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Murrumbidgee to Googong Water Transfer Project - Waste Management Plan

BWA-M2G-EN-ECP-004-1

21st March, 2012

Delivered by the Bulk Water Alliance

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Prepared by	BWA Environmental Manager	John Turville		
Reviewed by	M2G Owner's Project Manager	Simon Webber		
Approved by	M2G Project Manager	Jason Julius		

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ACTEW working with ActewAGL | Mt Stromlo Road, Mt Stromlo GPO Box 366 Canberra ACT 2601 | **Tel** (02) 6175 2400 **Fax** (02) 6175 2322

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Copy	Issued to	Date	Name
electronic	Bulk Water Alliance - Owner's Project Manager		Simon Webber
electronic	Bulk Water Alliance - Project Manager		Jason Julius
electronic	Bulk Water Alliance – Construction Manager		Matthew Richardson
electronic	Bulk Water Alliance- Community Engagement and Stakeholder Liaison Manager		Rachel Clarke
electronic	Bulk Water Alliance - Environmental Manager		John Turville
electronic	ACT Planning and Land Authority		Michaela Watts
electronic	DECCEW (ACT EPA)		Rodney Dix
electronic	ACT Parks, Conservation and Lands (TAMS)		Brett McNamara

Abbreviations – List of Abbreviations

Abbreviation	
ACT	Australian Capital Territory
ECD	Enlarged Cotter Dam
CMS	Construction Method Statement
BWA	Bulk Water Alliance
CEMP	Construction Environment Management Plan
TAMS	Territory and Municipal Services
DECCW	Department of Environment, Climate Change and Water (NSW)
CESM	Community Engagement Stakeholder Management
ACTPLA	Australian Capital Territory Planning and Land Authority
M2G	Murrumbidgee to Googong Water Transfer Project
WMP	Waste Management Plan

Environmental Commitments and Approval Conditions

Table 1.1 M2G EIS Commitments

Reference Document	Commitment	Reference within WMP
EIS Commitment 47	Wherever practicable spoil; will be reused. Any surplus soil that cannot be reused will be transported off-site to recycling depots or approved landfill sites. The material will be tested in accordance with relevant NSW and ACT legislation prior to disposal.	Sections 4.2.1, 5
EIS Commitment 48	The proponent will continue dialogue with local landowners and Palerang Shire Council regarding spoil re-use options.	Section 4.2.1
EIS Commitment 55	All greenhouse gas emissions associated with the construction and operation of the project will be offset.	Section 5.2.2

Table 1.2 M2G DA Conditions (NSW)

Condition	Commitment	Reference within WMP
Condition 2.30	All waste materials removed from the site shall only be directed to waste management facility lawfully permitted to accept the materials	Section 4.2.1, Table 5.3
Condition 2.31	The Proponent shall maximise the treatment, reuse and/or recycling on the site of any excavated soils, slurries, dusts and sludges associated with the project, to minimise the need for treatment or disposal of those materials outside the site.	Table 5.3 (mitigation measure A42)
Condition 2.32	The Proponent shall not cause, permit or allow any waste generated outside the site to be received at the site for storage, treatment, processing, reprocessing, or disposal on the site, except as expressly permitted by a licence under the Protection of the Environment Operations Act 1997, if such a licence is required in relation to that waste.	Section 5.1.2
Condition 2.33	The Proponent shall ensure that all liquid and/or non-liquid waste generated and/or stored on the site is assessed and classified in accordance with Environmental Guidelines: Assessment, Classification and Management of Liquid and Non-Liquid Wastes (DEC, 2004), or any future guideline that may supersede that document.	Section 2.3.1, Table 5.1

Table 1.3 M2G DA Conditions (ACT)

Condition No.	Condition	Reference within WMP
Condition B6 (c)	A *Waste Management sub plan* that includes disposal requirements, measures to reduce, re-use, recycle wastes be endorsed by TAMS.	WMP
Condition B8 (a) and (b)	An Environmental Authorisation/ Agreement must be obtained from the EPA prior to the commencement of works. This may include the following: (a) Environment Authorisation under the provisions of the *Environment protection Act 1997* for ant activity on the site which is listed under Schedule 1 as a Class A activity; and (b) Environment Protection Agreement with the EPA for any activity on the site which is listed under Schedule 1 as a Class B activity of the *Environment Protection Act 1997*.	Section 2.5

Table 1.4 ACT Environmental Authorisation 802 Conditions

No.	Condition	Reference within WMP
10.1	The following records are to be maintained and kept by the Authorisation holder for a period of five years: a) field sampling record sheets and chain-of-custody sheets b) results of monitoring of soils and groundwater c) reconciliation records for all fuels, oils and hazardous materials and wastes utilised and stored on site, and d) waste disposal certificates for any hazardous waste disposed off-site.	
13.1	No waste material is to be incinerated on site.	Table 5.1
13.2	The Authorisation holder shall use licensed waste transporters to transport "controlled/regulated wastes" as defined in the *Environment Protection Act 1997* and the Environment Protection Regulation 2005. Information on Controlled Waste handling and transport can be obtained from the Authority on 13 22 81.	Table 5.5
13.3	The Authorisation holder shall ensure excess spoil and other waste material removed from the site is in accordance with Schedule 2, Table 7.	Section 5
14.1	The Authorisation holder shall store and manage hazardous materials in a manner that prevents adverse impacts on the	Section 5

No.	Condition	Reference within WMP
	environment. The handling and storage of hazardous materials should be addressed in the Environment Management Plan required under section 17 of this Schedule.	
Schedule 2, Table 7 Waste Management		
1	The Authorisation holder shall not dispose of excess spoil at a site other than that which is approved by the Authority.	Section 5
2	Records of spoil removed from the site shall be kept by the Authorisation holder for a period of 2 years and made available to the Authority on request. These records are to include: (a) quantity of spoil removed from the site; (b) location of disposal;	Section 8.5
3	The Authorisation holder shall ensure all other waste material removed from the site is directed to a waste management facility lawfully permitted to accept that material.	Section 5

Table 1.5 NSW Environment Protection License Conditions

No.	Commitment	Reference within WMP
L 5.1	The licensee must not cause, permit or allow any waste generated from outside the premises to be received at the premises for storage, treatment, processing, reprocessing or disposal or any waste generated at the premises to be disposed of at the premises, except as expressly permitted by the licence.	Section 5

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2 Introduction

2.1 Background

The Murrumbidgee to Googong (M2G) Water Transfer (the project) is one of the recommended options for delivering improved security to the water supply for the ACT and Queanbeyan Region. It involves pumping water from the Murrumbidgee River (within the ACT) and transferring it via a pipeline to Burra Creek (in NSW), from where it will flow for approximately 12 km to the Googong Reservoir. The proposed transfer of water will supplement natural inflows to the reservoir, which have decreased by about 85% from 2001 to 2009. Googong Reservoir supplies water to Queanbeyan and the ACT following treatment at the Googong Water Treatment Plant.

The project comprises of the following key features:

Infrastructure	Description
Intake/low lift pump station	The intake/low lift pump station will comprise a concrete box structure built into the riverbank. The low lift pump station will include a screen, grit collection and removal, pumps and valves and filtration to prevent fish transfer.
High lift pump station	The pump station will pump water to a high point at Gibraltar Range, from where it will run under gravity to the discharge point. The high lift pump station will consist of a building enclosing a pump hall and electrical services and an amenities area.
Pipeline	The pipeline will transfer the water from the low lift pump station to the high lift pump station, then onto the outlet structure. It will be constructed of 1016 mm diameter steel pipe. The pipeline will be approximately 12 km long, with the pipe located approximately 1.8 m to 4 m below ground level. Air valves and scour valves will be located at regular intervals along the pipeline to provide pressure relief and to allow cleaning.
Outlet structure	The outlet structure will take the form of a weir box arrangement located on the bank of Burra Creek. It will comprise a rectangular concrete box approximately 12 m along the creek bank with a 250 mm grated opening along the west bank of Burra Creek. Water will flow into the weir box from the pipeline and will discharge over the weir and run down the creek bank to the creek, which flows to Googong Reservoir. This method of discharge is designed to minimise scouring of the creek bed near the outlet.
Electric power supply	The electrical infrastructure will comprise a 132 kV/11 kV substation in Williamsdale and a single 11 kV cable to the high lift pump station.
Mini-hydro power generator	Electricity provided by the grid will be supplemented by electricity generated by a mini-hydro electric power facility which will be constructed as part of the project.

The potential for the generation of waste will be increased significantly during construction of the pipeline and upper and lower pump stations. Effective waste management is critical to minimising any adverse impacts on downstream waterways and adjacent environs. This Waste Management Plan (WMP) outlines how waste and spoil issues will be identified, waste generation minimised, planned and monitored during the Project construction to minimise adverse impacts on the downstream environment. The WMP will interrelate with Construction Environmental Management Plan (CEMP) and other relevant plans. It also satisfies the NSW Department of Planning's Condition of Approvals 47, 48 and 55.

This plan has been designed to address client expectations and requirements, and adequately address risks and stakeholder concerns. The BWA is committed to providing the services it offers in a manner that conforms to the contractual requirements and to all relevant regulatory and legislative requirements.

The BWA will ensure that the controls are properly implemented and are regularly monitored and audited to assess their effectiveness. Changes to the stipulated controls will be instigated if they are not achieving their objectives.

2.2 Purpose

The purpose of this Waste Management Plan (WMP) is to assess, and where possible, reduce and recycle the amount of waste and resources used and produced during the M2G Project. This plan will assess how construction waste and resources will be dealt with in the most environmentally sustainable way and in accordance with legislative requirements.

2.3 Objectives

The objectives of this WMP are to identify measures that will:

- Minimise and reduce the extent of waste generated during the M2G works;
- Utilise and reuse, rather than dispose of, resources generated during construction works;
- Minimise the potential environmental impacts which could be associated with management of waste materials generated by the M2G Project;
- Educate construction staff and sub-contractors of the benefit of reusing and recycling wastes and resources during construction activities.

2.4 Performance Goals

- Comply with the NSW *Waste Avoidance and Resource Recovery Act 2001*;
- Comply with all legislative Acts and Regulations including the *Waste Minimisation Act 2001;* and
- Operate in accordance with the principles contained within the *ACT Government's No Waste by 2010 Strategy* (1996a) and the *Development Control Code for Best Practice Waste Management* (1999).

3 Legislative & Regulatory Compliance

3.1 Relevant Legislation

The BWA will comply with all legislation, Conditions of Approval, permits, guidelines and standards relevant to the project activities.

Table 3.1 Legislation

Legislative Jurisdiction	Relevant Act
Commonwealth	• Commonwealth : *Canberra Water Supply (Googong Dam) Act 1974,* and • Commonwealth: *Environment Protection and Biodiversity Conservation Act, 1999 (EPBC Act).*
Territory (ACT)	• Territory (ACT) : *Dangerous Substances Act 2004* • Territory (ACT) : *Dangerous Substances (Explosives) Regulation 2004* • Territory (ACT) : *Dangerous Substances (General) Regulation 2004* • Territory (ACT) : *Environment Protection Act 1997* • Territory (ACT) : *Litter Act 2004* • Territory (ACT) : *Environment Protection Regulation 2005* • Territory (ACT) : Waste Minimisation Act 2001
New South Wales	• NSW *Catchment Management Authorities Act 2003;* • NSW *Googong Dam Catchment Area Act 1975*; • NSW *Protection of the Environment Operations Act 1997*; • NSW *Waste Avoidance and Resource Recovery Act 2001*; • NSW *Environmentally Hazardous Chemicals Act 1985*;

3.2 Guidelines and Standards

The key reference materials relevant to management of soil and water during design and construction of construction projects include:

- NSW Department of Environment & Climate Change (DECC), 2008, “Waste Classification Guidelines”
- NSW Government’s “Waste Reduction and Purchasing Policy”
- NSW EPA’s “Construction and Demolition Waste Action Plan”
- NSW EPA’s “Green Waste Action Plan”
- EPA Guidelines: Solid Waste Landfills, 1996.
- Protection of the Environment Operations Act 1997 (POEO Act)
- The Waste Avoidance and Resource Recovery Act 2001 (WARR Act)

- Environment Protection Authority - Hazardous Materials Environment Protection Policy 2000;
- ACT's Environmental Standards: Assessment & Classification of Liquid and Non-Liquid Wastes (2000);
- Acceptance of Fill in the ACT, Information Sheet;
- Waste Minimisation in the Construction and Demolition Industry, TAMS (handbook); and
- Development Control Code for Best Practice Waste Management in the ACT (1999).
- ANZECC National Guidelines for the Management of Wastes – National Manifest and Classification System, 1994.
- Australian Code for the Transport of Dangerous Goods by Road and Rail, (ADG Code), 1999.
- ACT Environmental Authorisation Required to accept fill greater than 100 m^3 (Greater than 100 m^3 is a Class A activity)

3.3 Classification of Waste Streams

3.3.1 Overview

Where waste cannot be avoided, reused or recycled it will be classified and appropriately disposed of. The classification of waste will be based on the DECCW document *Waste Classification Guidelines (2008) and ACT's Environmental Standards – Assessment & Classification of Liquid and Non-liquid Wastes (2000)*. The guideline and standards outline how to assess waste specifies general rules for liquid and non-liquid waste classification and sets out management options for the disposal of classified waste.

NSW

Waste classification will involve one or more of the following for NSW:

- Determine if waste is special waste, liquid waste or pre-classified waste;
- If the waste is not special, liquid or pre-classified, determine if it is hazardous waste;
- Undertake laboratory analysis of waste (to determine hazardous/non-hazardous or putrescible/non-putrescible) where classification cannot be determined by other means.
- Any laboratory analysis and management of associated results will be co-ordinated by the M2G Environmental Manager and M2G Environmental Officer ; and
- Waste generated during construction can be broadly categorised as shown in 3.3.2.

ACT

ACT's Environmental Standards – Assessment & Classification of Liquid and Non-liquid Wastes (2000): classifies waste in the ACT into non-liquid, liquid and gaseous wastes. The predominant waste streams generated on site will consist primarily of liquid and non-liquid wastes. Where wastes cannot be classified into specified waste categories and/or when wastes have the potential to be hazardous, further laboratory analysis will be undertaken to assess the nature of the waste and guide disposal options. All documentation associated with this analysis will be filed and maintained on site by the Environmental Officer. The EPA will be notified if any contaminated/hazardous wastes are identified to deter appropriate waste analysis and treatment/disposal options. Details of each anticipated waste category are detailed below.

3.3.2 Classification of Waste for NSW

Table 3.2 Classification of Waste NSW

Category	Definition
Special	Clinical waste, asbestos waste, waste tyres or anything that is classified as a special waste pursuant to a DECCW gazettal notice
Liquid	Any waste (other than special waste) that includes any of the following: Anything that: • Has an angle of repose of less than 5^0 above horizontal; • Becomes free-flowing at or below 60^0C or when it is transported, or • Is generally not capable of being picked up by a spade or shovel. • Anything that is classified as liquid waste pursuant to an DECCW gazettal notice
Hazardous Waste	Refer to Part 3, Division 1, Clause 49 of the *Protection of the Environment Operations Amendment (Scheduled Activities and Waste) Regulations 2008*
Restricted solid waste	Wastes assessed and classified as restricted solid waste in accordance with the procedures set out in Step 5 of the Waste Classification guidelines, Part 1, Classifying Wastes. Currently, no wastes have been classified by the DECCW as restricted solid waste.
General solid waste (putrescible)	Refer to Part 3, Division 1, Clause 49 of the *Protection of the Environment Operations Amendment (Scheduled Activities and Waste) Regulations 2008*
General solid waste (non-putrescible)	Refer to Part 3, Division 1, Clause 49 of the *Protection of the Environment Operations Amendment (Scheduled Activities and Waste) Regulations 2008*

3.3.3 Classification of Waste for ACT

Non Liquid Wastes

For waste to be considered as a non-liquid waste it must meet **all** of the following requirements as detailed in *ACT's Environmental Standards – Assessment & Classification of Liquid and Non-liquid Wastes (2000):*

- it has an angle of repose of greater than five degrees (5°);
- it has no free liquids when tested in accordance with the United States Environment Protection Authority Paint Filter Liquids Test— Method 9095 (USEPA 1986);
- it liberates no free liquids when transported;
- it does not become free flowing at or below 60°C or when transported;
- it is spadeable (can be picked up with a spade or shovel); and
- If any of these requirements are not met during the assessment process the waste is classified as a liquid waste (excluding gaseous substances).
- Class A activity requires Authorisation from the ACT Environmental Authority. Accepting greater than 100 m^3 of spoil is a class A activity.

Classifications of non liquid wastes are detailed below.

Table 3.3 Classification of Non-Liquid Wastes

Classification	Examples
Inert Waste	Virgin excavated natural material (eg clay, gravel, sand, soil and rock) that is not mixed with any other waste and that: (a) has been excavated from areas that are not contaminated, as a result of industrial, commercial, mining or agricultural activities, with manufactured chemicals and that does not contain sulphidic ores or soils, or (b) consists of excavated natural materials that may be approved by the Environment Management Authority.
	Building and demolition waste (eg bricks, concrete, paper, plastics, glass, metal and timber [1]), being material resulting from the demolition, erection, construction, refurbishment or alteration of buildings or from the construction, repair or alteration of infrastructure-type development such as roads, bridges, dams, tunnels, railways and airports, and which: (a) is not mixed with any other type of waste, and (b) does not contain any asbestos waste.
	Asphalt waste (eg resulting from road construction and water proofing works).
	Bio-solids categorised as Unrestricted Use, or as Restricted Use [1], in accordance with the criteria set out in the Bio-solids Guidelines.
	Used, rejected or unwanted tyres (including shredded tyres or tyre pieces).
	Office and packaging waste (eg paper, plastics, glass, metal and timber) that is not mixed with any other type of waste.
Solid Waste	Bio-solids categorised as Restricted Use 2 or 3 in accordance with the criteria set out in the Bio-solids Guidelines, manure and night soil.
	Cleaned pesticide, biocide, herbicide or fungicide containers. [2]
	Drained and mechanically crushed oil filters, and rags and oil absorbent materials (not containing free liquids) from automotive workshops.
	Disposable nappies, incontinence pads and sanitary napkins.
	Food waste.
	Non-chemical waste generated from manufacturing and services (including metal, timber, paper, ceramics, plastics, thermosets and composites).
Industrial Waste	Stabilised asbestos waste in bonded matrix.
	Asbestos fibre and dust waste (eg waste resulting from the removal of thermal or acoustic insulating materials or from processes involving asbestos material, and dust from ventilation collection systems).

Classification	Examples
Hazardous Waste	Any waste that meets the criteria for assessment as dangerous goods under the *Australian Code for the Transport of Dangerous Goods by Road and Rail*, and categorised as one of the following: (a) explosives, (b) gases (compressed, liquefied or dissolved under pressure), (c) flammable solids (excluding organic waste, and all physical forms of carbon such as activated carbon and graphite), (d) flammable liquids, (e) substances liable to spontaneous combustion (excluding organic waste, and all physical forms of carbon such as activated carbon and graphite), (f) substances which in contact with water emit flammable gases, (g) oxidising agents and organic peroxides, (h) toxic substances, (i) corrosive substances.
	Pharmaceuticals and poisons (being waste generated by activities carried out for business or other commercial purposes and that consists of pharmaceutical or other chemical substances specified in the Poisons List under the *Poisons and Therapeutic Goods Act 1966 (NSW)*).
	Clinical waste.
	Cytotoxic waste.
	Sharps waste.
	Quarantine waste.

Note: $_1$. Includes treated timber such as copper chrome arsenate (CCA), high temperature creosote (HTC), pigmented emulsified creosote (PEC) and light organic solvent preservative (LSOP) treated timber.

Note: $_2$. The cleaning method used should be as good as or better than the triple rinsing method developed by AVCARE and reproduced in technical Appendix 3 of the Act's Environmental Standards assessment and classification of liquid and non liquid wastes, June 2000.

Liquid Wastes
Classifications of liquid wastes as detailed in ACT's Environmental Standards – Assessment & Classification of Liquid and Non-liquid Wastes (2000):

Table 3.4 Classification of Liquid Wastes

Classification	Examples
Hazardous	Wastes (liquid) that are classified as hazardous (as reproduced in Table 2 above)
Group A	Non-aqueous liquid waste (any liquid waste in which a liquid other than water constitutes 20% or more of the volume of liquid present)
	Controlled aqueous liquid waste
Group B	Liquid food waste
	Liquid grease-trap waste resulting from the preparation or manufacturing of food.
Group C	Liquid waste from human waste storage facilities or waste treatment devices including pump-out waste and septic facilities

3.4 Conditions of Approval

The CoA's for the Project are detailed in **Tables 1.1- 1.6** of this document and in the Compliance Tracking Plan.

3.5 Licences & Permits

Tables 3.5 and **3.6** identify the approvals, permits and licences that are required for the project.

Table 3.5 Approval Requirements for NSW

Approval Required	Relevant Legislation	Authority
Environment Protection Licence	*Protection of Environment Operations Act. 1997*	Department of Environment, Climate Change & Water (DECCW)

Table 3.6 Approval Requirements for the ACT

Approval required	Relevant Legislation	Authority
Environmental Authorisation	*Environmental Protection Act 1997*	DECCEW (Environment Protection Authority)

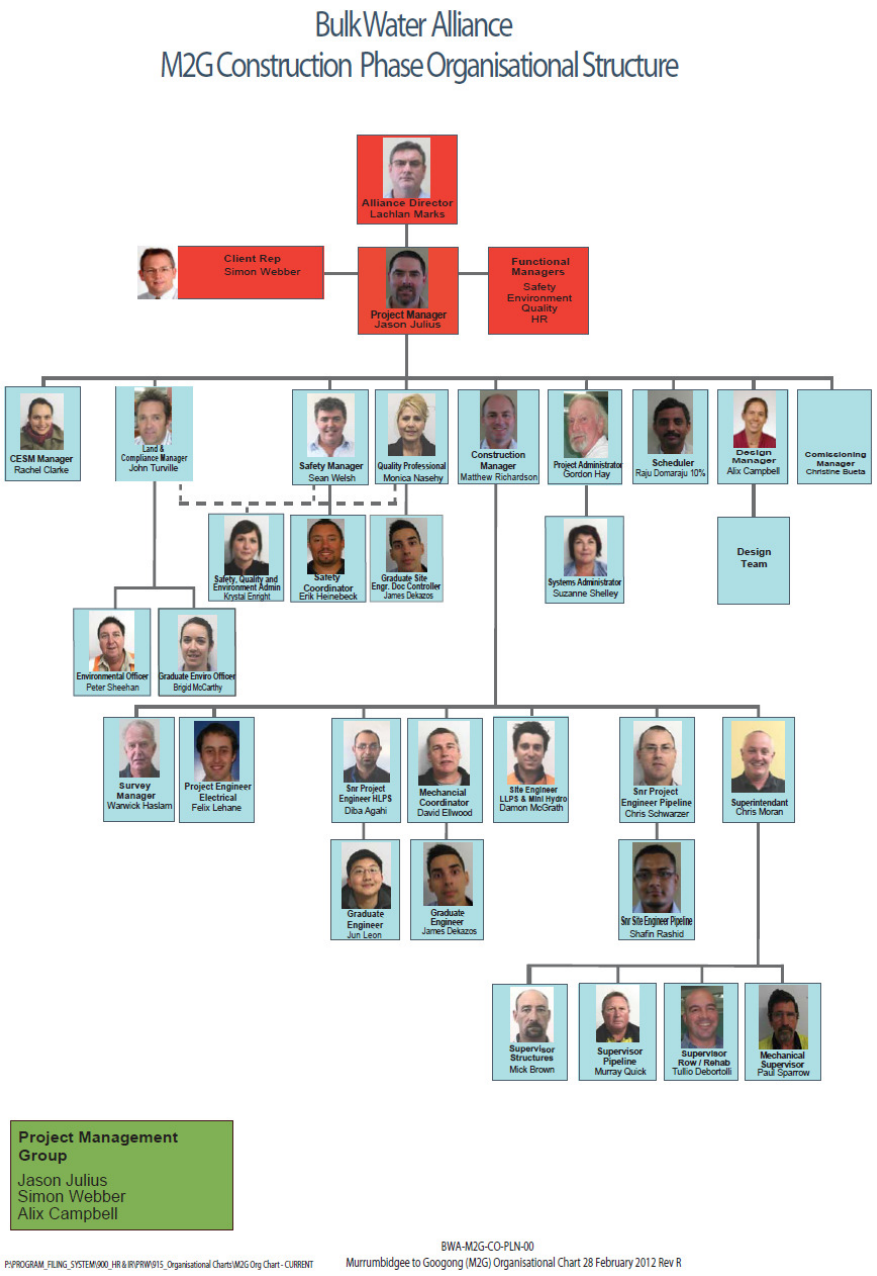
4 Structure & Responsibilities

The CEMP details the M2G's organisational hierarchy and environmental responsibilities allocated to specific site personnel. It is the responsibility of the BWA to ensure compliance with all relevant conditions and legislative requirements.

4.1 Site Structure

The general project structure for the management of soil and water issues is shown in **Figure 4.1** below.

Figure 4.1 Murrumbidgee to Googong Management Structure



4.2 Roles and Responsibilities

The following responsibilities are allocated to site personnel with regards to managing construction.

4.2.1 M2G Project Manager

The M2G Project Manager had the role of ensuring that the project is delivered on time, within budget and is consistent with the aims and objectives of the BWA. This role is accountable for all aspects of the project including safety, environment and heritage, quality, budget and overall delivery of the project.

4.2.2 M2G Construction Manager

The M2G Construction Manager is responsible for delivery of the construction phase of the project to ensure that impacts are minimised and obligations are met. The BWA Environmental Manager will be working in conjunction with the M2G Construction Manager to ensure that the BWA's prescribed environmental outcomes are achieved.

4.2.3 M2G Environment Manager

The BWA Environmental Manager has overall (project wide) responsibility for managing the environmental aspects of each BWA project and delivering the projects in accordance to the EMS and relevant Environmental Legislations.

4.2.4 M2G Environmental Officer

The M2G Environmental Officer has primary on-site responsibility for managing all aspects of environmental management and compliance for the construction phase of the project, as delegated by the M2G Environmental Manager. This position reports directly to the M2G Project Manager and the BWA Environmental Manager.

The key responsibilities of the M2G Environmental Manager and Environmental Officer will be to:

- Liaise with designers and construction manager with regard to construction program and Activities on site;
- Review the WMP prior to the start of construction;
- Implement the BWA Environmental Management System (EMS);
- Maintain, assess and monitor the implementation of the WMP;
- Ensure that all project environmental obligations are met;
- Ensure no work requiring a licence or permit is undertaken without such documentation;
- Complete environmental checklists;
- Provide input and advice to engineers on Environmental Work Method Statements (EWMS);
- Identify and prepare environmental induction and training materials;
- Liaise with government agencies and relevant stakeholders;
- Provide a regular construction program identifying critical construction activities;
- Manage the environmental budget;
- Respond to environmental incidents;
- Manage environmental sub-consultants;

- Oversee the maintenance of environmental documents;
- Prepare reports on compliance; and
- Monitor revegetation activities within the project boundary.

4.2.5 Engineers

Project and Site Engineers are responsible for ensuring that environmental considerations are integral to the decision making for all construction Activities. Engineers will liaise closely with the M2G Environmental Officer to ensure that the environmental controls and procedures contained in the WMP are implemented. Engineers will conduct regular checks of the site to ensure environmental controls such as sediment fences and dust suppression are functioning effectively.

Roles and responsibilities for both the Project and Site Engineers, in respect to environmental matters, will differ depending on the Activity being undertaken. Specific details on particular environmental responsibilities are included in each EWMS.

Where applicable, the engineers will be responsible for ensuring that any work performed by external parties meets with the requirements of this WMP including identifying and documenting the environmental risks of the proposed works.

4.2.6 Superintendent and Foremen

Superintendents and Foremen report to the Project Engineers and will have a direct role in the compliance and implementation of environmental procedures and controls on site. They will also be responsible for checking the site on a regular basis and ensuring that regular maintenance is undertaken to minimise environmental impacts and that personnel are provided with appropriate environmental training, prepared by the Environmental Team.

Where applicable the Superintendents/Foremen will be responsible for ensuring that any work performed by external parties meets with the requirements of the WMP, including identifying and documenting the environmental risks of the proposed works.

4.2.7 Subcontractors

The BWA recognises that it is often subcontractors that present the greatest environmental risks to a project due to:

- Their detachment from the main construction delivery teams, and therefore the potential for poor communication regarding environmental risks;
- The large number of subcontractors on site; and
- Subcontractors operating under a different management system from the BWA.

The BWA acknowledges its responsibility to ensure that all persons on the project including subcontractors and their employees comply with the relevant environmental requirements. As a minimum, subcontractors and their employees will be required to comply in full with the WMP. All subcontractor personnel are considered equivalent to BWA personnel in all aspects of environmental management and control, and their responsibilities in this respect mirrors those of BWA personnel.

M2G environmental requirements will be included in the selection and management of subcontractors working on site. This will include appropriate references to site specific environmental management requirements within subcontract documentation.

Subcontractors working on the project will be required to:

- Undertake the on site induction and where required participate in relevant environmental training and toolbox sessions;
- Observe subcontract and statutory requirements relating to environmental protection and other environmental legislation and to follow instructions issued by the BWA management and supervisory personnel;
- Nominate site representatives to liaise with M2G site representatives with respect to environmental requirements associated with their Activity. This representative must have the authority to administer and implement any outcomes/management strategies identified during such consultations;
- Adhere to the BWA management system as it applies to their operations on site;
- Co-operate fully with site emergency incident procedures and consultative arrangements; and
- Be familiar with, and adhere to, procedures incorporated in the WMP and associated sub-plans with regards to environmental management and legislative compliance; and
- Display a drive towards the implementation of “Best Management Practices” and the principles of sustainability during day-to-day operations.

The work of subcontractors will be monitored through the site inspection process detailed in Section 8 of this document. Observations will be made by relevant personnel (listed above) to assess the effectiveness of the environmental protection measures being used by the subcontractors and to determine compliance with the requirements of the WMP. Any non-conformances or improvements identified during these inspections will be documented on an SQE Inspection Checklist for minor non-conformances/improvements or an Environmental Improvement Notice (EIN) for significant non-conformances.

5 Environmental Aspects and Impacts

5.1 Environmental Aspect, Impact and Risk Identification

Environmental aspects as referred to in this document are those activities associated with the project that have the potential to cause, or result in, adverse environmental impacts. Due to the complexity of the project, it is conceivable that various aspects of the project would carry a varying degree of environmental risk which needs to be managed accordingly.

Effective environmental management should be proactive rather than reactive. In order to facilitate a proactive style of environmental management, a risk management style of assessment has been utilised to identify and assess environmental aspects associated with the project, and to implement appropriate mitigation strategies to minimise the likelihood of environmental risks associated with each aspect. This process involves:

- Identifying the risk/aspect
- Analysing the risk/aspect (determining likelihood and consequence)
- Evaluating the risk/aspect
- Treating the risk

All identified aspects are assessed based on the risk assessment matrix (**Table 5.1**). Risk assessment is based on (1) the likelihood of an impact occurring as a result of the aspect; and (2) the consequences of the impact if the event occurred. Following this assessment, each impact is assigned a risk category which ranges from “low” (low likelihood and consequence) to “extreme” (high likelihood and consequence). **Table 5.2** describes each level of risk.

A risk category identified as having an extreme or high risk (a significant impact) may be downgraded if appropriate environmental controls and measures are implemented and maintained. Proactive planning, installation and maintenance of appropriate environmental controls and ongoing monitoring will reduce the risks associated with each environmental impact identified for the project. **Table 5.3** details the environmental aspects identified for the project, the initial risk category prior to appropriate management strategies, the proposed management strategy and a revised risk category. **Tables 5.1** and **5.2** have been utilised to determine the risk on the proposed project.

Table 5.1 Risk Scoring Matrix

		Consequences				
	Likelihood	1	2	3	4	5
		Negligible discharge	Uncontrolled Discharges in minor quantities	Moderate breach of environmental Statutes	Major breach of environmental statutes	Shutdown of project due to Environmental breach
A	Almost Certain	H	H	E	E	E
B	Likely	M	H	H	E	E
C	Moderate	L	M	H	E	E
D	Unlikely	L	L	M	H	E
E	Rare	L	L	M	H	H

Table 5.2 Risk Definition and Classification – Qualitative Measures and Likelihood Scale

Level	Categorisation Of likelihood	Description
A	**Almost certain**	Is expected to occur during the project, 90% or > probability
B	**Likely**	Will probably occur during the project, ~50% probability
C	**Moderate**	Might occur at sometime during the project, ~10% probability
D	**Unlikely**	Could occur at some time during the project, ~1% probability
E	**Rare**	Only occur in exceptional circumstances, < 1% probability

5.1.2 Environmental Impacts and Risks

Table 5.3 Identified impacts and risks associated with waste generation on the project.

Aspect	Potential Impact	Risk category	Mitigation Measures (Table 5.1)	Revised Risk Category
Office activities	General litter (food waste, packaging) reaching local waterways	Low	A3, A4, A5, 8A10, A14, A66-A86	Low
	Inappropriate use of resources	Medium	A1, A3, A15, A66- A86	Low
	Odour and visual impact from waste	Medium	A2, A3, A8, A9, A10, A17, A58, A63	Low
	Leakage of toner cartridges	Low	A7, A8, A13, A74	Low
	Leakage of effluent	Low	A8, A9, A13, A86	Low
Lunch/crib hut activities	General litter (food waste, packaging)	Medium	A3, A4, A5, A6, A8, A10, A14, A58, A63	Low
	Inappropriate disposal of litter	Medium	A3, A4, A5, A6, A8, A10, A14, A58, A63	Low
	Leakage of effluent	Medium	A8, A9, A13, A86	Low
	Inappropriate disposal of effluent	Low	A86	Low
Excavation and land clearing	Inappropriate disposal of waste items which may be hazardous	Extreme	A3, A5, A6, A7, A8, A12, A13,B17, A35	High
	Generation of vegetative waste	Medium	A31	Low
Plant and equipment maintenance	Inappropriate disposal of hazardous waste	Extreme	A6, A7, A8, A13, A15, A18, A35	High
	Inappropriate disposal of waste	High	A6, A7, A8, A13, A15, A18, A35, A47	Low
	Inappropriate disposal of waste water	Medium	A6, A7, A8, A13, A15, A16, A35, A47	Low

Aspect	Potential Impact	Risk category	Mitigation Measures (Table 5.1)	Revised Risk Category
	Missed opportunities for reuse /recycling of waste products	Medium	A19, A20, A19 – A86	Low
Access road construction	Inappropriate disposal of fill material	High	A5, A6, A7, A8, A35	Medium
Construction of structures	Disposal of sediment	High	A5, A6, A7, A8	Medium
	Inappropriate use of resources	Medium	A1, A3, A4, A34-A47	Low
	Inappropriate disposal of waste	Medium	A6, A7, A8, A13, A15, A18, A58, A63	Low
	Inappropriate disposal of waste water	Medium	A6, A7, A8, A13, A15, A16, A47	High
Landscaping/ revegetation	Inappropriate disposal of fertiliser containers etc	High	A4, A5, A6,A8, A58, A63	Medium
Decommissioning of the site	Disposal of material collected in sediment fencing, etc	High	A7,,A8, A11, 58, A63	Medium

5.2 Project Description and Physical Characteristics

5.2.1 Excavated Rock and Soil Material

Rock and Soil Material excesses

The M2G Pipe line and pump stations' works will require the disposal of the following rocks and soils (spoil) as a worst case scenario:

Table 5.4 Rock and Soil Material excesses (including 30% bulking)

Section	Spoil
Low Lift Pump Station	56m^3
Coffer Dam	1,000m^3
High Lift Pump Station	3,200m^3
Angle Crossing Road Works	2,100m^3
Pipeline	5,264m^3 (ACT)
	21,056m^3 (NSW)
Mini Hydro and Burra Creek Discharge	2,000m^3
Total	**34,676m^3**

This spoil material is expected to be Virgin Excavated Natural Material (VENM), which has been excavated from areas not contaminated with manufactured chemicals or process residues as a result of industrial, commercial, mining or industrial activities and does not contain any sulphidic ores or soils or any other waste.

A concerted effort will be made by BWA to utilise the spoil onsite rather than dispose of materials off-site. However, this is not always achievable. To assist the BWA to dispose of excess material in an environmentally sustainable manner and in accordance with government agency expectations and licence requirements, a procedure for disposing of this material can be found in Appendix A of this document.

5.2.2 Disposing of spoil in NSW

A duly completed and signed notice under section 143(3A) of the *POEO Act 1997* ("s.143 Notice") will be received prior to transporting wastes generated by or for the M2G project to a place that is not owned by the BWA or ACTEW and is not a licensed waste facility (the "Waste Site"). This includes waste transported for reuse, recycling, disposal or stockpiling. Waste in this context includes spoil, fill, Virgin Excavated Natural Material ("VENM"), crushed rock, reclaimed asphalt pavement, mulched vegetation, waste concrete, etc.

The requirement for "s.143 Notices" does not apply to:

- wastes transported to land owned by BWA /ACTEW; or
- wastes transported to licensed waste facilities; or

Waste will not be transported to the Waste Site unless:

- The landholder has been provided with a letter highlighting the need for a "s.143 Notice", your role and the respective roles of the BWA and the landholder in ensuring that the waste is appropriately managed. The letter will be consistent with the template letter in Appendix D with the following documents attached:
  - A copy of the 'Questions and answers for the landowner/occupier' relating to illegal waste dumping, available from the DECCW website at http://www.environment.nsw.gov.au/waste/s143questions.htm
  - a "s.143 Notice" for the landholder to complete. The "s.143 Notice" must obtained from DECCW at http://www.environment.nsw.gov.au/resources/waste/notice_s143.pdf

- The “s.143 Notice” is completed and signed by the landholder, and the original copy of the signed “s.143 Notice” returned to the M2G site office; and
- A copy of the “s.143 Notice” is provided to the transporter of the materials, who will be made aware of the material’s classification and the details on the “s.143 Notice”.

The BWA will ensure that the waste is accurately described on the “s.143 Notice” and waste delivery arrangements have been confirmed with the landholder prior to transporting materials to the Waste Site.

5.2.3 Disposing of spoil in ACT

If soil of a quantity greater than 100m^3 is to be disposed of and placed on leased land with the ACT, an Environmental Authorisation will need to be obtained prior to importation and placement of the soil material. The Environmental Authorisation will need to be obtained by the party accepting the material and the BWA would need to comply with their own Environmental Authorisation (No. 802) prior to disposal of this spoil material, in particular Schedule 2, Table 7, Waste Management of Environmental Authorisation 802.

Other Inert Materials

On completion of the works, demolition of the temporary foundations for the site compound as well as removal of some grouting material used for the temporary cofferdam works will need to be disposed of. This is expected to generate some moderate quantities of other rock and inert waste materials, including:

- Moderate quantities of concrete from the demolition of the compound foundations; and
- Fill materials removed from the coffer dam.

Every attempt will be made to recycle/ reuse these waste products on site. If this is not feasible, the waste will be disposed of at a waste management facility lawfully able to accept such waste.

Industrial Waste (ACT) or Special Waste (NSW)

As part of the M2G works a portion of Railway line near the Monaro Highway may need to be temporarily removed on the boundary between NSW and ACT. The railway line is an old line that has timber sleepers that have deteriorated. Although not yet confirmed through testing, it is suspected that there may be traces of arsenic and asbestos. Testing of the material suspected to be contaminated will occur using an accredited consultant and the amount of contaminated material is estimated to be around 200m^3. If determined to be unsuitable the material will be disposed of at a licensed waste facility and transported using a licensed waste transporter. Excavated material removed from this location will be replaced with VENM sourced from either side of the rail reserve as part of the pipeline excavation.

An historical sheep dip is known to be located towards the end of the pipeline near the proposed outlet structure. Soil testing will be undertaken if it is thought that contamination from the sheep dip is present within the pipeline easement. As stated above, an accredited consultant will be engaged to undertake the sampling and report on the results. Any material deemed unsuitable (contaminated) will be disposed of at a licensed waste facility using a licensed waste transporter. If controlled waste material is to be transported between NSW and the ACT appropriate tracking of the waste materials will be undertaken in consultation with the relevant Authorities. Appendix C contains the Spoil Material Tracking register that will be used to document this process. It is noted that the definition of VENM in the ACT is slightly different to that of NSW and any material identified as VENM will need to meet the requirements of the relevant State’s definition.

6 Environmental Controls and Mitigation Measures

The implementation of various environmental control measures during the course of construction can reduce the risk category of environmental aspects associated with the project (i.e. controlling the risk). In addition to implementing "best management practices" on site, the following environmental control measures will be implemented on site to minimise environmental impacts associated with construction activities.

6.1 General Mitigation Measures

Table 6.1 outlines the general waste mitigation and re-use measures that will be implemented on the project.

Table 6.1 General Mitigation Measures

Item	Control Measures and Safeguards	Responsibility	Timing/ Frequency
A1	Where possible opportunities for water reuse/ recycling will be initiated	Construction Manager, Environmental Manager	Construction
A2	Ensure that there is no open burning or incineration on site.	Site Engineer	Construction -Ongoing
A3	Waste management and minimisation will form part of the induction program.	Environmental Manager	Pre-Construction
A4	Environmental Work Method Statements (EWMSs) will include practices to minimise waste generation and to maximise recycling and reuse of materials including rock fill material, concrete, oils, greases, lubricants, sanitary wastes, timber, glass, cleared vegetation and metal.	Environmental Manager	Construction
A5	Segregated waste disposal containers for the collection and recycling/disposal of all waste streams generated during the early works will be provided on-site. Waste disposal containers will have clear signage and instructions for use to avoid cross-contamination.	Environmental Manager	Construction
A6	A Waste Management Register of all waste collected for disposal and recycling, including amounts, data and time and details and location of disposal will be maintained at all times.	Environmental Manager	Construction - Ongoing
A7	Prior to disposal of non-recyclable liquid and non-liquid waste, it will be classified based on the DECC Waste Classification Guidelines, Part 1: Classifying Waste and *and ACT's Environmental Standards – Assessment & Classification of Liquid and Non-liquid Wastes (2000)*.	Environmental Manager	Construction - Ongoing
A8	All waste being transported off site on public roads must be covered.	Superintendents / Foreman	Construction - Ongoing

Item	Control Measures and Safeguards	Responsibility	Timing/ Frequency
A9	Toilets will be emptied and serviced regularly (pump-out system).	Foreman	Construction - Ongoing
A10	The site will be cleared of any litter.	Superintendents / Foreman	Construction - Daily
A11	Topsoil will be stockpiled, stabilised and reused for landscaping (where not infested with weeds). Weeds will be disposed of.	Environmental Officer	Construction - Ongoing
A12	Storage of all hazardous substances and dangerous goods will be in accordance with MSDS requirements in a bunded area. Solid and hazardous wastes will be contained and separated from inert waste.	Superintendents / Foreman	Construction – Ongoing
A13	Any material contaminated by spills i.e. fuel, oil, lubricants etc will be stored in a sealed secure container within a bunded area and will be transported to an EPA approved waste disposal site.	Superintendents / Foreman	Construction – Ongoing
A14	Biodegradable products will be used wherever possible.	Environmental Officer	Construction – Ongoing
A15	A wastewater collection and treatment system will be provided for all vehicles, plant and equipment maintenance and cleaning areas to prevent the discharge of pollutants to stormwater. Wastewater arising from such activities will be collected and disposed of in accordance with the relevant regulatory authority's guidelines. Water use in office will be metered and reported monthly.	Superintendent	Construction - Ongoing
A16	Truck wash-down facilities will be provided on site in an area designed to contain wastewater.	Environmental Manager	Construction - Ongoing
A17	Regular collection of wastes will ensure air emissions are at a satisfactory level. All waste and wastewater management systems will be regularly inspected and audited.	Environmental Officer	Construction - Ongoing
A18	Concrete washout pits will be provided and used.	Superintendent	Construction - Ongoing

6.1.2 Receivable Facilities

The classification of wastes will determine whether licensed transporters are required and also where disposal to licensed landfills is required. Licensed landfills that will be used during the project include:

- Inert Waste Class 1 or 2 Landfills that would accept all inert waste generated during the Project;
- Solid Waste Class 1 or 2 Landfills that accept oil filters and oil absorbent materials; and
- Solid Waste Class 1 only that accepts vegetative waste and waste from litterbins.

There are also facilities located within NSW and ACT that will accept hazardous waste, dependent upon the particular contaminant. An appropriately licensed facility will be sought for the known contaminant at the time of disposal, if the need arises to dispose of such hazardous waste. The M2G Environmental Officer will ensure that all receiving facilities are appropriately licensed to accept the type of waste transported offsite. When using landfills for the first time, a copy of the landfill's licence will be requested and reviewed.

The BWA will not cause, permit or allow any waste generated outside the site to be received at the site for storage, treatment, processing, reprocessing, or disposal on the site, except as expressly permitted by a licence under the *Protection of the Environment Operations Act 1997*, if such a licence is required in relation to that waste.

A waste management contractor will be engaged to pick up and appropriately dispose of waste material generated from the M2G Project.

6.2 Specific Mitigation Measures

In addition to the above, the following specific mitigation measures will be implemented on site to manage generated waste associated with the project activities.

6.2.1 Management of Key Waste Streams

Avoiding the generation of waste is of primary importance when considering waste management strategies and is recognised by the Bulk Water Alliance as a key component in reducing waste.

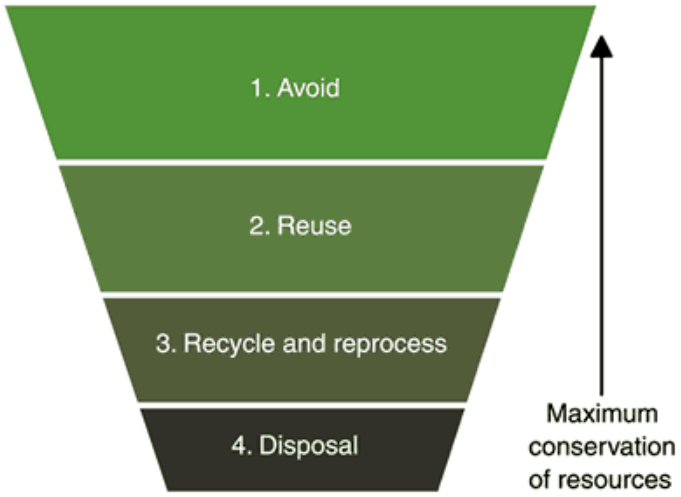


Figure 6.1 Waste Minimisation Hierarchy

Waste generating activities are listed in **Table 6.2**. It identifies the range of solid, inert, industrial, hazardous and liquid wastes that could be generated by the construction of the Project.

Waste management and reuse strategies will be assessed and implemented, where practical and cost-effective. Actions to minimise waste generation are detailed in **Tables 5.1** and **6.2**.

Table 6.2 Typical Waste Streams

Waste Stream	Types	Classification
Demolition	• vegetation (e.g. trees, weeds); • concrete from demolition work; • reinforced steel.	• Gen. Solid Waste (Putr.) • Gen. Solid Waste (Non Putr.) • Gen. Solid Waste (Non Putr.)
Excavated Materials	• VENM (Virgin Excavated Natural Material); • Potentially Contaminated Soils	• Gen Solid Waste (Non Putr.) • Industrial or Special waste
Building Waste	• steel reinforcing; • conduits and pipes; • concrete; • timber formwork; • packaging materials including wood, plastic, paper, cardboard and metals; • empty oil drums and other drums; • pesticides; • metal and bulk electrical cabling; • paints	• Gen. Solid Waste (Non Putr.) • Gen. Solid Waste (Non Putr.) • Gen. Solid Waste (Non Putr.) • Gen. Solid Waste (Non Putr.) • Gen. Solid Waste (Non Putr.) • Hazardous Waste • Hazardous Waste • Gen. Solid Waste (Non Putr.) • Hazardous waste
General Waste from Compounds	• waste generated by the maintenance of equipment including air and oil filters and rags; • oil, grease, fuel, chemicals and other fluids; • batteries; • domestic waste generated by workers such as cans, glass, paper, plastic, food scraps; • sewage	• Hazardous Waste • Hazardous Waste • Hazardous Waste • Gen. Solid Waste (Non Putr.) • Special Waste
Office Waste	• paper and cardboard; • glass bottles; • aluminium cans; • ink cartridges; • plastic.	• Gen. Solid Waste (Putr.) • Gen. Solid Waste (Non Putr.) • Gen. Solid Waste (Non Putr.) • Gen. Solid Waste (Non Putr.) • Gen. Solid Waste (Non Putr.)

Table 6.3 Plan of Action for Key Waste Streams

Reduce		Reuse		Recycle		Dispose	
Excavated Material (VENM)							
A19 A20	• Use around 8000m^3 of the pipe excavated material as bedding material • Washed gravel used to build the coffer dam used to improve the car park facility at angle crossing road.	A21 A22 A23 A24 A25	• Re-use rock fill material for creek crossing rehabilitation and for Burra Creek stabilisation • Process excavated rock material for use as existing access road upgrades • Gravel used for road works and temporary works readily acceptable for screening and reuse by quarries and recyclers • Sand removed as part of the low lift pump station reused for building a sedimentation basin for dewatering purposes • Rock fill or spoil material used by the local land holders under their own licence agreement **(Refer to Appendix A, Spoil Disposal Procedure).**	A26 A27	• Rock fill material further processed (e.g. by further crushing) and sorted to provide aggregates and recycled materials for beneficial re-use • Placement of sizable quantities of rock fill requires careful evaluation of sites, including geotechnical investigations to confirm the suitability of sub-surface / foundation conditions.	A28	• Contaminated material (from sheep dip or railway sleepers) will be sent to a licensed landfill or appropriate receival facility
Demolition Wastes							
A29	• Where possible ensure local roads remain intact during demolition work to reduce the need for new paving materials	A30 A31 A32	• Concrete from the demolition of site compound reused • Vegetation will be mulched and composted for landscaping and soil erosion mitigation • Large tree trunks will be left on site to provide habitat for fauna (refer to Landscape Rehabilitation Management Plan).	A33 A34	• Where practicable, any reinforcing steel will be segregated and sent to a recycler • Uncontaminated concrete transported off-site and used as recycled aggregate	A35	• Contaminated material (other than soils) will be sent to landfill or appropriate receival facility

Reduce		Reuse		Recycle		Dispose	
Building Waste							
A34	• Pre-painted products will be used wherever practicable	A41	• Wood will be chipped for use in landscaping	A44	• Where practical steel will be segregated and sent to a recycler	A47	• Contaminated material will be sent to landfill or appropriate receival facility
A35	• Delivered quantities will be matched to ordered quantities to ensure shortfall or over-supply is rectified at the supplier's expense	A42	• Where practicable, asphalt, materials containing slurry and gravel will be reused on site	A45	• Uncontaminated concrete and asphalt may be transported off-site and used as recycled aggregate		
A36	• Materials to be cut to the right size first time, minimising the generation of scraps	A43	• Timber formwork will be reused until worn out and then recycled	A46	• Recycled products will be used where practicable		
A37	• Planning to avoid waste and to minimise the likelihood of over ordering building materials						
A38	• Preference will be given where possible to products that are more durable, more compact and able to be maintained or repaired if they fail						
A39	• Where possible minimal packaging or recyclable packaging will be requested from product supplier						
A40	• Building materials delivered to the site will be properly stored and handled to prevent the loss or damage caused by exposure to moisture, dirt and temperature changes						
General Waste from Construction Compounds							
A48	• Signs will be displayed within the site compound to encourage employees to avoid, minimise and reduce waste where possible	A53	• Excess oil to be sent back to the supplier for reuse	A57	• Tyres will be sent back to supplier for recycling	A64	• Sewage will be discharged into a holding tanks for removal by tankers or flow through a septic system or through a biological
A49	• Where possible, staff will be involved in the design and implementation of specific waste reduction measures	A54	• Wherever practicable, air and oil filters will be cleaned and reused	A58	• A segregated bin system that separates recyclables such as aluminium cans and glass from general waste will be provided and personnel will be trained in their use		
A50	• Where possible, minimal packaging or	A55	• Empty oil drums will be sent to a drum recycler / reconditioner				
		A56	• Signs will be erected within construction compounds encouraging				

Reduce		Reuse		Recycle		Dispose	
	recyclable packaging will be requested from product suppliers, Management should take responsibility for waste management measures		site personnel to reuse	A50	• Paper and cardboard bins will be provided and personnel will be trained in their use to ensure recycling of these products		treatment and irrigation system.
A51	• Equipment that is more durable and repairable will be bought where practicable			A60	• Signs will be erected within construction compounds encouraging site personnel to recycle		
A52	• Cloth roll towels will be considered instead of paper rolls in restrooms			A61	• Recycled products will be ordered from suppliers and used where practicable		
				A62	• Small oil containers will be deposited in a segregated oily waste bin for recycling at a commercial facility		
				A63	• Rubbish skips will be provided for waste disposal and will be emptied on a regular basis from both construction compounds. Commercial recyclers will be used as a preference		
Office Waste							
A65	• Double sided and reduced-sized photocopying and printing will be encouraged	A74	• Refillable cartridges will be used	A78	• Recycled products will be used where practicable	A86	Sewage will be discharged into a holding tanks for removal by tankers or flow through a septic system or through a biological treatment and irrigation system.
A66	• Double sided printing with smaller font sizes, smaller margins and single spacing only will be encouraged	A75	• Where possible paper that has only been written on one side will be reused	A79	• An office paper separation system will be implemented		
A67	• On-screen editing will be encouraged to avoid unnecessary printing	A76	• Where practicable surplus or outdated letter head or leaflets will be bound to make note pads	A80	• Each staff member to be supplied with a cardboard container that will hold waste paper, when this container is full, it will be emptied into a central recycling bin.		
A68	• Documents and memos may be submitted or distributed electronically via email or by way of notice board	A77	• Delivery boxes will be reused for removal and storage	A81	• Where possible logos will be		

Reduce		Reuse		Recycle		Dispose	
	eliminating the need for multiple copies				placed on ordinary waste bins to enforce recycling		
A69	• Where possible only basic details will be included on the top of each fax coversheet leaving more room for text, reducing paper use			A82	• Where practicable staff will be involved in the design and implementation of specific waste recycling measures		
A70	• If possible fax status reports will be minimised by using electronic storage			A83	• Rewards and incentives for good recycling practices may be implemented		
A71	• Where practicable marketing, publication and purchasing practices will be examined to identify opportunities for waste reduction/avoidance			A84	• Where practicable cleaning staff and caretakers will be involved in the paper recycling scheme		
A72	• Equipment that is more durable and repairable will be bought			A85	• Where practicable bins for non-recyclable waste can be removed from immediate work areas and placed in more remote points around the office to encourage recycling above waste disposal		
A73	• Where possible minimal packaging or recyclable packaging will be requested from product supplier						

6.2.2 Energy Conservation

The construction of the project will be an energy consuming exercise, with the key contributors being the operation of plant for the excavation of spoil, subsequent road haulage of the spoil to the end use locations, and earthworks associated with the pipeline works and construction of the upper and lower lift pump stations. Accordingly, the policy of reducing the energy consumed, primarily through diesel consumption, will produce the following flow-on benefits:

- Energy efficient equipment operation will result in the reduction of energy demand and therefore costs.
- Reduction of energy demand through efficient spoil handing techniques will result in reduction of greenhouse gas emissions through direct means (i.e. less fuel consumed, less emissions) and indirect means (i.e. less electricity consumed – less coal burnt- less emissions)

The reduction of greenhouse gases will be promoted by adopting energy efficient and less greenhouse-intensive work practices. Key strategies adopted to reduce greenhouse gases will be promoted by energy efficient and less greenhouse-intensive work practices and will include the following actions:

- Green power will be purchased, if possible, for the supply of at least 50% of the energy requirements for the construction stage of the project. This will aid in reducing greenhouse emissions to the atmosphere and add to the overall global greenhouse initiative.
- Developing and implementing construction methodologies will include:
  - Selecting energy and time efficient methods whilst addressing other concerns.
  - Utilising well-maintained new equipment.
  - Minimising down-time of equipment through preventative maintenance programs.
  - Reducing idling when not in use.
  - Monitoring emissions for signs of inefficient operations (smoke).
- Conducting awareness programs for all site personnel regarding energy conservation methods
- During construction at each site an energy audit will be undertaken, to establish the baseline energy usage for the works and identify measures to improve efficiency and therefore reduce greenhouse gas emissions.

6.2.3 Reuse and Recycling Action Plan

Waste separation and segregation will be promoted on-site to facilitate reuse and recycling as a priority of the waste management program as follows:

- Waste segregation at work areas - all waste materials, including spoil and demolition waste, will be separated on-site into dedicated bins/ areas (where practicable) for either reuse on-site or collection by a waste contractor and transport to off-site recycling facilities.
- Waste separation off site - all wastes are to be deposited into one bin where space is not available on the worksite(s) for placement of multiple bins, and the waste is to be sorted off-site by a waste contractor.

Table 6.3 presents the proposed reuse, recycling and disposal strategy for segregated waste materials generated during construction of the project. **Appendix B** details the list of waste contractors.

Potential Wastes Sources and Proposed Waste Reuse, Recycling and Disposal Arrangements					
Waste Stream	**Classification *(* in accordance with DECCW guidelines April 2008)***	**Estimated quantities *(approximate)***	**Storage/handling requirements**	**Destination**	**Target % Reused, Recycled**
Construction Waste					
Excess spoil and soil (uncontaminated)	General solid waste (non-putrescible)	34, 676m^3	Spoil will be generated and it will be stockpiled until used or disposed of according to Section 4.2.1 of this document. If soil of a quantity greater than 100m^3 is to be placed on leased land with the ACT, an environmental Authorisation will be obtained prior to the importation and placement. A procedure relating to the disposal of spoil material outside of the construction works boundary can be found in Appendix A of this plan.	Re-use onsite or off-site disposal	80%
Contaminated soil	General solid to hazardous	Unknown	If unanticipated soil contamination is encountered, specific protocols outlined in the *Contaminated Land Management Plan* will be used. 15m^3 bins or truck will be used to contain contaminated material.	Appropriate waste disposal facility (depending on nature and level of contamination).	Secure Landfill
Concrete	General solid waste (non-putrescible)	Unknown	Crushed and reused as backfill, or sent off-site for recycling. Stored in 10m^3 bins	Reuse on site, or off-site concrete recycler	100%
Asphalt	General solid waste (non-putrescible)	Unknown	Re-used for road base during construction or off-site recycling.	Re-use onsite or off-site recycling	100%

Potential Wastes Sources and Proposed Waste Reuse, Recycling and Disposal Arrangements					
Waste Stream	**Classification *(* in accordance with DECCW guidelines April 2008)***	**Estimated quantities *(approximate)***	**Storage/handling requirements**	**Destination**	**Target % Reused, Recycled**
Waste Oil (plant and equipment maintenance).	Liquid waste	5 litres /day	Waste oil will be decanted from oil trays etc into drums located in a bunded area. A waste oil collections contractor will pick up and transport oil to an appropriate facility. Note: all plant contractors are responsible for the removal of oil from site and transport to appropriate facility. Loads greater than 200kg require transport by licensed waste transporters. Waste tracking requirements apply.	Waste oil recycler / refiner TBA	100% reuse or refined
Waste water from bunded areas – permanent and temporary	Liquid waste	Unknown	If water needs to be discharged from bunds, it will be examined for oil contamination. If clean, and the pH is between 6.5 and 8.5, it will be collected for re-use on site. If there is evidence of contamination, it will be stored in a container and taken to an appropriate liquid waste facility.	Liquid waste facility	100% reuse/ recycled if not contaminated
Scrap Metal	General solid waste (non-putrescible)	1 tonne/year	Place in $10m^3$ bins – removal by waste/recycling contractors.	Metal recycling facility	100%
Empty metal drums	General solid to hazardous (depending on previous contents)	1-2 drums/ month	Empty drums will be stored upright with lids on in designated bunded storage areas until picked up by the supplier or drum recyclers. Rinsing /cleaning will not be undertaken on site – this will be done by the receiver.	Return to supplier OR Drum reconditioner / recycler	100%
Batteries (from plant, vehicles and	Hazardous waste	2-3 per month	Temporarily store small quantities in a containment area (eg – trays). Arrange pick-up by	Battery recyclers	100%

Potential Wastes Sources and Proposed Waste Reuse, Recycling and Disposal Arrangements

Waste Stream	Classification *(* in accordance with DECCW guidelines April 2008)*	Estimated quantities *(approximate)*	Storage/handling requirements	Destination	Target % Reused, Recycled
equipment – lead acid)			waste contractor on an as-needs basis.		
Used absorbents, filtering materials, drained oil filters, oily rags, protective clothing	General solid waste (non-putrescible)	1-2 bins/month	Will be bagged and stored separately in labelled bins – once confirmed that there is no "free draining oil" (must be fully absorbed by materials) used absorbents will be removed by waste contractors with the regular waste collections in accordance with "DECCW General Approval of the Immobilisation of Contaminants in Waste" - 1999/06, Used oil absorbent materials.	Waste facility	Off-site disposal at approved facility
Soils contaminated by oils or other substances	General solid – hazardous	Minor spillages anticipated (quantity unknown)	Should soils be contaminated through accidental oils spills, the contaminated material will be excavated, classified and, removed by appropriately authorised waste transporters and taken to a facility that can lawfully accept that waste. Minor spills would be cleaned up immediately and the contaminated soil would be temporarily stored in metal containers with lid on, within a bunded area until removed. For information on larger spills, refer to Emergency Response and Incident Management Plan.	Appropriate waste facility (depending of level of contamination)	Secured landfill
Asbestos (potentially from illegal waste	Special Waste	Unknown	If encountered, asbestos waste will be removed using licenced asbestos contractors. Asbestos contaminated waste will not be stored on site.	Landfill authorised to accept asbestos	Secured landfill

Potential Wastes Sources and Proposed Waste Reuse, Recycling and Disposal Arrangements					
Waste Stream	**Classification *(* in accordance with DECCW guidelines April 2008)***	**Estimated quantities *(approximate)***	**Storage/handling requirements**	**Destination**	**Target % Reused, Recycled**
dumping)				waste.	
Cardboard packaging	General solid waste (non-putrescible)	2 bins / month	Store in cardboard skips. Remove by waste contractors.	Paper/cardboard recycling facility	100%
Plastic packaging, other plastic waste (eg – cable off-cuts, etc)	General solid waste (non-putrescible)	1 bin / month	Will be placed in general waste skip.	Waste facility	Waste facility
Timber (Formwork, off-cuts, packaging.)	General solid waste	1 bin every 3 months	Stored in 15m^3 bins for removal by recycler.	Recycling facility	100%
Wood pallets	General solid waste (non-putrescible)	1-2 per month	Store in designated area for return to supplier (hired pallets) or for re-use. Broken pallets will be placed in general waste bin. If significant quantities of broken pallets or other waste wood is generated, a wood waste skip will be brought onto site and taken to green waste facility for chipping.	Where possible, return to supplier or re-used	100%
Vegetation (green) waste	General solid waste (non-putrescible)	30 tonnes	There is a general policy in place to mulch vegetation cleared on site and re-use it for landscaping purposes wherever possible. Where it is not possible to use mulch on site, vegetation will be removed by appropriate waste contactors and taken to a green waste facility. Weed species will be removed from site. Weed species will be separated from the vegetation to be mulched and removed from site by the landscape contractors.	On-site mulching and re-use or Green waste facility (for recycling)	100% for non plant matter not contaminated by weeds. Weeds disposed of at Waste facility

Potential Wastes Sources and Proposed Waste Reuse, Recycling and Disposal Arrangements

Waste Stream	Classification *(* in accordance with DECCW guidelines April 2008)*	Estimated quantities *(approximate)*	Storage/handling requirements	Destination	Target % Reused, Recycled
Pesticides	Liquid waste	Negligible – no waste expected	Pesticides will generally only be brought onto site by specialist contractors and will be removed at completion of works. It is not anticipated that there will be more than minor quantities of pesticide waste generated.	Removed by contactor for future use	N/A
Construction Mixed wastes (Comingled- spray cans, silt fences)	General solid waste (non-putrescible)	1 bin / month	Will be placed in general waste skip.	Waste facility	% recycled to be noted on monthly report
Office / Site Compound Waste					
Paper	General solid waste (non-putrescible)	3 bins/month	240L paper recycling bins will be provided. These will be collected by waste contractors on a regular or as needs basis.	Recycling facility	100%
Toner cartridges	General solid waste (non-putrescible)	0.5box/month	Cartridge bin (capacity 20-25 standard cartridges) will be provided and will be picked up by the manufacturers on an as needs basis.	Return to manufacturer	100%
Cardboard boxes / packaging	General solid waste (non-putrescible)	3 bins/month	Cardboard will be separated and recycled as per paper.	Recycling facility	100%
General waste	General solid waste (putrescible)	1 skip/fortnight (18 m_3)	General waste 3.0m^3 bins will be provided on site and these will be collected on a regular basis from the designated waste storage area.	Waste facility	Off-site disposal at approved facility
Food and other compostable	General solid waste (putrescible)	3 bins/week	As per general waste	Waste facility	Off-site disposal at approved facility

Potential Wastes Sources and Proposed Waste Reuse, Recycling and Disposal Arrangements					
Waste Stream	**Classification *(* in accordance with DECCW guidelines April 2008)***	**Estimated quantities *(approximate)***	**Storage/handling requirements**	**Destination**	**Target % Reused, Recycled**
waste					
Recyclable containers (plastic, glass, cartons, steel, aluminium)	General solid waste (non-putrescible)	2 bins/week	Co-mingled recycling bins will be provided and will be collected on a regular basis.	Recycling facility	100%
Sewage	Liquid waste	2500 l/day (sewage only)	Site office and amenities will consist of tank water and bought water. Effluence will be removed by a licensed operator on a regular basis. Where used, portable toilets will be emptied and disposed of by a licensed contractor.	Licensed facility	Off-site disposal at approved facility

Table 6.4 Potential Wastes Sources and Proposed Waste Reuse, Recycling and Disposal Arrangements

The following action plan outlined in **Table 6.4** will be implemented to promote the use of recycled materials and the conservation of energy and water:

Table 6.5 Waste Action Plan

Aspect	Action	Timing
Administrative	Induct maintenance personnel and provide training on waste management.	Prior to commencing work
	Ensure that all personnel are aware of their obligations to use recycling and waste facilities on site.	At all times
	Encourage the identification of innovative options for the re-use and recycling of waste materials.	Ongoing
	Maintain accurate and comprehensive records of waste removed from site.	Ongoing
	Maintain adequate stocks of spill control equipment in compound and storage areas.	At all times
	Obtain all permits, licences and Environmental Authorisations prior to relevant work activities commencing.	
Water and energy conservation	Promote energy and water conservation through education and the placement of appropriate signage in office and crib areas.	Ongoing
	Turn off electrical equipment such as air conditioning units and office equipment at the end of each day.	Ongoing
	Implement water reduction strategies including flow restriction devices and take immediate action to fix dripping taps.	At all times
Purchasing	Purchase products from suppliers that provide a collection and reuse or refill service, where possible.	At all times
	Avoid over-ordering through careful planning and accurate material estimates.	At all times
	Discuss packaging options (ie reduced, reusable or recyclable packaging material) and the availability of bulk product orders, with suppliers.	As required
	Investigate and give consideration to the purchase of products with a recycled content.	At all times
Collection and Storage	Store waste within secure, designated compound areas and remove at regular intervals.	At all times

Aspect	Action	Timing
	Sort and store different waste types for ease of collection, recycling and disposal. Provide signage on waste and recycling receptacles to prevent 'contamination' (mixing) of waste streams.	Ongoing
	Undertake inspections of waste compounds to identify incorrectly stored or sorted waste, maintain a tidy work environment and determine waste removal needs.	Monthly
	Store chemicals and other liquids in secure, bunded areas.	At all times
Disposal	Ensure that waste depots are licensed to process the type of waste being received.	Check prior to disposal
	Ensure that only authorised waste contractors are used to transport waste.	Check prior to collection.
	Weeds and weed contaminated topsoil will be disposed of at a licensed waste disposal facility.	As required
	Green waste from clearing, tree prunings and the like will be used on site to promote revegetation.	Ongoing

6.2.4 External Notification

All environmental emergencies will be managed in accordance with the Emergency and Incident Response Management Plan (EIRMP).

In the event that an incident has caused, is causing, or is likely to cause material or serious environmental harm, whether the harm occurs on or off the site, the BWA Environmental Manager will report the incident to the ACT EPA, DECCW and ActewAGL in the following manner:

- Notify the ACT EPA by telephoning Canberra Connect on 132281 during and outside business hours if a spill occurs within the ACT or NSW DECCW on 131 555 if it occurs with NSW.
- Notify ActewAGL on either of the following numbers in order of priority.

  Do not leave a phone message or email, which may not be acted upon immediately.

  - Stromlo WTP – 6248 3642
  - Water Distribution Services – 0414 511 719
  - Lower Molonglo – 6248 3457
  - Googong WTP – 6248 3212

7 Communication & Consultation

7.1 Community Engagement and Stakeholder Management

Close community liaison will be maintained to ensure that local residents are aware of the times and durations when they may be affected by waste management and to provide an avenue for communication between the community and the Bulk Water Alliance.

All communication and consultation will be undertaken in accordance with the project Community Engagement and Stakeholder Management (CESM) Plan. The CESM team leader is responsible for the interface with the community. This includes (but is not limited to) notification of temporary road closures, community engagement regarding construction and the complaints process. The CESM team leader reports to the M2G Project Manager and Superintendent whilst working in conjunction with Project Engineers, M2G Safety Manager and the M2G Environmental Manager

In addition, consultation with government agencies will be undertaken regularly as described in the CEMP with the intention of reviewing the effectiveness of the WMP, site management practices, monitoring results and any other relevant issues.

Table 7.1 Communication Network

Communication	
Project personnel including sub-contractors/suppliers	• A site induction and environmental training will be provided to all personnel and sub-contractors engaged to work on the site. • Feedback on environmental matters, new legislation etc. will be provided and encouraged. • Close communication will be maintained between the Construction Manager, M2G Environmental Manager, Foremen and Environmental Officer.
Government agencies	**ACT** • Department of the Environment, Climate Change, Energy and Water (DECCEW) • Parks, Conservation and Lands (TAMS) • ACT Heritage Unit **NSW** • Department of the Environment, Climate Change and Water (DECCW) • Department of Planning (DoP) • Australian Rail Track Corporation (ARTC)
Community and Landholders	• Individual Landholders will be informed in advance of construction activity affecting them in accordance with the CESM Management Plan • Project information will be made available to the community in accordance with the CESM Plan through advertisements, community notices and newsletters.

Communication	
	• A protocol for registering and responding to complaints will be established as detailed in the Complaints Management Procedure and CESM Management Plan.

7.2 Complaints management strategy

The Bulk Water Alliance is committed to managing waste related complaints from affected residents or stakeholders in a proactive and conciliatory manner.

Relevant community and stakeholder groups will be progressively informed of the various stages of construction by the Community Engagement and Stakeholder Management (CESM) team.

The community and stakeholder groups identified in the CESM Plan will be informed of the duration of the works and they will be given a 1800 toll free number to contact the BWA CESM team should they wish to register a complaint regarding any aspect of the construction project.

The BWA CESM team will automatically implement a process for registering and responding to the lodged complaint as per the Complaints Management Procedure. The CESM Team Leader will report back to the project team on impact and mitigation effectiveness on a weekly basis.

The Water Security Hotline phone number (6248 3563) is available during business hours for general questions, project updates and to provide feedback. A toll free number (1800 211 242) is available 24 hours a day for emergencies. Complaints and comments can also be sent via email to watersecurity@actew.com.au.

8 Training, Awareness and Competence

All employees and sub-contractors would receive appropriate training and induction in the waste hierarchy and in their requirements. It is the responsibility of the Environmental Officer to provide appropriate training and induction to all site personnel that will:

- link effective waste reduction actions to everyday work activities;
- build environmental awareness and capacity to accept waste responsibilities;
- emphasise the opportunities for the re-use of waste and rock fill material;
- highlight the project's intention to integrate clean rock fill material into landforms and landscape areas that have previously been disturbed; and
- stress the importance of adopting environmentally sensitive work practices to minimise waste and to advance the values of ESD.

Three main forms of training will be implemented on site:

- site induction;
- environmental management training; and
- "toolbox" training

Records of all site inductions and on site training will be kept on a database, including details of the training topic(s) presented, participants and training dates. All participants will be required to "sign-off" that they have been informed and understand their environmental obligations at the conclusion of each training session.

Training will generally be prepared and delivered by the Environmental Officer, or by personnel delegated by the BWA Environmental Manager.

8.1 Site Induction

Prior to working on site, all personnel and subcontractors will undertake a site induction detailing significant environmental and OHS requirements associated with the M2G project. The will include, but not be limited to, the following environmental components.

- The EMS and CEMP (purpose, objectives, etc) and the requirements of the WMP;
- Legal requirements including due diligence, duty of care and potential consequences of infringements;
- Environmental responsibilities;
- Conditions of licences, permits and approvals;
- BWA policies (including the Shared Road Policy);
- Significant environmental issues and areas of the site, including the identification of project boundaries, location of refuse bins, washing, refuelling and maintenance of vehicles, plant and equipment;
- Environmental management techniques for key environmental elements (soil and water, waste and recycling, flora and fauna, heritage etc) e.g. EWMS;
- Incident management and emergency plans and reporting of environmental incidents;
- Protection and maintenance of environmental controls; and
- BWA sustainability objectives.

8.2 Environment Management Training

Targeted environmental management training will be provided to individuals responsible for environmental management on site, or groups who are undertaking Activities which have been identified as “high risk”. This environmental training is designed to achieve a level of awareness and competence appropriate to their assigned Activities.

Specific links will be made between environmental objectives and sustainability principles during training sessions (where possible). A comprehensive overview of sustainability may also need to be included (i.e. social, economic and environmental aspects, and inter-generational equity).

Records will be maintained on site of all training sessions conducted and personnel attendance. These records will be maintained by the Environmental Officer.

8.3 Toolbox Training

Toolbox training will help to ensure that relevant information is communicated to the workforce and that feedback can be provided on issues of interest or concern. Toolbox training will generally be prepared and delivered by the Project Engineers, Superintendent, Site Foreman and/or the Environmental Officer and will reflect risks and concerns associated with construction Activities occurring on site.

EWMSs will draw reference to specific toolboxes based on risks associated with the proposed construction Activity. The toolboxes will complement the WMP by providing additional details on the management and mitigation of identified environmental impacts. Environmental toolbox training topics may include but are not limited to:

- Working within or in close proximity to waterways;
- Clearing and grubbing procedures;
- Concrete washout procedures;
- Dust control;
- Protecting waterways and riparian zones;
- Wastewater control;
- Spills and leaks (including the application of remediation products);
- Emergency response procedures;
- Wet weather procedures and inspections;
- Changes to recent legislation; and
- Other general site issues.

9 Inspection, Auditing & Monitoring

9.1 Environmental Site Inspections

As outlined in the CEMP, site inspections will take place on a regular basis to ensure appropriate mitigation measures and controls are implemented and that they are fully operational and effective. A variety of site inspections will be initiated for the project. These include:

9.1.1 Informal Daily Inspections

Informal visual checks of waste management will be undertaken daily by the foremen. Any maintenance requirements identified can be actioned prior to Environmental Maintenance Action and Observation Checklist being issued by the Environmental Officer.

9.1.2 Weekly Site Inspections

Inspections by Environmental Officer will occur on a weekly basis or more frequently if specified in an Environmental Authorisation (ACT) or EPL (NSW) using the Site Environmental Inspection Checklist. Issues will then be documented on an Environmental Maintenance Action & Observation Checklist. Issues raised during this inspection will be closed out by the construction team within an allocated time frame depending on level of environmental risk.

9.1.3 External Inspections

External inspections will be held in consultation with the ACT EPA, NSW DECCW and other Regulatory Authorities to inspect the site and operating procedures. These inspections will be documented with all agreed outcomes documented in an Environmental Maintenance Action & Observation Checklist for actioning.

9.1.4 Independent Environmental Representative (ER)

Details of the independent Environmental Representative have been summarised within the CEMP. In general, the independent auditor will assess compliance against project conditions and licences during the course of construction.

9.2 Environmental Monitoring

The following environmental monitoring will be conducted on site during the construction phase of the project:

9.2.1 Waste Register

The project will maintain a waste register covering all waste removed from work sites, compounds and offices, and the extent of material reuse and recycling. Waste will be registered in Lotus Notes Project Pack (LNPP) and will include some or all of the following key waste components:

- Spoil.
- Contaminated materials (soil, overburden, fill etc. identified as contaminated by Contamination Investigations).
- Concrete.
- Asphalt.

- Aggregates.
- Vegetation/landscaping material.
- Contaminated water.
- Waste oils/lubricants/greases (from maintenance activities, spills etc).
- Drums/containers (sent to recyclers).
- Metal/wood for reuse/recycling.
- Any hazardous materials.

9.2.2 Monitoring

Table 9.1 details the monitoring actions for waste management that will be undertaken throughout the project.

Table 9.1 Monitoring

Item	Frequency	Applicable standards / goals	Responsibility	Reporting	Actions if non-compliance detected
Waste management data – reuse, recycling and disposal	Monthly	>70% by weight reuse or recycling rate	Environmental Officer	Use data from waste contractors monthly reports and waste and re-use register for Monthly Report	Review and refresh awareness training
Inspections for litter, unauthorised disposal of construction waste, contamination of waste streams and adequacy of capacity of waste receptacles	Weekly	Inspections completed daily and weekly – identified issues fixed within one day.	Environmental Officer	On inspection checklists (records to be kept) Non-conformance reports and associated corrective actions raised for major or ongoing breaches	As above
Inspections of contractors' work areas to ensure appropriate separation of wastes and storage and bunding of chemicals, oils, waste oils etc.	Weekly	Inspections completed weekly – identified issues fixed within one week. Where there is risk of harm to the environment, storage and bunding of chemicals issues are to be resolved immediately.	Environmental Officer	On inspection checklists (records to be kept Non-conformance reports and associated corrective actions raised for major or ongoing breaches	Require storage and bunding issues to be resolved immediately. Stop work where non-compliance continues
Tracking of wastes as required under DECCW and ACT EPA waste tracking requirements	Whenever wastes that require tracking are collected	All required wastes are tracked and records are kept	Environmental Officer	Retain records (receipts) of all waste that is required to be tracked. Incorporate in monthly report	Obtain records from contractors

9.3 Auditing

Regular periodic audits of the waste management activities would be performed to ensure compliance with this WMP. Responsibilities for audits and inspections are detailed in the CEMP.

Audits will include:

- A full site inspection
- Compliance with legislative requirements and project approvals
- Compliance with this WMP
- Full review of environmental records (e.g. checklist and inspections)
- Review of monitoring results
- Review of the Waste Register
- Closure of non-conformances and previous audit findings
- An assessment of the suitability of the WMP with regards to current construction activities. This may initiate a WMP review/revision
- Recommendations for further improvements

9.4 Non-conformance, Preventative and Corrective Actions

9.4.1 Environmental Actions Lists and Improvement Notices

The M2G Environmental Officer(s) will issue SQE Action Checklists or an Environmental Improvement Notice (EIN) as required. SQE Lists will be issued to the Superintendent and/or Foremen for deficiencies that are minor in nature but require rectification. An Environmental Improvement Notice (EIN) will be issued for more serious deficiencies which pose a greater level of environmental risk, or for when a reprimand is required for poor performance.

9.4.2 Resolving Non-conformances and implementing Corrective Actions

The process for managing environmental non-conformances will be as follows:

- When an environmental non-conformance is detected, the nature of the issue will be evaluated by the M2G Environmental Manager and/or M2G Environmental Officer and the requirement for new or additional controls will be discussed to prevent reoccurrences. Corrective actions will subsequently be identified and entered into the Environmental Action Register (EAR) for reference. This EAR will detail the non-conformance, corrective and/or preventative action, timing and the personnel responsible for implementing the action. The non-conformance will remain “Open” until corrective actions have been implemented.
- Once the corrective action has been implemented, the EAR will be updated to “Closed” status with details of the closure date attached.
- The EAR will be reviewed regularly by the Environmental Team to ensure actions are being completed in a timely manner. Any issues arising from these reviews will be discussed between the M2G Environmental Manager and relevant construction personnel.

9.5 Environmental Records

The M2G Environmental Manager with the assistance of the Environmental Officer(s) will maintain the following records:

- The WMP;
- Relevant approvals, regulatory licences and permits;
- Inspection records and checklists;
- Environmental monitoring results and chain-of-custody forms;
- Environmental accident/incident/emergency reports;
- Environmental Non-conformance and EIN documentation;
- Audit reports;
- Waste Register;
- Monthly Reports;
- Management review minutes and action taken

Where hard copy records are provided they will be scanned and made available electronically. Each set of records will be allocated a register/index for easy reference and filing. Records will be maintained for at least 5 years after the date of final completion and will be available to ACTEW Representatives and Regulatory Agencies as required.

9.6 Document and Data Control

All environmental documentation associated with this management plan will be documented and maintained on site in accordance with "*document and data control"* requirements detailed in the CEMP.

10 Review and Improvement of the WMP

The outcomes of inspections, monitoring, audits and the completion of checklists will facilitate the identification of problems, recurring issues or areas for improvement. Where identified, the effectiveness of the WMP will be reviewed and opportunities for improvement will be identified and discussed with site personnel.

A system for the review and improvement of the environmental management system is described within the CEMP.

Table 10.1 Register of Pending WMP

Reference	Amendment Required	Status
App. B	Removal of Waste Register Template. Lotus Notes Project Pack to be the BWA's register for tracking of waste.	Closed
Figure 4.1	Updated M2G Organisational Structure incorporated into this revision	Closed

Appendix A **Spoil Disposal Procedure**

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M2G Spoil Reuse and Disposal Procedure

BWA-M2G-PP-001

29 July 2011

Delivered by the Bulk Water Alliance

Abigroup Constructing Australia's Future | ACTEW CORPORATION | GHD | John Holland

securing water for life

Certificate of approval for issue of documents

Document number	BWA-M2G-PP-001
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Title	M2G Spoil Reuse and Disposal Procedure
Revision	
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	Position	Name	Signature	Date
Prepared by	M2G Land & Compliance Manager	John Turville		13.12.2011
Reviewed by	M2G Construction Manager	Matthew Richardson	M. Richard.	13.12.2011
Approved by	M2G Project Manager	Jason Julius		13-12-2011

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Version	Author	Date	Description	Approval
A	P. Sheehan	12th February, 2011	Initial Draft	JJ
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ACTEW working with ActewAGL | Mt Stromlo Road, Mt Stromlo GPO Box 366 Canberra ACT 2601 | **Tel** (02) 6175 2400 **Fax** (02) 6175 2322

ACTEW CORPORATION

ACTEW Corporation Ltd ABN 86 069 381 960

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1 Background

The Murrumbidgee to Googong (M2G) Water Transfer (the project) is one of the recommended options for delivering improved security to the water supply for the ACT and Queanbeyan Region. The M2G project involves pumping water from the Murrumbidgee River (within the ACT) and transferring it via a pipeline to Burra Creek (in NSW), from where it will flow for approximately 12 km to the Googong Reservoir. The proposed transfer of water will supplement natural inflows to the reservoir, which have decreased by about 85% from 2001 to 2009. Googong Reservoir supplies water to Queanbeyan and the ACT following treatment at the Googong Water Treatment Plant.

The M2G Pipe line and ancillary infrastructure works will require the reuse or disposal of the following rocks and soils (spoil) as a worst case scenario (refer to Table 1.1 below).

Section	Spoil
Low Lift Pump Station	56m^3
Coffer Dam	1,000m^3
High Lift Pump Station	3,200m^3
Angle Crossing Road Works	2,100m^3
Pipeline	5,264m^3 (ACT)
	21,056m^3 (NSW)
Mini Hydro and Burra Creek Discharge	2,000m^3
Total	**34,676m^3**

Table 1.1 Rock and Soil Material excesses (including 30% bulking factor)

With the exception of two areas detailed in Section 3 of this procedure, this spoil material is expected to be Virgin Excavated Natural Material (VENM), which has been excavated from areas not contaminated with manufactured chemicals or process residues as a result of industrial, commercial, mining or industrial activities and does not contain any sulphidic ores or soils or any other waste. More information relating to the disposal of material off-site is covered in Section 6.1 of this procedure.

A concerted effort will be made by BWA to reuse the spoil onsite rather than dispose of materials off-site. However, this is not always achievable and the BWA is investigating options for reuse on adjoining landholder properties, both within NSW and the ACT, or ultimate disposal to a licensed facility in either NSW or the ACT.

2 Purpose

The purpose of this procedure is to outline the process and approvals required for the reuse of spoil either used for backfill in the laying of the pipeline or in the construction of the low lift and high lift pump stations and discharge outlet for the Bulk Water Alliance's (BWA) Murrumbidgee to Googong Water Transfer Project (M2G) or transferred off site for beneficial reuse on neighbouring properties or disposal at a licensed waste facility.

This procedure serves to assist the BWA to reuse or dispose of excess material in an environmentally sustainable manner and in accordance with government agency expectations and licence requirements.

2.1 Legislation

The reuse or disposing of spoil material would be subject to the following legislation:

2.1.1 Commonwealth

- *National Environment Protection Measure (Assessment of Site Contamination), 1999 (NEPM)*

2.1.2 NSW

- *Protection of the Environment Operations Act 1997;*
- *Protection of the Environment Operations Amendment (Scheduled Activities and Waste) Regulation 2008;*
- *Protection of the Environment Operations (Waste) Regulation 2005;*
- *Water Management Act 2000;*
- *Waste Avoidance and Resource Recovery Act 2001.*

2.1.3 ACT

- *Environment Protection Act 1997;*
- *Waste Minimisation Act 2001.*

2.1.4 Palerang Council

- *Yarrolumla Local Environment Plan 2002*
- *Yarrolumla Development Control Plan, Rural Zones, November, 2008*

2.2 Guidelines

Further to these pieces of legislation, the following guidelines will be adhered to as part of managing spoil on the M2G project.

2.2.1 Commonwealth

- National Environment Protection Measure, Schedule B (1), Guideline on the Investigation Levels for Soil and Groundwater

2.2.2 NSW

- DECCW Waste Classification Guidelines, Part 1, 2009
- DECCW Guidelines on Resource Recovery Exemptions (Land Application of waste materials as fill)

2.2.3 ACT

- Environmental Standards Assessment and Classification of Liquid and non-liquid wastes, June 2000
- Environment Protection Guidelines for Construction and Land Development in the ACT, EPA, August 2007

2.2.4 Palerang Council

- Palerang Fact Sheet – Importing Fill (April, 2011).

2.3 Licences & Permits

Tables 2.1, 2.2 and 2.3 identify the approvals, permits and licences related to spoil management that are required for the M2G project.

2.3.1 NSW

Table 2.1 Approval Requirements for NSW

Approval Required	Relevant Legislation	Authority
Section 143 Notice – acceptance of waste.	*Protection of Environment Operations Act. 1997.*	NSW Office of Environment and Heritage (OEH)

In accordance with NSW Office of Environment and Heritage requirements, tracking of spoil will occur in accordance with M2G's Waste Management Plan and the Spoil Disposal Record Sheet provided in Appendix B of this procedure.

2.3.2 ACT

Table 2.2 Approval Requirements for the ACT

Approval required	Relevant Legislation	Authority
Environmental Authorisation (for placement of soil on a lease where the quantity of soil is more than 100m^3. To be obtained prior to importation and placement of soil).	*Environmental Protection Act 1997*	Environment and Sustainable Development (Environment Protection and Water Regulation)
Beneficial reuse approval[1].	*Waste Minimisation Act 2001*	Environment and Sustainable Development (Environment Protection and Water Regulation)

[1] Beneficial reuse – assessed against HIL and EIL criteria as outlined in *Schedule B (1) – Guidelines on the Investigation Levels for Soil and Groundwater, National Environment Protection Measure (Assessment of Site Contamination, 1999).*

ACT Environmental Authorisation 802

In accordance with Schedule 2, Table 7 of M2G's Environmental Authorisation (No. 802), the following requirements are to be adhered to:

1. *The Authorisation holder shall not dispose of excess spoil at a place other than that which is approved by the Authority.*
2. *Records of spoil removed from the site shall be kept by the Authorisation holder for a period of 2 years and made available to the Authority on request. These records are to include:*
    a) *Quantity of spoil removed from the site;*
    b) *Location of disposal.*
3. *The Authorisation holder shall ensure that all other waste material removed from the site is directed to a waste management facility lawfully permitted to accept that material.*

For the placement of soil (including spoil) within the ACT works boundary, the following clauses taken from Schedule 2, Table 8 applies:

1. *All material used is to be Virgin Excavated Natural Material (VENM). If signs of contamination are detected the Authorisation holder must cease accepting soil immediately and notify the Authority.*
2. *The supplier of the material is to provide written certification that the material is VENM and not contaminated prior to acceptance by the Authorisation holder.*
3. *Records of all fill obtained shall be kept by the Authorisation holder for a period of 2 years and made available to the authority on request. These records are to include*:
    a) *Source of material;*
    b) *Type of material;*
    c) *Quantity of material; and*
    d) *Who delivered the material.*
4. *All VENM material accepted for placement on the site shall only be placed within the area defined as the site in Schedule 1* (Appendix A).
5. *The Authorisation holder shall prepare a soil placement plan acceptable to the Authority prior to the acceptance of VENM for placement. The soil placement plan shall detail the following:*
    a) *Natural ground level;*
    b) *Proposed finished level;*
    c) *Stabilisation and/or remediation; and*
    d) *Maintenance.*

2.3.3 Palerang Council

Table 2.3 Approval Requirements for Palerang Council

Approval required	Relevant Legislation	Authority
Development Application (if disposing of material outside the construction corridor within the Palerang LGA)	*Yarrolumla Local Environment Plan 2002*	Palerang Council

Should the reuse of soil material be required within other local government areas (other than Palerang Council) then any approval required for reuse of this material within this particular LGA will be sought by the M2G Land and Compliance Manager.

2.4 Relationship to the M2G CEMP

This document is relevant to the construction environmental management documentation (CEMP and sub-plans) approved by both the NSW Department of Planning (now Department of Planning and Infrastructure) and the ACT Planning and Land Authority (ACTPLA). It is intended that this procedure sits as an Appendix (Appendix A) within the M2G Waste Management Plan (BWA-M2G-EN-ECP-004).

2.5 Definitions

2.5.1 VENM

NSW

The *Protection of the Environment Operations Act 1997* defines VENM as:

'natural material (such as clay, gravel, sand, soil or rock fines):

- *that has been excavated or quarried from areas that are not contaminated with manufactured chemicals or process residues, as a result of industrial, commercial, mining or agricultural activities, and*
- *that does not contain any sulfidic ores or soils or any other waste.*'

ACT

The ACT Environmental Standard, Assessment and Classification of Liquid and non-liquid wastes (2000) defines VENM as *virgin excavated natural material (e.g. clay, gravel, sand, soil and rock) that is not mixed with any other waste and that:*

a) *has been excavated from areas that are not contaminated, as a result of industrial, commercial, mining or agricultural activities, with manufactured chemicals and that does not contain sulphidic ores or soils, or*

b) *consists of excavated natural materials that meet such criteria as may be approved by the EMA*[2].

2.5.2 ENM

NSW

Under the NSW's excavated natural material exemption 2008 (*Protection of the Environment Operations (Waste) Regulation 2005 – General Exemption under Part 6, Clause 51 and 51A*), ENM is defined as *'a naturally occurring rock and soil (including but not limited to materials such as sandstone, shale, clay and soil) that has:*

a) *been excavated from the ground,*

b) *contains at least 98% (by weight) natural material, and*

c) *does not meet the definition of Virgin Excavated Natural Material in the Act.*

Excavated natural material does not include material that has been processed or contains acid sulphate soils (ASS) or potential acid sulphate soils (PASS).'

ACT

No definition of ENM exists in the ACT.

[2] (EMA = Environment Management Authority).

3 M2G Project Characteristics

3.1 Environmental Impact Statement

An assessment of soils, contamination and groundwater was undertaken as part of the Environmental Impact Statement (EIS) for the M2G Project, dated December, 2010. This assessment (Appendix J of the EIS) revealed that it is considered unlikely that construction of the pipeline would encounter contaminated soils within the ACT. However, within NSW, two locations were identified as a source of soil contamination. These being the Cooma-Goulburn railway line and a former sheep dip located at the Eastern end of the pipeline route, near the proposed mini hydro location. These two areas aside, the M2G project is considered to be predominately Virgin Excavated Natural Material (VENM) under both ACT and NSW legislative definitions.

3.2 Pre-construction Contamination Assessment Results

A further assessment of the two locations identified in the EIS as being a potential source of contaminated soil was undertaken in February, 2011 involving composite sampling of soil from 5 sites within the railway corridor and five sites within the vicinity of the sheep dip. The results of this sampling investigation from both sites are discussed accordingly below and can be found in the report titled, *Bulk Water Alliance Report for Murrumbidgee to Googong Pipeline, Rail Crossing and Sheep Dip Contamination Assessment, May 2011, Revision 1.*

3.2.1 Railway Corridor

Chemical concentrations reported in soil samples were below the relevant health based investigation levels (HIL) and no potential asbestos bearing materials was noted during sampling and laboratory analysis, nor were respirable asbestos fibres reported in the soil above the reporting limit of the laboratory. It was concluded that the risk to human health and the environment from soils disturbed during the construction of the M2G pipeline would be low.

It was assessed that the material sampled from the railway corridor would be classified as *Inert or Solid Waste* if disposal offsite was to be undertaken within the *ACT* or *General Solid Waste* if disposal as to occur within *NSW*. Offsite disposal of the excavated material would require further sampling and analysis to confirm the classification of the material. It is BWA's intention to reuse this soil material within the construction corridor and not to dispose of this material off site.

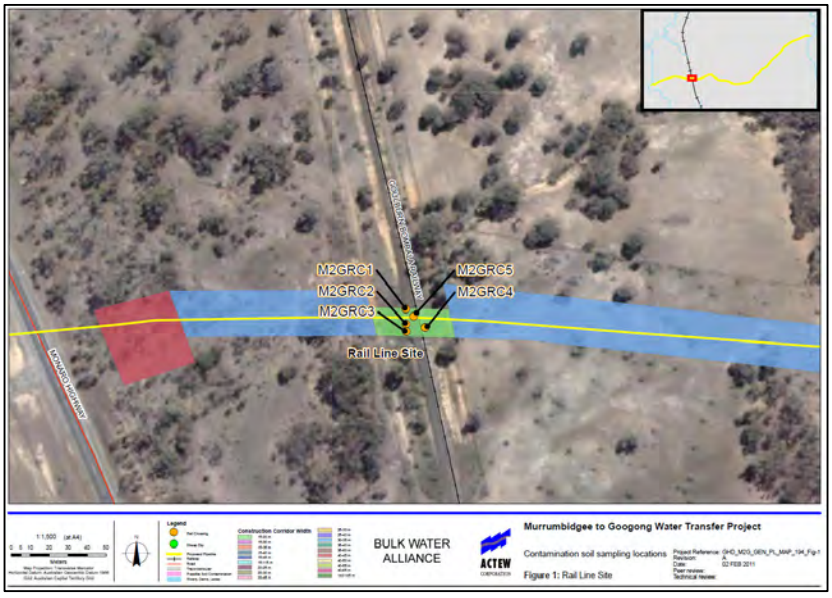


Figure 3.1 Location of soil samples taken within the Cooma Goulburn Railway Corridor.

{samples taken by GHD (Feb 2011)}

3.2.2 Sheep Dip

Samples taken by GHD (Feb 2011) within the vicinity of the sheep dip were found to exceed the Health Investigation Level (HIL)[3] concentrations for Arsenic {500 mg/kg for HIL (F[4])}. Further to this, the results gained exceed Arsenic levels for *solid waste* under the ACT Environmental Standards Assessment and Classification of Liquid and non-liquid wastes (500 mg/kg) and *general solid waste* under the NSW Waste Classification guidelines, part 1 (100 mg/kg) and *restricted solid waste* under these same guidelines (400mg/kg). These samples were taken immediately adjacent to the sheep dip location and outside of the construction footprint.

To gain an accurate reflection of the specific contaminant concentration (SCC) within the construction corridor, four further samples were taken within the construction footprint in April, 2011 and the results obtained in May, 2011. The results from this assessment found that, with the exception of one sample site, Arsenic levels had exceeded NSW criteria but were below HIL (F) levels and the ACT criteria. These samples were taken in the locations provided in Figure 3.2.

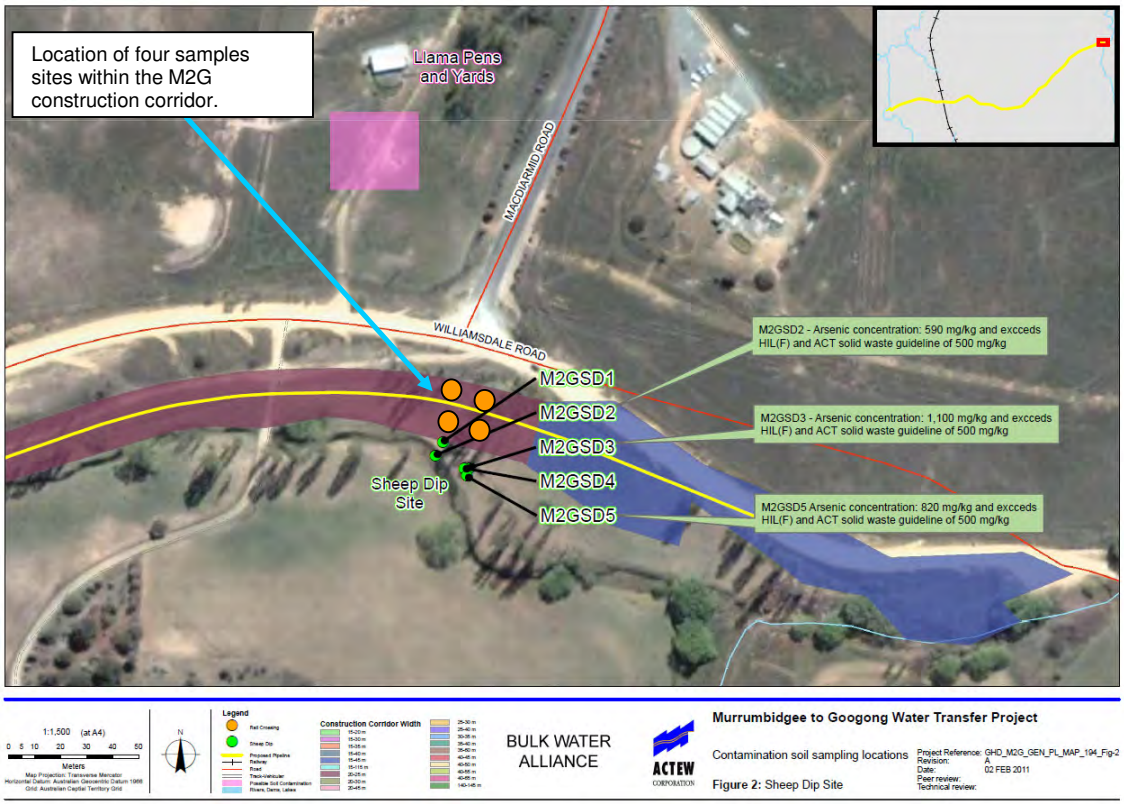


Figure 3.2 Location of soil sample sites at the sheep dip site.

Those sampled by GHD, M2GSD1 – M2GSD5 (Feb 2011) - denoted by green circles and those sampled by the Bulk Water Alliance – denoted by orange circles (April, 2011).

[3] *HILs are not cleanup or response levels nor are they desirable soil quality criteria. They are to be used for assessment of existing contamination only and are intended to prompt an appropriate site-specific assessment when they are exceeded. Site specific health and ecological risk assessment should be conducted where exceedance of investigation levels indicates there is the likelihood of adverse effects on human heath or ecological values for that site (NEPM 1999, Guidelines on the Investigation for Soil and Groundwater).*

[4] *HIL (F) = Human exposure levels based on land use. F refers to commercial/industrial and includes premises such as shops and offices as well as factories and industrial sites.*

As a consequence of the Arsenic levels adjacent to and within the project area near the sheep dip being above NSW levels, it has been decided that this material is to be reused on site within the same location as it was extracted.

Should the reuse of the soil material within this section of the pipeline not be practical or suitable, the material would require immobilisation in accordance with Technical Appendix 2 of the *ACT's Environmental Standards: Assessment and Classification of Liquid and Non-liquids Wastes June 2000* prior to disposal in the ACT or may be disposed interstate subject to appropriate approvals and licences being obtained. In the case of NSW, this material would be classified as a ***Restricted Solid Waste*** if disposed of within **NSW**. Prior to disposal off site, further sampling and analysis will be undertaken to reconfirm the classification of this material.

Note: there is no industrial waste facility within the ACT for disposal of this material.

OHS Considerations

The risk to pipeline construction workers would generally be low due to the following factors:

- The HIL (F) is a health investigation level at which further assessment should be considered. It is not necessarily the concentration at which harm to human health will occur.
- The HIL (F) is based on an occupational exposure period of 30 years and it is anticipated that pipeline construction workers would be working within the vicinity of the sheep dip for only one to two months, at maximum.
- The HIL (F) is based on direct exposure to soil, and therefore, provided that construction workers use the appropriate PPE, direct exposure to soil could be eliminated.
- The sheep dip is topographically down gradient of the pipeline alignment and provided that site works are not undertaken in the vicinity of the sheep dip the risk to site workers would be low.

The following occupational and environmental controls to further reduce the risk from arsenic will be implemented within this 100m section of the pipeline marked as contaminated.

- No food is to be consumed within the 100 metre section (50 metres either side of the sheep dip);
- Workers are to wash hands and face upon leaving the work area;
- Dust masks and some form of dust suppression are to be used during dry weather and particularly during high winds.
- Avoid direct dermal contact.

To assist in management of this contaminated material from an OHS and Environmental basis and to provide an appropriate buffer around the vicinity of the sheep dip, a 100m section of the pipeline (50m either side of the sheep dip) within the construction corridor will be fenced off, prior to the commencement of earthworks, so as to educate the M2G construction crew that this material is potentially contaminated and to warn them of the risks associated with excavating and laying the pipe within this section of the corridor.

4 Responsibilities

Table 4.1 Personnel responsible for approving and reviewing spoil disposal activities

Position	Responsibilities
Project Manager	Responsible for ensuring that adequate measures and resources are available so that spoil can be disposed of in compliance with ACT and NSW legislation.
Project Engineers	Responsible for reviewing and approving the spoil disposal sites and methods for disposal in accordance with this procedure.
BWA Supervisors (Foremen etc)	Responsible for the organisation of disposal in consultation with the Project Engineer and the M2G Environmental Officer. Record and track spoil loads and disposal locations.
M2G Environmental Officer	Available on a consultative and advisory basis for the M2G Construction Team and Project Engineers. Undertake adequate monitoring and surveillance to ensure guidelines are adhered to and understood. Obtain and file certificates and reports of spoil testing results.

5 Spoil Reuse / Disposal Scenarios

The M2G Spoil Disposal flow chart (Appendix A) is to be strictly adhered to in the disposing of spoil both within and outside the M2G construction area boundary.

To assist with understanding the procedure and approvals required to dispose of spoil material on the M2G project, the following table (Table 5.1) serves as an easy reference guide to inform the M2G construction team.

Table 5.1 Spoil Reuse / Disposal Scenarios

Source of Spoil	Spoil Reuse / Disposal Location	Approval Required Y / N	ACT / NSW / Local Government Agency Notification Required Y / N	VENM / ENM Certification Required Y / N	Laboratory analysis required Y / N
ACT	ACT (within M2G project boundary)	N[5]	N	N	N
ACT	ACT (outside M2G project boundary)	Y 1. Environmental Authorisation required by the party accepting the material (if > 100m^3). 2. BWA to provide VENM certificate (Schedule 2, Table 8, EA 802).	Y (ACT EPA to be notified)	Y (testing of the material to determine and provide VENM status)	Y
ACT	NSW (within M2G project boundary)	N	N	N	N
ACT	NSW (outside of M2G project boundary)	Y Development Application required to be approved by Palerang Council, or alternative LGA depending on location.	Y (Palerang or other LGA)	Y	Y

[5] *Although no approvals or testing may be required, all material disposed of within and outside the construction corridor will be tracked via the use of the Table presented in Appendix B.*

Source of Spoil	Spoil Reuse / Disposal Location	Approval Required Y / N	ACT / NSW / Local Government Agency Notification Required Y / N	VENM / ENM Certification Required Y / N	Laboratory analysis required Y / N
NSW	ACT (within M2G project boundary)	N (EA 802 already exists - provided that disposal occurs within works boundary). **Note**: if material from either the railway or sheep dip areas is to be reused within the ACT, section of the M2G project then a beneficial reuse approval would need to be sort from the ACT EPA).	N	N	N
NSW	ACT (outside M2G project boundary)	Y 1. Environmental Authorisation required by the party accepting the material (if > 100m^3). 2. BWA to provide VENM certificate (Schedule 2, Table 8, EA 802).	Y	Y	Y
NSW	NSW (within M2G project boundary)	N	N	N	N
NSW	NSW (outside M2G project boundary)	Y Development Application required to be approved by Palerang Council, or alternative LGA depending on location.	Y (Palerang or other LGA)	Y	Y

NOTE: *If spoil is approved to be disposed outside the M2G construction corridor (in the ACT or NSW) a permit to enter site form must be approved by the Project Manager prior to the disposing of spoil material.*

6 Monitoring, Auditing and Review

This spoil management procedure will be audited and reviewed during the course of construction to gauge adherence to and understanding of this procedure. This will occur in accordance with the requirements specified in the M2G Compliance Tracking Plan (part of the Construction Environment Management Plan – CEMP) and notably, the.M2G Waste Management Plan (BWA-M2G-EN-ECP-004).

6.1 Classification of spoil material

To be confident that the material to be disposed of is either classified as VENM or Excavated Natural Material (ENM), soil samples will be analysed and classified prior to disposal of material off site (refer to Table 5.1 for when this applies). The analysis of soil material will be carried out by a NATA certified laboratory with the results provided to the BWA for provision to either the landholder or relevant government agencies, where appropriate. This analysis of the spoil material is critical to meeting NSW, ACT and local government requirements in minimising impacts to the environment based on the inappropriate disposal of contaminated material. Below, tables 6.1 and 6.2 details what the excess spoil needs to be tested for and the frequency of testing required. These tables have been taken from the POEO (Waste) Regulation 2005 – General Exemption under Part 6, Clause 51 and 51A.

The classification of spoil material will occur as and when the need arises.

Table 6.1 Chemical concentrations and other values of compliance for excavated natural material. Excavated natural material must comply with the chemical and other attributes listed in column 1 and their values in column 2 and 3. Test methods listed in column 4 can be found in the POEO (Waste) Regulation 2005 – General Exemption under Part 6, Clause 51 and 51A.

Column 1	Column 2	Column 3	Column 4
Chemicals and other attributes	**Maximum average concentration for characterisation** (mg/kg 'dry weight' unless otherwise specified)	**Absolute maximum concentration** (mg/kg 'dry weight' unless otherwise specified)	**Test method specified within Section**
1. Mercury	0.5	1	12.1
2. Cadmium	0.5	1	12.2
3. Lead	50	100	12.2
4. Arsenic	20	40	12.2
5. Chromium (total)	50	100	12.2
6. Copper	50	100	12.2
7. Nickel	30	60	12.2
8. Zinc	100	200	12.2
9. Electrical Conductivity	1.5 dS/m	3 dS/m	12.3
10. pH *	6 to 9	5.5 to 10	12.3
11. Total Polycyclic Aromatic Hydrocarbons	20	40	12.4

(PHAs)			
12. Benzo(a)pyrene	0.5	1	12.4
13. Total Petroleum Hydrocarbons (TPHs)	250	500	12.5
14. Total Chlorinated Hydrocarbons	0.5	1	12.6
15. Rubber, plastic, bitumen, paper, cloth, paint and wood	0.05%	0.10%	12.7

Table 6.2 Spoil testing frequency requirements.

Column 1	**Column 2**
Characterisation frequency	**Validation**
10 composite samples per 4000 tonnes.	Required

7 Records

A Spoil Reuse / Disposal Record Sheet (Appendix B of this procedure) will be used to track where spoil originates, its ultimate disposal location, the type and volume of material being disposed of and who delivered the material.

These records will be retained on site and documented in accordance with the M2G Construction Environment Management Plan (CEMP) – BWA-M2G-EN-PLN-001.

7.1 Section 143 Notice (NSW)

Further to the tracking and classification of spoil material, the M2G project will, when providing spoil material to NSW based landholders, provide the landholder with a Notice, required under Section 143 of the NSW *Protection of the Environment Operations Act 1997,* that confirms the waste material[6] that is being provided to them is not contaminated and that their particular property can be used to accept this waste material.

[6] *Waste is a broad concept under NSW legislation and covers many types of material such as used tyres, construction and demolition materials and clean fill.*

8 Unanticipated Discoveries

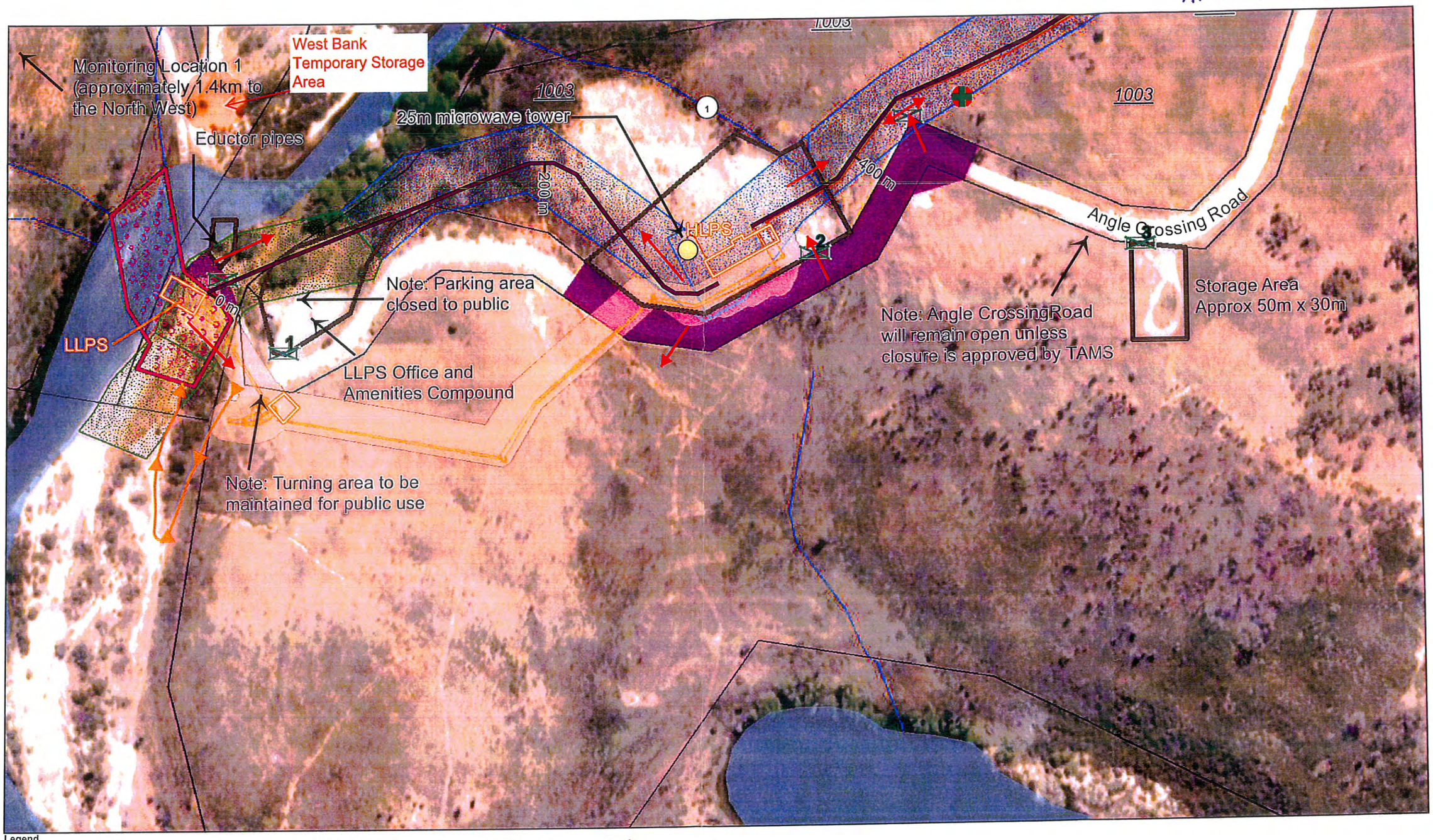
The discovery of unexpected or unanticipated material that may be suspected of being a material other than VENM will be reported to the Environmental Representative in accordance with the M2G Construction Environment Management Plan Incident Notification Procedure, Section 2.2.2 of the CEMP (BWA-M2G-EN-PLN-001).

In the event that material unearthed during the installation of the pipeline, or construction of ancillary structures such as the Low Lift Pump Station, High Lift Pump Station or the Mini Hydro / Discharge structure, is not Virgin Excavated Natural Material (VENM) or even Excavated Natural Material (ENM), then appropriate steps will be taken to assess this material in accordance with the NEPM guidelines and relevant jurisdictional requirements.

Appendix A **ACT Environmental Authorisation 802 – Schedule 1**

Site: The area identified in the documents, Murrumbidgee to Googong Water Transfer Project, Sensitive Area Diagrams, Landholder Constraints – Maps 1 thru to 6 inclusive.

ATTACHMENT B



Legend

- Monitoring Location
- Electrical Transmission Line
- River/Creek
- Pipeline Alignment
- Linear feature/structure
- Fenced Work Compounds & Laydown Areas
- Pipeline Structures
- Cadastral Boundary
- Waterbody
- Gate

Land owner constraint/feature

- Be Aware of: "XYZ"
- Farm dam
- Driveway
- Tree to be preserved

Construction Corridor Width

- 15m
- 20m
- 25m
- 30m
- 35m
- 40m

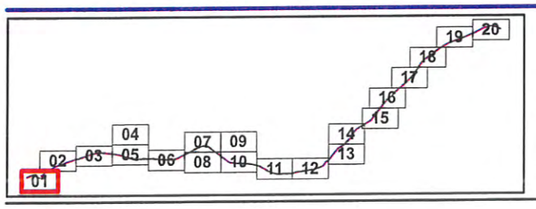
- Road Works
- Coffer Dam Works
- Access Track

Stream Order

1

2

Vehicle access and movement direction



N

0 25 50 75 100

Metres (at A3)

Map Projection: Transverse Mercator
Horizontal Datum: Australian Geocentric Datum 1966
Grid: Australian Captial Territory Grid

BULK WATER ALLIANCE

ACTEW CORPORATION

Murrumbidgee to Googong Water Transfer Project

Property Construction Drawings

Map 1 of ~~20~~ 6

Project Reference: GHD_M2G_GEN_EN_PCD_001_A_3
Revision: C
Date: 18 Jan 2010
Peer review:
Technical review:

Legend

- Monitoring Location
- Electrical Transmission Line
- River/Creek
- Pipeline Alignment
- Linear feature/structure
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- Pipeline Structures
- Cadastral Boundary
- Waterbody
- Gate

Land owner constraint/feature

- Be Aware of: "XYZ"
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- Driveway
- Tree to be preserved

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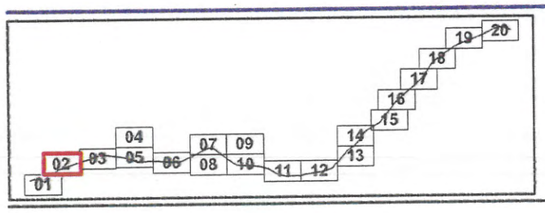
- 15m
- 20m
- 25m
- 30m
- 35m
- 40m

- Road Works
- Coffer Dam Works
- Access Track

Stream Order

1. 2

Vehicle access and movement direction



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Metres (at A3)

Map Projection: Transverse Mercator
Horizontal Datum: Australian Geocentric Datum 1966
Grid: Australian Captial Territory Grid

BULK WATER ALLIANCE

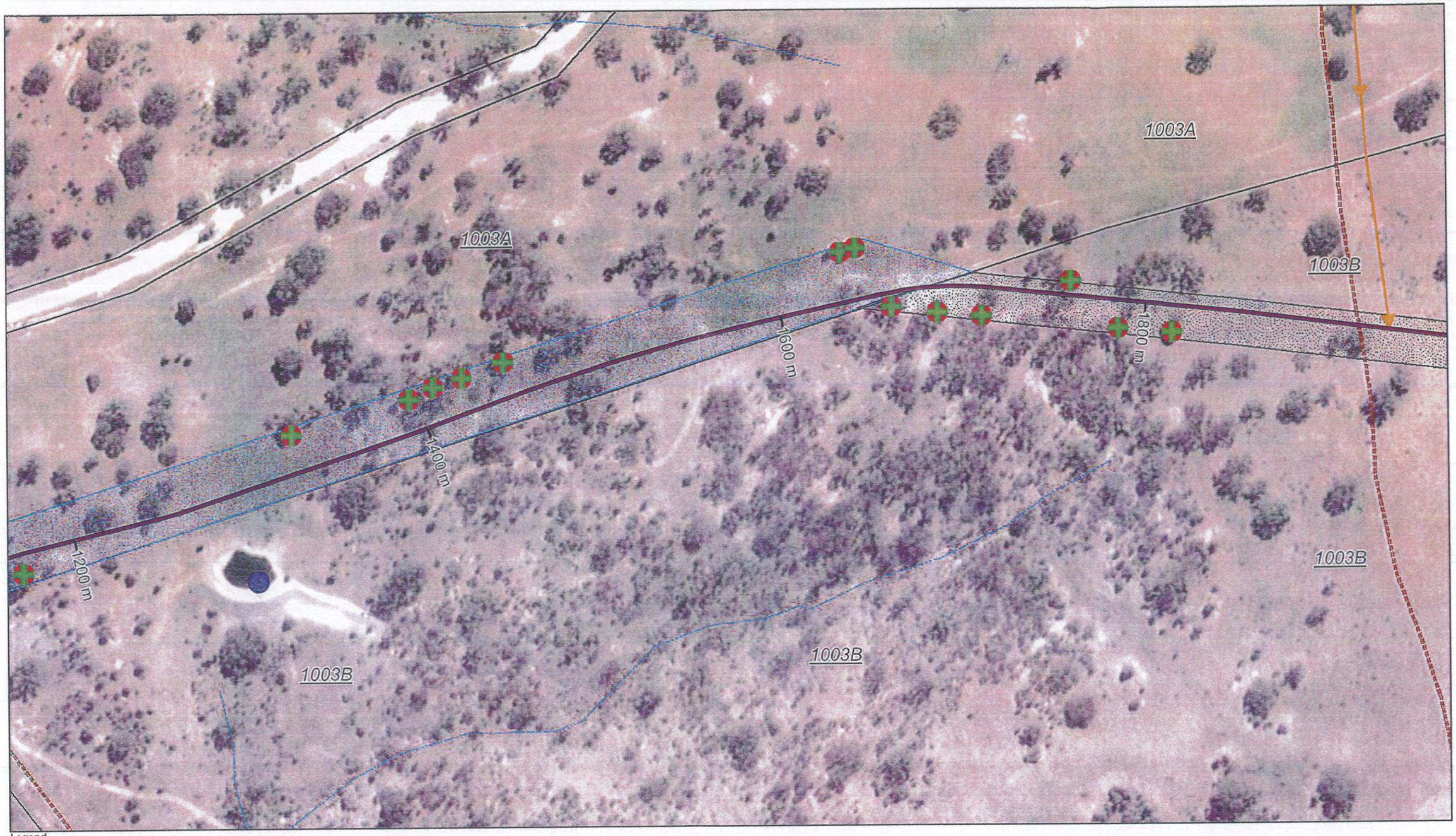
ACTEW CORPORATION

Murrumbidgee to Googong Water Transfer Project

Property Construction Drawings

Map 2 of ~~20~~ 6

Project Reference: GHD_M2G_GEN_EN_PCD_001_A_3
Revision: C
Date: 18 Jan 2010
Peer review:
Technical review:



Legend

- Monitoring Location
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- 30m
- 35m
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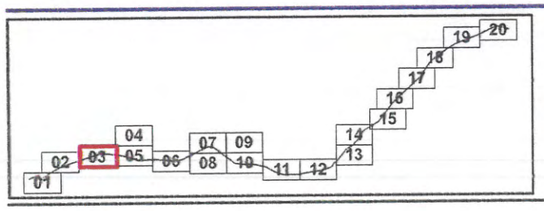
- Road Works
- Coffer Dam Works
- Access Track

Stream Order

1
2

Vehicle access and movement direction



N

0 25 50 75 100

Metres (at A3)

Map Projection: Transverse Mercator
Horizontal Datum: Australian Geocentric Datum 1966
Grid: Australian Captial Territory Grid

BULK WATER ALLIANCE

ACTEW CORPORATION

Murrumbidgee to Googong Water Transfer Project

Property Construction Drawings

Map 3 of ~~20~~ 6

Project Reference: GHD_M2G_GEN_EN_PCD_001_A_3
Revision: C
Date: 18 Jan 2010
Peer review:
Technical review:

Legend

- Monitoring Location
- Electrical Transmission Line
- River/Creek
- Pipeline Alignment
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- Pipeline Structures
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Land owner constraint/feature

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Construction Corridor Width

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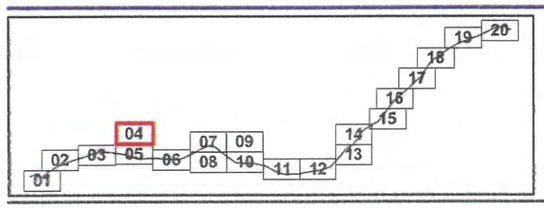
- 20m
- 25m
- 30m
- 35m
- 40m

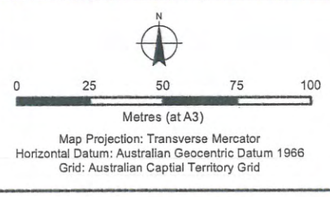
- Road Works
- Coffer Dam Works
- Access Track

Stream Order

1
2

Vehicle access and movement direction





Map Projection: Transverse Mercator
Horizontal Datum: Australian Geocentric Datum 1966
Grid: Australian Captial Territory Grid

BULK WATER ALLIANCE

ACTEW CORPORATION

Murrumbidgee to Googong Water Transfer Project

Property Construction Drawings

Map 4 of ~~20~~ 6

Project Reference: GHD_M2G_GEN_EN_PCD_001_A_3
Revision: C
Date: 18 Jan 2010
Peer review:
Technical review:

1003A

1003B

1003B

1003B

1003B

1003B

1006

1006

Monaro Highway

2000 m

2200 m

2400 m

2600 m

2

8

Note: Access to be provided
for stock to cross corridor

Legend

- Monitoring Location
- Electrical Transmission Line
- River/Creek
- Pipeline Alignment
- Linear feature/structure
- Fenced Work Compounds & Laydown Areas
- Pipeline Structures
- Cadastral Boundary
- Waterbody
- Gate

Land owner constraint/feature
- Be Aware of: "XYZ"
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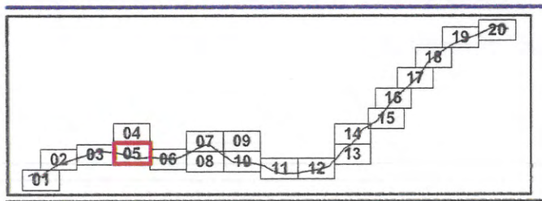
- Driveway
- Tree to be preserved

Construction Corridor Width
- 15m
- 20m
- 25m
- 30m
- 35m
- 40m

- Road Works
- Coffer Dam Works
- Access Track

Stream Order
- 1
- 2

- Vehicle access and movement direction



N

0 25 50 75 100

Metres (at A3)

Map Projection: Transverse Mercator
Horizontal Datum: Australian Geocentric Datum 1966
Grid: Australian Captial Territory Grid

BULK WATER ALLIANCE

ACTEW CORPORATION

Murrumbidgee to Googong Water Transfer Project

Property Construction Drawings

Map 5 of ~~20~~ 6

Project Reference: GHD_M2G_GEN_EN_PCD_001_A_3
Revision: C
Date: 18 Jan 2010
Peer review:
Technical review:

Significant threatened species - to be identified and fenced off prior to construction commencing

Note: Access to be provided for stock to cross corridor

Soil contamination assessment to be undertaken prior to construction commencement

1102

1006

1103

2800 m

3000 m

3200 m

3400 m

DISUSED RAILWAY

Legend

- Monitoring Location
- Electrical Transmission Line
- River/Creek
- Pipeline Alignment
- Linear feature/structure
- Fenced Work Compounds & Laydown Areas
- Pipeline Structures
- Cadastral Boundary
- Waterbody
- Gate

Land owner constraint/feature

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- Farm dam
- Driveway
- Tree to be preserved

Construction Corridor Width

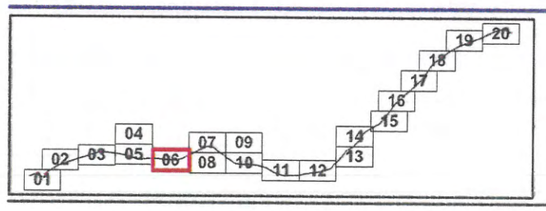
- 15m
- 20m
- 25m
- 30m
- 35m
- 40m

- Road Works
- Coffer Dam Works
- Access Track

Stream Order

- 1
- 2

- Vehicle access and movement direction



N

0 25 50 75 100

Metres (at A3)

Map Projection: Transverse Mercator
Horizontal Datum: Australian Geocentric Datum 1966
Grid: Australian Captial Territory Grid

BULK WATER ALLIANCE

ACTEW CORPORATION

Murrumbidgee to Googong Water Transfer Project

Property Construction Drawings

Map 6 of ~~20~~ 6

Project Reference: GHD_M2G_GEN_EN_PCD_001_A_3
Revision: C
Date: 18 Jan 2010
Peer review:
Technical review:

Appendix B **M2G Spoil Reuse / Disposal Flowchart**

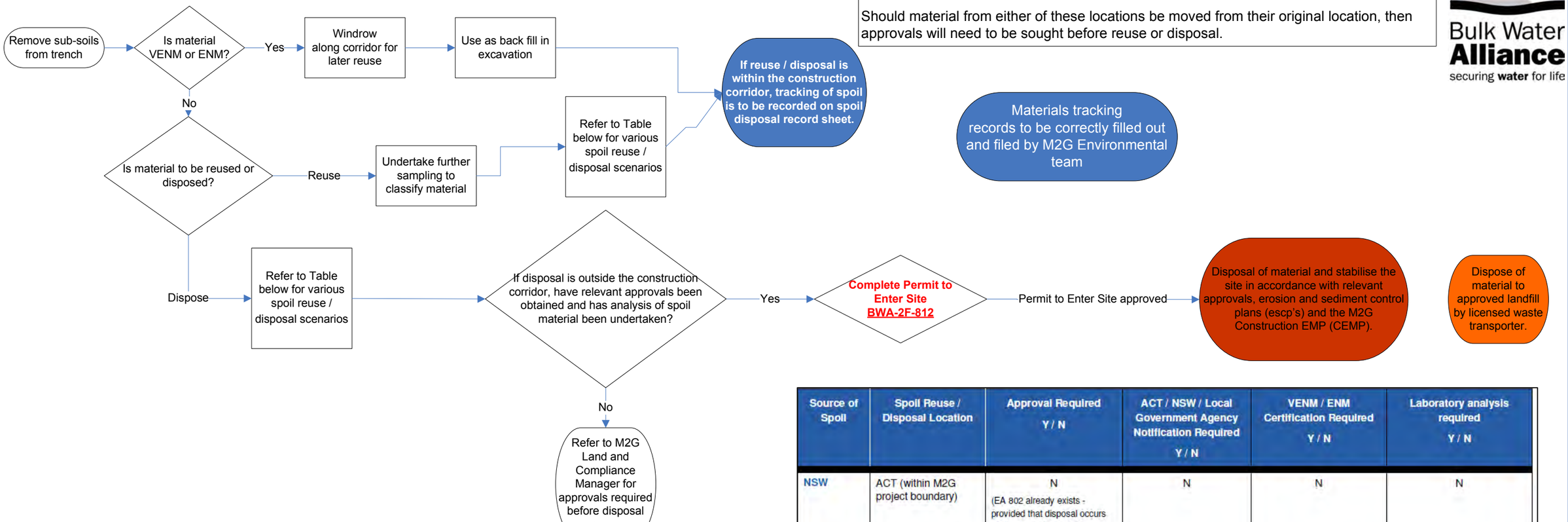
M2G Spoil Reuse and Disposal Flowchart

NOTE:
Two locations have been deemed to be potentially contaminated.

- Cooma Goulburn Railway Corridor (ch. 2850 – ch. 2900)
- Sheep Dip (ch. 11625 – ch. 11725)

Should material from either of these locations be moved from their original location, then approvals will need to be sought before reuse or disposal.

Bulk Water Alliance
securing water for life



Source of Spoil	Spoil Reuse / Disposal Location	Approval Required Y / N	ACT / NSW / Local Government Agency Notification Required Y / N	VENM / ENM Certification Required Y / N	Laboratory analysis required Y / N
ACT	ACT (within M2G project boundary)	N[6]	N	N	N
ACT	ACT (outside M2G project boundary)	Y 1. Environmental Authorisation required by the party accepting the material (if > 100m³). 2. BWA to provide VENM certificate (Schedule 2, Table 8, EA 802).	Y (ACT EPA to be notified)	Y (testing of the material to determine and provide VENM status)	Y
ACT	NSW (within M2G project boundary)	N	N	N	N
ACT	NSW (outside of M2G project boundary)	Y Development Application required to be approved by Palerang Council, or alternative LGA depending on location.	Y (Palerang or other LGA)	Y	Y

Source of Spoil	Spoil Reuse / Disposal Location	Approval Required Y / N	ACT / NSW / Local Government Agency Notification Required Y / N	VENM / ENM Certification Required Y / N	Laboratory analysis required Y / N
NSW	ACT (within M2G project boundary)	N (EA 802 already exists - provided that disposal occurs within works boundary). **Note**: if material from either the railway or sheep dip areas is to be reused within the ACT, section of the M2G project then a beneficial reuse approval would need to be sort from the ACT EPA).	N	N	N
NSW	ACT (outside M2G project boundary)	Y 1. Environmental Authorisation required by the party accepting the material (if > 100m³). 2. BWA to provide VENM certificate (Schedule 2, Table 8, EA 802).	Y	Y	Y
NSW	NSW (within M2G project boundary)	N	N	N	N
NSW	NSW (outside M2G project boundary)	Y Development Application required to be approved by Palerang Council, or alternative LGA depending on location.	Y (Palerang or other LGA)	Y	Y

***NOTE:** If spoil is approved to be disposed outside the M2G construction corridor (in the ACT or NSW) a permit to enter site form must be approved by the Project Manager prior to the disposing of spoil material.*

Developed By: John Turville | Date: 15th July, 2011 | Approved By: Jason Julius | Date: 15th July, 2011

Appendix C **Spoil Reuse / Disposal Record Sheet**

Date/ Time	Source of Spoil Material (ACT / NSW)	Approx. chainage of source material	Type of Material (general fill, rock)	Amount/ Volume (m3)	Location of area reused / disposed (NSW/ACT)	Delivered by (company and name of delivery driver)

Appendix D **Template letter and accompanying Section 143 Notice**

TEMPLATE FOR LETTER TO ACCOMPANY "S.143 NOTICE" TO LANDHOLDERS

The letter to accompany s.143 Notices to landholders must be consistent with the following template.

[*Insert reference number, if applicable*]

[*Insert file number, if applicable*]

[*Date*]

[*Recipient name*]

[*Recipient company (if applicable)*]

[*Recipient address*]

Dear [*Recipient Name*]

RECEIVING BWA WASTE AT [*INSERT LOCATION OF WASTE FACILITY*]

[*Insert Company Name*] has been engaged by the BWA to undertake [*insert brief description of the works*].

Your interest in receiving [*discuss type and quantity of waste of the waste*] ("BWA Waste") which will be generated by the project is appreciated. It is understood that you intend to use the BWA Waste for [*insert intended use for the waste*]. It is important to the BWA that all waste materials from this project are managed in a way that meets legislated requirements and will not harm the environment or human health.

This letter provides important information that will help you to understand what you need to do to legally receive this material and avoid harm to environmental and human health.

You will need to do the following things before the BWA Waste is delivered to your property:

- Read the "Questions and Answers" attached to this letter. The Department of Environment and Climate Change and Water ("DECCW") has other information that may help you to understand the laws relating to receiving waste materials. This information is available on the DECCW website at www.environment.nsw.gov.au/waste/dumping.htm.
- Check with your local council and the DECCW whether any approvals or licenses are needed before your property can accept the BWA Waste.
- Make sure that you obtain all relevant approvals, licenses or permits that are required for you to legally receive the BWA Waste. Often there will be no need for any approvals; licenses or permits, but always check with council whether this will be the case for your property.
- Complete and sign a "Section 143 Notice" (copy attached). Only sign this form if you are confident that the details on the Section 143 Notice are correct, your property can lawfully receive the BWA Waste, and the materials can be legally used for the intended purpose.
- Keep a copy of the completed Section 143 Notice for your records and mail the original document to:

[*Enter details of where Section 143 Notice should sent*]

Please contact [*insert name of contact person*] on [*insert telephone number*] if you have any questions in relation to the BWA Waste. This will help you, the local council and the DECCW to decide whether any approvals or licenses are needed, and whether the BWA Waste needs to be managed in any particular way once delivered to your property.

Once we have received the completed and signed Section 143 Notice and have confirmed that the BWA Waste can be legally transported to your property, we will contact you to make arrangements for waste delivery.

When the BWA Waste arrives on your property, you must ensure that:

- The BWA Waste is as described on the Section 143 Notice; and
- The BWA Waste is managed in a way that complies with any relevant approvals, licenses or permits and avoids harm to the environment, human health and other people's property.

[*Optional – outline any further requirements, depending on the environmental risks associated with the BWA Waste and the proposed use*].

If you have any inquiries about these matters please contact [*insert name of contact person*] on [*insert contact telephone number*].

Yours faithfully,

[*Insert sender name*]

[*Insert sender title*]

Appendix B **Local waste businesses and contractors**

Sources of Information	
NSW Department of Environment, Climate Change and Water	(02) 6229 7000
Palerang Council	(02) 6238 1056
Queanbeyan City Council	(02) 6298 4666
ACT Department of Environment, Climate Change, Energy and Water (DECCEW)	13 22 81

Waste Contractors/Recyclers			
Waste Away Cleanaway	Hume Industrial Area (02) 6260 1288 (02) 6260 2255	Cardboard, paper, vegetation, metal, glass	Cardboard, paper, vegetation, metal, glass
Thiess Services Cleanaway SITA Environmental Solutions	Hume Industrial Area (02) 6293 6777 11 Alderson St, Hume (02) 6260 2255 41 Alderson Place, Hume (02) 6260 1544	Building waste, hazardous waste, commercial and industrial waste,	Paper, cardboard, glass, metal,
ACT No Waste	Mugga Lane Landfill Symonston	Green waste, batteries, paint, metal, cardboard, glass,	Green waste / mulch, glass, metal
Canberra Recycling Pty Ltd	115 Gladstone St Fyshwick (02) 6280 5993	Cardboard, paper	Cardboard, paper
Metal Mart	53 Collie St, Fyshwick (02) 6239 2211	Metal	Metal
Canberra Concrete Recyclers Pty Ltd	Pialligo Avenue, Pialligo	Concrete, Asphalt	Concrete, Asphalt

Appendix C **S.143 Notice Letter Template For Transporting And Depositing Of Wastes**

TEMPLATE FOR LETTER TO ACCOMPANY "S.143 NOTICE" TO LANDHOLDERS

The letter to accompany s.143 Notices to landholders must be consistent with the following template.

[*Insert reference number, if applicable*]

[*Insert file number, if applicable*]

[*Date*]

[*Recipient name*]

[*Recipient company (if applicable)*]

[*Recipient address*]

Dear [*Recipient Name*]

RECEIVING BWA WASTE AT [*INSERT LOCATION OF WASTE FACILITY*]

[*Insert Company Name*] has been engaged by the BWA to undertake [*insert brief description of the works*].

Your interest in receiving [*discuss type and quantity of waste of the waste*] ("BWA Waste") which will be generated by the project is appreciated. It is understood that you intend to use the BWA Waste for [*insert intended use for the waste*]. It is important to the BWA that all waste materials from this project are managed in a way that meets legislated requirements and will not harm the environment or human health.

This letter provides important information that will help you to understand what you need to do to legally receive this material and avoid harm to environmental and human health.

You will need to do the following things before the BWA Waste is delivered to your property:

- Read the "Questions and Answers" attached to this letter. The Department of Environment and Climate Change and Water ("DECCW") has other information that may help you to understand the laws relating to receiving waste materials. This information is available on the DECCW website at www.environment.nsw.gov.au/waste/dumping.htm.
- Check with your local council and the DECCW whether any approvals or licenses are needed before your property can accept the BWA Waste.
- Make sure that you obtain all relevant approvals, licenses or permits that are required for you to legally receive the BWA Waste. Often there will be no need for any approvals; licenses or permits, but always check with council whether this will be the case for your property.
- Complete and sign a "Section 143 Notice" (copy attached). Only sign this form if you are confident that the details on the Section 143 Notice are correct, your property can lawfully receive the BWA Waste, and the materials can be legally used for the intended purpose.
- Keep a copy of the completed Section 143 Notice for your records and mail the original document to:

[*Enter details of where Section 143 Notice should sent*]

Please contact [*insert name of contact person*] on [*insert telephone number*] if you have any questions in relation to the BWA Waste. This will help you, the local council and the DECCW to decide whether any approvals or licenses are needed, and whether the BWA Waste needs to be managed in any particular way once delivered to your property.

Once we have received the completed and signed Section 143 Notice and have confirmed that the BWA Waste can be legally transported to your property, we will contact you to make arrangements for waste delivery.

When the BWA Waste arrives on your property, you must ensure that:

- The BWA Waste is as described on the Section 143 Notice; and
- The BWA Waste is managed in a way that complies with any relevant approvals, licenses or permits and avoids harm to the environment, human health and other people's property.

[*Optional – outline any further requirements, depending on the environmental risks associated with the BWA Waste and the proposed use*].

If you have any inquiries about these matters please contact [*insert name of contact person*] on [*insert contact telephone number*].

Yours faithfully,

[*Insert sender name*]

[*Insert sender title*]