- High risk activities and environment aspects (significant features) requiring particular attention;
- Environmental incident management and emergencies;
- Reporting requirements;
- Other site Specific documentation including Plans, Procedures, SWMS, JHA's and location.

The induction will be documented, competency based and assessed by a competent person. Upon completion of the induction information will be listed on the training matrix, in the corporate data base and personnel will receive an induction sticker to verify all site personnel have attended the site induction. Upon successful completion of the induction the employee shall sign the training attendance form and the OHSE Department will file in employee training records. Detailed records regarding the attendees and content of the induction/training shall be maintained. All induction trainers must hold a Nationally Accredited Workplace Trainer Certificate IV, or equivalent, qualification and be approved by the MPC Group HSSE Manager.

- Site Induction – All personnel must complete a site induction which will contain the following environment information at a minimum:
  - Site specific environmental requirements and locations; and
  - Other site specific documentation and the location of these documents.
- Visitors Induction – A visitor is deemed as a person who will spend less than 8 hours in one month on the SunWater project. Project Management are responsible for ensuring that visitor inductions are pre-arranged, the visitor is aware of the requirement to complete induction and have mandatory PPE. All visitors will complete a MPC short term induction. Visitors will be escorted at all times. The escort will have been fully inducted and familiar with the project and associated environment requirements.

The objective of the inductions is to ensure all personnel working on the project understand the requirements of the CEMP and the relevant legislation. It will also ensure everyone is committed to achieving the required environmental outcomes by following a due diligence system to minimise impacts on the environment.

18.1.2 Specialist Training

In addition to the inductions, training required for MPC staff will be identified through the Training needs analysis as well as the Training Matrix and shall be provided to personnel to improve their knowledge, skills and awareness as it pertains to their role (Refer Training Procedure). MPC shall maintain a register of each employee's competencies, licenses and training details which must be updated weekly. No employee is authorised (except in an emergency) to carry out any task (that has nationally recognized competency assessment) on the project unless they have successfully completed all modules of an approved training scheme where applicable, or has been deemed competent for the task or is an authorised trainee.

The need for training based on new or unforeseen workforce requirements shall be assessed on a continuous basis and will be determined using a risk based approach. Regular reporting shall identify these needs based on the outcomes of site inspections, audit reports, incident rates, toolboxes/pre-starts, changes to legislation, changes to project scope, management review, changes to MPC Environment Management System, peer review etc. The Project OHSE Administrator is to ensure a completed copy of the Training Record Form is forwarded to the Training Coordinator. Additionally, where certificates or equivalent advice of successful completion is awarded, these items should accompany the Training Record Form or be dispatched at the next available

opportunity. The Training Coordinator Is then responsible for updating the Training Standards Matrix to record all training which has been completed by Project personnel.

Types of skill training by suppliers of systems or services include:

- General Awareness Training;
- Internal workshops and In house training;
- Certified Training Courses offering National Accreditation; and
- Higher level education training (Diploma, Degree etc).

Documentation includes:

Reference Title
Training Matrix
Verification of Competence Assessment Procedure
Trainee Operator Register

19. Monitoring, Measurement and Inspection

19.1 Inspections

Inspections will be carried regularly throughout the construction period as specified within project conditions and relevant documents. Workplace inspections will be carried out by the OHSE Department as per the inspection schedule. These inspections take the form of:

- Environmental Site Walkthroughs
- Weekly Environmental Inspection Checklists
- Daily Fauna Inspections (Trenching)
- Routine Weed/Seed (Washdown) Inspections
- Plant and Vehicle Inspections
- Monthly Senior Management Inspections
- Hazard Observations

Environmental inspections will be utilised to monitor work practices, identifying non conforming areas and assessing the effectiveness of the environmental protection measures or controls on site. The Environmental inspections address the best management practices and safeguards identified throughout this CEMP, as well as any specific requirements. The purpose of the checklist will be to:

- Provide a surveillance tool to ensure that safeguards are being implemented;
- Identify where problems might be occurring;
- Identify where sound environmental practices are not being implemented; and
- Facilitate the identification and early resolution of problems.

Areas identified as requiring corrective preventative action shall be listed in the Corrective Action Register and relevant personnel issued corrective actions for close out (Corrective Action Request form). This process shall be managed by the Project HSSE Manager and will include continual monitoring of the Corrective Action Register.

Environmental Inspection checklists detailing compliance will be provided to SunWater within 10 days following each inspection.

Documentation includes:

Related Documents
Environmental Site Walkthrough Form
Fauna Inspection (Trenching) Form
Weed Hygiene Declaration Forms
Weekly Environmental Inspection Checklist Form
OHSE Corrective Action Register

19.1.1 Monitoring

Monitoring will be carried out as per the project audit schedule throughout the construction period as specified within project conditions and relevant documents. Random audits will be undertaken as deemed necessary from field observations and feedback and as a minimum monthly. Monitoring will be undertaken as detailed in Table 30.

Table 30: Project Monitoring

Monitoring Activity	Monitoring Frequency
• Water quality monitoring of hydro testing, dust suppression water and dewatering activities	As per the MPC Weekly Environmental checklist. Environmental Advisors to complete the checklist 3 times per week.
• Soil and water quality monitoring following a spill to land or water	
• All other soil and water quality monitoring relating to assigned monitoring programs	
• Rainfall Monitoring.	Daily

Other monitoring activity that may be required based on complaints and concerns include:

- Noise and Vibration Monitoring; and
- Air monitoring.

Specifically, the monitoring activity/exercise will list:

- The date on which the samples were taken
- The time at which the samples were taken
- Relevant sampler/Consultant details of who undertook the sampling/monitoring and relevant qualifications
- The monitoring location and at which the sample was taken
- The monitoring point/ID at which the sample was taken
- The in situ physical parameters and chemical analysis measured
- Comparison of measured in situ physical parameters and chemical analysis against stipulated project permit performance criteria with applicable exceedences highlighted
- Trend analysis and respective Evaluation, interpretation and explanation of data derived
- Outline of actions taken or proposed to occur to minimise environmental harm

All monitoring results that are elevated or outside of prescribed criteria are appropriately investigated, reported and necessary actions taken to rectify the condition or contaminant level.

Documentation includes:

Related Documents
Weekly Environmental Checklist
Surface Water Monitoring Form
Rainfall Reading Form

19.1.2 Monitoring and Measurement Testing Equipment/Devices

Furthermore, all environmental monitoring equipment used throughout the construction phase will be maintained and calibrated according to manufacturers and NATA accredited specifications. All monitoring equipment will be registered on the Calibration Register.

Where necessary to ensure valid results, measuring equipment shall:

- Be calibrated or verified, or both, at specified intervals, or prior to use, against measurement standards traceable to international or national measurement standards; where no such standards exist, the basis used for calibration or verification shall be recorded
- Be adjusted or re-calibrated as necessary
- Have identification in order to determine its calibration status
- Be safe guarded from adjustments that would invalidate the measurement result
- Be protected from damage and deterioration during handling, maintenance and storage.

Specifically, the calibration record and register will list:

- Equipment type
- Model, serial and part numbers etc
- Equipment measurement value
- Calibration field compliance value
- Date of laboratory or factory calibration
- Status of factory calibration/result
- Factory calibration due date.

To ensure calibration and verification records are maintained; an individual Water Analyser Calibration Record and the Calibration Register will be maintained and monitored by the Project HSSE Manager and/or appointed delegate for all environmental equipment requiring calibration.

Related Documents
Water Analyser Calibration Form
Calibration Register

20. Audits

20.1 Internal Audits

MPC is committed to ensuring that internal audits of the EMS are conducted at planned intervals to:

- Determine whether the EMS conforms to planned arrangements for environmental management including the requirements of ISO14001;
- To review scope, capability and effectiveness of the Environmental Management System;
- To review compliance with the Environmental Management System;
- To monitor performance against the objectives and targets set (KPI) for the project;
- Has been properly implemented and is maintained; and
- Provides information on the results of audits to management.

Audit programs or schedules will be planned, established, implemented and maintained, taking into consideration the environmental importance of the construction activities concerned and the results of previous audits. An annual monthly Internal Audit Schedule will be prepared, monitored and reviewed by the Group Environment and Sustainability Coordinator and approved by the Group HSSE Manager.

Internal audits will be undertaken on a monthly basis in accordance with the Audit Schedule which will be desktop and project specific as required. Internal environmental system audits will be conducted as detailed in the Audit Schedule, which is updated regularly. The Group Environment and Sustainability Coordinator or delegated person will conduct these audits, to ensure objectivity and impartiality of the audit process and further ensure the EMS conforms to ISO 14001:2004 and this Environmental Management Plan. The Project HSSE Manager and Environmental delegate will not be involved in directly auditing the Project site.

The Internal Audit Procedure will be implemented to define the roles, responsibilities and requirements for planning and conducting audits, establishing records and reporting results. Records of these audits and their results shall be maintained. The management responsible for the area being audited will ensure that any necessary corrections and corrective actions are completed without undue delay to eliminate detected nonconformities and their causes. The audit process consists of three distinct stages: (1) planning the audit (2) conducting the audit and (3) reviewing the results of the audit, including instigation of corrective action and preventive action.

The following information will be recorded during environmental audits performed:

- Audit Type (ISO14001:2004, contractual or legislative requirements, procedures etc)
- Form of Audit (Internal, External)
- Audit Team and attendees at opening and closing meetings
- Audit Location
- Purpose of Audit (System, Process, Product etc) and Audit Topic
- Audit Criteria
- Scope of Audit
- Audit methodology
- Executive summary, Audit Details, Results, and Recommendations or Actions if required
- NCRs or CARs arising from the Audit
- Action Item List (including due dates, priorities and responsibilities)
- Attachments and references to relevant documents, records, components
- Management review and comment.

Audit results shall be communicated to the project team and Corporate Murphy Pipe and Civil representatives. Actions arising shall be allocated priority and responsibility. At the completion of any internal or external audit Murphy Pipe and Civil will prepare a report. The status of Audit Reports will be updated as required by the auditor. The auditor will issue the report to the project following audit and report completion and any actions or recommendations documented will be assigned a timeframe for completion.

20.2 External Audits

External audits will be undertaken by 3rd party auditors - Compliance Australia. MPC will make available any necessary personnel and information during these audits.

External audits may encompass the following:

- Monitoring the integrity and efficiency of the environmental system
- Monitoring and verifying that the EMS is in accordance with the requirements of ISO14001 and all other legislative/statutory requirements
- Ensuring that any non-compliance is assessed and rectified where required in accordance with an agreed verifiable process
- Reviewing documents and submissions as required in the Contract.

All external audits carried out by a third party will be made available to SunWater, following request.

SunWater will undertake audits at the following milestones:

- Start-up audit – within approx. 4 weeks of establishment

- Progress audit – mid project (i.e. following a RPP creek crossing)
- Handover audit – within approximately 4 weeks of end of construction works.

20.3 Contractor, Subcontractor and Supplier Audits

Suppliers of major contract services and products will be required to submit Environmental documents (Management Plans, Procedures, SWMS, Risk Assessments, etc) and/or certification upon request describing how they will manage environmental related issues within the scope of their works. The Project HSSE Manager and delegated person will review the submitted environmental documents and/or certificates. Audits are to be conducted for major consultants, subcontractors and suppliers, and will be included in the Audit Schedule. Suppliers may be exempt from audits if they have a third party certified Environmental System or if they supply non-critical products or services. These audits shall be carried out in accordance with the Audit Schedule at intervals dependent on the risk of the product or service. The Project HSSE Manager or delegate will conduct these audits and audit reports will be issued to the consultant, subcontractor or supplier. The performance of consultants, subcontractors and suppliers including non-conformances will be reviewed as part of the ongoing audit schedule evaluation. Suppliers and subcontractors may be required to complete an Environmental Report and GEEM Report.

Documentation includes:

Related Documents
OHSE Surveillance Systems Audit – Preliminary Meeting Letter Form
OHSE Department Meeting Minutes - Systems Audit (Opening Meeting) Form
OHSE Department Meeting Minutes - Systems Audit (Closing Meeting) Form
OHSE Surveillance Systems Audit Report Form
Internal Audit Corrective Actions Plan
OHSE Audit Schedule
Subcontractor Evaluation Form
Subcontractor Evaluation Checklist
Subcontractor WMS Review Checklist

21. Environmental Emergency, Preparedness, Response and Incident Management

MPC is committed to ensure that identified potential emergency situations and potential accidents that have an impact on the environment are managed in order to mitigate and prevent associated adverse environmental impacts. Incident Reporting and Investigation

Incident investigation and reporting is an integral part of the risk management strategies at MPC. All incidents will be managed, documented, investigations conducted and corrective actions established to minimise the reoccurrence.

21.1.1 Reporting

All personnel will be required to report all incidents and complaints, as it is regarded as a valuable method of addressing shortcomings in procedures, training or equipment, and is an opportunity for improvement. Environmental incidents may arise as a result of but not limited to:

- Chemical, Sewerage or Hydrocarbon Spills
- Excessive vegetation clearance
- Protected vegetation damage
- Fauna and livestock Injury or Death
- Damage to cultural heritage items
- Mismanagement of wastes
- Excessive dust, noise, vibration or odour
- Discharge of water prior to sampling
- Excessive turbidity
- Breach of License/Approval/Permit conditions

All environmental incidents and near misses will be reported and recorded on the relevant approved forms. All Incidents will be reported as a Preliminary Incident Investigation Report and may or may not be reported as a Full Incident Investigation Report, dependent on incident severity and assessment.

21.1.2 Preliminary Investigation

A Preliminary Incident Report is to be completed as a minimum for all incidents identified. The preliminary incident report is to be signed off by the person/s directly involved in the incident and preliminary investigation.

The Project HSSE Manager will determine the level of the involvement by other members of the Project Management Team and shall brief all required Project Management personnel on the nature of the incident and the requirements of the preliminary investigation.

Once completed and reviewed by the author and person or persons involved in the incident the Preliminary Incident Report is forwarded to SUNWATER and the Group HSSE Manager.

The following information will be recorded on the preliminary investigation report form:

- Project
- Site Location
- Description and type of incident
- Date and time of incident
- Incident Category
- Risk Assessment/Rating
- Contributing Factors
- Documentation (JHA/SWMS) review
- Whether further full investigation is required
- Estimated cost of incident
- Method to prevent reoccurrence
- Immediate actions taken
- Persons involved in the incident and report completer details

21.1.3 Full Investigation

The requirement to complete a full Incident Investigation Report shall be determined on a case by case basis by the Project HSSE Manager and/or the Group HSSE Manager.

The Project and/or Group HSSE Manager shall determine the level of Senior Management involvement in the full investigation and shall brief all required Senior Management personnel on the nature of the incident and the requirements of the investigation (Refer to the Incident Investigation and Reporting Procedure).

Should an Incident Investigation Report be determined to be required a full investigation into the incident shall be conducted. Completed Incident Investigation Reports and associated Corrective Actions Requests shall be forwarded onto the following personnel for review and approval:

- Project HSSE Manager
- Project Manager
- Group HSSE Manager
- Operations Manager
- Director

The following information will be recorded on the full investigation report form:

- Project
- Site Location
- Description and type of incident
- Date and time of incident
- Risk Assessment/Rating
- Incident Category
- Immediate actions taken
- Notification Requirements
- Incident Details
- Estimated cost of incident
- Analysis of Incident
- Agency of Incident
- Contributing Factors
- Procedural Review
- Root Causes of Incident
- Corrective and Preventive Actions
- Associated Attachments
- Investigation team
- Project Management sign off

21.1.4 General Requirements

All incidents, whether reported on a preliminary or full investigation report will be recorded on the OHSE Incident Register. Associated corrective actions arising from the incident investigations will further be forwarded to the relevant personnel through the Corrective Actions Request Form and further recorded on the OHSE Corrective

Actions Register. All environmental incidents that occur throughout the project will be reported and recorded to the OHSE Department who will in turn relay the information and applicable report/documentation to SUNWATER as soon as possible and in accordance with the following timeframes:

- All Environmental incidents – immediately in accordance with the following:
  - Environmental Incidents with Medium or Low Potential Risk – Immediate verbal notification, Preliminary Investigation within 6 hours and full investigation within 2 working days;
  - Environmental Incidents with Extreme or High Potential Risk – Immediate verbal notification, Preliminary Investigation within 3 hours and full investigation within 3 working days;

The Project, Construction and HSSE Manager are responsible for reviewing the incident reports and incident report register to identify trends and specific circumstances that may require further investigation. Actions to improve the process or system will be developed by the Project HSSE Manager.

All incidents, the results of the investigation and trends identified shall be discussed at the weekly Project OHSE meeting. Furthermore, all incidents will be discussed at pre-start and toolbox meetings. Corrective actions shall be determined in consultation with workers or their representatives as appropriate and relevant information will be passed on to all workers to promote awareness of the incident causation and the action that is required to prevent a reoccurrence. Corrective actions shall be monitored for effectiveness in accordance with the OHSE Corrective and Preventative Action procedure

All incidents will further be reported and recorded as per legislative requirements and the requirements of Statutory Authorities. In accordance with SUNWATER and the Project HSSE Manager, MPC will be responsible for reporting notifiable incidents to the Administering Authority where applicable in accordance but not limited to the following situations:

- Where there are releases of any volume of contaminants to water
- Where releases of volumes of contaminates to land are greater than the listed quantities prescribed within the project approval/permit conditions and
- Where potential serious or material environmental harm has occurred or may occur as a result of releases of any volume of contaminates.

21.1.5 Investigation

Environmental incidents will only be investigated by competent qualified OHSE staff who are deemed competent in Incident Investigation and who have received training in accordance with MPC Training Standards Matrix (Training procedure). Incident investigation is the systematic analysis of an incident aimed at identifying the underlying causes of the occurrence. By understanding the root causes of the incident, strategies can be implemented to prevent a reoccurrence of the incident. Incident Investigation is not about assigning blame for the incident.

Project Managers, Supervisors, and OHS Personnel are responsible for undertaking investigations. Site personnel may be required by management to participate in the process. Senior Management shall be involved in the review and approval of incident investigation reports, and in the investigation itself when required (Refer to Incident Investigation and reporting procedure).

Investigations may be launched from information such as:

- Workplace inspections;

- Hazard inspections; and
- "Grapevine" reports.

Standards for investigations include:

- Trends;
- Potentially serious incidents;
- Near misses, or
- Notifiable incidents.

The investigation process involves gathering facts from many sources, examination of the information to identify the root causes of the incident and any omissions or inadequacies of the environment system. The Incident Investigation Reports have been developed to conform to this process.

Appropriate regulatory authorities may also carry out additional investigations, focusing on prevention and legal compliance.

Upon completion of the investigation the findings and recommendations will be distributed to relevant personnel and the work force via daily prestart and toolbox meetings. All incidents and the outcomes will be reviewed and discussed at the OHSE Committee and Project Health, Safety and Environment meetings. Where lessons are learnt from the investigation or current procedures are identified as being ineffective, the CEMP will be revised by the Project HSSE Manager to include the improved procedures or requirements.

Full details of the Incident Reporting and Investigation process are further detailed in the Incident Investigation and Reporting procedure.

Documentation includes:

Related Documents
Chemical Spills Procedure
Incident Investigation and Reporting Procedure
Preliminary Investigation Form
Incident Investigation Report Form
Witness Statement
Corrective Action Register

21.2 Community Issues and Complaints

All records of valid complaints causing environmental harm including actions taken to mitigate complaints and response time to the complainant will be recorded on the Complaints Register in accordance with the Community Plan. The complaint will then be investigated and adequate corrective/abatement actions implemented to mitigate the cause of the complaint and prevent further environmental nuisance. Corrective actions will be recorded on the OHSE Corrective Actions Register and relayed to the appropriate personnel using the OHSE Corrective Actions Request Form. Complaints will be treated as an Incident where assessed applicable and the Incident process prescribed above adopted. Reviews and audits of the environmental complaints register will be conducted to monitor the effectiveness of mitigation measures and identify any trends in complaints.

The following details will be recorded for all valid complaints:

- Name, address and contact number for valid complainant

- Time and date of valid complaint
- Reasons for the complaint as stated by the valid complaint
- Investigations undertaken in response to the valid complaint
- Conclusions formed
- Actions taken to resolved the valid complaint
- Any abatement or management measures implemented to mitigate the cause of the valid complaint
- Name and contact details of the person responsible for resolving the valid complaint

22. Non Conformances, Corrective and Preventive Action

MPC is committed to ensuring that nonconformities, corrective and preventive actions are managed by:

- Identifying and correcting nonconformities and taking actions to mitigate their environmental impacts
- Investigating nonconformities, determining their cause and taking actions in order to avoid their recurrence
- Recording the results of corrective actions and preventive actions taken
- Reviewing the effectiveness of corrective actions and preventive actions taken.
- Notifying DSEWPaC through SunWater within 24 hours of detection of any non-compliance with the active approved CEMP or the project approval conditions

CAR's and NCR's may be raised as a result of:

- Non-compliance with any component of this CEMP, procedures, instructions and SWMS
- Legislative breaches
- License/Permit and Approval breaches
- SunWater requirements and contractual breaches
- Environmental incidents and complaints
- Exceedance of environmental monitoring criteria if as a result of MPC activities.

CAR's and NCR's may be identified during audits and site inspections and will be raised as either:

- Inspection reports/checklists
- Environmental action lists
- Written warnings
- Formal NCR/CAR reports.

Environmental CAR's/NCR's will be issued either internally or externally dependant on the source and cause of non-conformity. The Project HSSE Manager will register such CAR's/NCR's through the Corrective Action Register.

CAR's/NCRs are managed, reviewed and closed out by the Project HSSE Manager. SunWater may be notified of the non-conformance if deemed necessary. The Project HSSE Manager will ensure that all relevant parties are notified and/or consulted in the closeout process. These parties may include SunWater and the Department of Environment and Heritage Protection (DEHP) if deemed necessary under the contract or Legislation.

Once a non-conforming product is corrected, MPC will undergo a re-verification process to demonstrate conformity to the requirements. Records of the nature of nonconformities and any subsequent actions taken, including concessions obtained, shall be maintained.

CAR's and NCR's will contain the following information:

- Details of the CAR/NCR and the date it was raised
- Root cause analysis
- CAR/NCR issuer and receiver
- Photographs and supporting documents
- Whether further external consultation is required
- Proposed corrective and/or preventive action
- Details of the when the deficiency is rectified/closed out
- Allowance for SunWater acceptance and comments.

22.1 Corrective and Preventive Action

MPC will take action to eliminate the causes of environmental actual or potential nonconformities in order to prevent recurrence, achieve improvements, reduce environmental impact and corrective/preventive actions will be appropriate to the nonconformities encountered or those that have the potential to be encountered.

Corrective and Preventive Action will involve:

- Reviewing actual nonconformities or potential nonconformities
- Monitor nonconformities to identify trends
- Determining the causes of actual and potential nonconformities
- Evaluating the need for action to ensure that nonconformities do not recur or are prevented
- Determining and implementing action needed
- Records of the results of action taken
- Reviewing the effectiveness of the corrective/preventive action taken.

The Project HSSE Manager or his/her delegate will be responsible to approve proposed corrective/preventive actions.

23. Records and Documents

23.1 Records Control

All records generated in relation to environmental issues will be maintained and filed. These documents will be kept for a minimum of five years including all monitoring results or other information required and made available for inspection upon request by the administering authority. Records management will be in accordance with the Archiving of Company Documents Procedure to ensure all records are identified, stored, protected, retrieved, retained and disposed of appropriately.

The following environmental records will be managed through internal system databases and SharePoint:

- Environmental Forms
- Environmental Registers
- EMS, monthly and quarterly reporting
- Inspection reports and checklists
- Incident Reports
- Audit Reports
- Non-conformances and corrective actions
- Monitoring results
- Diary entries
- Meeting Minutes
- Formal Letters
- Email Correspondence
- Waste measurement and tracking records
- Calibration records
- All other documents required under this CEMP and related plans.

23.2 Document Control

Document Management will be in accordance with the Document Development and Control Procedure to ensure all environmental document types follow the approved structure, format, control, revision and approval processes.

The following environmental document types are managed through the SharePoint System:

- Policy
- Plans
- Procedures
- Forms, Registers, SWMS etc

24. Reporting

Environmental updates and or reports will form a crucial component of monitoring on site environmental performance and overall management. A HSSE Report shall form a component of the reporting and be issued to the Group HSSE Manager and SunWater if required on a weekly and monthly basis. Details to be included in the HSSE report are as follows:

- Environmental Management System performance and updates on processes and procedures;
- Environmental opportunities or improvements
- Findings and Scheduling of Audits and reviews
- Status of NCR's, corrective and preventative Actions
- Incidents and investigations
- Status of reporting requirements/obligations and any other issues
- Any community, stakeholder and or SunWater comments and enquiries.

The HSSE Report will be prepared by Project HSSE Manager and/or delegate prior to submission to the Group HSSE Manager.

A Greenhouse, Energy and Emissions Management Report will also be issued to the Group HSSE Manager and SunWater if required on a monthly basis (in accordance with the GEEM Reporting Procedure). Details to be included in the GEEM Report are as follows:

- Petroleum based liquid fuel quantities
- Biofuel quantities
- Gaseous fuel quantities
- Petroleum based oil and grease quantities
- Other petroleum based product quantities
- Energy production quantities
- Energy consumption quantities
- Waste Management quantities;
- Land management disturbance and rehabilitation data;
- Business air travel mileage; and
- Production data quantities

25. Management Review

The Project HSSE Manager will review the EMS, including the CEMP and its operation and implementation at planned intervals (annually) to ensure its continuing suitability, adequacy and effectiveness. Reviews shall include assessing opportunities for improvement and the need for changes to the EMS, including the environmental policy and environmental objectives and targets.

The purpose of the review is to ensure that the system is meeting the requirements of the standards, policies and objectives. Input to management reviews will include:

- Results' of internal audits and evaluations of compliance with legal requirements and with other applicable environmental requirements
- Performance of consultants, subcontractors, suppliers and MPC
- Communications from external interested parties, including complaints
- Feedback from the SunWater, Community and other Stakeholders
- The environmental performance
- The extent of compliance with objectives and targets and policies
- Status of incident follow up, corrective and preventative actions - deficiencies including NCRs and Defects
- Environmental monitoring results/records/reports and inspection results
- Follow-up actions from previous management reviews
- Changing circumstances, including developments in legal, standard and other requirements related to its environmental aspects
- Recommendations for improvement.

The Project HSSE Manager will implement any changes arising from the reviews of the policies and/or the Management Plan. Records of such reviews will be maintained. Details of any significant changes made to the CEMP and Management Plans will be summarised in a table and forwarded in a memorandum to all relevant site personnel. Updates will be recorded as per MPC's document management process. Between the scheduled reviews, a register of issues will be maintained to ensure that any issue raised by internal and external personnel associated with the Project is documented.

Appendix A Reference Documents

A.1 Guidelines and Standards

The following guidelines and standards will apply to monitoring and auditing of performance:

A.1.1 General

- Australian Pipeline Industry Association – Code of Environmental Practice Onshore Pipelines March 2009
- ISO AS/NZS 14001:2004 – Environmental Management Systems – Requirements with guidance for use

A.1.2 Water and Wastewater

- Monitoring and Sampling Manual 2009, Environmental Protection (Water) Policy 2009 (Department of Environment and Resource Management)
- Standard Methods of the Examination of Water and Wastewater – American Public Health Association (APHA)/Australian Waste Water Association (AWWA)
- Australian/New Zealand Standard - Water quality—Sampling Part 1: Guidance on the design of sampling programs, sampling techniques and the preservation and handling of samples (AS/NZS 5667.1:1998)
- Australian/New Zealand Standard - Water quality—Sampling Part 6: Guidance on sampling of rivers/streams (AS/NZS 5667.6:1998)
- Australian/New Zealand Standard - Water quality—Sampling Part 9: Guidance on sampling from marine waters (AS/NZS 5667.9:1998)
- AS 2031 Selection of Containers and Preservation of Water Samples for Chemical and Microbiological Analysis
- Soil Erosion and Sediment Control Guidelines for Queensland Construction Sites. Institute of Engineers, 1996
- ANZECC 2000 Guidelines for Water Quality for Protection of Aquatic Ecosystems
- ANZECC 2000 Guidelines for Water Quality for recreational water quality and aesthetics
- Australian Water Quality Drinking Guidelines 2011
- QWQG 2009 – Queensland Water Quality Guidelines 2009
- Waste Management Strategy for Queensland (Environmental Protection Agency (EPA), 1996)
- Draft Urban Stormwater – Queensland best Practice Environmental Management Guidelines, 2009.

A.1.3 Soils

- Australian and New Zealand Environment and Conservation Council (ANZECC)/National Health and Medical Research Council (NHMRC) – Guidelines for the Assessment and Management of Contaminated Sites.
- Queensland Government Chemical Laboratory – Guidelines for Soil Sampling.
- Soil Erosion and Sediment Control Engineering Guidelines – Erosion and Sediment Control – A Field Guide for Construction Site Managers
- Introductory Erosion and Sediment Control Guidelines for Queensland Councils
- State and Regional Coastal Management Plans Queensland's Coastal Policy – EPA Best Practice Urban Stormwater Management – Erosion and Sediment Control
- Queensland Acid Sulphate Soil Investigation Team (QASSIT) "Guidelines for Sampling and Analysis of Lowland Acid Sulphate Soils (ASS) in Queensland 1998".
- "Draft Guidelines for the Assessment and Management of Contaminated Land in Queensland" (Department of Environment 1998).

A.1.4 Air

- AS 3580 Methods of Sampling and Analysis of Ambient Air.
- AS 2922-1987 Ambient Air – Guide for the Siting of Sampling Units
- DERM Air Quality Sampling Manual.

A.1.5 Noise and Vibration

- "Interim Guidelines and Technical Notes for Road Traffic Noise Amelioration" (DMR 1992).
- DERM Noise Management Manual.
- QDMR Road Traffic Noise Management: Code of Practice, 2000.
- Main Roads Standard Specification – Noise Barriers (MRS 11.15).
- E1 Environmental Guideline "Noise from Construction, Maintenance and Demolition Sites" (EPA 1989).
- Noise Measurement Manual, Third Edition, 2000.
- AS 1055.1 and AS 1055.2 Acoustics – Description and Management of Environmental Noise.
- AS 2187 Explosives – Storage Transport and Use (Explosives Code).
- AS 2436 Guide to Noise Control on Construction, Maintenance and Demolition Sites.
- AS 2659.1 Guide to the Use of Sound Measuring Equipment.
- AS 2659 Sound Level Meters.
- AS 2702 Acoustics – Methods for Measurement of Road Traffic Noise.
- AS3671 Acoustics – Road Traffic Noise Intrusion – Building Siting and Construction, 1989.
- DIN 4150 Part 2, 1975 and Part 3 Structural Vibration: Effects of Vibration on structures, 1999.
- BS 6472 Evaluation of Human Exposure to Vibration in Buildings.
- BS 7385: Part 2 Evaluation and Measurement for Vibration in Buildings, 1993.

A.1.6 Flammable, Combustible and Dangerous Goods

- AS 1216 Classification, Hazard Identification and Information Systems for Dangerous Goods.
- AS 1678 Emergency Procedure Guides – Transport.
- AS 1940 Storage and Handling of Flammable and Combustible Liquids.
- AS 2508 Safe Storage and Handling Information Cards for Hazardous Materials.
- AS 2809 Road Tank Vehicles for Dangerous Goods.
- AS 2931 Selection and Use of Emergency Procedure Guides for Transport of Dangerous Goods.

A.1.7 Declared Plant and Pest Management

- Declared plant, weed and pest fact sheets located on DAFF website.

Appendix B AS/NZS ISO 14001:2004 Compliance Checklist

Principal Requirement		Environment Plan Reference
4	**Environmental management system requirements (title only)**	
4.1	General Requirements	Chapter 1 - Introduction
4.2	Environmental Policy	Chapter 3 – Environmental Policy
4.3	**Planning (title only)**	
4.3.1	Environmental aspects	Chapter 8 – General project Environmental Management Aspects and Management Measures
4.3.2	Legal and other requirements	Chapter 2 and 3 - Legislative Requirements and Environmental Requirements
4.3.3	Objectives, targets and programme(s)	Chapter 4 – Environmental Objectives and Targets
4.4	**Implementation and operation (title only)**	
4.4.1	Resources, roles, responsibility and authority	Chapter 5 – Management Organisation, Responsibilities and Authorities
4.4.2	Competence, training and awareness	Chapter 11 – Competence, Training and Awareness
4.4.3	Communication	Chapter 10 - Communication
4.4.4	Documentation	Chapter 17.2 – Document Control
4.4.5	Control of documents	Chapter 17.2 – Document Control
4.4.6	Operational control	
4.4.7	Emergency preparedness and response	Chapter 14 – Environmental Emergency, Preparedness, Response and Incident Management
4.5	**Checking (title only)**	
4.5.1	Monitoring and measurement	Chapter 12 – Monitoring, Measurement, Inspection and Auditing
4.5.2	Evaluation of compliance	
4.5.3	Nonconformity, corrective action and preventive action	Chapter 15 – Non Conformances, Corrective and Preventive Action
4.5.4	Control of records	Chapter 17.1 – Records Control
4.5.5	Internal audit	Chapter 13.1 – Internal Audit
4.6	Management Review	Chapter 19 – Management Review

Appendix C Contractual Compliance Checklist

Clause	Contractual Requirement	Environmental Plan Reference
Woleebee Creek to Glebe Weir Pipeline Project – Stage 2 Construction Contract		
10 Contractors Obligations		
Performance of the Contractors Activities		
10.1	The Contractor must perform the Contractors Activities: (a) In a professional, timely, safe and environmentally responsible manner and in accordance with this Contract, including the Scope of Work, all Government Authority Approvals, all applicable Laws and Best Industry Practices	10 – Environmental Objectives and Targets Appendix C –Contractual Compliance Checklist 8.3 – Approval Requirements 8.2 – Legislative Requirements Appendix A – Reference Documents
Government Authority Approvals		
10.2	The Contractor must: (a) acquire each of the Contactor Approvals within the time periods necessary (b) maintain and renew each of the Contractor Approvals to the extent necessary, to execute the Contractors Activities and the Works in accordance with the requirements of the Contract	8.3 – Approval Requirements
10.3	The Contractor must provide evidence of its compliance with GC 10.2 (including original approvals and other documents) upon SunWater's request and as otherwise required by this Contract. If requested by SunWater, the Contractor must use its reasonable endeavours to assist SunWater with its obligations under	MPC are currently reviewing these approval requirements and submitting applications where required
10.4	The Contactor must comply with, and must ensure that its Personnel comply with, all Government Authority Approvals. The Contractor indemnifies SunWater from and against any and all liabilities, damages, claims, fines, penalties, fees, costs and expenses to the extent that they are directly caused by the failure by the Contractor or it' Personnel to: (a) acquire, maintain and/or renew any Contactor Approvals; and/or (b) Comply with any Government Authority Approvals.	10 – Environmental Objectives and Targets
Environment		
10.50	When performing the works and its other obligations under the Contract, the Contractors shall comply and ensure its Personnel comply with:	
(i)	All environmental laws	8.2 – Legislative Requirements 10 – Environmental Objectives and Targets

Clause	Contractual Requirement	Environmental Plan Reference
(ii)	All Government Authorisations (including development approvals)	8.3.2 – Murphy Pipe and Civil Approvals 10 – Environmental Objectives and Targets
(iii)	SunWater's Requirements for environmental management documentation (and the Contractors acknowledges that those requirements are available from SunWater's Representative on request)	8.1 – Environmental Requirements 10 – Environmental Objectives and Targets Appendix C – Contractual Compliance Checklist
(iv)	Site specific and other environmental requirements including those set out in Appendix 3 (and the Contractors acknowledges that those requirements are set out in the Site Conditions)	8.3.2 – Murphy Pipe and Civil Approvals 14.1.8 – Historical Heritage Management 14.1.13 – Pest and Weed Management
(v)	the Environmental Management Plan	10 – Environmental Objectives and Targets
(vi)	Any relevant Australian Standards or codes regarding environmental management	Appendix A – Reference Documents
10.52	The Contractor (a) must notify Sun Water as soon as possible but no later than 12 hours after it becomes aware of the occurrence on Site of an Environmental incident whether caused by the Contractor, the Contractors Personnel or noted regarding SunWater's activities at the site	10.2 – Environmental Targets/KPI's 20.1 - Incident/Accident Investigation and Reporting 20.1.2 - Reporting
(b)	Must notify SunWater as soon as possible after it receives: (i) Any complaints arising in connection with an Environmental Incident; and (ii) Any communication whether written or verbal, with or from any Government Authority, including the Environmental Protection Authority, arising in connection with an Environmental Incident	20.1 - Incident/Accident Investigation and Reporting 20.1.2 - Reporting
(c)	Shall keep SunWater informed of, and provide copies of, such complaints and communications; and	20.1 - Incident/Accident Investigation and Reporting 20.1.2 - Reporting
(d)	Must comply with any notice, order of direction issued to the Contractor or SunWater under an environmental Law in connection with the Works	6 - Review
Heritage, Minerals, Fossils and Relics		
10.61	The Contractor shall preserve and protect all cultural heritage, fossils, antiquities and other valuable material encountered at the Site in connection with the Works in accordance with the Cultural Heritage Management Plan detailed in Appendix 15 and any relevant Laws	14.1.8 – Historical Heritage Management
10.62	All of the Contractors Personnel are prohibited from entering into, or damaging, or interfering with any cultural heritage site which is identified within the Cultural heritage Management Plan and which is outside the Site	14.1.8 – Historical Heritage Management

Clause	Contractual Requirement	Environmental Plan Reference
10.63	As part of the Site induction training, The Contractor will ensure that all its Personnel are fully trained in the standard operating procedures and related cultural heritage practices that apply to the Site including attendance at any induction training required under the Cultural Heritage Management Plan	14.1.8 – Historical Heritage Management
10.64	The Contractor shall provide evidence to SunWater that the Contractors Personnel have completed the training	14.1.8 – Historical Heritage Management
10.65	The Contractor must as far as reasonably possible reorganise the Works to minimise any delay suffered by the Contractor as a consequence of such discovery	14.1.8 – Historical Heritage Management
Appendix 15 – Project Plans		
1. Critical Project Plans	Environmental Management Plan	Woleebee Creek to Glebe Weir Pipeline Project: Environmental Management Plan - 12843_ENV_PLN_001
	Construction CHMP (CCHMP)	Outline summarizing major management measures included within this CEMP - Section 14.1.8 – Historical Heritage Management CCHMP To be submitted at a later date in accordance with Appendix 15 Contractual obligations
3. Minimum Requirements for Project Plans - Environment Management Plan	The Environmental Management Plan must be consistent with: • All applicable government policies; • All environmental laws; and • The relevant code The Environmental Management Plan must also include a sub-plan, the Transport and Roads Plan, which must be approved by DTMR prior to implementation. This Plan must detail final traffic volumes, proposed transport routes, required road infrastructure maintenance and or upgrades to mitigate road impacts, especially ensuring road safety, any necessary conditions about access or connection to public roads, transport scheduling, duct control and so on. The Transport and Roads Plan must include arrangements to ensure compliance with the management of workforce movements associated with the Project, for example to achieve a committed level to bus travel	8.2 – Legislative Requirements 10 – Environmental Objectives and Targets Appendix A – Reference Documents Transport and Roads Plan to be developed
3. Minimum Requirements for Project Plans – Cultural Heritage Management Plan (CHMP)	The Construction CHMP (CCHMP) shall be consistent with Sun Water's CHMPs for each of the four Traditional Owner groups and should provide sufficient detail and glance to the Contractors and subcontractors employees to ensure that the requirements of the CHMP's are not breached	SunWater to provide CHMP in order to establish consistency MPC Management strategies outlined within 14.1.8 – Historical Heritage Management
Appendix 3 - Scope of Work		
33. Cultural Heritage		

Clause	Contractual Requirement	Environmental Plan Reference
33.1	The Principal will either give the Contractor copies of any approved Cultural heritage Management Plans (CHMP's) developed and entered into by the Principal and affected Aboriginal Party or details of the requirements relevant to the Contractor in those CHMP's	N/A – To be issued by SunWater
33.2	The contractor must develop a Construction Cultural Heritage management Plan (CCHMP) in compliance with the Principals CHMP's to be approved by the Principal	Section 14.1.8 – Historical Heritage Management. CCHMP to be developed and distributed to SunWater
33.3	During construction of the Project, the Contractor must comply with the CCHMP and cultural heritage duty of care under the *Aboriginal Cultural Heritage Act 2003*	Section 14.1.8 – Historical Heritage Management
33.4	Cultural heritage inductions by the Aboriginal Party representative are required for all relevant employees/contractors prior to ground – disturbing work commencing	Section 14.1.8 – Historical Heritage Management
33.5	The Aboriginal Party representatives may be required on site for the monitoring of areas that may not have received clearance due to access restrictions or the ground cover preventing the inspection of the ground for artefacts and creek crossings where traditionally Cultural heritage items are most likely to be uncovered	Section 14.1.8 – Historical Heritage Management
33.6	The Contractor shall give the Principal 21 day's written notice of when Aboriginal Party representation may be required and this notice should be sufficient to schedule the resources for monitoring of the work	Section 14.1.8 – Historical Heritage Management
33.7	During the Clearing and Grubbing operations, the Aboriginal Party representative may need to remove any cultural heritage materials that may have been exposed during this work and it is expected these will be relocated to areas outside of the pipeline corridor. The Contractor shall permit this work to take place and is deemed to have included in the Contract price an allowance for the impact for this work on the Contractors Works Program.	Section 14.1.8 – Historical Heritage Management
34. Wash-down Facilities		
34.1	To prevent bringing weeds into the site all earthmoving Equipment and Construction Plant and Equipment brought to the site shall be thoroughly cleaned and shall be free of soil and plant material that is to have a ash – down certificate from its place of origin	14.1.13 – Pest and Weed Management
34.2	All vehicles, machinery and Equipment, Construction and Plant and Equipment and construction materials entering various sections of the Pipeline easement shall be thoroughly cleaned and shall be free of soil and plant material. Sufficient wash-down facilities will be established by the Contractor for cleaning of vehicles and machinery to ensure that the Contractor complies with its obligations under this Contractor. They shall be constructed and operational prior to the commencement of other work on site.	14.1.13 – Pest and Weed Management

Clause	Contractual Requirement	Environmental Plan Reference
34.3	A movement protocol shall be developed and implemented for vehicle's and plant to ensure that declared weeds are not spread. This protocol will trigger the need for a "wash-down". It is anticipated that this trigger would occur when machinery or vehicles leave the access road hence they shall wash – down immediately at the next wash-down facility. It is anticipated that the plant transporting gravely sand between sand extraction points and site will not require wash down of each truck movement, provided that sufficient measures are put in place at each sand extraction point to minimise the risk of weed spread.	14.1.13 – Pest and Weed Management
40. Government Authority Approvals		
40.2 MPC Approvals		
1	Development permit under the SPA and the planning scheme and/or the Environmental Protection Act for material change of use of premises for workers accommodation and ERA 8 (Chemical Storage), ERA 14 (Electricity Generation), ERA 15 (Fuel Burning), ERA 63 (Sewerage Treatment) and ERA 64 (Water Treatment), if required	8.3 – Approval Requirements
2	Development permit under the SPA and the Environmental Protection Act for a material change of use of premises for mobile and temporary ERA No. 43 for concrete batching works, if required	8.3 – Approval Requirements
3	Development permit under the SPA and the planning scheme for operational work, if required	8.3 – Approval Requirements
4	Damage mitigation permit where an animal breeding place is identified and where an activity will tamper with an animal breeding place under the NC Act, if required	8.3 – Approval Requirements
5	Disposal permit for removing or disposing of contaminated soil under the Environmental Protection Act, if required	8.3 – Approval Requirements
6	Development permit under the SPA and Water Act for operational work involving taking or interfering with water, if required in any instance except in relation to the outlet works/infrastructure	8.3 – Approval Requirements
12	Prepare and submit notice of self-assessment in relation to operational work for temporary/minor waterway barrier works under the SPA and the Fisheries Act, if required	8.3 – Approval Requirements
13	ERA Registration Certificates Registration of Chapter 4 activities under the Environmental Protection Act is required. This will be applicable for all approved ERA's undertaken	8.3 – Approval Requirements
14	Pest/weed management – no approval required but obligation to control Class 1 and 2 declared pests	8.3 – Approval Requirements

Appendix D Significant Species Management Plans for EPBC listed species

Threatened fauna species which are known or likely to be present in the easement will be managed in accordance with species specific SSMP's. Should an additional Threatened fauna species or migratory species, or their habitat, later be identified and it is determined that clearing of their habitat is unavoidable, the management strategy will be:

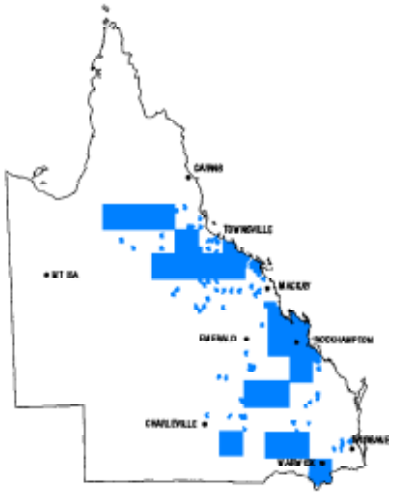
- Notify DSEWPC that clearing of this species habitat is required and the estimated extent of the impact (within 10 business days of identifying the species or its habitat);
- The Threatened fauna species habitat will be clearly flagged and identified as a "no go" zone. Clearing will not occur within this area until the following steps have been completed;
    - Update the SSMP for the fauna species with site specific details and submit the SSMP to DSEWPC for approval;
    - Identify the potential for relocation of the species, and other mitigation measures if direct harm is expected to occur to the animal itself;
    - Identify if the animals breeding place will be impacted and if so undertake actions in accordance with the Breeding Place SMP;
    - If the species does not have an approved disturbance limit, or it is exceeded, then identify if an offset is required for the unavoidable impacts to the species habitat.
- Clearing will be undertaken of the area once the SSMP is approved and all pre-impact mitigation measures have been undertaken.

Significant Species Management Plans are provided below for the following EPBC listed species which are either known or likely to occur within the easement:

- Squatter Pigeon;
- South-eastern Long-eared Bat;
- Large-eared Pied Bat; and
- Brigalow Scaly-foot.

SSMP1 - *Geophaps scripta scripta* (Squatter Pigeon)

Geophaps scripta scripta



Geophaps scripta scripta distribution map. K. Park and A. Borsboom, Resource. Sciences Centre, DNR. 1995

EPBC Act Conservation Status

Vulnerable

NC Act Conservation Status

Vulnerable

Known Distribution

This species was originally found along the inland slopes of the Great Dividing Range, between West Wyalong, NSW, and the Burdekin-Lynd Divide, Qld, extending to the coast between Port Curtis and Proserpine, Qld, and inland as far as Longreach and Charleville (Morris *et al.* 1981; Frith 1982; Blakers *et al.* 1984; Higgins and Davies 1996; Schodde and Mason 1997). No sightings have been made in New South Wales since the 1970s (Ayers *et al*. 1996; Higgins and Davies 1996) but the species still occurs patchily throughout its former range in central and north-eastern Queensland.

Occurrence within study area

No Squatter Pigeons have been recorded within the study area although the species is fairly common in the locality. Although habitat for the species is not optimal, they are still regularly recorded in exotic grasslands where the grass is sparse or low. However, the Squatter Pigeon is highly mobile and therefore able to avoid clearing activities, reducing the risk of individual mortality. Direct impacts from clearing are therefore expected to be negligible and no particular management is deemed necessary.

Biology and Reproduction

Squatter Pigeons nest on the ground, usually laying two eggs in sheltered positions, and forage for seeds (including those of improved pasture species) on bare ground between sparse grasses (Crome 1976; Frith 1982).

Preferred Habitat and Microhabitat

The Squatter Pigeon is commonly found in the grassy understorey of eucalypt woodlands, usually with ready access to water. Sandy areas dissected by gravel ridges are preferred and burnt areas are frequented (Frith 1982).

Where encountered in the study area, it occurs in non-remnant vegetation areas in close association with cattle. This habitat varies seasonally in the extent of vegetative cover; however, the essentially degraded nature of habitat and intensive use of the area for grazing suggest that this species is resilient to some extent to alterations in land use.

Threats

SSMP1 - *Geophaps scripta scripta* (Squatter Pigeon)

In New South Wales, the disappearance of the Squatter Pigeon has been attributed to overgrazing at times of drought, followed by clearing. Further north threats are principally from cattle grazing which may have been less damaging (Frith 1982), but ongoing clearance may be fragmenting the population. Cattle grazing followed by drought in 1902 apparently caused a decline in numbers in the Suttor and Dawson River valleys (Campbell and Barnard 1917; Barnard 1925), but the species is again common there.

In southern Queensland observations clearly support fox predation as a major threat. This was also suggested by Ayers (1996), with most declines having occurred in areas of high fox abundance.

Other threats that have been cited in the literature include the trampling of nests by domestic stock and illegal shooting. However these are likely to have negligible impacts for the current populations.

Negligible impacts are predicted as a result of project activities due to the Squatter Pigeon preferred habitat being cleared, grassy woodland and impacts to their habitat will be minimal.

Management Strategies

As the Squatter Pigeon has not been identified as occurring within the study area, the primary management strategy is to focus on the identification, avoidance and protection of individuals, populations, habitat and breeding areas. Various mitigation measures outlining how this will occur are detailed in the following section.

Mitigation Measures

Mitigation measures to minimise project impacts on the Squatter Pigeon are:

- A pre-clearance survey will be undertaken of each planned infrastructure area by a qualified ecologist to identify the presence / absence of Squatter Pigeons and nesting sites;
- As part of routine pre-start meetings, work crews will be briefed on any known and potential environmental constraints occurring in that work location, including any likely significant fauna species they may encounter;
- Wherever practicable signage should be erected to increase the general awareness amongst work crews of the presence of the Squatter Pigeon and particularly any nesting sites in the area;
- All clearing activities to be carried out in a sequential manner and in a way that directs escaping wildlife away from clearing and into adjacent native vegetation or natural areas;
- Prior to clearing, limits of clearing areas including “no go” zones identified during pre-clearance surveys will be clearly marked out with appropriate flagging material and/or barricade webbing as determined by the site Environment Representative;
- If any such nesting sites of the Squatter Pigeon are identified they shall also be clearly marked out as ‘no go’ zones with appropriate flagging material and/or barricade webbing as determined by the site Environment Representative. All possible measures shall be taken to avoid disturbing any such nesting sites, including the reduction of the clearance area or relocation of any associated site infrastructure;
- Due to the tendency of the Squatter Pigeon to utilise disturbed areas (such as access track and pastoral grasslands) vehicle and machinery speed limits will be restricted to 40 km/hr within key nominated areas with appropriate signage erected;
- Measures will be taken to avoid any injury to the Squatter Pigeon at all times, however if any injured birds are found they shall be transported to a veterinarian or recognised wildlife carer immediately for treatment;
- All recorded sightings of the Squatter Pigeon, the locations of any nesting sites and any relocations which may required will be reported to the relevant authority as part of the project reporting;
- Dust suppression measures will be implemented to minimise dust deposition in habitat areas;
- Where possible, when erecting any project related fencing the use of barb wire, particularly on the top strand, is to be avoided to avoid birds and other fauna getting caught;
- Where the species has been identified in proximity to proposed infrastructure, temporary lighting shall be directed away from light-sensitive areas such as nesting areas and light shades and low lighting must be applied to construction and operational areas where these are located adjacent to remnant vegetation and other environmentally sensitive areas;
- Vehicle activities should be restricted to roads, access tracks and hardened surfaces to reduce potential impacts to threatened species;
- Fire management measures shall take into account the need to protect remnant vegetation from frequent and hot fires. On site fire management practices shall be in accordance with Contractor HSSE requirements, relevant construction permits and method statements and appropriate dedicated fire fighting equipment will

SSMP1 - *Geophaps scripta scripta* (Squatter Pigeon)

be available at high risk construction sites to manage any fires that may start up and to avoid wildfires breaking out; and

- Should non-compliance with the mitigation measures or management strategies outlined in this SSMP occur on site an investigation shall be undertaken by all responsible parties followed by corrective action procedures if required. Work in the area will cease at the time of the non compliance if the incident is deemed significant by the site Environment Representative. DSEWPaC will be notified within 24 hours of detection of a non-compliance relating to the Squatter Pigeon.

Rehabilitation and Recovery

Rehabilitation will be progressively undertaken during construction following completion of infrastructure establishment. Natural regeneration of disturbed areas will be encouraged after construction activities and also at the conclusion of the project.

Performance Measures

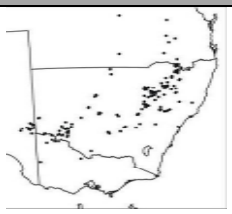
Pre-clearance surveys are undertaken of each planned infrastructure by a qualified ecologist to identify the presence / absence of Squatter Pigeon and nesting areas.

Monitoring

- An appropriate monitoring program, incorporating the monitoring of any offset site where applicable, will be established in conjunction with the relevant authority once any impact to the Squatter Pigeon is identified.
- Monitoring of rehabilitation areas as appropriate to determine uptake by the Squatter Pigeon.

SSMP2 - *Nyctophilus corbeni (South-eastern Long-eared Bat)*

Nyctophilus corbeni



Nyctophilus corbeni distribution map. Schulz and Lumsden 2010

EPBC Act Conservation Status

Vulnerable

NC Act Conservation Status

Vulnerable

Known Distribution

The South-eastern Long-eared Bat was formerly considered to be a distinct form of the Greater Longeared Bat *Nyctophilus timoriensis* complex (Parnaby 1988; Duncan et al. 1999). This former taxonomy is reflected in the common and scientific names under which the species is listed in State and Commonwealth nature conservation legislation, and in the scientific literature. However, the species was very recently formally described as a separate species and is now called, *Nyctophilus corbeni* (Parnaby 2009). *N. corbeni* is classified as Vulnerable under the EPBC Act under the former taxonomy as *Nyctophilus timoriensis* south-eastern form – Greater Long-eared Bat.

The South-eastern Long-eared Bat is found from eastern South Australia, through the slopes and plains of New South Wales and into central southern Qld. Throughout its distribution it appears to be uncommon with scattered populations (Turbill and Ellis 2006).

Occurrence within MEP area

Not recorded during current study or previous studies in the locality.

Biology and Reproduction

The South-eastern Long-eared Bat is an insectivorous bat. Food can be taken in flight, by gleaning vegetation or ground foraging (Lumsden and Bennett 2000; Van Dyck and Strahan 2008). In flight, it commonly feeds on beetles, bugs, and moths (Lumsden and Bennett 2000); however, it has also been recorded feeding on grasshoppers and crickets.

Foraging activities are concentrated around patches of trees in the landscape. Individuals appear to have defined foraging areas which they return to; they do not defend foraging areas and many individual from different species may share the same area.

There is little information currently available on this species' reproductive biology. Pregnant and lactating females have been trapped in November in central-western New South Wales and Queensland suggesting a similar breeding cycle to other sympatric long-eared bat species (Schulz and Lumsden 2010).

Preferred Habitat and Microhabitat

The South-eastern Long-eared Bat occurs in a range of inland woodland vegetation types, including box, ironbark and cypress pine woodlands (DSEWPC 2011b).

The species also occurs in Buloke woodland, Brigalow woodland, Belah woodland, Smooth-barked Apple, Angophora leiocarpa, woodland; River Red Gum, Eucalyptus camaldulensis, forests lining watercourses and lakes (DSEWPC

SSMP2 - *Nyctophilus corbeni (South-eastern Long-eared Bat)*

2011b).

Throughout inland Queensland, the species habitat is dominated by various eucalypt and bloodwood species, and various types of tree mallee with it being most abundant in vegetation with a distinct canopy and a dense cluttered shrub layer (Dominelli 2000; Ellis et al. 1999; Koehler 2006; Lumsden 1994; McFarland et al. 1999; Parnaby 1995; Turbill and Ellis 2006).

There are a small number of records from closed forest adjacent to dry sclerophyll woodlands; in Araucarian notophyll vine forest in the Bunya Mountains and in semi evergreen vine thickets on the banks of the Dawson River and in the Brigalow Belt Bioregion (Pennay 2002; Venz et al. 2002).

Threats

Due to the lack of data available, assessment of threats is difficult.

Broad-scale vegetation clearing is likely to be a key threat in many areas. This leads to habitat destruction and fragmentation. Prior to European settlement, mallee and woodland habitats were extensive across inland eastern Australia. Agriculture is the main cause of habitat fragmentation; this is a threat as trapping surveys show the species displays a preference for larger habitats.

Increased fire frequencies destroy understorey vegetation and this may be a key microhabitat feature for this species. The South-eastern Long-eared Bat is believed to forage on low ground and shrubs (DSEWPC 2011b).

High density grazing around such regions destroys shrubs and limits the regeneration of the habitat.

Overgrazing by feral species such as the rabbit may also pose a threat to this bat.

The availability of suitable roosting habitats is essential for the presence of bat populations. The Southeastern Long-eared Bat is known to roost in deadwood or hollow trunks / branches from 25mm – 30mm in size and frequently under bark. Standard forestry practices remove such items from the environment and are hence considered a potential threat.

Impacts to this species are projected to be quite low, since no broad scale clearing of remnant vegetation will occur in any areas. The species is also highly mobile across habitats, which should ensure that populations are not fragmented.

The only other impact may be due to the loss of large riverine, hollow-bearing trees; however, preclearance surveys will identify such trees and they will be avoided wherever possible.

Management Strategies

As the South-eastern Long-eared Bat or roost sites have not been identified as occurring within the study area, the primary management strategy is to focus on the identification, avoidance and protection of individuals, populations, habitat and roosting sites.

Various mitigation measures outlining how this will occur are detailed in the following section.

Should a South-eastern Long-eared Bat breeding place (i.e. roost in trees) be identified and it is determined that disturbance or tampering to the breeding site is unavoidable the management strategy will be to follow the procedures outlined in the Breeding Place SMP which will be prepared for the project. Offset sites will potentially be established for unavoidable impacts to EPBC listed fauna species habitat.

Mitigation Measures

Mitigation measures to minimise project impacts on South-eastern Long-eared Bat are:

- A pre-clearance survey will be undertaken of each planned infrastructure area by a qualified ecologist to identify the presence / absence of South-eastern Long-eared Bat and their roost sites;
- As part of routine pre-start meetings, work crews will be briefed on any known and potential environmental constraints occurring in that work location, including any likely significant flora and fauna species, populations and TEC they may encounter;
- Wherever practicable signage should be erected to increase the general awareness amongst work crews of the

SSMP2 - *Nyctophilus corbeni (South-eastern Long-eared Bat)*

presence of this species and particularly any roosts in the area;

- All clearing activities to be carried out in a sequential manner and in a way that directs escaping wildlife away from clearing and into adjacent native vegetation or natural areas;
- Prior to clearing, limits of clearing areas including "no go" zones delineating roost sites identified during pre-clearance surveys will be clearly marked out with appropriate flagging material and/or barricade webbing as determined by the site Environment Representative;
- Pre-clearance survey to be undertaken by suitably qualified, experienced and licensed fauna catchers prior to any clearing activities being undertaken. If roosting sites for the South-eastern Long-eared Bat are identified within the clearance area or within close proximity to it, these sites shall be clearly marked out as a 'no go' zone with appropriate flagging material and/or barricade webbing as determined by the site Environment Representative. An appropriate buffer zone as determined by the licensed fauna spotter catcher shall also be applied and marked out around the roost site. These areas shall be recorded by GPS and established as temporary 'no go' zones until management actions are finalised;
- All clearing will be completed in a sequential manner, whereby potential habitat trees/roost sites identified by a qualified ecologist will be left for a period of 24 hours after the felling of surrounding non-habitat trees. Upon felling of habitat trees, each hollow will be inspected to determine whether this species or any other bat species arwe present. If, after felling the potential habitat tree, there is still a presence of the South-eastern Long-eared Bat, the felled tree will be left in-situ for a further 24 hours to ensure the survival and departure of the individuals prior to pushing the tree into windrows or otherwise disposing of the tree.
- Clearing activities shall carry on around the outside of any defined buffer zone until appropriate actions to manage the roost site have been determined in conjunction with the licensed fauna spotter catcher. A monitoring programme to determine potential construction impacts to the roost shall be implemented during the construction period as per the monitoring section of this SSMP;
- All possible measures shall be taken to avoid disturbing any roost site including the reduction of the clearance area or relocation of any associated site infrastructure. If any previously unidentified high value roost areas such as caves are discovered during a pre-clearance survey, construction activities shall cease at this location and alternative construction techniques that will not compromise the stability of sandstone ridges containing the caves/roosts shall be investigated;
- If it is determined that an active roost cannot be avoided actions will be put in place as identified in the Study area. This will include ensuring a licensed and experienced fauna spotter catcher who is in possession of appropriate permits for fauna relocation is onsite during all clearing activities and that any injured bats are transported to an appropriate veterinarian or wildlife carer immediately;
- In areas where South-eastern Long-eared Bats are identified and breeding sites are removed as part of clearing activities, habitat creation activities shall be undertaken, including the installation of artificial roost sites in appropriate locations outside the clearing area as determined by the licensed fauna spotter catcher;
- All recorded sightings of South-eastern Long-eared Bats, the locations of any breeding sites and any relocations which may required will be reported to the relevant authority (Commonwealth DSEWPaC, Qld DEHP)as part of the project reporting;
- Dust suppression measures will be implemented to minimise dust deposition in habitat areas;
- Where possible, when erecting any project related fencing the use of barb wire, particularly on the top strand, is to be avoided to avoid birds and other fauna getting caught;
- Where the species has been identified in proximity to proposed infrastructure, temporary lighting shall be directed away from light-sensitive areas such as nesting areas and light shades and low lighting must be applied to construction and operational areas where these are located adjacent to remnant vegetation and other environmentally sensitive areas;
- Vehicle activities should be restricted to roads, access tracks and hardened surfaces to reduce potential impacts to threatened species;
- Fire management measures shall take into account the need to protect remnant vegetation from frequent and hot fires. On site fire management practices shall be in accordance with Contractor HSSE requirements, relevant construction permits and method statements and appropriate dedicated fire fighting equipment will

SSMP2 - *Nyctophilus corbeni (South-eastern Long-eared Bat)*

be available at high risk construction sites to manage any fires that may start up and to avoid wildfires breaking out; and

- Should non-compliance with the mitigation measures or management strategies outlined in this SSMP occur on site an investigation shall be undertaken by all responsible parties followed by corrective action procedures if required. Work in the area will cease at the time of the non compliance if the incident is deemed significant by the site Environment Representative. DSEWPaC will be notified within 24 hours of detection of a non-compliance relating to the South-eastern Long-eared Bat.

Rehabilitation and Recovery

Rehabilitation will be progressively undertaken during construction following completion of infrastructure establishment. Natural regeneration of disturbed areas will be encouraged after construction activities and also at the conclusion of the project.

Performance Measures

Pre-clearance surveys are undertaken of each planned infrastructure by a qualified ecologist to identify the presence / absence of South-eastern Long-eared Bat and its habitat.

Monitoring

If a South-eastern Long-eared Bat roost is identified and located within or in close proximity to the clearance area, a monitoring programme to record any potential disturbance impacts arising from construction activities will be developed in accordance with the Survey Guidelines for Australia's threatened Bats.

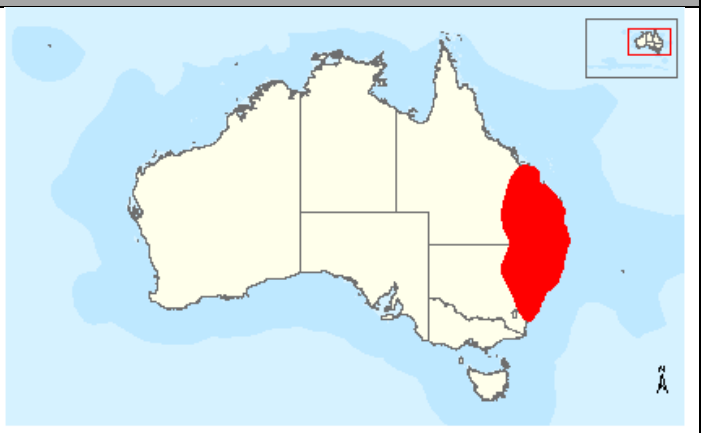
The monitoring programme shall continue for the duration during which any construction related activities are being carried out which may have a potential impact on the roost site.

Any installed artificial roost sites will be monitored quarterly for 1 year for successful occupation by the bats.

An additional monitoring program, incorporating the monitoring of any offset site, will be established in conjunction with the relevant authority once an impact to the South-eastern Long-eared Bat is identified and quantified.

SSMP3 – *Chalinolobus dwyeri* (Large-eared Pied Bat)

Chalinolobus dwyeri



Chalinolobus dwyeri distribution map.

EPBC Act Conservation Status

Vulnerable

NC Act Conservation Status

Not listed

Known Distribution

The current distribution of this species is also poorly known. Records exist from Shoalwater Bay, north of Rockhampton, Queensland, through to the vicinity of Ulladulla, in the south of New South Wales (Hoye 2005).

In Queensland, further records are known from sandstone escarpments in the Carnarvon, Expedition Ranges and Blackdown Tablelands. It is likely that these areas support a high proportion of the Queensland population of the Large-eared Pied Bat, although estimates of the number of individuals present and their distribution in these areas has not been established. Additional records exist in the Scenic Rim near the New South Wales / Queensland border. The populations in this area appear to be reliant on the presence of roosts in volcanic rock types (Hoye 2005).

Occurrence within study area

This species was not recorded during the current survey or previous fauna surveys completed in the locality.

Biology and Reproduction

Breeding in the disused mine tunnel at Copeton, NSW, was recorded during two consecutive summers from 1961 by Dwyer (1966). Females were pregnant in October and by early December they had all given birth and were lactating. Females most often had two young (average litter size of 1.8) with a juvenile sex ratio of males to females being 12 to 11. The nursery colony was established in September by both adult females and males with the majority of adult males leaving by the time the young were born in early summer. In late February and during March the juveniles had left the roost. The adult females left the roost after the juveniles and the site was abandoned during the winter months (Dwyer 1966).

Preferred Habitat and Microhabitat

Little is known about the habitat and roosting requirements of the Large-eared Pied Bat, but availability of natural roosts may depend heavily upon the availability of sandstone outcrops and possibly volcanic formations in southern parts of its range. It has been found roosting in disused mine shafts, caves, overhangs and disused Fairy Martin (*Hirundo ariel*) nests for shelter and to raise young (Hoye and Dwyer 1995; Schulz 1998). It also possibly roosts in the hollows of trees (Duncan et al. 1999).

In NSW this species has been recorded from a large range of vegetation types including dry and wet sclerophyll forest, cyprus-pine dominated forest, tall open eucalypt forest with rainforest sub-canopy, sub-alpine woodland and

sandstone outcrop country.

Recent habitat modelling based on surveys in the southern Sydney region (DECC 2007, cited in Pennay 2008) suggest that the Large-eared Pied Bat is largely restricted to the interface of sandstone escarpment (for roost habitat) and relatively fertile valleys (for foraging habitat) (Pennay 2008). Recent survey work in the Brigalow Belt South region of NSW supports this modelling (Pennay 2008).

Threats

Major threats faced by the Large-eared Pied Bat include:

- Loss or modification of habitat;
- Predation by cats; and
- Application of pesticides in or adjacent to foraging areas.
- Potential impacts associated with the project include destruction of foraging or roosting habitats, including trees with hollows and destruction of dead tree stumps during clearing operations.

Management Strategies

The primary management strategy is to focus on the identification, avoidance and protection of individuals, populations, habitat and roosting sites.

Various mitigation measures outlining how this will occur are detailed in the following section.

Should a Large-eared Pied Bat breeding place (i.e.roost in trees) be identified and it is determined that disturbance or tampering to the breeding site is unavoidable the management strategy will be to follow the procedures outlined in the Breeding Place SMP detailed in Section 3.

Mitigation Measures

Mitigation measures to minimise project impacts on Large-eared Pied Bat are:

- A pre-clearance survey will be undertaken of each planned infrastructure area by a qualified ecologist to identify the presence / absence of Large-eared Pied Bats and their roost sites;
- As part of routine pre-start meetings, work crews will be briefed on any known and potential environmental constraints occurring in that work location, including any likely significant fauna species they may encounter;
- Wherever practicable signage should be erected to increase the general awareness amongst work crews of the presence of this species and particularly any roosts in the area;
- All clearing activities to be carried out in a sequential manner and in a way that directs escaping wildlife away from clearing and into adjacent native vegetation or natural areas;
- Prior to clearing, limits of clearing areas including “no go” zones delineating roost sites identified during pre-clearance surveys will be clearly marked out with appropriate flagging material and/or barricade webbing as determined by the site Environment Representative;
- Pre-clearance survey to be undertaken by suitably qualified, experienced and licensed fauna catchers prior to any clearing activities being undertaken. If roosting sites for the Little Pied Bat are identified within the clearance area or within close proximity to it, these sites shall be clearly marked out as a ‘no go’ zone with appropriate flagging material and/or barricade webbing as determined by the site Environment Representative. An appropriate buffer zone as determined by the licensed fauna spotter catcher shall also be applied and marked out around the roost site. These areas shall be recorded by GPS and mapped in the Environmental Constraints Mapping as temporary ‘no go’ zones until management actions are finalised;
- All clearing will be completed in a sequential manner, whereby potential habitat trees/roost sites identified by a qualified ecologist will be left for a period of 24 hours after the felling of surrounding non-habitat trees. Upon felling of habitat trees, each hollow will be inspected to determine whether this species or any other bat species arwe present. If, after felling the potential habitat tree, there is still a presence of the Large-eared Pied Bat, the felled tree will be left in-situ for a further 24 hours to ensure the survival and departure of the individuals prior to pushing the tree into windrows or otherwise disposing of the tree.
- Clearing activities shall carry on around the outside of any defined buffer zone until appropriate actions to manage the roost site have been determined in conjunction with the licensed fauna spotter catcher. A

monitoring programme to determine potential construction impacts to the roost shall be implemented during the construction period as per the monitoring section of this SSMP;

- All possible measures shall be taken to avoid disturbing any roost site including the reduction of the clearance area or relocation of any associated site infrastructure. If any previously unidentified high value roost areas such as caves are discovered during a pre-clearance survey, construction activities shall cease at this location and alternative construction techniques that will not compromise the stability of sandstone ridges containing the caves/roosts shall be investigated;
- If it is determined that an active roost cannot be avoided actions will be put in place as identified in the Study area. This will include ensuring a licensed and experienced fauna spotter catcher who is in possession of appropriate permits for fauna relocation is onsite during all clearing activities and that any injured bats are transported to an appropriate veterinarian or wildlife carer immediately;
- In areas where Large-eared Pied Bat are identified and breeding sites are removed as part of clearing activities, habitat creation activities shall be undertaken, including the installation of artificial roost sites in appropriate locations outside the clearing area as determined by the licensed fauna spotter catcher;
- All recorded sightings of Large-eared Pied Bat , the locations of any breeding sites and any relocations which may required will be reported to the relevant authority (Commonwealth DSEWPaC, Qld DEHP) as part of the project reporting;
- Dust suppression measures will be implemented to minimise dust deposition in habitat areas;
- Where possible, when erecting any project related fencing the use of barb wire, particularly on the top strand, is to be avoided to avoid birds and other fauna getting caught;
- Where the species has been identified in proximity to proposed infrastructure, temporary lighting shall be directed away from light-sensitive areas such as nesting areas and light shades and low lighting must be applied to construction and operational areas where these are located adjacent to remnant vegetation and other environmentally sensitive areas;
- Vehicle activities should be restricted to roads, access tracks and hardened surfaces to reduce potential impacts to threatened species;
- Fire management measures shall take into account the need to protect remnant vegetation from frequent and hot fires. On site fire management practices shall be in accordance with Contractor HSSE requirements, relevant construction permits and method statements and appropriate dedicated fire fighting equipment will be available at high risk construction sites to manage any fires that may start up and to avoid wildfires breaking out; and
- Should non-compliance with the mitigation measures or management strategies outlined in this SSMP occur on site an investigation shall be undertaken by all responsible parties followed by corrective action procedures if required. Work in the area will cease at the time of the non compliance if the incident is deemed significant by the site Environment Representative. DSEWPaC will be notified within 24 hours of detection of a non-compliance relating to the Large-eared PiedBat.

Rehabilitation and Recovery

In areas where Large-eared Pied Bat are identified and breeding sites are removed as part of clearing activities, habitat creation activities shall be undertaken, including the installation of artificial roost sites in appropriate locations outside the clearing area as determined by the licensed fauna spotter catcher.

Rehabilitation will be progressively undertaken during construction following backfilling and completion of infrastructure establishment. Natural regeneration of disturbed areas will be encouraged after construction activities and also at the conclusion of the project.

Performance Measures

- Pre-clearance surveys are undertaken of each planned infrastructure area by a qualified ecologist to identify the presence / absence of the Little Pied Bats or their roost sites.
- Avoidance of roost sites where possible.
- Successful establishment of artificial roost sites where appropriate.

Monitoring

If a Large-eared Pied Bat roost is identified and located within or in close proximity to the clearance area, a monitoring programme to record any potential disturbance impacts arising from construction activities will be developed in accordance with the Survey Guidelines for Australia's threatened Bats.

The monitoring programme shall continue for the duration during which any construction related activities are being carried out which may have a potential impact on the roost site.

Any installed artificial roost sites will be monitored quarterly for 1 year for successful occupation by the bats.

An additional monitoring program, incorporating the monitoring of any offset site, will be established in conjunction with the relevant authority once an impact to the Little Pied Bat is identified and quantified.

SSMP4 – *Paradelma orientalis* (Brigalow Scaly-Foot)

Paradelma orientalis.

Paradelma orientalis distribution map.

EPBC Act Conservation Status

Vulnerable

NC Act Conservation Status

Vulnerable

Known Distribution

Endemic to the Queensland section of the Brigalow Belt Biogeographic Region from approximately Westmar in the south to Moranbah in the north. Within its distribution it is patchily distributed and likely to be restricted to remaining areas of remnant vegetation (Apan *et al.* 2010, unpublished report, USQ). There are however, collections that have been made in cultivated areas, suggesting persistence despite clearing (McDonald *et al*. 1991).

Occurrence within study area

Two Brigalow Scaly-foot were recorded from Juandah State Forest outside the easement, but within the study area. Historical records from disturbed habitats in the study area, including Buffel grass dominated pasture.

Biology and Reproduction

The Brigalow Scaly-foot is a nocturnal species of legless lizard, and by day, is typically found sheltering under rocks, sandstone slabs, logs, loose bark, dense leaf litter and in grass tussocks, including spinifex.

A detailed description of habitat associations is presented below.

Scats collected from Boyne Island included remains of a spider, an orthopteroid and many unidentified insect fragments. Scats collected 20 km north of Dingo consisted of tightly compressed membranous material (mostly plant) and the remains of a large spider and a cricket (Tremul 2000).

On Boyne Island the species makes frequent use of Acacia shrubs, climbing the trunk and main branches to feed on sap (Tremul 2000). No similar observations are available for the rest of the distribution.

Preferred Habitat and Microhabitat

The Brigalow scaly-foot is found in open forests and woodlands of Brigalow (*Acacia harpophylla*), Narrow-leaved Ironbark, Bimble Box (*Eucalyptus populnea*), Cypress Pine (*Callitris columellaris*), Belah (*Casuarina pauper*), Buloke (*Allocasuarina luehmannii*), Spotted Gum (*Corymbia maculata*), Gidgee (*Acacia cambagei*), Lancewood (*Acacia* spp.) and Hickory Wattle (*Acacia falciformis*). They have also been found in vine thickets. Topography varies from sandstone ridges to flats and gently undulating plains with clay, loam or sand (Schultz and Eyre 1997; Tremul 2000).

SSMP4 – *Paradelma orientalis* (Brigalow Scaly-Foot)

Specific habitat where the species has been found includes:

- Remnant Brigalow woodland with sparse tussock grasses on grey cracking clay soils (Cogger et al. 1993);
- Narrow-leaved Ironbark and Grey Box (E. microcarpa) open forest with a dense subcanopy of Cypress Pine and Buloke on loose sandy clay substrate, in Eena SF (Schultz and Eyre 1997);
- Buloke closed forest with widely scattered Narrow-leaved Ironbark emergents on loose sandy clay substrate, in Eena SF (Schultz and Eyre 1997);
- Dry sclerophyll forest on a sandstone rise, in Dunmore SF (Schultz and Eyre 1997);
- Spotted Gum and Narrow-leaved Ironbark open forest in Barakula SF (Schultz and Eyre 1997);
- Mixed species open woodland with a Triodia mitchelli dominated ground layer in the Chesterton Range near Charleville (Schultz and Eyre 1997)
- Low Gidgee woodland with cracking alluvial clay soils, in Ulcanbah Station (Kutt et al. 2003); and
- Poplar Box woodland on sandy-clay alluvial soils, in Downs Station (Kutt et al. 2003).
- The distribution of this species overlaps with the following EPBC Act-listed threatened ecological communities:
- Semi-evergreen vine thickets of the Brigalow Belt (North and South) and Nandewar Bioregions;
- The community of native species dependent on natural discharge of groundwater from the Great Artesian Basin;
- Bluegrass (Dichanthium spp.) dominant grasslands of the Brigalow Belt Bioregions (North and South);
- Brigalow (Acacia harpophylla dominant and co-dominant); and
- White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland.

Habitat modelling (Apan *et al.* 2010, unpublished report USQ), based on specimen records from the Glen Morgan area, indicated strongest correlations with specific RE's in Land Systems 3, 4 and 5.

The Brigalow Scaly-foot is found in a wide variety of open forest habitats on several soil types (Schultz and Eyre 1997; Tremul 2000). Specimens are often found sheltering under sandstone slabs, surface debris or in grass hummocks (Wilson and Knowles 1988).

One specimen from Moura was found in a fold in a sheet of fallen stringybark (Shea 1987b), while four specimens from Eena SF were found under slabs of fallen Narrow-leaved Ironbark (*Eucalyptus crebra*) bark (Schultz and Eyre 1997). Captive specimens prefer to shelter under flat objects and show no tendency to bury in the substrate (Shea 1987). Predictive modelling (Apan *et al.* 2010, unpublished report, USQ) shows that important microhabitat features include vegetation understorey attributes (e.g. logs, debris, and leaf-litter).

Threats

The main identified threats to Brigalow Scaly-foot include habitat loss due to land clearing and thinning; road widening and maintenance activities; and predation by feral animals such as feral cats (*Felis catus*).

It is also likely that fire presents a major threat for species such as these, which are relatively sedentary during the day, unable to burrow and dependant upon leaf litter and ground cover.

Management Strategies

Should a Brigalow Scaly-foot breeding place (i.e. young or eggs) be identified and it is determined that disturbance or tampering to the breeding site is unavoidable the management strategy will be to follow the procedures outlined in the Breeding Place SMP to be prepared for the project.

Mitigation Measures

Mitigation measures to minimise project impacts on the Brigalow Scaly Foot are:

- As part of routine pre-start meetings, work crews will be briefed on any known and potential environmental constraints occurring in that work location, including any likely significant fauna species they may encounter;
- Wherever practicable signage should be erected to increase the general awareness amongst work crews of skink species in the area and their habitat, including that certain skinks are protected species and should not be

SSMP4 – *Paradelma orientalis* (Brigalow Scaly-Foot)

harmed;

- Prior to clearing, limits of clearing areas including "no go" zones delineating Brigalow Scaly Foot habitat areas identified during pre-clearance surveys will be clearly marked out with appropriate flagging material and/or barricade webbing as determined by the site Environment Representative;
- Where possible, clearing areas should be reduced to avoid specific high risk micro habitat areas identified by fauna spotter catchers;
- Fauna spotter catchers shall subject areas of likely reptile habitat to mild disturbance prior to clearing to encourage the natural relocation of resident reptiles;
- Clearing to be carried out in a sequential manner and in a way that directs escaping wildlife away from clearing and into adjacent native vegetation or natural areas;
- If the Brigalow Scaly Foot is found prior to or during clearing activities, it shall be relocated from the clearing area to a suitable location by a licenced fauna catcher. Appropriate permits for fauna relocation shall be held by the Contractor. Any injured fauna shall be transported to a veterinarian or recognised wildlife carer immediately for treatment;
- In areas where significant species have been identified or their habitat is present, fauna spotter catchers must inspect and remove any fauna from gathering line and trunkline trenches twice daily (early morning and late afternoon) every day while the trenches are open and have access to the site in all weather. In all other areas fauna spotter catchers shall inspect trenches at least once daily;
- Additional measures in relation to the trenches and preventing fauna entrapment should be detailed in the Site Based Environmental Management Plan (SBEMP). They include providing exit ramps for fauna and shelter such as hessian sacks soaked in water;
- Prior to backfilling of any open trench site personnel will check the open trench for trapped fauna and where required a fauna spotter catcher will be called to move any fauna to a safe location away from the trench;
- All recorded sightings and relocation of the Brigalow Scaly Foot will be reported to DSEWPC and DERM as part of the project reporting;
- Dust suppression measures will be implemented to minimise dust deposition in habitat areas;
- In areas where mulching of cleared vegetation for distribution during rehabilitation may not be undertaken, vegetation shall be stick raked into piles to provide fauna habitat;
- Vehicle activities should be restricted to roads, access tracks and hardened surfaces to reduce potential impacts to threatened species;
- Fire management measures shall take into account the need to protect remnant vegetation from frequent and hot fires. On site fire management practices shall be in accordance with Contractor HSSE requirements, relevant construction permits and method statements and appropriate dedicated fire fighting equipment will be available at high risk construction sites to manage any fires that may start up and to avoid wildfires breaking out; and
- Should non-compliance with the mitigation measures or management strategies outlined in this SSMP occur on site an investigation shall be undertaken by all responsible parties followed by corrective action procedures if required. Work in the area will cease at the time of the non compliance if the incident is deemed significant by the site Environment Representative. DSEWPaC will be notified within 24 hours of detection of a non-compliance relating to the Brigalow Scaly Foot.

Rehabilitation and Recovery

- Post construction rehabilitation to include distribution of mulched vegetation across cleared areas, or non mulched vegetation to be stick racked into piles to assist with habitat recovery. Natural revegetation of areas to follow.
- Fauna habitat to be created where possible as part of rehabilitation of cleared areas, particularly in areas where Brigalow Scaly Foot is identified. To include replacement of habitat logs, rocks and other natural features.

Performance Measures

A pre-clearance survey will be undertaken to identify the presence / absence of the Brigalow Scaly Foot and its

SSMP4 – *Paradelma orientalis* (Brigalow Scaly-Foot)
suitable micro-habitat features. Any open trenches or other excavations will be inspected twice daily to detect entrapped skinks.
Monitoring
In areas where the Brigalow Scaly Foot is likely to be present, fauna spotter catchers must monitor clearing works at all times.

Summary

The terrestrial fauna and habitat values of the Woleebee Creek to Glebe Pipeline study area have been assessed through a comprehensive review of existing information and an intensive field survey.

This report has identified the following primary impacts associated with construction and operation of the proposed pipeline:

- Clearing of a maximum of 20.81a (referred alignment) or 18.53ha (alternative alignment) of remnant vegetation which comprises habitat for native fauna; and
- Potential impacts on habitat for five EVNT fauna species either recorded in surveys of the study area or considered to have a high likelihood of occurrence.
- Potential impacts on four species listed under the EPBC Act, although impacts are likely to be very minor in nature for three of those species. A conservative approach has been adopted and impact assessments completed for these species.

Proposed mitigation measures for impacts to vertebrate fauna include:

- Implementation of Significant Species Management Plans for species with a high likelihood of occurrence within the easement;
- Preparation of a DERM Species Management Program – Tampering with the Breeding Place of a Protected Animal Species;
- Preparation of a Rehabilitation and Revegetation Plan which considers targeted restoration of some Regional Ecosystem Tyoes and natural revegetation of all other impact areas outside the operational easement;
- Monitoring of open trenches during the construction period. Trenchfall represents the major potential threat to a range of EVNT reptile species known or highly likely to be present in the study area as well as a threat to a diverse array of Least Concern fauna species;
- Use of minimum clearing widths in areas of remnant vegetation which supports fauna habitat of the highest quality;
- Investigation into use of HDD techniques to avoid impacts on major watercourses (e.g. Juandah Creek). Major watercourses make a significant contribution to landscape connectivity for fauna.

A review of relevant desktop data and completion of field surveys indicates that 12 EVNT species and 12 migratory species are considered to have a moderate to high likelihood of occurrence within the proposed pipeline corridor or have already been recorded along the alignment. Of those species, seven EVNT species have been identified as having the potential to be adversely impacted by the proposed works, namely:

- Glossy Black Cockatoo (Vulnerable, NCA);
- Squatter Pigeon (Vulnerable, NCA/EPBC);
- Large-eared Pied Bat (Vulnerable, NCA/EPBC);
- South-eastern Long-eared Bat (Vulnerable, NCA/EPBC);
- Little Pied Bat (Near-threatened, NCA);
- Brigalow Scaly-foot (Vulnerable, NCA/EPBC); ; and
- Golden-tailed Gecko (Near-threatened, NCA) .

Impacts on these species have been carefully considered against statutory guidelines and it is considered that, with implementation of appropriate strategies, the project will be unlikely to result in significant impacts on the viability of affected populations.

A precautionary approach has been adopted and a detailed assessment of potential impacts is provided for those EPBC Act listed species considered to be likely to occur or which may occur within the pipeline easement and may be impacted by the project, these species are:

- Squatter Pigeon;
- Large-eared Pied Bat;
- South-eastern Long-eared Bat; and
- Brigalow Scaly-foot.

The assessment of potential impacts to these values found that, in many instances, impacts will be minimal and /or of limited intensity and duration. A suite of mitigation measures for the project has been proposed in keeping with best management practices. With the successful implementation of the recommended mitigation measures, it is considered that the impact of the project on terrestrial native fauna will be of low overall significance.

Appendix E Species management program for tampering with animal breeding places

SunWater – Woleebee Creek to Glebe Weir Pipeline

Species management program for tampering with animal breeding places

Under Section 88 of the *Nature Conservation Act 1992* and Section 332 of the *Nature Conservation (Wildlife Management) Regulation 2006*

25/03/2013

Revision	Date	Description	Prepared	Reviewed	Approved		
					Study Manager	Sign-off	Client
A	25/03/2013	Draft to SunWater	TC	JR	JR	JR	

Item	Page	Section	Comments

** Use after Rev. 0*

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1. SMP FOR LEAST CONCERN WILDLIFE

1.1 Scope of this species management program

The intention of this document is to have the Department of Environment and Heritage Protection (EHP) accept this to be an approved species management program (SMP) for least concern wildlife, with the exception of some specified least concern species, for the purposes of section 332 of the *Nature Conservation (Wildlife Management) Regulation 2006* (Wildlife Management Regulation).

This document provides a working arrangement for activities that may require the tampering with animal breeding places in a way that meets the legislative requirements of the *Nature Conservation Act 1992* (NCA). The species management program does not apply within a Forest Reserve or Protected Area prescribed under the NCA.

The species management program does not obviate the operation of any other legislation.

This SMP may only be applied by an entity that has obtained written approval from EHP to operate under this SMP (the approved entity).

1.2 Terms of the species management program

This authority does not prevent any reasonable action being taken to safeguard public and staff safety in an emergency situation. In an emergency situation, public and staff safety considerations will take precedence. Where possible, the approved entity will discuss options with EHP on a case-by-case basis by contacting the relevant Regional Team Leader Wildlife (EHP). The approved entity will notify in writing (via email) the relevant Regional Team Leader Wildlife (EHP) of actions taken under this clause within 48 hours.

The Chief Executive's approval of this SMP is valid and in effect until 30 June 2013, and thereafter expires. A review of the effectiveness and impact of the SMP will be undertaken by EHP before the expiry date.

The species management program is granted subject to compliance with the conditions provided in this document, and approval may be revoked by EHP at any time according to the following process:

a) EHP gives notices to the approved entity that the conditions of this document have not been complied with by the approved entity; and

b) The approved entity fails to rectify the breach within the time period specified by EHP, being at least 15 business days.

If tampering with an animal breeding place occurs in contravention of any conditions of the species management program, such taking or tampering is not approved.

1.3 Undertakings by the approved entity

The approved entity must:

Abide by the species management program conditions provided in this document to ensure protected wildlife and their respective breeding places are appropriately managed.

The approved entity must seek to achieve procedural uniformity across its organization in terms of understanding and implementation of the species management program across its operations.

The approved entity must commit to incorporating the species management program into contract specifications.

The approved entity will use its discretion to consult with EHP where it identifies breeding places of species that might have heightened community interest.

1.4 Conditions of the species management program

The species management program is subject to compliance with the conditions stated in this document.

The approved entity must maintain a register of tampering with animal breeding places (the register). For projects where the species management program applies, the register must record the number of obvious animal breeding places destroyed. Where the species management program does not apply, EHP's authority is required for tampering with breeding places.

The register must be made available to EHP upon request.

In relation to all new construction and maintenance activities undertaken in accordance with the species management program, the approved entity must minimize impacts on fauna by:

a) Inspecting trenches, culverts and other structures prior to works within an area to determine whether there are any trapped or injured native fauna species present and taking action as appropriate.

b) Where temporary fencing is required, giving consideration to fauna movement, current land uses and worker safety requirements.

c) Considering mechanisms to facilitate fauna movement through construction projects.

d) Educating staff, including contractors, in relation to the risks of fauna injury or deaths and how to management animals which are injured or displaced, including threatened species.

Subject to 2.1, prior consultation with EHP is required for interfering with breeding places for animals that are:

i) *special least concern animals* (as listed in the *Nature Conservation (Wildlife) Regulation 2006)*; or

ii) least concern (as listed in the *Nature Conservation (Wildlife) Regulation 2006)*, but are *colonial breeders*, and therefore whose populations are at greater risk from the impacts of single events.

Where there is a likely presence of protected species, the approved entity must notify the relevant regional EHP office (Team Leader Wildlife) and a suitably qualified and experienced person must be employed by the approved entity to undertake the field work required to identify potential, likely and known animal breeding places.

Disturbance of flying fox (grey-headed, spectacled, little red or black) camps (breeding places) is dealt with specifically in the NCA (s88c) and the Wildlife Management Regulation (s 181, 182 and 187A). This species management program does not authorise disturbance of flying fox breeding places. EHP must be contacted directly for any activity that may disturb such places.

For construction projects, the approved entity must:

a) Undertake a prior environmental assessment regarding animal breeding places. This assessment must be conducted by a suitably qualified and experienced person.

b) Where practicably safe, assess the value of permanent and temporary water sources as possible breeding habitat for aquatic wildlife including platypus, turtles, frogs and fish.

For maintenance activities an environmental assessment is not required. However where potential, likely or new animal breeding places are identified the approved entity will comply with the actions identified within Table 1 and details of the breeding place/s will be recorded in the register.

The following species management practices will be considered and, where practicable, will be applied to all activities independently or in combination to minimize disturbance to breeding animals and/or their young (higher order options are preferred):

a) Option 1: Avoid the need for tampering through concept phase assessment of animal breeding places and sympathetic consideration in planning and design (including route location)

b) Option 2: Avoid the need for tampering through operation timing (avoiding breeding seasons to allow young to mature and leave breeding places, delaying operations if breeding identified)

c) Option 3: Remove a breeding place without eggs or young (conditions apply)

d) Option 4: Remove a breeding place and place eggs/young with a wildlife carer (conditions apply)

e) Option 5: Remove a breeding place and destroy/terminate eggs (conditions apply)

Where the tampering with a known breeding place of a least concern species would also *take* protected wildlife, the approved entity must attempt to enlist the assistance of a licensed spotter-catcher and/or carer.

If it can be shown that the engagement of a spotter catcher was not practical and/or safe to do so, then a suitably qualified and experienced person must be engaged to facilitate any taking of wildlife for rehabilitation purposes and Table 1 must be complied with.

Where required, as determined by a suitably qualified and experienced person, the approved entity must provide the necessary support to allow for nest relocation, such as a substitute platform (there are existing successful examples for osprey and white-bellied sea-eagle).

Removal and relocation of nests must be undertaken by suitably qualified and experienced persons and advice sought where necessary.

Large mature trees must be retained to provide wildlife habitat unless their removal is warranted for safety or maintenance reasons. Trees, particularly for *Eucalypt* and *Corymbia* species, often have hollows that are valuable habitat for glider, bird and bat species.

The approved entity must engage a suitably qualified and licensed wildlife carer to incubate all eggs removed and to raise young animals, where the removal of eggs/animals is required. The decision to rehabilitate an animal must consider the ability for it to be successfully released and availability of appropriate natural habitat within the vicinity of where the animal was found.

The approved entity must record details of animal breeding places in the field into the register.

Animal species prescribed as 'extinct in the wild', 'endangered', 'vulnerable', 'rare' or 'near threatened' under the Wildlife Regulation are not subject to this Species Management Program.

Table 1-1 Authorised species management actions with respect to animal breeding places

Species group	Breeding place status	Action
Least concern – special least concern or colonial breeding	All	Consult with EHP. Specific authority to take[#] is required (damage mitigation permit or approved species management program).

Other least concern species	Contains young or eggs	Avoid unnecessary disturbance. Breeding place may be removed and eggs/young handed over to a licensed wildlife carer. It is preferable to allow eggs to hatch and/or young to mature and move away from a breeding place. As a last resort, eggs may be destroyed°.
Other least concern species	No eggs or young	Proceed with caution. Remove breeding place if applicable.

Table Notes:

[#] Where the removal or translocation of wildlife is required, the 'take' must be facilitated by a suitably licensed and experienced person.

° There are two acceptable methods for destroying or terminating eggs: quickly breaking an egg and crushing its contents; or reducing the temperature of the egg to less than 4 degrees C for at least 4 hours.

1.5 Recitals

Under the *Nature Conservation Act 1992 section 88* – a person must not take, keep or use a protected animal other than under some form of authorisation, such as a licence or permit or under a conservation plan. A defence to taking is provided by the Act where:

a) the taking happened in the course of a lawful activity that was not directed towards the taking; and

b) the taking could not have been reasonably avoided.

Nature Conservation (Wildlife Management) Regulation 2006 section 332 – Tampering with animal breeding place.

1) A person must not, without a reasonable excuse, tamper with an animal breeding place that is being used by a protected animal to incubate or rear the animal's offspring.

Maximum penalty—165 penalty units.

2) For subsection (1), an animal breeding place is being used by a protected animal to incubate or rear the animal's offspring if—

a) the animal is preparing, or has prepared, the place for incubating or rearing the animal's offspring; or

b) the animal is breeding, or is about to breed, and is physically occupying the place; or

c) the animal and the animal's offspring are physically occupying the place, even if the occupation is only periodical; or

d) the animal has used the place to incubate or rear the animal's offspring and is of a species generally known to return to the same place to incubate or rear offspring in each breeding season for the animal.

3) It is a reasonable excuse for a person to tamper with the breeding place if—

a) the tampering happened in the course of a lawful activity that was not directed towards the tampering; and

b) the tampering could not have been reasonably avoided.

4) Also, subsection (1) does not apply to a person removing or otherwise tampering with the breeding place if—

a) the removal or tampering is part of an approved species management program for animals of the same species; or

b) the person holds a damage mitigation permit for the animal and the permit authorises the removal or tampering.

2. SMP FOR EVNT SPECIES AND COLONIAL BREEDERS

2.1 SCOPE OF THIS SPECIES MANAGEMENT PROGRAM

This Tampering with Animal Breeding Places Management Program (Management Program) documents the principles and mitigation practices under which SunWater may tamper with protected (other than Least Concern) animal breeding places when carrying out authorised activities for the Woleebee Creek to Glebe Weir Project.

This Management Program has been prepared to mitigate impacts on animal (other than Least Concern species) breeding places for approval under Section 88 of the *Nature Conservation Act 1992* and Section 332 of the *Nature Conservation (Wildlife Management) Regulation 2006*.

2.2 RELEVANT SPECIES

This Management Program addresses the tampering with animal breeding places of species known or likely to be present associated with the Woleebee Creek to Glebe Weir Project, that are:

- 'Extinct in the Wild', 'Endangered', 'Vulnerable' or 'Near Threatened' (EVNT) as listed under Schedules 2, 3 and 5 of the *Nature Conservation (Wildlife) Regulation 2006* respectively (EVNT Species)
- 'Special Native' animals as listed under Schedule 4 of the *Nature Conservation (Wildlife Management) Regulation 2006*
- 'Special Least Concern' animals as listed under Section 34(3) of the *Nature Conservation (Wildlife) Regulation 2006*
- 'Colonial breeders', a group of animals of the same kind co-existing in close association for breeding purposes.

2.3 Term of Approval

This term of approval sought for this Management Program will be 3 years from date of approval. This Management Program will be incorporated into relevant contractual documents and specifications for the Project.

2.4 Subsequent Updates to the Program

This Management Program has been developed on the basis of field studies completed for the Project. This Management Program will be updated if an as required (if additional species are detected) and approval sought from the Department of Environment and Heritage Protection (DEHP) for the latest revision prior to interfering with the breeding places of listed EVNT species, Special animals and Colonial Breeder species on additional pipeline sections.

2.5 Breeding Place and Habitat Information

A review of relevant desktop data and completion of field surveys indicates that 12 EVNT species and 12 migratory species are considered likely to or may occur within the proposed pipeline corridor or have already been recorded. These species are assessed individually below with reference to potential for adverse impact. Some EVNT species are also Migratory species, in which case they are only assessed once below.

Of those species, 7 EVNT or Migratory species have been identified as having the potential to be adversely impacted by the proposed works, these species are:

- Glossy Black Cockatoo (V;NCA);
- Squatter pigeon (V; EPBC);
- Little Pied Bat (NT; NCA);
- South-eastern Long-eared Bat (V; EPBC);
- Large-eared Pied Bat (V; EPBC);
- Brigalow Scaly-foot (V; EPBC); and
- Golden-tailed Gecko (NT;NCA).

A range of potential breeding places occurs within the pipeline Right of Way (ROW), these are described briefly as follows:

- Hollow bearing trees and stags - Within the ROW a number of hollow bearing trees were observed. These were generally recorded within a limited number of remnant regional ecosystems (REs), being predominantly woodlands. Occasional paddock trees also occur.
- Decorticating bark – trees with loose bark provide breeding sites for a range of reptiles species.
- Wetlands - Wetland and gilgai areas provide potential breeding places for a number of wetland bird species and frogs, including migratory species that may not be present year round.
- General breeding places - Several bird species potentially occurring within the ROW have less specific nesting requirements using live trees within a broad range of regional ecosystemsm regrowth vegetation and scattered paddock trees.

2.6 Species Management Principles

The following management principles describe the broad objectives and scope in the project's planning and construction phases:

- Identify the presence of protected animal species, presence of their habitat and any breeding places (active and otherwise) prior to clearing activities to avoid and/or mitigate impacts to threatened species in a pre-clearance survey.
- Avoid tampering of animal breeding places through route assessment and refinement.
- Ensure fauna handling is undertaken by a qualified and experienced spotter-catcher operating under a Rehabilitation Permit.

- Salvage, relocate and replace active animal breeding places where confirmed threatened species are present and clearing of potential habitat for threatened species.

2.7 Management Practices

The following species management practices and actions outlined in Table 6.1 below will be adhered to if a breeding place of any protected EVNT or special least concern/native or colonial breeder is encountered along the pipeline ROW prior to or during construction activities.

Specific management practices, according to the species management principles for tampering with animal breeding places, are organised into:

- prior to clearing (planning, development and decommissioning phase)
- during (and/or after) clearing (construction phase).

Table 2-1 Management Actions for EVNT, Special Least Concern and Colonial Breeders

Species Group	Project Phase	Management Action

EVNT species	Prior to clearing	• Undertake a pre-clear and grade walkthrough prior to clearing by a 'suitably qualified person' such as an Environmental Advisor/Ecologist to:
		  • Identify and mark active breeding place locations including checking of hollow bearing trees and logs
		  • Identify significant hollow bearing trees and logs for salvaging
		  • Mark/Flag significant hollow bearing trees and logs for relocation (as direct mitigation for removal of active breeding places of species by a fauna spotter catcher in accordance with clearing requirements for fauna handling)
		  • Relocate recoverable inactive breeding places (with evidence of recent occupation) to a suitable place within adjacent undisturbed habitat
		  • Identify areas for relocation of (and salvaged) significant hollow bearing trees and logs and potential sites for (replacement/supplementation) nest boxes
		  • Identify requirement to engage a fauna spotter-catcher pre-clearing.
		<u>Education</u>
		• Train staff (e.g. site induction, toolbox talks) involved in pre-clear and grade walkthroughs about wildlife that may be encountered, their role, what will be done including monitoring and reporting and penalties for non-compliance with this Management Program.
		•
		<u>Active Nests</u>
		• If identified, establish and mark out a buffer as directed by the Environmental Advisor. Clearing activities must not occur within the buffer zone around the nest until the breeding place (and any associated

Species Group	Project Phase	Management Action

		young or eggs) are protected.
		• If identified as potentially suitable for EVNT species or EVNT species are present, the Environmental Advisor is to determine whether the active nest is to be relocated (within the trench footprint) or left *in situ* (outside the trench footprint) to allow the breeding cycle to occur (i.e. young have fully fledged or left the breeding place).
		•
		<u>Breeding Places with eggs or young (other than Active Nests)</u> e.g branches, forks, foliage, hollows, under peeling bark of trees/shrubs; earthen banks; leaf litter/ground debris; logs; under rocks; burrows)
		• If identified, mark out a buffer as directed by the Environmental Advisor. Clearing activities must not occur within the buffer zone around the breeding place until the breeding place (and any associated young or eggs) are managed.
		• If identified as potentially suitable for EVNT species, or EVNT species are present, the Environmental Advisor is to determine whether it can be relocated or left *in situ* to allow the breeding/maturing cycle to occur of occupied species.
		
		<u>Salvage and Relocate, and Replace animal breeding places</u>
		• Stockpile a range of manufactured nest boxes and bat houses and suitable construction material for creating artificial borrows specific to the requirements of the threatened species whose potential habitat is to be cleared, in particular:
		  • Birds
		  • Butterflies
		  • Micro-bats and Flying foxes
		• Install man-made breeding places within the surrounding vegetation as determined by the Environmental Advisor to replace directly impacted (active) breeding places. These breeding places will be of an appropriate size to cater for displaced affected breeding fauna and made out of long lasting materials.
		Retain breeding places for 3 years or as specified by the Environmental Advisor.
		
		<u>Reporting and Monitoring</u>
		• Report and monitor the tampering with animal breeding places undertaken prior to clearing in accordance with Section 2.8.

	During and/or after clearing	• Clear in a sequential manner to ensure wildlife is directed towards adjacent habitat and not across roads or into other areas of threat (e.g. trench). • Ensure a qualified fauna spotter-catcher is available during all clearing

Species Group	Project Phase	Management Action

		activities for all fauna handling and to guide Environmental Advisors.
		• Where threatened fauna potential habitat is being cleared, ensure the fauna spotter-catcher handles EVNT fauna in accordance with a current and relevant Rehabilitation Permit and complies with (at minimum) the:
		  • Welfare and Safe handling procedures consistent with the Policy and Procedure Statement *No. 9 Policy for the Translocation of Threatened Fauna in New South Wales* (NPWS, 2001)
		• Where wildlife carers are utilised during clearing activities, the rehabilitation of animal species must be in accordance with the requirements of the:
		  • Code of Practice for the Welfare of Wildlife During Rehabilitation (DPI Victoria, 2001)
		  • Code of Practice – Care of orphaned, sick or injured protected animals by wildlife care volunteers (DEHP Queensland, 2010)
		• If any animals are injured take them to nearest wildlife facility or vet. Animal transport shall be the responsibility of the Environmental Advisor or a suitably qualified person nominated by the spotter-catcher.
		• Notify DEHP Wildlife Rangers of injured ENVT species in the course of clearing activities.
		<u>Active Nests</u>
		• If identified, establish and mark out a buffer as directed by the Environmental Advisor. Clearing activities must not occur within the buffer zone around the nest until the breeding place (and any associated young or eggs) are managed.
		• If identified as potentially suitable for EVNT species or EVNT species are present, the Environmental Advisor is to determine whether the active nest is to be relocated (within the trench footprint) or left *in situ* (outside the trench footprint) to allow the breeding cycle to occur (i.e. young have fully fledged or left the breeding place).
		• Where an active nest is identified during clearing and is recoverable, the order of preference in taking of active nests with young or eggs is to:
		  1. Relocate the active nest to adjacent undisturbed habitat and monitor the active nest to determine a return by breeding individuals.
		  2. Remove active nest and place young or eggs in the care of a wildlife carer until ready for release to the wild. Once ready, release individuals within proximity to their original point of capture within its natural habitat and within similar habitat from which they were collected.
		  Recycle active nest to adjacent habitat and position appropriately to minimise artificial breeding place supplementation.
		  3. Where an active nest is irrecoverable during clearing, and it contains survived young or un-damaged eggs following clearing, the spotter-catcher is to place young or eggs in the care of a wildlife carer until

Species Group	Project Phase	Management Action
		ready for release to the wild. <u>Breeding Places with eggs or young (other than Active Nests)</u> • Where surviving young mammals / reptiles or reptile eggs are recoverable during clearing, the order of preference in taking of breeding places (other than active nests) with eggs or young is to (where possible): 1. Capture young mammals and relocate to man-made breeding places (1:1 ratio) constructed within similar microhabitats outside of the disturbance area but within the vicinity of where the animals were collected. • If young reptiles, capture and relocate to adjacent undisturbed habitat with essential microhabitat features. 2. Place young mammals, if a welfare assessment finds the survival of the individual is threatened, or reptile eggs in the care of a wildlife carer until ready for release to the wild. • <u>Salvage and Relocate, and Replace animal breeding places</u> • Where significant hollow bearing trees and logs have been identified for salvage, relocate these to nearby, undisturbed habitat. • Install man-made breeding places within the surrounding vegetation as determined by the Environmental Advisor to replace directly impacted breeding places: • During clearing based on advice from the spotter-catcher or • Prior to next breeding season, whichever is more appropriate for the reproductive success of the displaced fauna species. <u>Reporting and Monitoring</u> • Report and monitor the tampering with animal breeding places undertaken during clearing in accordance with Section 2.8.
Special Least Concern, Special Native, Animals and Colonial Breeders	Prior to clearing	• Undertake pre-clear and grade walkthrough prior to clearing by an Environmental Advisor to: • Identify and mark active breeding place locations including checking of hollow bearing trees and logs • Identify significant hollow bearing trees and logs for salvaging • Mark/Flag significant hollow bearing trees and logs for relocation • Relocate recoverable inactive breeding places (with evidence of recent occupation) to a suitable place within adjacent undisturbed habitat • Identify areas for relocation of (and salvaged) significant hollow bearing trees and logs and potential sites for (replacement/supplementation) nest boxes

Species Group	Project Phase	Management Action
		• Identify requirement to engage a fauna spotter-catcher pre-clearing. <u>Education</u> • Train staff (e.g. site induction, toolbox talks) involved in pre-clear and grade walkthroughs about wildlife that may be encountered, their role, what will be done including monitoring and reporting and penalties for non-compliance with this Management Program. <u>Active Breeding Places</u> • If identified, establish and mark out a buffer as directed by the Environmental Advisor. Clearing activities must not occur within the buffer zone around the nest until the breeding place (and any associated young or eggs) are protected. • If identified as potentially suitable for special or colonial breeder species or such species are present, the Environmental Advisor is to determine whether the active breeding place is to be relocated or left *in situ* to allow the breeding cycle to occur. • Report and monitor the tampering with animal breeding places undertaken prior to clearing in accordance with Section 2.8.

	During and/or after clearing	• Clear in a sequential manner to ensure wildlife is directed towards adjacent habitat and not across roads or into other areas of threat (e.g. trench).
		• Ensure a spotter-catcher, operating under a current relevant Rehabilitation Permit, is available during all clearing activities.
		• Fauna handling of special and colonial breeder species is to be in accordance with a current and relevant Rehabilitation Permit to, wherever possible, ensure the success of wildlife rehabilitation. As a minimum fauna handling is to comply with:
		  • Welfare and Safe handling procedures consistent with the Policy and Procedure Statement *No. 9 Policy for the Translocation of Threatened Fauna in New South Wales* (NPWS, 2001).
		• Wildlife carers utilised in the rehabilitation of animal species are to meet, at minimum, the requirements of the:
		  • Code of Practice for the Welfare of Wildlife During Rehabilitation (DPI Victoria, 2001)
		  • Code of Practice – Care of orphaned, sick or injured protected animals by wildlife care volunteers (DEHP Queensland, 2010)
		• If any animals are injured take them to nearest wildlife facility or vet. Animal transport shall be the responsibility of the spotter-catcher or a suitably qualified person nominated by the spotter-catcher.
		• Notify DEHP Wildlife Rangers of injured special or colonial breeding

Species Group	Project Phase	Management Action
		species in the course of clearing activities. • Where an active breeding place is recoverable: 1. Relocate the active breeding place to adjacent undisturbed habitat and monitor the active nest to determine a return by breeding individuals. 2. Place young or eggs in the care of a wildlife carer until ready for release to the wild. • If an active breeding place is irrecoverable and removal of young / eggs is required after clearing, the spotter-catcher is to take surviving young / eggs and (in order of preference): 1. Install man-made breeding places within the surrounding vegetation as determined by the Environmental Advisor and relocate young or eggs, and monitor to determine a return by breeding individuals over 72 hours. 2. Place orphaned young or eggs in the care of a wildlife carer until ready for release to the wild. • Report and monitor the tampering with animal breeding places undertaken during clearing in accordance with Section 2.8.

2.8 Reporting and Monitoring

SunWater will maintain a register of tampering with animal breeding places that may occur under this Management Program, as informed by the spotter-catcher.

The register will include as a minimum the following details:

- Date and time
- Location (GPS Point, Lot and Plan)
- Activity that was occurring
- Authorised person that undertook the tampering
- Species tampered with
- Details of tampering (e.g. relocation of vacant nest)
- Wildlife carer details (where relevant)
- Justification for tampering

Where an animal breeding place has been removed and relocated to an adjacent area of habitat, monitoring will be undertaken by a suitably qualified person to determine the outcomes and success of this measure. Monitoring will occur within one month from the relocation and then based on the particular species, during the time of year when eggs/young are likely to be present. Results of monitoring will be maintained by SunWater or an environmental advisor and can be provided to DEHP/DSEWPAC upon request.

Periodic monitoring of nest boxes / alternative (man-made) breeding places, at regular intervals to evaluate the success or otherwise of artificial breeding habitat, will be undertaken for the Term of Approval of this Management Program and results recorded.

3. Definitions

animal breeding place means—

a bower, burrow, cave, hollow, nest or other thing that is commonly used by the animal to incubate or rear the animal's offspring'.

for a koala – a non-juvenile koala habitat tree located within a bushland habitat that is known or likely to contain koalas.

approved species management program means—

For a species of animal, means a program about managing the population and habitat of the species of animal that is approved by the EHP chief executive.

bushland habitat means—

(a) an area that is mapped as bushland habitat on the maps of South East Queensland Koala Protection Area Koala Habitat Values; or

(b) an area:

(i) that is either:

(A) greater than two hectares in size; or

(B) less than two hectares in size but is within 50 metres of surrounding bushland habitat; and

(ii) that is characterised by intact contiguous native vegetation and may include remnant and non-remnant or regrowth vegetation; and

(iii) that has a land cover composition of predominantly forest ranging from closed canopy to open woodland; and

(iv) that contains an assortment of eucalypt species used by koalas for food, shelter, movement and dispersal; and

(v) that is not a plantation forest.

colonial breeders means—

a group of animals of the same kind co-existing in close association for breeding purposes.

construction includes—

each of the following for the infrastructure, to the extent it involves the development of the infrastructure –

(a) initial construction (including field investigations and surveys);

(b) improvement of its standard;

(c) realignment;

(d) widening;

(e) extension to infrastructure or associated assets.

koala habitat tree is—

a) a food tree of the *Corymbia, Melaleuca,* or *Lophostemon* or *Eucalyptus* genera; and

b) a preferred shelter species such as *Angophora*.

licensed wildlife carer means—

A person qualified to take and keep protected wildlife under a current rehabilitation permit in accordance with the *Nature Conservation (Administration) Regulation 2006*.

maintenance includes—

(a) rehabilitation; and

(b) replacement; and

(c) repair; and

(d) recurrent servicing; and

(e) preventative and remedial action; and

(f) removal; and

(g) alteration.

non-juvenile koala habitat tree—

is a koala habitat tree that has a height of more than four metres, or a trunk with a circumference of more than 31.5 centimetres at 1.3 metres above the ground, or both.

special least concern animal means the following—

(a) the koala (*Phascolarctos cinereus*);

(b) the echidna (*Tachyglossus aculeatus*);

(c) the platypus (*Ornithorhynchus anatinus*);

(d) a least concern bird to which any of the following apply—

(i) the agreement called 'Agreement Between the Government of Australia and the Government of Japan for the Protection of Migratory Birds and Birds in Danger of Extinction and their Environment' and signed at Tokyo on 6 February 1974;

(ii) the agreement called 'Agreement Between the Government of Australia and the Government of the People's Republic of China for the Protection of Migratory Birds and their Environment' and signed at Canberra on 20 October 1986;

(iii) the convention called 'Convention on the Conservation of Migratory Species of Wild Animals' and signed at Bonn on 23 June 1979.

suitably qualified and experienced means—

A person with formal qualifications and/or experience in fauna identification and life ecology and environmental management. A person is considered to be suitably qualified and experienced if they meet one or more of the following criteria:

- An ecological consultant with experience in conducting fauna surveys;

- A person who possesses a degree in natural science or similar with experience in conducting fauna surveys;

- A person who is a spotter-catcher under a rehabilitation permit issued under the *Nature Conservation Act 1992;*

- A person who can demonstrate significant experience in the removal of trees and spotting for wildlife to ensure they are not harmed during vegetation clearing.

spotter-catcher means—

A person qualified to take and keep protected wildlife under a current rehabilitation permit extended to authorise the take, keep or use of an animal whose habitat is about to be destroyed by human activity in accordance with the *Nature Conservation (Administration) Regulation 2006*.

tamper means—

Tamper with an animal breeding place, means damage, destroy, mark, move or dig up the breeding place.

take includes—

(a) in relation to an animal -

(i) hunt, shoot, wound, kill, skin, poison, net, snare, spear, trap, catch, dredge for, bring ashore or aboard a boat, pursue, lure, injure or harm the animal; or

(ii) attempt to do an act mentioned in subparagraph(i).

4. DEHP contacts (wildlife rangers)

Table 4-1 – DEHP Contacts

EHP	Office	Phone number
Northern region	Team Leader Wildlife	4796 7792
	Atherton	4091 1844
	Cairns	4047 9615
	Townsville	4796 7777
Central region	Team Leader Wildlife	4936 0529
	Airlie Beach	4967 7355
	Charleville	4654 1255
	Longreach	4652 7333
	Mackay	4944 7800
	Rockhampton	4936 0511
	Roma	4624 3539

EHP	Office	Phone number
Southern region	Team Leader Wildlife	5520 9620
	Bundaberg	4131 1600
	Burleigh	5520 9600
	Daisy Hill	3290 9110
	Gympie	5480 5443
	Maroochydore	5459 6110
	Maryborough	4121 1800
	Moggill	3202 0296
	Toowoomba	4699 4333