Construction Environmental Management Plan

Project: Keepit Dam Work Package 2 - Post Tensioning Works
Location: Keepit Dam, Namoi River, Northern NSW
Client: WaterNSW
Contract: 04532F31

QCSE Quality Certified System ISO 9001

QCSE Environmental Certified System ISO 14001

QCSE Safety Certified System AS/NZS 4801 OHSAS 18001

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Construction Environmental Management Plan

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REVIEWED: Date: 22 - 2 - 19

Louise Pitt

QSE Advisor

ACCEPTED: Date: 26 - 2 - 19

(for release) Sam Pearce

Project Manager

Revision history

Revision	Date	Description	Approval
Draft	13/11/16	Issued to SRG for review	-
0	21/11/16	Issued to SRG for review	A McFarlane
1	21/12/16	Issued to WaterNSW and EMR for review	A McFarlane
2	16/01/17	Updated to address WaterNSW and EMR comments	A McFarlane
3	4/2/17	Updated to address WaterNSW and EMR comments	A McFarlane
4	10/2/17	Issued to stakeholders and DPE for review	A McFarlane
5	6/4/17	Updated to address DPE comments	A McFarlane
6	23/02/18	Annual Review – Current Policy Included	A McFarlane
7	25/4/17	Revised to address DPE minor comments issued 13 April 2017 in approving the CEMP and subplans.	A McFarlane
8	14/11/18	Updated in accordance with EMR audit	A McFarlane
9	22/02/19	Project Manager details updated	Sam Pearce

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- Appendix A - Compliance Tracking Program
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Glossary

Term	Definition
CEMP	Construction Environmental Management Plan
CCLG	Community Construction Liaison Group
CoA	Conditions of Approval
CTP	Compliance Tracking Program
DPE	Department of Planning and Environment
DPI	NSW Department of Primary Industries
DPI Water	Department of Primary Industries Water (formerly NSW Office of Water (NOW))
EA	Environmental Assessment
EMS	Environmental Management System
Environmental aspect	Defined by AS/NZS ISO 14001:2004 as an element of an organisation's activities, products or services that can interact with the environment.
Environmental impact	Defined by AS/NZS ISO 14001:2004 as any change to the environment, whether adverse or beneficial, wholly or partially resulting from an organisation's environmental aspects.
Environmental objective	Defined by AS/NZS ISO 14001:2004 as an overall environmental goal, consistent with the environmental policy, that an organisation sets itself to achieve.
Environmental policy	Statement by an organisation of its intention and principles for environmental performance.
EP&A Act	*Environmental Planning and Assessment Act 1979*
EP&A Regulation	*Environmental Planning and Assessment Regulation 2000*
EPA	Environment Protection Authority
EPBC Act	*Environment Protection and Biodiversity Conservation 1999*
EMR	Environmental Management Representative
FFMP	Construction Flora and Fauna Management Plan
HRMP	Construction Hazard and Risk Management Plan
LGA	Local Government Area
NGER	National Greenhouse and Energy Reporting
NVMP	Construction Noise and Vibration Management Plan
Non-compliance	Failure to comply with the requirements of the Project approval or any applicable license, permit or legal requirements.
NPI	National Pollutant Inventory
NPW Act	*National Parks and Wildlife Act 1974*
NSW	New South Wales
OEH	Office of Environment and Heritage
POEO Act	*Protection of the Environment Operations Act 1997*
Project, the	Keepit Dam Work Package 2 – Post Tensioning Works
Secretary	Secretary of Planning and Environment (formerly Director-General of Planning)
SoC	Statement of Commitments

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Term	Definition
SRG	SRG Limited
SWMP	Construction Soil and Water Management Plan
TMP	Traffic Management Protocol
TSC Act	*Threatened Species Conservation Act 1995*
WaterNSW	Water New South Wales

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1. Introduction

1.1. Background

Keepit Dam is situated on the Namoi River, 13 kilometres upstream of its confluence with the Peel River in the north-west of NSW.

The NSW Dams Safety Committee requires that Keepit Dam be upgraded to be able to safely pass the probable maximum flood and to withstand earthquake events. WaterNSW is therefore undertaking dam safety upgrade works to Keepit Dam to comply with the requirements of the NSW Dams Safety Committee.

The *Keepit Dam Upgrade Environmental Assessment* (PB, 2007) (Environmental Assessment or EA) was prepared to identify and assess the potential environmental impacts associated with the proposal to upgrade Keepit Dam to meet necessary dam safety requirements. The *Keepit Dam Upgrade Submissions Report and Preferred Project Report* (PB, 2008) (Submissions Report) was then prepared to outline the responses to submissions received on the project, as well as to provide a review of the Environmental Assessment and details of additional investigations and project information since exhibition. The Submissions Report also included the final Statement of Commitments (SoC).

The proposal was assessed and approved by the (then) Department of Planning under the former Part 3A provisions of the *Environmental Planning and Assessment Act 1979* in April 2009. A referral under the *Environment Protection and Biodiversity Conservation Act 1999* was submitted to the (then) Commonwealth Department of Environment and Water Resources to seek approval for the necessary vegetation clearing. This approval was granted in January 2010.

WaterNSW has adopted a two-stage approach to upgrading Keepit Dam:

- Stage 1 - Construction of two fuse plug spillways – completed in 2011.
- Stage 2 - Electrical relocation, post tensioning of the main dam wall and raising of the dam concrete monoliths and the main embankment.

The Stage 2 works have been procured into three separate contract work packages, these being:

1. Electrical relocation works - completed in 2015.
2. Post tensioning the main dam wall.
3. Raising of the dam concrete monoliths and main embankment.

Stage 1 works involving construction of the two fuse plug spillways, was completed in 2011.

This CEMP has been prepared for the Stage 2, Work Package 2 - Post tensioning works on the main dam wall, and has been developed in accordance with the best practice guideline *Guideline for the Preparation of Environmental Management Plans* (DIPNR, 2004).

1.2. Purpose of this CEMP

This CEMP and sub plans have been prepared to comply with the conditions of the Project Approval for the Keepit Dam upgrade Project. A detailed description of the Project is provided in Section 2.

The purpose of this CEMP is to provide a structured approach to the management of environmental issues during construction of the Project. Implementing this CEMP effectively will ensure that the Project team meets regulatory and policy requirements in a systematic manner and continually improves its performance.

In particular, this CEMP:

- Describes the Project in detail including activities to be undertaken and relative timing.
- Provides specific mitigation measures and controls that can be applied on-site to avoid or minimise negative environmental impacts.

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- Provides specific mechanisms for compliance with applicable policies, approvals, licences, permits, consultation agreements and legislation.
- Describes the environmental management related roles and responsibilities of personnel.
- States objectives for issues that are important to the environmental performance of the Project.
- Outlines a monitoring regime to check the adequacy of controls as they are implemented during construction.

This CEMP meets the requirements of condition 6.2 of the Project Approval. The relevant requirements stipulated by the Conditions of Approval are detailed in Table 1-1.

Table 1-1 Conditions of Approval relevant to the preparation of the CEMP

CoA	Condition	Where addressed in CEMP
6.2	The Proponent shall prepare and implement a Construction Environmental Management Plan to outline environmental management practices and procedures to be followed during construction of the project. The CEMP shall be consistent with *Guideline for the Preparation of Environmental Management Plans* (DIPNR 2004) and shall include, but not necessarily be limited to:	This document and Appendix B
6.2a)	A description of all relevant activities to be undertaken on the site during construction and confirm the use of either earthen release plugs only or earthen release plugs and release gates for the project and the conditions under which they operate;	Section 2 of this plan. Note release mechanism not relevant to this stage of the project.
6.2b)	Statutory and other obligations that WaterNSW is required to fulfil during construction including all relevant approvals, consultations and agreements required from authorities and other stakeholders, and key legislation and policies;	Section 3 of this plan and Section 2 of all sub plans.
6.2c)	Details of how the environmental performance of the construction works will be monitored, and what actions will be taken to address identified potential adverse environmental impacts. In particular, the following environmental performance issues shall be addressed in the plan.	Section 8 of this plan and within all sub plans.
6.2 c) i)	Measures to monitor and manage dust emissions.	Air Quality Management Plan
6.2 c) ii)	Measures to monitor and minimise soil erosion and the discharge of sediment and other pollutants to lands and / or waters during construction.	Soil and Water Management Plan
6.2 c) iii)	Measures to monitor and control noise emissions during construction works.	Noise and Vibration Management Plan
6.2 c) iv)	Measures to monitor and control air emissions during construction to ensure air emissions are both minimised and in compliance with the requirements of the CoA and the Environment Protection Licence for the site.	Air Quality Management Plan
6.2 c) v)	Measures to minimise the impact of construction on local flora and fauna, consistent with the mitigation measures described in section 5.1.3 of EA.	Flora and Fauna Management Plan
6.2 d)	A description of the roles and responsibilities for the EMR and all employees involved in the construction of the project.	Section 4.2 of this plan.
6.2 e)	The additional plans listed under condition 6.3 of this approval.	Flora and Fauna Management Plan Noise and Vibration Management Plan Traffic Management Protocol Soil and Water Management Plan
6.2 f)	Complaints handling procedures during construction.	Section 6 of this plan

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CoA	Condition	Where addressed in CEMP
6.2	The CEMP shall be submitted for the approval of the Director-General (now Secretary) no later than one month prior to the commencement of any construction works associated with the project, or within such period otherwise agreed by the Director-General (now Secretary). Construction works shall not commence until written approval has been received from the Director-General (now Secretary).	Section 1.4 of this plan

This CEMP is the overarching document in the environmental management system for the Project that includes a number of management documents. These are described in Section 4. It is applicable to all staff and sub-contractors associated with the construction of the Project.

Relevant management measures and requirements for the project are included within the attached plans to this CEMP (Appendix B):

- Appendix B1 – Construction Flora and Fauna Management Plan (FFMP)
- Appendix B2 - Construction Noise and Vibration Management Plan (NVMP)
- Appendix B3 - Construction Traffic Management Protocol (TMP)
- Appendix B4 – Construction Soil and Water Quality Management Plan (SWMP)
- Appendix B5 – Construction Air Quality Management Plan (AQMP)
- Appendix B6 – Construction Heritage Management Plan (HMP)
- Appendix B7 – Construction Waste Management Plan (WMP)
- Appendix B8 – Construction Hazard and Risk Management Plan (HRMP)
- Appendix B9 - Other management measures

1.3. CEMP Consultation

Consultation of the CEMP and relevant subplans has occurred with relevant agencies in accordance with the Table 1-1.

Table 1-1 CEMP consultation requirements

	Department of Planning and Environment	Environmental Management Representative	Environment Protection Authority	Office of Environment and Heritage	Heritage Council	Department of Natural Resources	DPI Fisheries	Relevant Aboriginal groups	Relevant Councils	Roads and Maritime	Community Liaison Group
CEMP	A*	♦									
Appendix A CTP	A*										
Appendix B1 FFMP	A*			♦			♦		♦		
Appendix B2 NVMP	A*		♦*						♦		♦
Appendix B3 TMP	A*									♦	
Appendix B4 SWMP			♦			♦			♦		
Appendix B5 AQMP											
Appendix B6 HMP				♦	♦			♦			

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	Department of Planning and Environment	Environmental Management Representative	Environment Protection Authority	Office of Environment and Heritage	Heritage Council	Department of Natural Resources	DPI Fisheries	Relevant Aboriginal groups	Relevant Councils	Roads and Maritime	Community Liaison Group
Appendix B7 WMP											
Appendix B8 HRMP											

A – requires approval.
* As required by the Conditions of Approval. Those without an asterisk are required to be provided to relevant agencies through the Statement of Commitments. Note though not all plans need DPE approval, they will be forwarded to DPE as part of CEMP submission.

During the consultation process comments received were addressed within relevant subplans, with plans updated to address comments received. A separate document titled 'Consultation Records – Construction Environmental Management Plan' has been prepared to document the consultation process and how the CEMP and subplans have considered the stakeholder comments. This document is included in Appendix F.

1.4. CEMP Approval

Prior to commencing construction activities, this CEMP will be submitted for approval to the Department of Planning and Environment (DPE) no later than one month prior to the commencement of any construction works associated with the project.

Construction works will not commence until written approval has been received from the Secretary.

1.5. Distribution

This CEMP is available to all personnel and sub-contractors via the Project document control management system. An electronic copy can be found on the Project website.

The document is uncontrolled when printed. One controlled hard copy of the CEMP and supporting documentation will be maintained by the Quality Manager at the Project office.

Registered copies will be distributed to:

- WaterNSW Project Manager.
- Environmental Management Representative.
- SRG Project Manager.
- SRG Site SQE Representative.

1.6. Revision

A document review process ensures that environmental documentation including this CEMP is updated as appropriate for the specific works that are occurring on-site. This includes the management review process described in Section 9.

Should the document review process identify any issues or items within the documents that are either redundant or in need of updating, it is the responsibility of the Site SQE Representative to prepare the revised documents.

The revised document will then be issued to the Environmental Representative to certify that it is consistent with the approved CEMP. Once authorised by the Environmental Management Representative (EMR), the document will be approved by the Project Manager.

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The Site SQE Representative can approve minor changes to the CEMP following authorisation from the EMR. Minor changes would typically include those that:

- Are editorial in nature eg staff and agency/authority name changes.
- Do not increase the magnitude of impacts on the environment when considered individually or cumulatively.
- Do not compromise the ability of the Project to meet approval or legislative requirements.

Where the Site SQE Representative deems it necessary, the amended CEMP will be forwarded to DPE for approval.

Revised versions of the CEMP will be made available through the processes described in Section 1.5.

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2. Project Description

2.1. General Features

Keepit Dam is a major dam on the Namoi River and is located approximately 56 kilometres west of Tamworth and 39 kilometres north-east of Gunnedah, upstream of the confluence of the Namoi and Peel Rivers (refer to Figure 2-1). Key land uses around the southern end of Lake Keepit are shown in Figure 2-2.

Figure 2-1 Regional location of Keepit Dam

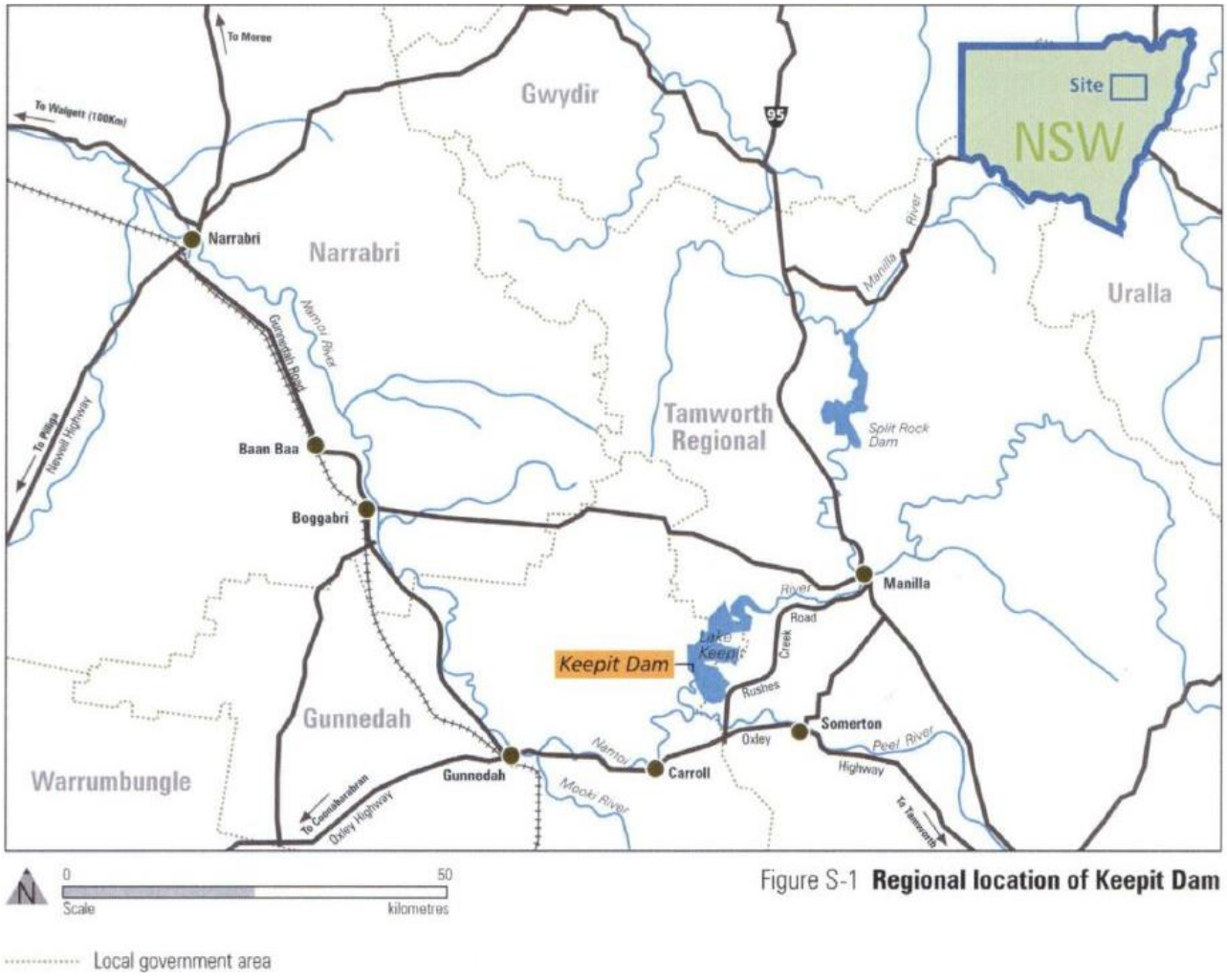

Figure S-1 **Regional location of Keepit Dam**

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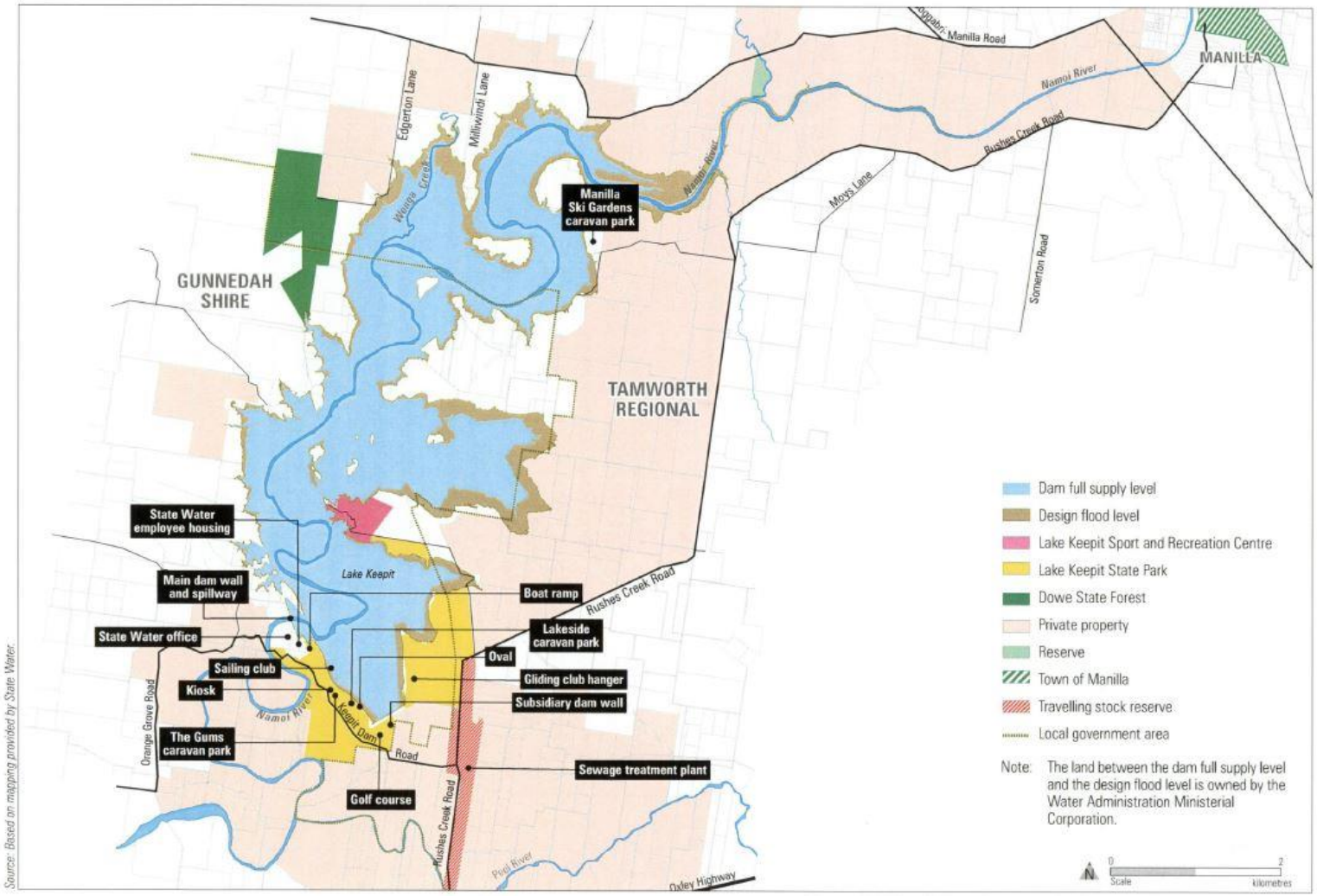
Figure 2-2 Keepit Dam features and land uses (EA)



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As can be seen from Figure 1-2, key land uses surrounding the dam include Lake Keepit State Park, Lake Keepit Sport and Recreation Centre and a further caravan park. A large proportion of the foreshore area around Keepit Dam has been designated as a State Park.

The dam was completed in 1960 and has a storage capacity of 425,510 megalitres. The dam was built by the New South Wales Water Conservation & Irrigation Commission to supply water for irrigation, flood mitigation and potable water for the town of Walgett.

WaterNSW is the owner and operator of the dam. As the dam was built in the 1950's, the upgrade works are required to comply with contemporary dam design and safety standards.

The project involves the installation of the post-tensioned cable anchors in the concrete section of the existing dam including the left abutment non-overflow monoliths, right abutment non-overflow monoliths, overflow spillway monoliths and spillway piers, and other associated works.

Eight staff will be engaged on the project with approximately 33 personnel in total working on site including site personnel such as labourers, drilling crew, crane crew and coring works.

2.2. Construction Activities and Methods

In summary, the construction activities are as follows:

- Preparation of work area.
- Demolition and concrete surface preparation works for dam monolith blocks.
- Survey works.
- Coring rig setup – dam crest.
- Coring rig setup – spillway.
- Coring operations.
- Drill rig setup – dam crest and spillway.
- Drill rig setup – spillway piers.
- Drilling operations.
- Anchor fabrication.
- Anchor installation and grouting.
- Anchor stressing.
- Anchor monitoring and capping.
- Concrete works to spillway piers.
- Miscellaneous metalwork to dam crest, spillway.

Further detail regarding some key activities are detailed below.

Coring rig setup and coring operations

On the dam crest, large diameter coring on the abutments will be undertaken with coring rigs which have been specifically built for shaft, foundation and dam drilling works. The main rig will be mounted on a platform with side shift capability to allow coring of the overlapping holes without repositioning the main platform.

The below is a summary of likely steps for each coring location:

- Survey will be completed and approved.

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- Wastewater controls installed and direct collection to discharge pump or international bulk containers (IBCs).
- Vertical saw-cutting and corner-drilling.
- Follow safety procedures for moving the traveller platform and move the self-propelled coring traveller to position it directly over the drilling location.
- Prior to commencing coring, confirm the level of coring rig in all directions.
- Position the drill bit and commence coring.

The coring rig setup for the overflow (spillway) sections of the dam crest involves the following:

- The coring rig will be positioned onto each of the spillways by crawler crane.
- The bottom of the drill-frame will be fitted with a roller guide system to maintain accurate coring alignment into the sloping face.
- Coring to occur.

Figure 2-3 Example of coring rig on dam crest

Figure 2-4 Example of coring rig on dam crest

Drill rig set up and operations

In summary, the drill rig setup involves:

- Assembly of the drill traveller/work platform on hardstand area.
- Lifting the drill traveller onto the crest rails using mobile craneage.
- Lifting the drill rig onto the marked position on the traveller platform using lifting chains connected to marked lifting points. Secure rig onto the platform.
- Connect the discharge line to the site waste collection network.
- Move the drill traveller to position directly over the drilling location.
- Prior to commencing drilling, confirm the level of drill rig in all directions.

Figure 2-5 Drill rig

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Anchor fabrication, installation and stressing

A ground anchor is a load transfer system fabricated on site to the desired length. The anchor consists of the bond length, which transfers tensile stresses from the tendon to the surrounding ground and the free length, which transfers tensile stresses from the anchor head to the bond length location. The manufacturing process involves assembly of a tendon on site, storage in storage beds and then installation through a series of trolleys and lifting frames (refer to Figure 2-6). The tendons will be placed, lifted and fed into anchor holes. To form a permanent anchorage, the tendon is grouted into place.

Following tendon grouting, the protruding strand bundle is prepared for stressing. Tendon stressing is then undertaken to a precise sequence of load stages, followed by several re-stressing operations to confirm tendon load stability.

Figure 2-6 Example trolleys conveying tendons

Figure 2-7 Anchor block

Temporary works

A 150 tonne crawler crane has been selected as the primary service crane for the spillway construction work. The crawler crane is mounted on an elevated frame, which travels on the existing rails. The frame and crane is moved along the spillway bridge with the aid of a winch system.

To enable access on the downstream face of the dam access towers and platforms will be installed. The access elements are designed so that the operation of the spillway gates is not impeded and that the elements can be removed quickly if there is a flood risk.

2.3. Plant and equipment

Plant and equipment which are to be used during construction are detailed in Table 2-1.

Table 2-1 Plant and equipment

Type	Number of	Comment
Crane 150T crawler on carriage	1	Used to move other plant & equipment along dam wall site
Anchor installation frame	1	Used to install anchors from horizontal orientation into vertical orientation so they can be installed into vertical drilled hole
Drill rig	1	Drills vertical hole through dam crest & spillway
Air compressors	3	Supplies air to run drill rig
Grout stations	2	1 for waterproof grouting of anchor holes, 1 for anchor grouting

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Type	Number of	Comment
Anchor fabrication bed	1	Used to manufacture greased and sheathed strands into bundles for Strand anchors
Storage bed	1	Stores anchors once fabricated.
Anchor transport trolleys (Figure 2-6)	45	Used to move anchors from storage bed to dam crest for installation
Coring equipment (Figure 2-3 yellow frame)	1	Used to remove concrete blocks from crest so pre-cast anchor blocks can be grouted back in.

2.4. Construction Program and Scheduling

An indicative program is provided in Table 2-2 below.

Table 2-2 Indicative program of works

Activity	2016	2017				2018				2019			
Site establishment and site preparation		X	X										
Anchor Fabrication		X	X	X	X	X	X	X					
Right Abutment			X	X	X	X	X						
Spillway Crest and Piers		X	X	X	X	X	X	X	X				
Left Abutment		X	X	X	X								
Restress Anchors						X	X	X	X	X	X		
Demobilise from site												X	X

2.5. Working hours

Construction activities associated with the project that would generate an audible noise at any sensitive receiver, are typically be undertaken during the following hours;

(a) 7.00 am to 6:00 pm Mondays to Fridays;

(b) 7.00 am to 6:00 pm Saturdays;

(c) At no times on Sundays or public holidays.

In order to achieve the concrete temperature limits during placing, it may be necessary to work at night, particularly when placing concrete in the spillway piers. Working at night is an effective means of ensuring the concrete does not exceed the temperatures specified.

Construction work associated with the project, other than blasting, may be undertaken outside of the hours above under the following circumstances:

(a) The works do not cause construction noise to be audible at any sensitive receiver; or

(b) For the delivery of materials required by the police or other authorities for safety reasons; or

(c) Where it is required in an emergency to avoid loss of lives, property and/or to prevent harm; or

(d) As approved through the following process outlines below.

The hours of construction may be varied with the prior written approval of the Secretary. Any request to alter the hours of construction shall be:

(a) Considered on a case by case basis;

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(b) Accompanied by details of the nature and need for activities to be conducted during the varied construction hours; and

(c) Accompanied by written evidence of the DECC's agreement with the proposed variation in construction times, after providing any information necessary for the DECC to reasonably determine that activities undertaken during the varied construction hours will not adversely impact on the acoustic amenity of receptor in the vicinity of the site.

2.6. Compound and Ancillary Facilities

The main office will be located near the left abutment at the site identified as item 6 in Figure 2-9. The main office will incorporate offices, site reception, safety induction and first aid.

The compound area is identified at item 5 in Figure 2-9. The compound area will incorporate the fabrication and storage yard, crib sheds, workshop, stores, storage of hazardous materials and car parking. Suitable environmental controls will be installed as detailed in the Soil and Water Management Plan for the control of soil and erosion, and hazardous materials.

The fabrication and storage yard at the compound area will take advantage of the existing hardstand for manufacturing and storage of completed anchors ready for transporting (refer to 'Fabrication and storage beds' in Figure 2-9).

There will be minor topsoil stripping required to be undertaken for the main office area and the compound area.

Supply of concrete (all 190 cubic metres) will be from off-site concrete batching plant.

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Figure 2-8 Location of project site. Detail of project site (yellow outline) provided in Figure 2-9. Blue highlight indicates access and egress routes to southern abutment. Pink highlight indicates access and egress to northern abutment.

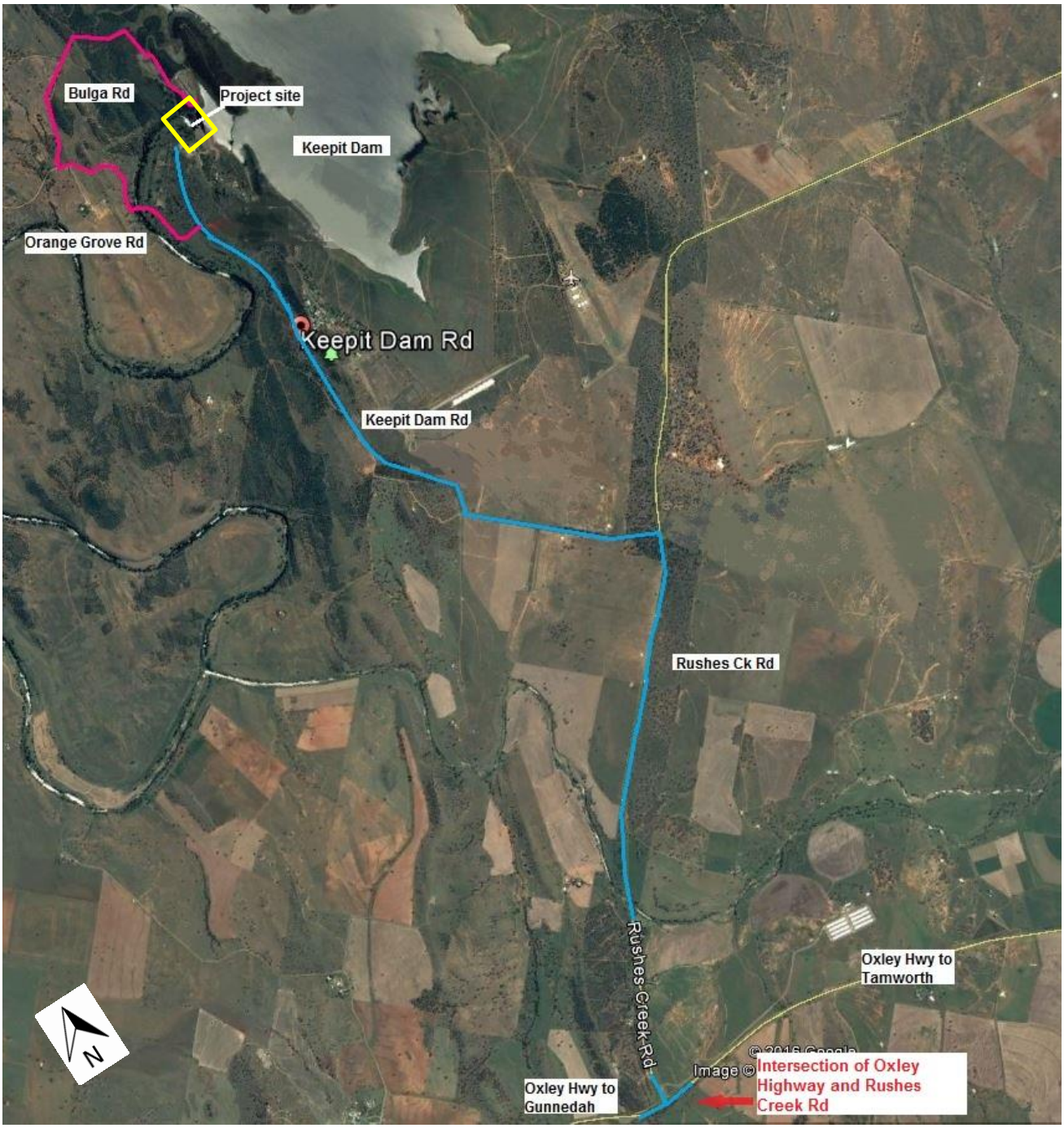

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Figure 2-9 Site work area and compounds

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3. Planning

3.1. Project Environmental Obligations

All construction personnel working on the Project have the following general obligations:

- Minimise pollution of land, air and water;
- Preserve the natural and cultural heritage environment;
- Minimise the occurrence of offensive noise; and
- Take all feasible and reasonable steps to ensure compliance with the requirements of this CEMP.

3.2. Legal and Other Requirements

A register of legal and other requirements relevant to this project are detailed below in Table 3-1 below.

Table 3-1 Summary of other relevant statutes

Legislation / Policy	Applicability	Regulatory Authority
Environmental Planning and Assessment Act 1979	Modification to the project scope requiring modification to the project approval.	Department of Planning and Environment
Protection of the Environment Operations Act 1997	Any unauthorised pollution of waters is considered an offence under section 120 of the POEO Act. Notification to EPA of any pollution incidents that have caused or give rise to material harm (section 148).	NSW EPA
National Parks and Wildlife Act 1974	Protection of Aboriginal Objects and Places. Duty to notify OEH in the event that an Aboriginal object is uncovered during the works.	NSW Office of Environment and Heritage
Fisheries Management Act 1994 (FM Act)	Approval required for any works undertaken within Namoi River downstream of the dam wall, under s199 and s218 of FM Act.	Department of Primary Industries (Fisheries NSW)
Dams Safety Act 1978	Works to be consistent with the Dams Safety Committee requirements.	Dam Safety Committee
Threatened Species Conservation Act 1995	Protection of species of threatened flora and fauna, endangered populations and endangered ecological communities and their habitats.	NSW Office of Environment and Heritage
Heritage Act 1977	Design of the dam upgrade works to be consistent with the requirements of the HIS to minimise impacts to the heritage significance of the dam.	NSW Office of Environment and Heritage

3.3. Approvals, Licences or Permits

A summary of the approvals relevant to this project as taken from the Keepit Dam Upgrade Environmental Assessment (PB, 2007) are listed in Table 3-2 below.

Table 3-2 Summary of Approvals and Requirements

Requirement	Reference	Regulatory Authority	Obtained by	Timing / status
Project Approval	Sections 75J and 75O of the EP&A Act (repealed)	DPE	WaterNSW	Complete
Controlled Action Approval	Section 130 and 133 of the EPBC Act	Department of Environment and Energy (Cth)	WaterNSW	Complete

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Requirement	Reference	Regulatory Authority	Obtained by	Timing / status
Water use approval to use water during the construction works	Section 89 of the *Water Management Act 2000*	NSW Office of Water	Contractor	Prior to water use during construction

3.4. Conditions of Approval

Approval was granted by the (then) Department of Planning (Major Project Application Number 6-0155) on 29 April 2009. A table showing compliance with the Conditions of Approval as relevant to the construction works for the Keepit Dam Stage 2, Package 2 is provided in Appendix A. The Conditions of Approval relating to the preparation of the CEMP are provided in Table 1-1.

3.5. Statement of Commitments

Final Statement of Commitments (SoC) were prepared as part of the *Keepit Dam Upgrade - Submissions report and Preferred Project Report* (PB, 2008). A list of the SoC as relevant to this component of the works and how they have been complied with in this CEMP is provided in Appendix A.

3.6. Environmental Policy

The environmental policy describes SRG's commitment to continual improvement in environmental performance and compliance with applicable legal requirements.

The environmental policy is displayed at the site office, and communicated to staff and other interested parties via inductions and ongoing awareness programs.

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ENVIRONMENTAL POLICY

It is SRG's ("Company") policy to integrate environmental "Best Practice" into all facets of the Company's operations. We will manage our programs in a manner that protects the ecosystem and public health.

In support of this policy, SRG makes the following commitments:

- The SRG Board of Directors and Managers are committed to achieving compliance with applicable environmental statutory and legal requirements.
- To maintain structured management systems consistent with ISO 14001 and ensure it remains relevant to all aspects of our operations.
- In consideration of the potential impacts of our activities on the environment, we will integrate pollution prevention / waste minimisation, resource conservation, and compliance into all of our planning and decision making. We will adopt cost- effective practices that eliminate, minimise or mitigate environmental impacts.
- We will prioritise, correct and clean up any environmental incident associated with our works.
- We will work to continually improve our environmental management systems and performance.
- We will establish appropriate environmental objectives and performance indicators to guide these efforts and measure our progress.
- We will maintain a positive, proactive, and constructive relationship with our neighbours in the community, regulators, EPA, and our other stakeholders.
- We will openly communicate with stakeholders on our progress and performance.

In addition to annual review of SRG progress on environmental goals and adherence to this policy, we invite all interested parties to provide input into our performance relative to this policy, and the policy itself.

This policy statement shall be reviewed two years from the date below.

David Macgeorge
Managing Director
May 2016

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3.7. Objectives

The objectives of this CEMP are:

- To identify and implement relevant environmental legal and other best practice requirements applicable to the construction works.
- To demonstrate that all legal requirements and conditions of approval are implemented.
- To identify the potential environmental risks associated with all phases of the project.
- To effectively manage and control the environmental risks.
- To establish the specific procedures for the project environmental management of the project.
- To assign responsibility for the implementation, management and the review process.
- To provide a consistent and uniform approach which assures that the required standards and environmental protection are attained and maintained for the project works.
- To minimise environmental impacts on the natural environment and the community.

3.8. Guidelines

Guidelines specific to an environmental aspect (such as soil and water) have been detailed within each relevant subplan. The Guideline for the Preparation of Environmental Management Plans (DIPNR 2004) is relevant to the development of the CEMP. Relevant sections of this Guideline have been addressed within this CEMP with detailed provided in Table 3-3.

Table 3-3 EMP Guidelines

Section	Requirement	Where addressed in CEMP
2.3.1	Environmental Management System	Section 4
2.3.2	EIA Documentation	Section 1 and Section 3
3.3	Consultation	Section 1.3
3.4	Approval of an EMP	Section 1.4
3.5	Review of an EMP	Section 1.6
4	EMP structure • Background • Environmental Management • Implementation • Monitor and Review	 Section 1 Section 3 and Section 4 Section 4 and Appendices Section 8 and 9

Construction Environmental Management Plan

4. Implementation and Operation

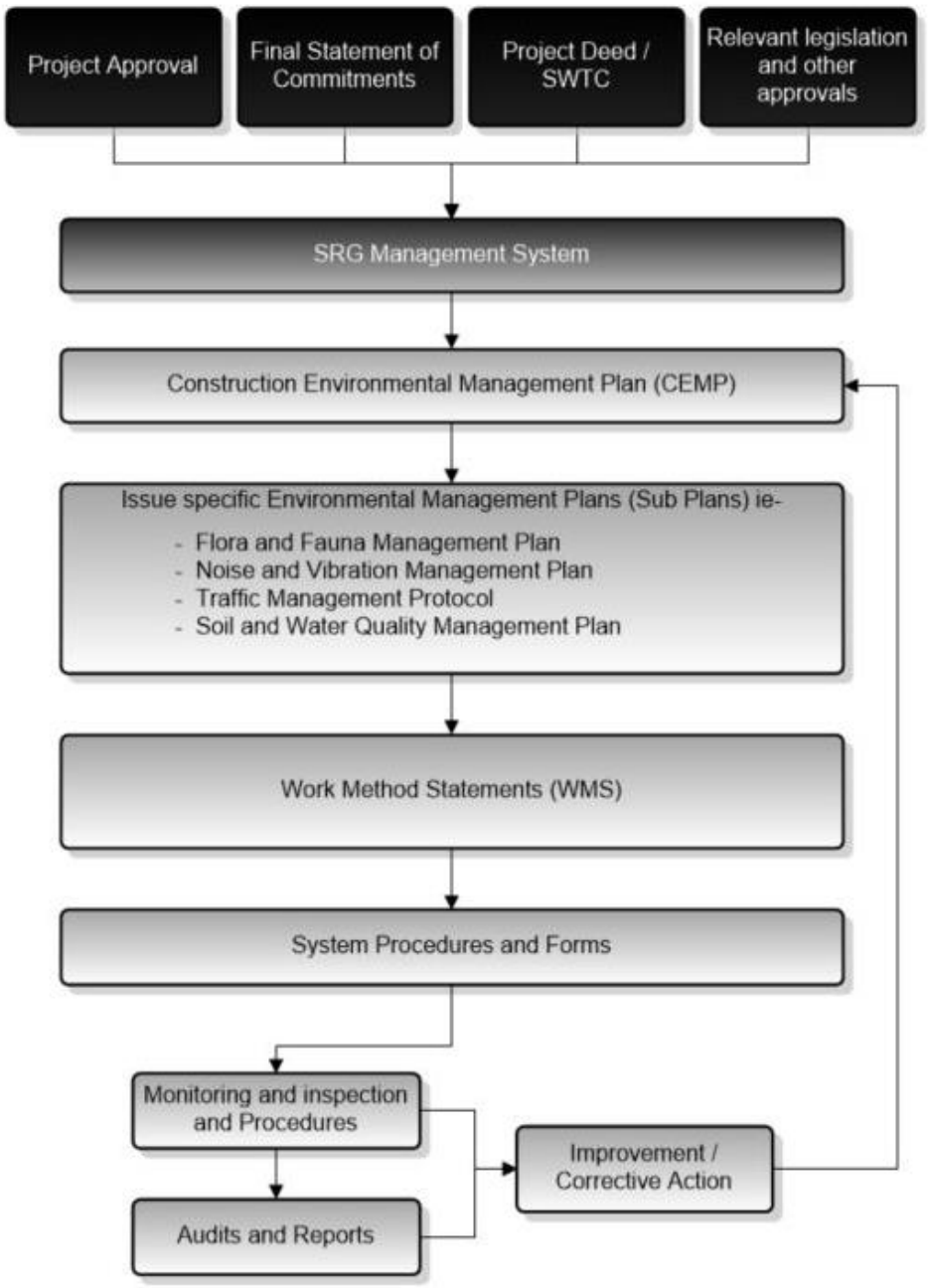
This CEMP is the overarching management plan for a suite of environmental management documents. It provides a structured and systematic approach environmental management.

The primary purpose of the system of documentation is to:

- Ensure compliance with all applicable environmental laws, obligations and approvals;
- To minimise environmental impacts.

The structure of the environmental management system for the Project is shown in Figure 4-1 below.

Figure 4-1 Environmental management system structure



Construction Environmental Management Plan

4.1. Environmental Management System Documentation

4.1.1. Construction Environmental Management Plan

This CEMP provides the system to manage and control the environmental aspects of the Project during pre-construction and construction. It identifies all requirements applicable to activities described in Section 2. It also provides the overall framework for the system and procedures to ensure environmental impacts are minimised and legislative and other requirements are fulfilled. The strategies defined in this CEMP have been developed with consideration of the Project approval requirement, safeguards and mitigation measures presented in the environmental assessment and approval documents. This CEMP establishes the system for implementation, monitoring and continuous improvement to minimise impacts from the Project on the environment.

This CEMP is consistent with:

- Guideline for the preparation of Environmental Management Plans (DIPNR, 2004);
- AS/NZS ISO14001: 2004, '*Environmental Management Systems - requirements with guidance for use*'.

4.1.2. Environmental Management Sub plans

A number of environmental management sub-plans support the CEMP. These documents are prepared to identify requirements and processes applicable to specific impacts or aspects of the activities described in Section 2. They address requirements of the safeguards identified in the environment assessment documentation. A list of construction sub plans are provided below:

- Appendix B1 - Construction Flora and Fauna Management Plan
- Appendix B2 - Construction Noise and Vibration Management Plan
- Appendix B3 - Construction Traffic Management Protocol
- Appendix B4 – Construction Soil and Water Quality Management Plan
- Appendix B5 – Construction Air Quality Management Plan
- Appendix B6 – Construction Heritage Management Plan
- Appendix B7 – Construction Waste Management Plan
- Appendix B8 – Construction Hazard and Risk Management Plan
- Appendix B9 - Other management measures

4.1.3. Environmental work method statements / Work method statements

Environmental Work Method Statements (EWMS) or Work Method Statements (WMS) are prepared to manage and control all activities that have the potential to negatively impact on the environment. EWMS/WMS will be prepared prior to the commencement relevant construction activities on site and will incorporate relevant mitigation measures and controls from management plans. They also identify key procedures to be used concurrently with the EWMS/WMS. EWMS/WMS are specifically designed to communicate requirements, actions, processes and controls to construction personnel using plans, diagrams and simply written instructions.

EWMSs/WMSs will be prepared progressively in the lead up to and throughout construction in consultation with relevant members from the Project team.

EWMSs/WMSs will be prepared for the following construction activities:

- Coring and drilling
- Concrete grouting including grout mixing.

Construction Environmental Management Plan

- Dewatering and management of wastewater basins.
- Maintaining and refuelling plant and equipment.

All construction personnel and sub-contractors undertaking a task governed by an EWMS/WMS must participate in training on the EWMS/WMS, and acknowledge that they have read and understood their obligations prior to commencing work.

Regular monitoring, inspections and auditing against compliance with the EWMS/WMS will be undertaken by project personnel to ensure that all controls are being followed and that any non-conformances are recorded and corrective actions implemented.

4.1.4. Site Plan

The above sub-plans should include maps / plans indicating the following as relevant to the works

- Sensitive areas.
- Waterways.
- vegetation requiring protection.

4.1.5. Environmental Risk Assessment

A qualitative risk assessment to identify environmental risks associated with each of the construction activities based on the proposed construction methodology has been undertaken and is provided in Appendix C. Appropriate control measures have been developed based on the level of risk and have been included in the individual sub plans or the construction method statements.

4.1.6. Environmental Management Activities and Controls

Environmental management measures which are required to be implemented are detailed within each subplan and Appendix B5 which details all other management measures.

4.1.7. Environmental Schedules

The following forms and registers (Table 4-1) will be used in the day to day environmental management of the project. All forms and registers will be maintained outside of the CEMP and in line with the overall Project Management System.

Table 4-1 List of forms and registers

Form / Register	Where located
Site inspection / monitoring checklist	Appendix D1 of this CEMP
Incident report form	Appendix D2 of this CEMP SRG Integrated Management System Incident Reporting Standard
Environmental Incident Register	Appendix D3 of this CEMP SRG drive – register available on request.
Project Induction and Training Register	Appendix D4 of this CEMP SRG drive – register available on request.

4.2. Resources, Roles and Responsibilities

4.2.1. Organisation Structure

The project organisational structure for SRG is provided below in Figure 4-2.

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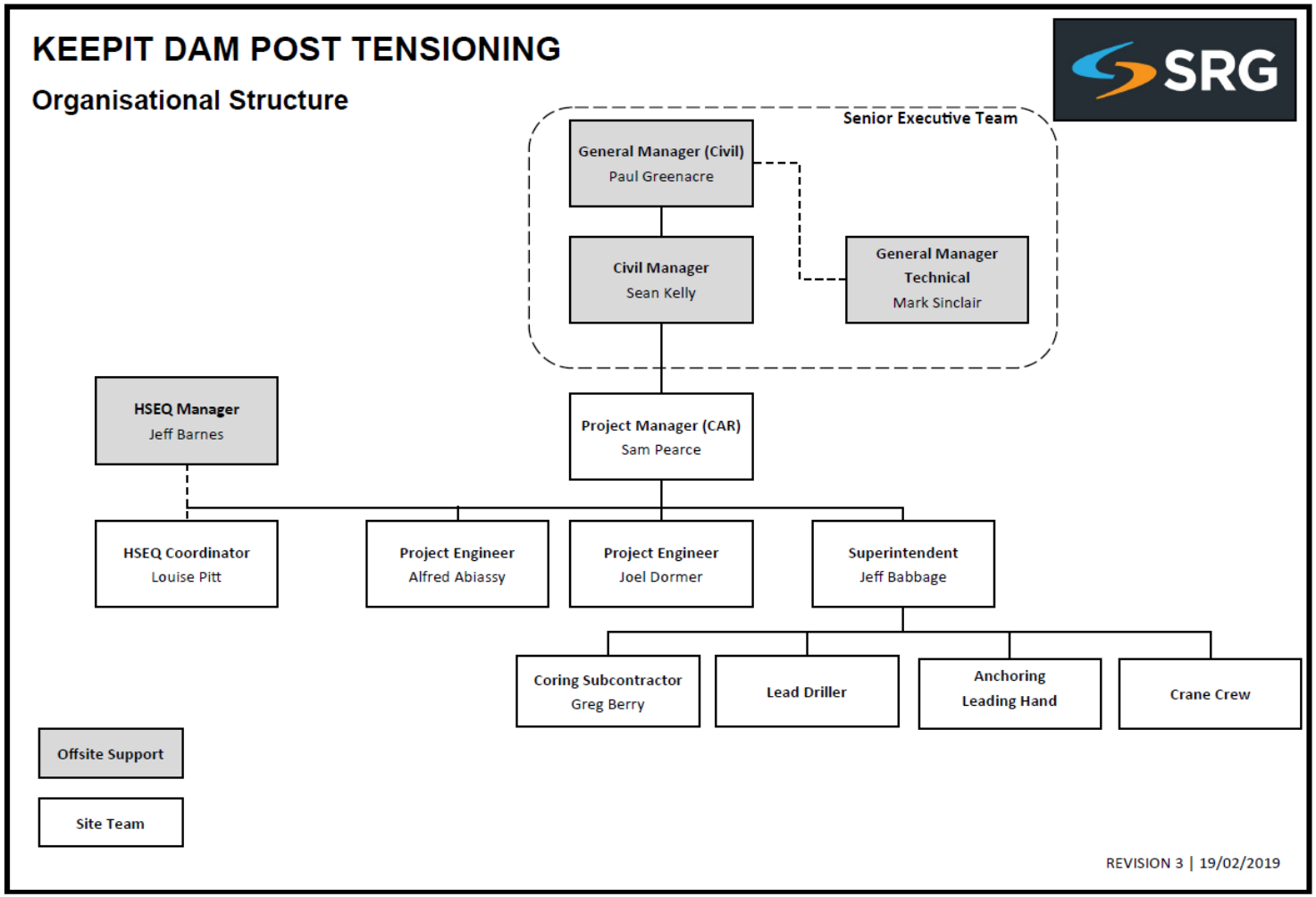
Figure 4-2 Organisational structure



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4.3. Responsibilities

SRG will ensure that appropriate resources are available to effectively manage the implementation of the CEMP during delivery of the project. SRG shall ensure that:

- There is an adequate level of experience within management and supervision.
- There are sufficient number of trained and skilled workers to carry out that work.
- Inspection, verification and auditing are carried out in a timely and efficient manner.

Project Manager

The Project Manager has overall environmental responsibility to:

- Include the environment into all aspects of project planning.
- Allocate project resources to handle environmental issues.
- Ensure suppliers and contractors comply with environmental requirements.
- Investigate and ensure that environmental incidents are reported and recorded.
- Review the performance of environmental management monthly.
- Ensure environmental inspections are conducted.

Site SQE Representative

The Site SQE Representative has overall environmental responsibility to:

- Assist and guide the respective workers to meet their environmental responsibilities.
- Check the implementation of the environmental section of this CEMP.
- Report to the Project Manager on environmental issues.
- Monitor the rectification of incidents.
- Provide technical advice to personnel and management in the review of work methods.
- Conduct a Site Start-up Meeting with the Site Personnel on site.
- Implement appropriate action to address any environmental incidents.
- Development, implementation, monitoring and updating of the CEMP and sub-plans.
- Ensure environmental risks of the Project are identified and appropriate mitigation measures implemented.
- Manage environmental document control, reporting, inductions and training.
- Oversee site monitoring, inspections and audits.
- Manage all subcontractors and consultants with regards to environmental matters, including assessing their environmental capabilities and overseeing the submission of their environmental documents.
- Respond to stakeholder enquires/complaints within required timeframes.
- Ensure suppliers and contractors comply with environmental requirements.

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Superintendent

The Superintendent reports to the Project Manager and is responsible for the Projects onsite compliance with the requirements of the CEMP:

- Communicating with all personnel and sub-contractors regarding compliance with the CEMP and site specific environmental issues/SWMS etc.
- Notification of environmental incidents.
- Coordinating the implementation of the CEMP.
- Undertaking site inspections.
- Co-ordinating the implementation and maintenance of pollution control measures.
- Identifying resources required for implementation of the CEMP.
- Coordinating action in emergency situations and allocating required resources in accordance with the Incident Response Plan.
- Notify the Project Manager of any environmental harm or potential environmental harm, or if authorised by the Project Manager notify the Client.
- Ensuring that instructions are issued and adequate information is provided to site resources which relate to environmental risks on site.

All Employees

All employees have a responsibility to:

- Contribute to effective environmental management at the site for the life of the project, by implementing this CEMP within their area of responsibility.
- Comply with the relevant Act(s), Regulations, Specifications and Standards.
- Comply with the Environmental Policy.
- Promptly report to management any environmental non-conformances, incidents and/or breaches.
- Participate in environmental awareness training as directed by management.

Environmental Management Representative

The Environmental Management Representative has a responsibility to:

- Oversee the implementation of all environmental management plans and monitoring programs required under this approval and advise WaterNSW upon the achievement of these plans/programs.
- Have responsibility for considering and advising WaterNSW on matters specified in the conditions of approval and the Statement of Commitments as referred under condition 1.1c) of the CoA.
- Oversee the implementation of the environmental auditing of the project in accordance with the requirements of condition 4.3 of this approval and all relevant project Environmental Management System(s).
- Be given the authority an independence to recommend to WaterNSW reasonable steps to be taken to avoid or minimize unintended or adverse environmental impacts, and, failing the effectiveness of such steps, to recommend to WaterNSW that relevant activities are to be ceased as soon as reasonably practicable if there is a significant risk that an adverse impact on the environment will be likely to occur.

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- Consider and advise the Secretary and WaterNSW on matters specified in this Final Statement of Commitments and compliance with such.
- Determine whether work falls within the definition of Construction where clarification is requested by WaterNSW.
- Review the CEMP.
- Periodically monitor WaterNSW activities to evaluate compliance with the CEMP. Periodic monitoring will involve site inspections of active work sites at least fortnightly.
- Provide a written report to WaterNSW of any non-compliance with the CEMP observed or identified by the EMR. Noncompliance will be managed as identified in the CEMP.
- Issue a recommendation to WaterNSW to stop work immediately if in the view of the EMR an unacceptable impact on the environment is occurring of is likely to occur. The stop work recommendation may be limited to specific activities causing an impact if the EMR can easily identify those activities. The EMR may also recommend that WaterNSW initiate reasonable actions to avoid or minimize adverse impacts.
- Review corrective and preventative actions to monitor the implementation of recommendations made from audits and site inspections.
- Certify that minor revisions to the CEMP are consistent with the approved CEMP.
- Provide regular (as agreed with the Secretary) reports to the Secretary on matters relevant to carrying out the EMR role including notifying the Secretary of any stop work recommendations.

4.3.1. Subcontractor management

All sub-contractors are required to work in accordance with the approved CEMP.

All sub-contractors are required to attend Project and/or site inductions where the requirements and obligations of the CEMP are communicated. A record of all sub-contractors inducted will be maintained as part of the Project induction and training register.

The template inspection monitoring form in Appendix D will be further developed with specific environmental controls to be assessed.

The form will be used to assess:

- The sub-contractor’s general work practices.
- The effectiveness of the sub-contractor’s environmental protection measures.
- The sub-contractor’s compliance with the requirements of this CEMP.
- The maintenance of environmental measures.

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5. Competence, training and awareness

Onsite environment training will be coordinated and recorded by the Site SQE Coordinator. Records include details of topics, attendees, and duration will be stored in a training register, signed attendance sheets will be filed.

Internal and on-the-job training will be provided on a regular basis for all staff and subcontractors and general awareness for site resources and office-based staff will be provided via notice boards, posters and environment bulletins.

Table 5-1: Environmental Training

Title	Description	Attendees Required
Site specific project induction	All staff attending site will be required to attend a health and safety, quality and environment induction prior to starting work on the project. The environment section covers core issues including (but not limited to): • Purpose and objectives of the CEMP; • Requirements of due diligence and duty of care; • Conditions of environmental approvals permits and approvals; • Potential environmental emergencies on Site and the emergency response procedures; • Reporting and notification requirements for pollution and other environmental incidents; • High-risk activities and associated environmental safeguards, e.g. working near waterways • Working in or near environmentally sensitive areas; • Traffic issues – including clear instructions to all project staff including delivery drivers with regards to speed limits, approved access routes, approved working hours and delivery times, noise mitigation requirements (such as no idling of machinery) and requirements regarding interface with the park users and the community; • Heritage values of the site and associated safeguards, and unexpected finds procedure; • Minimising noise emissions when working near noise sensitive receivers.	Anybody working on the project
Toolbox talks and project briefings	This is an internal brief delivered by the Site SQE Coordinator. Toolbox talk meetings are held weekly. Toolbox talks will also be tailored to specific environmental issues relevant to upcoming works. Relevant topics include: • Heritage aspects and unexpected finds procedure; • Traffic issues – including clear instructions to all project staff including delivery drivers with regards to speed limits, approved access routes, approved working hours and delivery times, noise mitigation requirements (such as no idling of machinery) and requirements regarding interface with the park users and the community; • Erosion and sediment control;	SRG staff and subcontractors working on the project.

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	• Pollution management; • Vegetation protection and management; • Hours of work; • Emergency and spill response.	
Daily Pre-start	This is an internal brief delivered by Site SQE Coordinator and Superintendent. Pre-start meeting is a tool for informing the workforce of the day's activities, safe work practices, environmental protection practices (including environmental work method statement requirements), work area restrictions, activities that may affect the works, coordination issues with other subcontractors, hazards and other information that may be relevant to the day's work.	SRG staff and subcontractors working on the project.

6. Communication

6.1. Internal communication

SRG is committed to ensure effective communication and consultation is undertaken on a regular basis at all levels of the business. The methods of communication on site will include:

- Pre-Start Meetings.
- Inductions.
- Toolbox Talks.
- Alerts/ Bulletins/ Initiatives.
- Environmental Work Method Statements.

6.2. External communication

6.2.1. Stakeholders

The Secretary of DPE will be notified in writing of the start of the construction of the project.

Details of external stakeholders are provided in Table 6-1.

Table 6-1 Stakeholder details

Agency	Contact Person	Phone
WaterNSW	Nathaniel Selladurai	02 8245 2006 0418 324 559
EPA	Jessica Barnes	02 6773 7000
DPI Water (NoW)	Dave Ward	02 6763 1444
OEH / Heritage Council	Stuart Read	02 9873 8554
Lake Keepit State Park	Neville Lemon	0427 298 989
Gunnedah Council	Blake O'Mullane	02 6740 2100
Tamworth Council	Bruce Logan	02 6767 5555

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6.2.2. Community Communication

WaterNSW will advertise the below details into local newspaper/s before construction commences and then at maximum three monthly intervals:

- the nature of the works proposed for the next three months.
- areas where works are proposed.
- construction hours.
- contact telephone number (for WaterNSW).

Information to be provided to the local community and businesses must include:

1. Details of any traffic disruptions and controls.
2. Construction of temporary detours.
3. Work approved to be undertaken outside standard construction hours in particular noisy works before such works are undertaken.

In accordance with CoA 5.7, before construction commences and then at three monthly intervals, WaterNSW will advertise in relevant newspapers the:

- Nature of the works proposed for the next three months;
- Areas in which these works are proposed;
- Construction hours;
- A contact telephone number.

Updates of work progress, construction activities and planned works schedules will be provided where significant changes in noise, air or traffic impacts are expected.

Project website

In accordance with CoA 5.8, WaterNSW will maintain a project website at http://www.waternsw.com.au which will provide details of the project, including:

a) periodic updates of work progress, consultation activities and planned work schedules. The site will indicate the date of the last update and the frequency of the internet site updates;

b) a description of relevant approval authorities and their areas of responsibility;

c) a list of reports and plans that are publicly available under this Approval and details of how these can be accessed;

d) contact names and phone numbers of relevant communications staff; and

e) the 24 hour toll-free complaints contact telephone number.

Community Construction Liaison Group (CCLG)

A Community Construction Liaison Group (CCLG) has been formed and is managed by WaterNSW. The CCLG includes the EMR and representatives from WaterNSW and SRG. Community representatives have been identified and selected from relevant community and business groups, individual members of the community adjoining the Activity and representatives from Relevant Councils. There have been no concerns raised to date in relation to the Stage 2 works.

All necessary information will be provided to WaterNSW to facilitate the CCLG, including:

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a) Project updates.

b) Provision of access for site inspections by the CCLG.

c) Provision of design information, mitigation measures, the CEMP and construction activities.

d) An explanation of technical information.

Compensation Liaison Group

In accordance with CoA 5.3 a Compensation Liaison Group has been formed and is to be maintained by WaterNSW. The purpose of the group is to discuss issues related to compensation and insurance related matters associated with the operation of the subsidiary dam wall spillway. The Group will also identify the basis for compensation payments.

6.2.3. Complaint Management

A Construction Complaints Management System / Complaints Register will to be maintained by WaterNSW. SRG will not be responsible for the receipt or management of complaints during construction.

The Construction Complaints Management System has been developed by WaterNSW and is consistent with AS 4269 “Complaints Handling” and includes:

a) system to receive, record, track and respond to complaints within a specified timeframe. When a complaint cannot be responded to immediately, a follow-up verbal response on what action is proposed will be provided to the complainant within two hours during night-time works and 24 hours at other times.

b) a process for the provision of a written response to the complainant within 10 days, if the complaint cannot be resolved by the initial or follow-up verbal response.

c) a mediation system for complaints unable to be resolved.

The Construction Complaints Management System will be maintained by WaterNSW for the duration of Construction.

WaterNSW will ensure that a 1800 telephone number is available 24 hours a day, seven days a week, so that community complaints and enquiries regarding the project can be lodged. Information about the 1800 number will be made available on the project website. The project website and project communications will also include a postal address and email address to enable complaints to be submitted through written and electronic means.

Information on all complaints received, including how they were addressed and whether resolution was reached with or without mediation, will be included in the Construction Compliance Reports.

All complaints received will be recorded by WaterNSW in an up to date Complaints Register.

The Register will record but not necessarily be limited to;

a) date and time of the complaint.

b) how the complaint was made.

c) any personal details of the complainant that were provided.

d) nature of the complaint.

e) any actions taken in relation to the complaint, including any follow up contact.

f) if no action was taken, the reason(s) why.

An initial response to complaints will be provided within 24 hours of a complaint being received. A further detailed response, including steps taken to resolve the issue(s) that lead to the complaint, will be provided within 10 days.

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All complaints should be closed off in the complaints register. At all times the stakeholder will be kept informed of when they will receive a response.

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7. Environmental Incidents and Emergencies

7.1. Emergency Contact Details

Emergency contact details are provided in Table 7-1.

Table 7-1 Emergency Contact Details

Name / Agency	Emergency phone
Project Manager – SRG (Sam Pearce)	0417 288 799
QSE Manager – SRG Jeff Barnes	0411 305 70
EPA	Environment Line 131 555
NSW Police	000
NSW Fire and Rescue	000
NSW Ambulance	000
Tamworth District Hospital	(02) 6767 7700

7.2. Environmental Incidents

Environmental incidents have the potential to occur on construction sites due to the scale and type of works. For the purposes of this CEMP, environmental incidents include matters such as:

- Chemical spills and leaks (including hydrocarbons);
- Fires;
- Discharges of contaminated waters to the environment;
- Death or injury of native fauna;
- Clearing or damage to vegetation outside of the designated clearing areas; and
- Breaches of the hygiene management actions.

WaterNSW and the EMR are to be informed of any potentially notifiable environmental incidents under the POEO Act and Conditions of Approval immediately. All incidents are to be reported into TICKIT within 24 hours.

An incident report will be prepared for any incident or potential incident with actual or potential significant off-site impacts on people or the biophysical environment. A report outlining the basic facts will be supplied to DPE within 24 hours of the incident.

A further detailed report will be prepared and submitted following investigations of the causes and identification of necessary corrective action and additional preventative measures within 5 days.

The cause or impact of any incident as it relates to the Conditions of Approval will be addressed as per the Secretary of DPE requirements.

Environmental incidents do not include matters where there is no impact, or no risk of impact, to the environment or do not cause concern for external groups, for example, a routine variance to compliance with this CEMP.

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7.2.1. Management actions

Management actions that will be implemented in response to an incident are detailed below in Table 7-2.

Table 7-2 Management actions to be implemented in response to an incident

Management Action	Responsibility
All suspected environmental incidents will be reported to the WaterNSW.	SRG
The cause will be investigated as soon as reasonably practicable (generally within 24 hours of the incident).	SRG
Construction works at the affected area will only recommence on the approval of the WaterNSW.	SRG
Implementation of the management actions will be reinforced. If appropriate, the management actions will be amended after the Superintendent's review.	SRG
All Incident Reports will be logged on a file retained at the construction site office.	SRG
SRG will undertake any required remediation works or measures.	SRG
SRG will provide a briefing to all site personnel following the investigation of a confirmed environmental incident. The briefing will include any identified construction process improvements that could prevent reoccurrence of the same environmental incident.	SRG

7.3. Environmental Emergency

An environmental emergency is any event that causes or has the potential to cause material harm to the environment.

Material harm to the environment is defined under Section 147 of the POEO Act as an event that involves actual or potential harm to the health or safety of human beings or to ecosystems that is not trivial, or results in actual or potential loss or property damage of an amount, or amounts in aggregate, exceeding $10,000 (or such other amount as is prescribed by the regulations).

There is a duty under the POEO Act to notify pollution incidents causing or threatening material harm. The following notification procedure would be implemented in the event that a notifiable pollution event occurs;

1) A person carrying on the activity must, immediately after the person becomes aware of the incident, notify EPA of the incident and all relevant information about it.
2) A person engaged as an employee in carrying on an activity must, immediately after the person becomes aware of the incident, notify the employer of the incident and all relevant information about it. If the employer cannot be contacted, the person is required to notify each relevant authority.
3) An employer who is notified of an incident or who otherwise becomes aware of a pollution incident which is related to an activity of the employer, must, immediately after being notified or otherwise becoming aware of the incident, notify each relevant authority of the incident and all relevant information about it.
4) The occupier of the premises on which the incident occurs must, immediately after the occupier becomes aware of the incident, notify each relevant authority of the incident and all relevant information about it.
5) An employer or an occupier of premises must take all reasonable steps to ensure that, if a pollution incident occurs in carrying on the activity of the employer or occurs on the premises. The persons engaged by the employer or occupier will, immediately, notify the employer or occupier of the incident and all relevant information about it.

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It is noted that notification provisions under section 148 of the POEO Act extends to a person engaged in carrying on an activity as an agent for another. Therefore, the above references to an employee extend to such an agent and a reference to an employer extends to the Principal.

It is noted also that notification provisions under the Act do not extend to a pollution incident involving only the emission of an odour.

WaterNSW is to be informed of any notifiable incidents.

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8. Inspections, Auditing and Reporting

8.1. Environmental Inspections

The SQE Representative will undertake weekly inspections of the work site to evaluate the effectiveness of environmental controls.

The SQE Representative will record inspection findings on the inspection checklist form which is provided in Appendix D. Weekly inspections are recorded on the SRG weekly inspection sheet which includes the matters outlined in the checklist in Appendix D.

8.2. Environmental Monitoring

Any required environmental monitoring will be detailed within relevant sub plans in Appendix B.

8.3. Environmental Auditing

Internal auditing will be undertaken on a six-monthly basis throughout the Project. The purpose of auditing is to verify compliance with:

- This CEMP and associated plans.
- Approval requirements (COAs) both State and Federal.
- Any relevant legal and other requirements (eg licences, permits, regulations, Roads and Maritime contract documentation).

An audit checklist will be developed and amended as necessary to reflect changes to this CEMP, subsequent approvals and changes to Acts, regulations or guidelines.

Energy audits will be conducted during construction to identify and address energy wastage.

8.3.1. Environmental Impact Audit Report

An Environmental Impact Audit Report will be prepared and submitted to the Secretary by WaterNSW a maximum of three months after construction is complete (or at any other time interval agreed to by the Secretary). The Environmental Impact Audit Report will also be submitted to the Relevant Councils and other government departments upon the request of the Secretary.

The Environmental Impact Audit Report will:

a) identify the major environmental controls used during construction and assess their effectiveness;

b) summarise the main environmental management plans and processes implemented during construction and assess their effectiveness;

c) identify any innovations in construction methodology used to improve environmental management; and

d) discuss the lessons learnt during construction, including recommendations for future activities.

8.4. Reporting

Table 8-1 lists the reports which will be prepared during delivery of the project.

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Table 8-1 Reporting Requirements

Description		Prepared by	Timing	Distributed to
Pre-Construction Compliance Report				
SoC 8	A Pre-Construction Compliance Report will be prepared and will include: a) details of how the Commitments required to be addressed before Construction were complied with; b) the time when each relevant commitment was complied with, including dates of submission of any required reports and/or approval dates; and c) details of any approvals or licences required to be issued by any Relevant Government Departments and/or Councils before Construction commences.	WaterNSW and SRG	At least four weeks before construction commences.	DPE and WaterNSW
Initial Construction Compliance Report				
CoA 4.1 SoC 10	The Construction Compliance Report will include information on; a) compliance with the CEMP and Conditions of Approval; b) compliance with any approvals or licences; c) implementation and effectiveness of environmental controls through comparison of actual impacts against d) performance criteria identified in the CEMP; e) environmental monitoring results for fauna and fauna noise, vibration, blasting, suspended dust and deposited dust for the first six months; f) number and details of any complaints, including a summary of the main areas of complaint, action taken, response given and intended strategies to reduce recurring complaints; g) details of any review and amendments to the CEMP during the reporting period; and h) any other matter relating to compliance with the Conditions of Approval or as requested by the Secretary.	WaterNSW	Six weeks following the first six months of construction	DPE, OEH and WaterNSW
Second and subsequent Construction Compliance Reports				
CoA 4.1 SoC 10	As above	SRG	Max of 6 month intervals during construction	DPE, OEH and WaterNSW
Final Construction Compliance Report				
CoA 4.2 SoC 9	Assess the accuracy and conclusions of all previous Construction Compliance Report and the adequacy of the response of the Proponent to monitoring results.	WaterNSW	Post construction	DPE, OEH and WaterNSW
Compliance Tracking Program				
CoA 4.3	Developed to track compliance with approval requirements and will include, but not necessarily be limited to; a) Provisions for periodic review of the compliance status against Project Conditions of Approval;	SRG	Prior to construction commencing	Secretary of DPE and WaterNSW

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Description		Prepared by	Timing	Distributed to
	b) Provisions for periodic reporting of compliance status; and c) Mechanisms for rectifying and noncompliance identified during environmental auditing or review of compliance.			
Incident Reporting				
CoA 7.1	To be undertaken for any incident or potential incident with actual or potential significant off-site impacts on people or the biophysical environment, a report will be supplied to outlining the basic facts. A detailed report to be prepared and submitted following investigations of the causes and identification of necessary additional preventative measures.	SRG and WaterNSW	Notification within 24 hours of any incident or potential incident. Detailed report no later than 14 days after the incident.	DPE and WaterNSW
Non-conformance Report				
CEMP Section 8.5	A non-conformance report will be prepared to detail any non-conformance of environmental management controls, incidents and emergencies (see Section 8.5). Proposed measures to prevent recurrence of the non-compliance will be prepared.	SRG and WaterNSW	Within one day of occurrence. Within five working days	WaterNSW WaterNSW
Environmental Impact Audit Report				
SoC 11	The Environmental Impact Audit Report will: a) identify the major environmental controls used during Construction and assess their effectiveness; b) summarise the main environmental management plans and processes implemented during Construction and assess their effectiveness; c) identify any innovations in Construction methodology used to improve environmental management; and d) discuss the lessons learnt during Construction, including recommendations for future Activities.	WaterNSW	Max of three months after construction is complete (or at any other time interval agreed to by the Secretary).	DPE and Councils or other Government Departments if requested by the Secretary.
National Pollution Inventory (NPI) Reporting				
Legislative requirement	Report emissions and wastes which exceed defined thresholds for NPI listed substances.	WaterNSW and SRG	Within three months after the end of the reporting period	EPA
National Greenhouse and Energy Reporting				
Legislative requirement	Register and report if an NGER if threshold is met.	WaterNSW and SRG	31 October of each year	Clean Energy Regulator (Cth)
Environmental Monthly Report				
CEMP Section 8.4	Monthly Environmental Report to WaterNSW.	SRG	Monthly	WaterNSW
A Waste Recycling and Purchasing Policy (WRAPP) Report				
CEMP Section 8.4	Report to be prepared in accordance with *WRAPP reporting guidelines 2011* (OEH, 2011)	SRG	Every two months	WaterNSW

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8.5. Corrective Action

A non-conformance is the failure to comply with the requirements of this CEMP and supporting documentation.

For each non-conformance identified, a corrective action (or actions) will be implemented. Corrective/preventative actions and improvement opportunities will be entered into the quality system database and include detail of the issue, action required and timing and responsibilities. The record will be updated with date of close out and any necessary notes. The database will be reviewed regularly to ensure actions are closed out as required.

Non-conforming activities may be stopped, if necessary, by the QSE Representative, Environmental Officers, or Project / Site Engineer following consultation with the Project Manager or delegate. The works will not commence until a corrective / preventative action has been closed out. A non-compliance report would be prepared within one day of occurrence and proposed measures to prevent recurrence of the non-compliance would be prepared within five working days.

Procedures for rectifying any non-compliances identified during environmental auditing, review of compliance or incident management are also documented in the Compliance Tracking Program.

Construction Environmental Management Plan

9. Review and Improvement

9.1. Continuous improvement

Continuous improvement of this Plan will be achieved by the ongoing evaluation of environmental management performance against environmental policies, objectives and targets for the purpose of identifying opportunities for improvement.

The continuous improvement process will be designed to:

- Identify areas of opportunity for improvement of environmental management and performance.
- Determine the cause or causes of non-conformances and deficiencies.
- Develop and implement a plan of corrective and preventative action to address any non-conformances and deficiencies.
- Verify the effectiveness of the corrective and preventative actions.
- Document any changes in procedures resulting from process improvement.
- Make comparisons with objectives and targets.

9.2. CEMP update and amendment

The CEMP is to be reviewed every 12 months by the Site QSE Representative.

Only the Environmental Site Representative, or delegate, has the authority to change any of the environmental management documentation. In terms of approval of updates or amendments to this Plan, this is to be carried out by the Environmental Management Representative (EMR), with the EMR verifying that the amendments are consistent (or not) with the Project Approval.

The approved CEMP will be held in SRG's site office and be available for audit as required.

Construction Environmental Management Plan

Appendix A – Compliance Tracking Program

Construction Environmental Management Plan

Appendix B – Environmental Management Subplans

- **Appendix B1 - Construction Flora and Fauna Management Plan**
- **Appendix B2 - Construction Noise and Vibration Management Plan**
- **Appendix B3 - Construction Traffic Management Protocol**
- **Appendix B4 – Construction Soil and Water Quality Management Plan**
- **Appendix B5 – Construction Air Quality Management Plan**
- **Appendix B6 – Construction Heritage Management Plan**
- **Appendix B7 – Construction Waste Management Plan**
- **Appendix B8 – Construction Hazard and Risk Management Plan**
- **Appendix B9 - Other management measures**

Construction Environmental Management Plan

Appendix B9 – Other management measures

Table B-1 Environmental management measures

ID	Environmental Management Measure	When to implement	Responsibility	Reference
	General			
G1	All licences, permits and approvals are obtained and maintained as required throughout the life of the project.	Pre-construction and construction	SRG	CoA 1.6
G2	Ensure that a copy of the project approval and all relevant environmental approvals are available on the site at all times during the project.	Pre-construction and construction	SRG and WaterNSW	CoA 1.6
G3	The Director-General (now Secretary) and the Relevant Councils will be notified in writing of the start of the Activity's Construction and Operation.	Pre-construction	WaterNSW	SoC 3
G4	A Pre-Construction Compliance Report will be submitted at least four weeks before Construction commences. The Pre-Construction Compliance Report will include: a) details of how the Commitments required to be addressed before Construction were complied with; b) the time when each relevant commitment was complied with, including dates of submission of any required reports and/or approval dates; and c) details of any approvals or licences required to be issued by any Relevant Government Departments and/or Councils before Construction commences.	Pre-construction	SRG	SoC 3
	Energy efficiency			
EE1	Procedures to minimise energy use will be implemented to promote reduction of greenhouse gases.	Pre-construction / design	WaterNSW	SoC 36.1
EE2	Awareness programs will be conducted for all site personnel regarding energy conservation methods.	Construction	SRG / WaterNSW	SoC 36.2
EE3	Energy audits will be conducted during construction to identify and address energy wastage.	Construction	WaterNSW	SoC 36.3
	Hazards and risks			
HR1	Construction activities to be undertaken in accordance with a Construction Safety and Hazards and Risk Management Sub Plan.	Pre-construction	SRG	CoA 2.12 and SoC 41.1
HR2	Erect signs and fencing as necessary to ensure the safety of bushwalkers etc near the site during construction.	Pre-construction	WaterNSW / SRG	CoA 2.12
HR3	Provide adequate fire protection works on site during construction in consultation with the NSW Rural Fire Services.	Pre-construction	SRG	CoA 2.12

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ID	Environmental Management Measure	When to implement	Responsibility	Reference
HR4	Ensure that all explosives and fuel are removed from the site or disposed of appropriately at the completion of construction work.	Pre-construction	SRG	CoA 2.12
HR5	Ensure that all dangerous goods and materials stored on site are stored in accordance with the relevant Australia Standards.	Pre-construction	SRG	CoA 2.12
HR6	Chemical pesticides or termicides for new construction work are not be used. Use preventive treatment by physical means to minimise the risk of pest infestations.	Construction	SRG	GC21 contract condition
HR7	Chemical treatments only to be used in existing buildings only as a last resort for the eradication of pest and termite infestations. Chemical pesticides used for this purpose must be registered by the National Registration Authority for Agricultural and Veterinary Chemicals and applied by a Pest Control Operator licensed by WorkCover.	Construction	SRG	GC21 contract condition
HR8	Pest preventive methods must comply with AS 3660.1-2000 Protection of Buildings from Subterranean Termites (except for references to chemical soil barriers), as well as supplementary standards for existing buildings.	Construction	SRG	GC21 contract condition
	Utilities and Services			
U1	The diversion, protection or support of services and utilities affected by the construction activities in consultation with the relevant service authorities would be undertaken.	Construction	SRG	CoA 2.20 and SoC 43.1
U2	Any alternations to utilities and services is to be carried out to the satisfaction of the relevant authority(ies) and unless otherwise agreed to, at no cost to the service authority.	Construction	SRG	CoA 2.20
U3	Any disruption to services resulting from the construction work is to be minimised.	Construction	SRG	CoA 2.20
U4	Anyone affected by the disruption to services to be notified prior to the disruption.	Construction	WaterNSW	CoA 2.20
	Visual Impact and Landscaping			
V1	Post construction site rehabilitation to be undertaken in accordance with a Visual Impact, Landscaping and Revegetation Sub Plan.	Pre-construction.	WaterNSW	SoC 40.1
	Community Information, Consultation and Involvement			
C1	Subject to confidentiality, all documents will be made available for public inspection on request.	Construction	WaterNSW	CoA 5.1
C2	Ensure all potentially impacted landholders from the operation of the project are informed of the extent of potential physical damage that may be caused from the operation of the project.	Construction	WaterNSW	CoA 5.2

Construction Environmental Management Plan

ID	Environmental Management Measure	When to implement	Responsibility	Reference
C3	The owners of properties affected by implementing mitigation measures will be consulted. Mitigation measures will be implemented consistent with the Statement of Commitments and Project Approval.	Pre-construction and during Construction	WaterNSW	SoC 22.1
C4	A Construction Complaints Management System will be prepared and implemented before Construction commences.	Pre-construction.	WaterNSW	SoC 23.1
C5	The Construction Complaints Management System will be maintained for the duration of Construction.	Construction	WaterNSW	SoC 23.2
C6	Prior to the commencement of construction ensure that the following are available for community complaints for the life of the project; a) telephone number which complaints may be registered; b) postal address to which written complaints may be sent; and c) an email address to which electronic complaints may be transmitted.	Pre-construction.	WaterNSW	CoA 5.5
C7	The contact details shall be displayed on a sign near the entrance to the Keepit Dam Office, in a position that is clearly visible to the public and which clearly indicates the purposes of the sign.	Pre-construction.	WaterNSW	CoA 5.5
C8	All complaints are to be referred to the relevant WaterNSW contact.	Construction	SRG	WaterNSW procedures
C9	The nature of the construction works proposed for the next three months, areas where works are proposed, construction hours and contact telephone number must be advertised in relevant newspapers.	Pre-construction and then three monthly intervals during construction.	WaterNSW	CoA 5.7
C10	Ensure that the local community and businesses are advised of construction activities that could cause disruption. Information to be provided must include: a) details of any traffic disruptions and controls; and b) work approved to be undertaken outside standard construction hours in particular noisy works before such works are undertaken.	Construction	WaterNSW	CoA 5.7
C11	Provide the relevant information to WaterNSW to enable the WaterNSW website to be updated before construction commences and maintained until the completion of construction. This is to include; a) periodic updates of work progress, consultation activities and planned works schedules. The site must indicate the date of the last update and the adequacy of the internet site updates; b) description of relevant approval authorities and their areas of responsibility; c) a list of reports and plans that are publicly available under the Project Approval; d) contact names and phone numbers of relevant communications staff; and e) the 24-hour toll free complaints contact telephone number.	Construction	WaterNSW	CoA 5.8

Construction Environmental Management Plan

ID	Environmental Management Measure	When to implement	Responsibility	Reference
	Updates of work progress, construction activities and planned works schedules must be provided where significant changes in noise, air or traffic impacts are expected.			
C12	Subject to landowner agreement, property inspections will be conducted on all Structures (other than structures owned by WaterNSW) within 50 metres of Construction activities that generate vibration impact or any other locations identified by WaterNSW.	Construction	WaterNSW	SoC 38.1

Construction Environmental Management Plan

Appendix C – Environmental Risk Assessment

Construction Environmental Management Plan

Calculating Risk

Risk Analysis Table

The following definitions are used to determine the "**Likelihood**" of an event occurring.

A- Almost Certain- Very high probability that the hazard/risk/event will occur. It would be an unusual occurrence if it didn't take place.

B -Likely- High probability that the hazard/risk/event will occur. It has happened before under the same circumstances.

C -Possible- Possibly would occur. Has occurred occasionally under the same circumstances. Wouldn't be surprising if it occurred.

D- Unlikely- there is a low probability of the hazard/risk/event occurring. May occur in exceptional circumstances.

E- Rare- Possible but highly unlikely. Likelihood is remote.

The "**Consequence"** is then determined as follows (1) Insignificant; (2) Minor; (3) Moderate; (4) Major; (5) Catastrophe.

LIKELIHOOD		CONSEQUENCES				
		1	2	3	4	5
		Insignificant	Minor	Moderate	Major	Catastrophic
A	Almost Certain	H - 15	H - 10	E - 6	E - 3	E - 1
B	Likely	M - 19	H - 14	H - 9	E - 5	E – 2
C	Possible	L - 22	M - 18	H - 13	E - 8	E – 4
D	Unlikely	L - 24	L - 21	M – 17	H - 12	E – 7
E	Rare	L - 25	L - 23	M - 20	H - 16	H - 11

The Hierarchy of Control is then used to establish the best possible means to control the hazard. **A- Eliminate** is the best control measure with **F**- **Protective** being the least desired control measure.

Code	Control	Example
A	Eliminate	Removing the risk entirely
B	Substitute	Replacing the item or risk with an item which creates a lower level of risk
C	Engineering	The use of mechanical equipment to reduce the risk
D	Isolation	Dust suppression, erection of physical barriers, etc
E	Administrative	Safe Work Procedures, Environmental Management Plans and procedures, and training
F	Protective	Use of Personal Protective Equipment i.e. Earmuffs / Plugs for noise.

Construction Environmental Management Plan

Category/Activity	Aspect	Potential Impacts/Risks	Likelihood	Consequence	Risk	Environmental Management Actions	Likelihood	Consequence	Residual risk
Inspecting and early access to site	• Undertaking works without relevant approvals	Unlawful clearing or disturbance to no go areas (including Aboriginal and non-Aboriginal heritage)	D	3	M - 17	• Liaise with client representative to determine if identified work will enter into no-go zones • Relevant documents (EWMS /WMS etc) to be submitted to client prior to works commencing • Sensitive area mapping (as available from WaterNSW) is to be made available to the workforce	E	3	M - 20
Site Establishment • Site compound(s) • Site fencing • Amenities/storage sheds & facilities • Water treatment plant • Storage of fuels, oils, chemicals	• Dust generation • Noise generation • Water quality • Soil/land contamination • Traffic access	Increased erosion potential	C	2	M-18	• The SWMP shall be implemented.	D	2	L - 21
		Water pollution (increasing suspended solids, oil and grease, chemical pollutants)	C	2	M-18	• The SWMP shall be implemented. • Amenities block – pump out to occur regularly. Item to be included on inspection sheet.	D	2	L - 21
		Noise pollution from plant/vehicles	D	2	L - 21	• The NVMP shall be implemented.	D	1	L - 24
		Traffic and access, entering into no-go zones	C	3	H - 13	• TMP to be prepared and implemented. • Traffic to remain on designated roads / access.	E	3	M - 20
Demolition and concrete surface preparation works for dam monolith blocks	• Heritage • Dust generation • Noise generation • Water quality	Heritage impacts beyond those approved for the project	C	4	E-8	• Induction for all staff to address heritage values of dam wall. • Materials used to be sympathetic to dam wall. • The HMP shall be implemented. • Weekly monitoring to occur to review management measures. • Unexpected finds procedure to be implemented in the event of discovery of an unexpected heritage artefact or item	D	4	H-12
		Air pollution (dust)	C	2	M - 18	• Implement AQMP. • Water will be used for dust suppression.	D	2	L - 21

Construction Environmental Management Plan

Category/Activity	Aspect	Potential Impacts/Risks	Likelihood	Consequence	Risk	Environmental Management Actions	Likelihood	Consequence	Residual risk
		Increased noise due to work and delivery vehicles	C	2	M - 18	• The NVMP shall be implemented. • Noise monitoring to occur as required and particularly in response to any complaints.	D	2	L - 21
		Wastewater management	H	3	H - 13	• Implement SWMP • All taken to settlement ponds and removed off site to a licensed facility • Collected into 1000 litre dots and put into settlement • Vacuum cleaners or sludge pumps • Area sealed off to enable containment • Inspections to monitor	D	2	L - 21
Assemble anchors	• Water quality • Noise	Grease bath	C	3	H - 13	• Triple interceptor pit to be installed • Grease bath to be in designated compound area • Spill kits to be available at the compound area • Sloped concrete pad installed to ensure wastewaters are directed to the triple interceptor • Drums of grease stored on concrete pad when in liquid state	D	2	L - 21
		Grinders, strands coming out bripacs	D	2	L - 21	• Implement the NVMP	D	1	L - 24
Drilling of vertical holes for cable anchors through the existing concrete of left abutment nonoverflow blocks, overflow sections and right abutment nonoverflow blocks	• Heritage • Dust generation • Noise generation • Water	Heritage impacts beyond those approved for the project	C	4	E-8	• Induction for all staff to address heritage values of dam wall. • Materials used to be sympathetic to dam wall. • The HMP shall be implemented. • Weekly monitoring to occur to review management measures. • Unexpected finds procedure to be implemented in the event of discovery of an unexpected heritage artefact or item	D	4	H-12
		Air pollution (dust)	C	2	M - 18	• Implement AQMP. • Water will be used for dust suppression.	D	2	L - 21

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Category/Activity	Aspect	Potential Impacts/Risks	Likelihood	Consequence	Risk	Environmental Management Actions	Likelihood	Consequence	Residual risk
		Excessive noise and complaints	C	3	H - 13	• The NVMP shall be implemented. • Noise monitoring to occur as required and particularly in response to any complaints.	C	2	M - 18
		Pollution of waters	D	3	M - 17	• Implement SWMP • All taken to settlement ponds and removed off site to a licensed facility • Wastewater generated during drilling, coring and concrete cutting is to be piped to settlement ponds or transferred by IBC to settlement ponds • Area sealed off to enable containment • Inspections to monitor	D	2	L - 21
Potential for overflow of the dam during project deliver	• Flooding impacts	Pollution of waters	E	5	H - 11	• Implement the 'Dam Failure Procedure' ensuring that machinery and equipment is removed from the dam wall in accordance with any requirements of this procedure.	E	3	M - 20
Installation, including grouting, of all cable anchors into drill holes for dam monolith blocks and spillway piers	• Water quality • Noise generation • Traffic	Pollution of waters	D	3	M - 17	• Implement SWMP • All taken to settlement ponds and removed off site to a licensed facility • Collected into containers and put into settlement ponds • sludge pumps • Area sealed off to enable containment • Inspections to monitor	D	2	L - 21
		High noise levels due to cutting anchor strands	C	2	M-18	• The NVMP shall be implemented. • Noise monitoring to occur as required and particularly in response to any complaints.	C	1	L – 24
		Traffic / machinery access impact	C	2	M-18	• Implement TMP including use of trolleys	D	2	L – 21

Construction Environmental Management Plan

Category/Activity	Aspect	Potential Impacts/Risks	Likelihood	Consequence	Risk	Environmental Management Actions	Likelihood	Consequence	Residual risk
Drilling and grouting starter bars and reinforced concrete construction for the spillway piers	• Heritage • Noise generation • Dust • Water quality	Heritage impacts beyond those approved for the project	C	4	E-8	• Induction for all staff to address heritage values of dam wall. • Materials used to be sympathetic to dam wall. • The HMP shall be implemented. • Weekly monitoring to occur to review management measures. • Unexpected finds procedure to be implemented in the event of discovery of an unexpected heritage artefact or item	D	4	H-12
		High noise levels	C	2	M-18	• The NVMP shall be implemented. • Noise monitoring to occur as required and particularly in response to any complaints.	D	2	L - 21
		Air pollution (dust)	C	2	M - 18	• Implement AQMP. • Water will be used for dust suppression.	D	2	L - 21
		Pollution of waters	D	3	M - 17	• Implement SWMP • All taken to settlement ponds and removed off site to a licensed facility • Collected into containers and put into settlement ponds • Area sealed off to enable containment • Inspections to monitor	D	2	L - 21
Vehicle/plant maintenance and refuelling *This will apply to all relevant activities.*	• Water quality	Pollution of waters through refuelling of gen sets, crane drill rig etc and refuelling vehicles	D	3	M - 17	• Implement the SWMP • SWMS for refuelling and maintenance works to be implemented • No refuelling of items within 25 m of watercourse (other than the crane and drilling equipment) big gen sets to be done on crane wall too • Spill kits • Gen sets will be self-bunded • Vehicles to be refuelled off site	D	2	L - 21

Construction Environmental Management Plan

Category/Activity	Aspect	Potential Impacts/Risks	Likelihood	Consequence	Risk	Environmental Management Actions	Likelihood	Consequence	Residual risk
Stressing of anchors	• Water quality	Using hydraulic pumps therefore potential for burst hose to create a risk	C	3	H - 13	• Use pre-start to occur to check lines – hoses and coupling to be checked • Spill kits • Booms to be available (from WaterNSW) as part of spill kits and emergency response	D	3	M - 17
Material stockpiling and removal	• Noise generation from vehicle movements and from movement of materials • Dust • Water quality	Air pollution (dust)	C	2	M-18	• AQ5 - The project is to be constructed in a manner that minimises dust emissions from the site, including windblown and traffic generated dust. All activities on the site shall be undertaken with the objective of preventing visible emissions of dust from the site. Should such visible dust emissions occur at any time, the proponent shall identify and implement all practicable dust mitigation measures, including cessation of relevant works as appropriate, such that emissions of visible dust cease.	D	2	L - 21
		Water pollution via runoff from stockpiles or deposition on roadways	D	3	M - 17	• The SWMP shall be implemented. • To go to a designated stockpile site determined by client. Suitable erosion and sediment controls are to be established around stockpile sites.	D	2	L - 21
		Excessive noise and / or complaints	C	2	M-18	• NVMP to be implemented	D	2	L - 21
Delivery/removal of materials to/from site	• Vehicle movements • Fuel consumption • Air emissions	Air pollution from exhaust emissions	D	1	L - 24	• All plant and equipment used in connection with the activity will be: a) maintained in a proper and efficient condition; and b) operated in a proper and efficient manner.	E	1	L - 25
		Noise pollution from delivery vehicles	D	2	L - 21	• The NVMP shall be implemented.	D	2	L - 21

Construction Environmental Management Plan

Category/Activity	Aspect	Potential Impacts/Risks	Likelihood	Consequence	Risk	Environmental Management Actions	Likelihood	Consequence	Residual risk
		Traffic generation and conflicts with residents/businesses	C	2	M - 18	• The TMP shall be implemented.	D	2	L - 21
Concrete pouring	• Vehicle movements • Air emissions • Noise generation • Waste management • Alkaline and suspended solids runoff	Noise pollution from vehicles and pouring	C	2	M - 18	• The NVMP shall be implemented.	D	2	L - 21
		Air pollution from concrete agitator trucks	D	2	L - 21	• AQ5 - The project is to be constructed in a manner that minimises dust emissions from the site, including windblown and traffic generated dust. All activities on the site shall be undertaken with the objective of preventing visible emissions of dust from the site. Should such visible dust emissions occur at any time, the proponent shall identify and implement all practicable dust mitigation measures, including cessation of relevant works as appropriate, such that emissions of visible dust cease.	D	2	L - 21
		Waste generation - concrete	B	2	H - 14	• W3 - The treatment, reuse and /or recycling on site of any waste oils, excavated soils, slurries, dusts and sludges associated with the project is to be undertaken as much as possible to minimise the need for treatment or disposal of those materials outside the site. • Designated concrete wash out to be installed.	D	3	M - 17
		Water pollution	C	3	H - 13	• The SWMP shall be implemented.	D	2	L - 21
Removing site buildings/facilities	• Waste management • Vehicle movements	Waste generation – surplus materials	C	2	M – 18	• W3 - The treatment, reuse and /or recycling on site of any waste oils, excavated soils, slurries, dusts and sludges associated with the project is to be undertaken as much as possible to minimise the need for treatment or disposal of those materials outside the site.	D	2	L - 21

Construction Environmental Management Plan

Category/Activity	Aspect	Potential Impacts/Risks	Likelihood	Consequence	Risk	Environmental Management Actions	Likelihood	Consequence	Residual risk
	• Noise generation	Noise pollution from vehicles/plant and reduction in residential amenity and disturbance to communities/ businesses	D	2	L - 21	• The NVMP shall be implemented. • The TMP shall be implemented.	D	2	L - 21

Construction Environmental Management Plan

Appendix D – Forms and registers

- **Appendix D1 – Monitoring Checklist**
- **Appendix D2 – Incident Report Form**
- **Appendix D3 – Environmental Incident Register**
- **Appendix D4 – Project Induction and Training Register**

Construction Environmental Management Plan

Appendix D1 - Monitoring Checklist

Construction Environmental Management Plan

Environmental Monitoring checklist				
Daily	Weekly	Monthly	Other	
Checklist completed by:	Signed:	Date:		
Environmental Control / Issue	**Monitoring assessment: (e.g. visual, audio, inspection)**	**Observations/action required**	**Person Responsible**	**Sign-off**

Construction Environmental Management Plan

Appendix D2 – Incident Report form

Construction Environmental Management Plan

INTEGRATED MANAGEMENT SYSTEM

Incident Report

Project No. / Name		**QEST Number**	

PART A: INITIAL REPORT (tick boxes as appropriate)

Type	☐ Hazard	☐ Property Damage	☐ Injury or Illness	☐ Plant/Equipment	☐ Other(Specify)
	☐ Near Miss	☐ High Potential	☐ Fatality	☐ Environment	
	☐ Report Only	(to be reported to Regional Manager within 24 hrs)	☐ LTI	☐ Conflict	
			☐ MTI		

Event Timing	Date of event (dd/mm/yy) / /	Time of event (24hr clock) :	Date of Report (dd/mm/yy) / /	Time of Report (24hr clock) :
Reported To Supervisor	Surname	First Name(s)	Position	Telephone
Division		Location		
Description	Brief Description of what happened, injuries or any equipment / environmental damage sustained, what the person was doing at the time.			
PPE Worn/Used	Type	PPE Adequate YES NO		
Witnesses (Get Statement)	Name	Name		
Person Involved	Surname	First Name	Gender (M/F)	Date of Birth
	Department	Position	Supervisor	
	☐ Direct Employee	☐ Contractor	Company Name:	
D & A Testing?	Drug: YES NO	Alcohol: YES NO		

PART B: ENVIRONMENTAL DETAILS

Details	☐ Spillage or release			
	Type	From	To	
	Duration	Volume	Area	
Type	☐ Wildlife	☐ Vegetation Damage	☐ Water Discharge	☐ Water Contamination
	☐ Noise/Vibration	☐ Dust / Odour	☐ Archaeological	☐ Community
Comments				

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Incident Report

PART C: FIRST AID TREATMENT (if more than one person injured/ill, complete Part B for each)

Injury / Illness Type/Nature	☐ Abrasions	☐ Crush	☐ Electric Shock	☐ Laceration	☐ Sprain						
	☐ Asphyxia	☐ Dislocation	☐ Fracture	☐ LOC	☐ Strain						
	☐ Bruising	☐ Chemicals	☐ Illness (specify)	☐ Nausea	☐ Respiratory						
	☐ Burns	☐ Exposure	☐ Puncture Wound	☐ Foreign Object	☐ Other (specify in comments below))						
Part of the Body		**Left**	**Right**		**Left**	**Right**		**Left**	**Right**		
	☐ Skull/Head	☐	☐	☐ Shoulder	☐	☐	☐ Hip	☐	☐		
	☐ Face	☐	☐	☐ Upper Arm	☐	☐	☐ Upper Leg	☐	☐		
	☐ Ear	☐	☐	☐ Lower Arm	☐	☐	☐ Lower Leg	☐	☐		
	☐ Eye	☐	☐	☐ Wrist	☐	☐	☐ Ankle	☐	☐		
	☐ Neck	☐	☐	☐ Hand	☐	☐	☐ Foot	☐	☐		
	☐ Back	Lowe	Upper	☐ Finger	☐	☐	☐ Toes	☐	☐		
	☐ Abdomen	☐	☐	☐ Thumb			☐ Other (specify)				
	☐ Groin	☐	☐								
	☐ Chest	☐	☐								
First Aid Given	Record any observations and treatment provided, as well as any advice given to the patient.										
Provider	Surname	First Name(s)	Signature	Date: (dd/mm/yy) / /							
Mechanism	☐ Caught in or between	☐ Contact or Exposure Heat / Cold	☐ Contact or Exposure Chemicals								
	☐ Struck Against	☐ Repetitive	☐ Weather								
	☐ Fall from Height	☐ Fall from same Height	☐ Contact or Exposure Biological Factors								
Outcome	☐ Return to normal duties	☐ Medical Certificate received									
	☐ Referred for doctor/hospital/medical treatment	☐ Injury management required									
	☐ Returned to alternate duties										
Comments											

Construction Environmental Management Plan

INTEGRATED MANAGEMENT SYSTEM

Incident Report

PART D: INCIDENT INVESTIGATION				
Authority Type		**Outside Agencies Contacted**		
Description of Activity **(Attach sketch if required)**	Summarise the incident and consequences being reported. Provide detail on how the incident occurred? (Not required for hazards). Describe the surroundings / environment of the incident (Not required for hazards). What task/s were being carried out or are associated with the incident? (Not required for hazards)			
Where did the activity happen	☐ On Site	☐ Off Site	☐ Commute	☐ Yard
	☐ Factory	☐ Office	☐ Workshop	
Equipment Involved		**Property or Materials Damaged**		
Immediate Actions	Brief description of what actions have been undertaken to reduce or mitigate the outcomes of the event.			
Contributing Factors Descriptors	☐ Organisational	☐ Task / Environmental Human	☐ Task / Environment Workplace	
	☐ Individual / Team	☐ Failed / Absent Defences		
Root Cause	☐ Procedures	☐ Quality Control	☐ Management Systems	
	☐ Supervision	☐ Communication	☐ Human Engineering	

Construction Environmental Management Plan

INTEGRATED MANAGEMENT SYSTEM

Incident Report

PART E: SUMMARY OF CONTRIBUTING FACTORS				
Details	Please provide details / summary of contributing factors			
Investigation Status	☐ Pending	☐ In progress	☐ Completed	☐ ICAM / TAPROOT

PART F: CORRECTIVE ACTION / PREVENTION PLAN			
Action	Please descried what actions are required to prevent this from occurring again	By Whom (Must be name & position)	By When (Date)

PART G: COST OF EVENT					
Parts:		Labour:		Lost productivity:	
				Total:	

PART H: CLOSE OFF OF REPORT			
Supervisor	Name:	Signature:	Date: (dd/mm/yy) / /
Manager	Name:	Signature:	Date: (dd/mm/yy) / /
Data entered into QEST	Name:	Signature:	Date: (dd/mm/yy) / /

PART I: NOTIFICATION & RECORDING			
Notifiable to Government Agency or Corporate Office	☐ Yes ☐ No Inform Department Head & General Manager prior to notification		Time reported (24 hour clock) : Date reported (dd/mm/yy) / /
	Notified To:		Notes:
	Notified By:		

Construction Environmental Management Plan

Appendix D3 – Event Register

Construction Environmental Management Plan

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Event Register – Insert Site Name

INTEGRATED MANAGEMENT SYSTEM

Date	Time	Details of Event	Injury	Hazard	Near Miss	Property Damage	Environmental	Corrective Action	Non-conformance	Report	Investigation required	Interactions	Actions Required To prevent further occurrences	Whom Name	Date Closed
To be kept as front page of Site Event File			Tick where appropriate												

Construction Environmental Management Plan

Appendix D4 – Project Induction and Training Register

Construction Environmental Management Plan

INDUCTION REGISTER

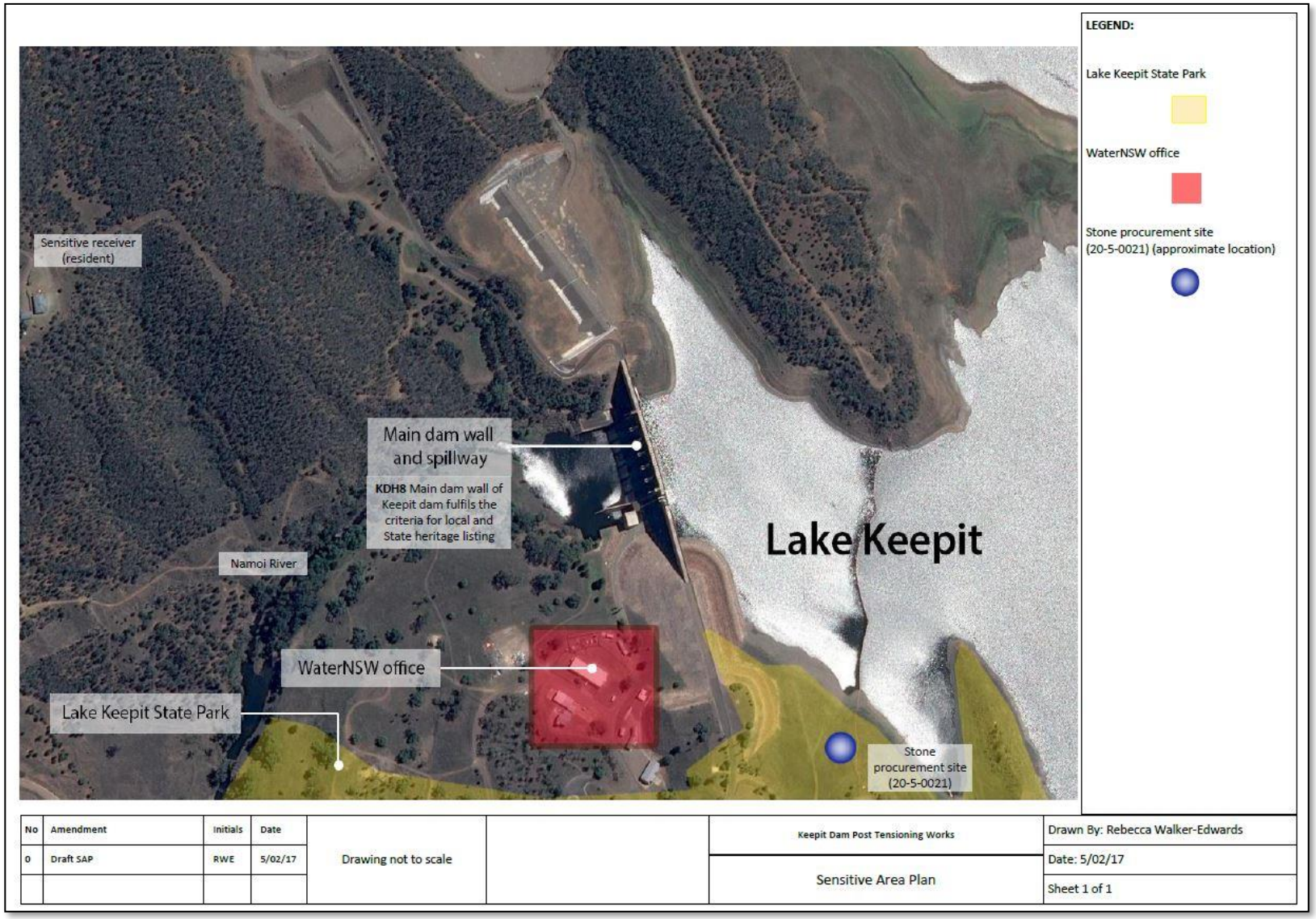
Keepit Dam

NAME	Date	COMPANY	Industry Card #	Working over water Plan	Emergency Management Plan	Bush Fire Plan	Construction Environment Management Plan	SIGNATURE

Construction Environmental Management Plan

Appendix E – Sensitive Area Plans

Construction Environmental Management Plan



Construction Environmental Management Plan

Appendix F – Consultation Records