

## **ATTACHMENT A**

### **WATER RESOURCES AND WATER DEPENDENT ASSETS OF THE MACQUARIE RIVER**

The proposal for Orange to increase its water supply is made in the context of a range of recent reforms in water at both the State and Commonwealth level. As noted in the documentation provided the extraction point for the proposed scheme lies in the unregulated upper Macquarie River, while impacts of the proposed increased extraction may occur in the regulated Macquarie River. NSW has a system of water sharing under the *Water Management Act (2000)* that regulates access to water for all users including town water supply and is intended to limit the impact of water use on the environment. These plans were gazetted and implemented to give effect to the Murray-Darling Basin Cap, which was put in place to limit growth in water use across the Murray-Darling basin and to promote the efficient and sustainable use of the State's water resources.

In addition, the National Water Initiative to which NSW is a signatory indicates that in the case of urban water supply the following approach is necessary:

- improve the reliability of water supply by using water from a range of supply options that are rainfall resistant and environmentally sustainable,
- improve water efficiency and reduce water use to ease demand.

#### **1. Use of the IQQM Model**

##### **Issue:**

The IQQM model has not been used appropriately.

##### **Background:**

The Macquarie River to Orange pipeline Environmental Assessment documents clearly state that the proposal is intended to not only improve the security of Orange's water supply during drought but to ensure that growth is not constrained by water availability: the project's clear intention is to allow for increased use of water. Such an increase in reliability and/or overall use necessarily occurs at a cost to other users, either consumptive or non-consumptive (environment), in a resources constrained environment.

The proponent has endeavoured to use the IQQM to show the extent of those impacts on the Macquarie Marshes, just one of the other users in the system. However, the IQQM is not configured to accurately model how environmental water is managed for the Macquarie Marshes which renders any conclusions drawn from the modelling as invalid. Modelling information has been supplied in terms of the impact on long-term annual averages; NSW OEH does not consider this to be an adequate level of detail for assessment, which should be demonstrated in terms of peak impact at times of critical water shortage and over an ecologically relevant time period.

It is not clear how increased use within Orange has been included in the IQQM, to assess impacts felt in Burrendong dam. It is not clear if increased use by Orange and other consumptive users has been factored into the IQQM used to assess impacts on the Macquarie Marshes.

##### **Recommendation:**

- a) Greater effort is required to improve the modeling in relation to the proposal's potential impact on the Macquarie Marshes and water users within the regulated system.
- b) Given the uncertainty around the impact of the proposal on downstream flows to the Macquarie Marshes because of the inadequacy of the modelling, the proponent could consider the purchase of regulated licences to be made available to the environment as an offset.

## **2. Efficiency and Sustainability**

### **Issue:**

Questions remain regarding the efficiency and sustainability of the project.

### **Background:**

Aside from the potential impacts on downstream flows, the figures quoted as average take and average spill, call into question the efficiency and sustainability of the project.

The level of impact in the construction of the pipeline, ongoing energy use and maintenance for an average net increase of 413 ML per year are clearly inefficient and are at odds with the requirements of the National Water Initiative (NWI). The NWI requires that water supply options be rainfall resistant, that is, not dependent on an unregulated river supply but preferably a groundwater supply. While the documentation has provided a brief assessment of the alternative of increasing pumping from existing bores there is no explanation of possible additional groundwater reserves that may be available to improve reliability. Storing pumped water in an open-reservoir where it will spill or evaporate (on average 1164 ML of the 1685 ML pumped from the river will spill or evaporate from Suma Park Dam) is an area of concern as being inefficient and ultimately unnecessary. In the absence of a suitable groundwater alternative at a minimum the proponent should consider storing water in a closed reservoir or pumping directly to treatment and reticulation as an alternative to topping up Suma Park Dam.

### **Recommendation:**

That DoPI require the proponent:

- a) to assess the availability of additional groundwater reserves; and
- b) to assess the option of storing water in a closed reservoir or pumping directly to treatment and reticulation as an alternative to pumping to Suma Park Dam.

## **3. Assessment of Extraction Impacts**

### **Issue:**

- a) OEH questions the use of a modeled flow duration curve to assess the impacts of the proposed extraction.
- b) Assessment of impact based on change in discharge volume does not indicate the likely aquatic ecological impacts of the extraction.

### **Background:**

In order to forecast the potential impacts on flows in the upper Macquarie at the point of extraction, the impact assessment relies on a modelled flow duration curve (FDC) and records from the Bruinbin gauge. While the approach has merit, the NSW Office of Water recently determined not to rely on those records or modelled FDC's for the purpose of determining water sharing arrangements in the upper Macquarie because they were deemed to be unreliable and of an unknown quality. This would therefore call into question the use of these tools to assess the impact of the proposed extraction.

Additionally, assessment of impact based on change in discharge volume (ML/d) does not shed light on the likely aquatic ecological impacts of the extraction. This is better assessed by consideration of the change in stage or stream level in the effected reach. The documentation indicates only that when pumping at 34 ML/d reducing flows to 22 ML/d will reduce the level at Gardiner's Hole by 19mm which would occur only on 0.2% of pumping days.

Again this superficial level of assessment is inadequate, the critical areas in the channel likely to be impacted by changing water level are the riffle environments. Repeated frequent changes to heights

in riffle areas are likely to have consequences on deposition of fine silts and growth of phytoplankton, which may alter food chain relationships for aquatic invertebrates, reduce habitat and water quality. Alteration of water movement through riffle sections may also impact on fish passage. Fluctuating water levels in shallow slow-water environments close to the banks due to pumping is also likely to impact on nursery habitat for the Booroolong Frog and Freshwater catfish. This potential impact on the Booroolong Frog is also not considered in the Assessment of Significance for this species.

**Recommendation:**

That DoPI require the proponent to provide further detail on the impacts of pumping on flows through riffles, which is expected to have an impact on any day the pump is in use not only on the days when minimum pumping conditions are experienced.

## ATTACHMENT B

### BIODIVERSITY IMPACTS (TERRESTRIAL)

We understand that the proposal is expected to result in:

- Loss of 1618 trees, including up to 250 hollow bearing trees;
- ‘Permanent’ impacts to 19.49ha of native vegetation, including 7.77ha of Box-Gum Woodland Endangered Ecological Community (EEC); and
- ‘Temporary’ impacts to 31.01ha of native vegetation, including 12.80ha of Box-Gum Woodland EEC.
- Impacts to the Mullion Range State Conservation Area.

The EA requirements of OEH and DoPI require proponents to present justification of their preferred option based on four key thresholds – including *‘whether or not the proposal, together with actions to avoid or mitigate impacts or compensate to prevent unavoidable impacts will maintain or improve biodiversity values’*. OEH also evaluates offset proposals against the OEH *‘Principles for the use of biodiversity offsets in NSW’* and, where applicable, the OEH *‘Interim Policy on assessing and offsetting biodiversity impacts of Part 3A, State significant development (SSD) and State significant infrastructure (SSI) projects’*.

Our review of the EA has concluded the requirements relating to biodiversity issues have not been met. Specifically:

- a) Avoid** – The EA has not presented adequate detail regarding all avoidance measures employed in the design of the project to date, nor estimated the level of avoidance likely to be achieved at the detailed design and construction stage.
- b) Mitigate** – OEH remains concerned regarding the potential level of reliance on nest boxes to mitigate the loss of hollow bearing trees.
- c) Offset** – Development of the offset strategy has been deferred to the post-approval stage.

Further details and recommendations are provided below.

#### **1. Mullion Range State Conservation Area**

##### **Issues:**

Further consultation with the Parks and Wildlife Division of OEH will be required regarding those sections of the pipeline and transmission line which pass through the Mullion Range State Conservation Area (SCA).

##### **Background:**

We note the additional information supplied by the proponent in relation to impacts on the SCA.

Additional approvals under the *National Parks and Wildlife Act 1974* are likely to be required in relation to the proposed works within the SCA. Any development that occurs within OEH Estate must be consistent with conditions of the relevant reserve Plan of Management and have minimum detrimental impacts, with an associated and appropriate rehabilitation strategy.

The appropriate contact person in the first instance is Colin Adams, Ranger, Macquarie Area Parks and Wildlife Division. Colin can be contacted via (02) 6332 7642 or [colin.adams@environment.nsw.gov.au](mailto:colin.adams@environment.nsw.gov.au).

### **Recommendation:**

That any approval granted by the DoPI :

- Requires the proponent to work closely with the Parks and Wildlife Division of OEH regarding those components of the proposal which would impact on the Mullion Range SCA.
- Requires the proponent to obtain all necessary approvals for works within the Mullion Range SCA prior to commencement of the project.

## **2. Avoidance**

### **Issues:**

The EA contains inadequate information regarding the degree to which impacts on native vegetation have been avoided so far. OEH does not support the removal of up to 250 hollow bearing trees.

### **Background:**

The Director General's Requirements require that *'The EA must detail all alternatives considered, both in terms of water supply and corridor selection (including alignment within the identified corridor). Clear reasons and justification for the selected corridor/alignment must be presented, demonstrating how environmental, social and economic issues have been addressed in this process'*.

We note that some specific environmentally sensitive areas along the proposed route have been avoided, and the EA has provided some justification for selecting the alignment of some specific sections of the preferred route.

However it remains that minimal information is included relating to the overall corridor options considered (ie 'Corridor 1' and 'Corridor 2'), with the EA stating that the multi-criteria analysis indicated the preferred route ('Corridor 1') to have the highest benefit-cost ratio in comparison to the alternative route considered. Only summarised results are provided. Therefore OEH is unable to comment on the degree to which the preferred corridor avoids impacts on biodiversity in comparison with alternative corridor considered.

We also note that additional avoidance measures will be implemented, where possible, at the detailed design stage. Nevertheless the EA states that the project will require the removal of 1613 trees ranging between 15cm and 125cm diameter at breast height (DBH) and 6 trees greater than 125cm DBH. The DBH range of 15cm to 125cm is very large with no break down provided. The Arborist's report (Keble and Marshall 2012) is not supplied and therefore there is no information to indicate that the DBH measurements of the majority of these 1613 trees are not at the larger end of the scale. The EA also states that up to 250 hollow bearing trees will be removed.

The EA also indicates (Part C, page 12.23) that attempts will be made to avoid mature trees with a DBH greater than 125cm, including large hollow-bearing trees. Considering information from other sections of the EA this statement suggests that only a maximum of 6 trees may be avoided (ie the EA reports 6 trees as being greater than 125cm DBH).

Without further details regarding the trees to be removed, it is difficult to provide detailed comments on habitat values to be lost. However OEH remains particularly concerned about the level of predicted impact on hollow bearing trees, particularly in the absence of detailed route selection information which demonstrates why these impacts are considered necessary. The degree to which these trees can actually be avoided is not indicated in the EA.

**Recommendation:**

That the proponent:

- Properly address the DGR's by supplying the full corridor selection assessment;
- Supply a copy of the Keble and Marshall (2012) aborist report; and
- Provide a map of the route depicting (at a minimum) the location of the 250 hollow bearing trees identified, and assessing avoidance options. This would indicate the proponent's ability to avoid these trees and better define the likely level of impact.

**3. Mitigation using nest boxes****Issue:**

OEH remains concerned regarding the potential level of reliance on nest boxes to mitigate the loss of hollow bearing trees.

**Background:**

Whilst the Assessment of Significance has been updated, the EA still proposes to use nest boxes to mitigate the potential loss of up to 250 hollow-bearing trees. We are concerned regarding the apparent reliance on nest boxes to compensate for this impact. Again, the focus should instead be on avoidance of impacts to hollow-bearing trees in the first instance. This is particularly important considering the conclusion of the EA that the proposal is likely to have a significant impact on the Superb Parrot.

In considering the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* listing of the Greater Long-eared Bat (although not when considering the *Threatened Species Conservation Act 1995* listing of the same species) the EA states that '*Provided the recommended mitigation measures are followed and lost paddock trees are replaced, offset options are undertaken and bat boxes installed to counteract the loss of breeding and roosting opportunities the project would be unlikely to interfere with the recovery of the Greater Long-eared Bat*' and '*Based on the above assessment the project is unlikely to have a significant impact on the Greater Long-eared Bat*'.

Goldingay and Stevens (2009) present a useful summary of literature related to the use of nest boxes generally. It is relevant to highlight the following observations from this paper and other sources:

- Nest boxes can be useful as research tools for detecting species and for ecological studies of hollow-using species. They may also be effective substitutes for natural hollows where hollow-dependent species are excluded or reduced in abundance by a lack of natural hollows, although practicality is debated (Lindenmayer *et al.* 1991, 2002, 2003; McKenny and Lindenmayer 1994; Spring *et al.* 2001; Harley and Spring 2003).
- However concern has been expressed regarding the use of nest boxes to compensate for hollow-bearing trees lost during authorised clearing. Importantly, Goldingay and Stevens (2009) stressed that the potential value of artificial hollows should not be used to justify the removal of hollow-bearing trees, and that in this context such artificial hollows are only an interim solution. They also highlighted that currently information is lacking to demonstrate the value of such a use of nest boxes to hollow-using species in this context.
- Goldingay and Stevens (2009) also note that in contrast with arboreal marsupials, the use of artificial hollows by Australian birds is poorly documented in published literature. Whilst there is increasing evidence that roost boxes will be used by Australian microbats (Golding 1979,

Irvine and Bender 1995; Ward 2000; Smith and Agnew 2002) the extent to which this can result in valuable research and management applications is not well understood.

- The success of nest boxes can be related to a combination of factors including, among others, design, placement (height and aspect), temperature (eg related to usage, nesting success and the thermal requirements of bats) and seasonal requirements. These factors have not been well studied in Australia (Goldingay and Stevens 2009). Nest boxes also have the potential to increase populations of aggressive, introduced and pest species (such as feral honeybees, mynas, starlings) as observed in a number of studies (eg Ambrose 1982, Coelho and Sullivan 1994, Pell and Tidemann 1997, Harper *et al.* 2005, ANU 2011 and 2012). Non-target, common, native fauna species can also prevent the occupancy of these artificial structures by target species (Goldingay and Stevens 2009). Effective use of nest boxes, particularly where specific species are being targeted, requires detailed consideration of these factors.
- In relation to bats specifically, Goldingay and Stevens (2009) observe that so few studies have been conducted of bats using roost boxes in Australia that suitable designs remain largely unknown. They conclude that roost boxes could play an important role in the recovery of threatened bats however a dramatic increase in understanding of preferred roost box designs would be required.
- Collapse and theft of nest boxes have also been documented (Beyer and Goldingay 2006, ANU 2011 and 2012). The viability of nest boxes as a long-term solution may be hindered by the high costs associated with both their installation and the maintenance and monitoring required (Harper *et al.* 2005 and Goldingay and Stevens 2009).

Regarding Superb Parrots specifically, monitoring of 3200 nest boxes (including parrot boxes) along the Hume highway (which crosses superb parrot breeding areas) revealed that not a single nest box was used by a Superb Parrot (ANU 2011 and 2012). David Parker (Superb Parrot expert from OEH Griffith) advises that in addition to the nest boxes along the Hume Highway, the Boorowa Lions Club erected nest boxes specifically for the Superb Parrot to address the loss of hollows across that landscape. It is thought that out of all of the boxes erected, only two were ever used by Superb Parrots. The RTA have also erected boxes along the Newell and Sturt Highways to mitigate their tree pruning activities. None of these have been utilised by Superb Parrots. David also concurs that in his experience nest box maintenance is an issue, that Superb Parrot nest boxes are well utilised by feral bees, starlings, mice and Noisy Miners, and that they would be readily taken up by Brushtail Possums.

Considering the significance of impact predicted for Superb Parrots, observations within the EA regarding the use of bat boxes to compensate for loss of hollows for the Greater Long-eared Bat, and in light of the identified gaps in knowledge about ensuring success of nest boxes, we are strongly of the view that the proponent should not be relying on this strategy as a way of reducing the impacts of the proposal to an acceptable level.

### **Recommendation:**

OEH recommends that:

- The use of nest boxes not be relied upon as a management action to compensate for the loss of hollow-bearing trees as a result of the project, because of the uncertainties surrounding the use of these structures by the target species, the ability to maintain and replace the boxes and the costs involved, and the required monitoring of their effectiveness.
- Emphasis is placed on the avoidance of impacts on hollow bearing trees. As previously noted, prior to approval the proponent should be required to:
  - Supply a copy of the Keble and Marshall (2012) arborist report.

- Provide a map of the route depicting the location of the 250 hollow bearing trees identified, and assessing avoidance options. This would indicate the proponent's ability to avoid these trees and better define the likely level of impact.
- Any approval granted should require the proponent to undertake detailed assessment to plan the fine scale location of the pipeline to minimize loss of trees with hollows (and habitat in general).
- Any approval granted should require the proponent to maximize the salvage of habitat resources where impacts are unavoidable. Hollow-bearing trees which require removal should be salvaged intact (ie whole tree not just the hollow). These trees should be re-positioned in suitable locations along the route (such as in 'temporary' disturbance areas flagged for rehabilitation) as stag trees. If the tree is adequately secured it is likely to be a better substitute than nest boxes and a better use of habitat elements that would be otherwise be lost.

#### **4. Offset Proposal**

##### **Issues:**

In OEH's view:

- (a) The EA contains some misleading information regarding the level of offset outcome able to be achieved.
- (b) The EA has not fulfilled the DGR's.
- (c) The EA proposes use of on-site rehabilitation to discount the offset required.

##### **Background:**

###### *Likely offset outcome*

The EA states that the project will address the OEH Interim Offset Policy and will aim to ensure a maintain or improve outcome, implementing either the Biodiversity Offset Principles or the Biobanking Assessment Methodology.

In OEH's view, the proponent will not be able to provide a maintain or improve outcome unless the proponent is able to avoid impacts to 'red flags' (eg Box-Gum Woodland). The degree to which the proponent will offset the residual impacts of the proposal will depend on them being able to secure sufficient matching credits to satisfy the quantum of the final offset required.

###### *Director General's Requirements*

As previously noted, the DoPI Director-General's Requirements (DGRs) for the EA include the requirement for the proponent to *'provide sufficient details to demonstrate the availability of viable and achievable options to offset the impacts of the project. Where impacts are unavoidable, how impacts would be minimized, mitigated and offset consistent with either the Biobanking Methodology or by following the Principles for the use of biodiversity offsets in NSW'*.

The exhibited EA states that a basic preliminary assessment (partially using the Biobanking Assessment Methodology) of the quantum of the offset likely to be required to offset the currently expected residual impacts on native vegetation has been undertaken and presents an indicative biodiversity credit profile. However it falls short of presenting a basic assessment of the availability of suitable offset options, nor the Council's ability to secure these.



The EA notes that the offset would be satisfied via use of Council-owned properties (in the first instance), purchase of additional properties or purchase of Biodiversity Credits. The EA states that a desktop assessment was undertaken of properties which could serve as potential offset sites within a 20km radius currently available on the market, and reports that *‘Several properties that could represent suitable offset sites are currently for sale on the open market within the search area’*. No further information is provided.

The EA also states that Council is currently reviewing properties within Council’s land portfolio for their suitability as offsets, in accordance with stated parameters. As these lands are already owned by Council, it is not clear why the review of these lands has not been completed and included within the Section 12.4.2 ‘Preliminary assessment of biodiversity offsets’. This information, at a minimum, should have been included in the public exhibition documents.

In OEH’s view, the proponent has not adequately demonstrated the availability of viable and achievable options to offset the project’s impacts.

#### *Impacts to be offset*

We also note that the EA considered ‘temporary’ disturbance areas (ie disturbed during construction then rehabilitated) to not require offsetting. Specifically, the EA notes the following do not require biodiversity offsets:

- Disturbance to derived native grasslands, in the case where those areas are to be rehabilitated (ie excluding those areas to be impacted by permanent access tracks); and
- Disturbance to, or removal of native ground layer vegetation for the purpose of constructing access tracks, temporary site compounds, stockpiles and other construction uses.

Rehabilitation of the development footprint is usually considered separate to required offsets. In other words, OEH expects proponents to develop an upfront offset for all impacts associated with a proposal, without counting rehabilitation of the footprint.

From Part C, Tables 12.11 and 12.12, we understand that the proponent expects ‘temporary’ impacts to a total of 53.45 hectares, including 9.5ha of native grassland and 22.1ha of woodland (of which 12.8 is reported to consist of EEC). Without provision of further justification for excluding these native vegetation impacts from the offsetting requirements, OEH would expect compensation for these impacts to be included within the Biodiversity Offset Strategy.

#### **Recommendation:**

- a) That prior to any approval being granted, the proponent be required to provide (at a minimum) a preliminary assessment of Council-owned land against the identified parameters (Part C, page 12.34). Provision of this information would demonstrate the degree to which these lands may be able to provide the estimated offset required, and indicate the likelihood of further land purchase being necessary.
- b) That the proponent be required to offset all residual impacts to native vegetation, without discounting the offset based on rehabilitation of the development footprint.

## References

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