



**NGH**



Murrumbidgee  
Irrigation

# Modification Application

## Barren Box Swamp Modification

October 2021

Project Number: 19-148



## Document verification

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## Acronyms and abbreviations

BBS	Barren Box Swamp – the general location prior to the Project
BBSW	Barren Box Storage and Wetland – the operational name of the modified BBS following Project implementation
BCD	Biodiversity and Conservation Division (NSW) of EES and DPIE
DECCW	(Former) Department of Environment, Climate Change and Water (NSW) (now DPIE)
DPIE	Department of Planning, Industry and Environment (NSW)
EEC	Endangered ecological community – as defined under relevant law applying to the proposal
EES	Environment, Energy and Science (NSW), Group of DPIE (formerly OEH, and, prior, DECCW)
EIS	Environmental impact statement
EPA	Environment Protection Authority (NSW)
EP&A Act	<i>Environmental Planning and Assessment Act 1979</i> (NSW)
ESD	Ecologically Sustainable Development
ha	hectares
km	kilometres
LALC	Local Aboriginal Land Council
m	metres
MI	Murrumbidgee Irrigation Ltd
MIA	Murrumbidgee Irrigation Area and districts
OEH	(Former) Office of Environment and Heritage (NSW) (now EES)
the Project	Barren Box Swamp Project – as put forward for development consent

# 1. Introduction

## 1.1 Approved Project

The Barren Box Swamp Project (the Project), undertaken by Murrumbidgee Irrigation Limited (MI), consisted of the following three main construction elements and their subsequent operation (Figure 1-1):

- the splitting of Barren Box Swamp (BBS) with internal embankments;
- the widening of the Wah Wah Main Channel; and
- the construction of an En-route Storage on land adjacent to Bray's Dam on Mirrool Creek.

The Development Consent was approved by the Minister for Infrastructure and Planning on 10 June 2005 (Application Number: DA101-4-2004-I) under Section 80 of the *Planning and Environment Act, 1979*. The Conditions of Consent for the Project are appended in Appendix A.

The splitting of BBS into three cells occurred to improve the operational performance of the storage and to restore the natural ecology of a wetland section of the BBS. The modified BBS, now known operationally as the Barren Box Storage and Wetland (BBSW), consists of three cells:

- Cell 1 - an active storage cell covering 1,230 hectares with a storage volume of 24,000 ML at full supply level (30% of current storage volume);
- Cell 2 - an intermediate storage cell covering 320 hectares with an effective storage volume of 4,000 ML (10% of current storage volume); and
- Wetland Cell - an ephemeral wetland and flood retention cell covering 1,500 hectares.

The active and intermediate storage cells, Cells 1 and 2, are used to temporarily store irrigation water for supply to downstream users. In addition, the BBSW continues to be used for flood mitigation as per the original EIS and OEMP.

The remaining ephemeral wetland area, the Wetland Cell, is currently used for ecological services, and flood mitigation purposes, a continuation of the previous use of the swamp.

The Environmental Impact Statement (EIS) was completed by URS Australia Pty Ltd in 2004. The EIS public exhibition period was 07 May 2004 until the 11 June 2004. Development consent was granted on the 10 June 2005, with conditions of consent provided on the 16 June 2005.

The Project has been operated as a component of the Murrumbidgee Irrigation Area (MIA) for the last thirteen years. Changing climatic, regulatory and technological influences have altered the role the Project plays in MI's operation of the MIA. These influences have also altered the way MI is able to manage and use the Project.

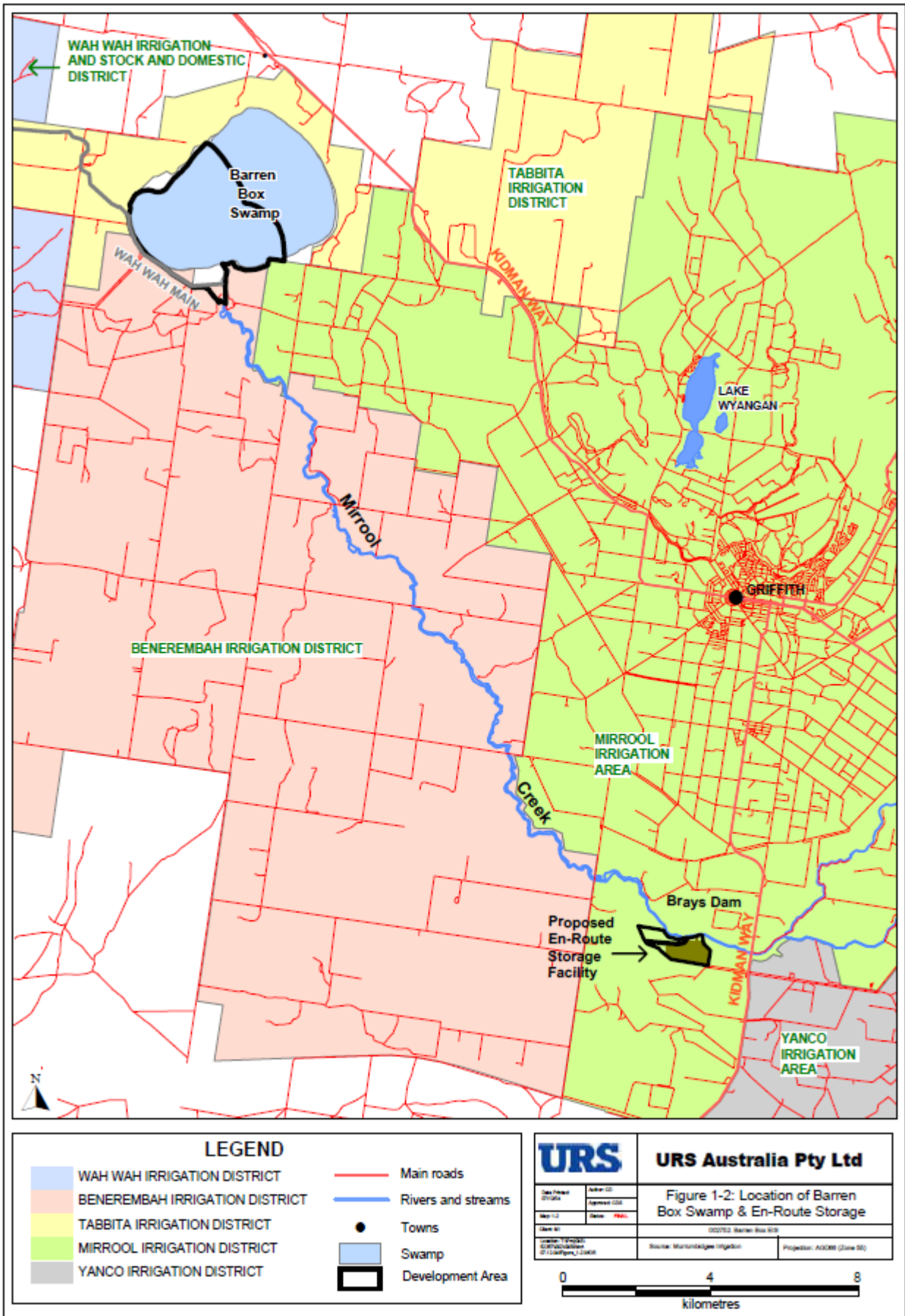


Figure 1-1 Elements of the BBS Project (URS Australia Pty Ltd, 2004)

## 1.2 The Proponent

The Proponent is:

Murrumbidgee Irrigation Limited  
86 Research Station Road  
Hanwood NSW 2680  
Locked Bag 6010  
Griffith NSW 2680

MI is a private irrigation company operating within the MIA, including the Project. Shares within the company are solely owned by customers in the MIA.

MI is responsible for the effective and efficient provision of water to customers within the MIA. This role includes development and maintenance of infrastructure and environmental stewardship. In addition, MI has a significant role in the management and protection of water resources within its area of operations.

## 1.3 Purpose of this Document

This report has been prepared to support an application to modify Development Consent DA101-4-2004-I. It includes:

Legislative context for the Modification Application.	Section 2
Detailed description of the modifications being sought.	Section 3
Detailed justification for the modification being sought.	Section 3
Details of the consultation undertaken in relation to the proposed modification.	Section 4
Assessment of the impacts of the proposed modification	Section 5

The proposed modification relates to updating administrative consent conditions with no on ground changes to the project. MI seeks to modify the consent to meet the current operating needs and environment of the Project. The proposed modifications will more fully reflect the current operating environment, the needs of the Project and the ability of the Project to deliver services in the MIA.

This report has been prepared by NGH Environmental on behalf of the Proponent, MI.

## 2. Statutory Context

### 2.1 Development Consent

Development Consent was provided by the Executive Director Department of Planning and Environment (DPE) on 10 June 2005 (Application Number:101-4-2004-i) under Section 80 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) (NSW).

### 2.2 Modification of Development Consent

Under Section 4.55 of the EP&A Act a development consent may be modified on further application, provided the modified development is ‘substantially the same’ as the original approved development and is if minimal environmental impact. An applicant, or other person entitled to act, may apply to the Minister for Planning to modify an SSD approval and lodge a request for assessment of a modification with the Department of Planning and Environment.

Subsection (1A) refers to modifications involving minimal environmental impact. It states that:

*A consent authority may, on application being made by the applicant or any other person entitled to act on a consent granted by the consent authority and subject to and in accordance with the regulations, modify the consent if:*

- a) *it is satisfied that the proposed modification is of minimal environmental impact, and*
- b) *it is satisfied that the development to which the consent as modified relates is substantially the same development as the development for which the consent was originally granted and before that consent as originally granted was modified (if at all)*

This modification application addresses these stipulations. Sections 3 and 5 address the nature and level of environmental impact that would result from the modification and has identified that there would be no additional impacts with the implementation of mitigation measures. Section 3 sets out the description of the modified proposal, which is considered to be substantially the same as the development for which consent was originally granted.

#### 2.2.1 Environmental Planning and Assessment Regulation 2000

Clause 115 of *Environmental Planning and Assessment Regulation 2000* (NSW) (the Regulations) requires an application to modify a development consent under clause 4.55 of the EP&A Act to contain the requirements as stipulated in Table 2-1.

Table 2-1 Relevant clauses of the Regulations

Relevant clause	Requirement	Section addressed
1(a)	the name and address of the applicant;	Section 1
(b)	a description of the development to be carried out under the consent (as previously modified);	Section 1
(c)	the address, and formal particulars of title, of the land on which the development is to be carried out;	Section 1
(d)	a description of the proposed modification to the	Section 3

Relevant clause	Requirement	Section addressed
	development consent;	
(e)	a statement that indicates that the modification is intended to have some effect, as specified in the statement;	Section 2
(f)	a description of the expected impacts of the modification;	Section 5
(g)	an undertaking to the effect that the development (as to be modified) will remain substantially the same as the development that was originally approved;	Section 2
(h)	if the applicant is not the owner of the land, a statement signed by the owner of the land to the effect that the owner consents to making of the application (except where the application for the consent the subject of the modification was made, or could have been made, without the consent of the owner);	N/A
(i)	a statement as to whether the application is being made to the Court (under Section 4.55) or to the consent authority under section 4.56), and, if the consent authority so requires, must be in the form approved by that authority.	N/A

### **3. Proposed Modification**

No on ground changes are proposed for the Project. The proposed modification relates to the following administrative consent conditions.

- Environmental Management
  - Environmental Representative
    - 6.1 e)
    - 6.1 note
  - Operational Environmental Management Plan
    - 6.5 d) Wetland Rehabilitation and Management Plan
    - 6.5 e) Flood Management Plan
    - 6.6 Review
- Environmental Reporting
  - Annual Environmental Management Report
    - 7.4 c) Impacts and performance
    - 7.4 d) Results
    - 7.4 h) Health of Lower Mirrool Creak Floodway Wetland System
    - 7.4 k) Data trends

The modifications proposed in this report are required to more fully reflect the current Project's operating environment, the needs of the Project and the tested abilities of the Project to reliably and efficiently deliver services in the MIA.

The proposed modifications are outlined in Table 3-1 including a discussion and justification for the modification and a summary of S4.55 consistency and environmental impact considerations. Environmental impact assessment is provided in detail in Section 5.

Table 3-1 Modifications sought

Condition of Consent	Proposed Action	Justification	S4.55 considerations	Proposed modification
<b>6. ENVIRONMENTAL MANAGEMENT</b>				
<b>Environmental Representative</b>				
<p>6.1 Prior to the commencement of construction of the development, the Applicant must nominate a suitably qualified and experienced Environmental Representative(s) whose appointment is to receive prior approval of the Director-General. The Applicant shall employ the Environmental Representative(s) throughout the life of the development. The Environmental Representative shall be:</p> <p>a) the primary contact point in relation to the environmental performance of the development;</p> <p>b) responsible for all Management Plans, mitigation measures and Monitoring Programs required under this consent;</p> <p>c) responsible for considering and advising on matters specified in the conditions of this consent, and all other licences and approvals related to the environmental performance and impacts of the development;</p> <p>d) responsible for receiving and responding to complaints in accordance with condition 5.2 of this consent; and</p> <p>e) given the authority and independence to require reasonable steps be taken to avoid or minimise unintended or adverse environmental impacts, and failing the effectiveness of such steps, to direct that relevant actions be ceased immediately should an adverse impact on the environment be likely to occur.</p> <p>The Applicant shall notify the Director-General of any changes to that appointment that may occur from time to time.</p>				
<p><b>6.1</b> The Applicant shall notify the Director-General of any changes to that appointment that may occur from time to time.</p>	<p>MI propose to modify the condition to limit the appointment of the ER to the construction and commissioning phases of the Project (now complete). With ongoing responsibilities and provisions integrated into existing MI systems and roles during operation. This would require a minor alteration to the consent condition.</p>	<p>MI has provided an ER for the construction and commissioning of the Project. The ER was approved by NSW Planning at that time.</p> <p>Following commissioning the ER Role was performed by MI's Environmental Manager. That role provided by the appointed ER has now been largely subsumed by MI's own Environmental Staff and management system. This includes other staff tasked with environmental performance during and following works.</p> <p>Note: It is not common for ERs to be required for one component of an operating infrastructure network where environmental systems and resources are available to manage performance. This is especially the case where EPLs and Water Use Licences provide a compliance framework and standards for the broader MI system.</p> <p>The ER when appointed for construction and commissioning exercised the required independence and authority as required. Management of environmental outcomes for the operation of the Project and MIA are driven in part by the environmental components of the MI Environmental Management System (EMS) and associated protocols. The MI EMS provides a sophisticated approach that ensures the environmental performance of the network including the Project meet compliance and reporting requirements. This system is larger and more robust than the ER Role and as such makes the designated role redundant in an operational setting.</p> <p>MI Environmental Staff now provide senior management input and routinely take action to avoid environmental impacts and ensure positive environmental outcomes across the whole MIA network.</p> <p>The Environmental Planning Manager for MI and environmental support staff provide the required supervision for the Project and MIA.</p> <p>The requirement for DG approval, while not onerous, provides an opportunity for non-compliance and absorbs resources that could be utilised for more tangible outcomes.</p>	<p>No change to development</p> <p>No additional environmental impact.</p> <p>Environmental performance still ensured by existing systems and staff.</p>	<p>The Applicant shall notify the Director-General of any changes to that appointment that may occur from time to time <a href="#">during construction and commissioning</a>. <a href="#">Following commissioning, ER responsibilities are to be integrated into MI's management systems and staff roles without the requirement for prior approval by the Director -General.</a></p>

Condition of Consent	Proposed Action	Justification	S4.55 considerations	Proposed modification
<b>Operational Environmental Management Plan (OEMP)</b>				
<p><b>6.5 d)</b> a Wetland Rehabilitation and Management Plan for Barren Box Swamp to outline the proposed measures that will be undertaken as part of establishing an ephemeral wetland system in Swamp area. The Plan must be prepared by an appropriately qualified person/s, in consultation with the Department of Primary Industries (former NSW Fisheries), Griffith Local Aboriginal Land Council, adjoining landowners, Griffith City Council, Department's Murray Murrumbidgee Office, Murrumbidgee Wetlands Working Group, Department of Environment and Conservation and the previously established Wetland Reference Group. The Plan shall include, but not necessarily be limited to:</p> <ol style="list-style-type: none"> <li>i. details of the anticipated timeframe for implementing the Plan;</li> <li>ii. results and adopted recommendations from the Wetland Concept Plan;</li> <li>iii. details of the proposed financial commitment to undertake the works required by this Plan and for the ongoing management of the Wetland area;</li> <li>iv. details of the proposed measures to protect and manage Aboriginal objects and cultural values;</li> <li>v. determination of the rate of filling and drying (as near as possible to natural rates);</li> <li>vi. measures for controlling stock grazing to retain dead standing material;</li> <li>vii. procedures for the management of salt and nutrient accretion;</li> <li>viii. details of proposed planting programs, including species to be used;</li> <li>ix. description of the hydrological requirements and ecological responses for threatened species and their habitat;</li> <li>x. details of the water requirements of the Lower Mirrool Creek floodway to ensure that the Barren Box Swamp Project does not have a negative impact on this wetland system;</li> <li>xi. details of an ecological monitoring regime. The monitoring regime shall include aquatic ecology and cover the entire Barren Box Swamp;</li> <li>xii. details of the proposed establishment of aquatic and arboreal habitats, and monitoring of the success of these habitats;</li> <li>xiii. performance indicators and monitoring in accordance with the Department of Environment and Heritage endorsed framework for development environmental water regimes in wetlands;</li> <li>xiv. details of an ongoing monitoring program of the Lower Mirrool Creek Floodway wetland system;</li> <li>xv. details on how water will be transferred for a deliberate release into the Lower Mirrool Creek Wetland System of sufficient quantity, including procedures for determining this quantity, should monitoring of the Lower Mirrool Creek Floodway Wetland System [refer to subclause xiv) above] identifies that the condition of the vegetation has deteriorated as a direct result of the operation of the proposed development. This is required to avoid degradation of the wetland system and comply with the principles of the NSW Wetland Management Policy.</li> </ol>				
<p><b>6.5 d) iii</b> details of the proposed financial commitment to undertake the works required by this Plan and for the ongoing management of the Wetland area.</p>	<p>Modify 6.5 d) iii) to focus on ongoing management commitments and where feasible facilitating further regeneration based on community or privately funded partnerships to enhance existing biodiversity values present on the onsite.</p>	<p>MI prepared a Wetland Rehabilitation and Management Plan (WMRP) as required by the consent that was approved during commissioning.</p> <p>The initial five-year plan was funded by MIA's EnviroWise program. In March 2010 Murrumbidgee Catchment Management Authority conducted a compliance audit of the MIA EnviroWise program and reported that works were nearing completion, had met project milestones and had been completed according to the Plan.</p> <p>Climatic factors, including the millennium drought, two significant flood events and a three-year drought between 2017 and 2020 have tested the program's resilience. Despite these perturbations weed control, ripping, planting of trees, shrubs and grasses and aerial seeding has occurred repeatedly over a ten-year period. The site is stable and has diversity that was not previously present at the site. Further detail on implementation of the WMRP is provided in <b>Error! Reference source not found.</b></p> <p>Whilst the five-year BBWRP has lapsed, MI remain committed to ongoing biodiversity management of the Project. Ongoing management of the site is now funded under MI's operational budgets.</p> <p>MI are not comfortable releasing financial details in a publicly available management plan. MI are of the opinion that the success of the management plan is better driven by performance goals and commitments, rather than a hard financial statement.</p>	<p>No change to development.</p> <p>No additional environmental impact.</p>	<p><del>iii) a financial commitment to undertake the works required by this Plan. and for the ongoing management of the Wetland area. Following implementation of the approved Plan the Applicant will continue to make the Wetland area within the Project available to conservation, carbon sequestration or biodiversity enhancement Projects funded internally or externally where they meet the general objectives of the implemented Plan.</del> Following implementation of the Plan the Applicant will continue to take actions that manage and aim to conserve biodiversity values within the operational needs of the Project and any legally binding agreements. The Applicant will continue to manage and control priority weeds, exclude livestock and facilitate increased structure and diversity for natural systems in and around the Project.</p>

Condition of Consent	Proposed Action	Justification	S4.55 considerations	Proposed modification
<p><b>6.5(d) vii)</b> procedures for the management of salt and nutrient accretion</p>	<p>Modify wording</p>	<p>Salt and nutrient accretion or accumulation has not been observed during the operation of the Project over the last 13 years. Flooding, routine filling and drainage work has been undertaken to minimise the accumulation of salt at the Project.</p> <p>MI actively monitor and manage water use, water application and groundwater levels across the MIA. This program has reduced accessions to groundwater and lowered the water table in the MIA. As an outcome of lowering shallow ground water levels the risk of salt and nutrient accumulation and accretion has been greatly reduced.</p> <p>In addition, on farm management of residual crop water has resulted in less discharge of water from farms that may have had elevated levels of salt and nutrients. This has further reduced the potential of salt and nutrient accumulation and accretion at BBSW. MI monitor their built assets at BBSW for functionality including corrosion and accretions. To date following 13 years of operation the built structures shown no signs of any accretions on either concrete or metal structures.</p>	<p>No change to development.</p> <p>No additional environmental impact.</p>	<p>6.5(d) vii) <b>develop</b> procedures for the management of salt and nutrient accretion <b>where monitoring establishes evidence of accretions on soils or structures requiring corrective action.</b></p>
<p><b>6.5 e) a Flood Management Plan</b> to outline the proposed management of flood waters in the development area. The Plan shall be prepared in consultation with Griffith City Council and the Department's Murray-Murrumbidgee Office, and is to include, but not necessarily limited to:</p> <ol style="list-style-type: none"> <li>i. measures to monitor the flood behaviour in the development area following the completion of construction activities. This information is to be used to update water balance models;</li> <li>ii. a program for the assessment of the water requirements of the Lower Mirrool Creek floodway to ensure that the Barren Box Swamp Project does not have a negative impact on this wetland system;</li> <li>iii. procedures for the release of flood waters from Barren Box Swamp to the floodway;</li> <li>iv. revised operational levels for flood mitigation in Barren Box Swamp;</li> <li>v. details of contingency measures should impacts be identified; and</li> <li>vi. evidence of consultations with relevant landowners.</li> </ol>				
<p><b>6.5 e) ii)</b> a program for the assessment of the water requirements of the Lower Mirrool Creek floodway to ensure that the Barren Box Swamp Project does not have a negative impact on this wetland system.</p>	<p>Fully remove condition 6.5 e) ii)</p>	<p>MI is not a flood authority and during flood events, can only take direction from flood authorities, and provide input based on operational knowledge of the MIA irrigation system. Councils (Griffith and Carrathool) are the flood authorities of relevance for the LMCF and the Project. MI have operational protocols in place to respond to:</p> <ul style="list-style-type: none"> <li>• its license requirements to manage flows for quality and quantity below the project, and</li> <li>• the directives of Flood Authorities (the Councils).</li> </ul> <p>Following construction of the Project there were major flood events in 2012 and 2016. Based on these real-life events it is now apparent that flood management, as directed by others, leads to flows in the LMCF. Normal years and drought years see negligible natural flows in LMCF. In drought or flood, flows are dictated by forces other than MI.</p> <p>Further, the lack of historic data, the episodic nature of climate and the current variability induced by climate change minimise the ability for an assessment of water requirements for the LMCF to remain current and valid.</p> <p>Comparative assessment of the wetland between its natural and future state will be difficult as the time zero condition was not previously assessed. Additionally, numerous structures and improvement including public assets such as roads have fundamentally affected the pattern of flood behaviour in the LMCF.</p>	<p>No change to development.</p> <p>Continuation of current practices will not result in additional environmental impact.</p>	<p><del>6.5 e) ii) a program for the assessment of the water requirements of the Lower Mirrool Creek floodway to ensure that the Barren Box Swamp Project does not have a negative impact on this wetland system;</del></p>

Condition of Consent	Proposed Action	Justification	S4.55 considerations	Proposed modification
<p><b>6.6</b> Within three years of the commencement of this consent, and at least every three years thereafter, the Applicant shall undertake a formal review of the Operation Environmental Management Plan (OEMP) required under condition 6.4 of this consent. The review shall ensure that the OEMP is up to date and all changes to procedures and practices since the previous review have been fully incorporated into the OEMP. The Applicant shall notify the Director-General, Council and the EPA of the completion of each review and shall supply a copy of the updated OEMP to those parties on request. The Applicant shall, subject to confidentiality, also make any revised OEMP available for public inspection on request.</p>				
6.6 as above	Remove or reword the condition to reflect BBSW management's inclusion in MI's overall management systems.	The ongoing operational management of the Project forms part of the overall management systems of the MIA. A subsidiary BBSW specific management plan addresses operational requirements unique to the BBSW. A standalone OEMP adds little value and creates complexity that serves little purpose. Other complex infrastructure providers do not have standalone OEMPs for individual components of the infrastructure managed.	No change to development. No additional environmental impact.	<p>6.6 a) Within three years of the commencement of this consent, <del>and at least every three years thereafter,</del> the Applicant shall undertake a formal review of the Operation Environmental Management Plan (OEMP) required under condition 6.4 of this consent. The review shall ensure that the OEMP is up to date and all changes to procedures and practices since the previous review have been fully incorporated into the OEMP.</p> <p>b) Following commissioning of the Project, the applicant is to notify the Director General, Council and the EPA of how and when the requirements of the OEMP have been integrated into the applicant's management system and procedures. <del>The Applicant shall notify the Director-General, Council and the EPA of the completion of each review and shall supply a copy of the updated OEMP to those parties on request.</del> The Applicant shall, subject to confidentiality, also make <del>the notification any revised OEMP</del> available to relevant agencies on request.</p>

Condition of Consent	Proposed Action	Justification	S4.55 considerations	Proposed modification
<b>Annual Performance Reporting</b>				
7.4 The Applicant must, throughout the life of the development, prepare and submit for the approval of the Director-General, an Annual Environmental Management Report (AEMR). The AEMR shall review the performance of the development against the Operation Environmental Management Plan (refer to condition 6.4 of this consent), the conditions of this consent and other licences and approvals relating to the development. The AEMR shall include, but not necessarily be limited to:				
<ul style="list-style-type: none"> <li>a) details of compliance with the conditions of this consent;</li> <li>b) a copy of the Complaints Register (refer to condition 5.3 of this consent) for the preceding twelve month period (exclusive of personal details), and details of how these complaints were addressed and resolved. This must include details of any environmental surplus flow related complaints;</li> <li>c) a comparison of the environmental impacts and performance of the development against the environmental impacts and performance predicted in the EIS and the additional information listed under condition 1.1;</li> <li>d) results of all environmental monitoring required under this consent and other approvals, including interpretations and discussion by a suitably qualified person;</li> <li>e) a list of all occasions in the preceding twelve-month period when environmental performance goals for the development have not been achieved, indicating the reason for failure to meet the goals and the action taken to prevent recurrence of that type of incident;</li> <li>f) demonstration and documentary evidence that a minimum average of 20,000 Megalitres of water savings have been made for the twelve month period, including evidence that the water savings have been returned to Water for Rivers. Should a minimum average of 20,000 Megalitres of water savings not be achieved for the reporting period, the Applicant shall provide detailed justification as to why the level of savings was not made;</li> <li>g) details of the total volume of water savings that have been made for the reporting period;</li> <li>h) details of the health of the Lower Mirrool Creek Floodway Wetland System. This is to include details of the condition of vegetation, duration and extent of inundation and quality of the water discharged through the system;</li> <li>i) details of any deliberate releases (refer to Condition 6.5d) xv);</li> <li>j) outline the number of occasions and estimate of water volume that was made available as off-allocation / environmental surplus flow water to licence holders in Barren Box, Mirrool Creek and the Wah Wah District for the 12 month period;</li> <li>k) identification of trends in monitoring data over the life of the development to date;</li> <li>l) a list of variations obtained to approvals applicable to the development and to the site during the preceding twelve-month period; and</li> <li>m) environmental management targets and strategies for the following twelve-month period, taking into account identified trends in monitoring results.</li> </ul>				
<b>7.4 c)</b> a comparison of the environmental impacts and performance of the development against the environmental impacts and performance predicted in the EIS and the additional information listed under condition 1.1.	Remove requirement to report against the predictions made in the EIS.  Reword to ensure MI reports against requirements for licenses and approvals for NSW Water and EPA.	The AEMR presents reportable information for the whole MIA system across multiple agency requirements. Currently the report provides a range of information on core operations and compliance to address approvals and assess the performance of the system.  Water savings, improvements in water use efficiency and a drying climate have led to a reduced need to recycle water through the Project and use the wetlands for same. This scenario was not predicted or anticipated by the EIS or approval. As such reporting against the base predictions in the EIS may misrepresent the project and the role it plays.	No change to development.  No additional environmental impact.	<del>c)-a comparison of the environmental impacts and performance of the development against the environmental impacts and performance predicted in the EIS and the additional information listed under condition 1.1.</del> <a href="#">details of BBSW performance against NSW Water and EPA licence/approval requirements.</a>
<b>7.4 d)</b> Results of all environmental monitoring required under this consent and other approvals, including interpretations and discussion by a suitably qualified person.	Modify wording	It is proposed to modify this element to make the results reported more relevant whilst including all current licence and approvals requirements.	No change to development.  No additional environmental impact.	7.4 d) Results of all environmental monitoring <a href="#">currently</a> required <a href="#">where relevant</a> to the <a href="#">EPL and WM Act licence</a> , including interpretations and discussion by a suitably qualified person.

Condition of Consent	Proposed Action	Justification	S4.55 considerations	Proposed modification
<p><b>7.4 h)</b> Details of the health of the Lower Mirrool Creek Floodway Wetland System. This is to include details of the condition of vegetation, duration and extent of inundation and quality of the water discharged through the system.</p>	<p>Fully remove consent condition.</p>	<p>Water released from the Project via the Mirrool Creek Floodway is required to be monitored by MI under their EPL4651. This information, when collected, is provided on MI's website and reported in Annual Compliance Reports to EPA and NRAR.</p> <p>This condition has little value and is impractical to implement as it is beyond MI to manage or influence the health of the system due to the following.</p> <ul style="list-style-type: none"> <li>• The Lower Mirrool Creek Floodway is privately owned land,</li> <li>• The health of the system is dependent on many factors including flooding and landholder management that are beyond MI's management.</li> </ul> <p>Natural flows in the LMCF are episodic in nature and are driven largely by flooding generated in the upper Mirrool Creek catchment. The health of the system is dependent on many factors including climatic variability and landholder management. As a consequence, a compendium of issues that might affect the health of the wetlands are beyond the management of MI.</p> <p>The LMCF is on privately owned land and is a complex hydrologic system limiting the ability of meaningful monitoring. The management of the Lower Mirrool Creek Floodway Wetland System is largely a government and private land-owners responsibility. The Project is largely unable to impede flood flows except for the smallest events. Irrespective of ownership MI has no role in the management of flood flows or land use in the LMCF and wetlands. As such, it is beyond MI to manage or influence the health of the system.</p> <p>MI have the ability and are fully prepared to facilitate environmental flows to the LMCF if requested by the Regulators.</p>	<p>No change to development. No additional environmental impact.</p>	<p><del>7.4 h)</del> <del>Details of the health of the Lower Mirrool Creek Floodway Wetland System. This is to include details of the condition of vegetation, duration and extent of inundation and quality of the water discharged through the system.</del></p>
<p><b>7.4 k)</b> Identification of trends in monitoring data over the life of the development to date.</p>	<p>Remove consent condition.</p>	<p>MI trend analysis of the entire MIA and MI system provides a perspective over and above the Project. On its own this requirement provides little value whilst being an administrative burden. As such is it proposed to remove the element (k) from consent.</p>	<p>No change to development. No additional environmental impact.</p>	<p><del>7.4 k)</del> <del>Identification of trends in monitoring data over the life of the development to date.</del></p>

## 4. Community and Stakeholder Engagement

The following consultation was undertaken to support this Modification Application.

### 4.1 Department of Planning, Industry and Environment (DPIE)

A letter of intent to lodge a Modification was submitted to DPIE on 3 February 2021.

A meeting was held with DPIE to discuss the modification on 26 March 2021.

Key discussion included:

- Transitional arrangements for Part 3A projects no longer apply and appropriate to assess under the current SSD pathway being 4.55 of the EP&A Act.
- In general support for minor modification.

Key issues/outcomes were:

- Further consultation with agencies and landholders to inform and be considered in assessment report.

### 4.2 Agency and landowners consultation

Two consultation streams were implemented based on likely issues of concern to stakeholders.

A wetland stream provided information and requested input into modifying the following conditions of consent relating to wetland management and environmental reporting:

- 6.5 d) Wetland Rehabilitation and Management Plan
- 6.6 Operational Environmental Management Plan
- 7.4 Annual Performance Reporting

Adjacent landholders and agencies for the wetland stream were identified for consultation based on their involvement in establishing the Wetland Rehabilitation and Management Plan.

A flooding stream provided information and requested input into modifying the following conditions of consent relating to flood management:

- 6.6 Operational Environmental Management Plan
- 6.5 e) Flood Management Plan
- 7.4 Annual Performance Reporting

Griffith City Council, Carrathool Shire Council and DPIE BCD were consulted based on their responsibilities for flooding.

Copies of correspondence are included in Appendix **Error! Reference source not found.** (Note: copies of private landholder correspondence with contact and address information is not included for privacy reasons). Correspondence was distributed via mail and email.

Responses were received as outlined in Table 4-1 and discussed in the following sub sections, with copies of responses included in Appendix **Error! Reference source not found.**

Table 4-1 Entities consulted and responses received

Entity	Stream(s)	Response received
DPIE - BCD	Wetland and Flooding	2 July 2021 23 July 2021
DPIE - DPI Fisheries	Wetland	7 June 2021 22 June 2021
DPIE – NSW EPA	Wetland	7 June 2021
Griffith City Council	Wetland and Flooding	8 July 2021
Carrathool Shire Council	Flooding	27 July 2021
Griffith Local Aboriginal Land Council	Wetland	No
Scottmore	Wetland	No
S H Morel	Wetland	No
J L Zanatta & J A Zanatta	Wetland	No
B Brombal & G Brombal	Wetland	No
J L Zanatta & J A Zanatta	Wetland	No
F A Temporalis & F Temporalis	Wetland	No
F & Fa Temporalis Pty Ltd	Wetland	No
Dajarra Farming Pty Ltd	Wetland	No
Benscrape Pty Ltd Atf Tingha Unit Trust	Wetland	No
Australian Frozen Foods Pty Ltd	Wetland	No
Stahmann Property Pty Ltd	Wetland	6 June 2021

#### 4.2.1 Adjoining Landowners

Stahmann Property Pty Ltd queried potential impacts to their organisation and land, with no further input provided following return emails and phone messages from NGH.

No responses were received from other landholders. Where emails were returned as undeliverable, phone contact was made to confirm receipt of the correspondence and return contact details.

#### 4.2.2 DPIE – BCD

BCD provided detailed comments regarding wetland consultation on 6 July 2021. These are provided in Table 4-2 with comments regarding applicability to the proposed modification.

Table 4-2 BCD Response and discussion

BCD response	Discussion
We do not support the amendments proposed in the position paper.	Acknowledged

BCD response	Discussion
<p>We do not agree that the Operational Environmental Management Plan is redundant. The applicant should provide evidence that the OEMP has been reviewed every three years and that those reviews demonstrate the redundancy of the OEMP. We recommend an assessment of whether the OEMP has been effective, how its effect might be improved, what resources and information has become available since consent that make the OEMP more effective, and evidence that assimilating the OEMP into the wider MI EMS is beneficial to all stakeholders.</p>	<p>MI will continue to implement the focus of the existing management plan and has documented processes and procedures in place to manage environmental performance. The requirements to manage BBSW will continue to be incorporated in those procedures.</p> <p>MI will continue to consult with relevant stakeholders on specific matters arising.</p>
<p>We are not aware of published findings about the ecological response to the implementation of the Barren Box Swamp Wetland Rehabilitation Plan 2009-14 in the third cell. We recommend the applicant provide empirical evidence of those findings.</p>	<p>No outcomes previously published.</p> <p>MI have recently prepared a short report on the success of the BBSW wetland rehabilitation plan for the ephemeral wetland cell. This is included in <b>Error! Reference source not found.</b></p>
<p>We encourage the applicant to disclose the biodiversity works that are proposed for the site, including costs and anticipated environmental outcomes.</p>	<p>Wetland rehabilitation has been undertaken (refer <b>Error! Reference source not found.</b>) as per the rehabilitation Plan. MI will continue to complete weed and pest management and protect and enhance the ecological values in the ephemeral wetland.</p>
<p>We consider it inappropriate to remove the requirement to provide detail of procedures to manage salt and nutrient accretion. We would encourage the applicant to disclose the observed events and associated data</p>	<p>MI have participated in NSW programs to reduce the effects of irrigation driven salinity. Procedures to reduce accessions to water tables have reduced the risk of elevated shallow ground water tables. MI monitoring of BBWS indicate that salt and nutrient accretion has not been observed.</p> <p>MI undertake regular asset inspections, water quality monitoring and maintain an asset register and water quality data set. If required procedures will be developed to address issues if they arise in accordance with MI quality systems.</p> <p>A summary of historical EC, P and N water quality monitoring data is provided in <b>Error! Reference source not found.</b></p>

BCD response	Discussion
<p>We see no evidence that the reduced use of the wetland can be attributed to a drying climate or the operation of the facility. We encourage the applicant to disclose any data that demonstrates that effect including the interaction of inflows, irrigation allocations and delivery to customers, any changes to wetland operation, evaporative losses and any other empirical evidence to substantiate that claim.</p>	<p>The project has contributed 20,000ML / annually to environmental flows as required by the consent.</p> <p>On farm management in the MIA has reduced drainage water discharge to the MIA system and therefore BBS. Predicted and actual flows past BBS are shown in <b>Error! Reference source not found.</b></p> <p>Supply management has reduced losses in the system.</p> <p>MI has recouped 60,000ML/ year for the environment through efficiency gains supported and audited by the Federal Government.</p> <p>Allocations have decreased over time as a result of reduced rainfall in the catchment.</p> <p>Wetland watering at BBS has been completed as planned.</p>
<p>We agree that the performance indicators of the OEMP need to be updated. We note that the Annual Environmental Management Report (AEMR) is retained under the proposed amendment. This is appropriate given the reformed legislative framework for the conservation of biodiversity generally.</p>	<p>Additional reporting will not add meaningful value to management.</p> <p>Reporting to the EPA and Water NSW/NRAR is the NSW benchmark to manage impacts.</p> <p>Revised EMP will document how reporting is undertaken.</p>
<p>We maintain that the health of the Lower Mirrool Creek is affected by the management of the Barren Box Swamp project. We do not support any proposal to remove the requirement to monitor and report on the health of the Lower Mirrool Creek.</p>	<p>Predicted and actual flows past BBSW are provided in <b>Error! Reference source not found.</b></p> <p>MI are not the land manager for the LMCF and BBSW does not restrict flows to the downstream LMCF. The LMCF has been used for agriculture for 150 years. MI will if requested by the relevant authority, and funded, provide environmental flows for the LMCF.</p>
<p>We do not agree that the monitoring of the MIA and the MI system as a single aggregated operation sufficiently reflects the way the BBS system is operated.</p>	<p>BBS is a component of the overall system. The MIA monitoring system is a complex multipoint system that includes monitoring of BBSW, with the resultant data influencing the operation of the BBSW and integrated MIA system.</p>

BCD response	Discussion
The 2005 consent does not provide for the clearing of native vegetation associated with the operation and maintenance of the project. Griffith City Council has a duty to ensure that any proposal to remove native vegetation is assessed consistent with Part 7 of the <i>Biodiversity Conservation Act 2016</i> before it occurs. MI must seek approval for any clearing ancillary to the proposed modification and implementation of the OEMP including the Barren Box Swamp Wetland Rehabilitation Plan.	<p>Noted.</p> <p>MI has been planting native vegetation at BBSW for the past 15 years.</p> <p>MI have not removed any native woody vegetation at BBS in the last 15 years.</p>

NGH (Les Seddon) discussed the emailed feedback with BCD (Marcus Wright) via telephone on 9 July 2021 and 23 July 2021. Discussions focussed on the following:

- Wetland rehabilitation working group have had little update on the wetland (Wetland Cell) rehabilitation implementation or outcomes.
- Concern amongst wetland and LMCF stakeholders and/or interest groups over lack of clear understanding of the operations of the BBSW and interactions with LMCF.
- Support for engagement and consultation on wetland rehabilitation and general BBSW operations, particularly around flooding responses, offtakes at and releases/diversions at BBWS and environmental flows to LMCF.
- Concerns over transparency around OEMP and compliance with conditions of consent.
- Desire for meaningful engagement and relationship amongst stakeholders and benefits of resulting 'social licence'.

In consideration of these discussions MI has subsequently:

- Undertaken a brief BBWS vegetation inspection and rehabilitation plan implementation snapshot. This is included in **Error! Reference source not found.**

Offered, in accordance with prevailing COVID restrictions, to take BCD stakeholders on a site tour of BBWS to discuss current biodiversity, rehabilitation implementation, current management practices and operation of the BBWS. It is also noted that annual compliance reports are publicly available on the MI website. Historical annual reports before those available on the website are available to agencies on request.

On 27 July 2021 BCD also responded to flood consultation including:

- Noted awareness of a range of issues on the Mirrool Creek Floodplain downstream of the Barren Box Wetland and Storage complex, involving landholders, water users and Carrathool Shire Council.
- Highlighted the importance of maintaining open dialogue and transparency with these groups, especially with regard to the development and implementation of the proposed flood operating protocols for Barren Box Storage.
- Acknowledged floodplain management is primarily the responsibility of Council, with all stakeholders having some role to play. Noted MI own and operate most of the

infrastructure, and that involves an obligation to be transparent and collaborative with other stakeholders.

- Recommended that any future review of the Project OEMP includes consideration of the operation of BBWS during major floods in Mirrool Creek to minimise impacts similar to what occurred in March 2012. This Flood Operating Protocol should be developed in consultation with Griffith City Council, Carrathool Shire Council and the NSW State Emergency Services.

#### **4.2.3 DPE – Fisheries**

Confirmed via return email 22 June 2021 no objections to proposed modifications.

#### **4.2.4 EPA**

Confirmed, via email 7 July 2021, that DPE would respond through the DPE regional southwest office.

#### **4.2.5 Griffith City Council**

Griffith City Council response, via email 8 July 2021, included:

- No issue with the proposed modification to move away from the OEMP to the overall MIA EMS.
- Noted Council has been working with MI, especially since 2012 March flood, to manage floods within our LGA, and we will continue to do so in the future.
- In relation to the water requirements to the Lower Mirrool Creek Floodway, Council:
  - will be happy to work with MI and Carrathool Shire Council to manage flood release from the Barren Box Storage site during any flood event.
  - are not in a position to suggest what should be the minimal discharge from the storage site during normal years and drought years to maintain the health of the floodway system and suggest to contact NSW Water/DPE/NRAR, EPA etc. for their comments.
- No issue with the proposed modifications to environmental reporting and suggested NSW Water/DPE/NRAR, EPA be contacted regarding Condition 7.4 h)

#### **4.2.6 Carrathool Shire Council**

Council responded verbally by phone 23 July 2021 with Les Seddon (NGH) to advise:

- No issues or concerns with flood plain management.
- Each flood is different and Council and MI have worked together well
- Some challenges with diverse stakeholder input to flood response
- Hillston Flood Study is being reviewed (and discussions have taken place with MI)
- Community doesn't always understand how flood decisions are made and release communications could be improved.

#### **4.2.7 Griffith Local Aboriginal Land Council**

Follow up phone calls and queries were made to Griffith Local Aboriginal Land Council (LALC) without establishing contact.

## 5. Impacts of Proposed Modification

Environmental impacts were assessed within the EIS (and where relevant, with the Submissions Report, additional information and Amendment Report) completed for the approved Project.

A review of the proposed modifications against the environmental aspects covered in the EIS is provided in Table 5-1. The review is commensurate with the negligible projected impacts from the administrative changes. It is considered no predicted environmental impacts would result from the alterations to the Project reporting and administration.

Table 5-1 Review of proposed amendments against EIS environmental risks

Relevant EIS section	Aspect	Discussion	Net Change
11-1	Surface Hydrology and Flooding	<p>The proposed modifications involve removal of the need for assessment of the water requirements Lower Mirrool Creek floodway.</p> <p>No change is proposed to BBWS operating protocols or water releases and diversions dictated by licences, approvals or flood authorities that would change downstream impacts.</p> <p>As such, removal of the condition will not alter surface hydrology or flood impacts experienced at the site and its surroundings during flood events. MI would continue to manage flows for quality and quantity as per their licensing requirements.</p> <p>No additional mitigation measures are required.</p>	No net change
12-1	Water Quality	<p>The proposed modifications would remove the need for assessment of the water requirements of the Lower Mirrool Creek floodway and to provide detail of the health of the Lower Mirrool Creek Floodway Wetland System.</p> <p>Water released via the Mirrool Creek Floodway is required to be monitored by MI under their EPL4651. This information, when collected, is provided on their website and reported in their Annual Compliance Report to EPA and NRAR.</p> <p>In addition to this, the Lower Mirrool Creek Floodway is privately owned land, and therefore landholder management along with other factors dictates the health of the system.</p> <p>Removal of these conditions would not be detrimental to the health of the water system, as MI will still meet its obligations under EPL4651.</p> <p>No additional mitigation measures are required.</p>	No net change
13-1	Flora and Fauna	<p>The proposed modifications would not affect the viability or health of the flora and fauna within the Project site.</p> <p>The proposed modifications would remove the need for reporting on the health of the Lower Mirrool Creek Floodway Wetland System.</p> <p>Appropriate monitoring and reporting on the health of the LMCF has been beyond the ability of MI due to the</p>	No net change

Relevant EIS section	Aspect	Discussion	Net Change
		<p>complexity and scale of the LMCF and its private ownership and management.</p> <p>MI operates within appropriate licence and approval requirements for water quality and water management to protect downstream environments.</p> <p>Removing reporting requirements would not alter downstream impacts.</p> <p>No additional mitigation measures are required.</p>	
14-1	Groundwater	The proposed reporting modifications would not influence or change any groundwater impacts. No additional mitigation measures are required.	No net change
15-1	Geology, Soils and Geotechnical	The geology and soils of the Project would not be affected by the proposed modification and as such there will be no change to impacts. No additional mitigation measures are required.	No net change
16-1	Archaeology and Heritage	There are no historic heritage sites that would be affected by the proposed modification and as such there will be no change to impacts. No additional mitigation measures are required.	No net change
17-1	Social and Community	The proposed modifications do not relate to social and community and as such there will be no change to impacts. No additional mitigation measures are required.	No net change
18-1	Economic Implications	<p>The proposed modification of condition 6.4(d)iii regarding the requirement under the Wetland Rehabilitation and Management Plan for <i>details of the proposed financial commitment to undertake the works required by this Plan and for the ongoing management of the Wetland area</i> would not reduce or increase the monetary values of the operation of the Project as the modification relates to an administrative change in financial reporting.</p> <p>Additionally, the works referenced relate to implementation of the initial 5yr rehabilitation plan that has been completed.</p> <p>No additional mitigation measures are required.</p>	No net change
19-1	Noise	The proposed modifications do not relate to noise and as such there will be no change to impacts. No additional mitigation measures are required.	No net change
20-1	Traffic and Transportation	The proposed modifications do not relate to traffic and transportation and as such there will be no change to	No net change

Relevant EIS section	Aspect	Discussion	Net Change
		impacts. No additional mitigation measures are required.	
21-1	Land Use	The proposed modifications do not relate to land use and as such there will be no change to impacts. No additional mitigation measures are required.	No net change
22-1	Meteorology and Air Quality	The proposed modifications do not relate to meteorology and air quality and as such there will be no change to impacts. No additional mitigation measures are required.	No net change
23-1	Landscape and Visual	The proposed modifications do not relate to landscape and visual and as such there will be no change to impacts. No additional mitigation measures are required.	No net change
24-1	Hazard and Risk	The proposed modification of condition 6.5 e) iii) would involve removal of the requirement for assessment of the water requirements of the LMCF. As detailed in Section 3, MI is not a flood authority and has operational flood protocols based on taking guidance and direction from flood authorities (Griffith Council and Carrathool Council) during flooding events. Not assessing the water requirements of LMCF would not present an increased risk during operation of the Project. No additional mitigation measures are required.	No net change
25-1	Energy	The proposed modifications do not relate to energy and as such there will be no change to impacts. No additional mitigation measures are required.	No net change
26-1	Waste and its Management	The proposed modifications do not relate to waste and its management and as such there will be no change to impacts. No additional mitigation measures are required.	No net change
27-1	Cumulative Impacts	The proposed modifications suggest administrative changes, as well as the removal of the requirement for assessment of downstream water requirements now governed by EPL and water licencing a flood management plan and assessment of water quality downstream of the Project. Therefore, the modifications would not generate any cumulative impacts.	No net change

## **6. Conclusion**

The BBS Consent was obtained in June 2005.

A number of alterations to administration and reporting conditions are requested so that they are more relevant to the responsibilities of MI and reflect the performance of MI.

Apart from reporting there are no operational changes to the Project that would result in on ground changes. Operation and environmental performance will still be regulated by the remaining consent conditions as well as, and importantly, EPL and water licences that have been established post the original consents.

The Project is not altered and will remain substantially the same. The modifications will not create a change to the environmental impacts of the Project.

The proposed modifications will more fully reflect the current operating environment, the needs of the Project and the tested abilities of the Project to deliver services in the MIA.

# Appendix A Conditions of Consent

505/2718



Department of  
**Infrastructure, Planning and Natural Resources**

16 June 2005

Contact: Chris Ritchie  
Phone: 02 9228 6413  
Fax: 02 9228 6466  
Email: [chris.ritchie@dipnr.nsw.gov.au](mailto:chris.ritchie@dipnr.nsw.gov.au)

Mr Rob Kelly  
Environmental Coordinator  
Murrumbidgee Irrigation Limited  
PO Box 492  
GRIFFITH NSW 2680

Our ref: S03/02569  
Your ref:

Dear Mr Kelly

**Notice of Determination – Development Application (DA-101-4-2004-i)  
Barren Box Swamp Project – Griffith Local Government Area**

The Minister for Infrastructure and Planning, the Hon Craig Knowles MP, approved the Development Application (DA) for the Barren Box Swamp Project on 10 June 2005, subject to conditions.

Please find enclosed a copy of the conditions of consent for the development application.

You may view a copy of the Minister's approval, including the conditions he has imposed on the development, at:

- Department's Information Centre (20 Lee Street, Sydney);  
**Note:** The Department's Information Centre will be re-located to the Department's Head Office at 23-33 Bridge Street from 27 June 2005.
- Griffith City Council (1 Benerambah Street, Griffith).

You may view a copy of the Department's Assessment report shortly on the Department's website ([www.dipnr.nsw.gov.au](http://www.dipnr.nsw.gov.au)).

I have also attached an information sheet that details those matters required to be notified under the *Environmental Planning and Assessment Act 1979* (the Act).

If you have any questions about the consent, please contact me on 02 9228 6413.

Yours sincerely

Chris Ritchie  
Senior Environmental Planner  
Major Development Assessment

16/6/05

## DEPARTMENT OF INFRASTRUCTURE, PLANNING AND NATURAL RESOURCES

## NOTICE OF DETERMINATION OF A DEVELOPMENT APPLICATION

<i>Title and reference number of the development.</i>	Barren Box Swamp Project – DA No. DA-101-4-2004-i
<i>Name of Applicant.</i>	Murrumbidgee Irrigation Limited
<i>The date on which consent has been granted or refused?</i>	Consent granted on 10 June 2005.
<i>Was consent subject to conditions?</i>	Yes.
<i>Reasons for the imposition of conditions.</i>	To provide a framework for the delivery of water savings generated by the proposed development for environmental flows, establish a program for the rehabilitation of part of Barren Box Swamp to a more natural ephemeral wetland system, to minimise any adverse environmental impacts and provide for on-going environmental and safety management and regular monitoring and reporting on the development.
<i>The date from which the consent operates.</i>	The Applicant must not act on the consent until 28 days after notification of the Minister's determination (this letter). If an appeal is lodged with the Land and Environment Court, the Applicant must not act on the consent until the appeal has been resolved, unless the Court determines to refuse the development application.
<i>The date from which the consent lapses.</i>	If the Applicant has not physically commenced work permitted by the consent within 5 years of the consent becoming operative (refer above), the consent will lapse.
<i>Was a public inquiry under s.119 of the EP&amp;A Act held?</i>	No.
<i>Which NSW Government Agencies gave General Terms of Approval as part of the consent?</i>	<ul style="list-style-type: none"> <li>• Department of Environment and Conservation; and</li> <li>• Department of Infrastructure, Planning and Natural Resources.</li> </ul>
<i>Does the EP&amp;A Act give rights of appeal to the applicant?</i>	Under Section 97 of the <i>Environmental Planning and Assessment Act, 1979</i> (the Act), the Applicant, if dissatisfied with the determination of the consent authority, has a right of appeal to the Land and Environment Court exercisable within 12 months after receipt of the notice of determination (this letter).
<i>Does the EP&amp;A Act give rights of appeal to an objector?</i>	Yes. Under Section 98 of the Act, any person who made a written objection to the development during the submission period has a right of appeal to the Land and Environment Court. If an objector is dissatisfied with the Minister's determination, he/she may appeal to the Land and Environment Court within 28 days of being notified of the Minister's determination.
<i>Where can I inspect the conditions of consent?</i>	Department's Information Centre and website – <a href="http://www.dipnr.nsw.gov.au">www.dipnr.nsw.gov.au</a> (Assessing development proposals / notices of determination) and Griffith Shire Council.

**DETERMINATION OF A DEVELOPMENT APPLICATION FOR STATE SIGNIFICANT,  
DESIGNATED AND INTEGRATED DEVELOPMENT UNDER SECTION 80 OF  
THE ENVIRONMENTAL PLANNING AND ASSESSMENT ACT, 1979**

I, the Minister for Infrastructure and Planning, under Section 80 of the *Environmental Planning and Assessment Act 1979* ("the Act"), determine the development application ("the Application") referred to in Schedule 1 by granting development consent subject to the conditions set out in Schedule 2.

The reason for the imposition of conditions is to:

- a) provide a framework for the delivery of water savings generated by the proposed development to be used for environmental flows;
- b) establish a program for the rehabilitation of part of Barren Box Swamp to a more natural ephemeral wetland system;
- c) minimise any adverse environmental impacts associated with the development;
- d) provide for the on-going environmental management of the development; and
- e) provide for regular monitoring and reporting on the development.

  
Craig Knowles MP  
Minister for Infrastructure and Planning

Sydney,

10/1  
2005

File No. S03/02569

**SCHEDULE 1**

- Application made by:** Murrumbidgee Irrigation Pty Ltd ("the Applicant");
- To:** The Minister for Infrastructure and Planning ("the Minister");
- In respect of:** Part of Lot 2 DP 788532, Lot 1 DP 433132, Lot 53 DP 756062 and Lot 90 DP 751686, and map reference numbers 2896-3060, 2086-3060;
- For the following:** The construction and operation of the Barren Box Swamp Project "the development" as part of the operation of an integrated irrigation scheme within the Murrumbidgee Irrigation Area, and including:
- the splitting of the Barren Box Swamp into three distinct cells;
  - an active storage cell covering 1,230 hectares with a storage volume of 24,000ML at full supply level (30% of the current Swamp storage volume);
  - an intermediate storage cell covering 320 hectares with an effective storage volume of 4,000ML (10% of the current storage volume);

- the restoration of a more natural flooding regime to the remaining 1,500 hectare area of the cell for the purposes of rehabilitating this area as an ephemeral wetland;
- widening of the Wah Wah main channel;
- construction and use of a 2,500 ML En-route storage facility on Mirrool Creek, which is located upstream of Barren Box Swamp.

**Development Application:**

Integrated DA No. DA-101-4-2004-i, lodged with the Department of Infrastructure, Planning and Natural Resources as an amended DA on 13 December 2004, accompanied by *Amended Environmental Impact Statement: Barren Box Swamp Project, NSW*, Volumes One, Two and Three prepared by URS Australia Pty Ltd and dated December 2004;

**State Significant Development:**

Under section 76A(7) of the Act, the proposed development is classified as State significant development by virtue of a specific declaration made by the Minister for Infrastructure and Planning on 7 April 2004 under the *Environmental Planning and Assessment Act 1979*.

**Note:**

- 1) To ascertain the date upon which this consent becomes effective, refer to section 83 of the Act.
- 2) To ascertain the date upon which this consent is liable to lapse, refer to section 95 of the Act.
- 3) If the Applicant is dissatisfied with this determination, section 97 of the Act grants him or her a right of appeal to the Land and Environment Court, which is exercisable within 12 months of receiving notice of this determination.

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**SCHEDULE 2**

In this consent, except in so far as the context or subject-matter otherwise indicates or requires, the following terms have the meanings indicated:

Act	<i>Environmental Planning and Assessment Act, 1979</i>
AEMR	Annual Environmental Management Report
Applicant	Murrumbidgee Irrigation Pty Ltd
construction	any activity requiring a Construction Certificate, significant excavation work, road works, demolition, or any construction related activity as described in DA-101-4-2004-i. This shall include construction works associated with Barren Box Swamp, the Wah Wah main and the En-route Storage Facility
Council	Griffith City Council
Department	NSW Department of Infrastructure, Planning and Natural Resources
DEC	NSW Department of Environment and Conservation (incorporating the EPA and former National Parks and Wildlife Service)
development	the development as described in DA-101-4-2004-i, and all additional information submitted in support of that application. This includes the works associated with Barren Box Swamp, the Wah Wah main and the En-route Storage Facility
Director-General	Director-General of the NSW Department of Infrastructure, Planning and Natural Resources, or delegate
dust	any solid material that may become suspended in air
EPA	NSW Environment Protection Authority (part of the Department of Environment and Conservation)
EIS	<i>Amended Environmental Impact Statement: Barren Box Swamp Project, NSW, Volumes One, Two and Three prepared by URS Australia Pty Ltd and dated December 2004</i>
EPL	Environment Protection Licence issued under the <i>Protection of the Environment Operations Act, 1997</i>
$L_{Aeq}(15 \text{ minute})$	equivalent average sound pressure level that is measured over a 15 minute period
Minister	NSW Minister for Infrastructure and Planning, or delegate
operation	any activity that results in the use of the Barren Box Swamp Project as described in DA-101-4-2004-i, including the use of the Intermediate and Active Storage Areas of Barren Box Swamp, the enlarged Wah Wah Main and En-route storage facility for the purposes of capturing, storing or diverting water
Principal Certifying Authority	the Minister or an accredited certifier, appointed under section 109E of the Act, to issue a Part 4A Certificate as provided under section 109C of the Act
Regulation	<i>Environmental Planning and Assessment Regulation, 2000</i>
RTA	NSW Roads and Traffic Authority
site	the land to which this consent applies
water licence	Licence issued under the <i>Water Act 1912</i>

## GENERAL

### Scope of Development

- 1.1 The Applicant shall carry out the development generally in accordance with:
- a) Development Application No. DA-101-4-2004-i, lodged with the Department of Infrastructure, Planning and Natural Resources on 30 April 2004;
  - b) Amendment Development Application lodged with the Department of Infrastructure, Planning and Natural Resources on 8 December 2004;
  - c) *Environmental Impact Statement: Barren Box Swamp Project, Volumes One, Two and Three* prepared by URS Australia Pty Ltd and dated April 2004
  - d) *Amended Environmental Impact Statement: Barren Box Swamp Project, NSW, Volumes One, Two and Three* prepared by URS Australia Pty Ltd and dated December 2004;
  - e) *Submission Response Report – Barren Box Swamp Project*, prepared by URS Australia Pty Ltd and dated March 2005
  - f) Additional information supplied to the Department from the applicant dated 3 June 2004 in response to issues raised by the Department;
  - g) Additional information supplied to the Department from the applicant dated 22 June 2004 in response to issues raised by the Department;
  - h) Additional information supplied to the Department from the applicant dated 12 July 2004 in response to issues raised in submissions received by the Department;
  - i) Additional information supplied to the Department from the applicant dated 7 October 2004 in response to a request for clarification on the proposal by the Department;
  - j) Additional information supplied to the Department from URS Australia Pty Ltd dated 8 October 2004 in response to issues raised by the Department; and
  - k) the conditions of this consent.
- 1.2 In the event of an inconsistency between:
- a) the conditions of this consent and any documents listed from condition 1.1 a) to j) inclusive, the conditions of consent shall prevail to the extent of the inconsistency; and
  - b) any document listed from condition 1.1 a) to j) inclusive, the most recent document shall prevail to the extent of the inconsistency.

### Statutory Requirements

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

### Dispute Resolution

- 1.4 In the event that a dispute arises between the Applicant and Council or a public authority other than the Department, in relation to a specification or requirement applicable under this consent, the matter shall be referred by either party to the Director-General, or if not resolved, to the Minister, whose determination of the dispute shall be final and binding on all parties. For the purpose of this condition, "public authority" has the same meaning as provided under section 4 of the Act.

**Note:** Section 121 of the *Environmental Planning and Assessment Act 1979* provides mechanisms for resolution of disputes between the Department, the Director-General, councils and public authorities.

### Provision of Documents

- 1.5 Where practicable, the Applicant shall provide all documents and reports required to be submitted to the Director-General under this consent in an electronic format. Provision of

documents and reports to other parties, as required under this consent, shall be in a format acceptable to those parties and shall aim to minimise resource consumption.

- 1.6 Nothing in this consent prevents the Applicant from combining reporting requirements under this consent with identical or similar reporting requirements for submission to another relevant party. Reporting requirements shall only be combined with the prior agreement of the Director-General of the Department of Infrastructure, Planning and Natural Resources and the Director-General (or equivalent) of the other relevant party.

**Note:** The purpose of conditions 1.5 and 1.6 is to provide for minimisation of resource utilisation (particularly paper) associated with administration of this consent.

#### **Water Savings Agreement**

- 1.7 Prior to the commencement of any construction works, the Applicant shall provide suitable evidence, to the satisfaction of the Director-General, that Murrumbidgee Irrigation and a suitable partner have commenced negotiations for entering into an agreement concerning the arrangements for funding the development and the process for providing water savings generated by the development to be transferred to the suitable partner.
- 1.8 Prior to the commencement of operations, the Applicant shall provide suitable evidence that the agreement with the suitable partner referred to in Condition 1.7 above has been finalised and is in place, to the satisfaction of the Director-General.

#### **Annual Water Savings**

- 1.9 Every 12 months following the commencement of operations of the development, the Applicant shall demonstrate and provide documentary evidence that a minimum average of 20,000 Megalitres of water savings have been made, including evidence that the water savings have been returned to the suitable partner referred to in conditions 1.7 and 1.8 above, to the satisfaction of the Director-General.

Should a minimum average of 20,000 Megalitres of water savings not be achieved for a 12 month period, the Applicant shall provide detailed justification to the satisfaction of the Director-General, as to why the level of savings was not made.

**Note:** Condition 7.4 of this development consent (the Annual Environmental Management Report) also requires the Applicant to report on meeting a minimum average target of 20,000 Megalitres of water savings per year.

#### **Heads of Agreement**

- 1.10 Prior to the issue of a construction certificate or the commencement of any construction activities the subject of the consent, whichever is earlier, the Applicant shall as agreed:
- (i) purchase that part of Mr and Mrs Michael and Julieanne Keenan's (referred to in the DA and EIS as HR3) land in Barren Box Swamp up to the high water level zoned 7(W) Environment Protection – Wetlands under the *Griffith Local Environment Plan 2002*; and
  - (ii) convert Mr Michael and Julieanne Keenan's Licence 40SL046108 to a members contract with Murrumbidgee Irrigation.

This condition will be satisfied by the provision of appropriate evidence demonstrating the above has occurred to the satisfaction of the Director-General.

#### **Demolition**

- 1.11 The Applicant shall undertake all demolition work strictly in accordance with *AS 2601-1991 The Demolition of Structures*.

## 2. COMPLIANCE

- 2.1 The Applicant must put in place a management system, and take reasonable steps, to ensure that employees, contractors and sub-contractors are aware of, and comply with, the conditions of this consent relevant to their respective activities.
- 2.2 The Applicant shall be responsible for the works the subject of this consent and the environmental impacts that may result from those works, and shall put in place an environmental management system governing the conduct of all persons on the site, including contractors, subcontractors and visitors.
- 2.3 Prior to each of the events listed from a) to b) below, or within such period otherwise agreed by the Director-General, the Applicant shall certify in writing to the satisfaction of the Director-General, that it has complied with all conditions of this consent applicable prior to that event. Where an event is to be undertaken in stages, the Applicant may, subject to the agreement of the Director-General, stage the submission of compliance certification consistent with the staging of activities relating to that event.
- a) commencement of construction; and
  - b) commencement of operation.
- 2.4 Notwithstanding condition 2.3 of this consent, the Director-General may require an update report on compliance with all, or any part, of the conditions of this consent. Any such update shall meet the requirements of the Director-General and be submitted within such period as the Director-General may agree.
- 2.5 The Applicant must meet the requirements of the Director-General in respect of the implementation of any measure necessary to ensure compliance with the conditions of this consent, and general consistency with the documents listed under condition 1.1 of this consent. The Director-General may direct that such a measure be implemented in response to the information contained within any report, plan, correspondence or other document submitted in accordance with the conditions of this consent, within such time as the Director-General may agree.

## 3. ENVIRONMENTAL PERFORMANCE

### Air Quality Impacts

#### *Odour Emissions*

- 3.1 <sup>1</sup>The Applicant must not cause or permit the emission of offensive odour beyond the boundary of the premises

**Note:** No conditions in this consent identifies a potentially offensive odour for the purposes of section 129 of the POEO 1997.

#### *Air Quality Impacts*

- 3.2 <sup>2</sup>The Applicant shall ensure that all activities occurring at the premises are carried out in a manner that will minimise emissions of dust from the Barren Box Swamp construction impact zone, the En-route storage construction impact zone and the Wah Wah Enlargement construction impact zone.
- 3.3 <sup>3</sup>The Applicant must ensure that all trucks entering and leaving the Barren Box construction impact zone, the En-route storage construction impact zone or the Wah Wah Enlargement

<sup>1</sup> Incorporates an EPA General Term of Approval (L4.1 and L4.2)

<sup>2</sup> Incorporates an EPA General Term of Approval (O1.1)

<sup>3</sup> Incorporates an EPA General Term of Approval (O1.2)

construction impact zone that are carrying loads are covered at all times, except during loading and unloading.

- 3.4 All trafficable areas and vehicle manoeuvring areas on the site must be maintained in a condition that will minimise the generation or emission of wind blown or traffic generated air pollution from the site at all times.
- 3.5 <sup>4</sup>The Applicant shall ensure that there is no incineration or open burning of any material(s) within the Barren Box Swamp construction impact zone, the En-route storage construction impact zone, or the Wah Wah Enlargement construction impact zone.

### Surface Water Management

- 3.6 The Applicant must carry out the development in a manner that prevents and/ or minimises potential water pollution generated by the development from impacting on nearby watercourses.
- 3.7 <sup>5</sup>Except as may be expressly provided by a licence under the *Protection of the Environment Operations Act 1997* (POEO) in relation of the development, section 120 POEO Act must be complied with in and in connection with the carrying out of the development.
- 3.8 <sup>6</sup>The Applicant shall ensure that prior to commencing any works a 'works approval' is obtained in accordance with the *Water Management Act 2000* from the Department for the works associated with Barren Box Swamp, the En-route storage facility and the Wah Wah main.

**Note:** The reference to the Applicant under this consent has the same meaning as a works approval holder under the *Water Management Act 2000*.

- 3.9 Within two months of completing construction work permitted by the works approval, the Applicant shall provide the Department's Murray Murrumbidgee Office with the following:
- The location of the authorised works on the lot and Deposited Plan preferably using GPS references; and
  - Details and design of the work (including size, dimensions and capacity of the works).

This design shall not be altered except with the agreement of the Department's Murray Murrumbidgee Office. Any proposal to alter the location or design of the works shall be accompanied by sufficient information for the department to determine the effects of the alteration.

- 3.10 <sup>7</sup>If in the reasonable opinion of a Department officer, any work is being carried out in such a manner as it may damage or detrimentally affect the flow of water or the bed or bank stability of Mirrool Creek or Barren Box Swamp outside the scope of works detailed in the DA and Environmental Impact Statement, work shall cease immediately upon oral or written direction of the officer.
- 3.11 <sup>8</sup>If required by the Department, the extraction of water from the works in Mirrool Creek associated with Brays Dam must be recorded and reported as specified by the Department. For instance, the Department may require an annual return of information on hours pumped, extraction rate and volume, and water levels in Mirrool Creek prior to and during the pumping period.

<sup>4</sup> Incorporates an EPA GTA (O2.1)

<sup>5</sup> Incorporates an EPA GTA (L1.1)

<sup>6</sup> Incorporates a Department GTA

<sup>7</sup> Incorporates a Department GTA

<sup>8</sup> Incorporates a Department GTA

- 3.12 <sup>9</sup>Prior to the commencement of operation, the Applicant shall consult the Department's Murray Murrumbidgee Office of the operating protocols of the proposed works, such as trigger and cease to pumps levels in Mirrool Creek, maximum daily extraction and of any potential impacts on Mirrool Creek and consider any suggestions to modify the protocol to minimise potential impacts to the satisfaction of the Director-General. If during the operation of the development the Director-General considers that unforeseen impacts on water users, land holders or the environment has occurred as a direct result of the Applicant's operational protocol, the Director-General in consultation with the Applicant, may direct the Applicant to modify the works or their operation as considered necessary to alleviate or mitigate the impact to the satisfaction of the Director-General.
- 3.13 The Applicant shall ensure that reasonable access to off-allocation / environmental surplus flow in Mirrool Creek remains available to those irrigators who have a history of access, including the Wah Wah Irrigators.

**Note:** This condition reflects statements made in the Applicant's "Submission Response Report – Barren Box Swamp Project", prepared by URS Australia Pty Ltd and dated March 2005 that there will be no loss of entitlement or access to surplus water as a result of the proposed development.

#### **Groundwater Management**

- 3.14 <sup>10</sup>Prior to the commencement of operation of the Barren Box Swamp and En-route Storage facility, the Applicant shall prepare a **Groundwater Monitoring Program** to the satisfaction of the EPA. The Program shall meet the requirements of the EPA and include, but not necessarily be limited to:
- a) details of the procedures to identify any changes or adverse trends as a result of the proposed development;
  - b) parameters / pollutants to be monitored, including procedures and protocols for sampling and testing; and
  - c) A contingency plan to mitigate any groundwater level rises or salinity increases that arise from the development.
- 3.15 The Applicant shall ensure that the enlargement of the Wah Wah main channel and construction of the en-route storage (Brays Dam) are undertaken in such a manner to ensure that the floor and walls of the water storages are appropriately constructed to minimise the potential for leakage and salinisation of adjacent properties.
- 3.16 Prior to the commencement of construction, the Applicant shall undertake an EM-31 survey of the entire area of the Wah Wah main channel enlargement and Brays Dam (en-route storage) in order to identify potential areas of high permeability such as "prior stream beds". The Geotechnical Study submitted in the EIS indicated the presence of higher permeability sub-surface strata (such as sandy clays, sandy silts and silty sands) beneath the proposed storage area. The permeability variation at a finer scale will be more appropriately assessed through an EM-31 survey rather than the bore hole analysis undertaken and detailed in the EIS using a limited number of samples. The EM-31 survey will provide the applicant with defined target areas of high permeability that may require compaction and/or lining. This survey must include appropriate "ground truthing" to validate results obtained. The existing boreholes may be used for validation purposes.

The EM-31 survey and report interpreting the survey results and, if required, outlining proposed mitigative works, must be submitted to the satisfaction of the Department's Murray Murrumbidgee Regional Office as soon as possible after the survey has been completed to be reviewed.

<sup>9</sup> Incorporates a Department GTA

<sup>10</sup> Incorporates an EPA General Term of Approval (G1.1 and G2.1)

- 3.17 The Applicant is to achieve a minimum compaction standard of 95% or greater standard density compaction for the floor and walls of the enlargement to the Wah Wah Main Channel and en-route storage facility. The storage integrity analysis must be undertaken and results submitted to Department's Murray Murrumbidgee Regional Office, as soon as possible after the completion of the channel. If the applicant has concluded that the floor and walls of the Wah Wah works and en-route storage comply with the 95% or greater standard density compaction, the storages may be inundated prior to the results being submitted to Department's Murray Murrumbidgee Regional Office.
- 3.18 Upon completion of Wah Wah Main enlargement and en-route storage at Bray's Dam, the Applicant shall validate the integrity of the artificial water storages through a series of compaction tests. The location and frequency of testing will be determined by Department's Murray Murrumbidgee Regional Office once it has reviewed the EM-31 survey and associated report.

**Note:** i) The Murray Murrumbidgee Regional Office will ensure that all matters relating to conditions 3.16-3.18 will be dealt with as soon as practical.  
 ii) If the applicant has an alternate method of identifying permeable soils within the enlarged section of the Wah Wah main channel and Brays Dam (en-route storage) this condition may be modified if the proposed method is acceptable to the Department.

#### ***Erosion and Sediment Control***

- 3.19 Prior to the commencement of construction (including earthworks), the Applicant shall provide documentary evidence to, and to the satisfaction of, the Director-General confirming that all erosion and sedimentation controls are in place.
- 3.20 <sup>11</sup>The Applicant shall ensure that soil must be removed from the wheels and undercarriage of any vehicles that leave the Barren Box Swamp construction impact zone, the En-route storage construction impact zone, or the Wah Wah Enlargement construction impact zone.
- 3.21 <sup>12</sup>The Applicant shall ensure that all works involving soil or vegetation disturbance shall be undertaken with adequate measures to prevent soil erosion and the entry of contaminants into any river, lake, waterbody, wetland or groundwater system.
- 3.22 <sup>13</sup>The Applicant may use excess soil to reinforce embankments or line channel floors and walls along the sections of Mirrool Creek and Barren Box Swamp that are included in DA-101-4-2004-i. If excess soil is used for embankment reinforcement it must be stockpiled on embankments at a grade no steeper than 3:1 (V:H) and revegetated as soon as practically possible to minimise erosion into said streams.
- 3.23 <sup>14</sup>On completion of construction works, the Applicant shall ensure that the development site, is rehabilitated and stabilised. Temporary structures (other than silt fences and other erosion control devices) installed during the course of the works are to be removed.
- 3.24 All erosion and sedimentation controls required as part of this consent shall remain in place until such time as all ground disturbed by the works has been stabilised and rehabilitated so that it no longer acts as a source of sediment.

#### **Waste Management Impacts**

- 3.25 <sup>15</sup>The licensee must not cause, permit or allow any waste generated outside the premises to be received at the premises for storage, treatment, processing, reprocessing or disposal or

<sup>11</sup> Incorporates an EPA GTA (O5.2)

<sup>12</sup> Incorporates a Department GTA

<sup>13</sup> Incorporates a Department GTA

<sup>14</sup> Incorporates a Department GTA

<sup>15</sup> Incorporates an EPA GTA (L2.1 and L2.2)

any waste generated at the premises to be disposed of at the premises, except as expressly permitted by a licence under the POEO Act 1997.

**Note:** For the purposes of condition 3.25, the condition only applies to the storage, treatment, processing, reprocessing or disposal of waste at the premises if it requires an environmental protection licence under the POEO Act 1997.

### Noise Impacts Construction

3.26 Prior to the commencement of Construction, the Applicant shall enter into an agreement(s) with the landowners referred to in the EIS and development as F1079 and HR60 or provide such other forms of benefit or amelioration as may be agreed between the parties as providing acceptable compensation for the predicted noise levels experienced. A copy of the agreement(s) shall be forwarded to the satisfaction of the Director-General prior to the commencement of construction works.

3.27 <sup>16</sup>The Applicant must ensure that noise from construction works associated with Barren Box Swamp, the En-route Storage and the Wah Wah Enlargement does not exceed a  $L_{Aeq}$  (15 minute) noise emission criterion of 35 dB(A) at any residence at any time.

**Note:** For the purposes of condition 3.27, the noise emission limits apply under meteorological conditions of:

- (i) wind speeds up to 3 m/s at 10 metres above ground level; or
- (ii) temperature inversions conditions of up to 3°C/100m and wind speed up to 2 m/s at 10 metres above ground level.

3.28 <sup>17</sup>Noise from either the Barren Box Swamp, the En-Route storage or the Wah Wah Enlargement construction works is to be measured at the most affected point or within the residential boundary or at the most affected point within 30 metres of the dwelling (rural situations) where the dwelling is more than 30 metres from the boundary to determine compliance with the  $L_{Aeq}$  (15 minute) noise limit in Condition 3.27.

Where it can be demonstrated that direct measurement of noise from the premises is impractical, the EPA may accept alternative means of determining compliance (refer to Chapter 11 of the NSW Industrial Noise Policy (INP). The modification factors presented in Section 4 of the NSW INP must also be applied to the measured noise levels where applicable.

3.29 <sup>18</sup>Prior to the commencement of Construction, the Applicant shall prepare a Construction Noise Management Protocol. The Protocol shall include but not be limited to:

- Compliance standards;
- Community consultation;
- Complaints handling and monitoring system;
- Site contact person to follow up complaints;
- Mitigation measures;
- The design/orientation of the proposed mitigation methods demonstrating best practice;
- Construction times;
- Contingency measures where noise complaints are received; and
- Monitoring methods and program.

<sup>16</sup> Incorporates an EPA GTA (L3.1 and 3.3)

<sup>17</sup> Incorporates an EPA GTA (L3.2)

<sup>18</sup> Incorporates an EPA General Term of Approval (L3.4)

Hours of Construction Activities

3.30 <sup>19</sup>The Applicant shall ensure that except as specified below, construction work may only be carried out within the construction impact zone as follows:-

(a) Wah Wah Main Enlargement

- 7am to 6pm Monday to Friday;
- 8am to 1pm Saturday; and
- at no times on Sundays and Public holidays.

(b) Barren Box Swamp – within 1500 metre radius of Residence F2373

- 7am to 6pm Monday to Friday;
- 8am to 1pm Saturday; and
- at no times on Sundays and Public holidays.

(c) Barren Box Swamp – outside a 1500 metre radius of Residence F2373

- 24 hours a day Monday to Friday\*;
- Midnight to 1pm Saturday\*;
- at no times on Sundays or Public holidays.

**Note:** \*Night time activities may only be conducted within Barren Box Swamp construction impact zone outside an exclusion zone of 1500 metre radius from Residence F2373.  
Night time is defined as 10pm to 7am Monday to Saturday

(d) En-route storage – within a 1200 metre radius of Residence F1078

- 7am to 6pm Monday to Friday;
- 8am to 1pm Saturday; and
- at no times on Sundays or Public holidays

(e) En-route storage – outside a 1200 metre radius of Residence F1078

- 24 hours a day Monday to Friday\*;
- Midnight to 1pm Saturday\*;
- at no times on Sundays or Public holidays.

**Note:** \*Night time activities within the En-route storage construction impact zone are not to be conducted until the En-route storage southern embankment is sufficiently completed to act as a noise barrier, and then activities must only be undertaken outside an off set of 1200 metres from Residence F1078.  
Night time is defined as 10pm to 7am Monday to Saturday

Construction Heavy Vehicle Movements

3.31 <sup>20</sup>All heavy vehicle movements to and from the Barren Box Swamp construction impact zone, the En-route storage construction impact zone, and the Wah Wah Enlargement construction impact zone must only occur as follows:

- (a) 7am to 6pm Monday to Friday;
- (b) 8am to 1pm Saturday; and
- (c) at no times on Sundays and Public holidays.

<sup>19</sup> Incorporates an EPA General Term of Approval (L3.5)

<sup>20</sup> Incorporates an EPA General Term of Approval (L3.6)

- 3.32 <sup>21</sup>The Applicant shall note that Condition 3.31 above does not apply to the delivery of material outside the hours of operation permitted by condition 3.30, if that delivery is required by Police or other authorities for safety reasons; and/or the operation or personnel or equipment are endangered. In such circumstances, prior notification is provided to the EPA and affected residents as soon as possible, or within a reasonable period in the case of an emergency.

### Traffic and Transport Impacts

- 3.33 If any public road (ie Shaws Road or the like) is to be used to remove or import material, then prior approval of Griffith City Council is required. In such cases the upgrading of public roads will be conditioned as per Griffith City Council requirements.
- 3.34 Extracted material used for the construction of embankments at the BBS, En-route Storage and Wah Wah Main, must be from quarries approved by Griffith City Council under the EP&A Act and Regulations.
- 3.35 <sup>22</sup>All vehicles that transport any material to and from the Barren Box Swamp construction impact zone, the En-route storage construction impact zone, or the Wah Wah Enlargement construction impact zone must be maintained so as to prevent the leakage of water or other fine materials.
- 3.36 Prior to the commencement of construction works on the en-route storage facility, the Applicant shall appropriately seal Pellizzer Road to the satisfaction of Griffith City Council.
- 3.37 Prior to the commencement of construction, the Applicant shall demonstrate, to the satisfaction of the RTA and Director-General, that the Safe Intersection Sight Distance (SISD) from the proposed egress locations at the intersection with Kidman Way are in accordance with the RTA's Road Design guide for the prevailing speed limit.
- 3.38 Any road works or road maintenance required to be undertaken as a result of the development shall be at no cost to the RTA or Griffith City Council. Any road maintenance shall be undertaken to the satisfaction of Griffith City Council

### Visual Amenity Impacts

- 3.39 The Applicant shall ensure that the landscape works surrounding the En-route storage facility is undertaken to the satisfaction of Griffith City Council.
- 3.40 The Applicant must ensure that all external lighting associated with the development does not create a nuisance to surrounding properties or roadways. The lighting shall be the minimum level of illumination necessary and shall comply with *AS 4282(INT) 1995 – Control of Obtrusive Effects of Outdoor Lighting*.

### Heritage Impacts

- 3.41 <sup>23</sup>The Applicant must obtain a section 90 approval under the *National Parks and Wildlife Act 1974* to 'destroy' the eleven (11) hearth sites recorded as BB 16, 18, 20, 21, 22, 23, 24, 25, 26, 27, and 28.
- 3.42 <sup>24</sup>That the Section 90 consent be issued in conjunction with a Section 87 Permit to excavate the hearths with the intention of obtaining a radio-carbon (C14) sample for dating purposes and salvage of a representative sample of artefacts for relocation or educational purposes. The collection of artefacts being subject to the issue of a conditional Care and Control permit to the Griffith Local Aboriginal Land Council.

<sup>21</sup> Incorporates an EPA General Term of Approval (L3.7)

<sup>22</sup> Incorporates an EPA General Term of Approval (O5.1)

<sup>23</sup> Incorporates a NPWS General Term of Approval

<sup>24</sup> Incorporates a NPWS General Term of Approval

- 3.43 <sup>25</sup>That the Section 90 consent also cover any sites within the construction zones not currently known but which may be incidentally discovered during earth disturbance works provided always that:
- any excavation works up to one metre in depth or ground surface clearance works (ie initial grading of access tracks) are monitored for the presence of cultural heritage sites and if found;
  - the site shall be inspected for the presence of datable material, a sample of which may be taken and in any event have its position recorded by means of a GPS reference. Any sites so discovered shall be formally recorded and submitted to the Aboriginal Heritage Information Management System (AHIMS) registrar for inclusion on the AHIMS database; and
  - construction work is not to proceed in areas where sites have been uncovered until the consultant archaeologist or his delegate has certified in writing that the permit works have been completed.
- 3.44 <sup>26</sup>Prior to the commencement of construction works, the Applicant shall prepare a Research and Study design appropriate for the above work referred to in conditions 3.42 and 3.43, including an analysis of the stone tools and the spatial considerations of sites around the swamp subject to approval the DEC Aboriginal Heritage Unit.
- 3.45 Prior to the commencement of construction, the Applicant shall ensure that the archaeological sites identified as numbers 17, 18, 19, 29 and 56 within the development area shall be clearly identified and provided with a highly visible temporary protective buffer of star pickets and flagging or similar for a minimum 10 metres around the sites to avoid disturbance.
- 3.46 To reduce the risk of disturbance to any potential cultural heritage deposits, the Applicant shall ensure that the Borrow Pits at the ends of the active cell embankment of the Barren Box Swamp are not extended onto the shoreline area.
- 3.47 To reduce the risk of disturbance to any potential cultural heritage deposits, the Applicant shall ensure that the termination point of the intermediate cell embankment of Barren Box Swamp does not extend to the natural shoreline. This termination point shall be determined following on the ground inspection and consultation between the developer and the relevant local Aboriginal Community.
- 3.48 In the event that any other previously unidentified relic of indigenous significance is uncovered during the construction of the development, all construction work in the vicinity of the relic must cease and the Applicant shall contact the DEC as soon as practicable. The Applicant shall meet the requirements of the DEC with respect to the treatment, management and/or preservation of any such relic.

## Hazards and Risk Impacts

### ***Bunding and Spill Management***

- 3.49 <sup>27</sup>The Applicant must ensure that all liquid chemicals, fuels and oils within the Barren Box construction impact zone, the En-route storage construction impact zone or the Wah Wah Enlargement construction impact zone are stored in containers inside a suitable bund(s).
- 3.50 <sup>28</sup>The Applicant must ensure that the bund(s) referred to in condition 3.49 above are designed, constructed and maintained in accordance with the EPA's Technical Guidelines "*Bunding and Spill Management*".

<sup>25</sup> Incorporates a NPWS General Term of Approval

<sup>26</sup> Incorporates a NPWS General Term of Approval

<sup>27</sup> Incorporates an EPA General Term of Approval (O3.1)

<sup>28</sup> Incorporates an EPA General Term of Approval (O3.2)

- 3.51 The Applicant shall store and handle all dangerous goods (as defined by the Australian Dangerous Goods Code, including pesticides, fertilisers, and LPG) and combustible liquids, strictly in accordance with:
- a) all relevant Australian Standards;
  - b) a minimum bund volume requirement of 110% of the volume of the largest single stored volume within the bund; and
  - c) the EPA's Environment Protection Manual Technical Bulletin *Bundling and Spill Management*.

In the event of an inconsistency between the requirements listed from a) to c) above, the most stringent requirement shall prevail to the extent of the inconsistency.

#### **Wetland Concept**

- 3.52 Six months after the commencement of construction, the Applicant shall must prepare and implement a **Wetland Concept Design** for the Barren Box Swamp area to describe the proposed wetland design parameters. The Concept Design must be prepared by an appropriately qualified person/s, in consultation with the Department's Murray Murrumbidgee Office, the Murrumbidgee Wetlands Working Group, Department of Primary Industries (former NSW Fisheries), Griffith City Council, Department of Environment and Conservation and the previously established Wetland Reference Group. The Concept Plan shall include, but not necessarily be limited to:
- i) details of the proposed water monitoring that would be undertaken, including duration, to ascertain the potential changes to the hydrological regime;
  - ii) expected vegetation communities and plant species to be utilised in the rehabilitation;
  - iv) consideration of potential aquatic habitats that would be created;
  - v) specific mitigation measures that would be implemented during construction activities;
  - vi) details of the anticipated outcomes/targets that would be achieved for the wetland area;
  - vii) outcomes of consultation with landowners adjoining the proposed wetland area.

## **4. ENVIRONMENTAL MONITORING AND AUDITING**

### **General Monitoring Requirements**

- 4.1 <sup>29</sup>The results of all monitoring required under this consent shall be:
- a) in a legible form, or in a form that can readily reduced to a legible form;
  - b) kept for at least four years after the monitoring or event to which the results relate took place; and
  - c) produced in a legible form to any authorised officer of the EPA, the Department or the Director-General, upon request; and
  - d) kept with the following details for each sample required to be collected:
    - i) the date(s) on which the sample was collected;
    - ii) the time(s) at which the sample was collected;
    - iii) the point at which the sample was collected; and
    - iv) the name of the person who collected the sample.

- 4.2 The Applicant must undertake all water quality monitoring required under this development consent in accordance with the NSW EPA's *Approved Methods for the Sampling and Analysis of Water Pollution in NSW*.

### **Independent Environmental Auditing**

- 4.3 Within two years of the commencement of construction of the development, and then as may be directed by the Director-General, the Applicant shall commission an independent person or team to undertake an Environmental Audit of the development. The independent person or team shall be approved by the Director-General prior to the commencement of the Audit. The Audit shall:

<sup>29</sup> Incorporates an EPA General Term of Approval (M1.1, M1.2 & M1.3)

- a) be carried out in accordance with *ISO 19011:2002 - Guidelines for Quality and/ or Environmental Management Systems Auditing*;
- b) assess compliance with the requirements of this consent, and other licences and approvals that apply to the development;
- c) assess the environmental performance of the development against the predictions made and conclusions drawn in the documents referred to under condition 1.1 of this consent; and
- d) review the effectiveness of the environmental management of the development, including any environmental impact mitigation works.

An **Environmental Audit Report** shall be submitted for comment to the Director-General, Griffith City Council, Department of Primary Industries, the EPA and the DIPNR (Natural Resources) within two months of the completion of the Audit, detailing the findings and recommendations of the Audit and including a detailed response from the Applicant to any of the recommendations contained in the Report.

The Director-General may having considered any submissions made by Griffith City Council, Department of Primary Industries, the EPA and the DIPNR (Natural Resources) in response to the Report, require the Applicant to undertake works to address the findings or recommendations presented in the Report. Any such works shall be completed within such time as the Director-General may require.

## 5. COMMUNITY INFORMATION AND INVOLVEMENT

- 5.1 Subject to confidentiality, the Applicant shall make all documents required under this consent available for public inspection upon request. This shall include provision of all documents at the site for inspection by visitors as well as being made available in an electronic format.

### Complaints Procedure

- 5.2 Prior to the commencement of construction of the development, the Applicant must implement a system for community complaints. Such a complaints system must include:
- a) a 24-hour telephone number on which complaints about operations on 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, should the Applicant have email capabilities.

The telephone number, the postal address and the email address shall be advertised in a newspaper circulating within the locality on at least one occasion prior to the commencement of construction of each stage of the development. These details must also be displayed on a sign near the entrance to the site, in a position that is clearly visible to the public and on the Applicant's internet site, should one exist. The telephone number, postal address and email address must be maintained throughout the life of the development.

- 5.3 The Applicant must record details of all complaints received through the means listed under condition 5.2 of this consent in an up-to-date Complaints Register. The Register must 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 Applicant in relation to the complaint, including any follow-up contact with the complainant; and
  - f) if no action was taken by the Applicant in relation to the complaint, the reason(s) why no action was taken.

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

### **Community Communication Strategy**

- 5.4 Prior to the commencement of operations of the development, the Applicant shall prepare and implement a Community Communication Strategy for the development. This strategy shall be designed to enable the Applicant to respond to any community / licence holder enquiries and to provide mechanisms to inform the local community, particularly from Murrumbidgee Irrigation licence holders, as to the nature and operational environmental performance of the facility. The Strategy shall include, but does not necessarily be limited to:
- a) mechanisms through which the Applicant can report to the licence holders on the operations of the development and its environmental performance;
  - b) process by which the Applicant can advise licence holders of availability of off-allocation water;
  - c) mechanism for providing licence holders with updates on any activities that may potentially disrupt water supplies;
  - d) mechanisms through which the licence holders can provide feedback to the Applicant in relation to the environmental management of the development; and
  - e) mechanisms through which the Applicant can respond to any enquires or feedback from the licence holders in relation to the environmental performance and the nature of operations at the development.

The Strategy shall be approved by the Director-General prior to the commencement of any operations at the site.

## **6. ENVIRONMENTAL MANAGEMENT**

### **Environmental Representative**

- 6.1 Prior to the commencement of construction of the development, the Applicant must nominate a suitably qualified and experienced Environmental Representative(s) whose appointment is to receive prior approval of the Director-General. The Applicant shall employ the Environmental Representative(s) throughout the life of the development. The Environmental Representative shall be:
- a) the primary contact point in relation to the environmental performance of the development;
  - b) responsible for all Management Plans, mitigation measures and Monitoring Programs required under this consent;
  - c) responsible for considering and advising on matters specified in the conditions of this consent, and all other licences and approvals related to the environmental performance and impacts of the development;
  - d) responsible for receiving and responding to complaints in accordance with condition 5.2 of this consent; and
  - e) given the authority and independence to require reasonable steps be taken to avoid or minimise unintended or adverse environmental impacts, and failing the effectiveness of such steps, to direct that relevant actions be ceased immediately should an adverse impact on the environment be likely to occur.

The Applicant shall notify the Director-General of any changes to that appointment that may occur from time to time.

### **Construction Environmental Management Plan (CEMP)**

- 6.2 The Applicant must prepare and implement a **Construction Environmental Management Plan (CEMP)** to outline environmental management practices and procedures to be followed during the construction of each stage of the development. The Plan must include, but not necessarily be limited to:
- a) a description of all activities to be undertaken on the site during construction of the development, including an indication of stages of construction, where relevant;

- b) statutory and other obligations that the Applicant is required to fulfil during construction, including all approvals, consultations and agreements required from authorities and other stakeholders, and key legislation and policies;
- c) specific consideration of measures to address any requirements of the Department, the EPA and Council during construction;
- d) details of the proposed construction of dry phase refuges in Barren Box Swamp (including the Intermediate, Active and Wetland cells) in consultation with the Department of Primary Industries;
- e) details of how the environmental performance of the construction works will be monitored, and what actions will be taken to address identified adverse environmental impacts;
- f) a description of the roles and responsibilities for all relevant employees involved in the construction of the development;
- g) complaints handling procedures during construction and site preparation;
- h) the relevant environmental monitoring requirements outlined under section 4 of the consent; and
- i) the Management Plans listed under condition 6.3 of this consent. The following environmental performance issues must also be addressed in the Plan:
  - i) measures to monitor and manage traffic impacts resulting from road works and general construction activities; and
  - ii) measures to monitor and manage dust emissions, including contingency measures in the event relevant criteria are not being met.

The CEMP shall be submitted for the approval of the Director-General no later than one month prior to the commencement of any site preparation and construction works associated with the development, or within such period as otherwise agreed by the Director-General. Where the construction work is to be undertaken in stages, the Applicant may, subject to the agreement of the Director-General, stage the submission of the CEMP consistent with the staging of activities relating to that work.

Site preparation and construction works associated with any stage of the development shall not commence until written approval has been received from the Director-General for that stage. Upon receipt of the Director-General's approval, the Applicant shall supply a copy of the CEMP to the DEC and Council as soon as practicable.

6.3 As part of the CEMP for the development, required under condition 6.2 of this consent, the Applicant shall prepare and implement the following Management Plans:

- a) an **Erosion and Sedimentation Management Plan** to detail measures to minimise erosion during construction of the development. The Plan must be prepared in consultation with the DEC, Council and the Department. The Plan must include, but not necessarily be limited to:
  - i) results of investigations into soils associated with the site, in particular the stability of the soil and its susceptibility to erosion;
  - ii) demonstration of best practice methods to be applied for the on-site control of run-off, sediments and other pollutants;
  - iii) <sup>30</sup>details of the measures that will be employed to minimise soil erosion and the discharge of sediment and other pollutants to lands and/or waters during construction activities;
  - iv) demonstration that erosion and sediment control measures will conform with, or exceed, the relevant requirements and guidelines provided in the most recent versions of the Department's publication *Urban Erosion and Sedimentation Handbook*, the EPA's publication *Pollution Control Manual for Urban Stormwater*, the Department of Housing's publications *Soil and Water Management for Urban Development* and the *Managing Urban Stormwater – Soils and Construction*;
  - v) design specifications for diversionary works, banks and any sediment basins;

<sup>30</sup> Incorporates an EPA General Term of Approval (O4.1)

- vi) details of steps to be implemented to minimise soil erosion and the discharge of sediments and/ or other pollutants from the site including how they will be monitored during those works, clearly indicating who will conduct the monitoring, how the results will be recorded; and, if any non-compliance is detected, what corrective action will be taken;
  - vii) description of procedures to ensure that the measures implemented to control sedimentation and erosion on site, are maintained at all times; and
  - viii) measures to address erosion, should it occur, and to rehabilitate/ stabilise disturbed areas of the site.
- b) a **Noise Management Plan** to detail measures to minimise noise emissions associated with the development, including road transport noise. The Plan shall include, but not necessarily be limited to:
- i) identification of all major sources of noise that may be emitted as a result of the carrying out of the development;
  - ii) specification of the noise criteria as it applies to the particular activity;
  - iii) identification and implementation of best practice management techniques for minimisation of noise emissions;
  - iv) procedure for notifying potentially affected local residents of construction program and of a contact person to contact should they have concerns with any construction noise generated;
  - v) measures to manage impacts from noisy construction work activities on residents, particularly during sensitive time periods (eg 6pm to 7am) and from road traffic noise;
  - vi) procedures for the monitoring of noise emissions; and
  - vii) description of procedures to be undertaken if any non-compliance is detected or complaints are made.
- c) a **Dust Management Plan** to detail measures to minimise the generation of dust on the development site during construction, and the impacts of dust on surrounding land owners. The Plan shall include, but not necessarily be limited to:
- i) identification of the potential sources of dust during construction;
  - ii) specification of appropriate dust control criteria for the works;
  - iii) a description of what actions and measures would be implemented to minimise dust generation during the proposed works;
  - iv) details of how the effectiveness of these measures would be monitored during the proposed works; and, if any non-compliance is detected;
  - v) a description of what procedures would be followed to ensure compliance.
- d) a **Vegetation Clearing Protocol** to detail measures to manage and minimise the impact of vegetation clearing and is to be prepared in consultation with Griffith City Council. The Protocol must include, but not necessarily be limited to:
- i) a detailed plan showing the area and type of vegetation that is to be cleared;
  - ii) requirements for the protection of vegetation not to be cleared (such as fencing);
  - iii) details of proposed pre-clearance surveys;
  - iv) re-use of cleared vegetation and leaf mulch including for weed eradication;
  - v) strategies to minimise impacts on fauna (such as checking hollows for any fauna and relocation of the fauna away from the impacted areas, prior to felling of any trees), such as strategies for the Brown Treecreeper;
  - vi) details of salvage and reuse of material from the site, particularly large woody debris (eg tree trunks and large limbs) as refuges during dry periods in all of Barren Box Swamp;
  - vii) water quality controls;
  - viii) control of weeds during clearance activities; and
  - ix) measures to ensure stockpiles are located on cleared areas.

- e) an **Alligator Weed Management Plan** to detail measures to manage and monitor the potential occurrence of Alligator Weed in the development area. The Plan shall be developed in consultation with Griffith City Council, the Department of Primary Industries and the Alligator Weed Task Force, include, but not necessarily be limited to:
- i) measures for the management of Alligator Weed;
  - ii) process for the on-going monitoring for Alligator Weed, including ensuring the wash down of vehicles leaving the site;
  - iii) details of proposed mitigation measures to manage any potential occurrences of Alligator Weed; and
  - iv) procedures for the notification of Council, the Department of Primary Industries, and the Alligator Weed Task Force should an outbreak occur.
- f) a **Traffic Management Plan** to outline measures for the management and coordination of road works required under this consent and to minimise potential conflicts between different user groups. The Plan must be prepared in consultation with the RTA and Griffith City Council and must include, but not necessarily be limited to:
- i) details of measures to minimise interactions between the development and other users of the roads such as through the use of fencing, lights, barriers, traffic diversions etc;
  - ii) measures to monitor and manage traffic impacts and also road maintenance resulting from road works and general construction activities;
  - iii) procedures for informing the residents along the selected transport routes of the proposed vehicle movements (eg media, newsletter or radio), duration and times of vehicle movements, the contact details of a Company representative for residents to raise any concerns with during the construction period for and details of any restrictions to road uses as a result of the development;
  - iv) details of traffic routes to be used by heavy vehicles associated with the development;
  - v) minimum requirements for vehicle maintenance to address noise and exhaust emissions, particularly along roads in close proximity to residences;
  - vi) speed limits to be observed along routes to and from the site and within the site;
  - vii) details of the expected behavioural requirements for vehicles drivers travelling to and from the site and within the site, such as through a driver code of conduct; and
  - viii) outlining mitigation measures to be employed to reduce noise emissions and ensure the relevant criteria as outlined in the EPA's publication *Environmental Criteria for Road Traffic Noise* are being met.

#### **Operation Environmental Management Plan (OEMP)**

6.4 The Applicant must prepare and implement an **Operation Environmental Management Plan (OEMP)** to detail an environmental management framework, practices and procedures to be followed during operation of the development. The Plan shall include, but not necessarily be limited to:

- a) identification of all statutory and other obligations that the Applicant is required to fulfil in relation to operation of the development, including all consents, licences, approvals and consultations;
- b) a description of the roles and responsibilities for all relevant employees involved in the operation of the development;
- c) overall environmental policies and principles that will be/ are applied to the operation of the development;
- d) standards and performance measures that will be applied/ are to the development, and a means by which environmental performance can be periodically reviewed and improved;
- e) details of contingency measures should seepages occur from the development;
- f) measures for the management and control of weeds in pests in the proposed development area;

- g) management policies to ensure that environmental performance goals are met and to comply with the conditions of this consent;
- h) details of all landscaping to be undertaken on the site;
- i) the Management Plans listed under condition 6.5 of this consent;
- j) the environmental monitoring requirements outlined under condition 3 and 4.1 of this consent, inclusive; and
- k) contingency measures should monitoring of environmental issues under this consent indicate that the development has had, or is having an adverse environmental impact.

The OEMP must be submitted for the approval of the Director-General no later than one month prior to the commencement of operation of the development, 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 Applicant shall supply a copy of the OEMP to the EPA and Council as soon as practicable.

6.5 As part of the OEMP for the development, required under condition 6.4 of this consent, the Applicant shall prepare and implement the following Management Plans:

- a) an **Exotic Flora and Fauna Management Plan** to detail measures to manage and monitor the occurrence of any exotic flora and fauna in the development area. The Plan shall be developed in consultation with Griffith City Council, the Department of Primary Industries, the Alligator Weed Task Force and adjacent landowners, and include, but not necessarily be limited to:
  - i) Details of long term management measures for the European Carp;
  - ii) Detailed management options and monitoring for weed management following any clearing of vegetation and the change in the hydrologic regime of the wetland cell;
  - iii) Procedures for the notification of Council, the Department of Primary Industries, and the Alligator Weed Task Force (in the event of an outbreak of Alligator Weed) of any outbreak of exotic flora or fauna;
  - iv) Measures for the management and monitoring for Alligator Weed; and
  - v) Measures for the management and monitoring for feral animals ie pigs and foxes.
- b) a **Groundwater Management Plan** to detail measures to manage and minimise the impact of the proposal on groundwater. The Plan must include, but not necessarily be limited
  - (i) details of baseline groundwater quality, as present prior to the commencement of construction of the development;
  - (ii) identification of materials and activities associated with the development that have the potential to impact on groundwater quality, and how these materials and activities are to be managed to prevent those impacts;
  - (iii) monitoring of groundwater quality, including parameters to be monitored and frequency of monitoring;
  - (iv) details of how any groundwater level rises or salinity increases in nearby properties will be monitored and managed;
  - (v) details of contingency measures and management options should monitoring of groundwater quality indicate that the development has had, or is having, an adverse effect on groundwater quality;
  - (vi) details on the location of monitoring piezometers around the Wah Wah main channel, en-route storage (Brays Dam) and Barren Box Swamp to monitor standing water levels and electrical conductivities on neighbouring properties. The construction and positioning of the piezometers shall be determined in consultation with the Department's Murray Murrumbidgee Office.
- c) a **Cultural Heritage Management Plan** shall be developed for the area following completion of the works with particular emphasis on establishing the extent and

ongoing management of the resource in the wetland cell. This shall be developed in conjunction with the local Aboriginal Community.

- d) a **Wetland Rehabilitation and Management Plan** for Barren Box Swamp to outline the proposed measures that will be undertaken as part of establishing an ephemeral wetland system in Swamp area. The Plan must be prepared by an appropriately qualified person/s, in consultation with the Department of Primary Industries (former NSW Fisheries), Griffith Local Aboriginal Land Council, adjoining landowners, Griffith City Council, Department's Murray Murrumbidgee Office, Murrumbidgee Wetlands Working Group, Department of Environment and Conservation and the previously established Wetland Reference Group. The Plan shall include, but not necessarily be limited to:
- i) details of the anticipated timeframe for implementing the Plan;
  - ii) results and adopted recommendations from the Wetland Concept Plan;
  - iii) details of the proposed financial commitment to undertake the works required by this Plan and for the ongoing management of the Wetland area;
  - iv) details of the proposed measures to protect and manage Aboriginal objects and cultural values;
  - v) determination of the rate of filling and drying (as near as possible to natural rates);
  - vi) measures for controlling stock grazing to retain dead standing material;
  - vii) procedures for the management of salt and nutrient accretion;
  - viii) details of proposed planting programs, including species to be used;
  - ix) description of the hydrological requirements and ecological responses for threatened species and their habitat;
  - x) details of the water requirements of the Lower Mirrool Creek floodway to ensure that the Barren Box Swamp Project does not have a negative impact on this wetland system;
  - xi) details of an ecological monitoring regime. The monitoring regime shall include aquatic ecology and cover the entire Barren Box Swamp;
  - xii) details of the proposed establishment of aquatic and arboreal habitats, and monitoring of the success of these habitats;
  - xiii) performance indicators and monitoring in accordance with the Department of Environment and Heritage endorsed framework for development environmental water regimes in wetlands;
  - xiv) details of an ongoing monitoring program of the Lower Mirrool Creek Floodway wetland system;
  - xv) details on how water will be transferred for a deliberate release into the Lower Mirrool Creek Wetland System of sufficient quantity, including procedures for determining this quantity, should monitoring of the Lower Mirrool Creek Floodway Wetland System [refer to subclause xiv) above] identifies that the condition of the vegetation has deteriorated as a direct result of the operation of the proposed development. This is required to avoid degradation of the wetland system and comply with the principles of the NSW Wetland Management Policy.

**Note:** The Applicant may be required to submit an application in accordance with the requirements of the *Environmental Planning and Assessment Act, 1979* (the Act) for the undertaking of any development works as part of the **Wetland Rehabilitation and Management Plan** should those works require development consent under the Act.

- e) a **Flood Management Plan** to outline the proposed management of flood waters in the development area. The Plan shall be prepared in consultation with Griffith City Council and the Department's Murray-Murrumbidgee Office, and is to include, but not necessarily limited to:

- i) measures to monitor the flood behaviour in the development area following the completion of construction activities. This information is to be used to update water balance models;
- ii) a program for the assessment of the water requirements of the Lower Mirrool Creek floodway to ensure that the Barren Box Swamp Project does not have a negative impact on this wetland system;
- iii) procedures for the release of flood waters from Barren Box Swamp to the floodway;
- iv) revised operational levels for flood mitigation in Barren Box Swamp;
- v) details of contingency measures should impacts be identified; and
- vi) evidence of consultations with relevant landowners.

6.6 Within three years of the commencement of this consent, and at least every three years thereafter, the Applicant shall undertake a formal review of the Operation Environmental Management Plan (OEMP) required under condition 6.4 of this consent. The review shall ensure that the OEMP is up-to-date and all changes to procedures and practices since the previous review have been fully incorporated into the OEMP. The Applicant shall notify the Director-General, Council and the EPA of the completion of each review, and shall supply a copy of the updated OEMP to those parties on request. The Applicant shall, subject to confidentiality, also make any revised OEMP available for public inspection on request.

## 7. ENVIRONMENTAL REPORTING

### Incident Reporting

- 7.1 The Applicant shall notify the EPA and the Director-General 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 Applicant shall provide written details of the incident to the EPA and the Director-General within seven days of the date on which the incident occurred.
- 7.2 The Applicant shall meet the requirements of the Director-General to address the cause or impact of any incident, as it relates to this consent, reported in accordance with condition 7.1, within such period as the Director-General may agree.

**Note:** Condition 7.2 of this consent does not limit or preclude the EPA from requiring any action to address the cause or impact of any incident, in the context of the EPA's statutory role in relation to the development.

7.3 <sup>31</sup>The Applicant shall submit an **Annual Return** to the EPA in relation to the development, as required by any licence issued under the *Protection of the Environment Operations Act 1997*. In the Return, the Applicant shall:

- a) report on the annual monitoring undertaken (where the activity has resulted in pollutant discharges);
- b) provide a summary of complaints relating to the development;
- c) report on compliance with licence conditions; and
- d) provide a calculation of licence fees (administrative fees and, where relevant, load-based fees) that are payable. If load-based fees apply, the Applicant shall be required to submit load-based fee calculation worksheets with the Return.

### Annual Performance Reporting

7.4 The Applicant must, throughout the life of the development, prepare and submit for the approval of the Director-General, an **Annual Environmental Management Report (AEMR)**. The AEMR shall review the performance of the development against the Operation Environmental Management Plan (refer to condition 6.4 of this consent), the conditions of

<sup>31</sup> Incorporates an EPA General Term of Approval (R1.1)

this consent and other licences and approvals relating to the development. The AEMR shall include, but not necessarily be limited to:

- a) details of compliance with the conditions of this consent;
- b) a copy of the Complaints Register (refer to condition 5.3 of this consent) for the preceding twelve month period (exclusive of personal details), and details of how these complaints were addressed and resolved. This must include details of any environmental surplus flow related complaints;
- c) a comparison of the environmental impacts and performance of the development against the environmental impacts and performance predicted in the EIS and the additional information listed under condition 1.1;
- d) results of all environmental monitoring required under this consent and other approvals, including interpretations and discussion by a suitably qualified person;
- e) a list of all occasions in the preceding twelve-month period when environmental performance goals for the development have not been achieved, indicating the reason for failure to meet the goals and the action taken to prevent recurrence of that type of incident;
- f) demonstration and documentary evidence that a minimum average of 20,000 Megalitres of water savings have been made for the twelve month period, including evidence that the water savings have been returned to Water for Rivers. Should a minimum average of 20,000 Megalitres of water savings not be achieved for the reporting period, the Applicant shall provide detailed justification as to why the level of savings was not made;
- g) details of the total volume of water savings that have been made for the reporting period;
- h) details of the health of the Lower Mirrool Creek Floodway Wetland System. This is to include details of the condition of vegetation, duration and extent of inundation and quality of the water discharged through the system;
- i) details of any deliberate releases (refer to Condition 6.5d) xv);
- j) outline the number of occasions and estimate of water volume that was made available as off-allocation / environmental surplus flow water to licence holders in Barren Box, Mirrool Creek and the Wah Wah District for the 12 month period;
- k) identification of trends in monitoring data over the life of the development to date;
- l) a list of variations obtained to approvals applicable to the development and to the site during the preceding twelve-month period; and
- m) environmental management targets and strategies for the following twelve-month period, taking into account identified trends in monitoring results.

7.5 The Applicant must submit a copy of the AEMR to the Director-General, Council and the DEC every year, with the first AEMR to be submitted no later than twelve months after the commencement of operation of the development. The second and subsequent AEMRs are to be submitted every 12 months from the first AEMR or concurrently with the EPA's annual reporting period established for the site under its Environment Protection Licence for the site.

7.6 The Director-General may require the Applicant to address certain matters in relation to the environmental performance of the development, in response to review of the Annual Environmental Report and any comments received from the EPA and Council. Any action required to be undertaken shall be completed within such period as the Director-General may agree.

## **Appendix B Consultation**

## **B.1 Consultation materials**

4 June 2021

Rog Southwest  
South West Planning  
Biodiversity Conservation and Science  
Department of Planning, Industry and Environment



rog.southwest@environment.nsw.gov.au  
Cc: andrew.fisher@environment.nsw.gov.au

Dear Rog Southwest

**Re: Modification Application Consultation – Barren Box Swamp DA101-4-2004-I (NGH ref 19-148)**

NGH is assisting Murrumbidgee Irrigation (MI) with a proposed Modification (Mod 1) for DA101-4-2004-I, Barren Box Swamp Project (the Project).

The purpose of our correspondence is to consult with relevant stakeholders, including Biodiversity Conservation and Science, Department of Planning, Industry and Environment, regarding the modification.

**PROJECT BACKGROUND**

The Project was developed to as part of an integrated strategy to conserve water resources both within the Murrumbidgee Irrigation Area (MIA) and the wider Murray-Darling Basin. The Project also facilitated the return of part of the swamp to a more natural ephemeral wetland system. The Project was approved in June 2005. The construction of associated infrastructure and internal embankments split the swamp into three cells in 2006-08 and was commissioned in 2008.

The Project has been operated as a component of the Murrumbidgee Irrigation Area (MIA) for the last thirteen years. Changing climatic, regulatory and technological influences have altered the role the Project plays in operation of the MIA. These influences have also altered the way MI is able to manage and use the Project.

**MODIFICATIONS**

The proposed modification relates to administrative consent conditions with no on ground changes to the project. A position paper is attached outlining the consent conditions and the altered operating environment for both the MIA and the Project. MI seeks to modify the consent to meet the current operating needs and environment of the Project. The proposed modifications will more fully reflect the current operating environment, the needs of the Project and the abilities of the Project to deliver services in the MIA.

The proposed Modification is considered to have no additional environmental impact, and the proposed modified development will be substantially the same Project for which consent was originally granted.

**MODIFICATION REPORT**

A Modification Report is being prepared to support a modification application under Section 4.55(1A) of the *Environmental Planning & Assessment Act 1979* (EP&A Act).



**WAGGA WAGGA**

35 Kincaid Street (PO Box 5464) Wagga Wagga NSW 2650

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NSW • ACT • QLD • VIC

ABN 31 124 444 622 ACN 124 444 622

NGH, on behalf of MI, request Biodiversity Conservation and Science, Department of Planning, Industry and Environment, input on the Modification Report by the 18<sup>th</sup> June 2021.

Information can be provided via email to [les.s@nghconsulting.com.au](mailto:les.s@nghconsulting.com.au).

If you have any questions, please contact me on 0425 283 868. I would be pleased to discuss this project with you further.

Yours sincerely,

A handwritten signature in blue ink, appearing to read 'Les Seddon', is positioned above the printed name.

**Les Seddon**  
Principal Planning Consultant  
0425283 868  
NGH

# Barren Box Swamp - Modification Position Paper

## Operational Environmental Management Plan

Condition 6.6 of the Project consent requires the Project Operational Environmental Management Plan (OEMP) to be reviewed every three years. Over the twelve plus years of operation of the Project the OEMP has been steadily incorporated into the overall MIA Environmental Management System (EMS). The EMS is a living plan and part of the MI operations and as such is a subset of the overall system.

As part of the Modification being pursued MI is requesting that components of the standalone OEMP and reporting requirements be removed from the consent. Further, that the consent recognise that ongoing management requirements are incorporated into MI's overall management systems.

A standalone OEMP creates administrative complexity that provides minimal value and serves little purpose. It is noted that other complex infrastructure providers have progressed similar integrated management systems and no longer have standalone OEMPs.

In integrating management and moving away from the standalone OEMP, conditions related to the OEMP are being reviewed.

## Wetland Rehabilitation and Management Plan for Barren Box Swamp

A condition of consent (6.5(d)) required a Wetland Rehabilitation and Management Plan for Barren Box Swamp to be developed and included in the OEMP.

*6.5 d) a **Wetland Rehabilitation and Management Plan** for Barren Box Swamp to outline the proposed measures that will be undertaken as part of establishing an ephemeral wetland system in Swamp area. The Plan must be prepared by an appropriately qualified person/s, in consultation with the Department of Primary Industries (former NSW Fisheries), Griffith Local Aboriginal Land Council, adjoining landowners, Griffith City Council, Department's Murray Murrumbidgee Office, Murrumbidgee Wetlands Working Group, Department of Environment and Conservation and the previously established Wetland Reference Group. The Plan shall include, but not necessarily be limited to:*

- i. details of the anticipated timeframe for implementing the Plan;*
- ii. results and adopted recommendations from the Wetland Concept Plan;*
- iii. details of the proposed financial commitment to undertake the works required by this Plan and for the ongoing management of the Wetland area;*
- iv. details of the proposed measures to protect and manage Aboriginal objects and cultural values;*
- v. determination of the rate of filling and drying (as near as possible to natural rates);*
- vi. measures for controlling stock grazing to retain dead standing material;*
- vii. procedures for the management of salt and nutrient accretion;*
- viii. details of proposed planting programs, including species to be used;*
- ix. description of the hydrological requirements and ecological responses for threatened species and their habitat;*
- x. details of the water requirements of the Lower Mirrool Creek floodway to ensure that the Barren Box Swamp Project does not have a negative impact on this wetland system;*
- xi. details of an ecological monitoring regime. The monitoring regime shall include aquatic ecology and cover the entire Barren Box Swamp;*
- xii. details of the proposed establishment of aquatic and arboreal habitats, and monitoring of the success of these habitats;*
- xiii. performance indicators and monitoring in accordance with the Department of Environment and Heritage endorsed framework for development environmental water regimes in wetlands;*
- xiv. details of an ongoing monitoring program of the Lower Mirrool Creek Floodway wetland system;*
- xv. details on how water will be transferred for a deliberate release into the Lower Mirrool Creek Wetland System of sufficient quantity, including procedures for determining this quantity, should monitoring of the Lower Mirrool Creek Floodway Wetland System [refer to subclause xiv) above] identifies that the condition of the vegetation has deteriorated as a direct result of the operation of the proposed development. This is required to avoid degradation of the wetland system and comply with the principles of the NSW Wetland Management Policy.*

To satisfy consent conditions the Barren Box Wetland Rehabilitation Plan 2009-2014 (BBWRP) (MI 2008) was prepared in 2008 and approved in 2009. The five-year BBWRP was developed in consultation with community members and technical experts and outlined the proposed measures that would be undertaken as part of establishing an ephemeral wetland system in the Swamp area, within the third cell of the completed Barren Box Storage and Wetland (BBSW). Since construction of the Project was completed in 2008, MI has funded and implemented rehabilitation, with the initial five-year plan funded by MIA's Envirowise program.

The rehabilitation has been tested through drought and significant flood events in 2012 and 2016, with ongoing management funded under MI's operational budgets. A rehabilitation assessment is currently being undertaken to provide an indication of the success of the rehabilitation and biodiversity values to assist guide future management by MI.

A recent review of the current OEMP requirements identified that the OEMP did not include: "*details of the proposed financial commitment to undertake the works required by this Plan and for the ongoing management of the Wetland area*" as required by 6.5(d)iii above. MI is, as a commercial entity, uncomfortable with publishing commercial arrangements in a public document. In addition, it is rare for the current style of conditions to include the disclosure of commercial information.

Whilst the five-year BBWRP has lapsed, MI remain committed to ongoing biodiversity management on the Project. MI's preference is not to include financial details within the OEMP. MI are of the opinion that the success of the management plan is better driven by performance goals and commitments. As such it is proposed to amend the wording in 6.5 (d)iii to focus on management commitments facilitating regeneration. MI are currently pursuing a range of programs to enhance existing biodiversity values present on the onsite.

The following wording is suggested to replace current wording in 6.5 (d)iii:

*MI will make areas within the Project available to conservation, carbon sequestration or biodiversity enhancement projects funded internally or externally where they meet the general objectives of the WRMP. MI will ~~manage~~ and conserve those projects within the operational needs of the Project and any legally binding agreements. MI actions will manage and control priority weeds, reduce livestock pressure and facilitate increased structure and diversity for natural systems in and around the Project.*

Removing the requirement to outline the financial commitment of MI in the WRMP may be perceived as risk that works would not occur to a satisfactory level. However, goal orientated commitments which have been prepared in consultation with various parties and form part of the current plan have ensured rehabilitation and management has occurred in the past and will occur in the future.

Condition of consent 6.5(d)vii requires: "*procedures for the management of salt and nutrient accretion*".

Salt and nutrient accretion or accumulation has not been observed during the operation of the Project over the last 13 years. Flooding, routine filling and drainage, and the monitoring and management of groundwater levels across the region are actively minimising the risk of salt and nutrient accumulation to the point where accretions become a feature. MI are seeking to remove this condition completely.

## Environmental Reporting

A condition of consent, 7.4, requires that throughout the life of the Project, MI must undertake annual performance reporting.

### Annual Performance Reporting

7.4 The Applicant must, throughout the life of the development, prepare and submit for the approval of the Director-General, an **Annual Environmental Management Report (AEMR)**. The AEMR shall review the performance of the development against the Operation Environmental Management Plan (refer to

condition 6.4 of this consent), the conditions of this consent and other licences and approvals relating to the development. The AEMR shall include, but not necessarily be limited to:

- a) details of compliance with the conditions of this consent;
- b) a copy of the Complaints Register (refer to condition 5.3 of this consent) for the preceding twelve-month period (exclusive of personal details), and details of how these complaints were addressed and resolved. This must include details of any environmental surplus flow related complaints;
- c) a comparison of the environmental impacts and performance of the development against the environmental impacts and performance predicted in the EIS and the additional information listed under condition 1.1;
- d) results of all environmental monitoring required under this consent and other approvals, including interpretations and discussion by a suitably qualified person;
- e) a list of all occasions in the preceding twelve-month period when environmental performance goals for the development have not been achieved, indicating the reason for failure to meet the goals and the action taken to prevent recurrence of that type of incident;
- f) demonstration and documentary evidence that a minimum average of 20,000 Megalitres of water savings have been made for the twelve-month period, including evidence that the water savings have been returned to Water for Rivers. Should a minimum average of 20,000 Megalitres of water savings not be achieved for the reporting period, the Applicant shall provide detailed justification as to why the level of savings was not made;
- g) details of the total volume of water savings that have been made for the reporting period;
- h) details of the health of the Lower Mirrool Creek Floodway Wetland System. This is to include details of the condition of vegetation, duration and extent of inundation and quality of the water discharged through the system;
- i) details of any deliberate releases (refer to Condition 6.5d) xv);
- j) outline the number of occasions and estimate of water volume that was made available as off allocation / environmental surplus flow water to licence holders in Barren Box, Mirrool Creek and the Wah Wah District for the 12-month period;
- k) identification of trends in monitoring data over the life of the development to date;
- l) a list of variations obtained to approvals applicable to the development and to the site during the preceding twelve-month period; and
- m) environmental management targets and strategies for the following twelve-month period, taking into account identified trends in monitoring results.

7.5 The Applicant must submit a copy of the AEMR to the Director-General, Council and the DEC every year, with the first AEMR to be submitted no later than twelve months after the commencement of operation of the development. The second and subsequent AEMRs are to be submitted every 12 months from the first AEMR or concurrently with the EPA's annual reporting period established for the site under its Environment Protection Licence for the site

7.6 The Director-General may require the Applicant to address certain matters in relation to the environmental performance of the development, in response to review of the Annual Environmental Report and any comments received from the EPA and Council. Any action required to be undertaken shall be completed within such period as the Director-General may agree.

The AEMR presents reportable information for the whole system across multiple agency requirements. Currently the report provides a range of information on the core operations and compliance conditions, including incorporating requirements from licence and approvals from NSW Water and the NSW EPA.

**Condition 7.4c)** requires a comparison against predicted impacts from the EIS. As the Project has matured in its operation the outcomes are better known and there are more contemporary and relevant performance targets. For example, water savings and a drying climate have led to reduced use of the wetlands and improvements in water use efficiency. This scenario was not predicted or anticipated by the EIS. As such reporting against the prediction in the EIS may misrepresent the project and the role it plays.

As such it is proposed to remove current requirements of consent condition 7.4(c) to report against the predictions in the EIS and include new wordings in the consent to streamline and ensure MI reports against requirements for licences and approvals from NSW Water and the EPA.

**Condition 7.4 d)** requires the AEMR to include results of all environmental monitoring required under this consent and other approvals and to include interpretations and discussion by a suitably qualified person.

It is proposed to modify this element (d) of consent condition 7.4 make the results reported more relevant whilst including all current licence and approvals requirements. As such it is proposed to remove “required” and replace with “currently required where relevant”.

**Condition 7.4 h)** requires the AEMR to include details of the health of the Lower Mirrool Creek Floodway Wetland System. This is to include details of the condition of vegetation, duration and extent of inundation and quality of water discharged through the system.

The water released via the Mirrool Creek Floodway is required to be monitored by MI under their EPL 4651. This information when collected is provided on MI’s website and included in Annual Compliance Reports to the NSW EPA and NRAR.

Flows in the Lower Mirrool Creek system are episodic in nature and are driven largely by flooding generated in the upper catchment. The management of the Lower Mirrool Creek system wetlands is largely a government and private land-owners responsibility. The Project is largely unable to impede flood flows except for the smallest events. Irrespective of ownership MI has no role in the management of flood flows or land use in the Lower Mirrool Creek wetlands. As a consequence, a compendium of issues that might affect the health of the wetlands are beyond the management of MI. This reduces the ability of MI to draw a meaningful correlation between MI’s management of the Project and the health of the wetland system.

This condition has little value and is impractical to implement as it is beyond MI to manage or influence the health of the system. As such it is proposed to remove this element (h) of consent condition 7.4.

**Condition 7.4 k)** requires the identification of trends in monitoring data over the life of the development to date.

As MI trend analysis of the entire MIA and MI system provides a perspective over and above the Project in its own this requirement provides little value whilst being an administrative burden. As such is it proposed to remove the element (k) from consent.

4 June 2021

Rog Southwest  
South West Planning  
Biodiversity Conservation and Science  
Department of Planning, Industry and Environment



rog.southwest@environment.nsw.gov.au  
Cc: andrew.fisher@environment.nsw.gov.au

Dear Rog Southwest

**Re: Modification Application Consultation – Barren Box Swamp DA101-4-2004-I (internal ref 19-148)**

NGH is assisting Murrumbidgee Irrigation (MI) with a proposed Modification (Mod 1) for DA101-4-2004-I, Barren Box Swamp Project (the Project).

The purpose of our correspondence is to consult with relevant stakeholders, including Biodiversity Conservation and Science, Department of Planning, Industry and Environment, regarding the modification.

**PROJECT BACKGROUND**

The Project was developed as part of an integrated strategy to conserve water resources within the Murrumbidgee Irrigation Area (MIA) and the wider Murray-Darling Basin. The construction of associated infrastructure and internal embankments split the swamp into three cells in 2006-08 and was commissioned in 2008.

The Project has been operated as a component of the Murrumbidgee Irrigation Area (MIA) for the last thirteen years. Changing climatic, regulatory and technological influences have altered the role the Project plays in operation of the MIA. These influences have also altered the way MI is able to manage and use the Project.

**MODIFICATIONS**

The proposed modification relates to administrative consent conditions with no on ground changes to the project. A position paper is attached outlining the consent conditions and the altered operating environment for both the MIA and the Project. MI seeks to modify the consent to meet the current environmental and operating needs of the Project. The proposed modifications will more fully reflect the current operating environment, the needs of the Project and the tested abilities of the Project to deliver services in the MIA.

The proposed Modification is considered to have no additional environmental impact, and the proposed modified development will be substantially the same development as the development for which consent was originally granted.

**MODIFICATION REPORT**

A Modification Report is being prepared to support a modification application under Section 4.55(1A) of the *Environmental Planning & Assessment Act 1979* (EP&A Act).



**WAGGA WAGGA**

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ABN 31 124 444 622 ACN 124 444 622

NGH, on behalf of MI, request Biodiversity Conservation and Science, Department of Planning, Industry and Environment, input on the Modification Report by the 18<sup>th</sup> June 2021.

Information can be provided via email to [les.s@nghconsulting.com.au](mailto:les.s@nghconsulting.com.au).

If you have any questions, please contact me on 0425 283 868. I would be pleased to discuss this project with you further.

Yours sincerely,

A handwritten signature in blue ink, appearing to read 'Les Seddon', is positioned below the closing text.

**Les Seddon**  
Principal Planning Consultant  
0425283 868  
NGH

# Barren Box Swamp - Modification Position Paper

## OEMP

Condition 6.6 of the Project consent requires the Project Operational Environmental Management Plan (OEMP) to be reviewed every three years. Over the twelve plus years of operation of the Project the OEMP has been steadily incorporated into the overall MIA Environmental Management System (EMS). The EMS is a living plan and forms part of the MI operations and as such is a subset of the overall system.

As part of the Modification being pursued MI is requesting that the stand alone OEMP and reporting requirements be removed from the consent and the consent recognise the ongoing management requirements are incorporated into MI's overall management systems.

A standalone OEMP creates administrative complexity that provides minimal value and serves little purpose. It is noted that other complex infrastructure providers have progressed similar integrated management systems and no longer have standalone OEMPs for discreet projects.

As part of integrating management and moving away from the standalone OEMP, conditions related to the OEMP are being reviewed.

## Flood Management

Condition of consent 6.5e) required a Flood Management Plan, outlining the proposed management of flood waters in the development area, to be included in the OEMP.

*6.5 e) a **Flood Management Plan** to outline the proposed management of flood waters in the development area. The Plan shall be prepared in consultation with Griffith City Council and the Department's Murray-Murrumbidgee Office, and is to include, but not necessarily limited to:*

- i. measures to monitor the flood behaviour in the development area following the completion of construction activities. This information is to be used to update water balance models;*
- ii. a program for the assessment of the water requirements of the Lower Mirrool Creek floodway to ensure that the Barren Box Swamp Project does not have a negative impact on this wetland system;*
- iii. procedures for the release of flood waters from Barren Box Swamp to the floodway;*
- iv. revised operational levels for flood mitigation in Barren Box Swamp;*
- v. details of contingency measures should impacts be identified; and*
- vi. evidence of consultations with relevant landowners.*

Condition of Consent 6.5 e) ii) requires a program for the assessment of the water requirements of the Lower Mirrool Creek floodway to ensure that the Project does not have a negative impact on this wetland system;

Flows in the Lower Mirrool Creek system are episodic in nature and are driven largely by flooding generated in the upper catchment. The Project is largely unable to impede flood flows except for the smallest events. As such most flood flows pass the Project and move through the Lower Mirrool Creek system. A program for assessment of flood flows in the Lower Mirrool Creek system is considered ineffective because of the inability of the Project to impact on flood flows. The episodic nature of climate and the current variability induced by climate change minimise the ability for assessment to remain current and valid.

The management of the Lower Mirrool Creek system wetlands is largely a government and private land-owners responsibility. Irrespective of ownership MI has no role in the management of flood flows or land use in the Lower Mirrool Creek wetlands. As a consequence, a compendium of issues that might affect the health of the wetlands are beyond the management of MI. This reduces the ability of MI to draw a meaningful correlation between MI's management of the Project and the health of the wetland system.

The following is noted:

- MI is not a flood authority and during flood events, can only take direction from flood authorities, while providing local knowledge of the MIA irrigation system. Council (Griffith and Carrathool) are the flood authorities of relevance for the operation of the Mirrool Creek system and the Project
- Following construction of the Project and as a result of two flood events in 2012 and 2016 it is now apparent that flood management as directed by others leads to flows in the lower Mirrool Creek floodway. Normal years and drought years see negligible natural flows in Lower Mirrool Creek. MI responds to its license requirements to manage flows for quality and quantity below the project. In drought or flood, flows are dictated by forces other than MI.
- Comparative assessment of the wetland between its natural and future state will be difficult as the time zero condition was never assessed. Additionally, numerous structures and improvement including public assets such as roads have fundamentally affected the pattern of flood behaviour in the Lower Mirrool Creek catchment east of the Project.

Due to these factors, *a program for the assessment of the water requirements of the Lower Mirrool Creek floodway* to ensure its health as a component of the Flood Management Plan is considered to be unachievable and ineffective and as such it is proposed to remove condition 6.5(e)ii.

Other elements of this condition of consent are incorporated into operational management systems.

## Environmental Reporting

A condition of consent, 7.4, requires that throughout the life of the Project, MI must undertake annual performance reporting.

### Annual Performance Reporting

- 7.4 The Applicant must, throughout the life of the development, prepare and submit for the approval of the Director-General, an **Annual Environmental Management Report (AEMR)**. The AEMR shall review the performance of the development against the Operation Environmental Management Plan (refer to condition 6.4 of this consent), the conditions of this consent and other licences and approvals relating to the development. The AEMR shall include, but not necessarily be limited to:
- a) details of compliance with the conditions of this consent;
  - b) a copy of the Complaints Register (refer to condition 5.3 of this consent) for the preceding twelve month period (exclusive of personal details), and details of how these complaints were addressed and resolved. This must include details of any environmental surplus flow related complaints;
  - c) a comparison of the environmental impacts and performance of the development against the environmental impacts and performance predicted in the EIS and the additional information listed under condition 1.1;
  - d) results of all environmental monitoring required under this consent and other approvals, including interpretations and discussion by a suitably qualified person;
  - e) a list of all occasions in the preceding twelve-month period when environmental performance goals for the development have not been achieved, indicating the reason for failure to meet the goals and the action taken to prevent recurrence of that type of incident;
  - f) demonstration and documentary evidence that a minimum average of 20,000 Megalitres of water savings have been made for the twelve month period, including evidence that the water savings have been returned to Water for Rivers. Should a minimum average of 20,000 Megalitres of water savings not be achieved for the reporting period, the Applicant shall provide detailed justification as to why the level of savings was not made;
  - g) details of the total volume of water savings that have been made for the reporting period;
  - h) details of the health of the Lower Mirrool Creek Floodway Wetland System. This is to include details of the condition of vegetation, duration and extent of inundation and quality of the water discharged through the system;
  - i) details of any deliberate releases (refer to Condition 6.5d) xv);
  - j) outline the number of occasions and estimate of water volume that was made available as off allocation / environmental surplus flow water to licence holders in Barren Box, Mirrool Creek and the Wah Wah District for the 12 month period;
  - k) identification of trends in monitoring data over the life of the development to date;
  - l) a list of variations obtained to approvals applicable to the development and to the site during the preceding twelve-month period; and

m) environmental management targets and strategies for the following twelve-month period, taking into account identified trends in monitoring results.

7.5 The Applicant must submit a copy of the AEMR to the Director-General, Council and the DEC every year, with the first AEMR to be submitted no later than twelve months after the commencement of operation of the development. The second and subsequent AEMRs are to be submitted every 12 months from the first AEMR or concurrently with the EPA's annual reporting period established for the site under its Environment Protection Licence for the site

7.6 The Director-General may require the Applicant to address certain matters in relation to the environmental performance of the development, in response to review of the Annual Environmental Report and any comments received from the EPA and Council. Any action required to be undertaken shall be completed within such period as the Director-General may agree.

The AEMR presents reportable information for the whole system across multiple agency requirements. Currently the report provides a range of information on the core operations and compliance conditions, including incorporating requirements from licence and approvals from NSW Water and the NSW EPA.

**Condition 7.4c)** requires a comparison against predicted impacts from the EIS. As the Project has matured in its operation the outcomes are better known and there are more contemporary and relevant performance targets. For example, water savings and a drying climate have led to reduced use of the wetlands and improvements in water use efficiency. This scenario was not predicted or anticipated by the EIS. As such reporting against the prediction in the EIS may misrepresent the project and the role it now plays.

Therefore it is proposed to remove current requirements of consent condition 7.4(c) to report against the predictions in the EIS and include new wordings in the consent to streamline and ensure MI reports against requirements for licences and approvals from NSW Water and the EPA.

**Condition 7.4 d)** requires the AEMR to include results of all environmental monitoring required under this consent and other approvals and to include interpretations and discussion by a suitably qualified person.

It is proposed to modify this element (d) of consent condition 7.4 make the results reported more relevant whilst including all current licence and approvals requirements. As such it is proposed to remove "required" and replace with "currently required where relevant".

**Condition 7.4 h)** requires the AEMR to include details of the health of the Lower Mirrool Creek Floodway Wetland System. This is to include details of the condition of vegetation, duration and extent of inundation and quality of water discharged through the system.

This condition has little value and is impractical to implement as it is beyond MI to manage or influence the health of the system due to the following.

- The Lower Mirrool creek Floodway is privately owned land,
- The health of the system is dependent on many factors including flooding beyond MI's management, climatic variability and landholder management.

Further the water released via the Mirrool Creek Floodway is required to be monitored by MI under their EPL 4651. This information when collected is provided on MI's website and included in Annual Compliance Reports to the NSW EPA and NRAR.

As such it is proposed to remove this element (h) of consent condition 7.4.

**Condition 7.4 k)** requires the identification of trends in monitoring data over the life of the development to date.

As MI trend analysis of the entire MIA and MI system provides a perspective over and above the Project in its own this requirement provides little value whilst being a administrative burden. As such is it propose to remove the element (k) from consent condition 7.4.

## **B.3 Consultation responses**

**From:** [Marcus Wright](#)  
**To:** [Karie Wilson](#); [ROG South West Region Mailbox](#); [Les Seddon](#)  
**Cc:** [Graeme Enders](#); [James Maguire](#); [Joanne Lenehan](#)  
**Subject:** RE: 19-148 - Barren Box Swamp Modification  
**Date:** Friday, 2 July 2021 5:54:20 PM  
**Attachments:** [image007.png](#)  
[image008.png](#)  
[image009.png](#)  
[image010.png](#)

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Dear Les

### **Re. DA-101-4-2004-i (Amended) - Barren Box Swamp Project- Griffith City Council**

Thank you for the opportunity to have input on the proposal to vary the consent conditions of the DA-101-4-2004-i as amended, being the Barren Box Swamp Project in Griffith City Council local government area. The following comments are provided by the Biodiversity and Conservation Division (BCD) of the Department of Planning, Industry and Environment. BCD has statutory responsibilities relating to biodiversity (including threatened species, populations, ecological communities, or their habitats) and flooding. We have consulted with our colleagues in the Environmental Water and Floodplain branch in preparing this response.

We have reviewed the documents supplied and note the following;

- We do not support the amendments proposed in the position paper.
- We do not agree that the Operational Environmental Management Plan is redundant. The applicant should provide evidence that the OEMP has been reviewed every three years and that those reviews demonstrate the redundancy of the OEMP. We recommend an assessment of whether the OEMP has been effective, how its effect might be improved, what resources and information has become available since consent that make the OEMP more effective, and evidence that assimilating the OEMP into the wider MI EMS is beneficial to all stakeholders.
- We are not aware of published findings about the ecological response to the implementation of the Barren Box Swamp Wetland Rehabilitation Plan 2009-14 in the third cell. We recommend the applicant provide empirical evidence of those findings.
- We encourage the applicant to disclose the biodiversity works that are proposed for the site, including costs and anticipated environmental outcomes.
- We consider it inappropriate to remove the requirement to provide detail of procedures to manage salt and nutrient accretion. We would encourage the applicant to disclose the observed events and associated data.
- We see no evidence that the reduced use of the wetland can be attributed to a drying climate or the operation of the facility. We encourage the applicant to disclose any data that demonstrates that effect including the interaction of inflows, irrigation allocations and delivery to customers, any changes to wetland operation, evaporative losses and any other empirical evidence to substantiate that claim.
- We agree that the performance indicators of the OEMP need to be updated. We note that the Annual Environmental Management Report (AEMR) is retained under the proposed amendment. This is appropriate given the reformed legislative framework for the conservation of biodiversity generally.
- We maintain that the health of the Lower Mirrool Creek is affected by the management of the Barren Box Swamp project. We do not support any proposal to remove the requirement to monitor and report on the health of the Lower Mirrool Creek.
- We do not agree that the monitoring of the MIA and the MI system as a single aggregated

operation sufficiently reflects the way the BBS system is operated.

- The 2005 consent does not provide for the clearing of native vegetation associated with the operation and maintenance of the project. Griffith City Council has a duty to ensure that any proposal to remove native vegetation is assessed consistent with Part 7 of the *Biodiversity Conservation Act 2016* before it occurs. MI must seek approval for any clearing ancillary to the proposed modification and implementation of the OEMP including the Barren Box Swamp Wetland Rehabilitation Plan.

If you have any questions about this advice, please contact me via

[rog.southwest@environment.nsw.gov.au](mailto:rog.southwest@environment.nsw.gov.au) or 02 6983 4917.

**Marcus Wright**

**Senior Conservation Planning Officer**

Biodiversity and Conservation | Department of Planning, Industry and Environment

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Contact the South West Planning Team about biodiversity planning matters by emailing

[rog.southwest@environment.nsw.gov.au](mailto:rog.southwest@environment.nsw.gov.au).



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---

**From:** Karie Wilson <[karie.w@nghconsulting.com.au](mailto:karie.w@nghconsulting.com.au)>

**Sent:** Friday, 4 June 2021 3:49 PM

**To:** ROG South West Region Mailbox <[rog.southwest@environment.nsw.gov.au](mailto:rog.southwest@environment.nsw.gov.au)>

**Cc:** Les Seddon <[les.s@nghconsulting.com.au](mailto:les.s@nghconsulting.com.au)>; Andrew Fisher <[Andrew.Fisher@environment.nsw.gov.au](mailto:Andrew.Fisher@environment.nsw.gov.au)>

**Subject:** 19-148 - Barren Box Swamp Modification

Please find email below and attached letter sent on behalf of Les Seddon, NGH Principal Environmental Consultant.

Kind regards

**KARIE WILSON**  
**PROJECT ADMINISTRATION OFFICER**

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Dear Rog Southwest

**Modification Application Consultation – Barren Box Swamp DA101-4-2004-I (NGH ref 19-148)**

NGH is assisting Murrumbidgee Irrigation (MI) with a proposed modification of the original 2005 Development Approval for the Barren Box Swamp Project.

No physical works are planned, the changes are administrative in nature.

Please find attached consultation correspondence providing further information on the modification and a request for your input into the Modification Report being prepared.

Information can be provided via email to [les.s@nghconsulting.com.au](mailto:les.s@nghconsulting.com.au). Responses will be appreciated by the 18<sup>th</sup> June 2021.

Kind regards

Les

**LES SEDDON**  
**PRINCIPAL ENVIRONMENTAL CONSULTANT**  
BEnvSc  
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**PROJECT ADMINISTRATION OFFICER**  
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**From:** [Marcus Wright](#)  
**To:** [Les Seddon](#); [ROG South West Region Mailbox](#)  
**Cc:** [Steve Manwaring](#)  
**Subject:** RE: 19-148 - Barren Box Swamp Modification  
**Date:** Friday, 23 July 2021 11:46:52 AM  
**Attachments:** [image009.png](#)  
[image010.png](#)  
[image011.png](#)  
[image012.png](#)  
[19-148 BBS Stakeholder Consultation Wetlands Biodiversity Conservation and Science, DPIE.pdf](#)

---

Thank you Les

**Re. DA-101-4-2004-i (Amended) - Barren Box Swamp Project- Griffith LGA**

Our previous response had regard to biodiversity and aquatic ecology only and did not take into account flooding. Please ensure that the following is included as part of our overall response.

We are aware of a range of issues on the Mirrool Creek Floodplain downstream of the Barren Box Wetland and Storage complex, involving landholders, water users and Carrathool Shire Council. We highlight the importance of maintaining open dialogue and transparency with these groups, especially with regard to the development and implementation of the proposed flood operating protocols for Barren Box Storage. While we agree that floodplain management is primarily the responsibility of Council, all stakeholders have a role to play. Murrumbidgee Irrigation own and operate most of the infrastructure, and that involves an obligation to be transparent and collaborative with other stakeholders. We recommend that any future review of the *Project Operational Environmental Management Plan* includes consideration of the operation of Barren Box Wetland and Storage during major floods in Mirrool Creek to minimise impacts similar to what occurred in March 2012. This Flood Operating Protocol should be developed in consultation with Griffith City Council, Carrathool Shire Council and the NSW State Emergency Services.

Sincerely

**Marcus Wright**

**Senior Conservation Planning Officer**

Biodiversity and Conservation | Department of Planning, Industry and Environment

T. 02 6983 4917 F. 02 6021 0610 M. 0429 226 895 E. [marcus.wright@environment.nsw.gov.au](mailto:marcus.wright@environment.nsw.gov.au)

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[rog.southwest@environment.nsw.gov.au](mailto:rog.southwest@environment.nsw.gov.au).



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*The Department of Planning, Industry and Environment acknowledges that it stands on Aboriginal land. We acknowledge the traditional custodians of the land and we show our respect for elders past, present and emerging through thoughtful and collaborative approaches to our work, seeking to demonstrate our ongoing commitment to providing places in which Aboriginal people are included socially, culturally and economically.*

---

**From:** Les Seddon <les.s@nghconsulting.com.au>  
**Sent:** Thursday, 8 July 2021 9:53 PM  
**To:** Marcus Wright <Marcus.Wright@environment.nsw.gov.au>; ROG South West Region Mailbox <rog.southwest@environment.nsw.gov.au>  
**Subject:** RE: 19-148 - Barren Box Swamp Modification

Hi Marcus,

Thank you again for coordinating BCD's response.

Two separate pieces of correspondence were issued to BCD relating to:

- a. biodiversity and
- b. flooding.

I have attached them both to this email.

Can you confirm if the email below is a consolidated response for input on both aspects?

Kind regards

Les

---

**From:** Les Seddon  
**Sent:** Tuesday, 6 July 2021 9:02 AM  
**To:** Marcus Wright <[Marcus.Wright@environment.nsw.gov.au](mailto:Marcus.Wright@environment.nsw.gov.au)>; Karie Wilson <[karie.w@nghconsulting.com.au](mailto:karie.w@nghconsulting.com.au)>; ROG South West Region Mailbox <[rog.southwest@environment.nsw.gov.au](mailto:rog.southwest@environment.nsw.gov.au)>  
**Cc:** Graeme Enders <[graeme.enders@environment.nsw.gov.au](mailto:graeme.enders@environment.nsw.gov.au)>; James Maguire <[james.maguire@environment.nsw.gov.au](mailto:james.maguire@environment.nsw.gov.au)>; Joanne Lenehan <[Joanne.Lenehan@environment.nsw.gov.au](mailto:Joanne.Lenehan@environment.nsw.gov.au)>  
**Subject:** RE: 19-148 - Barren Box Swamp Modification

Hi Marcus,

Thank you for BCD's response. I am back from leave and we will look into these comments this week and follow up with any clarifications as soon as we can.

Kind regards

Les

---

**From:** Marcus Wright <[Marcus.Wright@environment.nsw.gov.au](mailto:Marcus.Wright@environment.nsw.gov.au)>  
**Sent:** Friday, 2 July 2021 5:54 PM  
**To:** Karie Wilson <[karie.w@nghconsulting.com.au](mailto:karie.w@nghconsulting.com.au)>; ROG South West Region Mailbox <[rog.southwest@environment.nsw.gov.au](mailto:rog.southwest@environment.nsw.gov.au)>; Les Seddon <[les.s@nghconsulting.com.au](mailto:les.s@nghconsulting.com.au)>  
**Cc:** Graeme Enders <[graeme.enders@environment.nsw.gov.au](mailto:graeme.enders@environment.nsw.gov.au)>; James Maguire <[james.maguire@environment.nsw.gov.au](mailto:james.maguire@environment.nsw.gov.au)>; Joanne Lenehan <[Joanne.Lenehan@environment.nsw.gov.au](mailto:Joanne.Lenehan@environment.nsw.gov.au)>  
**Subject:** RE: 19-148 - Barren Box Swamp Modification

**From:** [Luke Pearce](#)  
**To:** [Karie Wilson](#)  
**Cc:** [Les Seddon](#)  
**Subject:** RE: 19-148 - Barren Box Swamp Modification  
**Date:** Tuesday, 22 June 2021 2:40:46 PM  
**Attachments:** [image001.png](#)  
[image002.png](#)  
[image003.png](#)  
[image004.png](#)

---

Hi Karie,

I am happy to advise that DPI has no objection to the proposed modification.

Regards

Luke

---

**From:** Karie Wilson <[karie.w@nghconsulting.com.au](mailto:karie.w@nghconsulting.com.au)>  
**Sent:** Friday, 4 June 2021 3:52 PM  
**To:** Luke Pearce <[luke.pearce@dpi.nsw.gov.au](mailto:luke.pearce@dpi.nsw.gov.au)>  
**Cc:** Les Seddon <[les.s@nghconsulting.com.au](mailto:les.s@nghconsulting.com.au)>  
**Subject:** 19-148 - Barren Box Swamp Modification

Please find email below and attached letter sent on behalf of Les Seddon, NGH Principal Environmental Consultant.

Kind regards

**KARIE WILSON**  
**PROJECT ADMINISTRATION OFFICER**

*Please note I do not work Mondays*

T. 02 6280 5053  
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---

Dear Luke Pearce

**Modification Application Consultation – Barren Box Swamp DA101-4-2004-I (NGH ref 19-148)**

NGH is assisting Murrumbidgee Irrigation (MI) with a proposed modification of the original 2005 Development Approval for the Barren Box Swamp Project.

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Please find attached consultation correspondence providing further information on the

modification and a request for your input into the Modification Report being prepared.

Information can be provided via email to [les.s@nghconsulting.com.au](mailto:les.s@nghconsulting.com.au). Responses will be appreciated by the 18<sup>th</sup> June 2021.

Kind regards

Les

**LES SEDDON**  
**PRINCIPAL ENVIRONMENTAL CONSULTANT**

BEnvSc

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**From:** [Paul Farrell](#)  
**To:** [Les Seddon](#)  
**Subject:** RE: 19-148 - Barren Box Swamp Modification  
**Date:** Monday, 26 July 2021 8:16:32 AM  
**Attachments:** [image010.png](#)  
[image011.png](#)  
[image012.png](#)  
[image013.png](#)

---

Hi Les,

No issues here from me.

Probably some public consultation required so property owners are aware of the modifications.

I'm in meetings all day today, feel free to email should you have anything further.

Regards,

**Paul Farrell**  
**Director Infrastructure Services**  
**Carrathool Shire Council**  
139-145 High Street  
**HILLSTON NSW 2675**

**P:** (02) 6961 7608

**F:** (02) 6961 7617

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---

**From:** Les Seddon <[les.s@nghconsulting.com.au](mailto:les.s@nghconsulting.com.au)>  
**Sent:** Friday, 23 July 2021 4:06 PM  
**To:** Paul Farrell <[pfarrell@carrathool.nsw.gov.au](mailto:pfarrell@carrathool.nsw.gov.au)>  
**Cc:** Carrathool Shire Council Mail <[council@carrathool.nsw.gov.au](mailto:council@carrathool.nsw.gov.au)>  
**Subject:** RE: 19-148 - Barren Box Swamp Modification

Hi Paul,

Further to my voicemail can you confirm if Carrathool would like to provide a response?

Happy to talk it through over the phone in the first instance if that is easier.

Kind regards

Les

**LES SEDDON**  
**PRINCIPAL ENVIRONMENTAL CONSULTANT**  
BEnvSc  
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NGH acknowledges that we work on the traditional lands of First Nations people across Australia and recognises the enduring connection to the land. We pay our respects to elders, past present and emerging.

---

**From:** Karie Wilson <[karie.w@nghconsulting.com.au](mailto:karie.w@nghconsulting.com.au)>  
**Sent:** Friday, 4 June 2021 4:06 PM  
**To:** [pfarrell@carrathool.nsw.gov.au](mailto:pfarrell@carrathool.nsw.gov.au)  
**Cc:** [council@carrathool.nsw.gov.au](mailto:council@carrathool.nsw.gov.au); Les Seddon <[les.s@nghconsulting.com.au](mailto:les.s@nghconsulting.com.au)>  
**Subject:** 19-148 - Barren Box Swamp Modification

Please find email below and attached letter sent on behalf of Les Seddon, NGH Principal Environmental Consultant.

Kind regards

**KARIE WILSON**  
**PROJECT ADMINISTRATION OFFICER**

*Please note I do not work Mondays*

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Dear Paul Farrell

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Information can be provided via email to [les.s@nghconsulting.com.au](mailto:les.s@nghconsulting.com.au). Responses will be appreciated by the 18<sup>th</sup> June 2021.

Kind regards  
Les

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\*\*\*\*\*

**From:** [Durgananda Chaudhary](#)  
**To:** [Les Seddon](#)  
**Cc:** [Karie Wilson](#); [Graham Gordon](#)  
**Subject:** RE: Modification Application Consultation – Barren Box Swamp DA101-4-2004-I (NGH ref 19-148)  
**Date:** Thursday, 8 July 2021 4:08:44 PM

---

Hi Les,  
Thanks for sending 'Modification Report' for our comments.

I had a scan through the report, and just minor comments from our side:

## OEMP

Griffith City Council will have no issue with the proposed modification to move away from the OEMP to the overall MIA EMS.

## Flood Management

Griffith City Council has been working with MI especially since 2012 March flood to manage floods within our LGA, and we will continue to do so in the future.

In relation to the water requirements to the Lower Mirrool Creek Floodway:

- Griffith City Council will be happy to work with MI and Carrathool Shire Council to manage flood release from the Barren Box Storage site during any flood event, however
- We are not in a position to suggest what should be the minimal discharge from the storage site during normal years and drought years to maintain the health of the floodway system, and suggest to contact NSW Water/DPIE/NRAR, EPA etc. for their comments.

## Environmental Reporting

Griffith City Council will have no issue with proposed modifications. Again in relation to Condition 7.4 h), please contact NSW Water/DPIE/NRAR, EPA etc. for their comments.

Thank you  
regards  
dn

**Durgananda Chaudhary**  
Water & Wastewater Manager  
p 02 6969 4857 | m 0439 391 531



Griffith City Council  
a 1 Benerambah Street Griffith NSW 2680  
p PO Box 485 Griffith NSW 2680  
w [griffith.nsw.gov.au](http://griffith.nsw.gov.au)

Griffith City Council pays respect to Aboriginal and Torres Strait Islander Elders, past, present and future, and acknowledges they are the custodians of this land. Council is committed to building our future together.



## **Appendix C Barren Box Wetland Inspection Report**



**NGH**



Murrumbidgee  
Irrigation

# Site Inspection

## Barren Box Storage and Wetland Modification

October 2021

Project Number: 19-148



## Document verification

Project Title:	Barren Box Storage and Wetland Modification
Project Number:	19-148
Project File Name:	19-148 BBSW Vegetation Assessment Final 1.0

Revision	Date	Prepared by	Reviewed by	Approved by
Final 1.0	22/10/2021	Z. Renner, Les Seddon	Client and Michial Sutherland	Z Jokadar

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## Acronyms and abbreviations

BBS	Barren Box Swamp – the general location prior to the Project
BBSW	Barren Box Storage and Wetland – the operational name of the modified BBS following Project implementation
BC Act	<i>Biodiversity Conservation Act 2016 (NSW)</i>
BCD	Biodiversity and Conservation Division (NSW) of EES and DPIE
Biosecurity Act	<i>Biosecurity Act 2015 (NSW)</i>
BOM	Australian Bureau of Meteorology
Cwth	Commonwealth
DPIE	Department of Planning, Industry and Environment (NSW)
EEC	Endangered ecological community – as defined under relevant law applying to the proposal
EES	Environment, Energy and Science (NSW), Division of DPIE (formerly OEH, and, prior, DECCW)
EIA	Environmental impact assessment
EIS	Environmental impact statement
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999 (Cwth)</i>
EP&A Act	<i>Environmental Planning and Assessment Act 1979 (NSW)</i>
ha	hectares
km	kilometres
LALC	Local Aboriginal Land Council
LEP	Local Environment Plan
m	metres
MI	Murrumbidgee Irrigation Ltd
MIA	Murrumbidgee Irrigation Area and districts
MNES	Matters of National Environmental Significance under the EPBC Act ( <i>c.f.</i> )
NPW Act	<i>National Parks and Wildlife Act 1974 (NSW)</i>
OEH	(Former) Office of Environment and Heritage (NSW) (now EES)
the Project	Barren Box Swamp Project – as put forward for development consent

# 1. Purpose

Murrumbidgee Irrigation (MI) engaged NGH to complete a site inspection in June 2021 of the wetland within Barren Box Storage and Wetland (BBSW) and readily accessible sites within the Lower Mirrool Creek Floodplain (LMCF). The inspection was to gather evidence suitable for use to evaluate the status of rehabilitation efforts for the wetland and a snapshot of the LMCF biodiversity.

In 2005/2006 Barren Box Swamp (BBS) was re-developed (the Project) to provide greater flexibility and efficiency in the management of water resources and restore a section of the BBS to an ephemeral wetland regime. This was achieved by the creation of three cells within BBS. The three cells and their operation became the BBSW. BBSW is comprised of Active, Intermediate and Wetland Cells and the widening of the Wah Wah Main (WWM) channel. The Project has been in full operation since 2006. BBSW is playing a valuable role in the management of water resources for the Murrumbidgee Irrigation Area.

## 2. Methodology

NGH reviewed available information for vegetation mapping, protected matters, the Project EIS biodiversity assessment and available literature. The information was used to compile an understanding of the flora and fauna associated with BBSW. The information was used to compile maps and prepare inspection survey points prior to field work.

NGH ecologists completed a site inspection of BBSW and LMCF on 15 June 2021. The site inspection made observations of various locations within:

- Wetland Cell,
- Active Cell,
- Intermediate Cell,
- Mirrool Creek entry point to BBSW,
- Narrabri Swamp,
- Five Oaks Swamp
- Lower Mirrool Creek

During the inspection observations were made of the vegetation type, revegetation success and overall biodiversity health. Visual assessments of the Active and Intermediate Cell, which are water storage cells, were conducted from the levees in BBSW. The Wetland Cell, which is ephemeral, was inspected from the levees, tracks and by foot (Figure 2-1). The central areas of the Wetland Cell were unable to be accessed due to soil moisture, inundation, and safety concerns.

A visual assessment of Narrabri Swamp, Five Oaks Swamp and Lower Mirrool Creek were conducted from public roads as seen in, Figure 2-2. Observations were used to gather information on the vegetation type and overall health of biodiversity.

Observations of flora and fauna observed were used to make general assessments regarding vegetation type, and overall health.

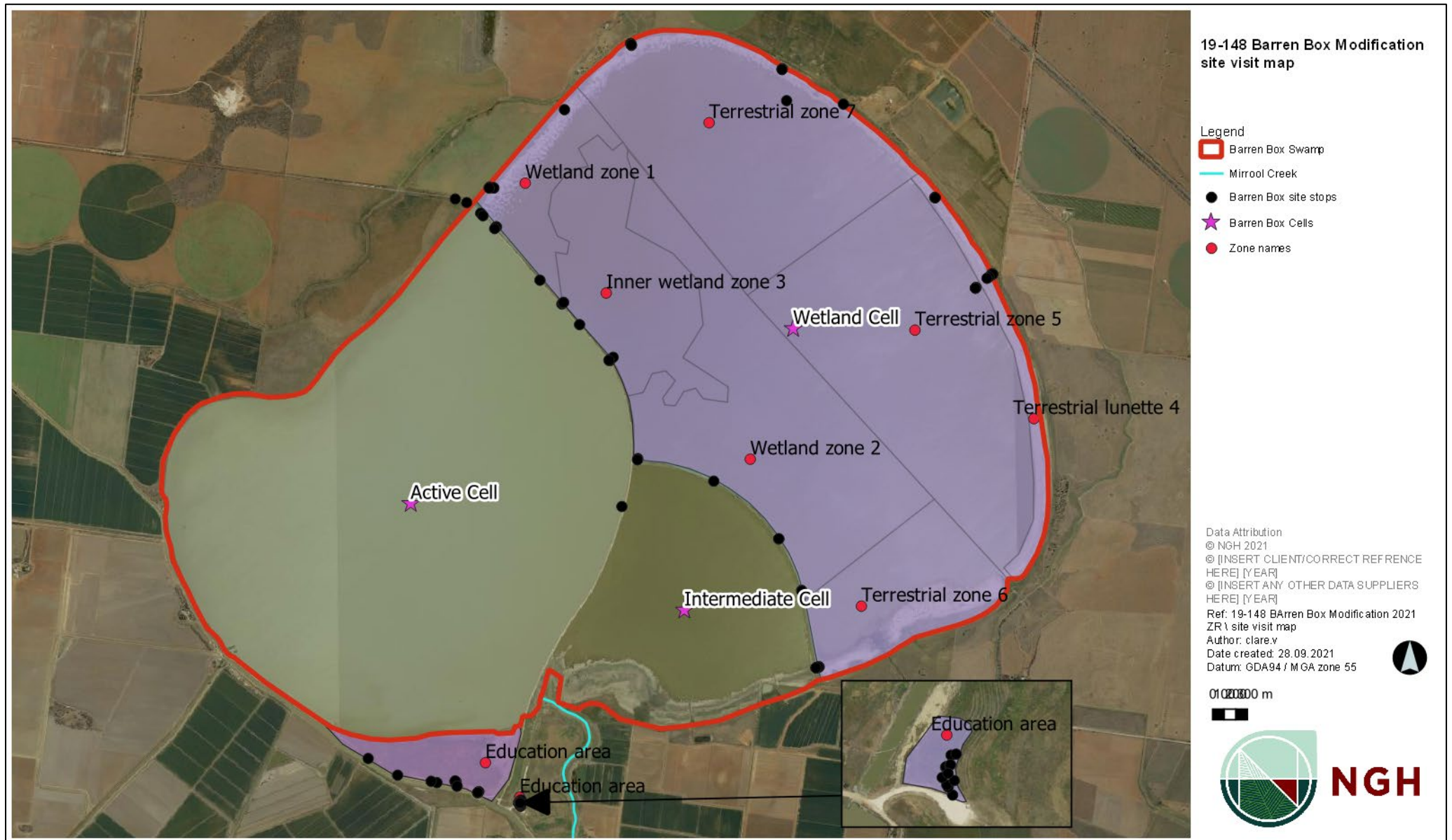


Figure 2-1 Barren Box Storage and Wetland Field Visit Locations



Figure 2-2 Lower Mirrool Creek Floodplain

### 3. Context

BBSW is located approximately 30 kilometres North-West of Griffith. BBSW is a large natural depression of roughly 3200 ha. BBSW is subjected to flooding from flood flows in the Mirrool Creek and Murrumbidgee River.

BBSW, during flood events, may discharge into the LMCF, which extends from BBSW to the Lachlan River in the West. The LMCF consists of the floodplain itself and six discrete depressions that hold water.

Prior to human disturbance the existing flora found at BBS were *Eucalyptus largiflorens* (Black Box), *Duma florulenta* (Lignum) and *Typha latifolia* (Cumbungi). Found in the LMCF were Black Box, Lignum, *Eleocharis acuta* (Sedge), *Chenopodium nitrariaceum* (Nitre Goosefoot), *Atriplex nummularia* (Old Man Saltbush) and *Eragrotis australasica* (Canegrass).

BBS received water from local farms since the 1920's as an unintentional consequence of irrigation in the area. Up until the 1960's BBS retained annual water flows and fluctuations with wetting and drying. During 1969 levees were constructed to increase water storage capacity. As a result, the depth of the water increased, and the wetland became permanently inundated from the 1970's through until 2003. Due to the consistent inundation woody vegetation ceased to persist. In 2003 prolonged drought conditions saw BBS dry completely. As a consequence of persistent drought conditions water conservation at BBS became an increasing priority for the MIA.

In 2005 the Project was approved, and construction commenced. The Project developed BBS into three distinct cells. The Active Cell (1230 ha) and Intermediate Cell (320 ha) operate as irrigation water storage cells. The Wetland Cell (1650 ha) allows a return of ephemeral drainage to a section of BBSW.

In 2006 there was a fire in the Wetland Cell during extended dry conditions which resulted in nearly half of the cell being burnt. A large portion of the dead trees that were standing were burnt reducing the number of dead trees present.

A condition of consent for the Project was the development of a Barren Box Wetland Rehabilitation Plan (BBWRP). The BBWRP outlined measures to establish vegetation consistent with an ephemeral wetland system. The goal of the planned rehabilitation from 2009-2014 being the enhancement of vegetation within the Wetland Cell. The aim being to establish Black Box, Lignum, *Acacia stenophylla* (River Cooba), *Acacia pendula* (Weeping Myall), Goosefoot, Old Man Saltbush, *Maireana pyramidata* (Sago Bush), *Rhagodia spinescens* (Spiny Saltbush) and a native grassland seed mix.

As outlined in the BBWRP, action was taken to improve the biodiversity within the wetland cell. In addition, weed control and feral animal controls has occurred on a regular basis. Measures included aerial seeding of Black Box, direct seeding of Boree, shrubs and native grasses. Tube stock planting was also conducted in the Education Area in the South of BBSW. This included Black Box, *Eucalyptus camaldulensis* (River Red Gum), *Casuarina cunninghamiana* (River Sheoak), Boree and shrubs.

In 2012 a major flooding event inundated the MIA and the Wetland Cell for an extended period. This resulted in the majority of Black Box and shrub seedlings dying. Again in 2016 a major flood event inundated the MIA and Wetland Cell for an extended period. This compounded the impacts of the previous flood and ensured that Black Box and shrub seedlings did not survive.

The floods also impacted the planted vegetation in the Education Area. However, more planting was conducted in the education area in July 2017 with 48,000 seedlings being planted and follow up planting in May 2018. Floods, and fires have not impacted BBSW since 2016, however minor flooding of Mirrool Creek occurred in July 2021 increasing inflows to BBSW. MI worked under the direction of Griffith City Council as the flood authority, during this event.

## 4. Results

### 4.1 Literature and management review

A high level literature review was undertaken to inform the site inspection as summarised in Table 4-1.

Table 4-1 BBSW Literature review summary

Document	Author/Date	Summary
EIS Biodiversity Assessment	URS 2006	<p><b>Barren Box Swamp:</b></p> <p>Prior to leveeing in 1969 it was likely an intermittent water body. There are descriptions of extensive and diverse aquatic and emergent vegetation from this period. Large stands of dead trees currently occur across the swamp indicating the dominate vegetation was once Eucalyptus (possibly Black Box). It is now characterised by expanses of open, turbid water with extensive cover of dead timber.</p> <p>BBS is surrounded by agricultural properties with pasture areas fringing much of the waterbody. These areas are predominately covered with dense and diverse herbs, mainly introduced and opportunistic taxa such as Patterson’s Curse, Prickly Lettuce and Medics. Since leveeing and changing water regime fauna values have declined. BBS is considered a poor habitat for wading birds and has a low diversity of nesting sites.</p> <p>Carp is the only recorded fish species present within BBS but is likely other species are present too. This would include natives such as Murry Cod, Carp Gudgeons, Bony Bream, Australian Smelt and Big0headed Gudgeons.</p> <p><b>Lower Mirrool Creek Floodplain (LMCF):</b></p> <p>Much of the floodplain and many of the wetlands exist on private property and as such are used for pasture, stock water supplies, hunting and horticultural activities. Due to this the LMCF is threatened by stock grazing, destruction by wild pigs, increased nutrient and salinity levels and introduction of exotic plants. However, some of the wetlands provide valuable habitat for aquatic biota, particularly waterbirds.</p>
OEMP	URS 2006	<p>In 2003 a drought lowered the BBS water levels and the wetland dried. Due to this littoral vegetation development were observed. Species present were moisture tolerant taxa. This colonisation was dominated by <i>Cumbungi</i> and was in large predominately mono-specific stands, however,</p>

Document	Author/Date	Summary
		<p>isolated patches of Slender Knotweed (<i>Persicaria decipiens</i>) in shallower areas.</p> <p>BBSW is surrounded by agricultural properties with pastures fringing much of the waterbody. BBS margins are covered by dense diverse herbs, mainly introduced and opportunistic taxa. This included Patterson’s Curse, Prickly Lettuce, Paddy Melon, Bathurst Burr, Rye Grass and Medics.</p> <p>BBS was once described as an important breeding area for waterfowl. However, since the inundation of water the habitat values have decreased dramatically. With no nesting area for most waterfowl no longer present.</p> <p>Carp is the only species of fish known to be present, but it is likely that other fish species are present. The lack of riparian vegetation though means that BBSW is a poor habitat for fish breeding.</p>
Barren Box Wetland Rehabilitation Plan 2009-2014	MI December 2008	<p>In 2003 just before the redevelopment of BBS, prevailing drought resulted in a fall in water levels which resulted in drying for the first time in decades. This resulted in littoral vegetation developing. With Cumbungi dominating the vegetation with isolated patches of Slender Knotweed (<i>Persicaria decipiens</i>). In 2003 41 species of vascular plants were recorded at BBS. 21 of these species were exotic and 70% were annual species. Dominant growth form was forb (26) and grass made up the second most (11). Only 6 species were considered semi-aquatic or aquatic.</p> <p>The most abundant species present was the native perennial grass Couch (<i>Cynodon dactylon</i>) and native annual Old Man Weed (<i>Centipeda cinnighamii</i>).</p>
Review of Current Vegetation and Recommendations for Revegetation of Barren Box Wetland, Griffith NSW	Paul Blumer 2015, Unpublished Third Year Undergraduate Report. School of Environment, Science and Engineering, Southern Cross	<p>Exotic species were found to be abundant throughout the wetland and accounted for 84% of the total vegetation. Native species accounted for only 13% of total vegetation and 3% recorded as bare earth within the transects.</p> <p>Exotic grass species, <i>Medicago polymorpha</i>, <i>Lactuca serriola</i> and <i>Cirsium vulgare</i>, were the most dominant species found in all transects.</p> <p>The most dominant native species found was <i>Scleroleana muricata</i>. When compared to results from vegetation surveys conducted before the major</p>

Document	Author/Date	Summary
	University, Lismore.	development, species diversity is similar; however, there were no species abundance recorded.

MI supplied evidence of historical rehabilitation and management measures demonstrating implementation of the Barren Box Wetland Rehabilitation Plan 2009 - 2014. A summary of implementation is provided in Appendix A.

## 4.2 Site Inspection

On 15 June 2021 two qualified ecologists from NGH went to BBSW to conduct a site assessment of vegetation type, seeding success and overall health of BBSW.

Observed fauna, and locations, are summarised in Table 4-2. A list of plant species identified and locations is included in Table 4-3.

The Active and Intermediate Cell, due stored water levels, were both inspected from the adjacent access tracks on cell walls. There was largely no vegetation in either cell except for dead trees due to inundation (refer Figure 4-1).

The BBWRP divided the Wetland Cell into seven zones as shown in Figure 2-1. These being Wetland Zone 1, Wetland Zone 2, Inner Wetland Zone 3, Terrestrial Zone 4, Terrestrial Zone 5, Terrestrial Zone 6 and Terrestrial Zone 7.

**Wetland Zone 1** (refer Figure 4-2) had a moderate density of dead standing trees present with heights of up to 10 metres and an abundance of hollows. Weeds dominated the access track edge to roughly 3 metres and included: Fleabane, Spear Thistle, Mustard Weed and Camel Melon. From 3-30 metres was dominated by shrubby vegetation with Black Rolypoly, Small-leafed Bluebush, Spear Grass and unidentified grasses present. After 30 metres the vegetation changed to a grass dominated vegetation. There was one living Black Box present on the edge of the zone and neighbouring property. Numerous bird species were found in this zone.

**Wetland Zone 2** had a moderate density of dead standing trees present with heights up to roughly 8 metres and presence of hollows. Weeds dominated the roadside to roughly 3 metres and included: Fleabane, Mustard Weed and Camel Melon. 3-50 from the roadside was half native and half weed species. Spear thistle was abundant with patches of Black Rolypoly, Native Liquorice, and Grasses also present. From 50 metres onwards the vegetation became a grass dominated vegetation. There were numerous birds present as well as Kangaroos and Foxes.

**Inner Wetland Zone 3** had a low density of dead standing trees present with heights up to 5 metres and few hollows. Weeds were dominant along the access track edge up to 3 metres and included: Spear Thistle, Mustard Weed and Camel Melon. From 3-35 metres was dominated by a grassy shrubland type vegetation and included: Black Rolypoly, Ruby Saltbush, Native Liquorice, Daisies and Clover. From 35 metres on the vegetation became a grass dominant vegetation type. Numerous bird species were found.

**Terrestrial Zone 4** was a predominately grassy vegetation type and included: Fleabane, Burr Medic, Clover, Orange New Zealand Sedge, Dockweed, Patersons Curse, Mustard Weed, Black Rolypoly, Daisies, Small-leaf Bluebush, Bindweed, Rolypoly, Spear Grass, Wallaby Grass and unknown grasses. Large flock of Emus were present as well as European Rabbits.

**Terrestrial Zone 5** was mostly devoid of dead standing trees with a predominately grassy vegetation type. Flora species found included: Black Rolypoly, Nitre Goosefoot, Grasses and Mustard weed.

**Terrestrial Zone 6** was dominated by weeds along the roadside for the first 3 metres. These included: Fleabane and Mustard Grass. Mustard Grass was the dominate species in this zone and found throughout. However, from 3 metres on other species included: Burr Medic, Black Rolypoly, Rolypoly, Small-leaf Bluebush and Grasses.

Terrestrial Zone 7 was weed dominated along the access track and species found included: Patersons Curse and Flea Bane. From 3-40 metres the vegetation became a mix of grass and shrubland. Species found included: Clover, Burr Medic, Black Rolypoly, Daisies, Small-leaf Bluebush and Gilgai Grass. From 40 metres on grassy dominated the vegetation type.

**The Education Area** had a diverse vegetation type. With numerous trees of different species, native grasses and shrubs all present. The vegetation was predominately native. Species observed included: Black Box, Camal Melon, Climbing Saltbush, Daisies, Native Liquorice, Nitre Goosefoot, Rolypoly, Ruby Saltbush, River Red Gum, Salt Bush, Sclerolaena, Small-leafed Bluebush, Spear Grass, Willow Wattle, Wallaby Grass and other grasses. It was healthy as shown in Figure 4-3.



Figure 4-1 Active Cell



Figure 4-2 Wetland Zone 1



Figure 4-3 Education Area

#### **4.2.1 Lower Mirrool Creek Floodway**

**Narrabri Swamp** was located on private property with grazing cattle present. As such, visual assessment was conducted from the roadside. The vegetation was predominately shrubby comprised of native vegetation in good health with a small number of Black Box present. Other species included: Black Rolypoly, Saltbush, Sclerolaena and Australian Fingergrass as seen in Figure 4-4. Fauna spotted included: Kangaroos, emus, Red-rumped Parrots, Wedge-tailed Eagle and Magpies.

**Five Oaks Swamp** was located on private property roughly 100-200 metres from the roadside with grazing animals present. As such visual assessments were conducted from the roadside. It appeared to be comprised of shrubby vegetation in moderately good health and contained mostly chenopods as seen in Figure 4-5.

**Mirrool Creek** was on private property and presence of grazing cattle was noted. As such a visual assessment was conducted from the roadside. It was comprised of some grass and shrub with Spear Thistle, Nitre Goosefoot, Black Rolypoly and grass species present. It was in poor health as seen in Figure 4-6.



Figure 4-4 Narrabri Swamp - LMCF



Figure 4-5 Five Oaks Swamp - LMCF



Figure 4-6 Mirrool Creek - LMCF

Table 4-2 Fauna observations

Fauna Observed			Location			
Family	Common Name	Scientific Name	Barren Box Wetland & Education area	Lower Mirrool Creek Floodway		
				Narrabri Swamp	Five Oaks Swamp	Mirrool Creek
<b>Birds</b>						
	Black Swan	<i>Cygnus atratus</i>	X			
	Australian Pelican	<i>Pelecanus conspicillatus</i>	X			
	Dusky Moorhen	<i>Gallinula tenebrosa</i>	X			
	Australasian grebe	<i>Tachybaptus novaehollandiae</i>	X			
	Little Pied Cormorant	<i>Microcarbo melanoleucos</i>	X			
	Little Black Cormorant	<i>Phalacrocorax sulcirostris</i>	X			
	Great Cormorant	<i>Phalacrocorax carbo</i>	X			
	Australian Darter	<i>Anhinga novaehollandiae</i>	X			
	Pacific Black Duck	<i>Anas superciliosa</i>	X			
	Hardhead	<i>Aythya australis</i>	X			
	Eurasian Coot	<i>Fulica atra</i>	X			
	White-faced Heron	<i>Egretta novaehollandiae</i>	X			
	Yellow-billed Spoonbill	<i>Platalea flavipes</i>	X			
	Straw-necked Ibis	<i>Threskiornis spinicollis</i>	X			
	Australian White Ibis	<i>Threskiornis molucca</i>	X			
	Willie Wagtail	<i>Rhipidura leucophrys</i>	X			
	Magpie Lark	<i>Grallina cyanoleuca</i>	X	X		
	Australian Magpie	<i>Gymnorhina tibicen</i>		X		

Fauna Observed			Location			
	Galah	<i>Eolophus roseicapilla</i>	X			
	Red-rumped Parrot	<i>Psephotus haematonotus</i>		X		
	White-bellied Sea Eagle	<i>Haliaeetus leucogaster</i>	X			
	Wedge-tailed Eagle	<i>Aquila audax</i>		X		
	Little Eagle	<i>Hieraaetus morphnoides</i>	X			
	Black-winged Kite	<i>Elanus caeruleus</i>	X			
	Black Kite	<i>Milvus migrans</i>	X			
	Whistling Kite	<i>Haliastur sphenurus</i>	X			
	Brown Falcon	<i>Falco berigora</i>	X			
	Black Falcon	<i>Falco subniger</i>	X			
	Nankeen Kestrel	<i>Falco cenchroides</i>	X			
	Emu	<i>Dromaius novaehollandiae</i>	X	X		
	Welcome Swallow	<i>Hirundo neoxena</i>	X			
<b>Mammals</b>						
	Eastern Grey Kangaroo	<i>Macropus giganteus</i>	X	X		
	European Red Fox	<i>Vulpes vulpes</i>	X			
	European Rabbit	<i>Oryctolagus cuniculus</i>	X			
	Feral Pig	<i>Sus scrofa</i>	X			
<b>Reptiles</b>						
	Eastern Long-necked Turtle	<i>Chelodina longicollis</i>	X			

Table 4-3 Flora Observation BBSW and LMCF

Flora Observed		Barren Box Storage and Wetland								Lower Mirrool Creek Floodway		
Common Name	Scientific Name	Wetland Zone 1	Wetland Zone 2	Wetland Zone 3	Terrestrial Zone 4	Terrestrial Zone 5	Terrestrial Zone 6	Terrestrial Zone 7	Planted Area Near Education Centre	Narrabri Swamp	Five Oaks Swamp	Lower Mirrool Creek
<b>Native</b>												
Australian Fingergrass	<i>Chloris truncate</i>							X		X		
Black Box	<i>Eucalyptus largiflorens</i>	X								X		
Black Rolypoly	<i>Sclerolaena muricata</i>	X	X	X	X	X	X	X	X	X		X
Bindweed	<i>Convolvulus sp.</i>				X							
Casuarina	<i>Casuarina sp.</i>		X									
Climbing Saltbush	<i>Eindaia nutans</i>							X				
Daisy	<i>Asteraceae (family)</i>				X			X	X			
Daisy	<i>Vittadinia sp.</i>			X	X							
Eucalyptus	<i>Eucalyptus sp</i>					X		X				

Flora Observed		Barren Box Storage and Wetland								Lower Mirrool Creek Floodway		
Grass	<i>Sporobolus sp.</i>	X	X		X	X	X					X
Gilgai Grass	<i>Walwhalleya sp.</i>								X			
Native Liquorice	<i>Glycyrrhiza acanthocarpa</i>		X	X								
Nitre Goosefoot	<i>Chenopodium nitrariaceum</i>					X		X				X
River Red Gum	<i>Eucalyptus camaldulensis</i>							X				
Rolypoly	<i>Salsola australis</i>				X		X	X				
Ruby Saltbush	<i>Enchylaena tomentosa</i>			X				X				
Salt Bush	<i>Atriplex sp.</i>				X			X		X		
Sclerolaena	<i>Sclerolaena sp.</i>							X		X		
Small-leaf Bluebush	<i>Maireana brevifolia</i>	X			X		X	X	X			
Spear	<i>Austrostipa</i>	X			X							

Flora Observed		Barren Box Storage and Wetland								Lower Mirrool Creek Floodway		
Grass	<i>sp.</i>											
Wallaby Grass	<i>Rytidospema sp.</i>				X							
Willow Wattle	<i>Acacia salicina</i>							X				
<b>Weeds</b>												
Burr Medic	<i>Medicago polymorpha.</i>				X			X		X		
Camel Melon	<i>Citrullus sp.</i>	X	X	X				X				
Clover	<i>Trifolium sp.</i>			X	X					X		
Dockweed	<i>Rumex sp.</i>				X							
Flea Bane	<i>Conyza sp.</i>	X	X		X			X		X		
Mallow	<i>Malva sp.</i>								X			
Mustard Weed	<i>Brassica sp.</i>	X	X	X	X	X		X				
Orange New Zealand Sedge	<i>Carex testacea</i>				X							

Flora Observed		Barren Box Storage and Wetland								Lower Mirrool Creek Floodway			
Patersons Curse	<i>Echium plantagineum</i>				X					X			
Spear Thistle	<i>Cirsium vulgare</i>	X	X	X	X								X

## 5. Conclusion

MI implemented the BBWRP over the period 2009-2014. Additional works were undertaken in 2017 and 2018 to reinstate lost revegetation works from non-inundated zones following the 2016 floods. Whilst the planned outcomes were not fully realised, valuable knowledge has been generated to inform ongoing management.

Both BBSW and the downstream flood plains currently have a mixture of native and non-native plants. This is commensurate with the dominance of agricultural land use of the areas. The presence of weeds was common and abundant throughout all sites visited.

Revegetation was implemented as outlined in the BBWRP. Generally, vegetation within 3m of the levees was predominantly weeds. From 3m to 30m, and up to 50m in wetland zone two, there was a mix of native and non-native vegetation. Weed populations may have increased due to the prolonged period of drought followed by rainfall and the unintentional access of adjacent grazing livestock. Livestock illegally accessing the site have subsequently been removed following MI consultation with Council and Local Land Services. Fence repairs are subsequently underway.

The native vegetation within the education area is healthy and thriving. This is largely as a result of the 2017-2018 MI revegetation work. Vegetation in the area is dominated by natives grasses, shrubs and trees.

Floods have applied a selection pressure on revegetation within the ephemeral wetland, with the 2016 flood further impacting any remaining revegetation. No planting has subsequently occurred in the wetland cell with natural processes dictating the current state. Inspection was not possible further than 50m from the levees due to inundation and access issues (Figure 9 and Figure 10), However, observations from the levees and up to 50m into the cells, indicate vegetation cover was evident throughout the site. It was not possible to confirm the composition of vegetation beyond 50m. Suffice to say that the wetland cell has the selection pressures from periodic inundation and drying, weed control and periodic seeding and planting with natives provided by MI activities.

Management of the wetland needs to accommodate conditions that reflect both the operating and climatic environment. As climate variability becomes a feature of the future only the most robust systems will endure. Management of the BBSW needs to be driven by and enhanced by these pressures to ensure success.

MI will continue to implement the BBSW the procedures and requirements of the OEMP via the management system and focus on effective weed and pest species management, while considering the ecological and cultural heritage values of the site.

Evidence of grazing downstream at the LMCF was noted as dominating the environment. Native flora species remaining are known to be unpalatable to cattle and the vegetative structure is reflective of domestic livestock's selective grazing habits.

## Appendix A Barren Box Wetland Rehabilitation Plan Implementation Summary

Table A-1 Implementation review of BBWRP - Revegetation Program

BBWRP Action <sup>1</sup>	Location <sup>1,2</sup>	Timing <sup>1</sup>	MI Implementation
Aerial sowing of 30kgs of local provenance Black Box ( <i>Eucalyptus largiflorens</i> ) seed	690 ha Wetland Zone 1	August 2008	2007 seed collection undertaken. Aerial seeding Zone 2c  July / August 2008 – 30 kg over 690 ha Zones 1, 2, 3 & 4 (drier conditions with some residual soil moisture, 50% burnt 50% unburnt)
Aerial sowing of 20kgs of local provenance Black Box ( <i>Eucalyptus largiflorens</i> ) seed	Wetland Zone 2	Spring following average winter rains and soil moisture is near field capacity Or Early Spring 2009 following forced autumn/Winter releases into Wetland Zone	November 2010 - 30kg applied over 500 ha of zone 1, 2 & 3 (optimum conditions due to semi-inundation from environmental water flow allocation application to wetland)
Tubestock of local provenance Lignum ( <i>Muelenbeckia florulenta</i> )	Inner Wetland Zone 3	Spring following average winter rains and soil moisture is near field capacity Or Early Spring 2009 following forced autumn/Winter releases into Wetland Zone	No record of tubestock planting in zone 3.  Aerial sown in 2008 and 2010
Tube stock Planting <b>Community 2</b> Refer to Appendix 3 (Rehab Plan) for full species list	Terrestrial Lunette Zone 4	Autumn 2010 Dependant on favourable conditions	Undertaken in Autumn 2011, 2012.
Direct Seeding of local provenance chenopod shrubland species	Terrestrial Zone 5 Terrestrial Zone 6 Terrestrial Zone 7	Zone 5 Spring 2009 Zone 6 Autumn 2010 Zone 7 Autumn 2011 Dependant on favourable conditions	Terrestrial Zone 5 – Direct Seeding 390 ha undertaken in May 2010, May 2011 and 2018. Air blown native grass seed 2010  Terrestrial Zone 6 – Direct seeding undertaken in May 2011.  Terrestrial Zone 7 – Direct Seeding Undertaken July and Aug 2009 300ha.

BBWRP Action <sup>1</sup>	Location <sup>1,2</sup>	Timing <sup>1</sup>	MI Implementation
<b>Additional works (not BBWRP actions)</b>			
Tube stock planting of native vegetation	Education Area	N/A	Direct Seeding in May 2011 Post 2016 floods: Tubestock planting July 2017 Tree planting May 2018
Tube stock planting	Active Cell (new 2a) Perimeter BBS	n/a	March 2008, July 2009 June 2009 native tree species perimeter BBS

<sup>1</sup> Barren Box Wetland Rehabilitation Plan – Section 6.1 Revegetation Program; <sup>2</sup> Refer Figure A1 for zone locations



Figure 25: Planting zones for revegetation activities

Figure A1 Revegetation zones (source: Barren Box Wetland Rehabilitation Plan 2009-2014)

Table A-2 Watering

BBWRP Action <sup>1</sup>	Location <sup>1</sup>	Timing <sup>1</sup>	MI Implementation
Water releases into the wetland cell to inundate the aerial seeded Black Box. Up to 600 ML may be required, but if can be timed to follow heavy rains to fill soil profile, 250 ML.	Wetland Zone	Annually in winter/spring for first three years post planting	Undertaken in 2008. Spring 2010 - 2,700 ML of Commonwealth Environmental Water, via NSW DECCW.
Hand watering of tubestock – Water cart	Stage1 Terrestrial Zone	During first two summers post planting if summer monthly rainfall is below average	No record of implementation. Seeding and planting coordinated to take advantage of rain or moist soil conditions where possible.

<sup>1</sup> Barren Box Wetland Rehabilitation Plan – Section 6.2.1 Water

Table A-3 Weed Management

Targeted Species <sup>1</sup>	Action <sup>1</sup>	Application <sup>1</sup>	Timing <sup>1</sup>	MI Implementation
Alligator Weed ( <i>Alternanthera philoxeroides</i> )	<i>Metsulfuron Methl.</i> <i>Glyphosate.</i>	10g/100L. 1L/100L.	February & May.	MI's Annual Alligator Weed strategy in place and includes annual monitoring and post-treatment follow up monitoring.  Formal inspections commenced in 2006/7 around the BBSW area for alligator weed. As plants were located, they were treated and GPS locations taken. This approach continues to date.  The MI spray record system, in place since 2016, shows the following treatments in the BBS zone:  2016 – 3 treatments 2017 – 4 treatments 2018 – 3 treatments 2019 – 3 treatments 2020-21 – numerous treatments, detailed inspections, physical removal and residual herbicide treatments.  MI works closely with both Griffith City and Carathool Shire councils on WONS management.

Targeted Species <sup>1</sup>	Action <sup>1</sup>	Application <sup>1</sup>	Timing <sup>1</sup>	MI Implementation
Athol Pine ( <i>Tamarix sp</i> )	Cut and paint stump. Glyphosate.	Undiluted.	Feb/May. Or as required.	No specific treatments recorded in recent years.
Peppercorn	Cut and paint stump. Glyphosate.	Undiluted.	Feb/May. Or as required.	No specific treatments recorded in recent years.
African boxthorn ( <i>Lycium ferrocissimum</i> )	Spray smaller plants. Remove larger plants with machine.	1L/100L	Feb/May. Or as required.	2020 – one treatment

<sup>1</sup> Barren Box Wetland Rehabilitation Plan – Section 6.2.2 Weed Management

Additional pest management:

- 2006 Aerial Shooting
- 2007 1080 baiting
- 2007 Pig trapping and shooting
- 2008-10 Pig trapping
- 2015 Fox baiting
- 2017-2018 European Carp removal
- 2021 Aerial shooting of pigs – LLS
- 2021 Sheep removal (escaped into BBS from surrounding properties)



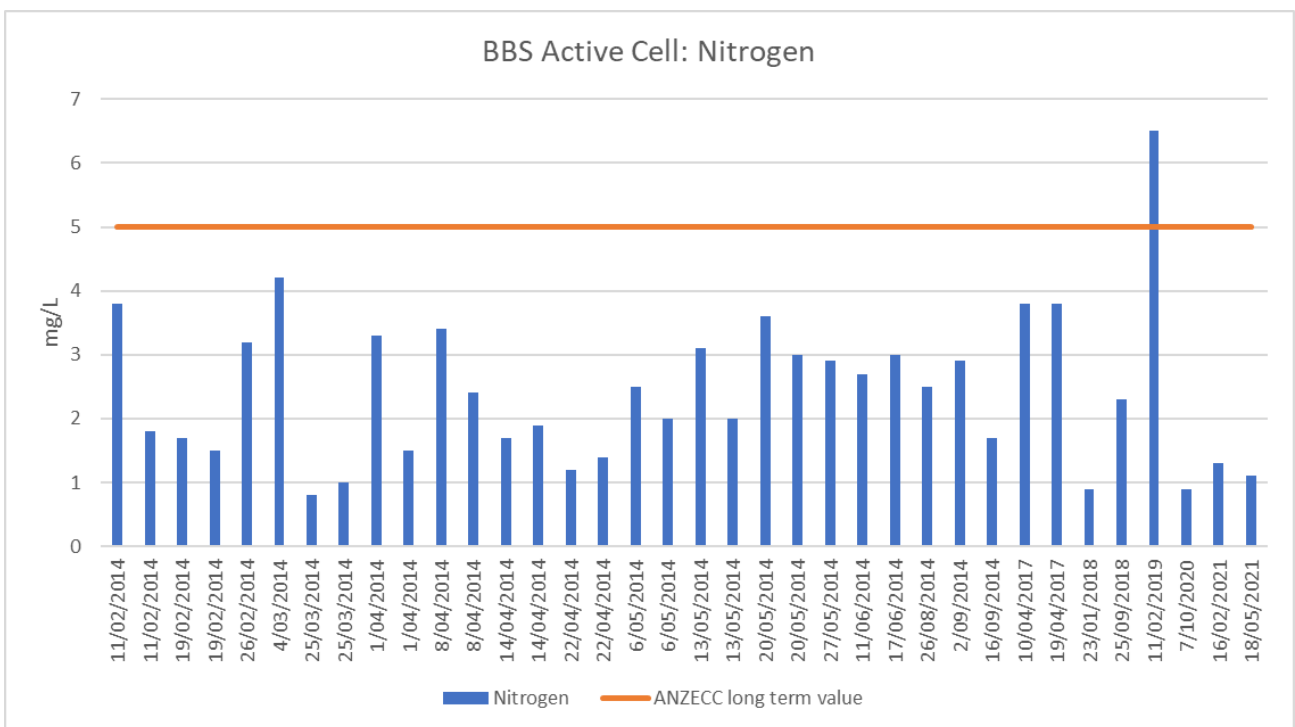
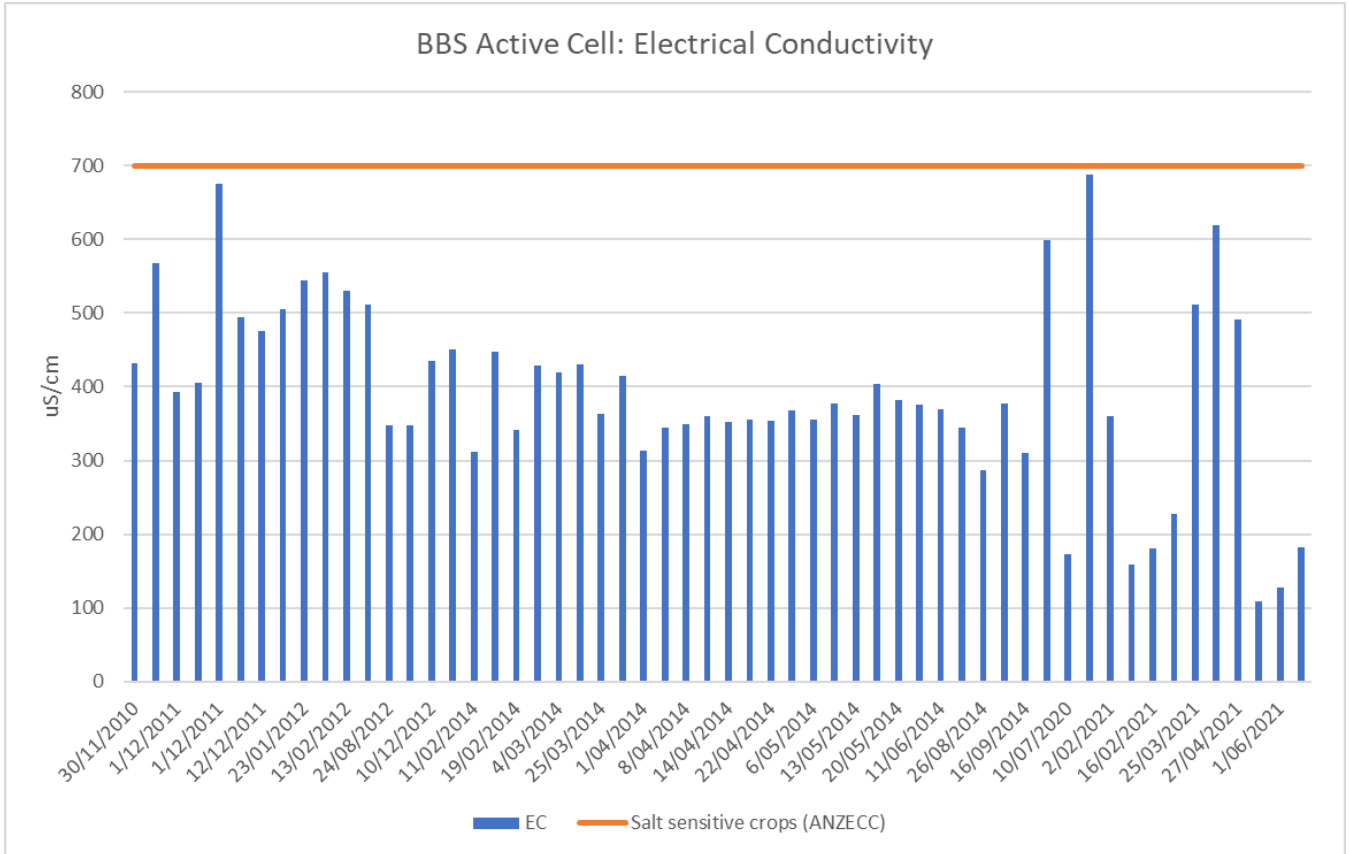
Figure 7 BBSW East August 2021

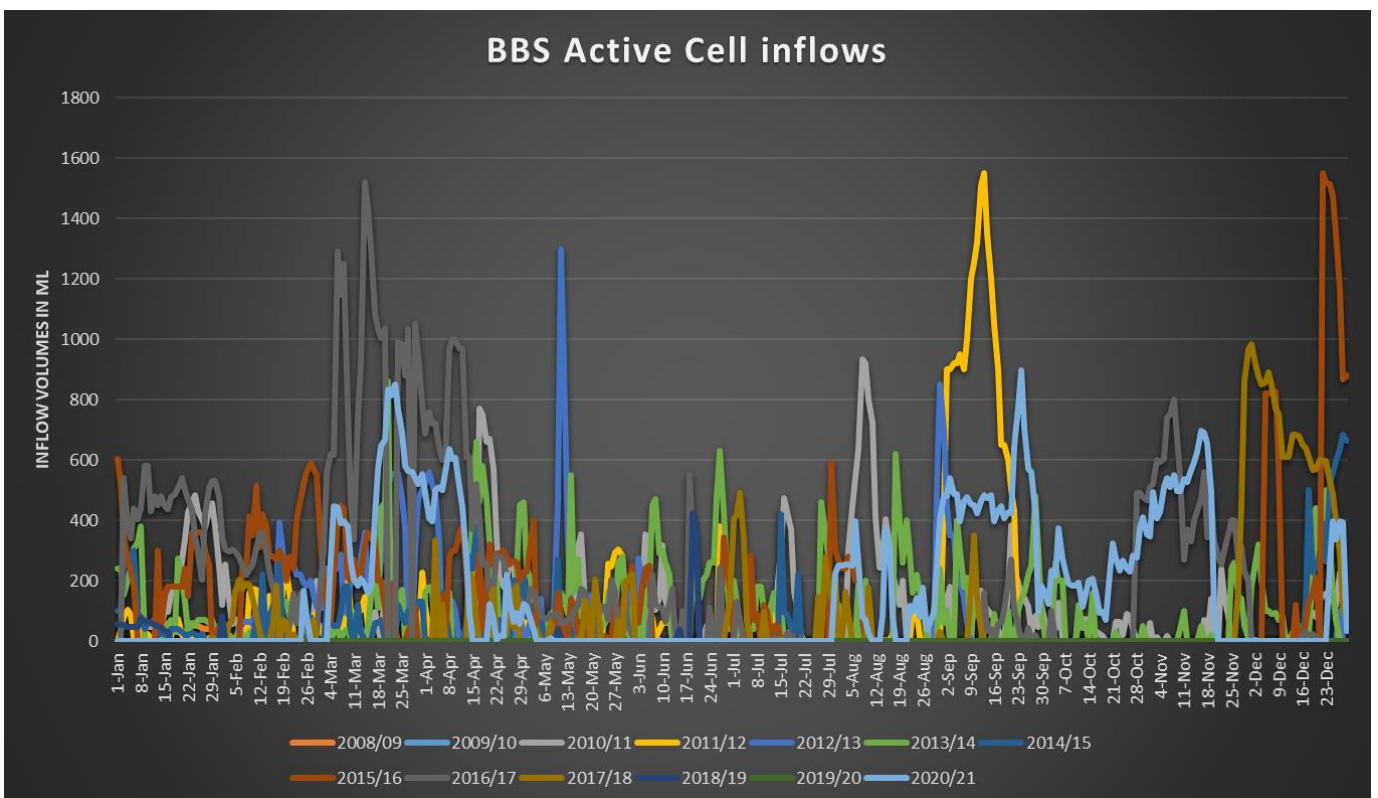
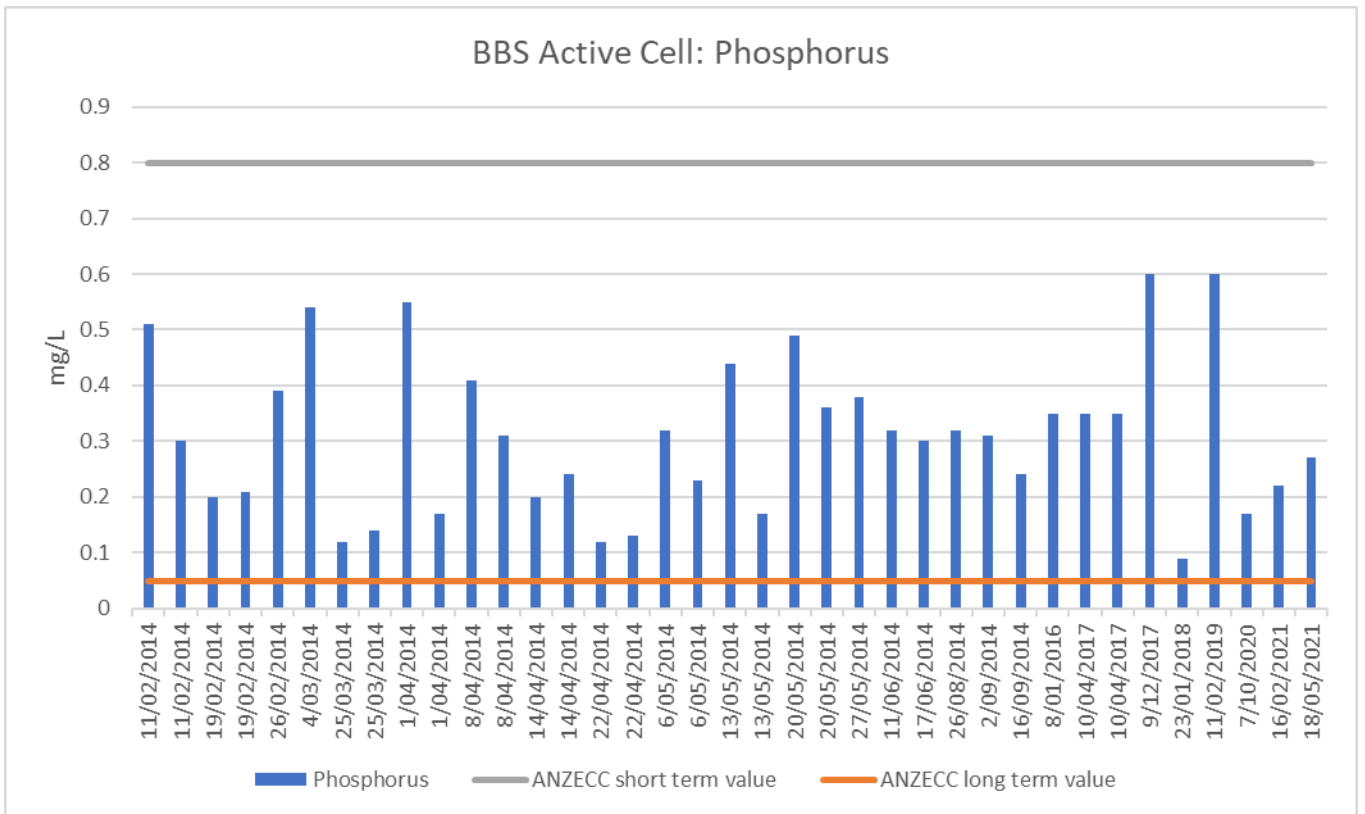


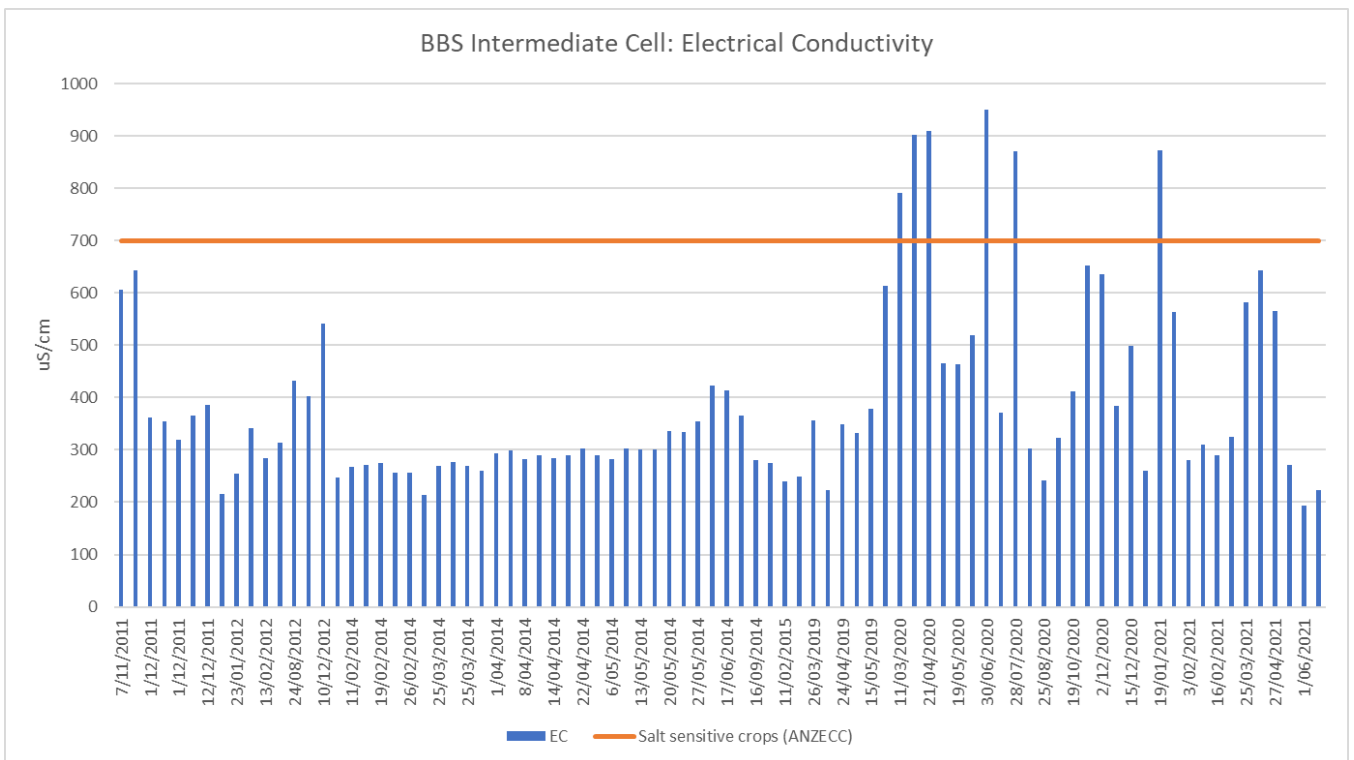
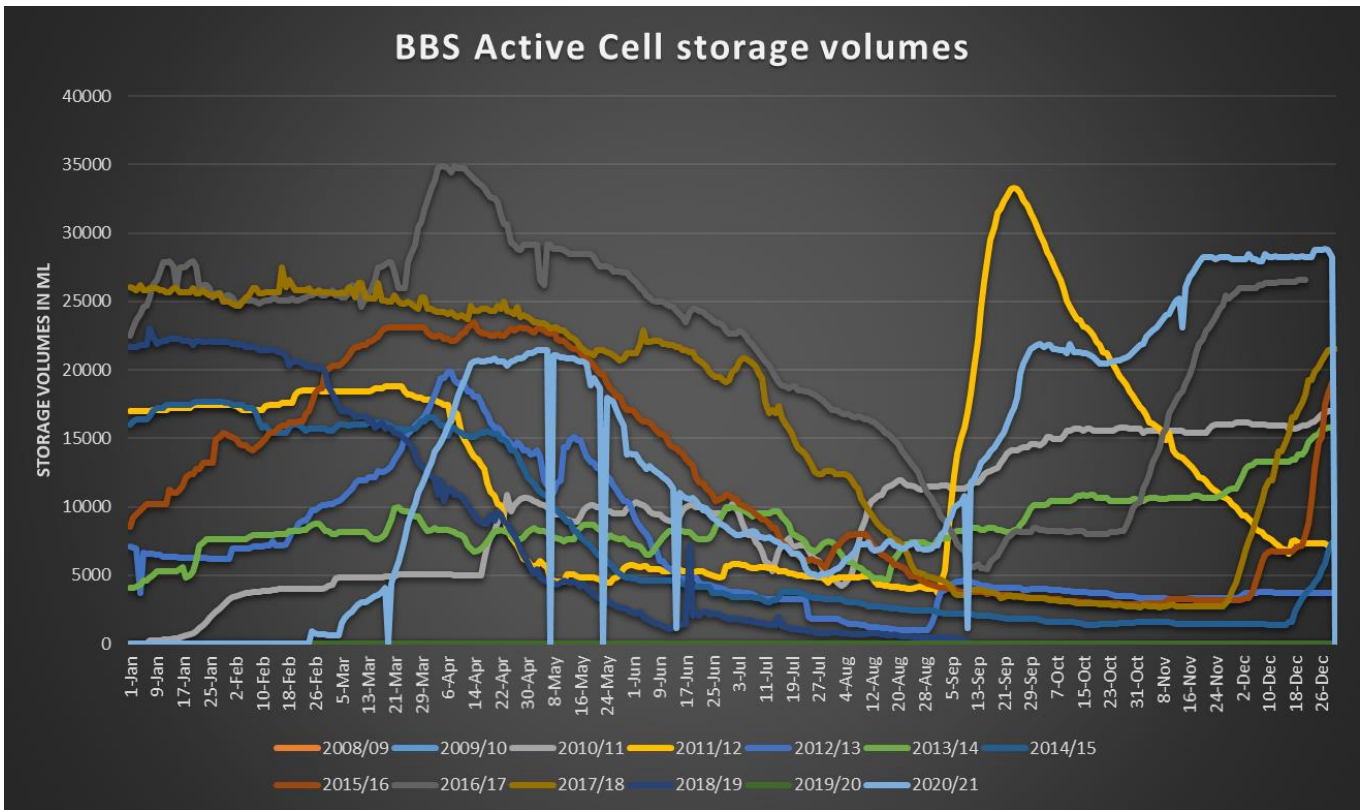
Figure 8 BBSW West August 2021

# Appendix D Water quality monitoring summary and flow chart

Active Cell:







**Modification Application**  
**Barren Box Swamp Modification**

