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**Macquarie River to Orange Pipeline Project- Orange Drought Relief Connection
(Application no. 10_0235)**

**Appendix G- Aquatic Ecology. Environmental Assessment and the impact on
native fishes**

Overview

This response addresses the development assessment for the Macquarie River to Orange pipeline project and specifically, the two aquatic assessments commissioned by Orange city council. I am an experienced freshwater fish biologist currently employed at the University of Western Sydney and in relation to this assessment I have worked on the impact of flows on native species in the nearby Cudgegong River catchment below Windamere Dam and I have undertaken surveys in the Macquarie Marshes. I also have a student who is currently working on the potential recruitment sources of the noxious species redfin perch *Perca fluviatilis* into Burrendong Dam from its tributaries (including the upper Macquarie River and its feeder streams). Given my expertise and current projects in the catchment, I feel it is pertinent for me to provide scientific review on the aquatic assessments conducted for the proposed pipeline.

The aquatic surveys commissioned by Orange City Council appear far too brief to fully assess and address the potential risks of the proposed pipeline on freshwater fish assemblages at the affected sites. In particular, the surveys used inappropriate methods to effectively identify the native fish assemblages utilising the river in the vicinity of the proposed pump site and this is demonstrated by local fishing club data from just a 5 month period, which recorded a large number of native fishes from both within the proposed pump hole and in surrounding holes. Overall, although the assessment refers to past fish surveys in the catchment, the fish assemblages in the river near the proposed pump site needed to be more appropriately documented given the nature of the development and this would allow the impacts to be fully explored and specific control or management measures could have then been recommended or alternatives to the pipeline could have been considered.

Response

The aquatic assessments conducted by Cardno and GHD indicated that “native fish are scarce” in the Macquarie River around the proposed pump location. However, the lack of native fish reported in these surveys appears to be a reflection of 1) the limited amount of sampling conducted during the surveys and 2) the use of inadequate methods that were used to sample the habitat available at the proposed off-take site.

Given the size and depth of the water holes in this area, back-pack electrofishing (which was the main technique used in the assessments) would only sample a minor proportion of habitat that is available in each water body as it is restricted to waters below about waist height. Much work has been done in Australia over the past 15 years to develop protocols for the assessment of riverine fish communities, this includes protocols within the Sustainable Rivers audit (SRA) and others commonly used by state government departments (e.g. NSW Rivers Survey and the Victorian Environmental Flows Monitoring and Assessment Program). These protocols often require boat electrofishing to be utilised in all navigatable habitats (e.g. any waters deeper than 0.75m or waters deeper than those that can be sampled with a back-pack electrofisher). While it is unrealistic to expect all consultants to have access to specialised boat electrofishing equipment, if this equipment was not available, other methods could be used effectively in order to better sample these habitats. For example, more thorough netting than that used in the current surveys or even structured angling surveys would give a reasonably comprehensive overview of the species present and their relative abundance.

The surveys should also include a structured sampling technique which should take into consideration seasonal variation, fish movements and migration, rather than the *ad hoc* sampling which was reported in Appendix G of the development assessment. The key here being that fish abundances could vary throughout the year and the operation and construction of the pipeline would need to take this into consideration and this should have been better addressed in the development assessment.

Despite the limited number of native fishes recorded in the Macquarie River as part of the assessment, local land owners and anglers report substantial numbers of native fishes from this same section of river. This is best demonstrated by Bundi Fishing Club data, where for even the short period from January 2012 to May 2012, 231 fishes were recorded and 217 of these fish were natives (208 of these fishes were released after capture). The main species caught by fisherman included Murray cod (*Maccullochella peelii*) and golden perch (*Macquarie ambigua*), a summary of catches reported by anglers at the Bundi Fishing Club in 2012 is shown in Figure 1.

When the location of the catch is examined, it can be seen that the majority of fishes are coming from the proposed pump hole (known as Gardiners) or from the holes immediately below it (known as Pumkin, Dick Burk and Boathole) (Figure 2). This further suggests that the waters most likely to be effected by the proposed pipeline are important habitats for native species. Other anglers also maintain records and photographs (with local land marks in the background to verify the capture location) for native fish captures in the area (including from sites above the pump hole) and these have not been included in the data presented below. This also includes recent records (and photographs) of the endangered trout cod (*Maccullochella macquariensis*).

Although the presence of these species is acknowledged in the report (and it is also reported that native fish are stocked into the area), the large numbers of fish reported by anglers indicate that it is obviously a highly suitable and important habitat for native species and it is also an area which is capable of maintaining a substantial recreational fishery for native species. Therefore, it is evident that more thorough surveys were required (and should have been requested by Orange City Council) in order to identify the full extent of the native fish assemblages (particularly in relation to the pumping site in the Macquarie River) and to determine how habitat availability, movement, fish health and spawning may be affected by the construction and operation of the proposed pipeline.

Kind regards,

Dr Nathan Miles

12/10/12

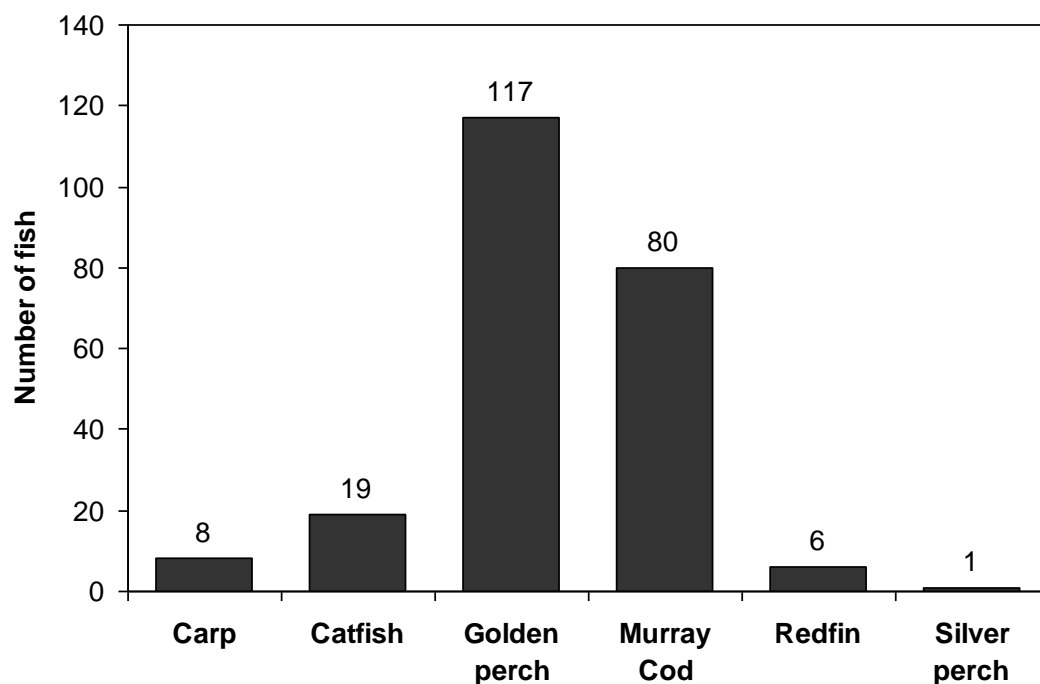


Figure 1. Summary of fishes recorded by members of the Bundi Fishing Club from January 2012 to May 2012.

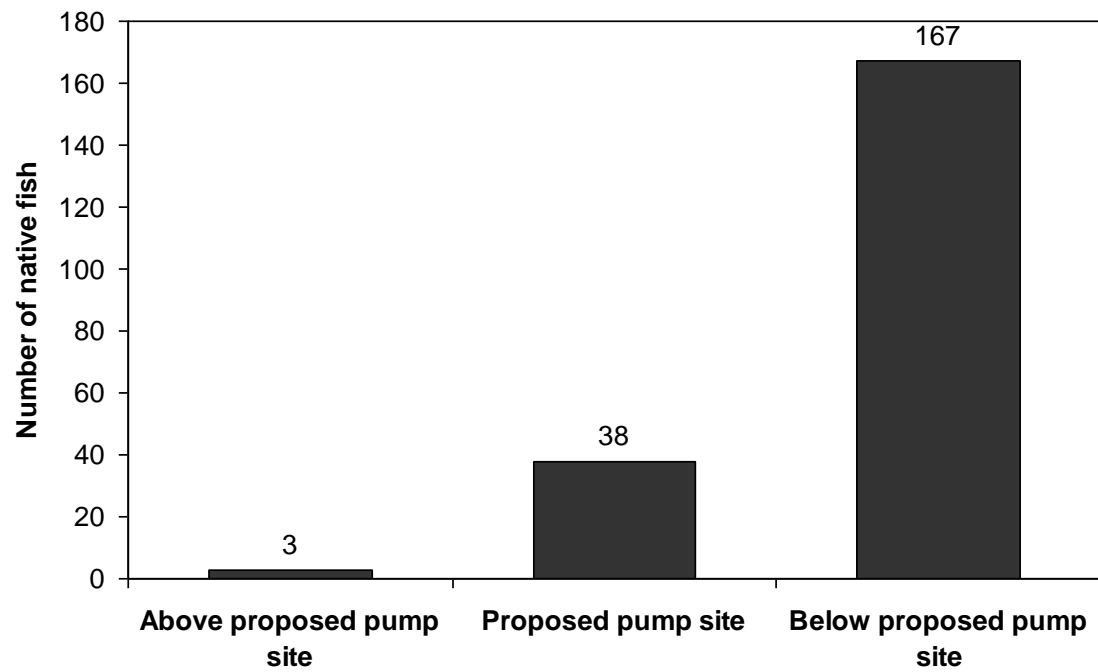


Figure 2. Summary of locations where native species were recorded by members of the Bundi Fishing Club from January 2012 to May 2012.