Environment

Construction Method Statement #11

Viaduct Structures

within

Sugarloaf Ranges Area

HEA-WMS-GL-ENV-009-00-00

Scope	This Environmental Construction Method Statement describes the environmental management measures to be applied to the construction of viaduct structures over the Sugarloaf Ranges Area.
Location/s	The following structures will be included: BW 009, 010 & 011
Timing	Construction
Minister's COAs	CoA 30

DOCUMENT CONTROL

Document Type:	Environmental Construction Method Statement	Document No/Ref: HEA-WMS-GL-ENV-009-00-00
Title:	Viaduct Structures over the Sugarloaf Ranges Area	
General Description:	This ECMS covers the activities and management measures for the construction of viaduct structures within Sugarloaf Ranges at BW 009, 010 & 011 as part of the construction of the 40 km Hunter Expressway from Newcastle Link Road to Branxton, of which 13 km is being constructed by the Hunter Expressway Alliance from Newcastle Link Road to Buchanan.	
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Approval	**Name**	**Position**	**Signed/Approved**	**Date**
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DOCUMENT REVISIONS

Rev	Date	Prepared by	Reviewed by	Approved by	Remarks
01	17/03/2011	A. Noonan	T. Doczy	T. Doczy	

EMR Certification

I have reviewed this ECMS and find it to be in accordance with the relevant Conditions of Approval and all relevant undertakings made in the EIS, Representations Report and the approved CEMP.

Signed:

Environmental Management Representative

Date:

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1 Introduction

This Environmental Construction Method Statement (ECMS) documents the requirements for works associated with the establishment and construction of the viaduct structures over the Sugarloaf Ranges area as part of the Hunter Expressway project.

This ECMS incorporates the requirements from the following:

- the relevant Minister for Planning's Conditions of Approval Nov 2001; the Appendix A: NPW's Conditions of Concurrence; the Ministers Modification July 2006, Aug 2007 and June 2010; including all documents referenced;
- the specific requirements of the Minister's Condition of Approval 30 for the Hunter Expressway project, Aug 2007;
- the Environmental Protection Licence (no:13296), July 2010;
- the requirements of the Hunter Expressway Alliance (HEA) Construction Environmental Management Plan and subplans (including all post approval revisions); and
- management requirements as outlined by the NSW Dept of Industry and Investment (formerly NSW Fisheries and DPI), OEH, and the RTA Specification documents.

This ECMS has been prepared as a practical environmental management tool for use by all HEA personnel and subcontractors and incorporates the assessment of the environmental and community risks for these works. It incorporates the assessment of the environmental and community risks for these works and describes the environmental management measures associated with viaduct structures over the Sugarloaf Ranges area.

The specific environmental and community management controls developed and detailed in the ECMS, include the following key information:

- Key site and management personnel - responsibilities and contact details.
- Operating hours.
- Construction details – activities, staging and schedule.
- Objectives and performance criteria – for environmental management system elements.
- Action tables – with specific actions, responsibilities, training, timing/frequency, reporting and monitoring/auditing.
- Site maps - site construction layout, sensitive sites and controls, monitoring locations, erosion controls and batters and project boundary for access and clearing limits.

1.1 Overview of activities

This ECMS incorporates the following viaduct structures:

- BW009 – Chainage 1440 to 1780
- BW010 – Chainage 2040 to 2320
- BW011 – Chainage 2460 to 2680

The methodology for constructing these viaduct structures, namely BW009, 010, & 011 are similar and since they're located within the same area of the HEA project they will be grouped together for the purposes of providing information in this document unless otherwise specified.

A brief summary of the requirements and specifications of each structure is provided below:

BW09

The structural form for Viaducts BW009, BW010 and BW 011 is the same. The main bridge structure has a main span of 75m between columns. There are separate 12.4m wide bridges for the Eastbound and Westbound carriageways, meaning that each Viaduct consists of two independent bridge structures.

The bridge structure is constructed from precast segments that are fabricated near the main site compound at Buchanan and transported to site where they are erected using a large steel erection truss. The weight of these segments range from approximately 60 tonnes to 100 tonnes.

The bridge structure sits on columns that are similarly constructed from precast elements that are fabricated at the same location as the main bridge elements. The column segments weigh 36 tonnes and are erected using cranes. The column height ranges from 10metres to 32 metres.

Each column sits on a concrete pilecap which in turn sits on bored piles. There are between 4 and six bored piles underneath each pilecap.

The ends of each bridge sit on an abutment structure. The abutments sit on 6 bored piles.

The total length of BW 0009 is 330m. There are 4 column/ foundation locations for each carriageway structure, with a total of 8 foundations for all of the structures comprising BW009.

BW10

BW010 has a similar structural form to BW009 but is shorter at 255 metres.

Each carriage way has one less foundation than BW009, meaning there are 3 foundations for each bridge structure and 6 in total for all of the structures comprising BW010.

BW11

BW011 has a similar structural form to BW009 but is shorter at 196 metres.

Each carriage way has one less foundation than BW010, meaning there are 2 foundations for each bridge structure and 4 in total for all of the structures comprising BW011.

1.2 ECMS overview

The General Construction ECMS #1 will be required for **all** construction sites. The General Construction ECMS will apply for the non-specific requirements for the site including the general mitigation measures, environmental training, induction, and roles and responsibilities for environmental management.

This specific ECMS provides only specific requirements for the construction of all viaduct structures on the HEA project, namely at the locations BW009, BW010, & BW011.

Table 1-1: Viaduct locations relevant to this ECMS.

Bridge Number	Chainage	Zone
BW009	1440 to 1780	Sugarloaf Ranges
BW010	2040 to 2320	Sugarloaf Ranges
BW011	2460 to 2680	Sugarloaf Ranges

The Viaducts ECMS #11 will also need to be used in conjunction with the following ECMS's:

- ECMS #2: Clearing and Topsoil Management
- ECMS #5: Access Track Widening and Upgrade
- ECMS #6: Treatment of Mine Voids
- ECMS #8 –Temporary Waterway Crossings

The Site Supervisor in consultation with the QA Manager will determine which ECMSs are required for each work site. Refer to the overview map contained in Attachment B of ECMS #1 for an overview of all ECMSs.

1.3 ECMS attachments

Attachment A of this ECMS contains an Environmental Control Plan (ECP). The ECP contains:

- Action tables with environmental management measures relevant to the construction of the viaducts over the Sugarloaf Ranges; and a
- Cadastral and aerial photo base of the Sugarloaf Ranges with an overlay of site boundary, vehicle routes, threatened flora and fauna species and communities, Aboriginal and historical heritage items and environmental controls.

Attachment B of this ECMS includes a Progressive Erosion and Sediment Control Plan for the structures: BW009, BW010 & BW011. This will be updated as works progress.

Attachment C of this ECMS includes a more detailed map of the access routes to viaduct areas.

ECPs are to be read/ implemented in conjunction with the ECMS document and relevant reference documents and are for day-to-day reference for managing activities on the individual sites. The ECPs have been designed as A3 and/or A0 drawings for attachment to site shed walls.

As detailed drawings are progressed for areas covered within this ECMS, further ESCPs will be developed.

1.4 Key reference documents to ECMS

The development of this ECMS has been guided by detailed management plans and reports prepared for the project's Construction Environmental Management Plan (CEMP). Impacts and mitigation measures from these plans and reports that are relevant to the viaducts structures have been incorporated into this ECMS. The relevant CEMP sub-plans listed in Table 1.1 and the specific references relevant to the viaducts construction works are listed in Table 1.2. The documents will be referred to as needed for specific information for day-to-day worksite activities.

Table 1-2: Relevant sub-plans to the ECMS

Issue	**Relevant Plan(s)** (current version as at issue of this ECMS).	**Details**
Noise & Vibration (incl. blast management)	Construction Noise & Vibration Management Sub Plan HEA-PL-GL-NVP-001-00-02 Construction Noise Impact Statement, Appendix B-C B: batch plants, site compounds & offices; C: bridges and intersections; D: main carriageway.	Provides a comparison of measured background noise levels at sensitive receivers with predicted noise impacts, details on duration of impacts from site works and traffic, physical and site management measures to minimise impacts and monitoring impacts.

Issue	**Relevant Plan(s)** (current version as at issue of this ECMS).	**Details**
Flora & Fauna Visual	Flora and Fauna Management Sub Plan (incl Landscape Master Plan) HEA-PL-GL-FFP-001-00-05	Provides details of the location of flora and fauna, including EECs and threatened species and specific mitigation measures which include: fauna structures; weed management; nest box requirements; survey and rescue procedures; clearing and grubbing procedures, & Landscape Master Plan.
Soil and Water Quality	Soil & Water Management Sub Plan HEA-PL-GL-SWP-001-00-03 Landscape Management Sub Plan HEA-PL-GL-LMP-001-00-02 Spoil Management Sub Plan HEA-PL-GL-SHP-001-00-03	Provides details of the physical and management controls for surface runoff. Mitigation measures cover; design; site assess; clearing; earthworks; drainage and bridgeworks; paving and vehicle movement; and rehabilitation. Appended are: procedures for dewatering and water quality management; sediment basins details; acid sulphate soil strategy; and afflux assessment.
Land Contamination	Hazard & Risk Management Plan HEA-PL-GL-HRP-001-00-03	Provides details of the assessment of contamination. Mitigation measures include: spill response procedure: plant refuelling protocol and storage and use of hazardous materials procedures.
Heritage	Aboriginal Cultural Heritage Management Sub Plan HEA-PL-GL-IHP-001-00-03 Historical Heritage Management Sub Plan HEA-PL-GL-HHP-001-00-03	Provides details of the location known and potential of archaeological sites and heritage sites as well as management measures to prevent damage or destruction. This includes assessment of significance, location, requirements for designated aboriginal management zones and protocols for discovery and monitoring.
Air Quality	Construction Air Quality Management Plan HEA-PL-GL-AQP-001-00-02	Provides details on the location of sensitive receivers, air quality impacts from construction works, mitigation strategies and measures, and monitoring locations.
Waste	Waste Management & Re-Use Sub Plan HEA-PL-GL-WMP-001-00-03	Provides details on the waste strategies and management measures to maximise reuse, minimise waste generation and ensure lawful disposal where required.

Table 1-3: Additional references

Issue	Relevant Plan(s)
Erosion and Sediment Control & basins	*Managing Urban Stormwater: Soil and Construction*, Volume 1 *Managing Urban Stormwater: Soil and Construction*, Appendix C- Unsealed Roads. Dept of Housing (2008) and Appendix D –Main Road Construction (2008). http://www.environment.nsw.gov.au/resources/stormwater/0802soilsconststorm2c.pdf
Waterway crossings -design elements	*Why do fish need to cross the road?* Passage Requirements for Waterway Crossings. NSW Fisheries, January 2003. Located on: http://www.dpi.nsw.gov.au/__data/assets/pdf_file/0004/202693/Why-do-fish-need-to-cross-the-road_booklet.pdf
Waterway crossings -legal requirements	*Policy and Guidelines for Fish Friendly Waterway Crossings*. NSW Fisheries, November 2003 Located on: http://www.dpi.nsw.gov.au/__data/assets/pdf_file/0003/202692/Fish-friendly-waterway-crossings-Policy-and-guidelines.pdf
Classification and required crossing structures	*Policy & Guidelines – Aquatic Habitat Management and Fish Conservation* – NSW Fisheries 1999
Consistency Review Report	Stage 2 Construction Design Changes to Stage 2 of the Hunter Expressway – Package 2, Feb 2011, HEA-EA-GL-ENV-005-00-00. Design changes C9 –Refinement of design for the 3 viaduct bridges from ch 1,420 – 2,680.

As in the development of the CEMP, all relevant RTA Specifications were incorporated in the development of the Environment Construction Method Statements.

Refer to the General Construction ECMS, Table 1.3 for specific work instructions developed for the CEMP and subplans as relevant to construction works and environmental management

2 Scope of works

This ECMS covers construction of viaduct structures at bridges BW009, BW010 & BW011. This document will provide a guideline procedure, however greater detail on each specific viaduct construction will be included in individual work method statements for each viaduct construction.

2.1 Key elements

The key elements of this work are shown in Table 2.1.

Table 2-1: Steps and activities under the ECMS

Step	Activity	Description
1.	Site access	Site access to the three viaduct areas is via local road and access tracks approved under Priority One & Two Consistency assessments by OEH; document no: HEA-GEN-RPT-EN000-0066-A & HEA-EA-GL-ENV-008-00-00. A map of the access points to be used is included in Attachment C of this document. **BW009** Access into Viaduct 1 for construction will be via Seahampton Road into access tracks V8a from V1 or into V29 from V9 & V10 access tracks. **BW010** Access into Viaduct 2 for construction will be via Seahampton Road into V12 / V15 tracks from V9 & V10 access tracks. **BW011** Access into Viaduct 3 area will be via access track V19a/30 from V15 access track and S7 or V21/22 from V27, which can be entered into from George Booth Drive. The access points to all these tracks from the junctions at points along George Booth Drive have been upgraded, and turning lanes in and out of these tracks have been installed to RTA specifications, so as to ensure public road user safety is maintained.
2.	Construction of creek crossing	No creek crossing is proposed to assist in constructing any of the viaduct structures; however a working platform will be required at BW011 and is referenced in step 5 below.
3.	Sedimentation and erosion control	An erosion and sediment control plan (PESCP) has been prepared for each viaduct site in consultation with the Environmental Coordinator for Viaducts, Alliance Environment Manager, and the Soil Conservationist

Step	Activity	Description
	measures	appointed by the Alliance. The PESCP plan is included in Attachment B of this document. Simultaneously or immediately after site clearing and tree removal activities, the erosion and sedimentation controls will be installed in order to ensure the water run-off from the site is captured and released in accordance with water quality guidelines for the project. Emphasis will be placed on maintaining separation of “clean” and “dirty” water.
4.	Site clearing and tree removal	Clearing must be undertaken in accordance with the clearing work procedure and clearing and grubbing work method statement. Before site clearing and tree removal commences the approved clearing area will be clearly identified with yellow flagging. Detailed services investigations will be undertaken on site where required by local service providers. Any works requiring excavation of the ground will be completed in accordance with the Ground Disturbance Permit system. Site clearing and tree removal will be undertaken using chainsaws, heli-saw, and/or hand tools along with excavator mounted tree felling equipment, truck and wood chippers. All material will be stockpiled for later use or removed from site. Minimal topsoil stripping will be required due to the nature of the works; however any topsoil stripping will be undertaken using excavators and tip trucks. All topsoil will be stored for reuse or removed from site. All weedy topsoil will be stored for treatment or removed off site.
5.	Construction of working platforms for piling access	All works within the waterways need to be approved by Fisheries including the final agreed method of scour protection. Also DOP (Department of Planning) approval is required prior to commencement of work platform in the existing waterway, as per MCOA 69. **BW009 & BW010** No working platform is required at either of these viaduct locations. **BW011** A working platform on Blue Gum creek is required to construct Viaduct 3 and will be constructed as described in the relevant working method statement; (document no: HEA-WMS-SLA-ENV-002-00-00). Refer to work method statement for greater detail of working platform construction. As a general description, two pipes will be placed to ensure that normal stream flows are not reduced and to ensure that fish passages are maintained. The creek crossing will typically be built by placing geo-textile over the surface of the creek and followed by placing the pipes and then placement of the clean rock over the fabric. Length of the

Step	Activity	Description
		platform is 12 metres and located within the V19a access track.
6.	Piling (substructure)	All of the foundations for all of the viaducts, except for the Western abutment of Viaduct BW011, are supported on bored piles. The depth of the piles depends on subsurface geological conditions and ranges from approximately 10m to 20m depth. Some of the piled foundations that are located in the lower valley areas of each viaduct require permanent casing to allow for ground movement that may occur due to mining subsidence outside the project corridor. The bored piles will be drilled from the level piling platform to the required depth. All excavated material will be collected and disposed off site. Once the drill hole is completed, a steel reinforcement cage is inserted and concrete is introduced.
7.	Columns and Pilecaps	This includes the installation of reinforcement and in-situ concrete for the pilecaps and the installation of the precast column segments using cranes.
8.	Deck (superstructure)	This includes placement of deck segments, parapets and expansion joints. The precast deck units will be transported from the precast yard near the main site compound using low loaders. All deck segments will be delivered along access track V27 from George Booth Drive. This activity is consistent for all bridges incorporated into this ECMS, with variation only in lengths and widths dependent upon individual bridge specifications.
9.	Rehabilitation	This includes the rehabilitation of the following areas: • Platforms • Access Tracks as agreed by land owner and other key stakeholders (RTA, Rural Fires, OEH) • Ancillary facilities

Step	Activity	Description
		• Working Platforms • Unforeseen impacts from viaduct / deck construction1

2.2 Staging of works

Stage 1: includes access, clearing, topsoil stripping, erosion and sediment control installation and site preparation works

Stage 2: working platforms (where required), and piling operations

Stage 3: Sub structure (pilecaps and columns and abutments) and construction of R.E. wall (if required)

Stage 4: Superstructure (precast deck segments, parapets)

Stage 5: Finishing and rehabilitation, site demobilisation

2.3 Timing of works

BW009: Works will commence in December 2011 and be completed in June 2013.

BW010: Works will commence in June 2011 and finish June 2013

BW011: Works will commence in May 2011 and finish June 2013.

2.4 Hours of operation

Normal construction hours apply to the activities included in this ECMS. These hours are:

- Monday to Friday 7:00 am – 6:00 pm
- Saturdays: 8:00 am – 1:00 pm
- Sundays & Public Holidays – no work

Activities resulting in impulsive or tonal noise emission (such as rock breaking, rock hammering, sheet piling, pile driving) will be limited to 8:00 am to 12:00 pm, Monday to Saturday and 2:00 pm to 5:00 pm Monday to Friday. These activities will not be undertaken for more than 3 continuous hours without a minimum one-hour respite period.

2.5 Out of Hours

If required, out-of-hours approval from OEH is obtained for works other than those approved in the Environment Protection Licence, Ministers CoA 74, and the Construction Noise and Vibration Impact Statement (as part of the CEMP subplan for Noise and Vibration Management).

Already a number of activities have been approved for out of hours construction based on the assessments in the NVMSP (July 2010), in particular Appendix C which deals with impacts from Main

bridge structures and Intersections, and the description of approved bridge structure activities approved in Section 7.4 include:

- The preparation of foundations and piers including excavation and piling works
- The installation and construction of bridge and intersection structures including prefabricated formwork and concrete spans
- Road paving works for the concrete pavement and asphalt road surfaces

To determine whether any further upcoming works is expected to meet or exceed noise criteria for daytime, evening and night time, refer to the Construction Noise Impact Assessment (Noise and Vibration Sub Plan appendices).

2.6 Site rehabilitation and restoration

At the completion of construction, construction site compounds and facilities will be demobilised. Appropriate replanting with local native species will be undertaken in accordance with the Landscape Management Plan, prepared in consultation with Councils affected landowners and the Community Liaison Group.

3 Key roles and responsibilities

Refer to the 'General Construction ECMS #1 for roles and responsibilities for key personnel.

4 Statutory requirements and approvals

A summary of the key statutory requirements and approvals for the works are detailed below.

Table 4-1: Legislation and statutory obligations

Regulator	Licence/Approval etc	Relevant works
NSW Dept of Industry and Investment	As a Part 3A project, rather than permit requirements, approval is required for the following: Dredging or reclamation (s.201) Blockage of fish passage (s.219)	Dredging, reclamation or blockage of creek flows (this includes placing of silt fences in creeks) (Note: RTA must notify Minister for Fisheries under Part 7 (div 3) the Fisheries Management Act 1994)
NSW Dept of Industry and Investment	MCoA -Consultation	Construction of temporary platforms for piles and pier construction in creeks
NSW Dept of Industry and Investment	MCoA -Consultation	Design and timing of bridge construction
NSW Dept of Industry and Investment, Dept of Planning	MCoA -Approval	Earthen platforms or placing of fill in creeks
Dept of Planning	MCoA -Comply with Blue Book: Managing Urban Stormwater: Soil and Construction	Design and construction of waterway crossing and erosion sediment control structures
OEH	Environmental Protection Licence - POEO Act 1997	Discharge from sediment basins Impact on waterways Noise criteria
OEH, Dept of Planning	Approval as per MCoA -60	To clear areas that exceeds project limits
OEH	Licence to harm or pick threatened species, populations or ecological communities or damage habitat	Harm or damage to threatened species, populations, or EEC from clearing, laydown & equipment or machinery use. Seed and cutting collection
NSW Heritage Council	NSW Heritage Act 1977: s139 excavation permit s146 notice of relic discovery	Excavation near a heritage item

Regulator	Licence/Approval etc	Relevant works
OEH	National Parks and Wildlife Act 1974: s87 / s90 Aboriginal Heritage Impact Permit	Construction works near an aboriginal sites

Note: Refer also to Table 3.5 in the CEMP for further information on the consultation with external stakeholders.

4.1 Revision of ECMS to reflect licence conditions

Relevant details of the HEA Environmental Protection Licence:13296 have been incorporated into the ECP of this ECMS. Up-to-date copies of this licence will be made available to all site personnel.

4.2 ECMS consultation process

Consultation for the project has been undertaken with agencies and stakeholders including:

- Department of Planning
- OEH
- NSW Office of Water
- City of Lake Macquarie Council
- NSW Industries and Investment
- Utility providers
- Aboriginal Focus Groups, including Local Aboriginal Land Councils, ie Awabakal LALC

Ongoing consultation during the works covered under this ECMS will be undertaken with relevant stakeholders where changes to works occur under this ECMS. Specifically DoP and OEH will be notified where necessary. Refer to CEMP for further details.

The design changes relevant to the viaduct construction were discussed with representatives from the Aboriginal Focus Group (AFG) on the 15 Sept 2010, 17 Nov 2010 and 2 Feb 2011.

Any further updates to the ECMS requires EMR endorsement and a summary of changes and updates will be provided to the public for their information, and a full copy of the ECMS be made available on the internet, following EMR endorsement.

4.3 Minister's Conditions of Approval

Minister's Condition of Approval 30 is reproduced in the table on the following page with cross reference to where the condition is addressed in this ECMS or other project management documents.

Table 4-2: Matrix of Minister's Condition of Approval 30

Reference	CoA 30 Requirement	ECMS Reference
	The Proponent shall prepare Construction Method Statements (CMS) identified in the CEMP required by Condition 24. CMSs must be certified by the EMR as being in accordance with the Conditions of Approval and all undertakings made in the EIS, Representations Report and the Approved CEMP.	Page 2
	Each CMS shall include, but not be limited to:	
I	construction activities and processes associated with the relevant construction site(s), including staging and timing of the proposed works;	1. Introduction and 2. Scope of works
Ii	specific hours of operation for all key elements including off-site movements;	2 Scope of Works 2.2 Hours of Operation
iii	cover specific environmental management objectives and strategies for the environmental system elements and include, but not be limited to:	Environmental Control Plan at Attachments A will cover following relevant issues
	noise and vibration;	✓& ECMS#1
	air quality;	✓& ECMS#1
	water quality;	✓& ECMS#1
	erosion and sedimentation;	✓& ECMS#1
	access and traffic;	✓& ECMS#1
	property acquisition and/or adjustments	CEMP
	heritage and archaeology	✓& ECMS#1
	flora and fauna	✓& ECMS#1
	groundwater	CEMP
	acid sulfate soils	ECMS#9
	spoil stockpiling and disposal	✓& ECMS#1
	waste/resource management	✓& ECMS#1
	weed management	✓& ECMS#1
	flooding and stormwater control	✓& ECMS#1
	geotechnical issues	CEMP
	visual screening	CEMP
	landscaping and rehabilitation	✓& ECMS#1
	safety, hazards and risk	✓
	energy use	CEMP
	resource use and recycling	✓ & ECMS#1
	utilities	CEMP

Reference	CoA 30 Requirement	ECMS Reference
Iv	address, but not be limited to:	
	identification of the statutory and other obligations which the Proponent is required to fulfil during project construction, including all approvals and consultations/agreements required from other authorities and stakeholders, and key legislation and policies which control the Proponent's construction of the project;	4. Statutory requirements and approvals
	measures to avoid and/or control the occurrence of environmental impacts;	Environmental Control Plan - Attachment A
	measures (where practicable and cost effective) to provide positive environmental offsets to unavoidable environmental impacts;	The key environmental offsets related to the worksite will be realised during the post construction rehabilitation.
	definition of the role, responsibility, authority, accountability and reporting of personnel relevant to compliance with the CMS;	3. Key roles and responsibilities & ECP in Attach. A of ECMS #1
	site specific environmental management techniques and processes for all construction processes which are important for the quality of the environment in respect of permanent and/or temporary works;	Environmental Control Plan - Adam NoonanA
	site specific monitoring, inspection and test plans for all activities and environmental qualities which are important to the environmental management of the project, including performance criteria, tests, and protocols (eg. frequency and location);	6. Monitoring and inspections
	locational details of important elements such as temporary noise barriers; portable offices and amenities; truck, plant and materials storage; access locations; provision of site hoardings etc;	Attachment A of ECMS #1- General Construction
	environmental management instructions for all complex environmental control processes which do not follow common practice or where the absence of such instructions could be potentially detrimental to the environment;	Table 1-3 & 1.4 in ECMS #1- General Construction
	steps the Proponent intends to take to ensure that all Plans and Sub Plans are being complied with;	CEMP
	consultation requirements with relevant government agencies and utility/ service providers; and,	Attachment A of ECMS #1- General Construction
	community consultation and notification strategy (including local community, businesses, relevant government agencies, and all relevant Councils), and complaint handling procedures.	CEMP
	Specific requirements of the main environmental system elements referred to in (iii) shall be as required under the conditions of this approval and/or as required under any licence or approval. All CMS shall be made publicly available	Section 4.3

4.4 Other Relevant Conditions of Approval

Other conditions of approval are relevant to these construction works, identified in Table 4.3 on the following page.

Table 4-3: Other relevant Conditions of Approval

Reference	Requirement	ECMS Reference
MP CoA No.68	The Proponent shall consult NSW Fisheries in relation to: the construction of temporary platforms for the construction of the piles and piers in the creeks; and the design and timing of bridge construction.	Table 4-1
MP CoA No.69	The Proponent shall ensure that no earthen platforms are constructed or fill material placed in the creeks unless prior approval is granted by NSW Fisheries and the Director-General.	Table 4-1
NPWS CC 4	Without further environmental assessment, no clearing for ancillary infrastructure or associated works including permanent or temporary detention or sediment control basins; materials stores; access roads; utility corridors; works areas; depots or any other activity or development (as defined by the Environmental Planning and Assessment Act 1979) shall be carried out, or be allowed to be carried out, within areas shown as habitat for endangered ecological communities or threatened species in any of the documents (see section 2 of this Concurrence Report) received by the NPWS in assessing the concurrence proposal.	Table 2-1, Clearing Work Procedure.
MCoA 93.	The Soil and Water Management Sub Plan shall identify mitigation measures proposed to be taken to address any: i. afflux impacts from the roadway or structures associated with the proposal eg. the proposed Wallis/Surveyors Creek crossing and impacts upstream in the Buchanan area; and ii. adverse impacts from the proposal as a result of losses to the Hunter River floodplain storage areas for flood events above and including the 1% Annual Exceedances Probability Event eg. the Wentworth and Dagworth Swamps;	The Soil and Water Management Sub Plan of the CEMP includes mitigation measures to manage afflux impacts, which are incorporated into the design of the bridge structures.

5 Site induction and training

Refer to ECMS 1 General Construction for details regarding induction and training.

6 Monitoring and inspection

Refer to the Environmental Control Plan contained in Attachment A for details on monitoring and inspection.

7 Revisions

Revisions to the ECMS will be made as required and changes will be endorsed by the Environmental Management Representative (EMR) as required.

The current copy of this ECMS is kept at the worksite and at the HEA Project Display Office following EMR endorsement (where they may be viewed on request) and a summary of the update provided to community members for their information.

8 Document control

Project document control is detailed in the PMP and project filing and numbering is defined in Management Procedure HEA-MP-GL-OPS-001-00. When the document is reviewed a new revision number is assigned by the Environmental Manager.

The current revision of the ECMS and specifically the ECP will be available and displayed in site offices for ongoing implementation and amendment as conditions or approval change. The documents will be saved in the electronic project management system, *Keystone*.

9 Attachments

- Attachment A – ECP BW009, BW010, & BW011
- Attachment B – Progressive Erosion and Sediment Control Plan (PESCP) BW009, BW010, & BW011
- Attachment C – Approved Access Routes into Viaduct Areas

Attachment A

ECP BW009, BW010 & BW011

Environmental Control Plan – Viaducts at BW009, BW010, & BW011

CEMP Sub-Plans	
Air Quality (AQMSP)	HEA-PL-GL-AQP-001-00-02
Flora and Fauna (FFMSP)	HEA-PL-GL-FFP-001-00-06
Hazard and Risk (HRMSP)	HEA-PL-GL-HRP-001-00-03
Historical Heritage (HHMSP)	HEA-PL-GL-HHP-001-00-03
Indigenous Heritage (IHMSP)	HEA-PL-GL-IHP-001-00-03
Noise and Vibration (NVMSP)	HEA-PL-GL-NVP-001-00-03
Soil and Water (SWMSP)	HEA-PL-GL-SWP-001-00-03
Spoil (SMSP)	HEA-PL-GL-SMP-001-00-03
Utility Services (USMSP)	HEA-PL-GL-USP-001-00-03
Waste Management/Reuse (WMSP)	HEA-PL-GL-WMP-001-00-03
Community Involvement Plan (CISP)	HEA-PL-GL-CIP-001-40-00

Licences/Approvals
Environment Protection Licence No. 13296
Section 87/90 Permit – *National Parks and Wildlife Act 1974*
Part 3A Permit – *Rivers and Foreshores Improvement Act 1948*

The following ECP is to be read in conjunction with the General Construction ECP in ECMS #1

Flora & Fauna Management	
Sub-Plan Ref: HEA Flora and Fauna Management Sub Plan (HEA-PL-GL-FFP-001-00-06 or updated version)	
Objectives: To protect vegetation and fauna in and around the construction zone.	
Performance criteria: • The clearing boundaries are clearly demarcated. • No disturbance to flora or fauna outside the clearing limits. • No harm to fauna. • No increase in distribution of weeds within the project areas. • No clearing or removal of hollow-bearing trees tagged for protection. • Native vegetation logs retained during clearing for revegetation works.	
Specific Mitigation Measures	**Responsibility**
Viaducts – Site Access and Vehicle Movements	
Restrict all construction vehicle movements to approved access tracks only (limited to V8a, V9, V10, V12, V15a, V19, V19a, V21, V22, V27, & V30) and no disturbance outside of project boundary shown by yellow flagging tape is permitted.	SS
Viaducts - Weed Infestation Management	

Responsibility: Community Relations Manager (CRM), Project Environmental Manager (PEM), Project Ecologist (PE), Project Field Construction Manager (CM), Site Engineer (SE), Site Supervisor (SS)

Flora & Fauna Management	
Prior to earthworks, identify and remove weeds manually or by mechanical means as per the Weed Management Strategy, App D of the FFMSP and relevant maps in App A. Care should be taken during mechanically clearing on steep land or near stream banks to prevent soil erosion.	SS
Following mechanical control of weeds, follow up with spot spraying of herbicide on seedlings or further mechanical control. Engage a contractor registered with the OEH for these works. For scheduled works include works in the RTA 'Forward Pesticide Application Program' on web site. Remote areas not accessed by public may be exempt. Refer to FFMSP for signage requirements.	SS
Undertake weed control within the construction zone, targeting particularly areas around Endangered Ecological Communities (EEC) and along drainage lines such as Blue Gum Creek. Note: highest weed priority in place at each Viaduct location.	SS
Viaducts - Site Establishment	
Refer to ECMS #8 Waterway Crossings for any clearing within 15m of Blue Gum Creek and unnamed creeks.	SS, CM
Viaducts - Clearing and Grubbing	
Install erosion and sediment controls prior to any land disturbance in accordance with the Progressive Erosion and Sediment Control Plan developed for each defined work site.	SS, SE
Viaduct - Stockpiling	
Stockpiling of soil and or building refuse will be limited to existing platforms handed over from mine fill operations.	SS, SE
Viaducts - Fauna structures	
Install a 240m fauna fence along the southern and northern carriageway (ch 1820 - 2060). Install a 130m fauna fence along the southern and northern carriageway (ch 2350 - 2480). (FFMP, Table C-7).	SS, SE
Construct fencing so as to direct ridge top fauna under the viaducts at BW009, BW010, & BW011. (FFMP, App C, Table C-6).	SS
Fauna structures to follow the design principles outlined in Table C-9 (FFMP, App C, Table C-9).	CM, SE
General Mitigation Measures	
Vegetation Protection and Management	
No dumping of fill or rubbish into remnant bushland.	SS, SE
Ensure all site employees remain within the site construction boundaries, including mainline formation, site compounds, and other approved ancillary areas.	SS, CM
Maintain erosion and sediment controls during construction until revegetation works are well established (at least 70% of exposed areas stabilised).	SS, SE
Ensure all soil or fill introduced does not contain noxious weed material.	SS, SE
Pre-Site Clearing	

Responsibility: Community Relations Manager (CRM), Project Environmental Manager (PEM), Project Ecologist (PE), Project Field Construction Manager (CM), Site Engineer (SE), Site Supervisor (SS)

Flora & Fauna Management	
As per ECMS#2, Clearing and Soil Disturbance Procedure, **2 weeks prior to clearing**: • Undertake survey: habitat trees, noxious weeds, threatened species • Confirm clearing limits • Complete Clearing Extents Survey • Complete Site Feature Survey	 PE PEM,SS PEM,SS PE
Relocate hollow-bearing limbs, woody debris and bush rocks to fauna translocation sites for habitat reestablishment.	SS
Install delineation fencing for clearing and sensitive areas, install erosion and sediment controls and 70% of nest boxes.	SS
Undertake weed control and remove targeted weeds prior to clearing. Install wheel wash to prevent the spread of weeds.	SS
Undertake Pre-Clearing Survey on the morning of clearing.	PE, PEM,SS
Site Clearing	
Undertake stage 1 clearing (non-habitat trees) only when supervised by the Project Ecologist and/or Project Environmental staff. Ensure a 48 hour break between stage 1 clearing and stage 2 clearing.	SS, PEM
Following stage 1 clearing and before stage 2 clearing, install remaining nest boxes (30%) and relocate any remaining hollow-bearing limbs, woody debris and bush rocks to fauna translocation sites.	SS
Mulch vegetation and stockpile. If felled vegetation has been sitting more than 7 days, an ecologist must be available to ensure no fauna have relocated into this timber prior to mulching.	SS
Weed Infestation Management	
Stockpile weeds for treatment or remove to a waste facility. Control weeds that are located in the construction site in accordance with the Weed Management Strategy, FFMSP. Burning of weed vegetation will require a permit under the Rural Fires Act 1997.	SS, SE
Maintain records of each topsoil stockpile to ensure they are only used in appropriate rehabilitation locations.	SS, SE
Washdown Facilities	
Ensure all construction vehicles and machinery moving from weed infested areas to native vegetation are washed down, inspected and passed as clean to prevent the spread of weed propagules. (Note: this includes pasture lands)	SS
Locate washdown facilities at the interface between weed infested areas and native vegetation until a sterile construction corridor is established.	SS
Fauna Management	
Contact Project Ecologist and appropriate fauna rescue organisations when native fauna is found on site, needs to be removed or is injured. As all native fauna are protect by the NPW Act, any injury or death of native fauna are to be prevented and must be notified.	SS, PEM

Responsibility: Community Relations Manager (CRM), Project Environmental Manager (PEM), Project Ecologist (PE), Project Field Construction Manager (CM), Site Engineer (SE), Site Supervisor (SS)

Flora & Fauna Management	
Inspect equipment and machinery left overnight and skip bins without lids before removal from site to prevent accidental injury or death of wildlife.	SS, SE
Threatened Species Management	
Ensure site staff induction includes the location and protection measures for flora and fauna, as per these tables and maps.	CM, PEM
Construction activities are to cease immediately if, during the course of construction (including vegetation clearing), any threatened flora and fauna species are identified. Project Ecologist and OEH are to be consulted.	SS, PEM
Site Rehabilitation	
Undertake progressive site rehabilitation and mitigation procedures as detailed in the Landscape Management Plan (prepared by a qualified rehabilitation specialist).	CM, SS
If Sheltered Blue Gum Forest (creekline variant) is to be removed for required clearance of 4 metres between structures and vegetation, ensure rehabilitation with native species that are representative of the threat-listed community of Sheltered Blue Gum Forest (creekline variant) is conducted in accordance with the procedures in Appendix I Landscape Master Plan of the FFMSP.	CM/PEM
Flora and Fauna Monitoring	
Undertake weekly site audits to assess vegetation clearing and ground disturbance. Ensure procedures are being adhered to as in accordance with Table 6.1 of the FFMSP.	PEM

Aboriginal Heritage Management
Sub Plan Ref: Aboriginal Heritage Management Sub Plan (HEA-PL-GL-IHP-001-00-03 or updated version)
Objective: To protect any identified heritage items where they are to be preserved. To ensure correct protocols are followed where unidentified items are discovered. **Performance Criteria:** No damage to any known Aboriginal heritage items or sites. Any heritage items inadvertently encountered during construction are protected in accordance with NSW legislative requirements.
Specific Mitigation Measures
Viaducts – Stockrington Road Area
1. The area where Stockrington Road traverses the alignment (immediately east of Viaduct One) has been identified by Awabakal Local Aboriginal Land Council (ALALC) as having high cultural heritage sensitivity and zoned yellow under the developed criteria for Zones of Management within the projects CIHSP, section 5.1.2. 2. Native vegetation clearing in this area is to be kept to within the RTA's approved conceptual design. 3. An appropriately qualified archaeologist along with a representative from the ALALC will be given the opportunity to inspect any further proposal for clearing and proposal will be raised with the ALALC prior to assessment and approval of works. 4. Any further design changes will first be raised with the ALALC prior to assessment and approval of these changes.

Responsibility: Community Relations Manager (CRM), Project Environmental Manager (PEM), Project Ecologist (PE), Project Field Construction Manager (CM), Site Engineer (SE), Site Supervisor (SS)

Aboriginal Heritage Management				
Chainage	**Aboriginal Item**	**Description**	**Management Requirements**	**Responsibility**
1281-1415	Aboriginal Pathway Stockrington Road (AHM Zone 6 - yellow)	Site of particular cultural importance to the Awabakal community	1. Minimisation of impacts 2. The road corridor will be temporarily fenced or faunal exclusion fencing will be erected and no works will be allowed outside the road corridor, except non-widening upgrades necessary to existing access tracks. 3. Ground surface disturbance and native vegetation clearance must not exceed the amount allowed within the RTA's approved conceptual design. 4. There will be no additional clearing of native vegetation for compounds, parking areas, stockpiles in areas that will not be directly impacted by road construction. Previously cleared areas or areas cleared for the approved conceptual design may be used for these activities.	SS SS SS CM, SS

General Mitigation Measures	**Responsibility**
Pre-construction	
Brief all Contractors on the provisions of the National Parks and Wildlife Act in relation to Aboriginal objects/items, location of no-go zones and the protocol for the discovery of previously unidentified Aboriginal objects prior to commencement of working on the site.	PEM
Ensure all heritage items and places are mapped on construction drawings and plans.	SE
Construction Works	
Restrict all ground disturbing works to within the existing Section 90 consent (#2562) area for the Hunter Expressway.	CM, SS
If suspected Aboriginal sites or relics, or human remains are identified during construction works then all work that may impact on that area shall cease immediately, notify machinery operators in vicinity, Site Supervisor and the Project Environmental Manager as per Protocols of the AHMSP (s. 5.4 & 5.5) implemented. If you don't know these protocols, ask the Environment Manager.	SS, PEM

Responsibility: Community Relations Manager (CRM), Project Environmental Manager (PEM), Project Ecologist (PE), Project Field Construction Manager (CM), Site Engineer (SE), Site Supervisor (SS)

Historical Heritage Management				
Sub-Plan Ref: Historical Heritage Management Plan (HEA-GL-PL-HHP-001-00-03 or updated version)				
Objectives: To minimise disturbance and avoid damage to any identified historical heritage items during construction, and provide staff with an increased level of understanding and awareness of heritage management issues.				
Performance Criteria: Heritage items are protected during construction in accordance with NSW legislative requirements.				
Specific Management Measures				
Chainage	**Heritage items**	**Description**	**Specific Management Requirements**	**Responsibility**
Viaducts - Heritage items to be conserved and managed insitu:				
2365 - 2480	Richmond Vale Railway – Rail Tunnel 134 (No 1 Tunnel) and cutting (Coord: E366926, N6361146)	A four-course brick tunnel built in 1905 spanning 163 metres long by 4.6 metres wide.	Tunnel to be fenced, signed, and mapped on construction drawings Access along Richmond Vale Railway corridor within V7 is for emergency access only and all other access along corridor is prohibited Site to be monitored for vibration impacts when works are within 100 metres initially and 50 metres thereafter on a monthly basis	SE CM SS PEM
2590 - 2710	Burrenjim Dam (Coord: E366765, N6361170)	Dam wall built in 1945 having potential local significance	Sites to be signed and mapped on construction drawings Site to be monitored for vibration impacts when works are within 100 metres initially and 50 metres thereafter on a monthly basis	SE CM SS PEM
2795	Jewboys Bushrangers Cave (Coord: E 366564, N6361222)	Cave named after an escaped Jewish convict who was thought to have resided along with gang members in the cave over a period of time.		
General Mitigation Measures				
Pre-construction				**Responsibility**
Provide personnel and contractors site induction on the requirements of the Heritage Act 1977 and heritage site identification/ protection.				PEM
Erect appropriate signage to note that the item/s is/are a historical heritage item and is protected by the provisions of the Heritage Act 1977 (NSW) and that any potential impact is an offence.				CM,SE
Construction Works				
Install appropriate erosion and sedimentation controls around/uphill to heritage items as required				SE, SS

Responsibility: Community Relations Manager (CRM), Project Environmental Manager (PEM), Project Ecologist (PE), Project Field Construction Manager (CM), Site Engineer (SE), Site Supervisor (SS)

Historical Heritage Management	
If suspected impacts to historical heritage items are identified during construction works then all work that may impact on that area shall cease immediately as per the HHMSP. Notify the Environment Manager.	SS
Monitoring	
Engage a qualified vibration consultant and/or a structural engineer to undertake monitoring of historical heritage items during construction, where risk from the potential impacts from vibration may result.	PEM

Soil and Surface Water Management			
Sub-Plan Ref: Soil and Water Management Sub Plan (HEA-PL-GL-SWP-001-00-03 or updated version)			
Objective: Minimise erosion and sediment loss from the worksite and comply with water quality standards for discharge from worksite.			
Performance criteria: 1. OEH water quality discharge criteria for all design storm are met 2. There are no pollution incidents causing environmental harm 3. Background water quality levels in surrounding waterways are maintained 4. Erosion and sediment controls are installed in accordance with the Blue Book (2004) , Vol 2C & 2D (2008) to control the impact of from earthworks and other construction activities. *5.* Pollution is prevented by containing and controlling fuel and chemical spills *(HEA Refuelling and Liquid Storage Protocol)* **Discharge criteria for basins:**			
Oil & grease	pH	TSS	
None visible	6.5-8.5	< 50 mg/L	
Specific Mitigation Measures			**Responsibility**
Viaducts (BW009, BW010, & BW011 to Blue Gum Ck) - Erosion and Sediment Control			

Responsibility: Community Relations Manager (CRM), Project Environmental Manager (PEM), Project Ecologist (PE), Project Field Construction Manager (CM), Site Engineer (SE), Site Supervisor (SS)

Soil and Surface Water Management	
Soils in ch 0-2600 are considered 'highly erodible'. Considered to have high rates of runoff and classified as fine type. Prepare Progressive Erosion and Sediment Control Plans (PESCP) for the following activities related to viaduct construction: • Clearing, grubbing and removal of topsoil • Earthworks • Bridgeworks; • Sensitive areas eg. near endangered ecological community & heritage items; • Waterway crossings; • Creek bank stability works; • Work occurring in areas with a high erosion hazard; • Working platform; • Piling; and • Pier construction. Have Project Soil Conservationist certify all PESCP.	SS, PEM
Viaducts (BW011 from Blue Gum Ck) - Erosion and Sediment Control	
Soils in ch 2600 - 3850 are classified as earthy loams (sandy to clay sandy loams) sitting on massive conglomerate and coal seams'. Considered to have medium rates of runoff and classified as fine type. Prepare Progressive Erosion and Sediment Control Plans (PESCP) for the following activities/locations at this viaduct location: • Clearing, grubbing and removal of topsoil • Earthworks • Installation of a culvert or major drainage structure clearing adjacent to a waterway; • Bridgeworks; • Sensitive areas eg. near endangered ecological community & heritage items; • Waterway crossings; • Creek bank stability works; • Work occurring in areas with a high erosion hazard; • Working platform; • Piling; and • Pier construction. Have Project Soil Conservationist certify all PESCP.	SS, PEM
Viaducts - Waterways Crossings – unnamed creeks and drainage lines	
Seek approval for dredging, reclamation works (ie footing & foundations) or temporary blocking of creeks and consult with Dept of I & I if diversions are required, as per ECMS #8 –Waterway Crossings.	PEM
Install culverts and temporary crossings over unnamed creeks and flowing drainage lines as per guidelines in ECMS #8 –Temporary Waterway Crossings, s2.1 *Guidelines for Waterway Crossings* and the *Temporary Low Flow Creek Crossing Procedure* in App C.	SS, SE
ıducts – Working Platform – Blue Gum Creek	
tall and maintain working platform as per HEA-WMS-SLA-ENV-002-00-00_Working	SS, SE

Responsibility: Community Relations Manager (CRM), Project Environmental Manager (PEM), Project Ecologist (PE), Project Field Construction Manager (CM), Site Engineer (SE), Site Supervisor (SS)

Soil and Surface Water Management	
Platform at Blue Gum Ck	
tforms will consist of rock containing nit to minimal fines that are not capped. Some fines may be used at the surface level for stability requirements; however these shall be capped to reduce the erosion potential.	SE
terway rehabilitation will be instigated immediately following construction utilising appropriate stabilisation products and species endemic to the area. Restoration may also involve the provision of instream habitat features such as riffles, pools and snags.	SS, SE
ducts - Groundwater	
Steel or concrete piles for bridges will be used where possible to minimise the potential for groundwater contamination, particularly in alluvial aquifers.	CM, SE
ducts - Spill management	
Immediate clean-up of any spillage of chemicals, fuels or oils	SS
Truck wash downs and cement truck washouts conducted in approved areas only	SS
Viaducts - Monitoring	
Undertake water quality monitoring at Blue Gum Creek twice monthly during construction at dry and wet weather periods, as per SWMSP, App A. (Note: Wet weather is considered as greater than 10mm in 24hrs).	PEM
General Mitigation Measures	**Responsibility**

Responsibility: Community Relations Manager (CRM), Project Environmental Manager (PEM), Project Ecologist (PE), Project Field Construction Manager (CM), Site Engineer (SE), Site Supervisor (SS)

Soil and Surface Water Management	
Provide site personnel and contractors with site induction regarding the requirements of these tables.	PEM, SS
Install erosion and sediment controls prior to any land disturbance in accordance with the PESCP developed for each defined work site.	SS, SE
Install diversion upslope of sites to prevent runoff water entering areas of ground disturbance.	SS
Maintain vegetation in and adjacent to drainage lines to improve the quality of runoff before entering waterway and to prevent erosion.	SE
Clearing	
Maintain soil surface cover with methods including use of the cut stump to minimise soil exposure to erosion.	CM
Remove site vegetation for re-use/sale, or tub ground and either stockpiled (& managed to become compost for revegetation purposes) or windrowed to form sediment retention berms.	SE, CM
During clearing ensure groundcover/grasses and topsoil are retained in order to capture the runoff infiltration capacity of the groundcover for as long as possible, and to minimise topsoil runoff.	SE
Earthworks	
Protect topsoil from water and wind erosion by seeding with a sterile cover crop or by covering with geo-textile fabric until required.	SS
Stabilise batters in areas of high erosion hazard using a sterile cover crop.	SS
Do not locate plant or operations within 20m of waterways unless other appropriate mitigation measures are employed for the duration of encroachment.	SS
Undertake progressive revegetation of disturbed areas.	CM, SS, PEM
Remove silt from erosion devices following major rainfall event. Silt to be managed in accordance with the CEMP, Waste Management and Reuse Sub-Plan.	SS
Reuse water collected in trenches and sedimentation basins where possible. When not possible treat water before discharge as per the Dewatering Procedure.	SS, SE
Undertake all dewatering procedures to safeguard groundwater as per the Dewatering Procedure.	SS, SE
Re-schedule works that may lead to erosion and sedimentation when the daily weather report received for the project forecasts rainfall events.	CM, SE
Maintain control measures until the site is stable and at least 70% soil surface cover has been achieved. Once the project site has been stabilised, temporary sediment controls can be removed.	CM, SE
Structures	

Responsibility: Community Relations Manager (CRM), Project Environmental Manager (PEM), Project Ecologist (PE), Project Field Construction Manager (CM), Site Engineer (SE), Site Supervisor (SS)

Soil and Surface Water Management	
Adequate systems will be developed for liaison with regulatory authorities and local council regarding installation of all waterway structures – Environmental Review Group Meetings	PEM
The placement of concrete into forms in or close to any watercourse will be carefully controlled. The use of quick setting mixes may be appropriate in some cases to minimise the risk of water pollution	SS, SE
Concrete pours will not be undertaken during rainfall where there is a risk of water pollution occurring.	SS
Diversion banks / drains will be installed upstream of construction activities where practicable to ensure run-on water is diverted around disturbed areas.	SS
Catch drains at the downstream boundary of construction activities will also be created (wherever possible) to ensure any sediment laden runoff is contained and directed toward treatment areas and not permitted to flow onto downstream undisturbed areas and will be lined where the flow velocity exceeds the erosive resistance of the soil. Where the installation of catch drains is not possible temporary cross-drains will be scribed in at regular intervals with temporary checks placed in the drains to lower the velocity within the drains to prevent erosion.	SS, SE
Stockpiling	
Place material stockpiles, construction buildings and other infrastructure only in cleared areas, typically in the road corridor or site compounds, adequately distant from sediment fencing that is installed down slope to prevent loss.	SE, SS, CM
Have all stockpiles including road batters that are predicted to be stored for longer than 10 weeks, covered or seeded with a sterile seed crop. Topsoil should be covered or have seeded with cover crop within 2 weeks.	SE
Do not undertake stripping of topsoil and stockpiling activities during periods of wet weather.	SS, SE
Do not place stockpiled materials within 5m of retained trees, within the drip line, over root systems or where overhead tree canopies could be damaged by machinery or trucks. Avoid where possible, stockpiling near waterways or drainage line, near properties or flood prone areas.	SS, SE
Ensure topsoil stockpiles do not exceed 2.5m in height and maintained to prevent the growth of weeds.	SS, SE
Vehicle Movements	
All vehicles must use the designated access tracks only.	SS
Conduct equipment and truck wash downs in bunded areas and cement truck washouts in approved areas only. Ensure wash areas and pits are adequately sized, located away from drainage lines and maintained regularly.	SS
Use recovered water from construction works where possible for vehicle and	SS

Responsibility: Community Relations Manager (CRM), Project Environmental Manager (PEM), Project Ecologist (PE), Project Field Construction Manager (CM), Site Engineer (SE), Site Supervisor (SS)

Soil and Surface Water Management	
equipment washdown and dust suppression.	
Store all excess grout, concrete and waste materials in bunded areas prior to reuse or disposal.	SS
Cover all spoil during transportation on public roads.	SS
Visually assess waste water captured in storage bunds for contamination prior to being released. Remove hydrocarbon contamination using appropriate absorbent materials.	SS
Spill Management	
Manage plant refuelling and spills in accordance with Refuelling and Liquid Storage Protocol' (HEA-WP-GL-ENV-03-00-00 or updated version).	CM, SS
Undertake refuelling and servicing of plant and equipment away from sensitive areas and ensure they carry or have ready access to a suitable spill kit.	SS
Supply spill kits at each fuel and chemical storage area of the worksite when handling dangerous goods. Provide hydrocarbon and chemical spill kits for minor spills and leaks, including floatable booms for deployment to nearby watercourses as appropriate and train relevant personnel in their use.	CM, SS
Rehabilitation and Landscaping	
All exposed areas to be stabilised (that is, compacted, sealed or vegetated) as soon as practicable following completion of works.	SS, SE
At the completion of the work, all disturbed areas to be restored as closely as practicable to their condition prior to completion of works.	SS, SE, PEM
Inspections	
Daily informal visual checks of all erosion and sedimentation devices to ensure that controls have been provided where required and/or are functioning correctly. Inspect controls following a rainfall event, within 24hour of cessation of rain.	SS, SE
Weekly inspections and completion of environmental checklists: • Check that controls are being maintained in an efficient condition; • Update of PESCPs when new controls are required; • Record any maintenance or repair.	PEM
Joint inspections with the Alliance Soil Conservationist, RTA client representatives and Project EMR during clearing and earthworks phases.	PEM
Monitoring and Reporting	
Reporting to OEH on compliance with EPL conditions	PEM

Responsibility: Community Relations Manager (CRM), Project Environmental Manager (PEM), Project Ecologist (PE), Project Field Construction Manager (CM), Site Engineer (SE), Site Supervisor (SS)

Noise and Vibration Management
Sub-Plan Ref: Construction Noise and Vibration Management Sub Plan (HEA-PL-GL-NVP-001-00-03 or updated version)
Objective: To minimise the impacts of noise and vibration from construction activities on surrounding receivers.

Performance criteria:

Ensure noise exceedances are avoided by monitoring at sensitive receivers and where exceedances impact on residents, apply mitigation strategies.

Sensitive noise receivers:

- Fifth Street & Fourth Street, Seahampton (800m South of Viaduct One at CH 01440, & 1000m South East of Viaduct Two at CH 02040)

Residential Receiver Adopted Noise Objectives:

Location	RBL L_{A90} dB(A)			Criteria $L_{Aeq,\ 15min}$ dB(A)		
	Day	Evening	Night	Day	Evening	Night
Seahampton (Fifth Avenue)	38	39	37	48	44	42

Note:Daytime (7.00am-6.00pm); Evening (6.00pm-10.00pm); Night time (10.00pm-7.00am)

Vibration sensitive structures:

- Tunnel 134 (heritage site)
- Burrenjim Dam Wall (heritage site)
- Jewboy Bushrangers Cave (heritage site)

Vibration criteria:

- 3 mm/s for vibration sensitive Aboriginal and historical heritage locations and structures. For adopted operational ground vibration management levels refer to HEA-PL-GL-NVP-001-00-03.

General Mitigation Measures	Responsibility
Provide site personnel with induction on key noise issues, mitigation measures, approved working hours and community concerns.	SS, PEM
Construction off-site traffic is to be less than 60 dB(A) $L_{Aeq,\ 1hr}$ during standard construction hours and 55 dB(A) $L_{Aeq,\ 1hr}$ outside of standard construction hours Where it is not feasible to achieve these goals, the project shall not increase existing road traffic noise at any receiver by more than 2 dB(A).	CM
All site equipment to be fitted with properly functioning noise attenuation devices (eg mufflers) and will be properly tested, serviced and maintained to minimise noise emissions.	SE, CM
Schedule activities to minimise coincidence of noisy plant operating simultaneously and/or close together near sensitive receivers.	SE, SS
Orientate equipment away from sensitive receivers and switch off when not in use.	SS
Undertake letterbox drops or direct consultation to local residents at least 5 days and no more than 14 days prior to "noisy" activities such as piling works.	CRM

Responsibility: Community Relations Manager (CRM), Project Environmental Manager (PEM), Project Ecologist (PE), Project Field Construction Manager (CM), Site Engineer (SE), Site Supervisor (SS)

Noise and Vibration Management	
Advise residents via local media and letterbox drops at least 7 days prior to any saw cutting.	CRM
Install signage on site to ensure workers are aware of the work hours on site for noisy activities.	SS, SE
Investigate and rectify any unusually noisy equipment.	SS
Provide supply, delivery vehicle and staff with designated traffic routes when required through residential areas.	SS, SE
For works generating high noise impact (greater than 75dB(A) following continuous blocks of 3 hours, schedule 1 hour respite period, where works are likely to impact sensitive receivers.	SS
Minimise impact of heavy vehicles operations during sensitive night time periods by: • utilising all available on-site storage of materials • scheduled during the less sensitive day time and evening periods • adopt haulage routes to limit operations adjacent to residential communities	SS, SE
Rock breaking, rock hammering and sheet piling	
Schedule these activities between : I. 8am – 12pm, Mon – Sat; and II. 2pm - 5pm Mon to Fri. Schedule a respite periods as above..	SE, CM
Where practicable, conduct rock excavation by ripping rather than rock breaking.	SS
Approved activities that may exceed noise criteria	
1. Main carriageway works, ie preliminary site works, earthworks including rock breaking, sub base and road base prep, paving and landscaping. 2. Bridges and Intersections, ie pile driving works, structural formwork installation, traffic control. 3. Concrete batching plant operation 24hrs, grout plant operation, site office and compound accessed 24hrs. Refer to NVMSP appendices for assessment of predicted noise impacts of these activities at sensitive receivers.	
Undertake noise assessment for noise generating activities not listed above or in the out of hours section, to determine compliance with evening and night time noise criteria.	SE, PEM
Construction hours of work	

Responsibility: Community Relations Manager (CRM), Project Environmental Manager (PEM), Project Ecologist (PE), Project Field Construction Manager (CM), Site Engineer (SE), Site Supervisor (SS)

Noise and Vibration Management	
Construction hours are: • 7:00 am to 6:00 pm Monday to Friday, • 8:00 am to 1:00 pm Saturday • No construction work is to be undertaken on Sundays and public holidays except: a. any works which are not audible at any nearby residential property b. the delivery of materials required outside these hours by the Police or other authorities for safety reasons; c. emergency work to avoid the loss of lives, property and/or to prevent environmental harm; d. any other work approved by OEH or allowed through the **EPL** (as below).	CM, PEM
Out of hours work	
If required seek written agreement from potentially affected noise sensitive receivers for works outside of standard construction hours and keep a copy of the agreement(s) on the HEA premises.	CRM
Notify potentially affected noise sensitive receivers for works outside of standard construction hours by letter at least 5 days in advance (and not more than 14 days) as per section 3.4 of the EPL.	CRM
As per the **EPL,** out of hours works are permissible for the following: i. any works which do not cause audible construction noise at any sensitive receiver; **OR** ii. the delivery of materials which is required outside these hours as requested by police or other authorities for safety reasons; iii. dust suppression works; iv. emergency work to avoid the loss of lives, property and/or to prevent environmental harm; and v. any other work as agreed in writing by OEH through the Noise and Vibration Management Sub Plan (Construction) process.	CM,SS
Out of hours works as approved by the July 2010 NVMSP for Main Bridge Structures and Intersections (including Viaducts structures BW009, BW010, & BW011) include the following activities: ▪ the preparation of foundations and piers including excavation and piling works, ▪ the installation and construction of bridge and intersection structures including prefabricated formwork and concrete spans, and ▪ road paving works for the concrete pavement and asphalt road surface.	SS
Minimise consecutive night time works in the same locality, where feasible.	SE, CM
Offer temporary relocation on a case by case basis for noisy works being undertaken at night-time.	CM
Monitoring	
Measure environmental noise at representative and potentially affected nearest noise sensitive receivers, within 14 days of the commencement of construction works and every month thereafter. Monitor airborne noise using a calibrated sound level meter.	PEM

Responsibility: Community Relations Manager (CRM), Project Environmental Manager (PEM), Project Ecologist (PE), Project Field Construction Manager (CM), Site Engineer (SE), Site Supervisor (SS)

Noise and Vibration Management	
Compare results against predicted noise levels in the CNVIS.	
Respond to any noise and vibration complaint by: - investigating complaint within 2 hours (or as agreed with complainant) - offering to undertake monitoring at their premises - informing complainant of results and any mitigation measures.	PEM
Monitoring of noise and vibration sensitive receivers and structures as per Noise and Vibration Management Sub Plan, Section 10.3 & 10.6.	PEM
Ground vibration levels shall be monitored where construction works are undertaken initially within 100 metres of vibration sensitive structures no later than 14 days from commencement of an activity and then within 50 metres for each activity on a monthly basis.	PEM
Reporting	
Where monitoring of noise or vibration identifies potential exceedance of the specified goals in this CNVMSP or the EPL the Environment Manager shall notify the EMR and the OEH within 24 hours of any exceedance event.	PEM
The Site Environmental Officer shall complete an environmental exceedance report, outlining the corrective actions proposed. This exceedance report will be submitted to the EMR within 2 days.	PEM
All results are to be included as part of 6 monthly construction compliance reporting as required in accordance with CoA 31 and any reporting requirements specified in the EPL.	PEM

Construction Air Quality Management	
Sub Plan ref: Construction Air Quality Management Plan (HEA-PL-GL-AQP-001-00-02 or updated version)	
Objective: To minimise dust generation and manage emissions from construction activities to prevent impacts on surrounding receivers. **Performance criteria:** • Depositional dust goals of max 4 g/m^2 per month, subject to monthly background levels, as per OEH guidelines. • No complaints received from nearby residents or local road users.	
General Mitigation Measures	**Responsibility**
Earthworks	
Use water sprays (water carts as required) to control dust emissions.	SS
Recycled water to be used for dust suppression in preference to potable water.	SS
Cease dust emitting activities during periods of high wind conditions	SS
Stockpiles require protection from environment including wrapping in plastic if proposed to stand for less than two weeks and seeding with cover crop if stored longer.	SS
Vehicle and transport management	
Vehicle speed within the worksite areas is not to exceed 40km/hr.	SS
Plant or equipment are not to be parked idling for longer than 15 minutes.	SS
Maintain operation and exhaust systems of construction plant, vehicles and machinery to minimise emissions to atmosphere. If exhausts smoke observed for longer than 10 seconds, appropriate maintenance is to be undertaken.	SS
Ensure wheels and undercarriage of trucks (wheel wash) are clean prior to the exiting the worksite.	SS
Clean any dirt tracked onto public roadways from construction vehicles using brooms or a street sweeper.	SS
Cover spoil loads and secure tailgates prior to trucks leaving the worksite.	SS
Monitoring	
Visual inspections to be carried out frequently to assess whether reprogramming of works or additional dust suppression measures are required to counter wind conditions and subsequent air pollution	SS
Conduct weekly inspections of worksite to monitor the effectiveness of the dust control measures.	PEM
Monitor dust deposition monthly throughout construction. Review location suitability quarterly. Review and modify dust control and operational procedures if dust deposition levels are exceeded.	PEM

Waste Management

Responsibility: Community Relations Manager (CRM), Project Environmental Manager (PEM), Project Ecologist (PE), Project Field Construction Manager (CM), Site Engineer (SE), Site Supervisor (SS)

Waste Management	
Sub Plan Ref: Waste Management and Reuse Plan (HEA-PL-GL-WMP-001-00-03 or updated version)	
Objective: To implement reuse and recycling programs where practicable for waste generated from project activities. **Performance Targets:** Vegetation clearing – 100% reuse on site; Removal of existing pavements -100%, Existing Bridges -80%, Contaminated water reuse – 50% (refer Waste Management and Re-use Sub-plan for details).	
General Mitigation Measures	**Responsibility**
Provide site personnel with induction in waste produced/ reused/ recycled/ disposed and any special storage or disposal arrangements (e.g. hazardous wastes, chemicals, waste oils/ acid sulfate soils/contaminated materials).	CM, PEM
Provide waste bins at the work site in convenient locations for segregation of recyclable materials and ensure no littering occurs on site.	SS
Ensure waste containers have clear signage to identify the specific containers for waste segregation.	SS
Minimise energy use by switching equipment off when not in use, minimising idle time and selecting power efficient equipment.	CM, SE, SS
Waste reuse and recycling	
Spoil is to be replaced in the hole where possible, otherwise to be reused on-site in accordance with the Spoil Management Plan.	SS
Store any empty fuel, lubricant and chemical containers for collection by a drum recycler for cleaning and reuse.	SS
Recycle wood packaging, pallets and wood used for formwork, scrap metal and cardboard boxes, plastic wrapping and recyclable domestic waste resulting from project activities.	SS, SE
Store any empty fuel, lubricant and chemical containers for collection by a drum recycler for cleaning and reuse.	SS
Recycle waste concrete for roadbase, in concrete batching or as fill or transport to a licensed landfill.	SS
Collect aggregates, sand and cement fines from wash-down bays and either use them in fills where feasible.	SS, SE
Cleared vegetation must be reused or recycled to the greatest extent practicable	SS, SE
Waste disposal	
Ensure a waste contractor is commissioned to regularly remove/empty the bins.	CM
Dispose of all non-hazardous waste that cannot be recycled/ reused for disposal to approved landfill. Contact Environmental Staff for the nearest local landfill sites.	SE, CM
Dispose of all hazardous or contaminated wastes materials at approved disposal facilities in accordance with the OEH 2009, Waste Classification Guidelines. Contact Environmental Staff prior to disposal for advice regarding disposal methods, handling, etc.	SE, CM
Check license of all waste transporters and make sure they are approved to carry the materials to licensed waste facilities.	SE, CM

Responsibility: Community Relations Manager (CRM), Project Environmental Manager (PEM), Project Ecologist (PE), Project Field Construction Manager (CM), Site Engineer (SE), Site Supervisor (SS)

Waste Management	
Monitoring	
Records of waste disposal and recycling (quantities, destination) will be tracked (docket system) and reported monthly.	SE
Monitor waste management and recycling practices at the worksite weekly.	SS, PEM

Environmental Hazard Management	
Report Ref: Hazard and Risk Plan (HEA-PL-GL-HRP-001-00-03 or updated version)	
Objective: To manage environmental hazards on the worksite.	
Performance Criteria: Management actions result in no incidents occurring as a result of worksite activities. Storage of dangerous goods complies with Australian Standards, and response to any spill or other incident occurs in accordance with the Incident Response Plan.	
General Mitigation measures	**Responsibility**
All personnel will be inducted and trained prior to commencing work onsite on the hazards and risks of the worksite including environmental risks (e.g. spill response and cleanup and reporting).	CM, CEM
Chemicals are to be stored on site in quantities less than limits defined as “dangerous” under the Australian Dangerous Goods Code, only compatible goods will be stored adjacent to each other, and in accordance with AS1940-2004.	SS
Store all dangerous goods brought onto the worksite within the designated bunded area(s). No storage is to occur outside the designated areas.	SS
Bunded area will be sized to contain spillage of least 120% of the above placed liquid storage container	SS
Record keeping of substances used on site is to be detailed on the MSDS register.	SS, SE
Provide spill kits (oil and hydrocarbon based absorbent materials) and relevant MSDS at each storage area and at areas of the worksite where handling and use of dangerous goods occur and provide appropriate staff with training in their use.	SS
Clean-up and reporting of any dangerous goods spill/leak is to occur immediately in accordance with the Incident Response Plan procedures.	SS, SE
Bushfire danger risk rating information will be identified prior to work activity commencement and communicated to the project team.	SS
Hot works will be in accordance with relevant procedure and undertaken away from flammable material including vegetation	SS
If fire approaches the work site then hazardous materials will be secured immediately	SS

Responsibility: Community Relations Manager (CRM), Project Environmental Manager (PEM), Project Ecologist (PE), Project Field Construction Manager (CM), Site Engineer (SE), Site Supervisor (SS)

Environmental Hazard Management	
All machinery must be inspected daily for leaks and wear of parts, and any leaks immediately repaired along with the replacement of worn parts with potential to leak in future.	SS
Ancillary facilities not to be placed on land within floodplains to nearby watercourses	SS, SE
If suspected contaminated materials are encountered during construction. Work will stop at the site until the material has been assessed and removed, or stabilised, in accordance with the Waste Classification Guidelines 2008 and the Protection of the Environment Operations Act 1997.	SS
Conduct weekly inspections of dangerous goods storage areas, including documentation of volumes/weights of dangerous goods, status of bunding, visible staining/spills/leaks etc, check of spill kit contents.	SS, CEM

Hours of work
Audible Construction Works • Monday to Friday 7am-6pm • Saturday 8am-1pm **Out of Hours Delivery** • Oversize Plant & Equipment in accordance with MCoA 61 • Community Relations Manager to be notified in advance **Out-of-Hours Operations** • No audible construction works out of hours, unless approved through the NVMSP or resident agreement has been sought. • Delivery of materials required by the Police or other authorities are permitted out of hours. • All out of standard hours construction works to be undertaken subject to approval from Environment Manager, Safety Manager, Traffic Manager, and Community Relations Manager.

HEA Points of Contact		
For all Public Enquiries	HEA Community Response Line	1800 001 267
	OEH Pollution Line	131 555
Peter Chatburn	Project Director	0418 233 905
Boyd Knights	Construction Manager (CM)	0400303125
Todd Myers	Constructability Manager	0418 637 173
Tracey Doczy	Project Environment Manager (PEM)	0439 300 118
Adam Noonan	Environment Coordinator	0402 825 885

Responsibility: Community Relations Manager (CRM), Project Environmental Manager (PEM), Project Ecologist (PE), Project Field Construction Manager (CM), Site Engineer (SE), Site Supervisor (SS)

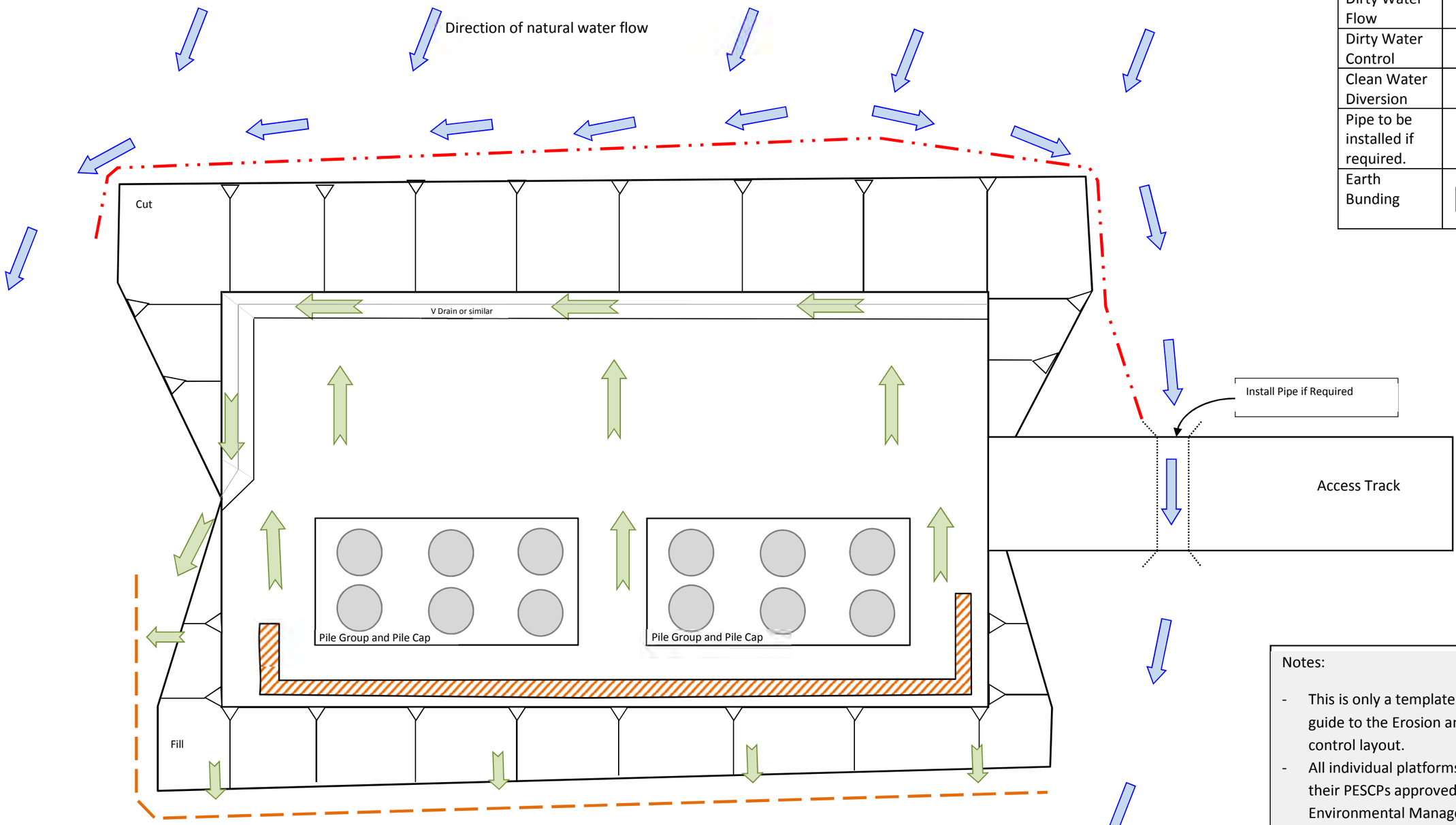
HEA Points of Contact		
Louise Neville	Community Relation Manager (CRM)	0447 464 031
Geoff Mance	Environmental Management Representative (EMR)	0439 034 270
David Ledlin	RTA Senior Environmental Officer	0411 126 989
Fauna rescue	Kurri Kurri Veterinary Clinic	02 4937 3799
	Greenhills Veterinary Clinic (24 hours)	02 4934 1900

Attachment B

PESCP BW009, BW010 & BW011

General Layout of Erosion and Sediment Controls for Viaduct Platforms

Clean Water Flow	
Dirty Water Flow	
Dirty Water Control	
Clean Water Diversion	
Pipe to be installed if required.	
Earth Bunding	



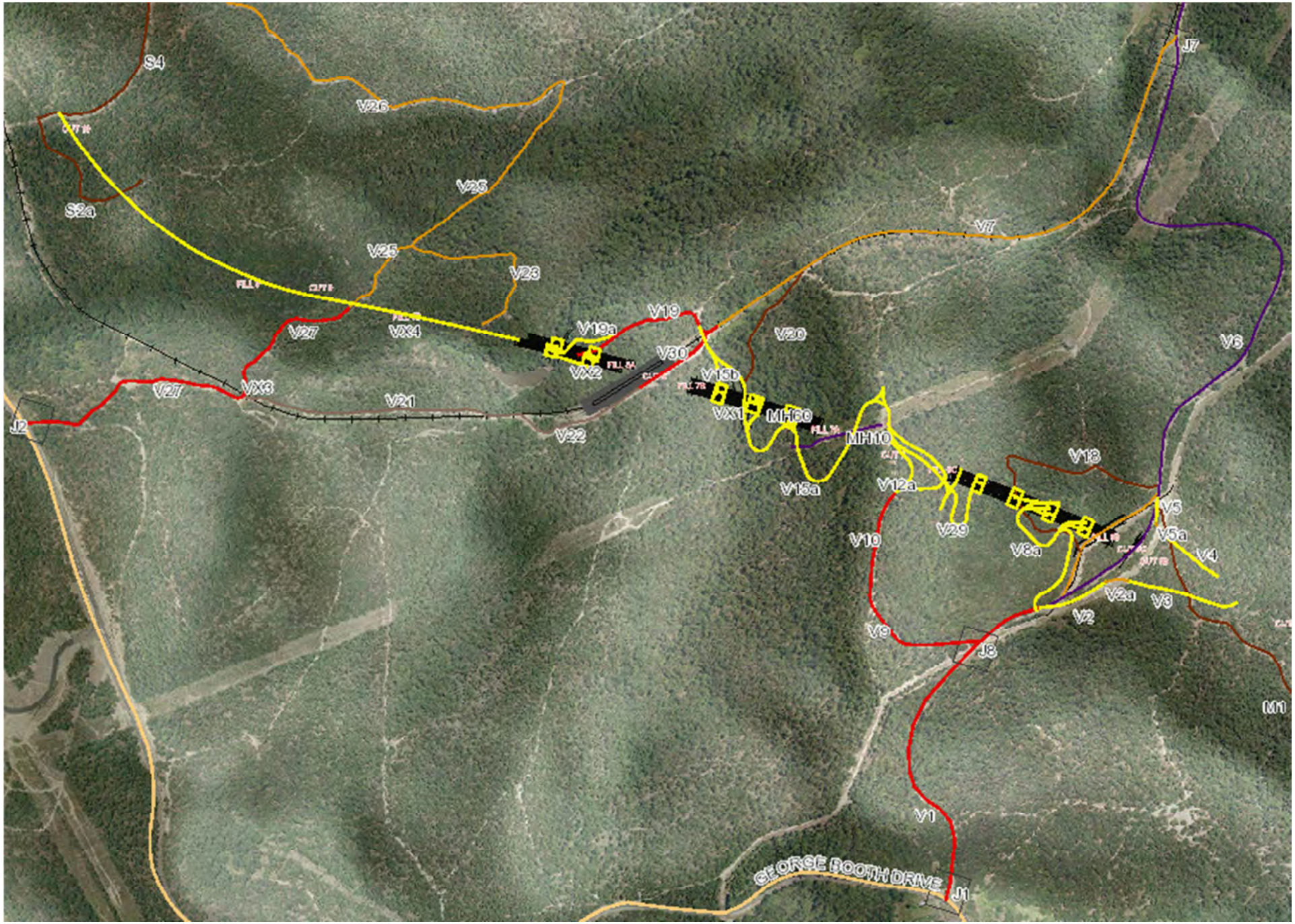
Dirty Water Control at toe of batter and control lines

Notes:

- This is only a template / General guide to the Erosion and Sediment control layout.
- All individual platforms will have their PESCPs approved by the Environmental Manager, Soil Conservationist and Area Foreman
- This is only a guideline for construction, conditions on site may vary.
- Drilling Pad to be drained so as no water ponds on the pad
- Install controls to divert clean water flow around platform
- Capped with material that is not easily erodible

Attachment C

Map of Approved Access Routes into Viaduct Areas of BW009, BW010 & BW011


S4
V26
S2a
V25
V23
V19
V19a
V27
VX4
V30
VX2
V20
V15b
VX1
MH30
MH10
V18
V15a
V12a
V29
V10
V8a
V5
V5a
V4
V2a
V3
V2
V9
J8
V1
GEORGE BOOTH DRIVE
J1
J2
VX3
V21
V22
V7
J7
V6
M1