Consistency Review

MURRUMBIDGEE TO GOOGONG WATER TRANSFER PROJECT
HARD ROCK RESOURCE REALIGNMENT (PROPERTY 1102)

MARCH 2011

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1.1 BACKGROUND

ACTEW Corporation and ActewAGL have partnered with John Holland Group, Abigroup and GHD to form the Bulk Water Alliance (BWA). The BWA was formed to construct and deliver four water security projects for the ACT:

- Enlarged Cotter Dam (ECD)
- Murrumbidgee to Cotter Pump Station (M2C)
- Googong Dam spillway upgrade (GDS)
- Murrumbidgee to Googong Reservoir Water Transfer Project (M2G)

The Murrumbidgee to Googong Water Transfer Project (M2G) involves transferring up to 100 megalitres of water per day from the Murrumbidgee River through a 12 kilometre underground pipeline to Burra Creek in NSW. The water will then flow approximately 13 kilometres along Burra Creek into Googong Reservoir.

1.2 THE APPROVED PROJECT

This Approved Project broadly involves the following activities:

- Construction of a low lift pump station and intake structure at the Murrumbidgee River
- Construction of a high lift pump station
- Construction of a 12km underground pipeline
- Construction of an outlet structure at Burra Creek
- Construction of a mini-hydro power station

The project lies within both NSW and the ACT, and is subject to approval under the Commonwealth EPBC Act. As such, three separate Planning Approvals have been obtained and the project construction and operation is subject to three separate Conditions of Approval.

1.3 THE PROPOSED DESIGN REFINEMENT

The NSW Minister for Planning imposed a number of conditions upon approval of the project. One of these conditions, Condition of Approval 2.5, required an assessment of hard rock resources at Property 1102 as such:

> *"Prior to the commencement of construction the Proponent shall conduct a review of potential conflicts between the project alignment and any identified hard rock resources existing along or adjacent to the pipeline easement. The review shall consider all reasonable and feasible options for resolving any identified conflicts, and shall be submitted for the Director-General's approval prior to the commencement of construction."*

An assessment of hard rock resources along the proposed pipeline route within Property 1102 (from hereon in referred to as Property 1102) was conducted in late 2010. A "Part A Report" was initially completed and submitted to DoP which identified one area as "GP hard rock resource". A "Part B Report" was completed and submitted to DoP on the 11th November 2010. This report identified an

alternative route, to the north of the Approved Project route, through Property 1102 in order to avoid impacts to the identified hard rock resource. The "Part B Report" was subsequently reviewed and supported by the NSW Department of Industry and Investment and the NSW Department of Planning (Letter from DoP dated 13.12.10).

The proposed realignment of the route involves a modification between chainages 3200 and 4850. Between these chainages, the route would be moved to the north by up to 200m, as shown in **Figure 1**. The route could continue to pass through the same properties as originally proposed, but would be moved closer to residences in the north.

1.4 STATUTORY PLANNING CONTEXT

The proposed realignment of the pipeline through Property 1102 is a direct response to meet the outcomes of the investigations undertaken to satisfy Condition of Approval 2.5. The Approved Project was approved through an Environmental Assessment under Part 3A of the *Environmental Planning and Assessment Act 1979*, therefore any potential modification to the Approved Project is appropriately assessed under Section 75W of the EP&A Act.

Section 75W of the EP&A Act regulates the modification of a project approval under Part 3A. The Bulk Water Alliance is not required to obtain the Minister's modification of an approval, if the project as modified will be consistent with the Minister's approval.

1.5 INDEPENDENT REVIEW OF CONSISTENCY OF DESIGN ALTERATION

BWA have appointed an independent Environmental Representative (ER) for the M2G project. The ER's specific roles are detailed in both the NSW and ACT approvals. The NSW condition is as follows:

NSW (Condition 6.1) - *Prior to the commencement of any construction or operational activities or as otherwise agreed by the Director-General, the Proponent shall nominate for the approval of the Director General a suitably qualified and experienced Environmental Representative(s) independent o. the design, construction and operation personnel. The Proponent shall engage the Environmental Representative(s) during any construction activities, and throughout the life of the project, or as otherwise agreed by the Director-General. The Environmental Representative(s) shall:*

a) oversee the implementation of all environmental management plans and monitoring programs required under this approval, and advise the Proponent upon the achievement of these plans/programs;

b) consider and advise the Proponent on its compliance obligations against all matters specified in the conditions of this approval and the Statement of Commitments as referred to under condition 1.1 c) of this approval, permits and licences; and

c) *have the authority and independence to recommend to the Proponent reasonable steps to be taken to avoid or minimise unintended or adverse environmental impacts, and, failing the effectiveness of such steps, to recommend to the*

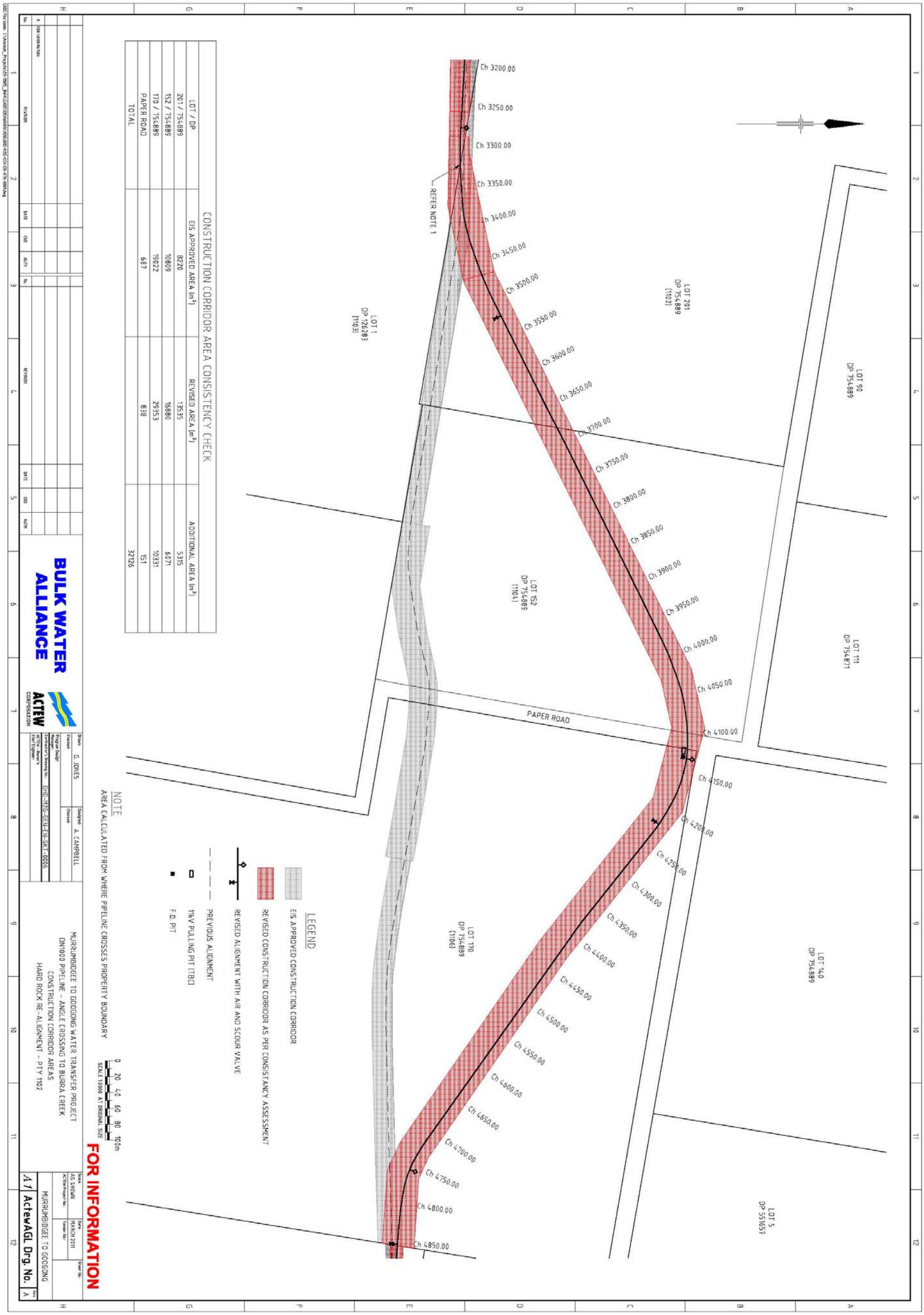

Figure 1 Approved Project Route and Proposed Design Alteration

a) *Proponent that relevant activities are to be ceased as soon as reasonably practicable if there is a significant risk that an adverse impact on the environment will be likely to occur.*

The broad role of the ER is to advise BWA on matters relating to compliance with the NSW Approval.

This report aims to provide an independent assessment of whether the proposed design alteration is consistent with the project's Conditions of Approval.

2 CONSISTENCY REVIEW

2.1 ASSESSMENT OF ENVIRONMENTAL DOCUMENT ISSUES IN RELATION TO CONSISTENCY

The proposed realignment through Property 1102 does not alter the overall Approved Project, which is to construct and operate a water supply pipeline between the Murrumbidgee River and Burra Creek. The major features of the Approved Project remain unchanged including the overall route, location of pump stations inlet and discharge structures and the mini-hydro power station.

The proposed realignment route remains within the 'study area' for the EIS. Consequently, the information obtained within the EIS is adequate for the assessment of any additional or changed impacts from the design alteration.

2.1.1 Flora and Fauna

The Bulk Water Alliance commissioned Eco Logical Australia to undertake a rapid vegetation assessment of the proposed design alteration (February 2011). The assessment involved a rapid survey of the area proposed for the revised alignment and an assessment of the ecological features within this area.

The assessment concluded that the vegetation comprises Box Gum Woodland in either moderate or good condition. The original pipeline route passed through Box Gum Woodland in moderate to poor condition. Note that this discrepancy has been put down to changed seasonal and climatic conditions. Box Gum Woodland in moderate or better condition is considered to be consistent with the definition of this community as listed under the TSC and EBPC Acts. In poor condition, it is only considered to be consistent with that listed on the TSC Act. Overall, an additional 3ha of Box Gum Woodland in moderate/good condition would be removed by the proposed design alteration. It is noted that the biodiversity offset requirements of the MCoA 2.9(c) provides for the situation where the extent of clearing is greater than that predicted and articulated in MCoA 2.9.
In accordance with MCoA 2.9, BWA/ACTEW needs to ensure that the BGW area is assessed during the post construction review to confirm the extent of clearing as part of the Compensatory Habitat Offset package.

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The study also found a large number of *Swainsona sericea*, a threatened species listed on the TSC Act. This species was recorded in the broader study area during the EIS studies and the EIS found that:

> *[Swainsona sericea] Occurred at low-moderate densities, some plants may be affected. Approximately 200 plants recorded in the Burra Creek area. The plant is scattered through the western NSW section and an estimated 50 – 100 plants will be removed. Impacts are unlikely to reduce the long term viability of the local population.*

The EIS estimates that the number of individual plants directly impacted by the proposed works would be around 50-100, and that this impact would not be significant. It is noted in correspondence from Eco Logical Australia that during the EIS studies, no targeted surveys for *Swainsona sericea* were conducted and only opportunistic records were maintained. Furthermore, climatic conditions during the EIS study were not ideal for identifying this species.

During the subsequent study for the proposed design alteration, a large number of individuals were found within the area of the proposed realignment. Eco Logical Australia note that the climatic

conditions had changed significantly to that during the EIS studies and were much more favourable for the detection of this species. It is estimated that over 1000 individuals may be present in the paddocks around the proposed realignment, of which it is predicated a maximum of 200 may be affected.

It is therefore estimated, based on the Eco Logical Australia study that the number of plants potentially impacted by the design alteration is significantly more than that documented in the EIS. Eco Logical Australia note in their report that recent surveys at the proposed offset area at Williamsdale recorded over 250 *Swainsona sericea*, and it is predicted a great many more are present (several thousand).

The EIS commitment in relation to the offset area is to develop an offset plan which:

> *focuses on delivering a "maintain and improve" outcome to address the residual impacts of the preferred project (i.e. impacts that occur following avoidance and mitigation measures)*

Eco Logical Australia consider that the proposed offset area fully compensates for both the original EIS impacts on *Swainsona sericea* and the additional impacts from the proposed design alteration.

Overall, the impacts are considered to be consistent with the EIS and any minor increase or change in impacts can be managed, mitigated and offset through existing commitments and approval requirements.

2.1.2 Property

No additional property impacts or impacts to property not previously impacted would occur. The proposed design alteration would reduce impacts to Property 1102 but removing the pipeline from a potential source of hard rock and thereby not jeopardise the economic value of this resource.

2.1.3 Aboriginal Heritage

No additional known sites identified in the EIS would be impacted by the design alteration. The detailed design must ensure no impacts to Sites 41 and 42 identified in the EIS.

2.1.4 Soil and Contaminated Lands

No additional impacts to that assessed in the EIS are expected. The proposed realignment would be within the same geological and soil setting as the original alignment and would not affect potentially contaminated sites.

2.1.5 Noise

Operational Noise

Operational noise from the pipeline operation is limited to noise generated from valves. One valve is located within the proposed design alteration route and this would be moved closer to 3 residences along Williamsdale Road.

Operational noise levels are regulated by the Environmental protection Licence (EPL 13322), which includes operation noise criteria. Pipeline and valve design and construction would consider the need

to meet these operational noise goals. Advice from BWA designers indicates the meeting the noise objective is technically feasible and possible, and would be achievable.

Therefore, there is unlikely to be any change to the operational noise experienced by any nearby receptor. Overall, the impacts are considered to be consistent with the EIS.

Construction Noise

The proposed design alteration would result in an increase in both daytime and nightime noise impacts from construction works at three residences along Williamsdale Road. The criteria for construction noise identified in the NSW Department of Environment, Climate Change and Water's Interim Construction Noise Guidelines (July 2009) are:

Recommended standard hours	Noise Affected level – 40 dBA Highly noise affected level – 75dBA
Outside recommended standard hours	Noise affected level – 35 dBA

Under the original proposed route, predicated construction noise levels were below the Noise Affected Level for both standard and non-standard hours. The proposed design alteration would increased daytime construction noise levels to above 40dBA (but well below the highly noise affected level of 75 dBA). Nightime construction noise levels would rise but remain below 35 dBA. It should be noted that works out of standard hours would only consist of delivery of oversized materials.

These altered impacts are considered to be readily managed through standard construction noise management measures and community consultation/complaints management procedures and do not represent a substantial change to construction-related impacts from the project. Therefore, the impacts are considered to be consistent with the EIS.

2.1.6 Other Environmental Issues

No other environmental issues are considered to be affected as a result of the proposed design alteration, including:

- Water Quality
- Air & Energy
- Waste
- Heritage (Non-Indigenous)

2.2 STATEMENTS OF COMMITMENTS

A review of consistency with the Statements of Commitments has been undertaken. None of the Statements of Commitments prohibit or limit the proposed realignment. Similarly, the proposed realignment would not prevent the full implementation of any of the Statements of Commitments.

2.3 CONDITIONS OF APPROVAL

A review of consistency with the Conditions of Approval has been undertaken. None of the Conditions of Approval prohibit or limit the proposed realignment. Similarly, the proposed realignment would not prevent the full implementation of any of the Conditions of Approval.

Conversely, the proposed design alteration further satisfies Condition of Approval 2.5.

2.4 CONSISTENCY REVIEW

A review of consistency issues is presented in **Table 1Table 1**.

Table 1 Consistency review

Consistency Question	Discussion	Response
Would the introduction of the proposed change, either by itself or in association with any other proposed change, result in any Condition of Approval (other than Condition of Approval 1) not being met?	None of the activities proposed in the design alteration would result in any of the CoA's not being met.	No
Do the proposed changes, considered together, result in a radical change to the approved project as a whole?	The overall Approved Project is not affected by the proposed changes. The proposed realignment of the pipeline route through Property 1102 in no way radically changes the Approved Project.	No
Do the proposed changes, considered together, result in a substantive change to the objectives and functions of the approved project as a whole?	The objective of the Approved Project is to provide water security to the ACT. The function of the Approved Project is to construct and operate a water pipeline from the Murrumbidgee River to Burra Creek. The proposed realignment through Property 1102 would not alter these objectives or functions.	No
Does any single proposed change considered separately (or, as relevant, in association with any other proposed change) result in a substantive change to the objectives and functions of that element of the approved project which is to be modified and in so doing, does not help to better satisfy any other Conditions of Approval?	The proposed realignment would not alter the project objectives or function.	No
Does any single proposed change result in any change in impact of such nature or scale (including impact on different people to those who were affected by the approved project) that it would be unreasonable not to make public?	None of the impacts likely to be incurred from the proposed design alteration would change in scale or nature any previously assessed and publicly displayed impact identified for the Approved Project.	No

2.5 CONCLUSION

Section 2.1 above identifies a range of issues in support of consistency. Although these issues are not specifically addressed by the five questions, they are relevant in verifying the proposed changes consistency to the Minister's approval of the Approved Project.

As the test questions are answered in the negative, the proposed design refinement is considered consistent with the Minister for Planning's approval of the Approved Project.

3 REFERENCES

Minister for Planning 2007. *Project Approval Section 75J of the Environmental Planning and Assessment Act 1979.*

Murrumbidgee to Googong Water Transfer Project Environmental Impact Statement.

Murrumbidgee to Googong (M2G) Hard Rock Resource Investigation Assessment of Feasible and Reasonable Alternatives November 2010.

4 GLOSSARY

Approved Project	The Murrumbidgee to Googong Water Transfer Project based on the EIS that was approved by: The NSW Minister for Planning on under Part 3A of the *Environmental Planning and Assessment Act 1979*. The Commonwealth Minister for Environment The ACT Government
BWA	Bulk Water Alliance
DoP	NSW Department of Planning
EIS	Environmental Impact Statement
EP&A Act	*Environmental Planning and Assessment Act 1979*
MCoA	Ministers Conditions of Approval
Proposed design alteration	The changes to the EIS concept design

Appendix 1 Conditions of Approval

Project Approval

Section 75J of the *Environmental Planning and Assessment Act 1979*

I, the Minister for Planning, approve the project referred to in Schedule 1, subject to the conditions in Schedule 2.

These conditions are required to:

- prevent, minimise, and/or offset adverse environmental impacts;
- set standards and performance measures for acceptable environmental performance;
- require regular monitoring and reporting; and
- provide for the ongoing environmental management of the project.

The Hon. Tony Kelly MLC
Minister for Planning

Sydney 31 MAR 2010 2010 File No: S08/01311

SCHEDULE 1

Application No:	08_0160
Proponent:	ACTEW Corporation
Approval Authority:	Minister for Planning
Land:	The pipeline route traverses approximately 12 kilometres on land between New South Wales and the Australian Capital Territory. Approximately 9 kilometres of the pipeline will traverse land within the Palerang Local Government Area of New South Wales.
Project:	Murrumbidgee to Googong Water Transfer project involves construction and operation of a water pipeline that transfers up to 100 megalitres of water per day from the Murrumbidgee River at Angle Crossing (Australian Capital Territory) to Burra Creek (New South Wales) approximately 10 kilometres south of Googong Reservoir.
Major Project:	The proposal is declared a Major Project under section 75B(1)(a) of the *Environmental Planning and Assessment Act 1979*, because it is a project of a kind described in Group 8, clause 26A of Schedule 1 to *State Environmental Planning Policy (Major Projects) 2005.* Namely development for the purpose of a pipeline in respect of which an application for a licence is made under the *Pipelines Act 1967* on or after the commencement of this clause
Critical Infrastructure Project:	The Project is "critical infrastructure" by virtue of an order made by the Minister on 26 June 2009 under section 75C. project within the meaning of section 75C of the Act.

KEY TO CONDITIONS

SCHEDULE 2

Act, the	*Environmental Planning and Assessment Act, 1979.*
Conditions of Approval	The Minister's conditions of approval for the project.
Construction	All pre-operation activities associated with the project other than survey, acquisitions, fencing, investigative drilling or excavation, building/road dilapidation surveys or other activities determined by the Environmental Representative to have minimal environmental impact such as minor access roads, minor adjustments to services/ utilities, establishing temporary construction sites (in accordance with the requirements of this project approval), or minor clearing (except where threatened species, populations or ecological communities would be affected).
Council	Palerang Council.
DECCW	Department of Environment, Climate Change and Water.
Department, the	Department of Planning.
Director-General, the	Director-General of the Department of Planning (or delegate).
Director-General's Approval	A written approval from the Director-General (or delegate) where the Director-General's Approval is required under a condition. The Director-General may ask for additional information if the approval request is considered incomplete.
Director-General's Report	The report provided to the Minister by the Director-General of the Department under section 75I of the EP&A Act.
Dust	any solid material that may become suspended in air or deposited.
EA	*Murrumbidgee to Googong Water Transfer Environmental Assessment* prepared by GHD and dated 7 August 2009.
Minister, the	Minister for Planning.
Pipeline	The water pipeline proposed in the *Murrumbidgee to Googong Water Transfer Environmental Assessment*.
Preferred Project Report	*The Murrumbidgee to Googong Water Transfer Preferred Environmental Impact Statement incorporating the Preferred Project Report* prepared by ACTEW and dated 21 December 2009.
Proponent	ACTEW Corporation, or any party acting under authorisation from and on behalf of ACTEW Corporation.
Project	Development to which Major Projects Application 08_0160 applies.
Publicly Available	Available for inspection by a member of the general public (for example available on an internet site or at a display centre).
Reasonable and feasible	Consideration of best practice taking into account the benefit of proposed measures and their technological and associated operational application in the New South Wales and Australian context. **Feasible** relates to engineering considerations and what is practical to build. **Reasonable** relates to the application of judgement in arriving at a decision, taking into account mitigation benefits and cost of mitigation versus benefits provided, community views and nature and extent of potential improvements.
Site	The land to which this approval applies.

1. ADMINISTRATIVE CONDITIONS

Terms of Approval

1.1 The Proponent shall carry out the project generally in accordance with the:
   a) Major Project Application 08_0160;
   b) the *Murrumbidgee to Googong Water Transfer Environmental Assessment* prepared by the Proponent and dated 7 August 2009;
   c) the *Murrumbidgee to Googong Water Transfer Preferred Project Report contained in the Environmental Impact Statemen* prepared by the Proponent and dated 21 December 2009; and
   d) the conditions of this approval.

1.2 In the event of an inconsistency between:
   a) the conditions of this approval and any document listed from condition 1.1a) to 1.1c) inclusive, the conditions of this approval shall prevail to the extent of the inconsistency; and
   b) any document listed from condition 1.1a) to 1.1c) inclusive, and any other document listed from condition 1.1a) to 1.1c) inclusive, the most recent document shall prevail to the extent of the inconsistency.

1.3 The Proponent shall comply with any reasonable requirement(s) of the Director-General arising from the Department's assessment of:
   a) any reports, plans or correspondence that are submitted in accordance with this approval; and
   b) the implementation of any actions or measures contained in these reports, plans or correspondence.

Limits of Approval

1.4 This project approval shall lapse five years after the date on which it is granted, unless the works subject of this approval has been completed on the site before that time.

Statutory Requirements

1.5 The Proponent shall ensure that all licences, permits and approvals are obtained and maintained as required throughout the life of the project. No condition of this approval removes the obligation of the Proponent to obtain, renew or comply with such licences, permits or approvals. The Proponent shall ensure that a copy of this approval and all relevant environmental approvals are available on the site at all times during the project.

1.6 This approval does not operate unless and until the Proponent has obtained relevant associated approvals for the Murrumbidgee to Googong Water Transfer project from the Australian Capital Territory Government under the *Planning and Development Act 2007* and the Commonwealth Government under the *Environment Protection and Biodiversity Conservation Act 1999*.

2. SPECIFIC ENVIRONMENTAL CONDITIONS

Soil and Water Quality Impacts

2.1 The Proponent shall comply with section 120 of the *Protection of the Environment Operations Act 1997* which prohibits the pollution of waters.

2.2 Soil and water management controls shall be employed to minimise soil erosion and the discharge of sediment and other pollutants to lands and/or waters during construction activities, in accordance with *Managing Urban Stormwater: Soils and Conservation* (Landcom, 2004).

2.3 The Proponent shall design, construct, operate and maintain the project to avoid impacts on bank stability within the Burra Creek riverine corridor and Googong Reservoir outlet and does not increase local flooding risk.

2.4 The Proponent shall not transfer water when Burra Creek is in flood based on a one in two year event or greater nor should the Proponent operate the pipeline where it results in water levels in Burra Creek being greater than the one in two year flood level.

2.5 Prior to the commencement of construction the Proponent shall conduct a review of potential conflicts between the project alignment and any identified hard rock resources existing along or adjacent to the pipeline easement. The review shall consider all reasonable and feasible options for resolving any identified conflicts, and shall be submitted for the Director-General's approval prior to the commencement of construction.

Ecological Impacts- Terrestrial

2.6 In regards to the Endangered Purple Pea, *Swainsona recta* the Proponent shall:

a) avoid and protect the identified population of the species during construction of the crossing at the Goulburn to Cooma railway line;

b) submit to the Director-General and DECCW, as part of the Construction Environmental Management Plan required under condition 6.2, a pre construction survey of all potentially suitable habitat along the pipeline easement. The survey shall be conducted during the species flowering period; and

c) minimise impacts to any population identified during the surveying described in b), through detailed design and alignment refinements.

2.7 The pipeline easement width shall be reduced to the minimum feasible width in areas along the easement that are known to contain endangered ecological communities and/or threatened species habitat. Details regarding the extent and location of these reductions shall be included in the Construction Environment Management Plan contained in condition 6.2.

2.8 Any clearing of native vegetation, native grassland particularly Box Gum Grassy Woodland and rocky outcrops during construction of the pipeline shall be limited to the minimum feasible extent.

2.9 Areas specified in Table 1 that are expected to be cleared shall be offset utilising the compensatory habitat offset package described in documentation represented by Condition 1.1 c). The package located on the Williamsdale Property in the Australian Capital Territory shall be implemented prior to commissioning of the project. The package shall offset in perpetuity the value of habitat lost as a result of the project. A final review of the compensatory habitat offset package shall be provided to the Director-General in the Operation Environment Management Plan. This version shall:

a) demonstrate the implementation of the offset;

b) describe how the offset shall be guaranteed and monitored in perpetuity; and

c) demonstrate a post construction review has been undertaken that confirms the extent of clearing was not greater than predicted. If clearing was greater, then the package shall demonstrate how the offset was modified and increased to the value of the actual habitat lost.

Table 1 – Habitat areas expected to be cleared

Endangered Ecological Community Habitat	Native Vegetation (Hectares)
Box-Gum Grassy Woodland	11.1
Natural Temperate Grassland	1.7
Snow Gum Grassy Woodland	0.3
Other Native Vegetation	3.6
Total	**16.7**

2.10 After construction is complete and for a period of two years after that time (or as otherwise required by the Director-General) the Proponent shall monitor areas along the project alignment, for weed infestation. Any infestations shall be actively managed to remove or minimise their spread.

Ecological Impacts- Aquatic

2.11 The Proponent shall implement the aquatic ecology management measures committed to in the documents set out in condition 1.1c) or elsewhere in these conditions of approval, including;

a) monitoring and subsequent maintenance of flow transfer volumes to reasonably and feasibly mimic the natural flow regime based on stochastic data defined in the Preferred Project Report of Burra Creek during the native fish breeding season in order to protect any spawning populations of threatened fish species;
b) design measures to prevent the spread of invasive fish species;
c) design measures for the protection of natural ponding habitat. If the current natural ponds along Burra Creek are lost as a result of increased flows, the Proponent is required to re-establish natural ponding habitat; and
d) regular review of aquatic ecology monitoring results for any trends toward significant impacts in Burra Creek or Googong Reservoir.

2.12 Prior to the commencement of construction, the Proponent shall consult with the Department of Industry and Investment regarding the final design of the fish egg screens and proposed operating procedures of the pump stations. The pumping station shall be designed and operated in such a way that pumping cannot occur when adequate fish egg screens are not in place.

Noise Impacts

Construction Noise

2.13 The Proponent shall only undertake construction activities associated with the project that would generate an audible noise at any residential premises during the following hours:

a) 7:00 am to 6:00 pm, Mondays to Fridays, inclusive;
b) 8:00 am to 1:00 pm on Saturdays; and
c) at no time on Sundays or public holidays.

2.14 This condition does not apply in the event of a direction from police or other relevant authority for safety reasons, to prevent environmental harm or risk to life.

2.15 The hours of construction activities may be varied with the prior written approval of the Director-General. Any request to alter the hours of construction shall be:

a) considered on a case-by-case basis;
b) accompanied by details of the nature and need for activities to be conducted during the varied construction hours and any other information necessary to reasonably determine that activities undertaken during the varied construction hours will not adversely impact on the acoustic amenity of receptors in the vicinity of the site; and
c) affected residential receivers being informed of the timing and duration of work approved under this condition at least 48 hours before that work commences.

Construction Blasting

2.16 Blasting associated with the construction of the project shall only be undertaken during the following hours:

a) 9:00 am to 5:00 pm, Mondays to Fridays, inclusive;
b) 9:00 am to 5:00 pm on Saturdays; and
c) at no time on Sundays or public holidays.

2.17 The Proponent shall ensure that air blast overpressure generated by blasting associated with the project does not exceed the criteria specified in Table 2 when measured at the most-affected residential or sensitive receiver.

Table 2 – Airblast Overpressure Criteria

Airblast Overpressure (dB(Lin Peak))	Allowable Exceedance
115	5% of total number of blasts over a 12 month period
120	Never

2.18 The Proponent shall ensure that the ground vibration generated by blasting associated with the project does not exceed the criteria specified in Table 3 when measured at the most-affected residential or sensitive receiver.

Table 3 – Peak Particle Velocity Criteria

Peak Particle Velocity Criteria	Allowable Exceedance
5	5% of total number of blasts over a 12 month period
10	Never

2.19 Prior to each blasting event, the Proponent shall notify the relevant local council and potentially-affected landowners, including details of time and location of the blasting event and providing a contact point for inquiries and complaints.

Operation Noise and Vibration

2.20 The Proponent shall take all reasonable measures to minimise noise emissions and vibration from all plant and equipment operated on the site such that they do not exceed noise and vibration criteria derived by application of the *NSW Industrial Noise Policy* (DECC, 2000) and *Assessing Vibration: A Technical Guideline* (DECC, 2006).

Traffic and Transport Impacts

2.21 Where the pipeline is located along and within a public road formation the Proponent shall:

a) commission a qualified person to undertake a Road Dilapidation Report of all roads proposed to be used for construction and access activities in consultation with relevant road authorities. The Report shall assess the current condition of the relevant roads.

b) following completion of construction a subsequent Road Dilapidation Report shall be prepared to assess any damage that may have resulted due to traffic and transport related to the construction and ongoing operation of the project.

The Proponent shall restore the relevant roads to a state, described in the original Road Dilapidation report. The cost of any restorative work described in the subsequent Report or recommended by the relevant road authorities after review of the subsequent Report, shall be funded by the Proponent. Such work shall be undertaken at a time as agreed upon between the Proponent and the relevant road authorities. In the event of a dispute between the parties with respect to the extent of restorative work that may be required under this condition, any party may refer the matter to the Director-General for resolution. The Director-General's determination of any such dispute shall be final and binding on the parties.

2.22 The Proponent shall ensure that all pipeline crossings of roads are constructed using construction methods and depth cover determined in consultation with the relevant road authority.

2.23 The Proponent shall apply to the relevant authority for any proposed temporary road closures at least one month prior to the proposed closure. Advertisement of the closure shall be funded by the Proponent.

2.24 The Proponent shall obtain the relevant consent to utilise the nominated Council storage areas within Williamsdale Road Reserve subject to Council requirements.

2.25 The Proponent shall consult with the Australian Railway Historical Society to ensure the timing of any construction impacts on the use of the Goulburn to Cooma Railway (Michelangelo Tourist Railway) are minimised.

Heritage Impacts

2.26 If during the course of construction the Proponent becomes aware of any previously unidentified significant Aboriginal object(s), all work likely to affect the object(s) shall cease immediately and the DECCW informed in accordance with the *National Parks and Wildlife Act 1974*. Relevant works shall not recommence until written authorisation from the DECCW advising otherwise is received by the Proponent.

2.27 If during the course of construction the Proponent becomes aware of any previously unidentified heritage object(s), all work likely to affect the object(s) shall cease immediately and the Heritage Council of New South Wales shall be notified immediately in accordance with the *NSW Heritage Act 1977*. Management measures set out in the Unanticipated Discovery Protocol discussed in the Statement of Commitments contained in the Preferred Project Report represented by condition 1.1c) shall be implemented.

2.28 Any indigenous or non-indigenous items of heritage significance located along or within the vicinity of the pipeline easement shall be avoided including sites and/or objects along Burra Creek and London Bridge karst formations as well as at Williamsdale School.

2.29 Monitoring of London Bridge karst formations is to occur subject to commitments made in the Proponent's Statement of Commitments contained in documents referred to in condition 1.1c).

Waste Generation and Management

2.30 All waste materials removed from the site shall only be directed to a waste management facility lawfully permitted to accept the materials.

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.

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.

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.

Air Quality Impacts

Dust Generation

2.34 The Proponent shall construct and operate the project in a manner that minimises dust emissions from the site, including wind-blown and traffic-generated dust. All activities on the site shall be undertaken with the objective of preventing visible emissions of dust from the site. Should such visible dust emissions occur at any time, the Proponent shall identify and implement all practicable dust mitigation measures, including cessation of relevant works, as appropriate, such that emissions of visible dust cease.

Odour

2.35 The Proponent shall not cause or permit the emission of offensive odours from the site in accordance with the provisions of Section 129 of the *Protection of the Environment Operations Act 1997.*

3. ENVIRONMENTAL MONITORING AND AUDITING

Geo-Morphological Monitoring

3.1 Prior to the commencement of construction the Proponent shall prepare and implement a **Geo-Morphological Monitoring Program** to monitor the impact of the project on the present morphology of Burra Creek at the pipeline outlet location and downstream to Googong Reservoir. The Program shall be developed in consultation with the DECCW and shall include but not necessarily be limited to:

a) set out monitoring requirements in order to assess the impact of the project on the present geo-morphology of Burra Creek at the pipeline outlet location and downstream to Googong Reservoir.
b) baseline monitoring prior to the introduction of flows through Burra Creek in order to establish any geo-morphological changes resulting from the project.
c) provisions for monitoring during construction, operational and non-operational phases;
d) mechanisms for immediately investigating any anomalous monitoring results;
e) mechanisms for the management and mitigation of any impacts on the waterways including cessation of flows where necessary; and
f) details of how the monitoring results will be reported to the Director-General and the DECCW.

The Program shall be submitted for the approval of the Director-General no later than one month prior to the commencement of construction, or within such period otherwise agreed by the Director-General, accompanied by written evidence that the DECCW has been consulted and that the DECCW is satisfied with the Program. Construction shall not commence until written approval has been received from the Director-General.

Water Quality Monitoring

3.2 Prior to the commencement of construction, the Proponent shall prepare and implement a **Surface Water Monitoring Program** to monitor and manage the impact of the project on the waterways into which any extracted Murrumbidgee River water is discharged. The Program shall be prepared in accordance with sections 8.2.3.3 and 8.2.3.4 of *Australian and New Zealand Guidelines for Fresh and Marine Water Quality – Volume 2: Aquatic Ecosystems* (ANZECC & ARMCANZ, 2000) The Program shall be developed in consultation with the DECCW and shall include but not necessarily be limited to:

a) the monitoring framework detailed in the documents referred to in condition 1.1;
b) a baseline monitoring program;
c) an evaluation of the discharges in terms of temporal and spatial scales;
d) a comparison of discharge data with baseline data;
e) sampling and data collection at representative sites, both impact (downstream of the discharge point) and control (upstream of the discharge point) sites;
f) sampling and data collection for the discharges and immediate receiving environment to quantify the changes in ecosystem health and water quality with specific reference to phytoplankton, aquatic vegetation, macroinvertebrates, fish, temperature, salinity, dissolved oxygen, iron and manganese;
g) provisions for the review of the Program within six months of commencement of the first full operational flow into Burra Creek;
h) identification of key water parameters including but not limited to flow rate, temperature, ph, salinity, total dissolved solids and nutrient parameters for the operation of the project;
i) management actions for the parameters identified in h) should they be breached; and
j) details of how the monitoring results will be reported to the Director-General and DECCW.

The Program shall be submitted for the approval of the Director-General no later than one month prior to the commencement of construction, or within such period otherwise agreed by the Director-General, accompanied by evidence that the DECCW has been consulted regarding the Program. Construction shall not commence until written approval has been received from the Director-General.

Ecological Monitoring

3.3 Prior to the commencement of construction the Proponent shall prepare and implement an **Ecological Monitoring Program** to monitor the impact of the project on the ecology that may be impacted by the proposal. The Program shall be developed in consultation with the DECCW and Department of Industry and Investment NSW and shall include but not necessarily be limited to:

a) set out monitoring requirements as detailed in the documents referred to in Condition 1.1 c), in order to assess the impact of the project on Ecology present along the easement and at Burra Creek at the pipeline outlet location and downstream including the Googong Reservoir.
b) baseline monitoring prior to the introduction of flows through Burra Creek in order to establish any ecological changes resulting from the project.
c) provisions for monitoring trench areas for any native fauna impacts likely to result from this work. Any native fauna found in the open trench shall be recorded and managed in consultation with DECCW;
d) provisions for monitoring during construction, operational and non-operational phases;
e) mechanisms for immediately investigating any anomalous monitoring results;
f) mechanisms for the management and mitigation of any impacts on the waterways including cessation of flows where necessary; and
g) details of how the monitoring results will be reported to the Director-General and the DECCW and the Department Industry and Investment NSW.

The Program shall be submitted for the approval of the Director-General no later than one month prior to the commencement of construction, or within such period otherwise agreed by the Director-General, accompanied by evidence that the DECCW has been consulted regarding the Program. Construction shall not commence until written approval has been received from the Director-General.

4. COMMUNITY INFORMATION, CONSULTATION AND INVOLVEMENT

4.1 Subject to confidentiality, the Proponent shall make all documents required under this approval available for public inspection on request.

Provision of Electronic Information

4.2 Prior to the commencement of construction of the project, the Proponent shall establish a dedicated website or maintain dedicated pages within its existing website for the provision of electronic information associated with the project subject to confidentiality. The Proponent shall publish and maintain up-to-date information on this website or dedicated pages including, but not necessarily limited to:

a) the current implementation status of the project;
b) a copy of this approval and any future modification to this approval;
c) a copy of each relevant environmental approval, licence or permit required and obtained in relation to the project;
d) a copy of each plan, report, or required monitoring program under this approval; and
e) details of the outcomes of compliance reviews and audits of the project.

Community Information Plan

4.3 Prior to the commencement of construction, the Proponent shall prepare and implement a **Community Information Plan** which sets out the community communications and consultation processes to be undertaken during construction and operation of the project. The Plan shall include but not be limited to:

a) procedures and timing to consult with the community and Palerang Council in order to come to an agreement regarding revegetation of Burra Creek adjacent to Burra Village, raising of pedestrian access to London Bridge Homestead above the predicted high water mark and the construction of a bridal trail along areas where roadwork is required.
b) procedures to inform the local community of planned investigations and Construction activities, including blasting works;
c) procedures to inform the relevant community of Construction traffic routes and any potential disruptions to traffic flows and amenity impacts;
d) procedures to consult with local landowners with regard to Construction traffic to ensure the safety of livestock and to limit disruption to livestock movements;
e) procedures to inform the community where work has been approved to be undertaken outside the normal Construction hours, in particular noisy activities;
f) procedures to inform and consult with affected landowners to rehabilitate impacted land;
g) procedures to notify relevant landowners of the process available to review potential impacts on radio and television transmission; and
h) procedures to notify relevant landowners of the process available to review potential impacts on aerial spraying.

Complaints Procedure

4.4 Prior to the commencement of construction of the project, the Proponent shall ensure that the following are available for community complaints for the life of the project (including construction and operation):
a) a 24 hour telephone number on which complaints about construction and operational activities at the site may be registered;
b) a postal address to which written complaints may be sent; and
c) an email address to which electronic complaints may be transmitted.

The telephone number, the postal address and the e-mail address shall be advertised in a newspaper circulating in the locality on at least one occasion prior to the commencement of construction and at six-monthly intervals for two years following commencement of operation of the project. These details shall also be provided on the Proponent's internet site. The telephone number, the postal address and the email address shall be displayed on a sign near the entrance to the site, in a position that is clearly visible to the public.

4.5 The Proponent shall record details of all complaints received through the means listed under condition 4.4 of this approval in an up-to-date Complaints Register. The Register shall record, but not necessarily be limited to:
a) the date and time, where relevant, of the complaint;
b) the means by which the complaint was made (telephone, mail or email);
c) any personal details of the complainant that were provided, or if no details were provided, a note to that effect;
d) the nature of the complaint;
e) any action(s) taken by the Proponent in relation to the complaint, including timeframes for implementing the action; and
f) if no action was taken by the Proponent in relation to the complaint, the reason(s) why no action was taken.

The Complaints Register shall be made available for inspection by the Director-General upon request.

4.6 The Proponent shall provide an initial response to any complaints made in relation to the project during construction or operation within 48 hours of the complaint being made. The response and any subsequent action taken shall be recorded in accordance with condition 4.5.

5. COMPLIANCE TRACKING PROGRAM

5.1 Prior to the commencement of construction, the Proponent shall develop and implement a **Compliance Tracking Program** for the project, to track compliance with the requirements of

this approval during the construction and operation of the project and shall include, but not necessarily limited to:

a) provisions for periodic reporting of the compliance status to the Director-General including at least prior to the commencement of construction of the project, prior to the commencement of operation of the project and within two years of operational commencement;
b) a program for independent environmental auditing in accordance with *AS/NZ ISO 19011:2003 - Guidelines for Quality and/or Environmental Management Systems Auditing*;
c) procedures for rectifying any non-compliance identified during environmental auditing or review of compliance;
d) mechanisms for recording environmental incidents and actions taken in response to those incidents;
e) provisions for reporting environmental incidents to the Director-General during construction and operation; and
f) provisions for ensuring all employees, contractors and sub-contractors are aware of, and comply with, the conditions of this approval relevant to their respective activities.

6. ENVIRONMENTAL MANAGEMENT

Environmental Representative

6.1 Prior to the commencement of any construction or operational activities or as otherwise agreed by the Director-General, the Proponent shall nominate for the approval of the Director-General a suitably qualified and experienced Environmental Representative(s) independent of the design, construction and operation personnel. The Proponent shall engage the Environmental Representative(s) during any construction activities, and throughout the life of the project, or as otherwise agreed by the Director-General. The Environmental Representative(s) shall:

a) oversee the implementation of all environmental management plans and monitoring programs required under this approval, and advise the Proponent upon the achievement of these plans/programs;
b) consider and advise the Proponent on its compliance obligations against all matters specified in the conditions of this approval and the Statement of Commitments as referred to under condition 1.1c) of this approval, permits and licences; and
c) have the authority and independence to recommend to the Proponent reasonable steps to be taken to avoid or minimise unintended or adverse environmental impacts, and, failing the effectiveness of such steps, to recommend to the Proponent that relevant activities are to be ceased as soon as reasonably practicable if there is a significant risk that an adverse impact on the environment will be likely to occur.

Construction Environmental Management Plan

6.2 The Proponent shall prepare and implement a **Construction Environmental Management Plan** (CEMP) to outline environmental management practices and procedures to be followed during construction of the project. The Plan shall be consistent with the *Guideline for the Preparation of Environmental Management Plans* (DIPNR, 2004) and shall include, but not necessarily be limited to:

a) a description of all relevant activities to be undertaken on the site during construction including an indication of stages of construction, where relevant;
b) details of the areas designated for the erection of public information signage;
c) statutory and other obligations that the Proponent is required to fulfil during construction including all relevant approvals, consultations and agreements required from authorities and other stakeholders, and key legislation and policies;
d) details of how the environmental performance of the construction works will be monitored, and what actions will be taken to address identified potential adverse environmental impacts;
e) a description of the roles and responsibilities for all relevant employees involved in the construction of the project;
f) details of any construction camp sites and the management of these sites;

g) specific consideration of relevant measures to address any requirements identified in the documents referred to under conditions 1.1b) and 1.1c) of this approval;
h) the additional monitoring listed in this approval;
i) complaints handling procedures during construction; and
j) route alignment sheet to identify the final pipeline alignment including identification of areas where the easement area has been reduced to minimise impacts to threatened species as contained in condition 2.6.

The Construction Environment Management Plan shall be submitted for the approval of the Director-General no later than one month prior to the commencement of any relevant construction works associated with the project, or within such period otherwise agreed by the Director-General. Construction works shall not commence until written approval has been received from the Director-General.

6.3 As part of the Construction Environmental Management Plan required under condition 6.2 of this approval, the Proponent shall prepare and implement the following:

a) a **Surface and Groundwater Water Management Plan** to manage water quality impacts during construction. The Plan shall be prepared in consultation with the DECCW and shall include, but not necessarily be limited to:
   i) detailed engineering designs for the outlet structure;
   ii) detailed engineering designs for each category of watercourse crossing;
   iii) rehabilitation methodology of each category of watercourse crossing;
   iv) a description of any dewatering activities associated with groundwater interception;
   v) monitoring measures listed in condition 3.1 and 3.2;
   vi) a description of the quantity and source of all water supplies relating to construction, hydro-testing and operation; and
   vii) a description of any dewatering activities associated with groundwater interception along the pipeline easement that includes the quantity of groundwater to be used and a description of any expected impacts associated with the works.

b) a **Flora and Fauna Management Plan** to outline measures to protect and minimise loss of terrestrial and aquatic native vegetation and native fauna habitat as a result of construction of the project. The Plan shall include, but not necessarily be limited to:
   (i) plans showing terrestrial vegetation communities; important flora and fauna habitat areas; locations where threatened species such as the *Swainsona Recta*, Pink-tailed Worm Lizard and Rosenberg's Goanna as well as iconic species such as the Platypus, have been recorded or are likely to occur; and areas to be cleared. The plans shall also identify vegetation adjoining the site where this contains important habitat areas and/or threatened species, populations or ecological communities;
   (ii) methods to manage impacts on flora and fauna species and their habitat which may be directly or indirectly affected by the project, such as location of fencing, procedures for clearing of vegetation or soil and procedures for re-locating hollows or installing nesting boxes;
   (iii) rehabilitation details and a program for reporting on the effectiveness of flora and fauna management measures, including a schedule for planting and seeding within areas supporting Endangered Ecological Communities. Management methods shall be reviewed where found to be ineffective.

c) a **Construction Noise and Vibration Management Plan** to manage noise and vibration impacts during construction and to identify all feasible and reasonable noise and vibration mitigation measures. This plan shall be developed by a qualified acoustic consultant, agreed to by the Director-General and demonstrate the maximum feasible noise attenuation. The Plan shall address the requirements of the DECCW and shall include, but not necessarily be limited to:
   i) details of all potentially affected sensitive receivers modelled to have noise construction exceedances according to the NSW Interim Construction Noise Guidelines (July 2009.) where exceedances are shown an analysis of all feasible mitigation measures to reduce construction noise and vibration impacts including the use of noise attenuation barriers, alternative construction methods and work practices where potential noise impacts exceed the relevant objectives;

ii) an alternative construction schedule may be developed with the prior consent of the potentially affected receivers
iii) description and commitment to work practices which limit noise;;
iv) procedures for notifying residents of construction activities that are likely to affect their noise and vibration amenity.
v) extent of noise monitoring (as well as blast monitoring)
vi) contingency plans to be implemented in the event of non-compliance and / or noise and vibration complaints
vii) site contact person to follow up complaints

d) a **Traffic Management Plan** to manage traffic conflicts that may be generated during construction of the project. The Plan shall address the requirements of the relevant road authority and shall include, but not necessarily be limited to:
i) details of how construction of the project will be managed in proximity to local and regional roads;
ii) details of traffic routes for heavy vehicles, including any necessary route or timing restriction for oversized loads;
iii) demonstration that all statutory responsibilities with regard to road traffic impacts have been complied with;
iv) details of measures to minimise interactions between the project and other users of the roads such as the use of fencing, lights, barriers, traffic diversions etc;
v) procedures for informing the public where any road access will be restricted as a result of the project;
vi) procedures to manage construction traffic to ensure the safety of livestock and tc minimise disruption to livestock;
vii) speed limits to be observed along routes to and from the site and within the site;
viii) minimum requirements for vehicle maintenance to address noise and exhaust emissions, particularly along roads in close proximity to residences; and
ix) details of the expected behavioural requirements for vehicle drivers travelling to and from the site and within the site

Operation Environmental Management Plan

6.4 The Proponent shall prepare and implement an **Operation Environmental Management Plan** in accordance with the *Guideline for the Preparation of Environmental Management Plans* (DUAP, 2004) or its latest revision. The Plan shall include but not necessarily be limited to:
a) identification of all statutory and other obligations that the Proponent is required to fulfil in relation to the operation of the development, including all consents, licences, approvals and consultations;
b) a management organisational chart identifying the roles and responsibilities for all relevant employees involved in the operation of the project;
c) overall environmental policies to be applied to the operation of the project;
d) standards and performance measures to be applied to the project, and means by which environmental performance can be periodically monitored, reviewed and improved, (where appropriate) and what actions would be taken in the case that non-compliance with the requirements of this approval are identified. In particular the following environmental performance issues shall be addressed:
(i) bushfire hazard and risk management; and
(ii) management and maintenance of offsets including the presentation to the Director-General of the final offset compensatory habitat package post-construction impact review;
(iii) management measures for easement areas, including management of vegetation, soil erosion, weed control and landholder liaison.
e) the environmental monitoring requirements outlined under this approval;
f) complaints handling procedures as identified in conditions 4.4 to 4.5; and
g) the Management Plans listed under condition 6.5 of this approval;
h) specific consideration of relevant measures to address any requirements identified in the documents referred to under conditions 1.1b) and 1.1c) of this approval; and

i) management policies to ensure that environmental performance goals are met and to comply with the conditions of this approval;

The Plan shall be submitted for the approval of the Director-General no later than one month prior to the commencement of Operation of the project or within such period as otherwise agreed by the Director-General. Operation shall not commence until written approval has been received from the Director-General. Upon receipt of the Director-General's approval, the Proponent shall make the Plan publicly available as soon as practicable.

6.5 As part of the Operation Environmental Management Plan required under condition 6.4, the Proponent shall prepare and implement a **Flow Management Plan** that identifies the quantity, timing, duration and velocity of water transfer flows to Burra Creek. The Plan shall be developed in consultation with the DECCW.

7. ENVIRONMENTAL REPORTING

Incident Reporting

7.1 The Proponent shall notify the Director-General and any relevant Government authority of any incident with actual or potential significant off-site impacts on people or the biophysical environment as soon as practicable after the occurrence of the incident. The Proponent shall provide written details of the incident to the Director-General within seven days of the date on which the incident occurred.

7.2 The Proponent shall meet the requirements of the Director-General to address the cause or impact of any incident, as it relates to this approval, reported in accordance with condition 7.1 of this approval, within such period as the Director-General may require.

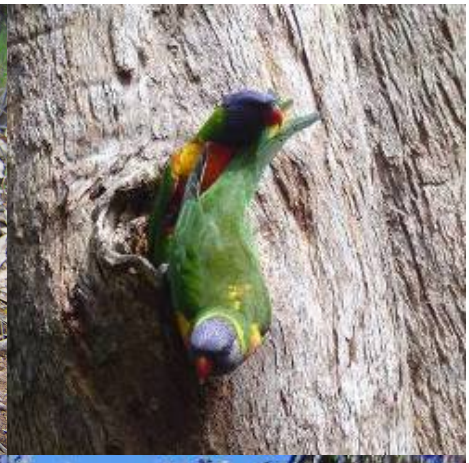
Appendix 2 Rapid Ecological Assessment by Eco Logical Australia

M2G Rapid Vegetation Assessment of the Hard Rock Re-alignment Route

Prepared for
Bulk Water Alliance Joint Venture

March 2011






DOCUMENT TRACKING

ITEM	DETAIL
Project Name	M2G Rapid Vegetation Assessment of the Hard Rock Re-alignment Route
Project Number	11CANECO-0002
Prepared by	Matthew Dowle
Approved by	Tom Kaveney
Status	Final
Version Number	2
Last saved on	March 2011

ACKNOWLEDGEMENTS

This document has been prepared by Eco Logical Australia Pty Ltd with support from Tom O'Sullivan and the Bulk Water Alliance Joint Venture.

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1 Introduction

1.1 BACKGROUND AND STUDY AIMS

The Murrumbidgee to Googong (M2G) Water Transfer project involves pumping water from the Murrumbidgee River at Angle Crossing within the ACT and transferring it through an underground 12 km pipeline to Burra Creek in NSW. Burra Creek flows into the Googong Reservoir through the Commonwealth Government's Googong Foreshores.

Eco Logical Australia Pty Ltd (ELA) was commissioned by the Bulk Water Alliance Joint Venture (BWAJV) to undertake pre-clearance construction surveys for the M2G Pipeline. These surveys involved:

- Surveying for and mapping the location of threatened plant species including the Small Purple-pea, Silky Swainsona-pea, Hoary Sunray, and Button Wrinklewort;
- Surveying for and mapping the location of Pink-tailed Worm Lizards and their habitat;
- Mapping and marking hollow-bearing trees for conservation and/or re-instatement post construction;
- Mapping and marking the location of wombat burrows.

This short report specifically aims to report on the surveys undertaken within the proposed pipeline corridor for the hard rock re-alignment route option through lot 1106.

This report is intended to be read in conjunction with the *Murrumbidgee to Googong Pipeline Pre-Clearance Surveys Report* (Eco Logical Australia, 2010).

1.2 STUDY AREA

The surveys were undertaken within the hard rock re-alignment route option for the pipeline easement, in Lots 1102, 1104 and 1106, prior to commencement of construction (**Figure 1**).

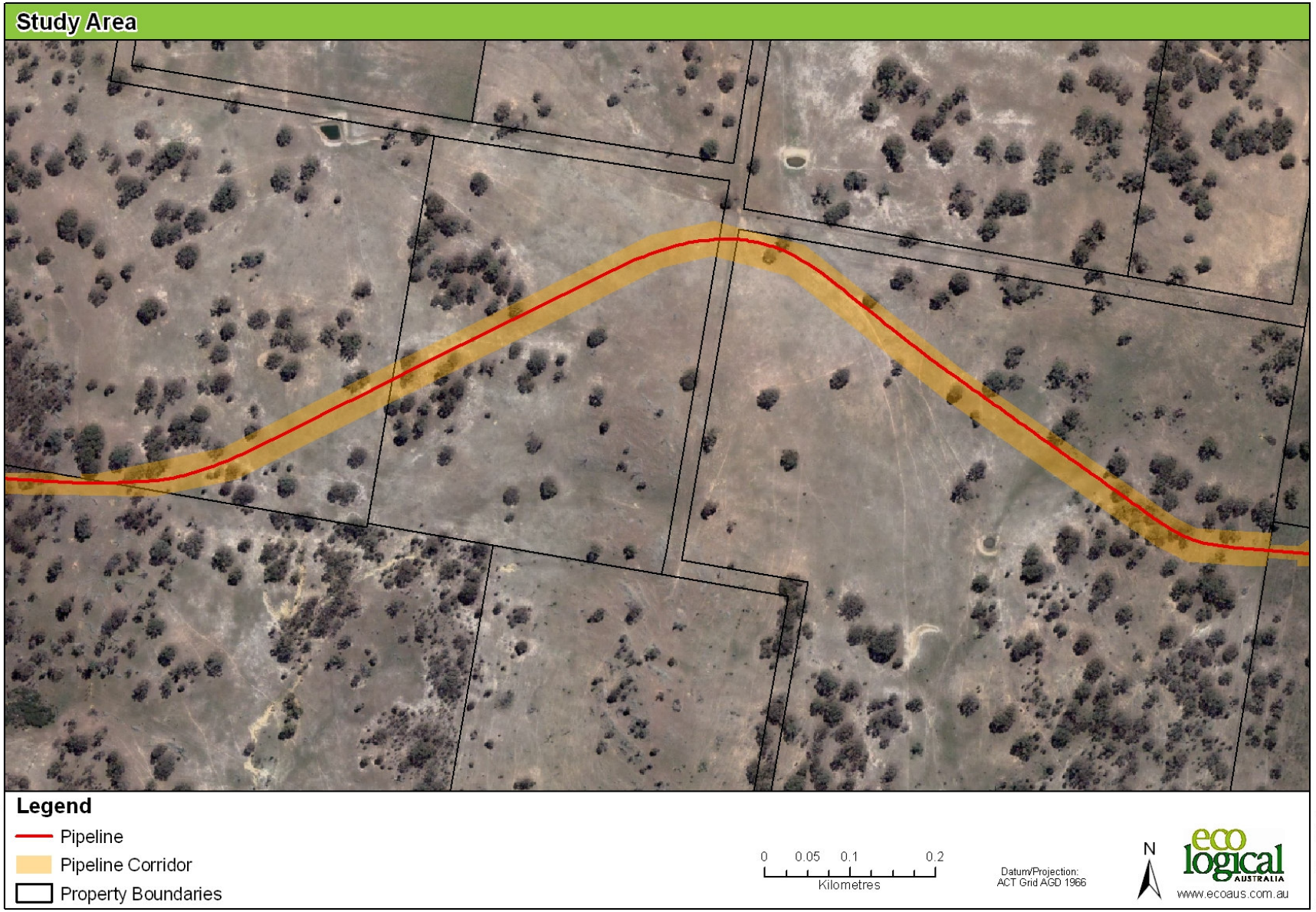

Figure 1: Study area.

2 Methodology

For a detailed description of all pre-clearance surveys undertaken within the pipeline easement, please refer to the *Murrumbidgee to Googong Pipeline Pre-Clearance Surveys Report* (Eco Logical Australia, 2010).

The methodology below describes the additional rapid vegetation assessment undertaken within the hard rock re-alignment route.

2.1 SURVEY METHODOLOGY

A visual inspection of vegetation condition was conducted whilst undertaking the pre-clearance surveys. From the initial visual inspection it was determined that the composition of the dominant understorey species present was relatively consistent across the entire pipeline easement and likely to represent a similar vegetation community, despite slight changes at any one point. As such, a single survey point was selected in native dominated grassland to determine the floristic composition and likely vegetation community present. A single short traverse of no more than 100m was conducted to compile a list of flora species present. A GPS recording was taken for the start point of the traverse.

A GPS recording was also taken to record the presence of Hollow-bearing trees and other significant occurrences of threatened flora, such as large patches of Silky Swainsona-pea (*Swainsona sericea*).

It is important to note that whilst the composition of native and exotic species may change slightly along the pipeline easement in the hard rock re-alignment route, the dominant overstorey and understorey species are consistent and represent native derived grasslands and open woodlands. It is likely that the variation in condition and composition is a direct result of current and past land use practices.

At the time of the surveys, it was considered that Lots 1102 and 1104 were subjected to a very low grazing pressure while Lot 1106 was subjected to a low-moderate grazing pressure.

Limitations

The vegetation survey was not intended to provide an inventory of all species present within the hard rock re-alignment route but instead aimed to provide an overall rapid assessment of the likely ecological values across the pipeline easement with particular emphasis on the dominance and condition of native vegetation present.

3 Results

The vegetation observed within the hard rock re-alignment route within Lots 1102, 1104 and 1106 represents open woodland and derived native grasslands. A mixture of good and moderate quality vegetation was observed with a relatively high level of native species diversity. A low abundance and number of exotic species was recorded throughout the alternative pipeline easement.

3.1 VEGETATION ASSESSMENT

The vegetation present throughout Lots 1102, 1104 and 1106 is likely to satisfy the EPBC Act (1999) listing for *White Box - Yellow Box - Blakely's Red Gum Grassy Woodlands and Derived Native Grasslands* (Box-Gum Woodland) and NSW TSC Act (1995) listing for *White Box Yellow Box Blakely's Red Gum Woodland*.

The good condition vegetation observed is dominated by native grasses with a high native diversity of forbs and herbs and low abundance and diversity of exotics. The moderate condition Box-Gum Woodland within Lots 1102 and 1106 was observed to contain a lower native species diversity and higher abundance of exotic species than the good condition vegetation. The poor condition vegetation represents an area of low native diversity (forbs and herbs) and a high number and abundance of exotics. It contains a mixture of Spear Grasses (*Austrostipa spp.*) and Wallaby Grasses (*Austrodanthonia spp.*) amongst common weeds and exotic pasture (such as Barley Grass).

The overstorey species recorded within the hard rock re-alignment route were Yellow Box (*Eucalyptus melliodora*), Blakely's Red Gum (*E. Blakelyi*) and Apple Box (*E. Bridgesiana).* The dominant native understorey species included Spear Grasses (*Austrostipa bigeniculata* and *A. scabra*) and Wallaby Grasses (*Austrodanthonia spp.*).

A compiled list of native herbs and forbs which were used to determine the presence of Box-Gum Woodland at the survey point include *Dichopogon sp* (Chocolate Lily), *Chrysocephalum apiculatum* (Yellow Buttons), *Ajuga australis* (Austral Bugle), *Convolvulus erubescens* (Blushing Bindweed), *Hydrocotyle laxiflora* (Stinking Pennywort)*, Oxalis perennans, Eryngium rostratum* (Blue Devil), *Wahlenbergia sp.* (Blue Bell), *Wurmbea dioica* (Early Nancy), *Cymbonotus lawsonianus* (Bears-ear), *Triptilodiscus pygmaeus* (Common Sunray)*, Desmodium varians, Solenogyne dominii, Stuartina muelleri* (Spoon cudweed)*, Bulbine bulbosa* (Bulbine Lily), *Lomandra sp.* (Mat Rushes), *Geranium solanderi* (Native Geranium), *Asperula conferta* (Common Woodruff).

Common exotic species observed include Clovers (*Trifolium sp.*) and Catsear (*Hypochaeris radicata*).

3.2 THREATENED SPECIES (TSC ACT)

The good condition vegetation within Lot 1104 that extends eastward into Lot 1106 and westward into Lot 1102 also contains a high number (estimates of 1000+) of *Swainsona sericea*, which is listed as Vulnerable under the *NSW Threatened Species Conservation Act 1995*. *Swainsona sericea* was also recorded to a lesser extent in both the good and moderate condition patches in Lot 1106.

It is important to note that the counts for *Swainsona sericea* are estimates across the entire Lotsand were observed in a very good season. At the time of the surveying (October 2010) the pipeline corridor was not pegged, so estimates were based on the whole area in general. However, from the above estimates it is expected that a maximum of 200 individual *Swainsona sericea* plants will potentially be impacted by the construction of the pipeline through the alternative hard rock re-alignment. Numbers are presented as estimates as targeted searches to determine specific abundances of threatened species were not conducted as part of this vegetation assessment in the hard rock re-alignment route.

The EIS reported that the original pipeline route would potentially impact up to 50 individual *Swainsona sericea* plants. While the alternative hard rock re-alignment route was surveyed as part of the broader biodiversity study, the EIS also did not include targeted *Swainsona sericea* searches. The greater estimate in number of *Swainsona sericea* was subsequently identified as part of pre-clearance studies undertaken by Eco Logical Australia in October 2010.

While the hard rock re-alignment route has the potential to impact a larger number of *Swainsona sericea* than documented in the EIS, the approval of the alternative hard rock re-alignment route took into account the potential impacts of the new route. The vegetation transect surveys of the projects offset area at Williamsdale recorded similar high abundances of *Swainsona sericea* (conservative estimate of 250+).

It is important to note that the high abundance of *Swainsona sericea* in these areas makes a complete count very difficult, particularly when not undertaking targeted abundance surveys. Ecologist observations of the offset area indicate that suitable habitat exists throughout the offsets area and the presence of *Swainsona sericea* can be expected to be much higher than the actual count, possibly in the thousands.

It is considered that the offset area fully compensates for the potential impacts associated with the construction of the pipeline, including the alternative hard rock re-alignment route on *Swainsona sericea*.

3.3 BOX-GUM WOODLAND

For the purposes of this report, Eco Logical Australia used the EPBC Act listing as a minimum standard to classify vegetation patches as Box-Gum Woodland. In general, Box-Gum Woodland listed under the EPBC Act also fulfils the listing requirements of NSW.

For a vegetation patch to classify as EPBC Box-Gum Woodland, the vegetation had to comply with the parameters described in the listing advice for the community (refer to below). For reference, vegetation identified as moderate or good quality NSW Box-Gum Woodland in the residual impacts (see M2G EIS Report) is equivalent to EPBC Act listed Box-Gum Woodland.

EPBC Act Box-Gum Woodland

Box-Gum Woodland is listed as a Critically Endangered ecological community under the EPBC Act. According to the EPBC Act Listing Advice (Threatened Species Scientific Committee, 2006):

> *Box–Gum Grassy Woodlands and Derived Grasslands are characterised by a species-rich understorey of native tussock grasses, herbs and scattered shrubs, and the dominance, or prior dominance, of White Box, Yellow Box or Blakely's Red Gum trees.*

Key elements of the Listing Advice that describe the ecological community include:

The Committee considers that areas in which an overstorey exists without a substantially native understorey are degraded and are no longer a viable part of the ecological community.....

In order for an area to be included in the listed ecological community, a patch must have a predominantly native understorey.

.....Therefore, in order to be the listed ecological community, an understorey patch, in the absence of overstorey trees, must have a high level of native floral species diversity, but only needs to be 0.1 hectares or greater in size. A patch in which the perennial vegetation of the ground layer is dominated by native species, and which contains at least 12 native, non-grass understorey species (such as forbs, shrubs, ferns, grasses and sedges) is considered to have a sufficiently high level of native diversity to be the listed ecological community. At least one of the understorey species should be an important species (e.g. grazing-sensitive, regionally significant or uncommon species; such as Kangaroo grass or orchids) in order to indicate a reasonable condition.

Areas with both an overstorey and understorey present are also considered of sufficiently good condition to be part of the listed ecological community if the understorey meets any of the conditions above, or if they have a predominantly native understorey, are two hectares or above in size, and have either regeneration of the overstorey species or 20 or more mature trees per hectare.

The condition criteria outlined above are the minimum level at which patches are to be included in the listed ecological community.

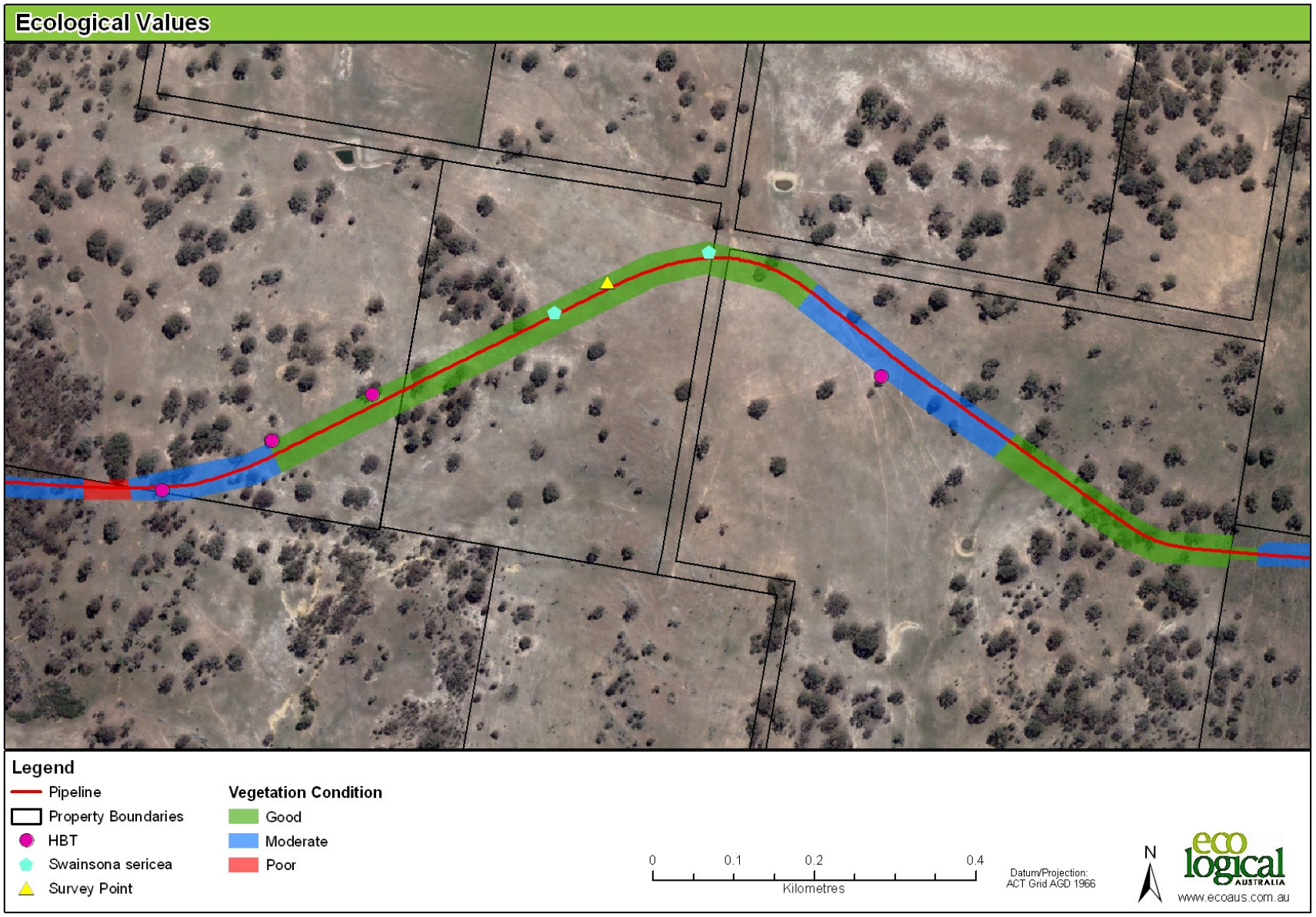

Figure 2: Ecological Values within the hard rock re-alignment route (Lots 1102, 1104 & 1106).

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