

## Replacement Flows Project

FLORA AND FAUNA ADDENDUM FOR PROPOSED  
MODIFICATIONS TO THE CONCENTRATE POND AT  
QUAKERS HILL STP

■ 18 September 2008



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### FLORA AND FAUNA ADDENDUM FOR PROPOSED MODIFICATION TO THE CONCENTRATE POND AT QUAKERS HILL

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## 1. Introduction

### 1.1. Background

The Western Sydney Recycled Water Initiative (Replacement Flows Project) will connect the Penrith, St Marys and Quakers Hill sewage treatment plants (STP's) by pipes to allow treated wastewater from the three plants to be further treated at a new advanced water treatment plant (AWTP) at the St Marys STP. The highly treated recycled water will be released into the Hawkesbury-Nepean River below Penrith Weir.

An Environmental Assessment (EA) for the project was submitted to the NSW Department of Planning and approved by the Minister on the 20<sup>th</sup> June 2007, subject to Conditions of Approval (CoA). A specific CoA was issued for the Project in relation to ensuring that the Project does not directly impact on threatened species and endangered ecological communities, such as Cumberland Plain Woodland and River-flat Eucalypt Forest on coastal floodplain.

During detailed design investigations it was determined that the original EA footprint of the concentrate pond adjacent to Quakers Hill STP would not be sufficient to cater for the configuration of the pond and hence a revised environmental assessment is required.

### 1.2. Objectives of the Addendum

This report has been prepared as an addendum to original Replacement Flows Terrestrial Ecology Report (October 2006), which was contained in Appendix D of the EA.

An aerial photograph showing the original EA concentrate pond and the revised layout are shown as **Figure 1**. This addendum reports on an inspection of the proposed concentrate pond and associated infrastructure including pumping station and car parking and provides an assessment of the potential ecological impacts and their significance on the endangered ecological communities; River Flat Eucalypt Forest and Cumberland Plain Woodland under Part 3A of the NSW *Threatened Species Conservation Act*, 1995 (TSC Act) and assessment guidelines applicable to the *Environment Protection and Biodiversity Conservation Act*, 1999 (EPBC Act). The information presented in the report is based on a review of available data and follow-up site inspections.





■ Figure 1 Original and Proposed Concentrate Pond layout



The original EA assessed footprint is shown in pink and overlay on revised concentrate pond shown in black.



## 2. Site Assessment

### 2.1. Methods

A review of the additional land covered by the proposed pond design amendment was conducted on the 7<sup>th</sup> August and 10<sup>th</sup> September 2008 in the company of representatives from Sydney Water and the construction contractors. A brief on the physical extent of the proposed concentrate pond was provided as per Figure 1. Additional spaces required for pump station and carparking to be located in the central western parts of the site.

The inspection aimed to confirm the vegetation community types and flora and fauna species and habitat types present within the proposed construction areas and assess the potential direct and indirect impacts on these from the proposed clearing for the new infrastructure.

### 2.2. Results

The site proposed for construction of the pond occurs on a river flat terrace associated with Breakfast Creek (located west of the site) and comprising alluvial soils with a high degree of water logging. The majority of the site has been cleared previously and was used for the dumping of sludge materials from the adjoining Quakers Hill STP. This previous land use has resulted in the site currently being occupied by a dense cover of exotic groundcover plant species, particularly Kikuyu (*Pennisetum clandestinum*) and several dead trees. Standing surface water is present over large portions of the site resulting from localised modification to the site topography through earthworks and an associated alteration to the natural drainage regimes. This factor combined with expected elevated nutrient levels may account for the extensive dieback and stressed condition of remnant and regrowth vegetation which is evident throughout the site and proximal lands.

A small artificially created dam is also present in the north east corner of the site proposed for stockpile of soil during construction. This dam is densely covered with Rushes (*Typha orientalis*). The presence of abundant standing surface water including this dam, provides moderate quality habitat for several common amphibian and reptile species.

It is evident that the low-lying areas of site were formerly occupied by River-Flat Eucalypt Forest comprising a mix of eucalypts, mainly Forest Red Gum (*Eucalyptus tereticornis*) and Cabbage Gum (*E. amplifolia*) with Rough-barked Apple (*Angophora floribunda*), Paperbark (*Melaleuca linarifolia*) and Swamp Oak (*Casuarina glauca*). The largest remaining fragment in the vicinity of the site is located at Area F and comprises two mature Forest Red Gum and numerous juveniles of this species, Cabbage Gum and Swamp Oak (*Casuarina glauca*) at 3-4 m, many of which are in a very stressed condition and experiencing advanced dieback. Several small fragments of river flat forest, including isolated young trees are located across the southern ends of the site (refer Areas B, C, D and G on Figure 8).

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Elevated and well drained lands to the east of the creek flats and proposed pond consist of Shale Hills Woodland (Cumberland Plain Woodland) (refer Figure 8) dominated by Grey Box (*E.mollucana*) with scattered Forest Red Gum and dense cover of Blackthorn (*Bursaria spinosa*) in the shrub layer. The north-eastern boundary of the pond would occur within a transitional zone between the River-Flat Eucalypt Forest and the Cumberland Plain Woodland (Figure 4 Area C), although would not directly impact on the Cumberland Plain Woodland which increases in extent to the east of the site upslope from the low lying creek flats. Area C is part of the former River Flat Eucalypt Forest Community. Area A1 (Figure 2 and 8) shows two Grey Box (*E.mollucana*) trees located in this transitional zone which are exhibiting severe stress and dieback associated with altered hydrological and nutrient regimes. The two adjoining trees are already dead (Figure 2). These trees will be removed to accommodate the concentrate pond and are not worthy of conservation as part of the Cumberland Plain Woodland community. The remaining trees in Area A2 are associated with the Cumberland Plain Woodland community and strict design and construction controls are required to avoid these trees in accordance with the Conditions of Consent for the EA.

The proposed amendments to the concentrate pond footprint would involve the direct removal of several small fragments of River Flat Eucalypt Forest (Area B, C, D, F and G). The vegetation in these areas is in very poor condition, with the understory dominated by disturbance tolerant exotic species particularly Kikuyu (*Pennisetum clandestinum*), and also Slender Pigeon Grass (*Setaria parviflora*), Purpletop (*Verbena bonariensis*), Common Sowthistle (*Sonchus oleraceus*) and Plantain (*Plantago lanceolata*). Native species include Forest Red Gum, Cabbage Gum, Rough-barked Apple (*Angophora floribunda*), Paperbark (*Melaleuca linariifolia*), Swamp Oak and *Acacia parramattensis*. In its current condition the vegetation has minimal conservation significance and value due to the very high level of disturbance and its small and fragmented nature. The highest quality vegetation in the locality, and that worthy of conservation and restoration, occurs upslope and to the north-east of the site and also along Breakfast Creek to the south and west of the power easement.

The concentrate pond site does not provide optimum habitat for the Cumberland Land Snail (*Meridolum corneovirens*), with vegetation upslope and to the north-east of the site being more suitable. Remaining areas of vegetation to be removed include several dead standing trees which are situated in the area originally approved under the EA (near Area E) and do not form part of this assessment.





Figure 2: Area A1 –Two stressed Grey Box (*Eucalyptus moluccana*) (right of personnel) and 2 dead trees, tree at pink marker also Grey Box is within Area A2.



Figure 3: Area B-Two *Angophora floribunda*



Figure 4: Area C- Small stand of Forest Red Gum (*E.tereticornis*) and Cabbage gum (*E.amplifolia*)



Figure 5: Area D -Two *Melaleuca linariifolia*



Figure 6: Area E – part of original EA concentrate pond location



Figure 7: Area F – Remnant and regrowth River flat Eucalypt Forest





■ Figure 8 Distribution of vegetation characteristics





### 3. Impact Assessment

#### 3.1. Potential Impacts

The proposed amendments to the concentrate pond will increase the size of the pond and therefore impact on vegetation that was originally not assessed as part of the EA (refer Figure 1). Remnant and regrowth vegetation from the low-lying portions of the site is consistent with the endangered ecological community (EEC) referred to as River Flat Eucalypt Forest on Coastal Floodplain scheduled in NSW under the *TSC Act*. Portions of this community will be impacted by the proposed works, and therefore an assessment of significance under Part 3A of the *EP&A Act* has been conducted in accordance with guidelines for threatened species assessment (DECC and DPI 2005) to address the significance of this impact.

The nationally endangered ecological community Cumberland Plain Woodland is present to the east and upslope of the proposed pond. The northern boundary of the pond will occur in close proximity to a number of Grey Box forming part of this community. There is scope to avoid direct impacts on these trees through strict construction design and controls and this is a requirement of the Conditions of consent for the project to avoid further direct impact on Cumberland Plain Woodland.

Sediment and erosion control fencing will be used on sloping areas to the west to minimise indirect impacts to riparian vegetation near Breakfast Creek.

No hollow-bearing trees, logs, natural and artificial cover were identified in the additional pond areas required for construction. Thereby fauna sheltering opportunities are absent and habitat is restricted to low groundcovers of exotic grasses and herbs and standing shallow water.

As noxious and invasive weeds are currently abundant at the site there is potential to inadvertently spread weeds through machinery and vehicles entering and leaving the work site. Top soil is expected to be infested with weed seed and not suitable for specific partitioning for regeneration purposes.

The proposed works area does not contain any significant or critical habitat for threatened or significant fauna species and provided suitable construction mitigation measures are employed as is proposed in the recommendations of this report, the proposal is unlikely to impact on native fauna species and habitat in the locality..

The worksite and adjacent areas would be rehabilitated post construction with native flora, including a weeding program to offset the small loss of vegetation on the site.



### **3.2. Assessment of Significance (Section 3A; EP&A Act 1979)**

The proposal is to be assessed under Part 3A of the *EP&A Act* and consequently this impact assessment was undertaken in accordance with the Draft Guidelines for Threatened Species Assessment (DEC and DPI 2005). On the basis of the field inspection and the proposed amendment to the size of the concentrate pond adjoining Quakers Hill STP, the following provides an assessment of the significance of potential impacts on the River-Flat Eucalypt Forest Endangered Ecological Community.

#### ***How is the proposal likely to affect the lifecycle of a threatened species and/or population?***

Cumberland Plain Woodland is not a threatened species or population.

#### ***How is the proposal likely to affect the habitat of a threatened species, population or ecological community?***

In the local area much of the River-Flat Eucalypt Forest community is restricted to the immediate riparian areas along Breakfast Creek, up to 50 m from the creek in some locations. It is more extensively located along Eastern Creek to the west and south west of Quakers Hill, including scattered remnants in Nurragingy and Aquiline Council Reserves. All areas are modified and disturbed through the impacts of urban development and modified flooding regimes. The proposal will remove very small, degraded and isolated fragments of this community. The understorey is dominated by a dense cover of invasive exotic species, particularly grass (Kikuyu) which is likely to be suppressing the natural regeneration of native species, including trees and shrubs. All areas showed signs of stress and dieback associated with altered hydrological and nutrient regimes.

The highest quality vegetation in the locality and that worthy of conservation and restoration occurs upslope and to the north-east of the site (Cumberland Plain Woodland) and also along Breakfast Creek to the south and west of the power easement. Efforts to restore riparian vegetation along the local creeks would assist the recovery and conservation of the community locally. The proposed removal of vegetation for these works will remove several small areas of disturbed and isolated vegetation, which has very limited natural or assisted regeneration potential.

#### ***Does the proposal affect any threatened species or populations that are at the limit of its known distribution?***

River Flat Eucalypt Forest on coastal floodplain is not a threatened species or population.

#### ***How is the proposal likely to affect current disturbance regimes?***

A number of current disturbance activities are evident in the study area. The most extensive of these is altered hydrological and nutrient regimes resulting in stressed vegetation and extensive



dieback and weed invasion. The proposed excavation and disturbance of topsoil has potential to exacerbate these issues, particularly weed invasion. Measures to ameliorate potential impacts during the construction are required and have been identified in this report. Adherence to these measures will provide adequate provisions to protect native flora and may improve the overall condition of the site.

***How is the proposal likely to affect habitat connectivity?***

The proposal will not result in the further fragmentation of any habitats as the works will be restricted to an existing cleared and disturbed area and not within a recognised habitat corridor. Rehabilitation of the site and planted of vegetation around the perimeters is designed to improve the limited connectivity which occurs in the area.

***How is the proposal likely to affect critical habitat?***

No critical habitat has been identified for this community within the study area.



## **4. Conclusions**

### **4.1. Summary**

It is concluded that the proposed amendments to the design will involve the additional removal of several very small stands of remnant vegetation consistent with a River-Flat Eucalypt Forest community as listed as an Endangered Ecological Community under the NSW Threatened Species Conservation Act, 1995. As this area is additional to that which was originally assessed by the EA for the Replacement Flows project, an assessment of significance under Part 3A of the EP&A Act as amended by the TSC Act has been prepared. The assessment concludes that the direct and indirect impacts of the proposal would not result in a significant impact on the extent and condition of River-Flat Eucalypt Forest in the locality and are in context with the conclusions determined in the EA. Construction mitigation measures as outlined in the EA are applicable to the proposed amendment area and are to be implemented during construction.

The northern boundary of the pond will occur in close proximity to a number of Grey Box trees forming part of the nationally endangered Cumberland Plain Woodland community identified to the east of the pond footprint (Area A2). In order to ensure that the proposal is consistent with the Conditions of Consent for the EA it will be necessary to avoid direct and indirect impacts on these trees through strict construction design and control. Failure to avoid impacting on these trees will require a referral to the Commonwealth under the provisions of the Environment Protection and Biodiversity Conservation Act, 1999.

### **4.2. Recommendations**

- Avoidance of impact on Cumberland Plain Woodland (Area A2) through appropriate design and strict controls during construction.
- Install boundary fence prior to clearing and construction of the site to prevent accidental incursions into the adjacent Cumberland Plain Woodland.
- Offset the loss of River flat Eucalypt forest on site through active restoration of currently cleared and degraded portions of the community located between the new pond and Breakfast Creek to the west, along the length of the development.