Independent Environmental Representative Environmental Audit Report

BULK WATER ALLIANCE

MURRUMBIDGEE TO GOOGONG WATER TRANSFER

1ST AUDIT (CEMP COMPLIANCE)

APRIL 2011

ngh environmental

AUDITED ORGANISATION	PROJECT
Bulk Water Alliance	Murrumbidgee to Googong Water Transfer Project
ADDRESS	**CONTACT DETAILS**
Angle Crossing Road Williamsdale	John Turville (02) 6175 2369
DEPTH OF AUDIT	**SCOPE OF AUDIT**
Environmental	Management Plan Compliance
DATE OF AUDIT	**AUDIT CRITERIA**
30th March 2011	Management Plans
PERSONS CONTACTED	**AUDIT TEAM**
John Turville – Environment Manager Peter Sheahan – Environment Officer Brigid Metcalf – Environment Officer	Erwin Budde, NGH Environmental – Lead auditor
PREVIOUS AUDIT DATE	**PREVIOUS AUDIT REFERENCE**
None	None

AUDIT SUMMARY

Environment:

This was the first audit of the Murrumbidgee to Googong Water Transfer Project by the Independent Environmental Representative. It involved an audit of compliance against the CEMP and associated construction plans.

The audit found general compliance with the project's environmental management commitments was being achieved and maintained. It found a number of positive initiatives and actions which have led to positive outcomes. This includes the management of clearing works to date, which has been undertaken with the assistance of ecologists and to date has resulted in minimal clearing, protection of threatened species, and retention of trees not essential for clearing. The BWA have also initiated an innovative internal audit program whereby personnel across the Alliance, including management, are responsible for undertaking at least 1 environmental audit of a component of the works. This places emphasis and ownership of environmental issues onto the entire construction team and not just environmental staff.

A number of areas of improvement were identified relating to both systems and document management. One (1) Corrective Action Request, three (3) Observations of Concern and six (6) Opportunities for Improvement are raised.

Signed: _____ **Lead Auditor**	**Date: 7th April 2011**

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1. REPORT SUMMARY

1.1 INTRODUCTION

This audit represents the first (1st) independent environmental representative audit conducted of the M2G project to date.

At the time of the audit, the following works were being undertaken:

- Clearing had commenced on the eastern side of the Monaro Highway within the ACT. Fencing works had been completed there. A stabilised access was being constructed.
- Earthworks were continuing at the High Lift Pump Station
- Roadworks on Angle Crossing Road had been completed
- Coffer dam grouting works had temporarily ceased due to mechanical issues.
- The access track to the LLPS was being constructed.

1.2 SCOPE OF AUDIT

The audit scope for this audit was the implementation of Construction Environmental Management Plan, the relevant Subplans and the relevant Environmental Work Method Statements. The following plans were audited:

- Construction Environmental Management Plan (March 2011)
- Aquatic Ecology Management Plan (October 2010)
- Terrestrial Ecology Management Plan (October 2010)
- Landscape Rehabilitation Management Plan – Appendix D (March 2011)
- Soil and Water Management Plan (December 2010)
- Noise and Vibration Management Plan (December 2010)
- Air Quality Management Plan (September 2010)
- Waste Management Plan (September 2010)
- Emergency Response Management Plan (March 2011)
- Progressive ERSED Plans for
    - LLPS
    - HLPS
    - Monaro Highway Widening Works
    - Main Site Office
    - LLPS Access Track
    - LLPS Temporary Laydown
    - HLPS Laydown
- Environmental Work Method Statement – Construction of the Coffer Dam

The audit covered all operations of the project undertaken to date.

1.3 SUMMARY OF CORRECTIVE ACTIONS

The following Corrective Action Requests (CARs) were issued to the Contractor during the audit Closing Meeting and are to be addressed in accordance with the provisions of RTA QA Specification Q6.

CAR No.	Section of Report	Details
1	3.2.1	No pre-construction surveys for the Platypus or its habitats was conducted.

1.4 SUMMARY OF OBSERVATIONS OF CONCERN

The following Observations of Concern (OoC) were explained to BWA during the audit Closing Meeting. They are considered to be deficiencies in meeting specified requirements.

OoC No.	Section of Report	Details
1	3.2.3	No Aquatic Ecologist has been engaged yet. Therefore no specialist was involved in the in-stream works for the Coffer Dam
2	3.3.1	Clearing works are being conducted prior to fences being in place
3	3.4.1	The SWMP makes a number of commitments to use the services of a Soil Conservation Specialist. The previous Specialist no longer works on the project and has not been replaced.

1.5 SUMMARY OF OPPORTUNTIES FOR IMPROVEMENT

The following Opportunities for Improvement (OfI) were explained to BWA during the audit Closing Meeting. They are considered to be suggestions for improvements to better meet specified requirements.

OfI No.	Section of Report	Details
1	3.2.2	It is considered that the procedure for preventing the spread of carp eggs during construction through water cart dust suppression could be improved
2	3.5.1	The record keeping system for weed control could be improved to more clearly show correlation between works completed and works identified in the Weed Management Plan (Appendix D of the LRMP)
3	3.1.2	The Sensitive Area Diagrams could be more widely distributed and made available.
4	3.4.2	Consideration should be given to provide erosion and sedimentation training to relevant site staff, including the dedicated ERSED crews.
5	3.7.1	Waste segregation at the site compound could be improved – paper, timber and bottles were observed in the general waste bin.
6	3.7.2	No tracking system has been established to determine whether recycling targets contained in the Waste Management Plan are being achieved.

2 AUDIT PROCESS

2.1 OPENING MEETING

An opening meeting was held at 8am on 30th March. The opening meeting was attended by John Turville, Peter Sheahan and Brigid Metcalf.

2.2 CLOSING MEETING

The closing meeting was held at 3:00pm on 30th March. It was attended by Peter Sheahan and Brigid Metcalf.

2.3 SITE INSPECTION

A site inspection was undertaken during the fortnightly Environmental Representative's inspection on 29/3/11.

2.4 DESIGNATED FOLLOW-UP

A follow-up of the audit findings will be managed by the BWA Environment Manager to verify the completion of all corrective action. The next IER Audit will be conducted in 3 months.

2.5 PREVIOUS ENVIRONMENTAL AUDIT

No previous environmental compliance audit has been conducted.

3 DETAILS OF AUDIT FINDINGS

This section details the findings of the audit report. It only details those findings requiring action. For complete details of the findings of the Audit, refer to the completed Audit Protocol contained in Appendix A.

3.1 CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN

3.1.1 CEMP Section 2.4 – After Hours Works

It is noted that after hours works have been undertaken during the Angle Cross Road upgrade. It is noted that a person was stationed at Sensitive Receiver 1 (opposite the main site compound) during these works and no audible noise was noted as coming from the works.

3.1.2 CEMP Section 5.1.2 – Sensitive Area Diagrams

The CEMP commits to distributing the Sensitive Area Diagrams (SADs) to all of the construction team. Currently, the SADs are made available only by viewing them on a wall at the main site compound. It is considered that this does not adequately address the commitment to distribute to the construction team. **OFI 3**

3.1.3 CEMP Section 5.1.4 -Progressive ERSED Plans

The CEMP calls for progressive ERSED plans to be developed. It is noted that progressive ERSED plans are not being developed for clearing/grubbing works due to the low erosion risk of this activity, and that pipeline progressive ERSED plans will be developed prior to earthworks commencing.

3.2 AQUATIC ECOLOGY MANAGEMENT PLAN

3.2.1 AE1 and AE2 – Platypus Surveys

This commitment relates to undertaking Platypus surveys at Burra Creek and the Murrumbidgee River prior to works commencing in these areas. No surveys for platypus had been undertaken prior to bank disturbance works on the Murrumbidgee River. **CAR 01**

3.2.2 AE6 – Dust Suppression Water Management

This commitment relates to managing water extraction and dust suppression such that water from the Murrumbidgee River which may contain Carp Eggs do not enter the Burra Creek catchment. Several protocols are in place, including toolbox training and awareness for water truck operators not to use Murrumbidgee water east of Gibraltar Range. A sign will also be placed at Gibraltar Range containing similar information. It is considered that some improvements to this protocol could be made to further ensure water management processes do not lead to the potential for carp eggs to be transported. **OFI 01**

3.2.3 AEMP Section 3.5

The AEMQ commits to the appointment of an Aquatic Specialist and identifies a number of discreet tasks this specialists needs to undertake. No specialist has yet been appointed. **OOC 01**

3.3 TERRESTRIAL ECOLOGY MANAGEMENT PLAN

3.3.1 TE12 – Fencing prior to Clearing

This commitment relates to completing fencing works prior to clearing. The protocol adopted to date involves establishing clearing limits and marking these with pegs, flagging trees to be retained within the clearing limits, clearing, then fencing. Whilst this is contrary to the commitment, evidence obtained during ER inspections indicates that the method has been effective in preventing unwanted or unauthorised clearing. **OOC 2**

3.4 SOIL AND WATER MANAGEMENT PLAN

3.4.1 SWMP Section 3.3.1 and 8.1.5 – Soil Conservationist

The SWMP commits to appointing a Soil Conservationist with specific tasks and responsibilities. This has not yet been undertaken. **OOC 03**.

3.4.2 SWMP Section 5.1.4 – Dedicated ERSED Crews

The SWMP commits to establishing and maintaining a dedicated erosion and sedimentation crew responsible for implementing and maintaining the erosion and sediment controls. It is noted that this crew has yet to be established but the responsibility will be charged to the Right of Way crew. It is suggested that BWA ensure this crew have received specialist and appropriate erosion and sedimentation training. **OFI 04**

3.4.3 S2 – Progressive ERSED Plans

See Section 3.1.3.

3.5 LANDSCAPE REHABILITATION MANAGEMENT PLAN

3.5.1 Appendix D – Weeds

Figure D-1 identifies weeds within the alignment. Table D-2 identifies the management measures for weeds known to occur within the alignment, and generally correlates with Figure D-1. Both use the same method of identifying land and weeds. Weed control records are maintained by S&J Morrison, on which both location and target species are recorded. The records maintained by S&J Morrison do use the same system for identifying land or weeds as the Weed Management Plan (as detailed in Figure D-1 and Table D-2). It is suggested for tracking purposes that S&J Morrison adopt the same land tracking system and weed identification system as is contained in the Weed Management Plan. **OFI 2**

3.6 NOISE AND VIBRATION MANAGEMENT PLAN

3.6.1 A5 – Continuous education

It is noted that to date continuous education has been undertaken through two toolbox sessions:

- 18/3 – Meeting the EPL Requirements
- 25/3 – DoP Approval Conditions

It is suggested that consideration be given to increasing noise management awareness as works progress into NSW, particularly towards Burra Creek where the majority of sensitive noise receivers are located.

3.7 WASTE MANAGEMENT PLAN

3.7.1 A5 – Waste Segregation

An inspection of the bins at the main site compound found that the General Waste Bin contained a large amount of recyclable materials including timber, paper and bottles. It is noted that the waste contractor maintains that the waste is segregated at the waste management centre. This could not be verified during the audit. Nonetheless, it is best practice to separate waste at the source and consideration should be given to establishing waste segregation procedures for timber, paper and bottles (and any other recyclables) on the project. **OFI 05**

3.7.2 WMP 6.2.3 – Recycling Targets

It is noted that the WMP includes numerical targets for waste recycling. It is further noted that no monitoring plan or other tracking system is in place to be able to establish whether these targets are being met. **OFI 06**

3.8 EMERGENCY RESPONSE PLAN

The audit reviewed the procedure undertaken in response to an oil spill on 10/2/11. The audit reviewed the steps taken against section E.9 of the ERP and found that the steps had been undertaken appropriately and effectively.

4 ATTACHMENTS

Attachment A Completed Audit Protocol

N/A - Not audited or not applicable to the current stage of the works
Yes - Compliance Achieved

Reference	Plan	Description	Audit Finding	Evidence
AE1	Aquatic Ecology Management Plan	Prior to the commencement of construction activities, arrange an inspection of all habitat to be disturbed (using a qualified ecological specialist). Any fauna encountered during this pre-clearance survey should be removed if possible, or its shelter/burrow site clearly marked so that an attempt can be made a later/more suitable time to remove the fauna. All locations that need to be dewatered must be cleared of fauna with fauna to be relocated immediately upstream of the work site or to an appropriate area predetermined by the ecologist.	CAR01	
AE2	Aquatic Ecology Management Plan	Iconic and listed threatened species to be specifically targeted during fauna pre-clearance surveys and is to include the following: Platypus Prior to construction, undertake Inspection of river and creek banks within the construction footprint for Platypus burrow entrances including nocturnal spotlighting and dusk surveys to detect presence of Platypus in the vicinity of the construction site. If burrows are located, careful excavation in small scoops with an un-toothed bucket is to be undertaken, in case a lactating female and/or dependent young are present. Where appropriate, arrangements for the transfer of any dependent Platypus young to an establishment with established protocols for rearing platypus young (e.g. Taronga Zoo, Sydney).Â Any adults found in burrow to be left to return to the stream or to be captured and released, depending on the proximity to the construction site and the assessment of the ecologist . Murray River Crayfish Regular inspections of sediment controls, including the Coffer Dam and Silt Curtains to be undertaken to ensure sediment is not escaping and that turbidity in the river is maintained at acceptable levels The Environmental Officer is to be present during dewatering of the coffer dam to capture and release any individuals	CAR01	
AE3	Aquatic Ecology Management Plan	During any near stream works such as trenching or excavating, water quality will be protected under the construction environmental management plan, including suitably designed and maintained sediment controls (detailed in ESCPs) designed to cope with a greater than average rainfall and/or flow event and regularly inspected and maintained throughout the construction and rehabilitation phase Mesh netting will not be used as part of the sediment and erosion control measures as it has the ability to trap, kill and/or injure aquatic fauna that may try to pass through	Water quality monitoring records maintained. Silt curtains in place. Checks done weekly. No net meshing used.	Water monitoring records. Inspection records. ESCP.
AE4	Aquatic Ecology Management Plan	Avoid undertaking excavation or other works in or near the Murrumbidgee River or Burra Creek during periods of actual or predicted heavy rain or higher than average flows as per the requirements of the SWMP	Some works were undertaken after rain. No issues regarding water levels	ER Inspections
AE5	Aquatic Ecology Management Plan	Cease work immediately if any previously unknown threatened flora or fauna species are encountered and consult the Ecologist with regards to the actions to be taken Refer to the procedures in Section 5.4 of this document for summary information on how rescued fauna are to be treated PCL, RSPCA, Wildcare or WIRES would be consulted in relation to injured animals.	None recorded to date at the LLPS. No ecology surveys undertaken.	Interview P.S.

Reference	Plan	Description	Audit Finding	Evidence
AE6	Aquatic Ecology Management Plan	Water will be extracted from the Murrumbidgee River for construction purposes (predominantly for dust suppression). Whenever the water is required for use within the Burra Creek / Googong catchment (i.e. east of Gibraltar Range), the water must be filtered (at the source) to prevent the potential transfer of pest species between catchments This will involve the use of a fixed and robust filter system to be placed over the intake pipe when taking water to prevent the potential intake of eggs or juvenile fish of pest species. Construction staff will undertake training to ensure that they are aware of the requirements on this and other ecological issues subject to potential construction impacts.	Heritage excavation works required water carts - October 2010. Works undertaken east of Gibraltar range - water taken from Burra Creek. OFI01 - procedure for managing water carts is not robust.	Review of AEMP, water cart load register, interview P.S.
AE7	Aquatic Ecology Management Plan	In the event of high flows/rainfall there is the possibility of an overflow of water into the Coffer Dams which may then have the potential to accumulate silt in the base of structure. During occasional maintenance operations this silt may need to be removed in accordance with the EWMS.05 â€“ Dewatering. Refer to the SWMP for more information on this strategy.	No dewatering yet. A dewatering EWMS has been prepared.	EWMS
AE8	Aquatic Ecology Management Plan	Any waters extracted from the proposed coffer dams must be certified clean from contamination (oils, spills) associated with the construction before release back into the Murrumbidgee River or Burra Creek This applies to the initial dewatering of the Coffer Dams This activity is to be undertaken under the guidance of the SWMP. Dewatering will be undertaken in accordance with EWMS.05 â€“ Dewatering.	The EWMS includes measures to ensure testing occurs	EWMS
AE9	Aquatic Ecology Management Plan	Turbidity controls to ensure water quality standards comply with the relevant guideline/agreed standards as per the requirements of the SWMP.	Silt curtains, sediments fences	SWMP/ESCP
AE10	Aquatic Ecology Management Plan	Stockpiles will be located away from the Murrumbidgee River and Burra Creek Approvals from relevant agencies will be gained prior to the disposal and placement of soil material.	No stockpiles present near river or creek	Inspection
AE11	Aquatic Ecology Management Plan	Erosion and sediment control measures will be implemented according to site specific Erosion and Sediment Control Plans (ESCPs) for works adjacent to waterways	ESCP's implemented	ESCP Inspection
AE12	Aquatic Ecology Management Plan	Disturbed areas will be rehabilitated and/or landscaped as soon as practical, through a progressive landscaping regime to ensure stabilisation of bare areas and to take advantage of optimal growing conditions This will be undertaken in accordance with the approved Landscape Rehabilitation Management Plan (LRMP).	N/A	
AE13	Aquatic Ecology Management Plan	A waste management plan (WMP) has been prepared and will be implemented to avoid potential contamination of waterbodies through inappropriate storage and/or stockpiling of construction waste material Key strategies of the WMP will be to ensure that all construction waste material is stored properly and located well away from any watercourses The WMP will provide management strategies for the handling of chemicals and other hazardous construction materials and to detail the immediate action to be undertaken for any spills	See WMP	
AE14	Aquatic Ecology Management Plan	All stream bed and banks will be reinstated and revegetated with appropriate (locally occurring) species to ensure long term bank stability	N/A	

Reference	Plan	Description	Audit Finding	Evidence
AE15	Aquatic Ecology Management Plan	Rehabilitation of aquatic ecology impacted by pipeline construction at waterway crossings will be undertaken as soon as practical following the completion of construction (refer to the LRMP for further details)	N/A	
AE16	Aquatic Ecology Management Plan	Ensure fuels and chemicals are bunded and stored appropriately on site in accordance with ACT EPA and NSW DECCW guidelines.	Chemical storage appropriate	Inspection
AE17	Aquatic Ecology Management Plan	Monitor rehabilitation activities in accordance with the objectives stated in the approved Landscape Rehabilitation Management Plan (LRMP)	N/A	
S1	Soil & Water Management Plan	Prepare progressive ESCPs for all impacted areas that comply with : Soils and Construction Volume 1, 4th Edition (Landcom) March 2004; Managing Urban Stormwater: Soils and Construction, Volume 2C: Unsealed Roads (DECC, 2008); Environmental Protection Guidelines for Construction and Land Development in the ACT (EPA, 2007) Relevant EWMSs (eg. Stockpiling)	Due for earthworks	ESCP folder
S2	Soil & Water Management Plan	Works will not commence prior to an ESCP being developed and adequately implemented on site. This may include the development and implementation of EWMSs for high risk activities	Clearing and grubbing has occurred without a progressive ESCP being prepared. OOC 02	
S3	Soil & Water Management Plan	Erosion and sediment controls will be inspected prior to predicted rainfall, prior to long work breaks and after rainfall events to ensure they are fully functional. If required, initiate any repair or maintenance requirements	Yes	Records
S4	Soil & Water Management Plan	ESCPâ€™s will be progressively updated as construction activities change and distributed to relevant site personnel for reference and implementation.	Yes	
S5	Soil & Water Management Plan	Site personnel (in particular ERSED crews) will be provided with training on sound environmental practice and the implementation of effective Erosion and Sediment Control structures.		
S6	Soil & Water Management Plan	Specific site personnel will be trained and/or toolboxed on correct coffer dam management prior to any discharge.	Toolbox of EWMS not yet done	
S7	Soil & Water Management Plan	Site personnel will be kept informed of relevant environmental issues through the implementation of environmental training and toolboxes.	Yes	
S8	Soil & Water Management Plan	Clearing and grubbing limits will be established and clearing will be undertaken in a controlled manner to limit areas of disturbance	Yes	TEMP
S9	Soil & Water Management Plan	Silt curtains will be installed in the Murrumbidgee River and Burra Creek around the coffer dams.	Yes	
S10	Soil & Water Management Plan	Where possible, felled vegetation will be utilised as erosion and sediment control or placed as Coarse Wood Debris (CWD) for animal habitat.	N/A	
S11	Soil & Water Management Plan	Access tracks will be delineated and sign posted to prevent unnecessary ground disturbance.	At LLPS access track delineation Yes	
S12	Soil & Water Management Plan	Vehicular access and the bed and banks of the Murrumbidgee River and Burra Creek will be limited.	Yes this is being done	Inspection
S13	Soil & Water Management Plan	Control measures will be implemented at site exits to minimise tracking of sediment onto public roads and identified in relevant ESCP	N/A	
S14	Soil & Water Management Plan	Water carts will be used to suppress dust along the project route.	Yes	Inspection
S15	Soil & Water Management Plan	Changes to runoff flow paths to the Murrumbidgee River and Burra Creek will remain unchanged or be minimised as much as practical, with disturbed banks of the Murrumbidgee River and Burra Creek to be lined with geotextile to prevent erosion.	At river not relevant due to sandy material N/A	
S16	Soil & Water Management Plan	The excavation, lower and lay and backfilling of the pipe line will be undertaken progressively.	N/A	

Reference	Plan	Description	Audit Finding	Evidence
S17	Soil & Water Management Plan	Regular inspections will be undertaken, at least weekly, to ensure erosion and sediment control structures are effective (including following significant rain events). If improvements are identified, these will be documented in an inspection report which is to be closed out within designated times frames.	Weekly and daily inspections being undertaken after rain	Inspection records
S18	Soil & Water Management Plan	Records regarding water quality and functionality of erosion and sediment control devices will be kept, including details of rain events, use of flocculants, sediment removal and dewatering activities. A checklist will be completed prior to when treated water is to be discharged from the coffer dams.		
S19	Soil & Water Management Plan	The coffer dams will be inspected after each rain event (greater than 20 mls in 24 hours), flocculated and discharged or pumped into containers, as required. All appropriate recording will be undertaken prior to discharge. Inside the coffer dams will be kept as clean as possible (eg. Machinery, equipment or excess dirt will not be stored in the coffer dams) to minimise flood damage and potential pollution of the River).	Inspections done. Dewatering not yet required.	
S21	Soil & Water Management Plan	Where appropriate, water from the coffer dams will be utilised for construction purposes, such as compaction and dust suppression.	N/A	
S22	Soil & Water Management Plan	Stockpiles (Topsoil/ spoil) will be located away from drainage lines, including the Murrumbidgee River and Burra Creek.	Yes	Inspection
S23	Soil & Water Management Plan	Sediment fences will be installed below stockpiles to manage erosion, clean water diversion drains constructed upslope of stockpiles where there is medium to large catchment upslope and stockpiles will be stabilised as soon as practical.	Yes stockpiles secured as site had sediment fencing, however one not stabilised.	Inspection
S24	Soil & Water Management Plan	Progressive rehabilitation will occur during construction activities to stabilise exposed areas and minimise erosion potential.	N/A	
S25	Soil & Water Management Plan	Records regarding water quality and functionality of erosion and sediment control devices will be kept, including details of rain events, use of flocculants, discharge, sediment removal and dewatering activities with controls updated if ineffective.	Yes	
S26	Soil & Water Management Plan	A coffer dam checklist will be completed whenever treated water is to be discharged from the coffer dams.	EWMS developed	EWMS
S27	Soil & Water Management Plan	All work in or adjacent to watercourses must be undertaken in compliance with EWMS â€“ Working in Watercourse areas EN-EWMS09.	EWMS prepared but not audited	
S28	Soil & Water Management Plan	All temporary crossings must be undertaken in compliance with EWMS â€“ Temporary Waterway Crossings General â€“ EN-EWMS04 and Removal of Temporary Crossings â€“ EN â€“ EWMS07	N/A	
S29	Soil & Water Management Plan	All temporary diversions of waterways must be undertaken in compliance with EWMS â€“ Temporary Waterway Diversion EN-CMS06	N/A	
S30	Soil & Water Management Plan	All installations of temporary water crossings must be undertaken in compliance with EWMS â€“ Temporary Waterway Crossings - general EN-EWMS04	N/A	
S31	Soil & Water Management Plan	Waterway crossings will not be constructed during periods of heavy rain and flooding.		
S32	Soil & Water Management Plan	A contingency plan will be implemented if heavy rain and/ or flooding occur during the installation of a temporary waterway crossing.	N/A	

Reference	Plan	Description	Audit Finding	Evidence
S33	Soil & Water Management Plan	A landscape rehabilitation program would be instigated immediately following construction utilising appropriate stabilisation products and species endemic to the area Restoration may also involve the provision of in-stream habitat features such as riffles, pools and snags.	N/A	
S34	Soil & Water Management Plan	Staff will be trained through site inductions and tool box talks in relation to management of wastewater, the potential impact on water ways and made aware of their responsibilities and penalties under the ACT Environment Protection Act (1997) and the NSW Protection of the Environment Operations Act (1997) in relation to water pollution.	Training has involved some elements of soil and water management	Induction package, toolbox records
S35	Soil & Water Management Plan	Unplanned wastewater discharges will be reported to the Environmental Manager who will notify Regulatory Authorities if required.	N/A	
S36	Soil & Water Management Plan	Wastewater from site amenities will be treated by an approved treatment system onsite or removed by a licensed contractor to an appropriate disposal facility with the approval of EPA, PCL and/ or DECCW.	N/A	
S37	Soil & Water Management Plan	Discharges from the coffer dams will be undertaken in compliance with EWMS â€“Coffer Dam Management	N/A	
S38	Soil & Water Management Plan	Hydrostatic pressure testing will occur progressively	N/A	
S39	Soil & Water Management Plan	Water collected in excavations, the pipeline trench or low points on site will be pumped to containers, used on site for dust suppression or be managed following the EWMS Dewatering.	N/A	
S40	Soil & Water Management Plan	Concreting and curing operations will be undertaken in compliance with EWMS â€“ Using curing compounds, and other relevant EWMSs, eg EWMS â€“ Concrete Management	N/A - not yet relevant	
S41	Soil & Water Management Plan	Concrete washout areas/pits will be adequately sized, located away from drainage lines and waterways and maintained regularly Activities will undertaken in compliance with EWMS â€“ Concrete Management	N/A - not yet relevant	
S42	Soil & Water Management Plan	Where possible opportunities for water reuse/ recycling will be initiated	N/A	
S43	Soil & Water Management Plan	Water captured in bunded areas will be assessed for contamination prior to discharge. Contamination will be removed using appropriate absorbent material and disposed of in a licensed waste management facility.	N/A - EWMS requires testing	
S44	Soil & Water Management Plan	Construct the coffer dams in accordance with EWMS â€“ Construction of Coffer Dams and specific ESCP.	Yes - reviewed and OK	EWMS
S45	Soil & Water Management Plan	Manage the coffer dams in accordance with EWMS â€“ Coffer Dam Management EN-CMS05.		
S46	Soil & Water Management Plan	Where appropriate, water from the coffer dams will be utilised for construction purposes, such as compaction and dust suppression		
S47	Soil & Water Management Plan	Records regarding quantity of extracted water, water quality and functionality of erosion and sediment control devices will be kept, including details of rain events, use of flocculants, discharge, sediment removal and dewatering activities.	Yes	
S48	Soil & Water Management Plan	A coffer dam checklist will be completed whenever treated water is to be discharged from the coffer dams.		
S49	Soil & Water Management Plan	Site personnel undergo training on appropriate spill management and emergency response procedures.		

Reference	Plan	Description	Audit Finding	Evidence
S50	Soil & Water Management Plan	Works involving the use of chemicals, dangerous goods or other potential contaminants, will be planned and implemented to minimise the possibility of spillage	N/A	
S51	Soil & Water Management Plan	The use and storage of chemicals and dangerous goods will be strictly in accordance with relevant legislation, manufacturers instructions, MSDS and the relevant Safe Work Method Statements	N/A	
S52	Soil & Water Management Plan	Adequate quantities of emergency response materials such as oil spill kits, absorbent materials, sand bags, flocculating agents and pH buffer solutions will be readily available and kept in designated compounds. Hydrocarbon spill kits will also be kept in emergency response vehicles, Superintendents€™s vehicles, Environmental Officers€™s vehicle and other vehicles that carry substantial quantities of chemicals (e.g. subcontractors).	N/A	
S53	Soil & Water Management Plan	Temporary bunding will be provided for all refuelling or maintenance of plant and equipment or any other activity onsite that could result in spillage of a chemical, fuel or lubricant (especially where the activity is undertaken in a location with direct drainage to a waterway or environmentally sensitive area).	Note - incident at UPS	
S54	Soil & Water Management Plan	Where chemical drums (greater than 20 litres) are removed from bunded areas, they will be placed in temporary bunds and returned to the bunded area by the end of the day.	N/A	
S55	Soil & Water Management Plan	Machinery, pumps and other equipment will be checked regularly for excessive wear and leaks, and if required, repaired promptly.	N/A	
S56	Soil & Water Management Plan	Permanent storage of fuels and chemicals will only occur within impervious bunded areas with a capacity of at least 120% of the total capacity of the largest vessel stored and roofed with 10Â° overhang.	Yes	ER Inspections
S57	Soil & Water Management Plan	Bunded areas will be located in an area at least 30m from a Riparian Management Zone or Exclusion Zone as defined in the ACT Forest Code of Practice.	Yes	ER Inspections
S58	Soil & Water Management Plan	Water captured in a bunded area will be monitored and drained (if uncontaminated) after each rain event to ensure bund capacity is maintained at all times. If contamination is evident the contaminant will be absorbed using remediation products (absorbent pads, etc) and disposed to an appropriate waste management facility.	N/A	
S59	Soil & Water Management Plan	Records of water quality checks, discharges and any remedial actions taken will be recorded.	Records maintained N/A	
S60	Soil & Water Management Plan	Where safe to do so, containment measures such as sandbags, booms, earth bunds or cut drains will be installed to capture and retain spilled material and prevent it from leaving site, entering any watercourse or impacting on vegetation stands.		
S61	Soil & Water Management Plan	Spill kits will be maintained in emergency response vehicles and at identified site facilities where significants spills may occur (e.g. workshops)	See above	
S62	Soil & Water Management Plan	No refuelling will occur within 30m of an riparian management zone or in a location where fuel may enter a waterbody.	See above	
S63	Soil & Water Management Plan	Establish a program for the implementation of revegetation and topsoiling works along the site and in/adjacent to water courses (Landscape Rehabilitation Management Plan).	LRMP	

Reference	Plan	Description	Audit Finding	Evidence
S64	Soil & Water Management Plan	Undertake progressive reshaping and rehabilitation works in conjunction with the completion of bulk excavation and land shaping, and in accordance with the Landscape Rehabilitation Management Plan	N/A	
S65	Soil & Water Management Plan	Graded banks on a 2-3% grade will be constructed across the easement or mulched rip lines installed where the easement is perpendicular to the existing ground slope to reduce the potential for erosion The spacing between the graded banks/ mulched rip lines will be determined by the gradient of the existing topography and range from 15m to 40m apart. The graded banks will also be located so as to outlet onto a stable surface.	N/A	
S66	Soil & Water Management Plan	Topsoil will be reused in areas as close as possible to its source location to maximise the benefits available from the existing seed bank.	N/A	
S67	Soil & Water Management Plan	Vegetated filter traps will be established or other measures implemented quickly where possible to minimise erosion and offsite sedimentation.	N/A	
S68	Soil & Water Management Plan	Weed management strategies will be implemented in newly rehabilitated areas to control weed infestation and propagation	See WMP Audit	
S69	Soil & Water Management Plan	Appropriate endemic and native species will be used wherever possible particularly those that will provide future habitat for endangered fauna	N/A	
S70	Soil & Water Management Plan	A program of seed collection will be implemented to bolster endemic and native seed stores which can be later used for final rehabilitation works	N/A	
S71	Soil & Water Management Plan	Felled vegetation may be positioned in a manner that prevents erosion (i.e. positioned in windrows along contour banks) or can be mulched to assist in erosion control and rehabilitation works	N/A	
S72	Soil & Water Management Plan	Rehabilitation of waterway crossings or areas in and adjacent to the Murrumbidgee River or Burra Creek will occur as soon as works are complete in that area.	N/A	
TE1	Terrestrial Ecology Management Plan	Accurately and clearly mark out the edge of clearing and trees/vegetation to be retained including hollow trees, significant species, and riparian zones (min 20m each side).	Clearing limits marked with pegs. Trees to be flagged.	Inspection
TE2	Terrestrial Ecology Management Plan	Prior to the commencement of construction activities, arrange an inspection of all habitat to be disturbed (using a qualified ecological and licensed specialist). Any fauna encountered during this pre-clearance survey should be removed if possible, or its shelter/nest site clearly marked so that an attempt can be made a later/more suitable time to remove the fauna.	Eco Logical has done pre-clearing surveys	Pre-clearing fauna records
TE3	Terrestrial Ecology Management Plan	Wherever practical and feasible, locate ancillary structures such as site offices and sediment basins on previously cleared sites.	Site office and stockpiles are on cleared land	Inspection

Reference	Plan	Description	Audit Finding	Evidence
TE4	Terrestrial Ecology Management Plan	Identify, retain and protect old or mature trees (alive or dead) which are in close proximity to the construction area by marking out/fencing This is to be done in accordance with the procedures detailed in Section 5.2 of this report.	See TE1	
TE5	Terrestrial Ecology Management Plan	Install all erosion and sediment control measures prior to clearing and grubbing and other construction activities and maintain throughout the construction period, to prevent potential impacts on any nearby offsite native vegetation and habitat areas.	ERSED controls being implemented at clearing stage	Inspection
TE6	Terrestrial Ecology Management Plan	Install vehicle wash-down areas, if required, in accordance with the Weed Management Strategy to ensure weeds from the site are not transported outside of the site or into sensitive areas. Wash-down areas are to be located at entrances/exits to the construction site as well as between areas of high or low weed infestation within the site. Exact locations of wash-down will be shown clearly in the Site Environment Management Plans. Refer also to the Weed Management Strategy in the Landscape Rehabilitation Management Plan.	Weed Management Plan includes washdown areas and strategies to prevent spread of weeds.	WMP; S&J Morrison weed control sheets.
TE7	Terrestrial Ecology Management Plan	Any noxious weeds in the vicinity of the development are to be removed and further controlled throughout the duration of construction.	Measures included in WMP	WMP
TE8	Terrestrial Ecology Management Plan	The ecologist will identify habitat trees and they will be scheduled for removal in sections. During removal of a section with identified habitat trees a licensed fauna spotter/catcher (handler) is to be present, specifically, must be available during the clearing of any large/hollow-bearing trees The spotter/catcher is to inspect all large trees after felling to see if hollows are present that were not visible from the ground during the initial pre-clearance and hollow-bearing tree surveys All hollows, once felled, are to be inspected in felled trees with the use of a torch Should significant species be detected breeding in hollow bearing trees, these trees are to be retained until the breeding activity is complete Refer to Environmental Work Method Statement, Clearing and Grubbing.	Ecologist present during clearing	Fauna records. Interview D Metcalf.
TE9	Terrestrial Ecology Management Plan	Cease work immediately if any previously unknown threatened flora or fauna species are encountered and contact PCL (TAMS, ACT Government) or DECCW immediately. Refer to the procedures in Section 5.4 on how rescued fauna is to be treated.	None found yet	Interview P.S.
TE10	Terrestrial Ecology Management Plan	The pipeline trench and any other excavations that are left open for more than 24 hours are to be regularly inspected (each morning) to ensure that no animals have fallen into the trench and become trapped. Ideally, the ends of each section of trench will be battered to allow animals to climb out of the trench. If the trench section is greater than 150m in length, then at the end each day, place a solid branch (at least every 50m) in the trench to allow trapped fauna to climb back out of the trench to escape, or, create an escape point in the excavated trench for fauna. Should fauna species be continually observed within the trenches left open overnight, then more secure measures will be taken to protect terrestrial species from becoming trapped within the trench.	N/A	
TE11	Terrestrial Ecology Management Plan	Limit native vegetation clearing to that required for construction and safety and, where possible, retain established trees and native shrub understorey.	Yes - good vegetation management across project	ER Inspections
TE12	Terrestrial Ecology Management Plan	Ensure that all required fencing is carried out prior to any clearing works commencing and is done in such a way that minimal soil disturbance and impact on native vegetation occurs.	No - fencing is being udnertaken after clearing. OOC 2	Inspection

Reference	Plan	Description	Audit Finding	Evidence
TE13	Terrestrial Ecology Management Plan	Ensure that after felling, some timber is retained for : 1. dispersing onsite for coarse woody debris purposes; 2. use in Landscape Rehabilitation works; or, 3. use as timber windrows.	N/A	
TE14	Terrestrial Ecology Management Plan	Avoid removal of trees with hollows (alive or dead). Where removal cannot be avoided, maintain the tree intact (as far as possible) and place it on the ground in adjoining vegetation.	Yes	
TE15	Terrestrial Ecology Management Plan	Provide protection (fencing) around trees including their root zone wherever possible. Fencing should ideally be extended out to the drip-line of the tree's canopy.	Yes. This is being done well	Evidence seen on site
TE16	Terrestrial Ecology Management Plan	Clearly identifying stockpile and storage locations and provide erosion and sediment controls around these structures. Stockpiles are to be located away from drainage lines and vegetation to be retained.	Yes	
TE17	Terrestrial Ecology Management Plan	Topsoil will be windrowed along the limit of the clearing except in narrowed sections of the easement (ie sections that are 20m wide or less). Weed infested topsoil will be windrowed separately to weed free topsoil and will be marked as weed infested.	N/A	
TE18	Terrestrial Ecology Management Plan	Disturbed areas will be rehabilitated and/or landscaped as soon as practical, through a progressive landscaping regime to ensure stabilisation of bare areas and to take advantage of optimal growing conditions This will be undertaken in accordance with the approved Landscape Rehabilitation Management Plan (LRMP).	N/A	
TE19	Terrestrial Ecology Management Plan	Revegetate and rehabilitate the construction area with locally indigenous plant species where appropriate or an approved pasture species in consultation with the landowner. The list of species to be used in the landscaping and rehabilitation is included in the LRMP.	N/A	
TE20	Terrestrial Ecology Management Plan	Relocate native fauna species from locations that need to be cleared and/or dewatered.	N/A	
TE21	Terrestrial Ecology Management Plan	Toolbox and provide environmental training to personnel involved in clearing and grubbing as well as topsoil stripping operations.	Yes	Attended by 7 people on 9-03-11 and 29-09-10
TE22	Terrestrial Ecology Management Plan	Plant machinery and vehicles driving/parking beyond the limit of clearing in unauthorised areas or under trees to be retained. Toolbox training for staff and parking areas are to be provided and clearly identified.		
TE23	Terrestrial Ecology Management Plan	Cease work immediately if any previously unknown threatened flora or fauna species are encountered and consult Environmental Officers immediately to verify species indentified. PCL, RSPCA or Wildcare would be consulted in relation to injured animals.	Yes	
TE24	Terrestrial Ecology Management Plan	If any snakes require removal from site, for areas in the ACT, Parks, Conservation and Lands (via Canberra Connect) or a licensed and qualified snake handler will be contact to assist in removal of snake species. Refer to Section 5.4 of this plan.	Yes	
TE25	Terrestrial Ecology Management Plan	Undertake regular inspections to ensure sensitive areas are clearly marked and that barrier fencing is in place.	Yes	Plenty of inspections included on weekly form
TE26	Terrestrial Ecology Management Plan	Undertake inspections of fenced areas on a weekly basis to check their integrity.	Yes	
TE27	Terrestrial Ecology Management Plan	Include appropriate native species in revegetation initiatives.	N/A	

Reference	Plan	Description	Audit Finding	Evidence
TE28	Terrestrial Ecology Management Plan	Ensure fuels and chemicals are bunded and stored appropriately on site in accordance with ACT EPA and NSW DECCW guidelines.	N/A	
TE29	Terrestrial Ecology Management Plan	Monitor rehabilitation activities in accordance with the objectives stated in the approved Landscape Rehabilitation Management Plan (LRMP)	N/A	