

Nepean River Pump and Pipeline

Submissions Report



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Client: Penrith Lakes Development Corporation

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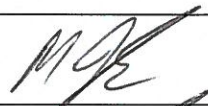
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1.0 Introduction

1.1 Project Overview

Penrith Lakes Development Corporation (PLDC) is seeking approval to construct a key piece of infrastructure for the Penrith Lakes Scheme (PLS) – the Nepean River Pump and Pipeline (NRPP). The proposed NRPP development is a pumping station and pipeline on the banks of the Nepean River required for the filling of the Lakes within the PLS, a future major water based parkland in Western Sydney. The NRPP development provides the NSW Government and the future PLS authority, the critical infrastructure required to extract water from the Nepean River and to functionalise the PLS for its intended water based recreational use. The approval sought for the NRPP forms part of the requirements enshrined in the 1987 Deed of Agreement between PLDC and the NSW Government.

The NRPP development site is located on the eastern bank of the Nepean River approximately 600 m downstream from the Penrith Weir, within the boundary of the PLS.

The NRPP development would include:

- Pumping station, comprising a pumping wet well buried into the Nepean River embankment.
- Water intake structure, consisting of three fine mesh intake screens and submerged in a minimum of 0.5-1 m of water within the Nepean River.
- Water pipeline, underground and approximately 80 m long which would discharge into the constructed wetland within the PLS.
- Outlet structure, consisting of a constructed headwall structure and rip rap dissipater to slow water velocity before discharge to the PLS.
- Motor control centre, consisting of electronic and communications equipment panel housed in an open structure.
- Electrical infrastructure, comprising an overhead power line connection (and associated power poles) between the development and the existing network on Lugard Street.
- Construction and operational access, which would primarily utilise existing access roads within the PLS and a temporary access road to the pumping station during construction.

The NRPP development and disturbance footprint is shown in Figure 1.

1.2 Environmental Assessment Process

1.2.1 Planning Framework

The NRPP development constitutes State Significant Development (SSD) as it is specified in Schedule 2 of *State Environmental Planning Policy (State and Regional Development) 2011* (SRD SEPP), being:

Development on land identified as being within the Penrith Lakes Site on the State Significant Development Sites Map if the development is for the purposes of extraction, rehabilitation or lake formation (including for the purposes of associated infrastructure on land located within or outside that Site).

Under clause 8(1)(b), the development is declared to be SSD for the purposes of section 89C of the *Environmental Planning and Assessment Act 1979* (EP&A Act). Accordingly, an Environmental Impact Statement (EIS) was prepared and submitted to the Department of Planning and Environment (DP&E) to seek approval under Division 4.1, Part 4 of the EP&A Act.

1.2.2 Public exhibition

The EIS was placed on public exhibition for 30 days from 16 October 2014 until 17 November 2014. The EIS was exhibited electronically on the DP&E major projects website. Electronic and written submissions were accepted by DP&E until 17 November 2014.



Figure 1 NRPP development footprint

1.3 Purpose of this Report

The purpose of this Submissions Report is to respond to the submissions received during the public exhibition of the EIS.

This Submissions Report documents and responds to submissions received from the community, stakeholders and government agencies. Submissions received on the EIS are available on DP&E's major projects website. A register of the submissions, and a reference to where each submission has been addressed in this report, is provided in **Appendix A**.

1.4 Structure of this Report

This Submissions Report has been structured in a manner that sets out the key issues raised in the submissions on the EIS and addresses each issue.

Chapter 1.0 provides an overview of the proposed development, the impact assessment process and report purpose and structure.

Chapter 2.0 provides a summary of the submissions and identifies the key issues raised.

Chapter 3.0 provides a response to the key issues raised.

Chapter 4.0 provides a conclusion and justification for the development

Appendix A provides a table of responses to each submission and issue raised. Each submission has been categorised and has been given a reference number.

Appendix B provides the findings of a supplementary flora and fauna survey.

2.0 Summary of Submissions

2.1 Submissions Process

During the exhibition period, submissions regarding the modification request were accepted by DP&E from online, email, fax and postal sources. Submissions were numbered as received and provided to PLDC in accordance with the requirements of the EP&A Act.

All submissions were reviewed and issues raised have been included and addressed in this Submissions Report.

2.2 Submissions Received

In total, DP&E received nine submissions and copies were provided to PLDC. Of these:

- Seven were from local and State government authorities and agencies, including:
 - Crown Lands division of NSW Trade & Investment
 - Sydney Water
 - Penrith City Council (PCC)
 - Sydney Catchment Authority (SCA)
 - NSW Environment Protection Authority (EPA)
 - NSW Office of Environment and Heritage (OEH)
 - NSW Department of Primary Industries (DPI), comprising comments from:
 - Fisheries NSW
 - NSW Office of Water (NOW)
 - Agriculture NSW
- Two were from individuals within the community.

2.3 Issues Raised in Submissions

This section provides a summary of the issues raised in the submissions received. The summary is presented, by topic, in Table 1.

An analysis of the issues raised identified that the topics of most concern, based on the submissions received, included:

- Approvals, licences and permits;
- Water quality, data and modelling;
- Environmental management; and
- Flora and fauna.

Responses to key issues identified above are presented in **Section 3.0**. All other submissions received are responded to in Appendix A.

Table 1 Summary of issues raised in submissions

Topic	Subtopic, issues and concerns	Reference
Approvals, licences and permits	Several issues were raised with regard to licensing for water extraction from the Nepean River, including reference to existing entitlements and allocation. Requests were made for additional and ongoing consultation with NOW to discuss licensing issues.	Section 3.1 and Appendix A
Water	A number of submissions raised concern regarding water issues, summarised in the following subtopics. <i>Water quality, data and modelling</i> Concerns were raised regarding the water quality data used in modelling scenarios for the filling of the lakes within the PLS (including the relevance of those scenarios) and the conditions under which the pumps would operate. In addition, concern was raised regarding the quality of water extracted from the river as well as water that may be released back into the river, once it has passed through the PLS. Concern was also raised regarding downstream irrigation impacts. <i>Flood risk</i> The SCA requested DP&E to consider potential changes to flood risks to the NRPP following the review on flood management within the Hawkesbury Nepean Valley. <i>River flow</i> Concern was raised regarding other sources of discharge into the river, including high nutrient and environmental flows from upstream sources, and their potential implications with regard to the project. <i>Water availability</i> Sydney Water raised concerns regarding use of available water from the St Marys AWTP and the potential for purchase of recycled water to supplement the NRPP during drier periods. <i>Water Management Plan</i> PCC requested clarification on the status of the Water Management Plan approval process for the PLS. <i>Water Sharing Plan</i> DPI clarified an EIS statement regarding the Water Sharing Plan for Greater Metropolitan Unregulated Rivers Water Sources.	Section 3.2 and Appendix A Appendix A Appendix A Appendix A Appendix A Appendix A
Environmental Management	A number of submissions raised concern for the management of environmental impacts during the construction phase of the project, given the project's location within and adjacent to the Nepean River.	Section 3.3 and Appendix A
Flora and Fauna Assessment	<i>Flora and Fauna Survey</i> OEH identified a number of actions to be undertaken to improve the robustness of the assessment of the NRPP with respect to flora and fauna. This included additional field survey, updates to 7-part tests, and further commentary and consideration of whether offsets are required. <i>Fish Passage</i> Other issues raised regarding flora and fauna included consideration of in-stream flora or habitat and potential impacts on fish habitat and fish passage.	Section 3.4 and Appendix A Appendix A
Infrastructure design	It was raised that consideration should be given to the physical robustness of infrastructure within the river due to potential high flow velocities during flood events.	Appendix A
Operations	It was raised that consideration should be given to operational maintenance requirements to ensure the stability of infrastructure along river banks. Similarly, that consideration of a Bushfire Asset Protection Zone is required.	Appendix A

Topic	Subtopic, issues and concerns	Reference
Project siting	It was noted that the revised location of the NRPP is closer to the St Marys AWTP and as such, liaison with Sydney Water and DP&E is required to ensure the appropriateness of this location.	Appendix A
Urban development	Concern was raised that the development of the PLS would lead to urban development and a reduction in the natural landscape.	Appendix A
Contamination and remediation	PCC queried whether an assessment of the suitability of the land subject to development was undertaken in accordance with SEPP 55.	Appendix A
Landscape and visual	Concern was raised that natural views of farmland and mountain escarpment would be marred by urban development.	Appendix A
Noise	The EPA proposed that construction hours be consistent with the current approved timeframes for a “noise sensitive zone” during construction of the power reticulation works.	Appendix A

3.0 Response to Key Issues

3.1 Approvals, Licensing and Permits

Key issue

NOW identified in its submission that it is concerned that the flow modelling undertaken for the NRPP is based on the assumption that the PLS has unlimited access to water in the Nepean River when the specified flows are exceeded. It was suggested that any new or revised extraction licence will need to specify an annual entitlement which is the maximum volume of water that can be extracted from the river in any water year. It has been noted that PLDC and NOW will need to discuss and confirm the most appropriate annual entitlement for the PLS.

Response

The project is SSD under Division 4.1 of the EP&A Act and as such, consent can be granted without the approvals listed in section 89J of the EP&A Act. Because these approvals are not required after consent has been granted, any issues associated with the listed approvals need to be resolved as part of the SSD application. Of those listed in section 89J, the relevant approvals not required include approvals under sections 89 and 90 of the *Water Management Act 2000* (WM Act):

89 Water use approvals

- (1) A water use approval confers a right on its holder to use water for a particular purpose at a particular location.*
- (2) A water use approval may authorise the use within New South Wales of water taken from a water source outside New South Wales.*

90 Water management work approvals

- (1) There are three kinds of water management work approvals, namely, water supply work approvals, drainage work approvals and flood work approvals.*
- (2) A water supply work approval authorises its holder to construct and use a specified water supply work at a specified location.*
- (3) A drainage work approval confers a right on its holder to construct and use a specified drainage work at a specified location.*
- (4) A flood work approval confers a right on its holder to construct and use a specified flood work at a specified location.*

It is PLDC's contention that the NRPP would not require an approval under either of sections 89 or 90 of WM Act, as it is not using water within the means of the above definition, nor does the proposal constitute any of the three kinds of works listed. It is therefore considered that resolution pertaining to these approvals is not required prior to the SSD project approval, as they do not apply.

It is acknowledged that a water licence under other provisions of the WM Act would be required for extraction of water from the Nepean River to fill the lakes and for ongoing "topping up" of the lakes on a very infrequent basis. An application for such a licence, including negotiations for conditions for such licence (pumping rules), can be progressed once an SSD project approval has been granted.

Further, it is noted that the activator and holder of any such licence under the WM Act for the NRPP development is likely to be the NSW Government in accordance with the 1987 Deed of Agreement. As such, the Minister may grant an extraction licence under section 63B of the WM Act.

PLDC would continue to discuss and negotiate with NOW as required with regard to applicable licences under the WM Act.

3.2 Water quality, data and modelling

Key issue

A number of water quality and modelling issues were raised in submissions from government agencies, in particular by NOW. The issues raised included:

- Consideration of required lake retention times to allow for water treatment
- Consideration of wetland design in water treatment
- Feasibility of modelled scenarios (e.g. unrestricted pumping)
- Specification of low flows and consideration of other pumping rules and cease to pump conditions
- Information on return flows and water quality
- Information on water quality downstream of St Marys AWTP and its suitability for extraction and discharge to the PLS.

Response

As part of the Stage 1 Water Management Plan approval, Cardno has completed an extensive water balance report with additional scenarios as requested by NOW, demonstrating that the completed Scheme will be able to meet lake water requirements without the need for additional pumping infrastructure. A Water Quality Strategy supported this Stage 1 Water Management Plan.

The previously advised cease to pump condition at 350 ML/day has been applied to all modelling works, and it is considered that the modelling undertaken presents a worst case assessment. Pumping rates and operations were approved as part of the 2012 Stage 1 Water Management Plan approval. However, it is noted that the pumping rules would be negotiated as part of a future (post approval) water licence application (refer to Section 3.1).

The Stage 2 Water Management Plan details the water quality responses in place for the completed Scheme, including the extensive Southern Wetlands treatment system and the Quarantine Lake fitted with a sluice gate. The practices have been modelled following best practice and demonstrate the source water will be suitable for use within the Penrith Lakes system.

The Stage 2 Water Management Plan has modelled the assumed quantity and quality of water available from the Nepean River using the most current data available sourced from Sydney Water's water modelling works. This includes assessing the daily flows at the pump inlet point in the river and only drawing water when it meets the proposed licence conditions. The requirement for flows to be measured at the Yarramundi weir is noted and will likely form part of the future water licence, applying an additional operational constraint. Water quality will be sampled and assessed prior to drawing water from the river and releasing through the designed holding points such as the Southern Wetlands and Quarantine Lake within the Scheme.

The Stage 2 Water Management Plan was finalised and submitted to NOW and DP&E in November 2014. The Plan identifies the following management aspects of the PLS:

- Design and operational objectives.
- End water users and water quality indicators.
- Groundwater and stormwater management.
- Ecosystem development, including lake filling, establishment of aquatic ecosystem, stocking, and ongoing monitoring.
- Fisheries management.
- Water quality modelling and outcomes.
- Lakes Operations Plan.

3.3 Environmental Management

Key issue

Given the location of the NRPP development within the river bank, a number of submissions raised concern for the potential erodibility and stability of the river bank, and potential aquatic impacts as a result of construction of the intake structure. It was recommended that monitoring be undertaken to detect and manage downstream impacts.

Response

Mitigation measures to be implemented during construction and operation of the NRPP development were identified in Section 21.2 and Section 21.3 of the EIS, respectively. In particular, the following management plans would be prepared and implemented:

- Vegetation Management Plan: detailing bush regeneration works, weed management strategies and monitoring to be undertaken.
- Aquatic Flora and Fauna Management Plan: detailing a Weed Management Plan, appropriate clearing methods, scheduling to avoid fish migration season, relocation of sensitive biota, erosion and sediment control and appropriate rehabilitation measures.
- Construction Noise and Vibration Management Plan: prepared as part of the overarching CEMP and in line with the existing management measures for the PLS.
- Traffic Management Plan: detailing speed limits, haulage routes, site access points and other protocols for traffic management. It is anticipated any operational requirements would form part of the wider PLS operation and management.

It is anticipated that requirement for these environmental management plans will form part of the conditions of approval.

3.4 Flora and Fauna

Key issue

OEH noted a number of limitations to the flora and fauna assessment accompanying the EIS and recommended the following actions be undertaken:

- Field survey of the proposed power line route by a qualified botanist/ ecologist to determine the vegetation type and whether or not it constitutes a threatened ecological community.
- Update the Seven Part Test for River-flat Eucalypt Forest (RFEF) to accurately reflect the current proposal. As RFEF is listed as having a high probability of being a Groundwater Dependent Ecosystem (NOW 2012), it is recommended that the updated Seven Part Test discuss any potential impacts to groundwater (e.g. temporary interception during construction of trenches).
- Field survey of the subject site by a qualified zoologist/ecologist for potential Osprey nests and Diamond Firetails. Note: the Osprey was recorded only 650 m upstream of the proposed intake structure, this year.
- Preparation of Seven Part Tests for the Osprey and Diamond Firetail. Consideration of further species as required following survey of habitat within the proposed power line corridor.
- Discussion on requirement, or otherwise, for specific biodiversity offsets (e.g. for RFEF). This discussion is to consider whether offsets are required in addition to the ecological habitat created by the Penrith Lakes Scheme and proposed mitigation measures to rehabilitate cleared areas.

Response

AECOM has undertaken a supplementary field survey of the NRPP development in response to the issues raised by OEH. The survey was undertaken by a qualified botanist/ecologist and the findings of this survey are provided in Appendix B, and confirmed:

- Vegetation along the proposed power line does not constitute RFEF and consists of planted vegetation.
- NRPP development is unlikely to impact groundwater dependent ecosystems (and the Seven Part Tests have been updated).
- No Osprey or Diamond Firetails were observed. The survey did not identify potential habitat or nests for these species. Seven Part Tests were prepared for the two species.
- Approximately 0.14 hectares of RFEF occurs within the project footprint. As such, specific biodiversity offsets may be required dependent on the final detailed design. Rehabilitation activities undertaken within the wider PLS will provide high quality ecological habitat that would enhance biodiversity values and would offset removal of some RFEF. Further discussion would be undertaken with OEH to determine offset requirements following detailed design and prior to construction.

4.0 Conclusion and Justification

PLDC has sought approval for the NRPP development to allow the future operator of the PLS to fill and maintain water within the Scheme. The EIS for the NRPP development was placed on public exhibition for 30 days from 16 October 2014 during which a total of nine submissions were received. Key issues raised included:

- Concerns regarding water licensing and approvals for the extraction of water from the Nepean River;
- Concerns regarding the quality of extracted water, and the appropriateness of data and modelling assessed;
- Environmental management measures and plans; and
- Adequacy of flora and fauna assessment.

These issues have been responded to in this Submissions Report, and additional technical studies have been undertaken where required.

This Submissions Report, including the findings of updated and additional technical studies, is largely consistent with the initial EIS for the NRPP development, which demonstrates that the development can be undertaken without significant environmental or social impacts. The NRPP development would generate social and environmental benefits as the development would help realise the environmental, recreational and lifestyle benefits of the PLS as a whole to the people of Western Sydney.

Appendix A

Detailed Response to Submissions

Appendix A Detailed Response to Submissions

Submission #	Issue #	Category	Issue Raised (excerpt from submission)	Response
01 Crown Lands	1	Operations	A Bushfire Asset Protection Zone needs to be provided round the pumping station structure, essentially on Penrith Lakes Development Corporation land. Asset protection also needs to be afforded to overhead power supply connections to the pumping station.	Noted. An APZ determined in accordance with Standards for Asset Protection Zones (NSW RFS, 2006) would be provided around the pumping station and overhead power supply connections as part of the detailed design.
01 Crown Lands	2	Approvals, licences and permits	The river intake and intake pipe are proposed on a currently deep section of the Nepean river. In circumstances at present or in the future where dredging the river is required around or associated with operation of the intake, then a licence would be required from Crown Lands for the dredging works, subject to appropriate environmental assessment	It is noted that any dredging works would require a licence from Crown Lands. The construction method for the intake structure and pipe would not require the dredging of any material from the Nepean River. Therefore, a licence from Crown Lands is not required for the NRPP proposal.
01 Crown Lands	3	Environmental Management	Given the potential erodability of river bank (likely comprised essentially of a fine sand), construction of the intake works, pumping well and access facilities need to ensure that the structural stability of the river bank is maintained and enhanced as practical in accommodating these works	Noted. The existing commitments in the EIS remain valid (refer Section 13.5 of the EIS). A maintenance and monitoring program would be developed and implemented to monitor the effectiveness of revegetation and ground stabilisation measures implemented as part of the CEMP and the wider PLS operations, once the NRPP development is completed.
01 Crown Lands	4	Environmental Management	Noxious aquatic and land-based weeds upstream of and in the vicinity of the intake works need to be eliminated with ongoing monitoring and management provided.	Noted. The existing commitments in the EIS remain valid (refer Section 9.6.2 of the EIS). A Weed Management Plan would be prepared as a sub plan of the Vegetation Management Plan and would be commensurate with existing weed management undertaken as part of the PLS operation.
01 Crown Lands	5	Environmental Management	Degraded aquatic and terrestrial habitat upstream of and in the vicinity of the intake works needs to be restored as practical, particularly to River-flat Eucalypt Forest in the riparian zone.	Noted. The existing commitments in the EIS remain valid (refer Section 9.6 of the EIS). Rehabilitation of impacted habitat will be undertaken as soon as practical.
01 Crown Lands	6	Water - River flow	While treated sewage will likely be benign component of flows pumped into the lakes scheme, a potential consequence in drier times will be the build-up of nutrients in the lakes, possibly contributed to by recreation uses. If nutrient build-up posed a serious problem then this potentially may require flushing of the lakes, possibly at the expense of guaranteed environmental flows in the Nepean-Hawkesbury system.	PLDC has conducted a water modelling process upon the advice of the appointed water agencies. The model used the existing Hawkesbury Nepean water quality model to source the predicted future water inflows following the previous water licence pumping rules. The outcome of the modelling showed that the lakes were able to achieve the desired water quality outcomes through the ecological management practices as applied to the existing Scheme and will not require access to 'flushing flows' allocations. The water quality strategy is contained within the Stage 2 Water Management Plan and aims to reduce nutrient enriched water.
01 Crown Lands	7	Infrastructure Design	Figure 8.4 for a 10 year Average Recurrence Interval shows relatively high peak velocities of 4-5 metre per/second in the vicinity of the proposed intake structure. This section of the river is on the outside of a natural meander, and it is likely that the bed and bank profile of the river at this locality may alter during flood events. Hence, the intake structure and supporting infrastructure need to be sufficiently robust to withstand such events over the long term	The proposed Nepean River Pump Station and Pipeline has been through a reference design process by Worley Parsons Services Pty Ltd who have had the plans certified to comply with best engineering practice, meeting the requirements of the Building Code of Australia and the relevant Australian and International Standards which includes flooding responses.
01 Crown Lands	8	Operations	It is noted in Appendix E - Concept Sketches (e.g. weir 3) that it is proposed for weirs and inlet/outlet structures are to be constructed using reno mattresses and/or rip rap. Given that reno mattresses are effectively heavy wire baskets, with a definite life span, there would need to be an enduring inspection and maintenance program for such structures during the life of the scheme, to ensure that the structures are stable. Further, adjoining natural river banks and/or constructed soil banks may also be affected if structures are damaged and require additional protection from water flows of high volume and/or velocity	The reference design of the project has progressed and reno mattresses have been substituted for pre-cast concrete blocks. It is anticipated this substitution will provide greater stability and protection from high water volume or velocities.
02 Sydney Water	1	Project Siting	Sydney Water notes that the water quality rationale for moving the pump and pipe location may not be robust and assumptions about the operation of St Marys AWTP are not wholly accurate..... Sydney Water cannot guarantee that AWTP will always operate as it does now.	Comment noted. Monitoring of water quality inflow and water quality targets are contained in the Stage 2 Water Management Plan. Water quality will be sampled and assessed prior to drawing water from the river and releasing through the designed holding points within the Scheme.
02 Sydney Water	2	Water - Data and modelling	It is not clear from the EIS if the water quality data cited only reflects the high river flows that will be used by Penrith Lakes for extraction. Table 21 should only include water quality data obtained when the river is flowing at above 350 ML/day, to ensure water quality data reflects the conditions in which the pump will operate.	Information used in the EIS was provided by the NSW Office of Water. Further to this, the Stage 2 Water Management Plan has modelled the assumed quantity and quality of water available from the Nepean River using the most current data available sourced from Sydney Water's own water modelling works and applying the previously advised pump operation approvals. Water quality will be sampled and assessed prior to drawing water from the river and releasing through the designed holding points within the Scheme. Water quality modelling under the Stage 2 Water Management Plan indicates water quality objectives are achieved when operating under these license conditions.
02 Sydney Water	3	Water - Water quality	Water quality data shown in Table 2 and Table 21 extends to March 2012. Warragamba Dam spilled in March and April 2012. Wet weather and the associated high river flows generally result in poorer water quality, but this is not reflected in the data included in the EIS. Table 22 presents results for enterococci as an indicator for bacterial pollution. It shows enterococci samples exceed the range for primary contact 59 percent of the time and secondary contact recreation 19 percent of the time. The tables include 19 samples between January 2007 and March 2012.	The Stage 2 Water Management Plan details the water quality responses in place for the completed Scheme, including the extensive Southern Wetlands treatment system and the Quarantine detention Lake fitted with a Sluice Gate. The practices have been modelled following best practice and demonstrate the source water will be suitable for use within the Penrith Lakes System.

Submission #	Issue #	Category	Issue Raised (excerpt from submission)	Response
			Sydney Water data for January 2008 to August 2013 includes 172 samples. It indicates that water was unsuitable for primary contact recreation 78 percent of the time.	
02 Sydney Water	4	Water - Water availability	While water from St Marys AWTP is not included as an option in the current EIS, the document notes that “the development design does not preclude use of recycled water in the future through a potential future pipeline connection to the St Mary's STP discharge pipeline (before discharge into Boundary Creek) or similar. “ However, it must be noted that the primary objective for St Marys AWTP was to replace flows captured by Warragamba Dam for drinking water. Penrith Lakes' demand for recycled water is likely to be greatest during hot, dry periods when pumping from the river is not possible. In these conditions lake water is not likely to return to the river. Use of AWTP water in this manner would not satisfy AWTP's original project objectives or development approval. Penrith Lakes Development Corp. have previously noted their desire to construct a system with minimal ongoing operating costs. Purchase of recycled water, even if available, may not be consistent with this aim.	Noted. A pipeline connection directly to the replacement flows is not envisaged as part of the Stage 2 Water Management Plan.
03 Penrith City Council	1	Environmental Management	A Construction Noise and Vibration Management Plan is proposed to be developed to assist in the management of acoustic impacts. It is requested that this be conditioned as part of any approval issued.	Noted. The existing commitments in the EIS remain valid (refer Section 12.6.1 of the EIS). A Construction Noise and Vibration Management Plan would be prepared prior to construction.
03 Penrith City Council	2	Contamination and Remediation	It is not clear in the Environmental Impact Statement whether the site has been found suitable for the intended use, as required by SEPP 55 - Contamination and Remediation. It does not appear that any sampling has been undertaken, and it is outlined that some sampling will occur prior to works commencing. SEPP 55 requires that the consent authority be satisfied that the site is suitable for the proposed works or activity. As a result the Department of Planning & Environment is requested to ensure that SEPP 55 is adequately addressed. In addition, it was not acknowledged in the EIS that remediation works would require development consent, should any contamination investigations find that remediation is required. In the Penrith Local Government Area, SREP 20 and SEPP 55 require that consent be obtained prior to remediation works being undertaken. This should be relayed to the applicant for their information.	Clause 2(2) of SREP 20 states that this plan does not apply to the land which SEPP (Penrith Lakes Scheme) 1989 applies, and as such is not relevant to the NRPP development application. Similarly, the Penrith LEP does not apply to Part 4.1 projects, such as the NRPP development application. Notwithstanding this, contamination and remediation was addressed in Section 13.0 of the EIS. No registered contaminated lands were identified on the site. While potentially contaminating activities within the wider PLS (primarily relating to quarrying) have been identified, these activities are unlikely to have historically occurred at the specified NRPP site, where the soil profile is considered to be relatively intact. Potential migration of contaminants was considered and therefore appropriate mitigation measures were identified in Section 13.5 of the EIS. Provided these are implemented the site is considered suitable in accordance with SEPP 55.
03 Penrith City Council	3A	Water - Water Management Plan	The supporting documentation states that a water balance assessment has been undertaken for the Penrith Lakes Scheme under a number of alternative scenarios, including different pumping regimes from the Nepean River and different configurations of the Lakes Scheme. A hydrological model (MUSIC) and a hydraulic model (SOBEK) were being established to model the behaviour of the Lakes Scheme under various scenarios. In June 2013 the Office of Penrith Lakes on behalf of a number of agencies requested certain scenarios be modelled, however, the status of the final model is unclear as the workshops being held with relevant stakeholders ceased to occur during the middle of 2013. It is understood that the applicant has indicated that the modelling has been finalised and the applicable Water Management Plan will be lodged to the Department of Planning for approval shortly. Clarification on the status of the Water Management Plan approval process is requested.	The Stage 1 Water Management Plan was approved by DP&E in November 2013. The Stage 2 Water Management Plan was submitted to DP&E on the 10th of November 2014.
03 Penrith City Council	3B	Environmental Management	All disturbed areas should be reinstated with suitable vegetation. A Soil and Water Management Plan is requested to be conditioned to be prepared and implemented which includes measures to ensure that disturbed areas are protected with suitable erosion and sedimentation controls until such time that the revegetation is sufficient to stabilise the site.	Noted. The existing commitments in the EIS remain valid (refer Section 13.5.2 of the EIS). An Erosion and Sediment Control Plan (ESCP) would be prepared prior to construction and would form part of the CEMP.
03 Penrith City Council	3C	Project Siting	It is however noted that the revised location for the proposed pump and pipeline is in closer proximity to the discharge point of Sydney Waters Effluent Management Facility (2181 - 2185 Castlereagh Road, Penrith). The Department is requested to liaise with Sydney Water and ensure the proposed location of the pump and pipeline is appropriate given the location of this discharge point and the future intended recreational use of the lakes created as part of the Penrith Lakes Scheme.	Noted. Sydney Water's submission has been received and is responded to in this Submissions Report.
03 Penrith City Council	4A	Flora and Fauna	The following concerns however are raised with this methodology and the conclusions made: - There appears to have been no assessment of the in-stream habitat or flora and fauna at the location of the pump. As such, it is difficult to determine what is present and the level of impact that may result from the proposed works; and - There appears to have been no assessment of the vegetation that is required to be cleared for the power line(s). It requested that these concerns be addressed by the applicant prior to any determination being issued.	AECOM has undertaken an additional survey and assessment of the site in December 2014 to address these concerns. The findings of this assessment have been included in this Submissions Report at Appendix B.
03 Penrith City Council	4B	Environmental Management	It is recommended that the following be prepared and approved as part of the application (or required to be submitted for approval as a condition of consent): o Vegetation Management Plan	Noted. The existing commitments in the EIS remain valid including the preparation and implementation of: - Vegetation Management Plan

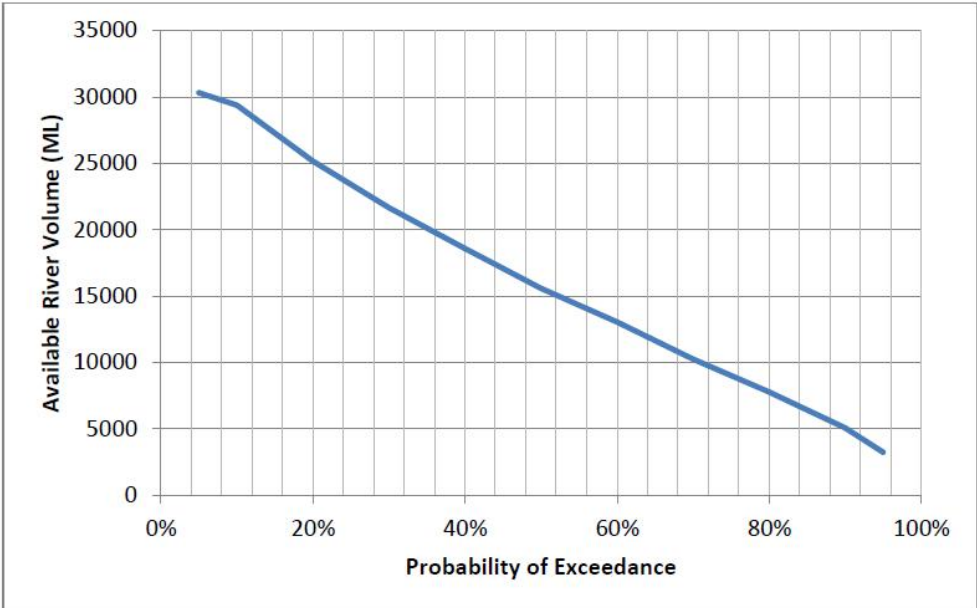
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			- o Weed Management Plan - o Erosion and Sediment Control Plan - o Aquatic Flora and Fauna Management Plan	- Weed Management Plan - Erosion and Sediment Control Plan - Aquatic Flora and Fauna Management Plan
03 Penrith City Council	4C	Environmental Management	It is recommended that the applicant be required to develop and implement a monitoring plan to monitor any ongoing downstream impacts on the riverbank and the flora and fauna habitats as a result of the water extraction. The plan should outline measures that are to be undertaken by the applicant should a downstream impact be identified. This also should be submitted for consideration and approval.	Noted. The existing commitments in the EIS remain valid (refer Section 13.5 of the EIS). A surface water monitoring program would be developed and implemented both upstream and downstream of works and would identify measures to be implemented should impacts be detected.
03 Penrith City Council	5A	Approvals, licences and permits	Any necessary Roads Act Approvals, easements or legal agreements as required under relevant legislation should be obtained or entered into prior to carrying out works on land not in the ownership of PLDC and for on-going restoration and maintenance.	Noted.
03 Penrith City Council	5B	Environmental Management	A Traffic Management Plan should be prepared by an appropriate qualified person and implemented during the construction phase of the development with a copy of the plan available on site at all times	The existing commitments in the EIS remain valid (refer Section 15.4 of the EIS). A Construction Traffic Management Plan would form part of the CEMP for the project. It is anticipated any operational requirements would form part of the wider PLS operation and management.
03 Penrith City Council	5C	Approvals, licences and permits	Any approval issued should ensure compliance with the requirements of the NSW Office of Water	Noted.
03 Penrith City Council	5D	Environmental Management	A dilapidation report should be conditioned to review existing infrastructure including roads and buildings. It should be submitted to Council and the Department prior to the commencements of works and any damage rectified by PLDC prior to finalisation of works.	No buildings would be impacted as a result of the NRPP development. Roads would be utilised as per existing arrangements for the PLS. It is anticipated any operational requirements would form part of the wider PLS operation and management.
04 Sydney Catchment Authority	1	Water - River flow	The SCA is required to release environmental flows from the dams it operates upstream of the proposed pumping site. The SCA's position is that pumping arrangements should not cause there to be changes to the SCA's environmental flow requirements that would be detrimental to the Authority. The SCA considers the NSW Office of Water should provide advice to the Department on this issue.	Noted. This issue is to be resolved between NOW and DP&E.
04 Sydney Catchment Authority	2	Flora and Fauna	The SCA has constructed and maintains a fish passage structure at Penrith Weir. The SCA would be concerned if pumping downstream of the weir reduced the effectiveness of the structure. Fisheries NSW should provide advice to the Department on this issue.	Noted. Fisheries NSW has provided separate comment and PLDC has responded to those comments herein.
04 Sydney Catchment Authority	3	Water - Flood risk	The SCA notes that the EIS has assessed the flood risk to the development. The SCA requests the Department consider the decisions of the Government on the review into flood management and preparedness in the Hawkesbury Nepean valley. These may result in changes to flood risk and have implications for pump infrastructure and the adjacent disturbed riverbank.	Noted. This issue is for consideration by DP&E.
05 Environment Protection Authority	1	Noise	The EIS proposes that construction hours be consistent with the current approved timeframes for quarrying operations as a "non-sensitive noise zone" as defined in the existing Environment Protection Licence (EPL 2956). Due to the potential to impact residential receivers of up to 20dB(A) for a potential period of up to 3 months, the EPA considers the hours more appropriate for a "noise sensitive zone" as defined in the EPL 2956. The EPA requests that the OPE consider that due to the potentially significant impact on residential receivers of up to 20dB(A) during construction of power reticulation works, that these works be limited to standard construction hours.	Standard construction hours will apply to the works. As part of the Construction Noise and Vibration Management Plan, approval is to be sought from affected landholders where the impact will be greater than 20dB(A).
05 Environment Protection Authority	2	Environmental Management	As identified by the Proponent, the Construction Environment Management Plan (CEMP) must include a detailed Erosion and Sediment Control Plan (ESCP) in accordance with the guidelines "Managing Urban Stormwater Guidelines, Soils and Construction" (Landcom, 2004) "Blue Book".	Noted. The existing commitments in the EIS remain valid (refer Section 13.5.2 of the EIS). An Erosion and Sediment Control Plan (ESCP) would be prepared prior to construction and form part of the CEMP.
05 Environment Protection Authority	3	Environmental Management	The EPA would also like to take this opportunity to highlight that during both the construction and operation phase of the NRPP project, the proposed works must not breach s120 of the Protection of the Environment Operations Act 1997 "Prohibition of Pollution of Waters" (i.e. pollution of waters is prohibited unless undertaken in accordance with relevant regulations).	Noted.
05 Environment Protection Authority	4	Environmental Management	Any waste that is unable to be reused or recycled must be classified in accordance with the Waste Classification Guidelines (DECCW, 2009) prior to disposal at a licensed off site disposal facility.	Noted.
06 Public submission	1	Water - Water quality	Although I object to the project proceeding prior to completion of analysis and design of the wetland and associated water quality management measures for Penrith Lakes, my specific objection is that the project as	Water quality will be sampled and assessed prior to drawing water from the river and releasing through the designed holding points such as the Southern Wetlands and Quarantine Lake

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(name withheld)			stated has no firm or definite measures to ensure that river abstraction does not occur if the Replacement Flows Project is not operational. This could be easily and affordably achieved without any significant cost (as it would be a inter govt agency issue readily effected by telemetry or other digital methods) and would ensure consistency with the whole purpose of the EIS, which is to ensure river abstractions free of sewage contamination. If there can be no assurance that the Replacement Flows Project would indeed be operational during river abstractions, then that goes back to my overall objection.	within the Scheme. The Stage 2 Water Management Plan has been finalised and submitted to NOW and DP&E (November 2014). This Plan provides management measures and water quality outcomes to be achieved by the lakes.
07 Office of Environment & Heritage	1	Approvals, licences and permits	In summary, OEH does not support the need to vary the existing AHIP application as outlined in the EIS to include the study area. As no Aboriginal Heritage values have been identified during this assessment, no further consideration of Aboriginal cultural heritage will be necessary at this point in time. However OEH notes that should the Penrith Lakes Scheme require any additional approval in future, the assessment process should rely on up to date survey, site data and cultural investigation in order to support the determination of whether Aboriginal cultural heritage values will be affected by the proposed project.	Noted.
07 Office of Environment & Heritage	2	Flora and Fauna	The flora and fauna impact assessments conclude that the proposed NRPP project is unlikely to result in a significant impact to threatened species, populations and ecological communities. However, a number of limitations must be noted: - The previous flora and fauna impact assessment (Biosis Research 2006) did not include assessment of the proposal in its current form. It assessed a number of route options for the pipeline and no options for the associated powerline. The Assessments of Significance consisted of the now superseded Eight Part Tests. - The current flora and fauna impact assessment (PLDC 2014) is largely a copy-and-paste of the previous Biosis Research however does include more recent site visits on 4 December 2012 and 8 April 2014. The current report still discusses the previous pipeline options and clearing areas, even in the transformed Seven Part Tests (although the total area of RFEF to be cleared has been increased within the Seven Part Test). The current proposed powerline route was not assessed. Updated database searches were undertaken however only included a small search area (and did not include the usual 10 km search buffer to detect more mobile species).	AECOM has undertaken an additional survey and assessment of the site in December 2014 to address these concerns. The findings of this assessment has been included in this Submissions Report at Appendix B.
07 Office of Environment & Heritage	3	Flora and Fauna	The OEH has reviewed the information provided with respect to the (ecological) DGRs, and has undertaken a new search of the Atlas of NSW Wildlife, and recommends the following actions be undertaken: • Field survey of the proposed powerline route by a qualified botanist/ ecologist to determine the vegetation type and whether or not it constitutes a threatened ecological community. • Update the Seven Part Test for River-flat Eucalypt Forest (RFEF) to accurately reflect the current proposal. As RFEF is listed as having a high probability of being a Groundwater Dependent Ecosystem (NOW 2012), it is recommended that the updated Seven Part Test discuss any potential impacts to groundwater (e.g. temporary interception during construction of trenches). • Field survey of the subject site by a qualified zoologist/ecologist for potential Osprey nests and Diamond Firetails. Note: the Osprey was recorded only 650 m upstream of the proposed intake structure, this year. • Preparation of Seven Part Tests for the Osprey and Diamond Firetail. Consideration of further species as required following survey of habitat within the proposed powerline corridor. • Discussion on requirement, or otherwise, for specific biodiversity offsets (e.g. for RFEF). This discussion is to consider whether offsets are required in addition to the ecological habitat created by the Penrith Lakes Scheme and proposed mitigation measures to rehabilitate cleared areas.	AECOM has undertaken an additional survey and assessment of the site in December 2014 to address these concerns. The findings of this assessment have been included in this Submissions Report at Appendix B. In summary: - Vegetation along the proposed power line does not constitute RFEF and consists of planted vegetation. - NRPP development is unlikely to impact groundwater dependent ecosystems (and the Seven Part Tests have been updated). - No Osprey or Diamond Firetails were observed. The survey did not identify potential habitat or nests for these species. - Specific biodiversity offsets may be required and further discussion has been provided.
07 Office of Environment & Heritage	4	Flora and Fauna	Appendix F of the EIS includes a 'Seven Part Test' for the RFEF and concludes no significant impact however is mostly a copy-and-paste of the Biosis Research (2006) 'Eight Part Test'. It appears the EEC has not been adequately considered against the Seven Part Test questions as the text still refers to a 10 m wide disturbance area and the various options being considered at the time of the Biosis Research assessment, and not the current proposal.	AECOM has undertaken an additional survey and assessment of the site in December 2014 to address these concerns. The findings of this assessment have been included in this Submissions Report at Appendix B. The relevant Seven Part Tests have been updated.
07 Office of Environment & Heritage	5	Flora and Fauna	OEH's Cumberland Plain and SCIVI vegetation mapping, and the NPWS (2003) mapping referred to by Biosis Research, don't map the patch of vegetation occurring within the proposed powerline corridor (700 m x 20 m; 1.4 ha). It appears this area of vegetation has not been ground-truthed as it wasn't part of the scope of works for Biosis Research and the current surveys by PLDC covered a different route. It is therefore unknown if this vegetation also constitutes an EEC. It is recommended that a qualified botanist/ecologist survey the proposed powerline route to determine the vegetation type and whether or not it constitutes an EEC, and that the RFEF Seven Part Test be updated to more accurately reflect the current proposal. RFEF is listed as having a high probability of being a Groundwater Dependent Ecosystem (NOW 2012) and it is recommended that the updated Seven Part Test discuss any	AECOM has undertaken an additional survey and assessment of the site in December 2014 to address these concerns. The findings of this assessment have been included in this Submissions Report at Appendix B.

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			potential impacts to groundwater (e.g. temporary interception during construction of trenches).	
07 Office of Environment & Heritage	6	Flora and Fauna	A search of the OEH Atlas of NSW Wildlife (using a 10 km search buffer) identified threatened fauna species that had not been considered by either Biosis Research (e.g. due to new listings and/or records since 2005) or PLDC (e.g. due to limited search area). Two species are considered to have a low-moderate (Diamond Firetail) or moderate (Eastern Osprey) likelihood of occurrence. It is recommended that a qualified zoologist/ecologist survey the subject site for potential Osprey nests and Diamond Firetails. Following survey, a Seven Part Test should be prepared for both species.	AECOM has undertaken an additional survey and assessment of the site in December 2014 to address these concerns. The findings of this assessment have been included in this Submissions Report at Appendix B. The relevant Seven Part Tests have been updated.
07 Office of Environment & Heritage	7	Flora and Fauna	Figure 9.2 of the EIS shows "Endangered species" as red dots. The Green and Golden Bell Frog is Endangered (TSC Act; Vulnerable under EPBC Act), the Freckled Duck is Vulnerable (TSC Act) and the other species are protected but not threatened.	Noted. The figure provided (Figure 9.2) erroneously categorised all species from the database search as 'endangered'.
07 Office of Environment & Heritage	8	Flora and Fauna	Following the recommended survey of the proposed powerline easement, the issue of biodiversity offsets should be revisited (i.e. if more EEC is identified that would be impacted).	AECOM has undertaken an additional survey and assessment of the site in December 2014 to address these concerns. The findings of this assessment have been included in this Submissions Report at Appendix B. The issue of offsets has been revisited and as approximately 0.14 hectares of RFEF occurs within the project footprint, specific biodiversity offsets may be required. Rehabilitation activities undertaken within the wider PLS will provide high quality ecological habitat that would enhance biodiversity values and would offset removal of some RFEF. Further discussion would be undertaken with OEH to determine offset requirements prior to construction.
07 Office of Environment & Heritage	9	Flora and Fauna	No environmentally sensitive area mapping is discussed in the flora and fauna assessment. The EIS (Section 6.4.2) states that environmentally sensitive areas include the river and riparian lands (which have been assessed). Table 8 of the EIS states that the development site does not support any areas indicated on Council's "Natural Resources Sensitive Land Map".	A review of the mapping contained within the Hawkesbury-Nepean Catchment Management Authority Catchment Action Plan 2007-2016 was undertaken as part of the preparation of the Submissions Report. Of relevance was the potential priority fauna habitat of riverflat forests (Map 9). This has been addressed in the additional assessment included in this Submissions Report at Appendix B.
08 Public Submission (Mrs P. Moore)	1	Urban development	Why should the Nepean, the people's river have its waters drained from it to fill a man-made lake. I believe there are plans for wildlife sanctuaries, parklands, bushwalking trails. One can't help but think that the parklands etc. are to compensate and appease the public for the huge urban development that I believe is planned.	The project is limited to a pump and pipeline (and associated infrastructure) from the Nepean River to the PLS. The project does not propose urban development or changes to the existing land uses.
08 Public Submission (Mrs P. Moore)	2	Urban development	Once upon a time you could look across from Castlereagh and Cranebrook and see paddocks of green produce that in the early 1800's fed the colony of Sydney. Over the last hundred years people came to enjoy the river, to picnic and explore, they didn't need man-made lakes or having to contend with locked gates or urban development to reach their river and heritage.	The project is limited to a pump and pipeline (and associated infrastructure) from the Nepean River to the PLS. The project does not propose urban development or changes to the existing land uses.
08 Public Submission (Mrs P. Moore)	3	Landscape and visual	That once lovely natural farmland vista has already gone only to be seen in paintings and photos. The views of the mountain escarpment will be marred if urban development is to take place within that scene.	The project is limited to a pump and pipeline (and associated infrastructure) from the Nepean River to the PLS. The project does not propose urban development or changes to the existing land uses. A visual assessment was included in the EIS and concluded that impacts are not considered to be significant due to the generally low sensitivity of receivers surrounding the development, the transient nature of likely visitation to the area and the relatively minor scale of works and infrastructure proposed.
09 Department of Primary Industries (Fisheries)	1	Flora and Fauna	Fisheries NSW has reviewed the environmental impact statement and considers that impacts to the aquatic environment will be minimised and rehabilitated provided that the mitigation measures relating to 'Ecology', 'Soils and Water' and 'Hydrology' summarised in Tables 54 and 55 of the EIS are implemented. In particular: - the proposed mesh screens are to be placed on the intake structure and the rate at which water is withdrawn is low, so that impacts through the uptake of fish are avoided. - impacts to fish passage must be avoided by complying to cease to pump rules in the Water Sharing Plan. - erosion and sedimentation measures are to be used during construction. - the Aquatic Flora and Fauna Management Plan is to be implemented. It is important that the temporary spit is fully removed from the Nepean River following construction.	Noted. The documented mitigation measures would be captured within the CEMP which would be prepared and implemented prior to construction. The CEMP will contain measures for the full removal of the temporary spit.
09 Department of Primary Industries (NSW Office of Water)	2	Approvals, licences and permits	The Office of Water is concerned that the flow modelling is based on the assumption that the Penrith Lakes Scheme (PLS) has unlimited access to water in the Nepean River when the specified flows are exceeded. The high flow licence will specify an annual entitlement which is the maximum volume of water that can be extracted from the river in any water year. In this regard, PLDC and NOW will need to discuss and confirm the most appropriate annual entitlement for the PLS. The Department may wish to convene a meeting to discuss key issues raised in this advice.	Discussion on the water licence and pumping rules would be undertaken as part of the post-approval process (refer Section 3.1 of Submissions Report). The activator of the approval will consult with NOW to determine conditions of the required water licence.

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09 Department of Primary Industries (NSW Office of Water)	3	Water - Data and modelling	The reference gauge for the PLS cease to take condition is the Yarramundi gauge. As such, the movement of the extraction location to below Penrith Weir does not impact on the flow at the reference gauge. The following points also need to be addressed: • Evidence should be provided to support the claim that water quality at the pump site has improved compared to that reported in the previous assessment. • Required retention times to allow for water treatment in the wetlands to achieve appropriate water quality for the PLS has not been appropriately considered in setting limits on extraction volumes. • Water quality needs to be assessed at the flows of interest (i.e. high flows not low flows) to understand required retention times in the wetlands and Quarantine Lake to achieve the desired water quality outcomes. In order to understand the system, its impacts on the river, the pumping regime, and volumes that may be extracted, the assessments outlined above cannot be done in isolation. Wetland design is integral to understanding retention times and volumes that can be extracted in an event in order to treat the water to the appropriate standards. Without this understanding it will not be possible to determine when and how much water can be extracted in wet, dry or average years.	The Stage 2 Water Management Plan has modelled the assumed quantity and quality of water available from the Nepean River using the most current data available sourced from Sydney Water's own water modelling works. This includes assessing the daily flows at the pump inlet point in the river and only drawing water when it meets the proposed water quality and flow criteria. The requirement for flows to be measured at the Yarramundi weir is noted and will likely form part of the Water Access Licence applying an additional operational constraint. Water quality will be sampled and assessed prior to drawing water from the river and releasing through the designed holding points such as the Southern Wetlands and Quarantine Lake within the Scheme.
09 Department of Primary Industries (Agriculture NSW)	4	Water - Data and modelling	Agriculture NSW advise that the modelled impacts should be reviewed once more data is obtained regarding available irrigation water for the downstream users. Noting that if the Penrith Lakes Scheme operation does influence the Cease to Pump time frame i.e. comes in 2 days earlier than normal, this could impact negatively on downstream agriculture businesses.	Noted. Downstream users and determination of available water is for NOW to determine when licence discussions are undertaken.
09 Department of Primary Industries (NSW Office of Water)	5	Water - Water quality	Further evidence needs to be provided to support this statement. The focus of water quality analysis needs to be at flow rates during which water will be allowed to be extracted. (referring to "Water quality downstream of Boundary Creek is suitable for extraction and discharge to PLS now the St Marys Water Recycling Initiative is discharging highly treated water into the Nepean River")	The Stage 2 Water Management Plan has modelled the assumed quantity and quality of water available from the Nepean River using the most current data available sourced from Sydney Water's own water modelling works. This includes assessing the daily flows at the pump inlet point in the river and only drawing water when it meets the proposed water quality and flow criteria. The requirement for flows to be measured at the Yarramundi weir is noted and will likely form part of the Water Access Licence applying an additional operational constraint. Water quality will be sampled and assessed prior to drawing water from the river and releasing through the designed holding points such as the Southern Wetlands and Quarantine Lake within the Scheme.
09 Department of Primary Industries (NSW Office of Water)	6	Flora and Fauna	Further evidence needs to be provided to support the claim that the river-flat eucalypt forest (RFEF) community that will be disturbed by the Nepean River Pump and Pipeline (NRPP) is degraded.	This issue has been addressed in response to OEH's submission. Refer to Appendix B of this Submissions Report for further information.
09 Department of Primary Industries (NSW Office of Water)	7	Flora and Fauna	Further information should be provided on the relevant species of fish considered and their migration patterns, to better understand the impacts to be avoided.	Fish species that have the potential to occur in the local area were described in Table 27 of the EIS, of which the Macquarie Perch has potential habitat within the study area. Construction of the NRPP would be undertaken outside of the migratory season of this species.
09 Department of Primary Industries (NSW Office of Water)	8	Water - Data and modelling	The summary statistics for water quality presented in Table 2 do not provide sufficient evidence to support changing the extraction point. Data from sampling conducted before the commencement of the St Marys Water Recycling Initiative is required, and comparisons made to the upstream (Penrith Weir) site. Data collected during flows between 350 - 5000 ML/d need to be used. The water quality data collected during low flows is not representative of the water that will be extracted.	Water quality data collected during low flows demonstrates a conservative assessment and a number of scenarios have been modelled using data provided by government authorities. Water quality outcomes are outlined in the Stage 2 Water Management Plan and meeting such outcomes would form part of extraction rules attached to any water licence sought following project approval.
09 Department of Primary Industries (NSW Office of Water)	9	Water - Water Sharing Plan	This statement is incorrect ["2006 - NSW Office of Water releases a water sharing plan"]. The year 2006 is the date of the Metropolitan Water Plan, a plan to balance water use across the Sydney Metropolitan area. This is a plan that identifies water sources, water use targets, recycling targets and so on. The Water Sharing Plan for Greater Metropolitan Unregulated Rivers Water Sources commenced on 1 July 2011, and is a legal document that identifies water sharing rules (e.g. pumping and trading rules and environmental water).	Noted.
09 Department of Primary Industries (NSW Office of Water)	10	Water - Data and modelling	NOW modelling indicates that lake drawdown beyond identified tolerances will occur in extreme droughts, but that this can be managed with water transfers within the PLS, e.g. from the Wildlife Lake to the other lakes.	Noted. As part of the Stage 1 Water Management Plan approval, Cardno have completed an extensive water balance report with additional scenarios as requested by the Department demonstrating the completed Scheme will be able to meet lake water requirements without the need for additional pumping infrastructure. The Stage 2 Water Management Plan was submitted in November 2014.
09 Department of Primary	11	Water - Data and modelling	Scenario AS (unrestricted pumping) is unrealistic as there will be a cap on extraction, in accordance with water licences held. Unrestricted pumping is not a viable option. Scenario AS should be revisited with higher flow rates	As part of the Stage 1 Water Management Plan approval, Cardno has completed an extensive water balance report with additional scenarios as requested by the Department demonstrating

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Industries (NSW Office of Water)			if water quality analysis of high flows warrants this. In relation to scenario A1, the Quarantine Lake (QL) is now designed to be separated by a gate, and so an alternative A 1 with a cap on the volumetric entitlement should be run.	the completed Scheme will be able to meet lake water requirements without the need for additional pumping infrastructure. The Stage 2 Water Management Plan was submitted in November 2014 . Extraction rules would be negotiated and sought following project approval.
09 Department of Primary Industries (NSW Office of Water)	12	Water - Data and modelling	The proponent must consult with the Office of Water on possible volumes. There will be an entitlement on the high flow licence and so modelling should include this as a restriction. This will affect the amount of time that the lakes remain in their operational ranges. Table 5 will need to be revised.	Noted. Extraction rules and license discussions will be undertaken with NOW following project approval.
09 Department of Primary Industries (NSW Office of Water)	13	Water - Data and modelling	Shallow water in low flows should not be an issue. "Low flows" are not specified. There will have to be at least 350 ML/d passing the pump - with extraction volumes above this. Is there a submergence issue at these flows? Flow rate at which submergence becomes an issue should be identified.	The previously advised cease to pump condition at 350 ML/day has been applied to all modelling works. The pump inlet design requires a minimum submergence prior to operating under the modelled constitutions to accommodate for the intake structure.
09 Department of Primary Industries (NSW Office of Water)	14	Water - Water quality	This has not been shown to be the case. More information is required. [referring to "Removing water quality issues"]	Comment is noted, and in light of comments raised by Sydney Water. Water quality outcomes are outlined in the Stage 2 Water Management Plan and meeting such outcomes would form part of extraction rules attached to any water licence sought following project approval.
09 Department of Primary Industries (NSW Office of Water)	15	Water - Data and modelling	Wetlands design is crucial not only to achieving water quality criteria in the PLS, but in understanding how many days' storage the wetlands and QL will be able to provide and thus how many days the pumps would be operational. These two things cannot be separated; however the EIS makes no attempt to integrate them. The proposed pump size and extraction volumes may achieve lake levels within operational targets, but these volumes may not be achieved in reality. Holding times in the wetlands and QL to achieve appropriate water quality may reduce the overall number of days that extraction can occur. This needs to be modelled.	It is agreed that wetland design is crucial to achieving water quality in the PLS. The Stage 2 Water Management Plan was submitted in November 2014 and identifies the design and operational criteria for the scheme, as well as detailing the water quality model . The detailed design of the wetlands would be undertaken to meet these criteria. Extraction rules would be negotiated as part of a water licence application and sought following project approval.
09 Department of Primary Industries (NSW Office of Water)	16	Infrastructure Design	The geomorphic implications of this proposal need to be explored. The preferred site is likely to be exposed to high velocities during flood flows (outer bank on the curve of the river). Burying the pipeline under poorly consolidated materials will not prevent erosion of the disturbed area during floods. Other options to prevent erosion may need to be explored.	The proposed Nepean River Pump Station and Pipeline has been through a reference design process by Worley Parsons Services Pty Ltd who have had the plans certified to comply with best engineering practice, meeting the requirements of the Building Code of Australia and the relevant Australian and International Standards which includes flooding responses. Further, environmental management measures would be implemented as described in the EIS and highlighted in this Submissions Report (maintenance and ongoing monitoring).
09 Department of Primary Industries (NSW Office of Water)	17	Approvals, licences and permits	This has been done to an extent [cumulative impacts of water management licences and approvals]; needs to be revised based on the changed location .	Noted. It is understood that NOW will be responsible for the issuing of a water licence in consideration of other licences and approvals issued for the water resource.
09 Department of Primary Industries (NSW Office of Water)	18	Approvals, licences and permits	PLDC must discuss this with NOW [referring to a new or revised extraction licence]. It is expected that the existing water licence entitlements would be utilised for the ongoing maintenance of the lakes scheme. Opportunities for an additional licence to fill the lakes will need to be discussed with NOW.	Noted. Consultation with NOW will be undertaken regarding the need for a new or revised extraction licence following project approval.
09 Department of Primary Industries (NSW Office of Water)	19	Approvals, licences and permits	PLDC already holds a number of licence entitlements and no new entitlement is available for this purpose. Regardless, section 63B of the Water Management Act 2000 applies only to the State or to a public authority, and as such does not apply to PLDC.	It is anticipated that the activator of the licence under the WM Act for the NRPP development is likely to be the NSW Government in accordance with the 1987 Deed of Agreement. As such, PLDC is of the opinion that the Minister may grant an extraction licence under section 63B of the WM Act (refer Section 3.1 of the Submissions Report).
09 Department of Primary Industries (NSW Office of Water)	20	Flora and Fauna	Protection of fish passage opportunities at Bishops Bench needs to be a primary driver of the extraction rules.	Noted. Extraction rules are part of licensing discussions that would be undertaken with NOW following project approval.
09 Department of Primary Industries (NSW Office of Water)	21	Water - Water quality	The proponent should ensure it considers any impacts on water extraction at the North Richmond Water Filtration Plant.	The North Richmond Water Filtration Plant is approximately 20km downstream from the NRPP development, and approximately 10km downstream from the PLS. Water quality will be sampled and assessed prior to drawing water from the river and releasing through the designed holding points such as the Southern Wetlands and Quarantine Lake within the Scheme. The PLS has been designed to minimise the likelihood of discharge of undesirable water quality as described in the Stage 2 Water Management Plan which was submitted in November 2014.

Submission #	Issue #	Category	Issue Raised (excerpt from submission)	Response
09 Department of Primary Industries (NSW Office of Water)	22	Infrastructure Design	See above page 47 comment. Location of the site on an outside bend may mean exposure of the disturbed, filled pipeline trench to very high velocities during a flood. Steps should be taken to mitigate the risk of erosion.	The proposed Nepean River Pump Station and Pipeline has been through a reference design process by Worley Parsons Services Pty Ltd who have had the plans certified to comply with best engineering practice, meeting the requirements of the Building Code of Australia and the relevant Australian and International Standards which includes flooding responses. Further, environmental management measures would be implemented as described in the EIS and highlighted in this Submissions Report (maintenance and ongoing monitoring).
09 Department of Primary Industries (NSW Office of Water)	23	Approvals, licences and permits	The Penrith Lakes Development Corporation should liaise with the NSW Office of Water to confirm details of the cease to pump rules.	Discussion on the water licence and pumping rules would be undertaken as part of the post-approval process (refer Section 3.1 of Submissions Report). The activator of the approval will consult with NOW to determine conditions of the required water licence.
09 Department of Primary Industries (NSW Office of Water)	24	Water - Data and modelling	Times should be reviewed and take into account the volume in the wetlands and the QL, and time taken to treat the water to an appropriate standard. The specified times to fill the lakes are likely to have been underestimated. Based on hydrology alone, NOW predicted that the lakes could take anywhere from 1 year 1 month for Lake A, and 1 year 2 months for Lake B in wet conditions, to 4 years 5 months (Lake A) and 6 years 6 months for Lake B. Average time to fill (i.e. in average climate conditions) was 2 years 3 months for Lake A and 3 years 1 month for Lake B.	As part of the Stage 1 Water Management Plan approval, Cardno has completed an extensive water balance report with additional scenarios as requested by the Department. Further, the Stage 2 Water Management Plan was submitted in November 2014 and includes the Penrith Lakes Receiving Water Quality Model Calibration Report which demonstrates the filling of the lakes.
09 Department of Primary Industries (NSW Office of Water)	25	Approvals, licences and permits	While there is no plan to extract water from deep aquifers on site, what provisions are made for shallow groundwater seepage into PLS? Page 118 (2"d para) indicates that there is seepage from shallow groundwater. A licence may be required for any groundwater interception if not exempt.	Noted. The EIS identified that approval under Section 91 of the WM Act may be required during construction as: "Trenching", "access tracks" and "building and work pads" are listed under the policy as "defined minimal impact aquifer interference activities" and are consistent with the proposed works to be undertaken as part of the NRPP development. As such it is considered that the ground water interference during the construction of the development can be licensed consistent with the requirements of the NSW Aquifer Interference Policy. Any application for a groundwater interference approval can be sought prior to construction, following approval of the NRPP development.
09 Department of Primary Industries (NSW Office of Water)	26	Water - Data and modelling	[Referring to pumping rules] Refers to total river flows - site needs to be specified, e.g. when the river flow at the Yarramundi gauge exceeds 500 ML/day.	Noted. Extraction rules and license discussions will be undertaken with NOW following project approval.
09 Department of Primary Industries (NSW Office of Water)	27	Water - Data and modelling	Clarification is required regarding the meaning of Table 16. For example the river flow, by definition, does not exceed the 5th percentile for 365 days.	Clarification is provided through the graph below which shows the available water for pumping and the number of pumping days described in Table 16 (source: Cardno). 

Submission #	Issue #	Category	Issue Raised (excerpt from submission)	Response
09 Department of Primary Industries (NSW Office of Water)	28	Water - Data and modelling	This assumes that there will be an outflow to the river from PLS. This is unlikely under a regime with a volumetric cap on extractions, unless it is particularly wet and there is a lot of catchment runoff.	Noted.
09 Department of Primary Industries (NSW Office of Water)	29	Water - Water quality	While the authors state that total phosphorus (TP) exceeded guidelines on 36% of sampling occasions and total nitrogen (TN) on 1 occasion, there is no attempt to correlate these exceedances with flow conditions. This must be done to make more sense of the data .. If all exceedances occur during high flows, more may need to be done to treat the water once. extracted and before discharge into PLS. When making the comment that water quality in the Nepean River has improved following the implementation of the St Marys Water Recycling Plant (Recycled Water Initiative), data from before the Recycled Water Initiative was implemented should be presented for comparison.	Water quality will be sampled and assessed prior to drawing water from the river and releasing through the designed holding points such as the Southern Wetlands and Quarantine Lake within the Scheme. The PLS has been designed to minimise the likelihood of discharge of undesirable water quality as described in the Stage 2 Water Management Plan which was submitted in November 2014. Extraction rules pertaining to water quality would be negotiated as part of a water licence application and sought following project approval.
09 Department of Primary Industries (NSW Office of Water)	30	Water - Data and modelling	This statement is misleading [referring to net volumes of 2.5GL/y (or 0.85GL/y when taking into account groundwater seepage)]. During most years there will be no return flows to the Nepean River, into and there is currently no allowance for return flow credits. Groundwater appears to be inconsistently included and excluded (e.g. page 110, s.8.3.4 states no groundwater is extracted).	No groundwater extraction is proposed. However, it is acknowledged that some groundwater seepage may occur as a result of pipeline burial. Groundwater seepage may also occur in the wider PLS as a result of existing quarries. This wider PLS seepage is not an impact of the NRPP development.
09 Department of Primary Industries (NSW Office of Water)	31	Water - Water availability	Further work is required to determine potential impacts on other water users. How many other users are in this river zone and what are their entitlements? Comparing a volume of 16.4 GL/annum to the total extraction for the 1400+ licences in the Hawkesbury Lower Nepean Water Source has limited value.	Noted. This issue is considered a post-approval responsibility of NOW and activator of the approval/applicant for water licence.
09 Department of Primary Industries (NSW Office of Water)	32	Approvals, licences and permits	The water allocation is already 100% in this area. The Water Sharing Plan for the Greater Metropolitan Region Unregulated River Water Sources 2011 does not provide for applications generally for unregulated river access licences, including any applications by PLDC specifically for a water access licence. In addition, section 61 of the Water Management Act 2000 only provides for applications to be made for zero share water access licences or specific purpose water access licences, so any additional volume required is unable to be granted to PLDC, above the volumetric entitlement of the existing licences already held by PLDC.	Discussion on the water licence and pumping rules would be undertaken as part of the post-approval process (refer Section 3.1 of Submissions Report). The activator of the approval will consult with NOW to determine conditions of the required water licence.
09 Department of Primary Industries (NSW Office of Water)	33	Flora and Fauna	Obstruction occurs at Riffle 3, Bishops Bench, and will not allow upstream passage of adult Australian bass at flows less than approximately 500 ML/d. Downstream migration will be facilitated at flows down to 350 ML/d. These flow rates have been confirmed by recent work by NOW.	Noted.
09 Department of Primary Industries (NSW Office of Water)	34	Water - Data and modelling	Main Lake A will only discharge to the river after a large flood event. Hydrological impacts from pumping will occur downstream of the pump site most of the time that the pump is operating (unlikely to be operating in a flood), and will be seen at least down to the Grose River junction, and possibly further. At flows of less than 500 ML/d, the pump may be extracting up to 20% of the river flow, which is a considerable hydrological impact. Further hydrological modelling is required to quantify this impact.	Once the lakes are filled, extraction and discharge to the Nepean River would be required infrequently. The Stage 2 Water Management Plan considers hydrological impacts and mitigation of such impacts. The Plan was submitted in November 2014.
09 Department of Primary Industries (NSW Office of Water)	35	Approvals, licences and permits	A groundwater licence may be required from NOW to account for this interception of groundwater if no exemption applies.	Noted.
09 Department of Primary Industries (NSW Office of Water)	36	Water - Data and modelling	[Referring to Appendix E model] It is not clear what river flow data were used in this model. While the SCA models inflows and releases, this does not take other factors such as extraction and inflows downstream of the dams into account. Extraction modelling should have been based on the IQQM model prepared by NOW, which incorporates the SCA model outflows, (including environmental flow releases) and catchment inflows I extractions downstream of the SCA's dams. River flows and therefore extraction rates and timing may not reflect river conditions.	Historic measured river flows were provided by the SCA as well as advice on expected environmental flows for this modelling works. The Stage 2 Water Management Plan provides further information on the Penrith Lakes Catchment and Water Quality Model.
09 Department of Primary Industries (NSW Office of Water)	37	Water - Data and modelling	[Referring to Appendix E model] For accuracy, the pumping rules should specify the reference location (in accordance with clause 57 of the Water Sharing Plan for the Greater Metropolitan Region Unregulated River Water Sources 2011), as follows: Modelling in this report has been based on the following extraction rules from the Nepean River: • Pumping can commence from the Nepean River to the lakes when the total river flow on a rising river exceeds 500 ML/day at the Yarramundi gauge; • Pumping must cease when the total Nepean River flow on a falling river drops to 350 MUday or less at the	Noted. The activator of the approval will consult with NOW to determine conditions of the required water licence.

Submission #	Issue #	Category	Issue Raised (excerpt from submission)	Response
			Yarramundi gauge.	
09 Department of Primary Industries (NSW Office of Water)	38	Water - Data and modelling	[Referring to Appendix E model] The Water Balance report does not address the impact of the annual entitlement (extraction limit) of 3.3 GL per year.	Water balance was approved as part of the Stage 1 Water Management Plan and is not relevant to approval of the NRPP
09 Department of Primary Industries (NSW Office of Water)	39	Water - Data and modelling	Lake A target operation level is 13.0 - 14.5 m (FSL 14.0 with 0.5 m surcharge). i.e. allow -1.0 m. The IQQM modelling scenarios allow -0.5 m only. Is -1 .0 m is the final target operating level range?	Recommended Lake Variations were approved as part of the Stage 1 Water Management Plan which includes a drawdown of -1.0m for Lake A
09 Department of Primary Industries (NSW Office of Water)	40	Water - Data and modelling	The modelling does not consider pumping from Lake B to A The IQQM model scenario considers pumping from Lake B to Lake A to maintain Lake A water level within - 0.5 m. The attached IQQM modelling report (attachment B) shows the Lake A and B water levels with and without pumping from Lake B to A (Figure C2-01A to C2-01C and C2-02A to C2-02D).	Water balance was approved as part of the Stage 1 Water Management Plan and irrelevant to approval of the NRPP
09 Department of Primary Industries (NSW Office of Water)	41	Water - Data and modelling	IQQM modelling is required to protect downstream irrigation demand from Penrith lake extractions. This is not considered in Appendix E Water balance modelling.	Water Access licence is a post approval issue as discussed in Section 3.1 of the Submissions Report.

Appendix B

Supplementary Flora and Fauna Survey Findings

Appendix B Supplementary Flora and Fauna Survey Findings

13 January 2015

Justin Russell
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Dear Justin

Nepean River Pump and Pipeline Project - Additional Flora and Fauna Assessment

1.0 Introduction

AECOM Australia Pty Ltd was engaged by Penrith Lakes Development Corporation to complete an addendum to the ecological assessment for the Nepean River Pump and Pipeline (NRPP) Project. The Project involves the construction and operation of a water pipeline and pumping station to extract water from the Nepean River, for the purposes of filling lakes as part of the Penrith Lakes Scheme. Under the original plans, the pumping station was located upstream of the final site to avoid effluent discharge from the Penrith Sewage Treatment Plant; however, since the construction of the Western Sydney Recycled Water Initiative – Replacement Flows project, water quality in the Nepean River has improved and the preference now is for the pumping station to be located downstream, closer to the lakes where the water will be discharged.

The purpose of this ecological assessment was to investigate the impacts of the revised location for the pumping station, water pipeline and power line (hereafter referred to as the 'study area'), on threatened species and ecological communities listed under the New South Wales *Threatened Species Conservation Act 1995* (TSC Act). Specifically, the species and ecological communities assessed were:

- River-Flat Eucalypt Forest on Coastal Floodplains (listed as an endangered ecological community)
- Diamond Firetail *Stagonopleura guttata* (listed as Vulnerable)
- Eastern Osprey *Pandion cristatus* (listed as Vulnerable).

In addition, the assessment also included mapping the extent and determination of the community-type of any native vegetation within the study area.

A map of the study area is provided in Appendix A. The study area occurs within the Hawkesbury-Nepean Catchment Management Region, the Sydney Basin Bioregion, the City of Penrith Local Government Area and is administered by the Great Sydney Local Land Service.

2.0 Method

2.1 Field Assessment

AECOM's Senior Ecologist (Dr. Thomas. Wright) completed a site walkover of the study area on 18 December 2014, in the company of the Project Manager for Penrith Lakes Natural Heritage Projects (Mr. J. Russell). Weather conditions were warm and humid with a maximum temperature of 29.6 °C. No rainfall was recorded during the field assessment¹. A map showing the extent of the study area is provided in Appendix A.

A GPS-enabled Trimble Nomad ® was used to record important spatial information such as the location of native vegetation or threatened species (including habitat) if observed (accuracy of device $\pm$ 5 m depending on satellite signal). Binoculars (10x) were used to assist with bird identification and scanning large trees for Eastern Osprey nests. Standard botanical texts were used to assist with the identification of plants².

2.2 Assumptions and Limitations

The field assessment did not include a detailed inventory of flora and fauna with the study area.

Targeted surveys for Diamond Firetail and Eastern Osprey were not conducted; however, the field assessment did focus on identifying suitable habitat for these species.

¹ Weather data from the Bureau of Meteorology's Penrith Station.

² Costerman, L. 2009 *Native Trees and Shrubs of South-Eastern Australia*. New Holland Publishing, Melbourne.

Richardson, F.J., Richardson, R. G., and Hephherd, R.C.H *Weeds of the South-East – an identification guide for Australia*. RG and FJ Richardson Publishing, Meredith, Victoria.

3.0 Results

3.1 General Site Condition

3.1.1 Intake Structure, Pump, Access Track and Pipeline

The banks of Nepean River were found to be dominated by exotic weeds, with native vegetation restricted to a few species of overstorey and mid-storey trees. A dense layer of exotic shrub species covered the ground layer, with Lantana *Lantana camara* the most dominant species, and White Mulberry *Morus alba* and Balloon Vine *Cardiospermum grandiflorum* also common. In the few areas where shrubs did not have a foothold, the introduced grass Kikuyu *Pennisetum clandestinum* formed a monoculture in the groundlayer. Alligator Weed *Alternanthera philoxeroides* was dominant along the shallow margins of Nepean River.

Both Large-leaf Privet *Ligustrum lucidum* and Small-leaf Privet *Ligustrum sinense* were scattered along the river bank, and formed the midstorey together with other exotic trees including (but not limited to) Box-Elder *Acer negundo* and Black Willow *Salix nigra*.

At the top of the banks alongside an existing dirt track, were a number of native trees (chiefly Eucalypts and Wattles) which were evidently planted given their consistent spacing and structure. The understorey was dominated by exotic grasses and shrubs, including Red-Natal Grass *Melinis repens*, Ribwort *Plantago lanceolata*, Purple Top *Verbena bonariensis* and African Love-grass *Eragrostis curvula*.

A number of large, remnant River Oaks *Casuarina cunninghamiana* subsp. *cunninghamiana* were observed along the lower banks and also scattered along the mid and upper banks. This species, along with Sandpaper Fig *Ficus coronata*, were the only native tree/shrub species to be noted in the study area; however, Willow Bottlebrush *Callistemon salignus* is known to be locally present.



Plate 1 Vegetation near the proposed location of the pump and pipeline.

3.1.2 Overhead power line

The proposed location for the overhead power-line runs between rows of planted native trees. The plantings are believed to have occurred some-time ago (>20 years) as the Eucalypts were quite large; however, were yet to form hollows. The arrangements of the plantings were evenly spaced, and only included overstorey tree species, with midstorey and small trees and shrubs noticeably absent except for the occasional immature tree which had

recruited from the plantings. The plantings connect with vegetation along the banks of the Nepean River; however, on all other sides is isolated and surrounded by cleared land or industrial buildings.

It is likely that the proposed power line location has been subject to historical disturbance either as part of the quarry operations or other development. The groundlayer was dominated by exotic herbaceous species with *Eragrostis curvula* particularly dominant.



Plate 2 Tree plantings along proposed location for the power line.

3.2 River-flat Eucalypt Forest on Coastal Floodplains

Vegetation along the banks of the Nepean River was assessed as meeting the criteria for River Eucalypt Forest on Coastal Floodplains. The extent of this community followed the distribution of River Oak, as this species was the only element of the community that still remained. It is expected that River Eucalypt Forest on Coastal Floodplains would have been more extensive in the local area prior to disturbance. The area of River Eucalypt Forest on Coastal Floodplains within the study area is considered to be a low-quality representation of this community due to the lack of species diversity; however, the NSW Government does recognise disturbed remnants provided they still offer some conservation values including habitat connectivity.³

The full extent of River-flat Eucalypt Forest on Coastal Floodplains within the study area is mapped in Appendix A. In accordance with the New South Wales *Environment Planning Act 1979*, a Seven-part Test has been conducted to determine the potential for a significant impact on this community, and the results are provided in **Appendix B**.

Sections of River-flat Eucalypt Forest on Coastal Floodplains within the study area, were also identified as the biometric vegetation type: River Oak open forest of major streams (Veg Type ID: HN574).

³ Department of Environment and Climate Change 2007 *Identification Guidelines for Endangered Ecological Communities – River-flat Eucalypt Forest on Coastal Floodplain*, Department of Environment and Climate Change, NSW Government.

River-flat Eucalypt Forest on Coastal Floodplains has a high probability of being a groundwater dependent ecosystem (GDEs)⁴. The clearing of groundwater dependent vegetation may result in a small localised rise in groundwater due to a reduction in transpiration. It is expected the groundwater system would be quite dynamic and influenced by flow rates in the Nepean River. As such, given the relatively small area of GDE to be removed, there is unlikely to be any impacts on groundwater systems. Trenching may intercept with groundwater and the need for dewatering during construction should be considered.

3.3 Diamond Firetail

The preferred habitat for Diamond Firetail is open grassy woodlands and grasslands, and the species is often found along riparian areas. It feeds exclusively on the ground on grass seeds, leaves and insects. Diamond Firetail is known to occur within a range of vegetation classes within the Hawkesbury-Nepean Catchment Region, including River Oak open forests of major streams. The species movement patterns are considered to be sedentary or locally migrating⁵.

Diamond Firetail was not observed during the field assessment. The closest record for the species on BioNet is approximately 5 km east of the study area at Mount Pleasant, with the species observed in March 2014. The nearest BioNet record along the Nepean River is approximately 25 km south of the study area, with this observation made almost thirty years ago.

The banks of Nepean River provides suitable breeding habitat for the species; however, given the lack of open grassy areas in proximity to the study area that are not currently impacted by operations within the Penrith Lakes Scheme site or other disturbances, there is unlikely to be suitable feeding habitat for the species. As such, it has been assessed that the study area provides low habitat value for Diamond Firetail. A Seven-part Test has been conducted in Appendix B to determine the potential for a significant impact on Diamond Firetail.

3.4 Eastern Osprey

Eastern Osprey is found along coastal waters, estuaries, and major rivers inland. In coastal areas, the species often nests on headlands, cliff tops of protruding rocks; and further inland they form nests in trees. They require large expanses of water for foraging but may be observed over heath, woodland or forest when moving between foraging sites⁵.

Eastern Osprey was not recorded during the field assessment, nor was any of the species' nests. The nearest BioNet record for Eastern Osprey is approximately 30 km east of the study area. There are no records for the species along the Nepean River.

The large River Oaks along the banks of the Nepean River may provide suitable breeding habitat for Eastern Osprey; however, the size of the Nepean River is considered to be too narrow to provide adequate foraging habitat for the species. It has been assessed that the study area provides low habitat value for Eastern Osprey. A Seven-part Test has been conducted in Appendix B to determine the potential for a significant impact on Eastern Osprey.

4.0 Legislative Implications

4.1 Biodiversity Offsets

The removal of native vegetation and the requirement for offsets is regulated under the *Native Vegetation Act 2003*. The removal of native vegetation within the City of Penrith is excluded from the *Native Vegetation Act 2003*, under Schedule 1 of the Act.

Under Part 7AA of the TSC Act, offsets will be required for the removal of River-flat Eucalypt Forest on Coastal Plains.

The Environmental Impact Statement for the NRPP development anticipated up to 0.23 hectares of River-flat Eucalypt Forest may be impacted. However, the recent survey mapped approximately 0.14 hectares within the project footprint that may be disturbed. It is anticipated that the detailed design would confirm the total River-flat

⁴ NOW 2012 *Risk assessment guidelines for groundwater dependent ecosystems – Volume 3 Identification of high probability groundwater dependent ecosystems on the coastal plains of NSW and their ecological value*, NSW Department of Primary Industries, Office of Water, Sydney.

⁵ Morcombe, M 2004 *Field Guide to Australian Birds*, Rigby of Adelaide, South Australia.

Eucalypt Forest that would need to be removed. The quantity of and type offsets that need to be achieved under the TSC Act can be determined using the Biodiversity Certification Assessment Methodology⁶.

It is considered that removal of River-flat Eucalypt Forest would be offset by rehabilitation activities undertaken as part of the wider Penrith Lakes Scheme, which would enhance existing biodiversity and create a high quality and compensatory ecological habitat. Any offset would be determined in consultation with the Office of Environment and Heritage prior to construction.

4.2 Threatened Species Conservation Act 1995

A seven-part test has been completed for the following ecological communities and species in accordance with the New South Wales EP&A Act:

- River-flat Eucalypt Forest on Coastal Floodplains
- Diamond Firetail
- Eastern Osprey.

Although the project will require the removal of River-flat Eucalypt Forest on Coastal Floodplains, it has been assessed that a Species Impact Statement (SIS) does not need to be prepared for this ecological community (see Appendix B). It has also been assessed that the preparation of a SIS is not required for Diamond Firetail or Eastern Osprey. Neither species are likely to be found in the study area.

5.0 Conclusion and Recommendations

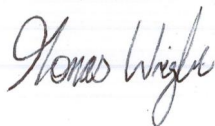
The study area was found to support a highly degraded form of River-flat Eucalypt Forest on Coastal Floodplains along the Nepean River. This community is expected to be partially removed during the construction of the pump, pipeline and access track. This community is analogous to the Biometric Vegetation Type: River Oak open forest of major streams (Veg Type ID: HN574). No other remnant vegetation was recorded within the study area. The location for the proposed powerline is heavily degraded, and supports rows of planted native trees over a groundcover of exotic grasses and shrubs.

Habitat suitability for Diamond Firetail and Eastern Osprey within the study area was also assessed, and it was determined that neither species is likely to occur in the study area due to a lack of suitable habitat, the highly degraded condition of the study area, and lack of historical records within close proximity to the study area.

Biodiversity offsets will be required for the removal of River-flat Eucalypt Forest on Coastal Plains in accordance with the TSC Act. It is recommended any required offsets are determined in consultation with the Office of Environment and Heritage prior to construction. Based on the results of seven-part tests, Species Impact Statements do not need to be prepared for the threatened species and ecological communities assessed in this letter report.

Please feel free to contact me on the enclosed details for any queries regarding this letter report.

Kind regards



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⁶ Department of Environment, Climate Change and Water 2011 *Biodiversity Certification Assessment Methodology*, Department of Environment, Climate Change and Water, NSW Government.

Appendix A

Figures



Appendix B

Seven-part Tests

Seven Part Test for River-flat Eucalypt Forest on Coastal Floodplains

- a) **In the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.**

Not applicable to an endangered ecological community.

- b) **In the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction.**

Not applicable to an endangered ecological community.

- c) **In the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:**

- i) **is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or**
- ii) **is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction.**

Although the extent of the community outside of the study area was not formally assessed, it was noted during the field assessment that the community extended along the banks of the Nepean River within the immediate vicinity. As such, any clearing as part of the NRPP Project will not result in the localised extinction of the community, as adjoining patches of the community will remain.

- d) **In relation to the habitat of a threatened species, population or ecological community:**

- i) **the extent to which habitat is likely to be removed or modified as a result of the action proposed, and**
- ii) **whether an area of habitat is likely to become fragment or isolated from other areas of habitat as a result of the proposed action,**
- iii) **the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality.**

Clearing within the community will be restricted to a 10 m linear corridor running down the banks of the Nepean River to the intake structure, and an access track of similar width. There will be opportunity during the detailed design phase to avoid clearing any River Oaks, the only artefact of River-flat Eucalypt Forest on Coastal Floodplains. Considering the extent of River-flat Eucalypt Forest on Coastal Floodplains which will remain in the local vicinity, the extent of removals and the quality of vegetation, any clearing is unlikely to result in fragmentation, isolation, or threaten the local persistence of River-flat Eucalypt Forest on Coastal Floodplains.

- e) **Whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly).**

The study area is not recognised as critical habitat for River-flat Eucalypt Forest on Coastal Floodplains or any other species or ecological community listed under the TSC Act or *Fisheries Management Act 1994*. There is also no areas of critical habitat within close proximity to the study area that may be indirectly affected by the NRPP Project.

- f) **Whether the action proposed is consistent with the objectives or actions of a Recovery Plan or Threat Abatement Plan.**

The Cumberland Plain Recovery Plan also includes River-Eucalypt Forest on Coastal Floodplains⁷. The specific objectives of the Recovery Plan are not applicable to the NRPP Project as they relate to research and Government priorities for the protection of biodiversity values on the Cumberland Plain. However, the Recovery Plan is based on the following principles:

- the protection and management of large, intact remnants is more effective and efficient than for small, fragmented remnants

⁷ Department of Environment, Climate Change and Water 2010 *Cumberland Plain Recovery Plan*, Department of Environment, Climate Change and Water, NSW Government.

- recovery efforts need to aim to ensure that a representative sample of biodiversity is conserved
- active management to best practice standards is needed to prevent the degradation of bushland in a fragmented landscape
- where impacts on biodiversity cannot be avoided, they should be offset using appropriate means.

The clearing of River-flat Eucalypt Forest on Coastal Floodplains is consistent with these principles because removals will be restricted to a small, highly degraded area and will be offset according to the TSC Act. Restoration works post clearing including revegetation and weed management works will also improve the quality of the community.

g) Whether the action proposed constitutes or is part of a key threatened process or is likely to result in the operation of, or increase the impact of, a key threatening process.

River-flat Eucalypt Forest on Coastal Floodplains is subjected to the following key-threatening processes listed under the TSC Act:

- clearing of native vegetation
- alteration to the natural flow regimes of rivers, streams, floodplains and wetlands
- invasion of native plant communities by exotic perennial grasses
- predation, habitat destruction, competition and disease transmission by feral pigs
- anthropogenic climate change
- high frequency fire
- removal of dead wood and dead trees.

The NRPP Project will result in the clearing of native vegetation and possibly the removal of dead wood and dead trees. Vegetation offsets and restoration works post clearing such as revegetation will reduce the net loss of native vegetation, and restoration works will also focus on reducing the dominance of weeds around the pipeline and access track.

Conclusion – The NRPP project will require the removal of River-flat Eucalypt Forest on Coastal Floodplains. However, considering the removal area is heavily degraded, relatively small, and the community is well represented in adjoining areas along Nepean River, it is unlikely there will be a significant impact. As such it is assessed that a Species Impact Statement for River-flat Eucalypt Forest on Coastal Floodplains does not need to be prepared as part of the NRPP project.

Seven Part Test for Diamond Firetail

- a) **In the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.**

There is unlikely to be a local population of Diamond Firetail within vicinity of the study area, given the lack of records on BioNet within a 5 km radius and availability of suitable feeding habitat. If present, the clearing of River Oaks may reduce nesting opportunities for the species; however, only to a very limited extent given the significantly greater number of nesting trees that will remain in the immediate area than will be cleared. Therefore, in the unlikely event that a viable local population of Diamond Firetail is present, the removal of vegetation is unlikely to place the species at risk of localised extinction.

- b) **In the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction.**

There are no endangered populations of Diamond Firetail listed under the TSC Act.

- c) **In the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:**
- i) **is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or**
 - ii) **is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction.**

Not applicable to a threatened species.

- d) **In relation to the habitat of a threatened species, population or ecological community:**
- i) **the extent to which habitat is likely to be removed or modified as a result of the action proposed, and**
 - ii) **whether an area of habitat is likely to become fragment or isolated from other areas of habitat as a result of the proposed action,**
 - iii) **the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality.**

River Oaks are considered to provide suitable breeding habitat for Diamond Firetail. However, given the species is not known to disperse large distances and there is a lack of feeding habitat within or adjoining the study area, there is a low likelihood that the study area provides habitat for Diamond Firetail for breeding or feeding. Therefore any removals are unlikely to affect habitat important to the long-term survival of Diamond Firetail. Given the relatively small area of removals, it is also unlikely the project will fragment or isolate Diamond Firetail from other habitat it may be using in the adjoining landscape.

- h) **Whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly).**

There is no critical habitat for Diamond Firetail listed under the TSC Act.

- i) **Whether the action proposed is consistent with the objectives or actions of a Recovery Plan or Threat Abatement Plan.**

The recovery of Diamond Firetail is being addressed through the Saving Our Species Program (Landscape Species Management Stream). The NSW Government is currently developing a targeted management approach for Diamond Firetail, and for the interim the following management actions apply to all Landscape Species addressed under the Saving Our Species Program:

- conduct ecological research to determine habitat and resource requirements, threats and conservation issues
- conduct annual monitoring of key populations that are managed under property agreements or are within OEH estate, conservation reserves, council reserves and crown reserves

- provide stewardship payments, develop property agreements and apply other land management incentives for the protection and enhance management of priority woodland vegetation used by the Diamond Firetail
- increase community awareness about the Diamond Firetail through the promotion of the OEH Threatened Species Website and the development of education and extension material for threatened woodland birds.

The project will not specifically address these management actions. However, the management actions are directed at Government Agencies, Local Government, researchers and extension officers, and would not be typically implemented as part of private development.

j) Whether the action proposed constitutes or is part of a key threatened process or is likely to result in the operation of, or increase the impact of, a key threatening process.

Diamond Firetail is subject to the following key threatening processes listed under the TSC Act:

- clearing and fragmentation of woodland, open forest, grassland mallee habitat for agriculture and residential development, and firewood collection
- poor regeneration of open forest and woodland habitat
- invasion of weeds, resulting in the loss of important food plants
- modification and destruction of ground- and shrub layers within habitat through: removal of native plants, litter and fallen timber; introduction of exotic pasture grasses; heavy grazing and compaction by stock; and frequent fire
- predation of eggs and nestlings by increased populations of native predators such as the Pied Currawong *Strepera graculina*
- risk of local extinction due to small, isolated populations.

The project will result in the clearing and fragmentation of woodland, and the modification and destruction of shrub layers. However, these processes are unlikely to impact Diamond Firetail as the study area is unlikely to provide habitat for the species.

Conclusion – It is unlikely the project will have a significant impact on Diamond Firetail. The study area is considered to have a low potential of being utilised by the species due to the highly disturbed habitat and lack of feeding resources. It is also unlikely the species would be found in areas directly adjoining the study area, and that removals would impact on the species dispersal through the local landscape. As such, it is assessed that a Species Impact Statement for Diamond Firetail does not need to be prepared for the NRPP project.

Seven Part Test for Eastern Osprey

- a) In the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction**

There are no records for Eastern Osprey on BioNet along the Nepean River, and the closest record for the species is approximately 30 km east of the study area. The large River Oaks which will be removed provide suitable nesting habitat; however, no nests were observed during the field assessment. Eastern Osprey are known to use the same nest for decades. It is considered unlikely the species would forage along the Nepean River as the species prefers more open expanses of water. Thus it is unlikely the removal of vegetation will have any impact on the life cycle of Eastern Osprey. If the species is present within the study area, it is also unlikely that a viable local population would be at risk of extinction, as the area of removals is relatively small compared to the availability of similar habitat including suitable nesting trees in the immediate vicinity.

- b) In the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction.**

There are no endangered populations of Eastern Osprey listed under the TSC Act.

- c) In the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:**

- i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or**
- ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction.**

No applicable to a threatened species.

- d) In relation to the habitat of a threatened species, population or ecological community:**

- i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and**
- ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action,**
- iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality.**

It is unlikely the study area provides habitat for Eastern Osprey given the lack of records for the species in the surrounding area, and the lack of suitable foraging habitat. It is also unlikely that Eastern Osprey utilises habitat adjoining the study area, or anywhere along the Nepean River. The species may be observed as a fly-over while dispersing between foraging habitats but unlikely to utilise habitat within the study area during dispersal. If the species is present, the extent of removals is considerably small compared to the availability of similar habitat including nesting trees in the immediate vicinity. Therefore, the removal of vegetation within the study is unlikely to have any impact on habitat for Eastern Osprey, nor fragment or isolate the species from using habitat in adjoining areas.

- e) Whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly).**

Not applicable. There is no critical habitat for Eastern Osprey listed under the TSC Act.

- f) Whether the action proposed is consistent with the objectives or actions of a Recovery Plan or Threat Abatement Plan.**

Recovery actions for Eastern Osprey are addressed by the NSW Government as part of the Save Our Species Program (Landscape Species Management Stream). Targeted actions for the species are yet to be developed, and for the interim the following management actions apply:

- protect nest sites (usually large dead trees) and surrounding vegetation using appropriate buffer zones (suggest 100 metres).

- preservation of the existing nest and structure is a priority and relocation should be considered a last resort
- identify and protect regular feeding areas, perch (feeding) trees and nest material collection sites, particularly vegetation surrounding nest tree
- consider direct and indirect impacts on the species and its habitat in planning processes including adequate field survey to identify nest tree, buffer protection zone, perch trees and feed areas
 - nesting season is from June to October
- continue programs monitoring the breeding status of the species in NSW incorporating surveys of the number of active nest trees, breeding success at nests and protection of buffer zones and roost trees
- undertake community awareness initiatives such as media campaigns, brochures and interpretive signs
 - these should cover issues such as the threat of discarding fish with fishing tackle attached, protection of potential and future nest trees
- investigate the effectiveness of ameliorative management actions on the species including effectiveness of artificial nest structures
- continue ecological research to determine whether availability of potential nest trees and/or food resources are limiting to the species as well as potential impacts of pesticides and pollutants on species breeding success
- continue to consult with Aboriginal communities to determine cultural significance of the Osprey
- work with managers of infrastructure to manage or translocate nests if site selection puts Osprey at risk.

Consistent with these management objects, a field survey was completed to identify nesting trees and feeding areas. Although River Oaks may provide suitable nesting habitat, no nests were found during the field assessment within the study area, and it is unlikely that the species feeds in Nepean River. Other actions are more relevant to Government Agencies, Local Government, researchers and extension officers, and generally would not be addressed as part of private development.

g) Whether the action proposed constitutes or is part of a key threatened process or is likely to result in the operation of, or increase the impact of, a key threatening process.

Eastern Osprey is subject to the following key threatening processes under the TSC Act:

- removal of large trees near the coast that could be used as nest sites
- disturbances to water quality, such as from the disposal of treated effluent or stormwater runoff, that increases turbidity in feeding areas
- ingestion of fish containing discarded fishing tackle

The project may require the removal of River Oaks that could provide suitable nesting habitat for Eastern osprey; however, no nests were observed during the field assessment and it is considered unlikely the species would nest at the site. The project will not require the disposal of any treated effluent or stormwater runoff into Nepean River, or involve discarding fishing tackle into Nepean River. Therefore it is unlikely that removals of River Oak would constitute or contribute to a key threatening process.

Conclusion – It is unlikely the project will have a significant impact on Eastern Osprey. No existing nests were observed during the field assessment, and Nepean River is considered to be too narrow an expanse of water to provide suitable foraging habitat for the species which prefers more expansive water bodies. The species has also not been recording within a 30 km radius of the study area, and has not been previously observed along Nepean River. If the species is locally present, the extent of removals is relatively small considering the availability of similar habitat in adjoining areas. As such, it is assessed that a Species Impact Statement does not need to be prepared for Eastern Osprey as part of the project.