Sydney WATER

Water and wastewater servicing of the West Dapto Urban Release Area and Adjacent Growth Areas

Submissions Response Report

Publications number SW 260 02/13

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Abbreviations

AGAs	Adjacent growth areas
ASS	Acid sulfate soils
ASSMAC	Acid Sulfate Soils Management Advisory Committee
ANZECC	Australian and New Zealand Environment and Conservation Council
dB	Decibel
DECC	Department of Environment and Climate Change (then Department of Environment, Climate Change and Water, now Office of Environment and Heritage)
DGR	Director-General's Requirement
DIPNR	Department of Infrastructure, Planning and Natural Resources (then DoP, now DP&I)
DoP	Department of Planning (now DP&I)
DPI	Department of Primary Industries
DP&I	Department of Planning and Infrastructure
DTIRIS	Department of Trade and Investment, Regional Infrastructure and Services
EA	Environmental Assessment
EEC	Endangered Ecological Community
EPA	Environment Protection Authority
EP&A Act	*Environmental Planning and Assessment Act 1979*
EPBC Act	*Environmental Protection and Biodiversity Act 1999*
EPL	Environment Protection Licence
FC	faecal coliforms
GCC	Growth Centres Commission (now part of DP&I)
ISS	Integrated Servicing Strategy
LIA	Lake Illawarra Authority
mg/L	milligrams per litre
ML/d	Megalitres per day
NHMRC	National Health and Medical Research Council
NOW	NSW Office of Water
NSW	New South Wales
NTU	Nephelometric turbidity unit
OEH	Office of Environment and Heritage (formerly EPA, then DECC, then DECCW)
POEO Act	*Protection of the Environment Operations Act 1997*
Psu	Practical salinity unit
RMS	Roads and Maritime Services (formerly Roads and Traffic Authority)
RTA	Roads and Traffic Authority (now RMS)
SCC	Shellharbour City Council
SKM	Sinclair Knight Merz
TN	Total nitrogen

TP	Total phosphorus
TSC Act	*Threatened Species Conservation Act 1995*
TSS	Total suspended solids
WCC	Wollongong City Council
WDURA	West Dapto Urban Release Area
WFP	Water Filtration Plant
WRP	Water Recycling Plant
WSAA	Water Services Association of Australia
WPS	Water Pumping Station
WWPS	Wastewater Pumping Station
WWTP	Wastewater Treatment Plant

Glossary

1 in 100 year flood: A 1 in 100 year flood event is defined as a one per cent chance, that in any one year, a flood of this size or larger will occur.

Ammonia: (NH_4^+) represents the most reduced form of inorganic nitrogen available, and is preferentially utilised by plants and aquatic micro-organisms. The main sources of ammonia in aquatic ecosystems are found to be from human and animal wastes and also from release during decomposition of organic material by bacteria.

ANZECC: Australian and New Zealand Environment and Conservation Council provides a forum for the development of national land use policies to protect environmental quality and for the setting of national objectives for air, land and water quality.

ANZECC Guidelines: *Australian Water Quality Guidelines for Fresh and Marine Waters* published by ANZECC in 2000. These guidelines provide reference levels for comparison with water quality results.

Biodiversity: Variety and number of different species living in an ecosystem or a defined geographic area.

Catchment: The area of land draining to a waterway. May also refer to areas served by a wastewater or stormwater system.

Concept Approval area: Area covered by the application for Concept Plan Approval for the overall Proposal to provide water and wastewater services to the WDURA and AGAs. This is synonymous with the Proposal area.

Decibel: The units that sound is measured in.

Direct Impact Area: Conservative estimate of the area of native vegetation to be cleared, as a result of the Proposal's construction.

Drinking water: Drinking water is defined as water intended primarily for human consumption, but which has other domestic uses.

Ecosystem: A community of organisms, interacting with one another, and the environment in which they live. Processes occurring within an ecosystem are the flow of energy by food chains and food webs and nutrient cycling. An ecosystem may be a pond that is dry for half the year, a lake or even a planet.

Endangered Ecological Community: As defined under section 4(1) of the *Threatened Species Conservation Act 1995* (TSC Act) and any additional endangered ecological communities listed under Part 13 of the *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act).

Environmental impact: Any change to the environment, whether adverse or beneficial, wholly or partially resulting from an organisation's activities, products and services.

Field assessment area: The area along pipeline corridors and other infrastructure sites assessed as part of the specialist studies. We based the Proposal's environmental assessments on the 'field assessment area', to provide flexibility to revise infrastructure alignments and construction methods.

Groundwater: Water found below the surface, usually in porous rock or soil or in underground aquifers (natural underground formations that contains sufficient saturated, permeable material to yield significant quantities of water).

Habitat: An area or areas occupied, or periodically or occasionally occupied, by a species, population or ecological community, including any biotic or abiotic component.

Megalitre (ML): A measurement of volume equal to one million litres (1,000,000 L).

Milligrams per litre (mg/L): Unit of measurement which is equivalent to 0.001 of a gram of a substance dissolved in a litre of water.

Mixing zone: The zone surrounding the outfall where the wastewater plume mixes with the receiving waters. The initial mixing zone may extend beyond the near-field model (initial dilution zone).

NHMRC: The National Health and Medical Research Council (NH&MRC) is an advisory body to the Australian Government. Advisory standards are established by the NH&MRC for the performance of products, such as drinking water, to ensure they are of appropriate quality.

NTU: Nephelometric Turbidity Units – the unit of measure for suspended material in water that may cause it to look muddy or discoloured.

Nutrients: Substances required for growth by plants and other organisms. Major plant nutrients are phosphorus and nitrogen.

Pollutants: Contaminants in water, soil or air that, when in sufficient quantity, may cause environmental degradation.

Practical salinity units (**PSU):**– a measurement of salinity. Absolute (or ideal) salinity is the mass fraction of salts in seawater. In practical terms, salinity is expressed as PSU, which are based on water temperature and conductivity measurements. Salinity used to be expressed in parts per thousand (ppt). For oceanic seawater, ppt and PSU are very close.

Project Approval area: Area covered by the application for Project Approval for components of the Proposal required to service the early release precincts (Kembla Grange, Sheaffes/Wongawilli and West Horsley).

Proponent: the person proposing to carry out an activity (such as erecting a building), as defined under the *Environment Planning and Assessment Act 1979.* For the purposes of this Proposal, the proponent is Sydney Water or any party acting under authorisation from and on behalf of Sydney Water.

Proposal: to construct and operate water and wastewater infrastructure required to service the new development in West Dapto Urban Release Area (WDURA) and adjacent growth areas (AGAs) in the Illawarra Region.

Proposal area: That area comprising the WDURA and AGA. This is synonymous with the Concept Approval area**.**

Receiving water: A stream, river, pond, lake or ocean that receives stormwater or wastewater discharges.

Remaining Proposal area: The area within the Proposal area, excluding the Project Approval area.

Reservoir: An artificial body of water. Water is transferred from the dams and treatment plants either by gravity or pumping stations to a water storage reservoir. These reservoirs are human-made water storage areas, usually on high land. From these storage facilities the water flows through a system of mains pipes to homes, shops, factories, schools and public places.

Riparian corridor: Land next to creeks and rivers. Corridor widths are defined by DIPNR (2004) and NOW (2008).

RMS: Roads and Maritime Services (formerly the RTA), is the primary NSW public sector organisation responsible for roads.

Run-off: Water that flows across the land surface and does not soak into the ground.

Sediment: Soil or other particles that settle to the bottom of lakes, rivers, oceans and other waters.

Stakeholder: Any individual or group, which can affect or is affected by an organisation's activities.

Statement of Commitments: Measures for environmental mitigation, management or monitoring of the Proposal.

Stormwater: Rainwater that runs off the land, frequently carrying various forms of pollution such as litter and detritus, animal droppings and dissolved chemicals.

Suspended solids: Particles in water that can be removed by sedimentation or filtration.

Threatened species: Critically endangered, endangered or vulnerable threatened species and populations as defined in section 4(1) of the TSC Act; or any additional threatened species listed under Part 13 of the EPBC Act as critically endangered, endangered or vulnerable.

Total Nitrogen (TN): a measure of all the nitrogen species found in a water body including ammonia, oxidised nitrogen and total organic nitrogen.

Total Phosphorus (TP): a measure of both biologically available and unavailable species. The biologically available species is known as Filterable Reactive Phosphorus. There are two forms of dissolved phosphorus in the water body, organic phosphorus produced from the decay of plant and animal material and inorganic orthophosphates, which released through breakdown of rock and transported into the water body.

Total suspended solids (TSS): A water quality measurement, referring to the mass of suspended material in suspension in a volume of liquid.

Under-boring: A pipeline construction method (using thrust boring and/or horizontal directional drilling) that involves less disturbance of the ground surface.

Vegetation type: The finest level of classification of native vegetation used in the assessment. Vegetation types are assigned to vegetation classes, which in turn are assigned to vegetation formations. There are about 1,600 vegetation types within NSW.

Waste: Discarded, rejected, unwanted, surplus or abandoned substances, excluding gas, water, wastewater, beneficially used biosolids and reuse water.

Wastewater: The dirty water or wastewater that goes down the drains of homes, offices, shops, factories and other premises and is discharged into the wastewater system. Also known as sewage.

Wastewater pumping station (WWPS): A facility in the wastewater system that mechanically lifts wastewater to a higher level to help the wastewater flow from its origin to its destination (eg to a treatment plant).

Wastewater system: The system of pipes and pumping stations for collecting and transporting wastewater from each property to the wastewater treatment plant.

Wastewater treatment (**primary):** The initial stage of wastewater treatment, in which floating or settleable solids are removed by screening and sedimentation.

Wastewater treatment (secondary): The second stage of wastewater treatment involves capturing and removing dissolved and fine organic solids. This usually involves a biological process.

Wastewater treatment (tertiary): The third stage in the purification of wastewater consists largely of removing dissolved nutrients and any remaining suspended solids and may include disinfecting the effluent.

Wastewater treatment plant (WWTP): a facility to improve wastewater quality before discharge to receiving waters which applies to the facilities at Shellharbour.

Water quality: Physical, chemical and biological measures of water.

Water recycling plant (WRP): a facility to improve wastewater quality before discharging it to receiving waters or providing recycled water to other users. This applies to the facilities at Wollongong.

Waterways: All streams, creeks, rivers, estuaries, inlets and harbours.

Wetland: A wetland is a low-lying area of land, often inundated or permanently covered by shallow water. Wetlands play a major role in the water cycle by storing and filtering water and replenishing underground water supplies. Wetlands can also be effective in cleaning polluted water by reducing aquatic plant nutrients, suspended solids and oxygen demands.

Wet weather: is defined in an environment protection licence (EPL). The EPLs for Wollongong WWTP and Shellharbour WWTP define wet weather as occurring when 10 millimetres or more of rainfall has been measured at a rain gauge in the catchment of the wastewater treatment system during a 24 hour period.

Wet weather overflow: Means an overflow in the reticulation system caused by wet weather, as determined by the hydraulic wastewater system model.

1. Introduction

This chapter introduces the *Submissions response report for the water and wastewater services for the West Dapto Urban Release Area (WDURA) and adjacent growth areas (AGA)*. It outlines the purpose and structure of the report.

1.1 General

The *Illawarra Regional Strategy* (2006 – 2031) (Department of Planning (DoP) 2007) and later studies by the (then) Growth Centres Commission (GCC) identified that the main opportunity for urban expansion in the Illawarra Region is located around West Dapto where the coastal plain broadens. The GCC concluded that the staged development of WDURA can and should proceed, as it will help meet the housing and employment needs of the Illawarra Region up to 2048.

The WDURA and AGAs are located about 15 km to the south west of Wollongong. The WDURA and AGA are planned to accommodate about 30,000 dwellings and 420 ha of non-residential development to cater for population growth in the Illawarra Region up to 2048.

The importance of the WDURA and AGAs is described in the DoP's *Illawarra Regional Strategy (2007)*, which identifies West Dapto as the priority new release area for the region. In addition, the *West Dapto Release Area Review Planning and Infrastructure Report (GCC 2008 Review)* identified infrastructure servicing as key to the successful development of the area.

The WDURA consists of the following precincts:

- Kembla Grange
- Sheaffes/Wongawilli
- West Horsley
- Cleveland
- Avondale
- Yallah/Marshall Mount.

Since the GCC 2008 Review, the area for staged development has been extended to include the following AGAs:

- Tallawarra Lands
- Huntley
- Calderwood
- Tullimbar Village.

The WDURA and AGAs were divided into a number of precincts to facilitate the staged release of land for development. Based on the recommendation in the GCC 2008 Review, rezoning and land release sequencing for the initial stages of WDURA was from north to south. The Department of Planning and Infrastructure (DP&I), in consultation with relevant local councils, agencies and developers, will determine the rezoning, land release and sequencing of development for future stages.

Development of the early release precincts of WDURA (Kembla Grange, Sheaffes/Wongawilli and West Horsley) commenced in April 2012. The remaining precincts will be developed and released

over time depending on the future rezoning, land release sequencing, development timing, staging and expected lot take-up rates and future demand.

Sydney Water is seeking approval from the Minister for Planning and Infrastructure, under the former provisions of Part 3A of the *Environmental Planning and Assessment Act 1979* (EP&A Act), to supply water and wastewater services to the WDURA and AGAs.

1.2 The Part 3A approval process

Part 3A of the EP&A Act established an assessment and approval regime for major infrastructure projects. Part 3A applied to development declared to be a Part 3A project by either the *State Environmental Planning Policy (Major Development) 2005*, or by Ministerial Order.

On 7 September 2009, the Minister for Planning issued an order for the Proposal to be assessed and determined under Part 3A of the EP&A Act, due to its state and regional environmental planning significance. On 3 November 2009, the then Minister for Planning authorised the submission of a Concept Plan under section 75M for providing water and wastewater services for the WDURA and AGAs. The Proposal is made up of an application for concept plan approval for the Proposal, together with an application for project approval for the initial components required to service the early release precincts.

On 1 October 2011, the government amended the EP&A Act to repeal Part 3A. The amended EP&A Act includes transitional arrangements (Schedule 6A) for projects that were being assessed under Part 3A before its repeal. The DP&I issued environmental assessment requirements for the Proposal, on 4 July 2011, which applied to both the Concept Plan element of the Proposal and the Project Approval elements. Since the environmental assessment requirements were issued before the repeal of Part 3A, both elements of the Proposal are considered to be 'transitional Part 3A projects' and will continue to be assessed under Part 3A. The Minister for Planning and Infrastructure remains the approval authority.

Sydney Water prepared an Environmental Assessment (EA) for the Proposal, in accordance with the DP&I's Director-General's Environmental Assessment Requirements (DGRs) issued for the Proposal. The EA was finalised following the Director-General's pre-exhibition evaluation of the document's adequacy. In accordance with the EP&A Act, the EA for the Proposal was publicly exhibited from 13 September 2012 to 29 October 2012. During this time, Sydney Water provided information to the community on the Proposal (refer to Section 2.2), and invited stakeholders to comment.

1.3 Purpose of this *Submissions response report*

DP&I received submissions in response to the EA and forwarded them to Sydney Water, who received the last submission on 10 December 2012. The Director-General advised on 8 November 2012 that Sydney Water must respond to the issues raised in the submissions, in accordance with Section 75H of the EP&A Act.

The purpose of this *Submissions response report* is to address issues raised in the submissions received following public exhibition of the EA. Responses to the submissions draw on the findings of the EA. This report will help DP&I advise the Minister for Planning and Infrastructure whether the Proposal should proceed, and on potential conditions of approval.

Following assessment of the *Submissions response report*, the Director-General will prepare a report to the Minister for Planning and Infrastructure. The Minister for Planning and Infrastructure, after considering this report, may issue an approval and set conditions for the constructing and operating the Proposal.

1.4 Structure of this report

Sydney Water prepared this report, in response to the Director-General's request of 8 November 2012. A summary of the information contained within each chapter of this report is below.

Chapter 1:

- introduces the *Submissions response report*
- summarises the approval process
- summarises the Proposal for which approval is sought.

Chapter 2:

- summarises the consultation that was done before and during exhibition of the EA
- outlines the exhibition process
- lists the submissions received.

Chapter 3:

- summarises concerns raised within submissions
- provides responses to concerns raised.

Chapter 4:

- provides the Statement of Commitments.

1.5 Proposal description

1.5.1 Summary

The WDURA and AGA is planned to accommodate about 30,000 dwellings and 420 ha of non-residential development, to cater for population growth in the Illawarra Region up to 2048. The DP&I will ultimately determine the rezoning and land release sequencing of the WDURA and AGAs, in consultation with relevant local councils, agencies and developers. Development of the early release precincts commenced in April 2012.

Sydney Water supplies water and wastewater services to about 4.4 million people in Sydney, Illawarra and the Blue Mountains. Sydney Water is responsible for the planning to deliver drinking water and wastewater services for the WDURA and AGAs.

The Proposal to provide new water and wastewater services includes:

- constructing about 80 km of drinking water pipelines
- constructing about 45 km of wastewater pipelines
- constructing one new water and three new wastewater pumping stations and upgrades to three existing wastewater pumping stations
- constructing five new drinking water reservoirs at three sites
- potentially amplifying and/or upgrading Wollongong Water Recycling Plant (WRP) and Shellharbour Wastewater Treatment Plant (WWTP).

Sydney Water is seeking Concept Approval for the Proposal to service new development within the WDURA and AGAs. Approval is required for all infrastructure within the new development areas, as well as lead-in works that extend between the development areas and the existing systems. We are seeking Project Approval for the infrastructure required to provide water and wastewater

services to the early release areas of WDURA, including the Kembla Grange, Sheaffes/Wongawilli and West Horsley precincts.

The summary of the Proposal above is consistent with that described in the EA. The Proposal has not changed (from that documented in the EA) in response to any matters raised in the submissions received through the public exhibition process.

The Proposal's location and components are shown in Figures 1-1 to 1-3.

1.5.2 Proposal refinement

Due to the iterative nature of infrastructure design, the Proposal description in the EA includes the ongoing refinement of pipeline corridors and site-based assets. Sydney Water's standard business practices involve completing route and location feasibility studies during detailed design. For the Proposal, these studies would consider site-specific issues and could include, for example, geotechnical and contamination surveys, geomorphological assessments, identifying the location of existing underground services, condition surveys and other minor surveys and tasks required to optimise and finalise alignments, design and constructability.

During the design process Sydney Water would identify opportunities to reduce potential environmental impacts, considering the mitigation measures detailed in Chapter 6 of the EA, the Statement of Commitments, and relevant recommendations detailed in Appendices C – I of the EA. This would avoid or otherwise minimise potential impacts on higher risk issues identified in the EA, including:

- Illawarra Lowland Grassy Woodlands endangered ecological community
- hollow-bearing trees
- riparian corridors and associated ecological and geomorphological risks
- items of Aboriginal cultural heritage significance
- items of non-Aboriginal heritage significance
- soils and geological risks
- community impacts.

Sydney Water will select the final design after considering environmental issues, constructability and operational requirements. To accommodate possible future changes to the Proposal, the EA considered maximum impacts along pipeline corridors and within sites. In most instances, a larger area has been assessed (known as the field assessment area in the EA) than will actually be impacted, however, there may also be changes outside the field assessment area.

To provide flexibility to enable future refinements to the Proposal, Sydney Water seeks approval for:

- the Proposal to be located anywhere within the field assessment area described in Chapter 6 of the EA; and
- the Proposal to be located outside the field assessment area where:
    - changes are consistent with the environmental objectives of the Proposal; and
    - environmental impacts are no greater than those described in the EA; and
    - no additional environmental mitigation measures are required.

Sydney Water will complete consistency assessments, if components of the Proposal are refined during optimisation of the detailed design. We will only seek a modification to the Project Approval if the changes are found to be inconsistent and/or the potential impacts are predicted to be greater than those described in the EA.

We have incorporated this approach into the Statement of Commitments in Chapter 4.

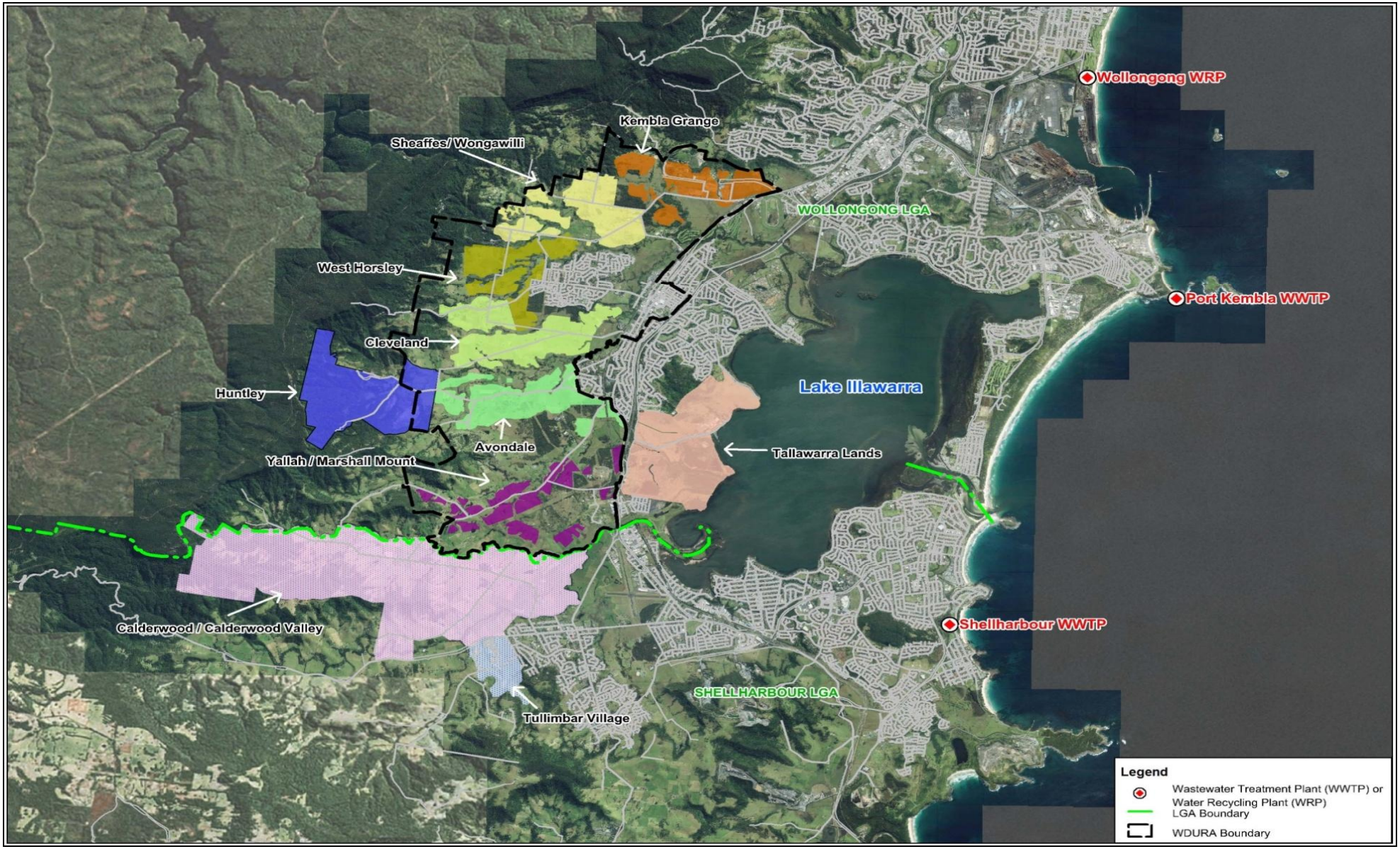

Figure 1-1 Location of Proposal area

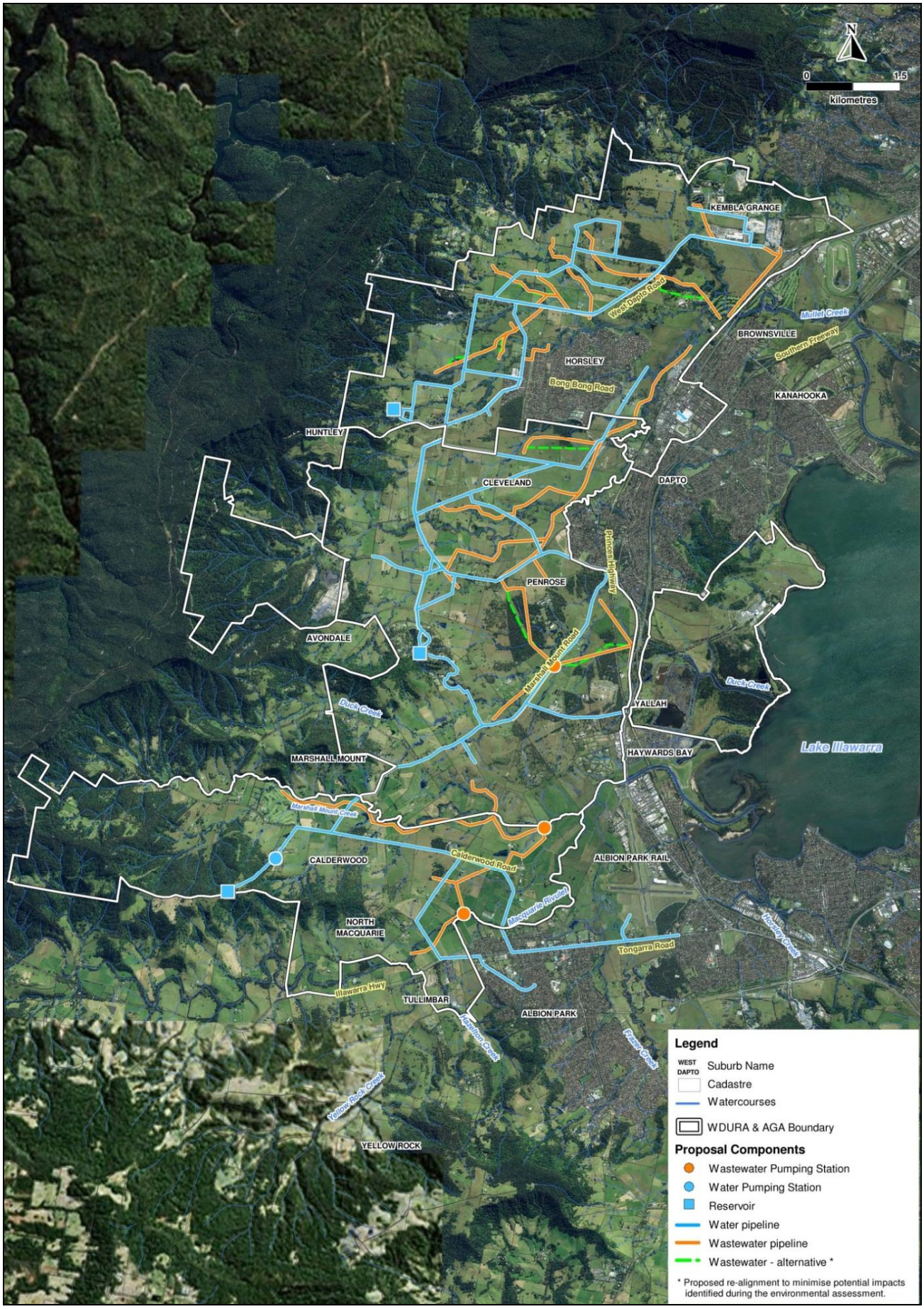

Figure 1-2 Indicative location of Proposal components

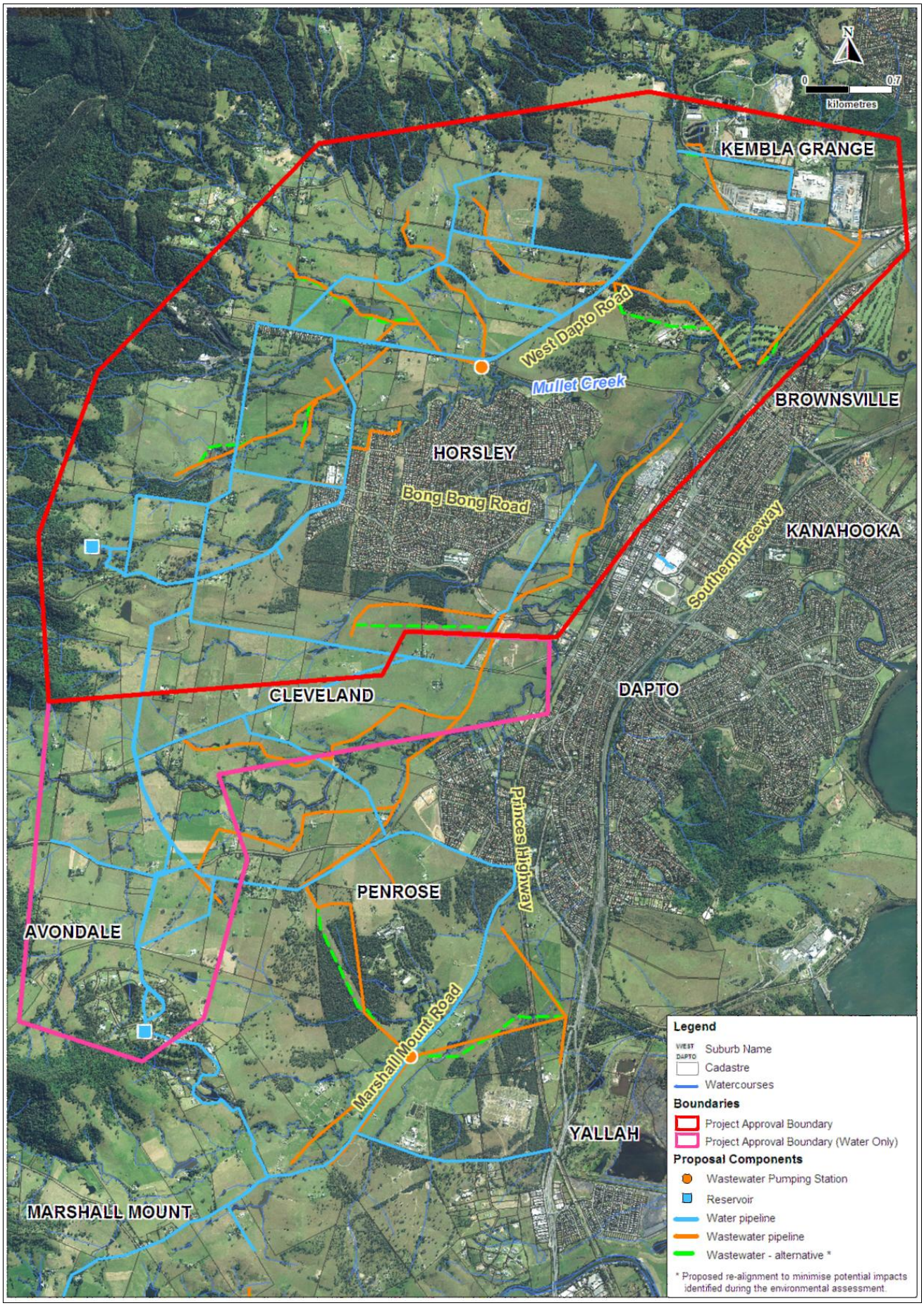

Figure 1-3 Indicative location of Project Approval components

2. Consultation and submissions

2.1 Consultation

Sydney Water developed a *Stakeholder consultation and communications strategy* to keep key stakeholders involved and informed throughout the preparation of the EA. We consulted with the relevant local and State government agencies during the EA preparation and exhibition. Consultation before and during preparation of the EA is described in Chapter 8 of the EA. Consultation activities during exhibition included:

- distribution of more than 1,800 letters to residents that may be directly or indirectly affected by the Proposal, local ministers, community/environmental groups and state agencies, notifying them that the EA is on exhibition and inviting them to attend the community information sessions
- newspaper advertisements
- two community information sessions, which were held on the 22 September 2012 and 20 October 2012
- information about the Proposal on Sydney Water's website
- freecall community telephone number
- email: areaplanning@sydneywater.com.au.

2.2 Exhibition of the Environmental Assessment

The DP&I exhibited the EA, including Sydney Water's draft Statement of Commitments, from 13 September 2012 to 29 October 2012. During the exhibition period, the public was able to review the document, attend public information sessions and forward submissions to the DP&I to help it to assess the Proposal. The EA exhibition gave the community, government agencies and stakeholder groups an opportunity to input ideas, raise issues and provide feedback.

Sydney Water conducted information days on 22 September 2012 at Centenary Hall in Albion Park and on 20 October 2012 at the Dapto Leagues Club. The information days were promoted through a series of advertisements placed in three local newspapers, and a mail-out to property owners within the Proposal area boundaries. In addition to this, a 20-second grab was aired on ABC radio.

Visitors to the information days were given various printed material about the Proposal and a compact disc of the EA. Opportunities were provided to inspect maps of the proposed services and ask Sydney Water staff questions about the Proposal.

The DP&I exhibited the EA document for public information and comment at Albion Park Library, Dapto Library, Nature Conservation Council's office in Newtown and at Wollongong and Shellharbour City Councils. The EA was also available at DP&I's office in Sydney.

Information about the Proposal, including the EA, maps of the Proposal, responses to frequently asked questions, and summary brochures, was made available on the Sydney Water website at sydneywater.com.au. The community could comment on and obtain further information about the Proposal by contacting Sydney Water by phone or e-mail. The issues raised by phone and e-mail were recorded in a contacts database.

Both Sydney Water and the DP&I used newspaper advertisements to notify the community about the exhibition of the EA and the public displays. Sydney Water placed advertisements in local press in September and October 2012.

2.3 Submissions

During the public exhibition of the EA, submissions were invited from the community and other stakeholders. The DP&I received 14 submissions from NSW government agencies, local government, special interest groups and the local community (Appendix A). Three submissions stated support for the Proposal and the remaining 11 raised concerns regarding aspects of the EA but did not object to the Proposal.

The following statutory agencies or organisations provided submissions on the Proposal:

- Heritage Council of NSW
- Southern Rivers Catchment Management Authority
- Lake Illawarra Authority (LIA)
- NSW Office of Environment and Heritage (OEH)
- NSW Roads and Maritime Services (RMS)
- Shellharbour City Council
- NSW Environment Protection Authority (EPA)
- Wollongong City Council
- NSW Department of Primary Industries (including submissions from Fisheries NSW, NSW Office of Water, and Catchments and Lands Divisions).

Five submissions were received from members of the community.

Chapter 3 summarises and responds to the issues raised in the submissions.

3. Consideration of submissions

This chapter summarises and addresses the issues that were raised in submissions in response to the exhibition of the EA.

3.1 Submission 1 – Heritage Council of NSW

3.1.1 Impacts on Avondale Homestead

Issue - Impacts on Avondale Homestead should be avoided

Avondale Homestead is of State heritage significance. The Heritage Council considers potential impacts on this item to be unacceptable and requests that Sydney Water refine the water pipeline alignment to avoid impacts on Avondale Homestead, before Wollongong Council confirms the road alignment.

Response

Section 3.1 of the EA reflects that water pipelines would be placed in existing and proposed road corridors where practical to minimise potential environmental impacts. Figure 6-27 of the EA indicates that a water pipeline would be constructed through Avondale Homestead, which was based on the assumption that the pipeline would be placed within a future road corridor that Wollongong Council provided to Sydney Water.

Since the exhibition of the EA, Sydney Water has consulted with Wollongong Council about the proposed road alignment near Avondale Homestead. Council has advised that they are considering revising the road alignment, so that it is located to the north of Avondale Homestead. If this refinement is implemented, impacts on Avondale Homestead would be avoided.

During the optimisation of the design, Sydney Water would realign the water pipeline to follow the revised road alignment. This approach is consistent with the management measures detailed in Table 6.28 of the EA.

Sydney Water would conduct a consistency assessment for the refined water pipeline alignment, during the optimisation of the design. This would cover potential impacts of the refined alignment on heritage items, including Avondale Homestead. Sydney Water would seek to modify the approval, if the changes are inconsistent with the Minister's approval and/or the potential impacts are predicted to be greater than those described in Chapter 6 of the EA. This process is outlined in Section 6.1 of the EA.

Issue - There are discrepancies between the information in the main body of the Environmental Assessment and the Non-Aboriginal Heritage Assessment

There are discrepancies between the information in the main body of the EA and the Non-Aboriginal Heritage Assessment, in relation to potential impacts on Marshall Mount Homestead, Gardens and Outbuildings. This item is of state heritage significance and the Heritage Council considers potential impacts on this item unacceptable. The Heritage Council requests that this item is not impacted during the works.

Response

As indicated in Section 6.1.1 of the EA, specialist technical assessments were performed for some environmental issues during the initial stages of the Proposal, including the Non-Aboriginal Heritage Assessment (Appendix G of the EA). The technical reports identified constraints and developed recommendations to minimise potential impacts associated with those constraints. The

recommendations were developed in isolation and did not consider the context of other environmental issues, or engineering and operational limitations. Sydney Water adopted this approach because while we were preparing the EA, the Proposal was at the planning stage. We intend to optimise the design during subsequent phases that would be staged to meet the development timeframes set by the DP&I.

The network of pipelines and associated infrastructure was refined after the technical report for non-Aboriginal heritage was completed. This resulted in inconsistencies between the description of the Proposal and mitigation measures described in the main body of the EA, and the content and recommendations in the technical reports (refer to Section 6.1 of the EA).

Sydney Water is now seeking approval for a smaller network of pipelines than was assessed in this technical report, so the technical report overestimates the extent of impacts. The main body of the EA prevails to the extent of any inconsistency with the technical reports.

Table 6.27 of the EA identifies the indirect impacts to Marshall Mount Homestead with mitigation measures in Section 6.7.2. Section 3.4.1 of the EA also outlines how Sydney Water will:

- identify opportunities to reduce impacts during the design phase
- incorporate mitigation measures detailed in Chapter 6 of the EA
- include the relevant recommendations in the Statement of Commitments, detailed in Appendices C – I of the EA.

This would avoid or otherwise minimise potential impacts on higher risk issues identified in the EA, including impacts on Marshall Mount Homestead.

Marshall Mount Homestead is located within the remaining Proposal area. Accordingly, we will consider potential impacts on this heritage item when the DP&I schedules the precinct for release.

3.1.2 Requested that conditions of approval be included in the Proposal to manage heritage impacts

Issue - The draft Statement of Commitments is not considered adequate

The Heritage Council considered that the draft Statement of Commitments (numbered 14-17) is inadequate and would not be capable of mitigating the large number of impacts the Proposal would have on non-indigenous items.

If the project is approved, the Heritage Council requested that the following conditions of approval (in addition to the Statement of Commitments) be included:

a. Each non-indigenous heritage item identified as being of local or above significance, which is to be directly or indirectly impacted by the Proposal, must be managed in accordance with the individual and specific recommendations made for each item within Appendix 1 of the Non-Aboriginal Heritage Assessment.

b. In cases where further archaeological testing or salvage excavation is proposed to minimise impacts, the chosen Excavation Director must demonstrate in writing that they meet the Heritage Council Excavation Director's Criteria for excavation at these sites. The submission must be sent to the Heritage Branch, OEH for comment before any archaeological works commence.

c. Should the layout proposed for the water and wastewater pipelines change, and additional heritage items will be impacted by the change, a Heritage Impact Assessment must be done to identify these impacts and provide mitigation measures to offset them.

d. A Historic Heritage Construction Management Plan must be done before works commence, to guide the management and protection of heritage items during construction, particularly in relation to vibration impacts. This plan must be sent to the Heritage Branch for approval before any archaeological work commence.

Response

Sydney Water does not support the Heritage Council's recommended conditions of approval and believes the Statement of Commitments is adequate to manage potential impacts on non-indigenous heritage items.

The EA considered maximum impacts along pipeline corridors and within sites. In most instances a larger area has been assessed than will actually be impacted. This approach was adopted because during preparation of the EA, the Proposal was at the planning stage and the design was intended to be optimised during subsequent phases that would be staged to meet the development timeframes set by the DP&I. Sydney Water would select the final design of the Proposal after considering environmental issues, constructability and operational requirements.

Conditions (a) to (c) recommended by the Heritage Council of NSW are generally consistent with the intent of the strategy detailed in the EA to minimise potential impacts on items of non-Aboriginal heritage significance. In regards to recommended condition (a), the recommendations in the specialist Non-Aboriginal Heritage report (Appendix G of the EA) were developed in isolation and did not consider the context of other environmental issues, or engineering and operational limitations. As detailed in Section 3.4.1 of the EA, we would identify opportunities to reduce impacts during the optimisation of the detailed design and would consider the mitigation measures detailed in Chapter 6 of the EA, the Statement of Commitments, and relevant recommendations detailed in the Non-Aboriginal Heritage Assessment. This process would determine whether further investigation is required to assess potential impacts associated with changes to pipeline alignments.

In regards to requested condition (d), Sydney Water does not intend to provide a Historic Heritage Construction Management Plan to the Heritage Branch for approval. Sydney Water's contract with the selected construction contractor would require the contractor to implement measures to manage and protect heritage items that are detailed in Section 6.7.2 of the EA and any relevant recommendations from the Non-Aboriginal Heritage Assessment (Appendix G of the EA), Statement of Commitments and conditions of approval. The contract would include mechanisms to ensure that the construction contractor complies with the contract terms and required mitigation measures to protect heritage items during construction. Sydney Water would audit the contractor's compliance with the contract to ensure that these measures are implemented. This approach is Sydney Water's standard practice for managing the environmental impacts for all construction projects. Sydney Water has found that incorporating stand-alone additional management plans in this process adds an unnecessary layer of administration, creating confusion and uncertainty for contract administration and auditing. Sydney Water is committed to ensuring the mitigation measures stated in the EA are implemented and is confident that its standard practices and monitoring processes are sufficient to ensure the measures are implemented.

Sydney Water does not consider a stand-alone Historic Heritage Construction Management Plan to be necessary because:

- implementing relevant measures in the Non-Aboriginal Heritage Assessment would be managed through Sydney Water's contract with the construction contractor.
- preparing and submitting a management plan for the Heritage Council's approval would repeat the recommendations in the Non-Aboriginal Heritage Assessment, resulting in unnecessary duplication. The Heritage Council has already indicated support for the recommendations in the Non-Aboriginal Heritage Assessment.

3.2 Submission 2 – Southern Rivers Catchment Management Authority

3.2.1 Locating assets to minimise impacts on creeks and rivers

Issue - Assets should be located so that they do not adversely impact creeks and rivers of the Proposal area

The Southern Rivers Catchment Authority advised that the Proposal should be consistent with the priorities outlined in the current Catchment Action Plan and, as a minimum, infrastructure should be located so that it does not adversely impact on the creeks and rivers of the Proposal area or on the associated riparian zones. Impacts on threatened species, populations and ecological communities should be minimised and proposed infrastructure should be located outside existing habitats.

Response

The Proposal addresses the intent of the issue raised by the Southern Rivers Catchment Management Authority, as Sydney Water has designed the proposed pipeline alignments to avoid threatened vegetation communities and sensitive riparian and aquatic environments, wherever practical. As wastewater pipelines would generally be laid next to drainage lines and creek lines, we completed desktop studies and field assessment, during the design phase, to confirm alignment adjustments avoid sensitive environments.

Sydney Water's standard business practices include route and location feasibility studies during detailed design. For the Proposal, these studies consider site-specific issues and could include:

- geotechnical and contamination surveys
- geomorphological assessments
- identification of the location of existing underground services
- condition surveys
- other minor surveys and tasks required to optimise and finalise alignments, design and constructability.

This process would consider measures to minimise impacts on riparian zones.

The outcome of additional surveys or investigations would influence which watercourses are under-bored and which are trenched. In general, it is anticipated that creek crossings would be under-bored if the localities have features such as dynamic watercourses, perennial streams, highly erodible soils, and sensitive riparian corridors (including Category 1 waterways (refer to Section 6.5 of the EA)). Trenching is likely to be the preferred construction method to cross minor creeks that are shallow, ephemeral, highly disturbed and weed infested.

The design of watercourse crossings would consider the potential for the bed and banks of watercourses to scour and migrate, as this would influence the depth of cover required over pipelines and the location of launch and receival pits for assets that would be under-bored.

Sydney Water would identify opportunities to reduce impacts during the optimisation of the detailed design and would consider the mitigation measures detailed in Chapter 6 of the EA, the Statement of Commitments, and relevant recommendations detailed in Appendices C – I of the EA.

This would minimise the potential for adverse impacts on creeks, rivers and riparian areas, as well as threatened species, populations, ecological communities and their habitats.

3.3 Submission 3 – Lake Illawarra Authority

3.3.1 Potential for net increase in pollutants discharged to waterways

Issue - There should be no net increase in pollutants discharged to Lake Illawarra

The Lake Illawarra Authority holds a strong view that all proposals for urban growth should target 'no net increase in pollutants' for wastewater and stormwater impacts on Lake Illawarra.

Response

As detailed in Chapter 4 of the EA, Sydney Water developed an Integrated Servicing Strategy (ISS) to provide water and wastewater services to the WDURA and the AGAs, up to the year 2048. The ISS was developed in consultation with key stakeholders including the DP&I, the Department of Trade and Investment, Regional Infrastructure and Services (DTIRIS), the OEH, NSW Health, LIA and Wollongong and Shellharbour councils.

The ISS was prepared to provide safe, reliable and sustainable water and wastewater services for the WDURA and AGAs. The preferred strategy was chosen following a sustainability planning process used throughout Sydney Water to ensure preferred options are environmentally, financially, technically and socially sustainable.

A sustainable decision is one that weighs up all relevant social, environmental, economic, and technical considerations in a manner that key stakeholders understand and accept.

The decision making process in Sydney Water was adapted from the sustainability framework commissioned by Water Services Association of Australia (WSAA), which is the peak representative body of the Australian urban water industry. The framework includes steps for engaging external stakeholders (including local councils, community and business groups), setting objectives, developing options and appropriate quantitative and qualitative criteria, assigning weightings to those criteria, and using them to evaluate options and carry out sensitivity analysis.

The preferred ISS chosen was to provide:

- drinking water services by extending the existing Illawarra water system
- wastewater services by extending the existing Wollongong and Shellharbour wastewater treatment systems
- non-drinking water supply by homeowners installing rainwater tanks on each residential lot.

Preliminary calculations indicate that the existing WWTPs may need amplification, but the water filtration plant (WFP) currently servicing the area has sufficient uncommitted spare capacity to cater for additional growth. However, extensions to the existing drinking water and wastewater network of pipelines are required to cater for the proposed growth in the WDURA and AGAs.

The Proposal is to construct and operate the infrastructure required to implement the ISS. This includes operating wastewater treatment systems that are scheduled activities under the NSW *Protection of the Environment Operations Act 1997* (POEO Act). Sydney Water holds environment protection licences (EPL) for the Shellharbour wastewater treatment system (licence number 211) and Wollongong wastewater treatment system (licence number 218).

As indicated in Section 3.2.2 of the EA, the Wollongong WRP and Shellharbour WWTP are currently operating well below their approved capacity. The Proposal would expand the existing wastewater reticulation system and use uncommitted capacity at the WRP and WWTP. It would also involve operating the WRP and WWTP to the limit of their approved capacity.

Sydney Water would review the need to upgrade and or expand the Wollongong WRP and Shellharbour WWTP over time, to ensure there is capacity to cater for the ultimate development of the WDURA and AGAs. This may involve variations to the conditions of the EPLs in the future.

The EPLs set treatment requirements that limit the concentration and loads of discharges and the overflow frequencies. The Pollution Reduction Program target for wet weather overflows in the EPL for the Wollongong System (Licence No 218) is 40 events in 10 years and hydraulic modeling indicates that the Proposal would comply with this requirement.

The limit for wet weather overflows in the EPL for the Shellharbour System (Licence No 211) is 45 events in 10 years. Two overflow points within the Shellharbour wastewater system are predicted to exceed EPL wet weather overflow limits beyond 2031. The overflow performance at these locations would need continual monitoring as growth progresses. Sydney Water must monitor and report on overflow performance as part of its EPL reporting requirements. Additional measures may be required in the future to maintain the overflow frequency within the EPL limits.

The Proposal has sufficient hydraulic capacity to meet the objective of having no dry weather overflows.

The Proposal has not been designed to result in no net increase in pollutant discharges. It has been designed to implement the ISS, which was developed in consultation with relevant government agencies to meet urban growth demand. As the Proposal would comply with requirements of existing EPLs, potential impacts associated with nutrient discharges to Lake Illawarra are considered to be appropriately managed.

Issue - The Statement of Commitments should include measures to avoid nutrient increases

The intent of the Director-General's Requirements (DGRs) is to assess and minimise impacts, particularly long-term operational impacts on sensitive downstream waterways, including Lake Illawarra. The LIA believes that the DGRs regarding inland water quality have not been satisfactorily addressed, detailed quantitative modelling has not been done and that the EA and draft Statement of Commitments do not indicate any need for specific mitigation measures, despite an identified increase in nutrient levels in Lake Illawarra. The LIA requests that mitigation measures are provided in the Statement of Commitments to avoid nutrient increases or do more detailed studies to quantitatively demonstrate the impact of increased pollutant loads on inland waters.

Response

The DGRs do not require that the Proposal demonstrate no net increase in nutrient loads. The DGRs require that the Proposal contain measures to prevent or minimise overflows. The EA has addressed the DGRs and Sydney Water has designed the Proposal to comply with the requirements of existing EPLs to minimise impacts on sensitive downstream waterways.

As discussed in Section 6.4.3 of the EA, a fully quantitative assessment (typically involving monitoring and numerical modelling) was not considered viable, due to there being insufficient data regarding quality of the receiving waters, stormwater quality and river hydraulics. The Proposal is highly complex in terms of the variable aspects of each overflow event and location and the impact of different rainfall events and there is uncertainty around ecosystem responses and interpretation. The risk-based methodology used for the EA is consistent with the *National Health and Medical Research Council, Guidelines for managing risks in recreational water* (NHMRC 2008) and *Australian and New Zealand Guidelines for Fresh and Marine Water Quality* (ANZECC 2000) guidelines (SKM 2011).

The hydraulic modelling of the new system configuration showed that all three directed overflows in the Lake Illawarra Catchment would comply with the wet weather overflow performance

requirements set by the EPA and included in the Wollongong EPL (Licence No. 218) and the Shellharbour EPL (Licence No. 211). The frequency of wet weather overflows from two overflow points within the Shellharbour System is predicted to increase before 2031 to an extent that they will cause wet weather overflows from the system to exceed the current limit. Sydney Water would continue to monitor and operate the system to ensure that wet weather overflows comply with the EPL requirements. Additional measures may be required in the future to maintain the overflow frequency within the EPL limits.

Issue - The EA does not make a commitment to reduce pollutant loads

LIA is concerned that the Proposal would increase the release of nutrients into Lake Illawarra. Total Phosphorous is predicted to increase three per cent above existing levels and Total Nitrogen is predicted to increase by four per cent above existing levels. The EA does not make any commitment to reduce these pollutant loads and does not provide a comprehensive assessment of the long-term impacts of increased pollutant loading on Lake Illawarra. LIA noted that the EA identifies stormwater run-off as a major contributor to existing pollutant loads in Lake Illawarra, however, this does not justify the proposed increase in pollutant loading from the wastewater system. The LIA holds a strong view that a 'no net increase in nutrients/pollutants' target be adopted for all elements of the WDURA.

Response

As stated above, Sydney Water holds EPLs for the Wollongong and Shellharbour wastewater systems. Compliance with an EPL ensures that '… the environmental impacts associated with the operation and management of sewer overflows will be properly addressed' (EPA 2000). The potential impacts of overflows from the Proposal are considered to be acceptable, as the Proposal has been designed to comply with the requirements of existing EPLs that limit the concentration and loads of discharges and the overflow frequencies for the Wollongong and Shellharbour wastewater systems. Sydney Water would continue to monitor the performance of the systems and operate it to ensure that overflows comply with the EPLs.

Section 6.4.3 of the EA compared the contribution of wet weather overflows to nutrient loads as a percentage of stormwater loads. The EA does not describe a three per cent increase in the phosphorus load. The EA showed that the Proposal's contribution of the annual total nitrogen load is estimated to be about four per cent (at 2048), with 96% of the annual load coming from stormwater and diffuse sources. The Proposal is estimated to contribute three per cent of annual total phosphorus load and the remaining 97% of the contribution would be from stormwater and diffuse sources. The comparison showed that the loads/event from wastewater are relatively minor compared to contributions from stormwater and other diffuse sources.

The Proposal would comply with the requirements of the EPLs. Nutrient loads from wastewater overflows would be small, in comparison to those from stormwater. Sydney Water considers that potential impacts associated with overflows have been minimised as required by the DGRs.

Issue - Concern that the EPL permits an increase in nutrient discharges to Lake Illawarra

The LIA is concerned that the existing EPL for the wastewater systems would permit an increase in nutrient release to Lake Illawarra and requests that the Director-General impose a condition of consent, or seek a binding formal commitment that Sydney Water would progressively improve the performance of the infrastructure system to further mitigate the proposed increased nutrient loading in Lake Illawarra. This is particularly important since the EA does not ensure the long-term sustainability of the Lake Illawarra's water quality.

Response

As stated above, Sydney Water holds EPLs for the Wollongong and Shellharbour wastewater systems. Compliance with an EPL ensures that '…the environmental impacts associated with the operation and management of sewer overflows will be properly addressed' (EPA 2000).

Sydney Water considers the potential impacts of overflows from the Proposal to be acceptable, as the Proposal has been designed to comply with the requirements of the existing EPLs that limit the concentration and loads of discharges and the overflow frequencies for the Wollongong and Shellharbour wastewater systems. Sydney Water would continue to monitor the performance of the systems to ensure that overflows comply with the EPLs.

Issue - There is no commitment to monitor future impacts on inland waterways

LIA is concerned that there is no commitment to monitor future impacts of wastewater overflow on inland waterways. The LIA believes that some existing wastewater overflows are directed to areas of the lake including Koona Bay and Koonawarra Bay that have little assimilative capacity due to very shallow water depths. LIA requests a condition of consent that requires future monitoring of wastewater overflow impacts on inland waters.

Response

Sydney Water does not support the LIA's recommended condition of approval. As stated in Section 6.4.3 of the EA, Sydney Water would continue to monitor and operate the system to ensure that wet weather overflows comply with the EPLs. If system monitoring results indicate that the overflow frequencies in the EPLs are about to be exceeded, options would be investigated to upgrade the system to ensure continued compliance with the EPLs.

As stated above, compliance with an EPL ensures that '…the environmental impacts associated with the operation and management of sewer overflows will be properly addressed' (EPA 2000). Sydney Water is required to maintain the system over time to ensure that the frequency of overflows specified in system EPLs is not exceeded.

As Sydney Water must monitor the performance of the system to comply with the EPL, we do not propose additional monitoring of wastewater overflow impacts to inland waterways or consider this necessary.

3.3.2 Sensitivity analysis for potential impacts on inland water quality

Issue - A sensitivity analysis should be done to assess potential impacts on inland water quality

The EA adopts a mean rainfall of 815 mm derived from a 10-year data set for Albion Park. LIA considers that the adopted rainfall is too low. The LIA understands a data set of about 100 years is available for Albion Park. A long-term data set that would have higher rainfall and more statistical validity should be modelled as a sensitivity analysis. The EA contends that the adopted rainfall provides a conservative outcome. Nevertheless, a sensitivity analysis would test system performance including wastewater overflow under more valid rainfall assumptions.

Response

In response to this submission, Sydney Water recalculated the total suspended solids (TSS) and faecal coliform (FC) loads, based on the annual average rainfall of 1,191 mm at Albion Park (Gauge number 068000), compared to the average rainfall of 815 mm that was the basis for the assessment in the EA. The results reflect that the relative contribution of wastewater overflows to total suspended solid and faecal coliform loads decreases, if the calculations are based on a higher annual average rainfall.

The results for total suspended solid are displayed in Figure 3-1 and Figure 3-2 and indicate that applying a higher rainfall of 1,191 mm/year increased the contribution of stormwater to total suspended solid and faecal coliform loads into each of the catchments by about 47%.

This reduces the proportion of the total suspended solids attributed to wastewater overflows from the Proposal. Less than one per cent of annual total suspended solids are expected to be derived from wastewater.

The assessment done for the EA indicated that there was little difference between the contribution of stormwater and wastewater to faecal coliform loads. Faecal coliform loads were recalculated based on annual rainfall of 1,191 mm/year and the results show that stormwater would contribute a higher proportion of faecal coliforms (refer to Figure 3-3 and Figure 3-4).

The total nitrogen and total phosphorus stormwater loads that were calculated for the EA used generation rates of kg/ha/yr and this method is independent of rainfall. As such, increasing the annual average rainfall would not alter the assessment presented in the EA.

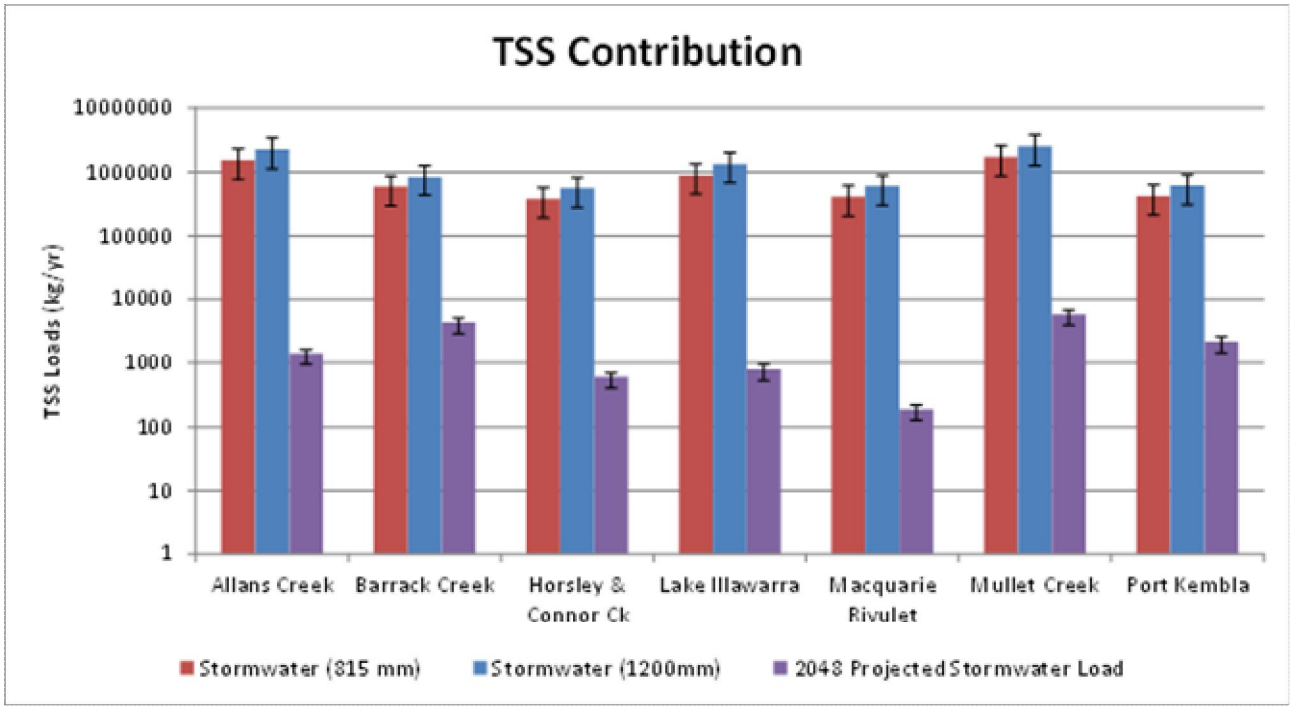

Figure 3-1 Contribution of annual TSS loads from stormwater (and overflows in 2048) per sub-catchment (based on rainfall of 815 mm/yr and 1,200 mm/yr)

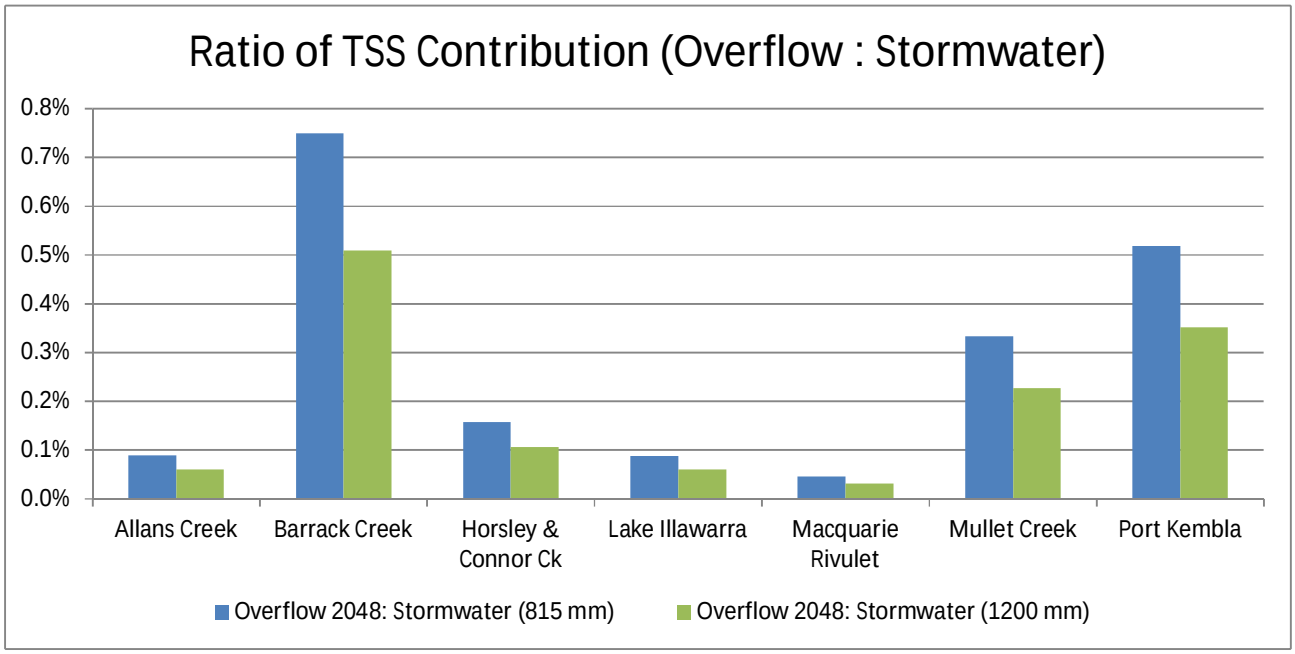

Figure 3-2 Ratio of TSS contribution from overflows and stormwater in 2048 (based on rainfall of 815 mm/yr and 1,200 mm/yr)

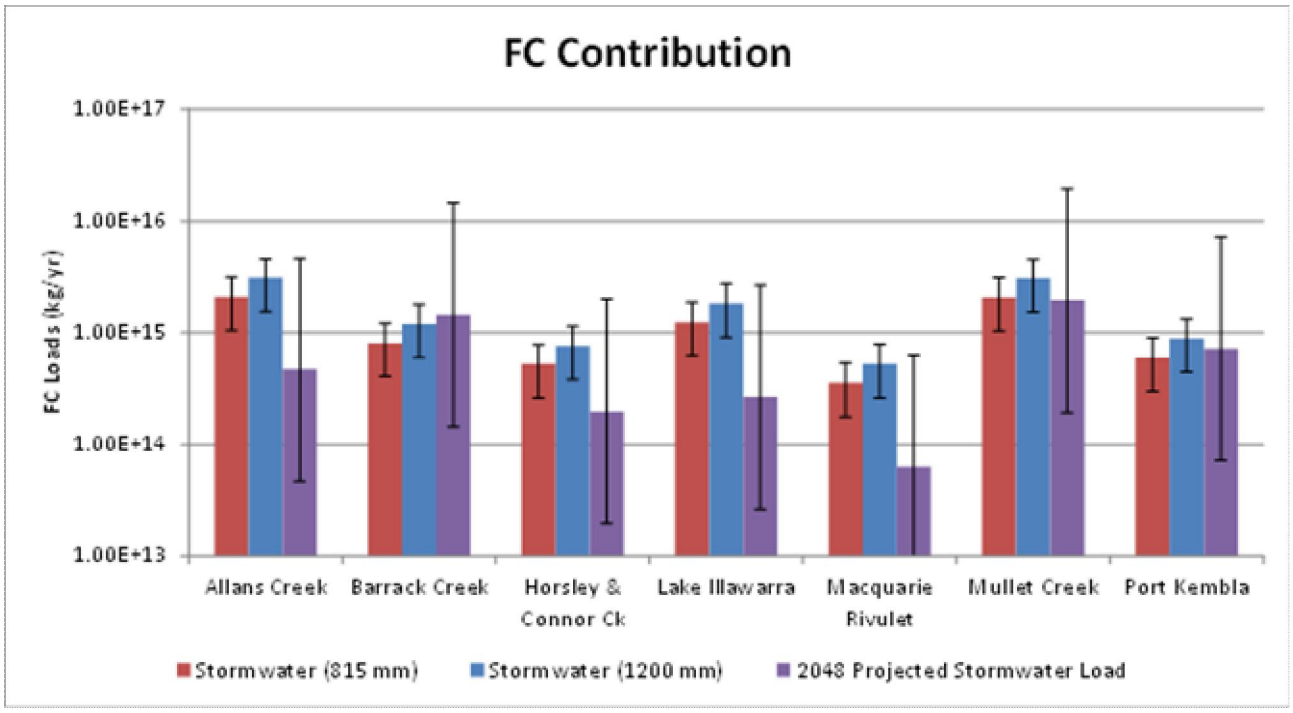

Figure 3-3 Contribution of annual FC release from stormwater and overflows in 2048 per sub-catchment (based on rainfall of 815 mm/yr and 1,200 mm/yr)

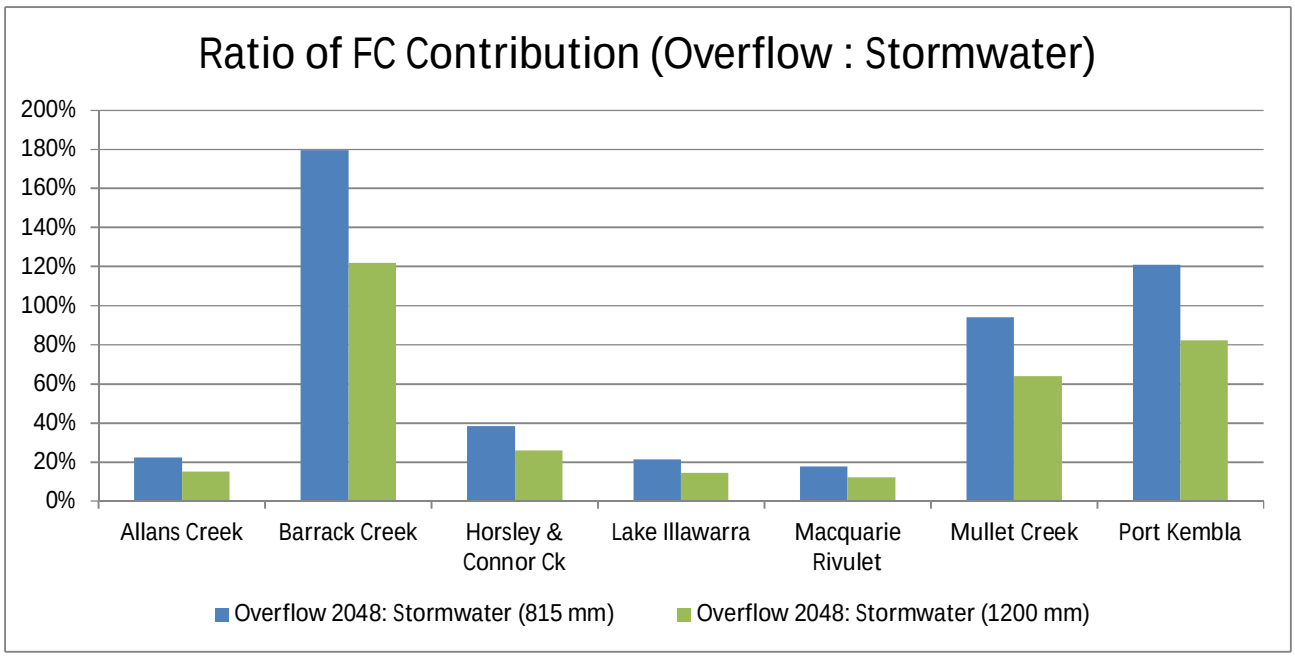

Figure 3-4 Ratio of FC contribution from overflows and stormwater (based on rainfall of 815 mm/yr and 1,200 mm/yr)

Issue - It is unclear if hydraulic modelling assumed that leak-tight pipes would be used to minimise wet weather overflows for the entire wastewater systems, or just the components covered by the Proposal

LIA commented that the EA indicates that wet weather infiltration into the wastewater system can be a significant contributor to wet weather wastewater overflows. The EA assumed the use of leak-tight pipes with low infiltration rates in the order of one per cent, as a means to minimise wet weather infiltration.

It is not clear if leak-tight pipes have been assumed for the entire system serving West Dapto or only the components of the system covered by the EA. The LIA notes that the long-term performance of leak-tight pipes may reduce over time and that the overall wastewater system serving West Dapto may have conventional wastewater pipes.

The LIA recommend a sensitivity analysis on the impact of conventional/non leak-tight pipes. This sensitivity run would test system performance including wastewater overflow, under a scenario that should be considered before the application is determined. The LIA is concerned that higher rainfall and increased wet weather infiltration may significantly increase wastewater overflow. These scenarios are not improbable and should be tested by sensitivity analysis before the application is determined.

Response

The hydraulic modelling for the EA was based on leak-tight pipes with low infiltration rates being used for new development within the WDURA and AGA, and conventional wastewater pipelines (as per the *WSAA Sewerage Code (WSAA 2002b)*) being used for all existing development.

The modelling adopted the following assumptions to assess the long-term performance of the Proposal:

- assets installed as part of the Proposal within WDURA and AGA would be leak-tight
- the rainfall ingress for leak-tight assets was assumed to be one per cent over 20 years (or 0.05% each year)

- for the existing infill area of Wollongong system, there was assumed to be a two per cent increase in rainfall ingress in the long-term for sub-catchments that have existing rainfall ingress over 10%. For sub-catchments that have existing rainfall ingress levels of less than 10%, long-term rainfall ingress was assumed to be one per cent
- conventional wastewater pipes would not be used as Sydney Water's minimum standard is 'low infiltration' pipes that have rainfall ingress of two per cent.

Sydney Water consulted with EPA during the Illawarra Wastewater Strategy and the Sewerage Overflows Licensing Project and they agreed that an annual rainfall of 815 mm is representative and an appropriate basis for hydraulic modelling in the Illawarra.

Sydney Water does not propose to re-run the hydraulic model based on higher rainfall levels as the model used a value that has been agreed with EPA. It should also be noted that the EPL limits are based on an annual rainfall value of 815 mm and Sydney Water must manage the wastewater system to meet these limits irrespective of annual rainfall (eg 1,200 mm).

3.4 Submission 4 – Member of the community

3.4.1 Wastewater pipeline servicing northern side of Duck Creek

Issue - Concerned that that the wastewater pipeline would not be able to service developable land on the northern side of Duck Creek

This submission referred to an indicative wastewater pipeline alignment that was included in a fact sheet dated May 2011. The submission raised concerns that the wastewater pipeline near 386 Marshall Mount Road would not be able to service developable land located on the northern side of Duck Creek.

The submission suggested that extending the pipeline to North Marshall Mount Road on the northern side of Duck Creek would better service the area of Yallah/Marshall Mount. Locating the wastewater pipeline along the creek line would allow for gravity flows and avoid impacts on developable land.

Response

Sydney Water did not develop the Proposal to service development to the north of Duck Creek at Yallah/Marshall Mount. But, we acknowledge that the most recent plans, prepared by Wollongong City Council, show proposed development to the north of Duck Creek within the Yallah/Marshall Mount Precinct.

As part of the future detailed planning for this precinct, Sydney Water would review and update the servicing strategy. The final alignments would provide the least life cycle cost to service the proposed development areas.

The proposed wastewater pipelines shown in the EA do not include reticulation pipelines (that is, pipes that are smaller than 300 mm diameter) that must be constructed to service proposed developments such as that along North Marshall Mount Road. These reticulation mains would generally be constructed by developers, who would also be responsible for obtaining the appropriate environmental planning approvals.

3.5 Submission 5 – Member of the community

3.5.1 The approval should provide flexibility to adjust plans

Issue - Requested that Sydney Water be granted the flexibility to adjust plans as detailed planning is finalised

This submission noted that the plans for water and wastewater services in the Yallah/Marshall Mount Precinct are very generalised and requested that Sydney Water be granted the flexibility to adjust their plans as detailed planning is finalised in consultation with landholders that would be directly affected.

As detailed strategic planning for the Yallah/Marshall Mount Precinct is being completed by Wollongong City Council, the final location of trunk infrastructure and pumping stations may need to be adjusted.

Response

Sydney Water acknowledges that Wollongong City Council is still completing the planning for the Yallah/Marshall Mount precinct and that there may be minor changes to the extent of the development. As part of Sydney Water's future detailed planning for this development site, Sydney Water would review and update the servicing strategy based on the final precinct plan.

As indicated in Section 3.4.1 of the EA, Sydney Water would select the final design after considering environmental issues, constructability and operational requirements. We would do a consistency assessment to determine whether the impacts associated with the final design are greater than those described in Chapter 6 of the EA.

This would identify whether any site-specific mitigation measures would be required additional to those detailed in this EA.

Accordingly, Sydney Water is seeking approval for:

- the Proposal to be located anywhere within the field assessment area described in Chapter 6 of the EA; and
- the Proposal to be located outside the field assessment area where:
    - changes are consistent with the environmental objectives of the Proposal; and
    - environmental impacts are no greater than those described in the EA; and
    - no additional environmental mitigation measures are required.

This approach would provide Sydney Water with the flexibility to refine the Proposal as requested in this submission.

3.6 Submission 6 – Office of Environment and Heritage

3.6.1 Offsets should be secured before construction

Issue - Assessment of impacts on vegetation is adequate

OEH supports the approach of avoiding environmentally sensitive locations. OEH has reviewed the information in the EA relating to vegetation clearing and compared this to vegetation mapping. It concluded that the EA has identified the potential impacts of the Proposal where infrastructure is proposed.

Response

It is noted that OEH has acknowledged that the EA identified the potential impacts on vegetation clearing where infrastructure is proposed.

Issue - Offsetting is required for all native vegetation impacted by the Proposal

OEH advised that if additional areas of native vegetation would be impacted that have not been assessed in the EA, these would require additional offsetting. Offsetting is required for all native vegetation types impacted by the Proposal, not just the Illawarra Lowlands Grassy Woodland endangered ecological community.

OEH does not consider the comment on offsetting in the flora and fauna assessment that states 'that offsetting is not considered necessary as the impacts are low in the context of the region and the likely impacts to follow when the area is developed' to be acceptable. OEH considers that biodiversity offsets are required and requests that Sydney Water secure these offsets, before any vegetation is cleared.

Response

Sydney Water would identify opportunities to further reduce potential environmental impacts during the optimisation of the detailed design and would consider the mitigation measures detailed in Chapter 6 of the EA, the Statement of Commitments, and relevant recommendations detailed the Flora, Fauna and Ecological Assessment (Appendix E of the EA).

Section 6.5.2 of the EA states that vegetation removal has been conservatively estimated and biodiversity impacts may be further reduced by refining the Proposal during optimisation of the detailed design (refer to Section 3.4.1 of the EA).

Once the extent of native vegetation to be impacted by the Proposal has been confirmed, Sydney Water would determine whether it is necessary to offset impacts. If an offset is required, this would be secured before removing the native vegetation that is the subject of the offset.

Issue - Data available should be used to determine number and type of biobanking credits that would offset the impacts of the Proposal

OEH advises that the *Interim Policy on Assessing and Offsetting Biodiversity Impacts of Part 3A, State Significant Development and State Significant Infrastructure Projects* is being trialled in partnership with DP&I. OEH noted that the policy acknowledges that these projects do not necessarily have to meet the improve or maintain standard of biobanking, however it adopts the BioBanking Assessment Methodology to quantify the offsets that would be required if an improve or maintain outcome were to be met. OEH notes that a number of biobanking plots for the Proposal have been completed, but that the data is not provided. OEH recommends that Sydney Water use the data available to determine the number and type of biobanking credits that would be required to offset the impact of the Proposal.

Response

The Director-General's requirements do not require biodiversity impacts of the Proposal to be offset using the BioBanking Assessment Methodology. Biobanking plots were completed as part of the flora and fauna assessment, but only as a tool for determining the scale of the impact.

The number of biobanking credits that would be required if the BioBanking Assessment Methodology was applied to the Proposal has not been calculated. This is because vegetation removal has been conservatively estimated and biodiversity impacts may be further reduced by refining the Proposal during optimisation of the detailed design, as described in Section 3.4.1 of the EA. Once Sydney Water has confirmed the extent of native vegetation to be impacted by the Proposal , we would determine whether it is necessary to offset impacts.

The Proposal would involve works within shared infrastructure corridors and, in these instances, if offsets are considered appropriate they would be proportional to the impact of Sydney Water's activities.

Sydney Water will do detailed design for the Project Approval area within the next 15–18 months. Once we have confirmed the extent of native vegetation to be impacted, we will consider offsetting.

If offsets are required, we would investigate the availability of offsets in the region, including available land owned by Sydney Water. We would secure any required offsets before we remove any of the native vegetation that is the subject of the offset.

Furthermore, recent discussions between Wollongong Council and OEH (Southern Region) indicated that biodiversity certification is being investigated for the WDURA and AGAs. For these reasons, it is not considered appropriate at this time to quantify the offset using the Biobanking Assessment Methodology.

3.6.2 Mitigation measures for potential impacts on Aboriginal cultural heritage items

Issue - Mitigation measures for potential impacts on Aboriginal cultural heritage items should be identified

OEH considers that Sydney Water should identify the proposed mitigation measures that would be implemented to mitigate potential impacts on items of Aboriginal cultural heritage significance.

Response

As detailed in Section 6.6.2, Sydney Water is committed to avoiding impacts on items of Aboriginal cultural heritage during construction. Where impacts to registered Aboriginal archaeological sites and areas of high archaeological sensitivity cannot be avoided, specific mitigation approaches would be developed in consultation with a heritage professional and relevant registered Aboriginal parties. This would be done during optimisation of the detailed design (Section 3.4.1 of the EA) when the extent of impact is known.

The mitigation approach would correlate with the extent of the potential impact, type of site, the significance of the Aboriginal site and may include the list of mitigation measures provided in Section 6.6.2 of the EA.

3.6.3 Floodplain risk management

Issue - Floodplain risk management must be considered by DP&I

OEH noted that DP&I must consider several specific requirements relating to flooding, by including:

- the impact of flooding on the Proposal;
- impact of the Proposal on flood behaviour
- full range of flood events up to and including the probable maximum flood (PMF) and the availability and function of water and wastewater after all floods, including those greater than the one per cent Annual Exceedence Probability (AEP) event
- implications of climate change and cumulative development impacts on flooding
- development control plans of Wollongong City Council (WCC) and Shellharbour City Council (SCC) in relation to management of flood risk
- the best available flood information for the area of WCC and SCC.

Response

Sydney Water uses several design mitigation measures in its planning to protect assets from flooding and to minimise the assets' impact on flooding. Section 6.12.4 of the EA discusses how

we have applied these measures while developing the Proposal design, including the geographical location of the asset, minimum standard depths of cover over the asset, pipe design, bunding and elevation.

The Proposal considers WCC and SCC development rezoning, which excludes development of land within the 1 in 100 year flood zone. The Proposal therefore does not service land within the 1 in 100 year flood zone. In addition, most water and wastewater infrastructure is located outside of the 1 in 100 year flood zone to comply with the *Water Supply Code of Australia 2002* (WSAA 2002a) and the *Sewerage Code of Australia 2002* (WSAA 2002b). Where this is impractical, for example in difficult terrain, the asset may be located within the flood zone, provided the asset is below ground, elevated or bunded.

Most of Sydney Water's assets are pipelines located below the ground. Both water and wastewater pipelines have minimum depths of cover according to the *Water Supply Code of Australia 2002* (WSAA 2002a) and the *Sewerage Code of Australia 2002* (WSAA 2002b).

Reservoirs will not be located in the 1 in 100 year flood zone as they are placed in elevated locations to provide adequate water pressure to customers via gravity. Pumping stations would be located out of the 1 in 100 year flood zone in most cases. If the 1 in 100 year flood zone cannot be avoided, the pumping station would be designed to ensure it is not impacted by a 1 in 100 year flood event.

We would implement the mitigation measures provided in Section 6.12.5 during design, construction and operation of an asset within the 1 in 100 year flood zone.

3.6.4 Consideration of floods greater than the one per cent AEP event

Issue - Flooding information provided in the EA does not consider events greater than the one per cent AEP event to the PMF

There is concern that flooding information provided in the EA does not consider events that are greater than the one per cent AEP event, including the PMF. It is unclear as to why the analysis did not consider flood events greater than the one per cent AEP, including potential impacts of flood behaviour on the infrastructure or due to the presence of the infrastructure.

Response

Several design mitigation measures are implemented for all of Sydney Water's planning operations to protect assets from flooding and to minimise the assets' impact to flood regions. These have been adopted for the Proposal and include the geographical location of the asset, minimum standard depths of cover over the asset, pipe design, bunding and elevation.

The EA does not include a detailed assessment of flood events greater than the one per cent AEP event, because Sydney Water locates most of its water and wastewater infrastructure outside of the 1 in 100 year flood zone to comply with the *Sewerage Code of Australia 2002* and *Water Supply Code of Australia 2002*.

Where this proves to be impractical, for example in difficult terrain, then the asset may be located within the flood zone provided the asset is below ground, elevated or bunded. Most of the assets would be below ground and would be unlikely to impact on flood events greater than the one per cent AEP event.

Sydney Water would implement the following operational mitigation measures for all assets according to our maintenance procedures:

- Water and wastewater pipelines above ground would be inspected on a regular basis to ensure the pipe condition remains adequate and any maintenance issues are detected.

- Pipelines would be monitored for leaks as a part of the leak detection program.
- WWPSs and WPSs would be routinely inspected to ensure the condition remains adequate and any maintenance issues are detected.

When a flood occurs, Sydney Water inspects assets where possible to identify whether services to flooded areas have been impacted. Measures would be implemented to restore services, if they have been disrupted. As most pipelines would be located below ground, water and wastewater services should be able to be provided to customers, if electricity is available.

WPSs would be installed with a backup generator where possible. WWPSs may be installed with a backup generator and four hours emergency storage capacity where possible to ensure minimal discharges occur during a flood period.

3.6.5 Recent flood studies provide additional information

Issue - Recent flood studies provide invaluable information

It was noted that recent flood studies including the Macquarie Rivulet Flood Study and Mullet Creek Floodplain Risk Management Study would provide additional information to the proponent and consent authority.

Response

The Proposal was designed to take into account the Mullet Creek Floodplain Study and infrastructure has been located to avoid flood liable land identified in this study, where practical.

The Macquarie Rivulet Flood Study was not available when we were preparing the EA. Findings of this study would be considered during detailed design of this section of the Proposal, once the area is scheduled for release by DP&I.

3.7 Submission 7 – NSW Roads and Maritime Services

3.7.1 Recommended conditions for design

Issue - Preference that final design does not impact classified roads and recommends conditions for design

RMS noted that the exact locations of pipelines, pumping stations and reservoirs have not yet been determined, and that the Proposal may affect classified roads. RMS does not generally allow longitudinal or transverse utilities within the road formation and therefore any option that does not impact on an RMS asset would be preferable.

The following conditions may be added in the future depending on the infrastructure design and location:

a. Any infrastructure should be designed to be maintenance free for the duration of its life.

b. Any longitudinal trenching would be at a minimum of 0.6 m depth while in the road reserve, as close to the road boundary as possible, and not within 3 m of the road formation or drainage structure.

c. RMS will not permit transverse trenching of any RMS maintained road, without exhausting every other option. Geotechnical reports may be required to ascertain why an under-bore is not possible.

d. The pits for any bores would need to be located outside the road reserve where possible. Where this is not practical, they are to be no closer than 3 m from the seal of

the road for both the exit and entry holes. The depth would need to be not less than 1.2 m below the road surface level to the top of the pipe or concrete.

e. All buried pipes must be maintenance free.

f. Any areas within the road reserve of a classified road that are disturbed by works related to the Proposal would need to be restored to their original condition upon completion of work. All restoration work would need to be carried out to the satisfaction of RMS.

g. The developer will need to apply for, and obtain a Road Occupancy Licence from the RMS traffic operations unit before commencing works within the road reserve of a State Road or any other works that impact a travel lane of a State Road or impact operation of traffic signals on any road.

h. For works within the road reserve of a state classified road, RMS will be exercising its powers under Section 64 of the *Roads Act 1993* to become the roads authority. This means Sydney Water must obtain Section 138 consent under the *Roads Act 1993* from the RMS, before construction. To receive consent, Sydney Water would need to send detailed design plans and specific locations of the relevant pipelines, pumping stations and reservoirs to RMS.

Response

Sydney Water accepts the intent of the conditions raised by RMS. In regards to items (a) to (e), we would develop and implement appropriate construction methodologies for road crossings, in consultation with the relevant council and/or the RMS, as outlined in the Statement of Commitments (Number 28).

In response to item (f), as outlined in Section 7.2.2 of the EA, if construction requires excavation of roads or footpaths, restoration would involve reinstating the road or footpath following Sydney Water's standard practices.

In response to items (g) and (h), as outlined in Section 5.3 of the EA, Sydney Water would consult with the appropriate road authority in each circumstance regarding works in roads and obtain any approvals required under the *Roads Act 1993*.

3.8 Submission 8 - Member of the community

3.8.1 Provision for higher density development in the Yallah/Marshall Mount Precinct

Issue - The Proposal should provide for higher density development in the Yallah/Marshall Mount Precinct

This submission supports the Proposal and indicates that it should provide for higher housing densities than are currently envisaged. It asks Sydney Water to reconsider the trunk infrastructure required to extend the existing wastewater systems to the Yallah/Marshall Mount Precinct, because increased densities, beyond current estimates, could be supported.

The submission suggests that, over time, some areas of low density development may be rezoned to enable medium density development and that the absence of appropriately sized infrastructure could restrict rezoning proposals.

Response

Sydney Water has completed a number of planning investigations for the preferred servicing solution for the WDURA and AGAs. This work has been in close consultation with DP&I,

Wollongong City Council and Shellharbour Council to ensure we are using the latest planning information (occupancy rates, housing densities, population forecasts, development sequencing etc) to determine the best servicing solution at least cost to the community.

3.8.2 Extension of wastewater main to North Marshall Mount Road

Issue - The wastewater main should be extended to North Marshall Mount Road

The submission notes that the Proposal includes two wastewater pipelines to the west of the WWPS in the Yallah/Marshall Mount Precinct and that these pipelines would carry different loads, according to the number of lots that would be serviced. The submission suggested that Sydney Water should extend the pipeline servicing the western end of Marshall Mount Road and North Marshall Mount Road to North Marshall Mount Road.

The submission noted that Marshall Mount Road would provide access to the Calderwood AGA and that there are items of heritage significance near the intersection of Marshall Mount Road and North Marshall Mount Road. It suggested that Sydney Water should develop a heritage precinct near this intersection and extend the wastewater main to North Marshall Mount Road to support development of this heritage precinct.

Response

The proposed wastewater pipelines shown in the EA do not include reticulation pipelines (that is, pipes smaller than 300 mm diameter) that would be required to service proposed developments like that along North Marshall Mount Road. Developers would generally construct these reticulation mains and would also be responsible for obtaining the appropriate environmental planning approvals.

3.8.3 Managing work on private property

Issue - Easements are required for infrastructure to minimise access problems

The submission noted that Sydney Water has powers of entry under the *Sydney Water Act 1994* and that developers do not have the same powers. It was suggested that:

- extending the wastewater main servicing Marshall Mount Road and North Marshall Mount Road would minimise access problems where lead-in pipelines and reticulation pipelines pass through a number of properties
- easements are required for lead-in and reticulation pipelines to minimise potential access problems.

Response

Sydney Water's powers of entry onto private property are set out in Sections 38, 39 and 40 of the *Sydney Water Act 1994*. Sydney Water has developed a guideline to assist all applicants and suppliers (including developers) who are altering or extending Sydney Water services and who need to enter someone else's property. This guideline addresses the issue raised in this submission and can be obtained from Sydney Water's website.

3.9 Submission 9 – Member of the community

3.9.1 Consultation with landowners/developers

Issue - Sydney Water should consult with landowners/developers regarding final infrastructure locations

This submission supported the Proposal and requested that Sydney Water consult with landowners/developers regarding the final location of infrastructure.

Response

Sydney Water's approach to future consultation activities is described in Section 8.4 of the EA. The Proposal would be implemented in stages and at any time, it is possible that consultation would be underway relating to either the approval, pre-construction, or construction phases. We will prepare a revised Community and Stakeholder Engagement Plan for each phase. This would provide details on the consultation procedures and would ensure that there is a consistent approach to consultation across the Proposal by defining:

- roles and responsibilities for consultation
- the objective of the consultation for each development phase
- protocols and procedures that are to be implemented consistently.

This would include consultation with a range of stakeholders, including landowners and developers.

3.9.2 The design should avoid limiting development of land

Issue - The Proposal should be designed to avoid limiting development of land and where it would limit development, landowners should be compensated.

The Proposal should be designed such that it does not limit the area of land that is able to be developed. If the Proposal does impose limitations on the area of land that is able to be developed, landowners should be compensated. Construction works should ensure that there is no disruption to business activities and that livestock on private property is not endangered.

Response

Chapter 3 of the EA reflects that pipelines would be constructed to the WSAA *Water Supply Code (WSSA 2002a)* and *Sewerage Code (WSSA 2002b)* standards. Pipes would generally be laid in road corridors (water) or private properties (wastewater) and the preferred alignments generally provide the least life cycle cost at acceptable risk to Sydney Water.

The Proposal area would undergo significant urban development and a number of new roads are proposed and some existing roads would be upgraded or realigned. The optimisation of the detailed design and planning would also take into account the final layout of the road network to minimise potential impacts on developable land.

Where new infrastructure will be constructed on private property, Sydney Water would meet with affected residents, before construction starts, to develop a pre-construction customer agreement. This agreement sets out how Sydney Water would manage work on private property and how we would reduce impacts. Sydney Water and its contractors would:

- inform the community and stakeholders about the timing and potential impacts of construction

- minimise impacts to private property and affected businesses
- provide the community with timely, accurate and easily accessible information about the Proposal
- respond to community enquiries and concerns.

Where assets are proposed on private property, Section 41 (3) of the *Sydney Water Act 1994* states that '… the Corporation is required to pay compensation only if the sewer damages, or interferes with, a building or other structure on the land or causes other physical damage to property or if an access chamber or main ventilator is constructed on the land.'

Sydney Water provides guidelines for building over/next to Sydney Water assets on our website.

3.9.3 Consideration of future services

Issue - The Proposal must take into account the location of future services

The submission noted that the Proposal must take into account future services being located in the same corridor. For example, the design of water and wastewater services along Wongawilli Road should consider the future upgrade of this road, including associated improvements to the culvert and stormwater drainage.

Response

When designing any of its key assets, Sydney Water consults with other utility and government agencies to ensure that future assets or plans (such are road widening) are considered in the design. This ensures an efficient and cost-effective delivery of services with minimal disruption to customers. Sydney Water would continue to consult with other agencies throughout the detailed planning and design stages of the Proposal.

3.9.4 Insurance and public liability

Issue - Insurance and public liability should be provided for works on private property

Sydney Water should provide insurance and public liability for all construction on private property.

Response

Sydney Water effects, and requires its contractors to effect insurance that protects customers, if they are injured or if their property is damaged as a result of construction works.

3.10 Submission 10 – Member of the community

3.10.1 Wastewater servicing in the Yallah/Marshall Mount Precinct

Issue - Wastewater servicing should be extended to North Marshall Mount Road

The wastewater main servicing the western end of Marshall Mount Road and North Marshall Mount Road should be extended to North Marshall Mount Road and be adequately sized, so that this is not a limiting factor in future planning decisions.

Response

This issue is addressed in Section 3.8.2.

3.11 Submission 11 – Shellharbour City Council

3.11.1 Insufficient detail provided for the Project Approval application

Issue - Concerned that the EA was prepared for Concept Approval with only limited reference to the Project Approval application

SCC is concerned that the EA has been prepared for Concept Approval only and that there is limited reference to the Project Approval application. In this regard, Sydney Water has provided insufficient detail and impact assessment to enable an informed opinion of the suitability of the proposed development.

Response

Section 3.1 of the EA clearly describes those elements for which Concept Approval is sought, and those for which Project Approval is sought. Chapter 6 in the EA describes the impacts associated with the elements for which Sydney Water seeks Concept Approval and Project Approval.

3.11.2 The EA lacks certainty

Issue - Concerned that there is a lack of certainty in the EA regarding infrastructure locations and construction techniques

SCC is concerned that the EA lacks certainty and frequently uses the term ‘indicative’. In this regard, there are no set locations of infrastructure works, delineation of construction techniques, no set monitoring regimes, and no emergency or management plan should the system prove to be detrimental to the environment.

Response

The Proposal must be flexible to enable it to be optimised during detailed design and allow it to be efficiently delivered in stages over a 35-year development horizon. The EA reflects this need for flexibility and the assessment accommodates possible changes to the Proposal by assessing maximum impacts along pipeline corridors and within sites. As stated in Section 3.4.1 of the EA, Sydney Water would select the final design after considering environmental issues, constructability and operational requirements. We would complete a consistency assessment to determine whether the impacts of the final design are greater than those described in Chapter 6 of the EA. This would identify whether any site-specific mitigation measures would be required above those detailed in the EA.

Accordingly, Sydney Water is seeking approval for:

- the Proposal to be located anywhere within the field assessment area described in Chapter 6 of the EA; and
- the Proposal to be located outside the field assessment area where:
    - changes are consistent with the environmental objectives of the Proposal; and
    - environmental impacts are no greater than those described in the EA; and
    - no additional environmental mitigation measures are required.

Sydney Water has standard emergency and management plans in place, to ensure proper operation and maintenance of all of its infrastructure.

3.11.3 Employment lands at Kembla Grange and Tallawarra

Issue - The EA has not allowed for the creation of employment lands at Kembla Grange and Tallawarra

SCC indicated that the EA appears to have not allowed for the creation of employment lands at Kembla Grange and Tallawarra, or considered the impact of increased trade waste on overflow points and receiving waters.

Response

The 'typical' composition of wastewater devised during the Sewage Overflow Licensing Project considered loads from a range of land uses, including industrial and commercial land uses, and was used in the EA to assess impacts. This is appropriate and considers wastewater loads from potential sources, such as the employment lands at Kembla Grange and Tallawarra. Waste from industrial customers would be managed to control wastewater composition.

3.11.4 The EA needs to outline the scope of the Proposal

Issue - The EA is ambiguous and should outline exactly what approval is being applied for and include a staging strategy

SCC considered that the EA is ambiguous and often uses the word 'may'. The application should outline exactly what approval is being applied for and clearly outline a staging strategy.

Response

The staging strategy would depend on land releases that would be decided by DP&I, councils and developers. The approach set out in Section 3.4.1 of the EA is required to enable us to optimise the Proposal to respond to these strategies. Sydney Water is unable to define the staging strategy and the Proposal must be flexible to incorporate a 35-year development horizon.

Section 3.1 of the EA clearly describes those elements for which Sydney Water seeks Concept Approval, and those for which we seek Project Approval. Where practical, Chapter 6 in the EA describes the impacts associated with the elements for both Concept Approval and Project Approval.

3.11.5 Including the wider Calderwood Valley area is premature

Issue - It is premature to seek approval to service the wider Calderwood Valley area before the area is determined suitable for development

The Proposal area is inclusive of the wider Calderwood Valley area. Only part of this area has had any assessment to determine its suitability for urban development (that is Calderwood Concept Plan Approval Area). SCC consider that it would appear premature to design or seek approval for a servicing strategy and subsequent infrastructure provision for this area, before there is a more detailed assessment to confirm whether it is suitable for development.

Response

Sydney Water has designed the servicing of the Calderwood area to cater for an expected population growth, as determined by council and DP&I. We have designed the proposed pipeline to carry expected wastewater flows catering for the expected population in the Calderwood Valley. Due to design requirements, a reduction in the area that is ultimately developed will not affect the location of the pipeline.

Calderwood is in the remaining Proposal area and will be considered at the time the precinct is scheduled for release by DP&I.

3.11.6 Calderwood reservoir has not been raised previously with council

Issue - Concerned that the proposed Calderwood Reservoir has not been raised previously with council

SCC indicated that the proposed Calderwood Reservoir has not been raised previously with council at any discussions with either Sydney Water or the DP&I. SCC may raise concerns about its location and possible impacts on various aspects of the environment.

Response

Sydney Water has been and will continue to consult with Shellharbour City Council for the Proposal according to our Stakeholder Consultation and Communications Strategy. The potential impacts associated with the proposed reservoir have been assessed in the EA, however, we will reconsider the need for the reservoir and its proposed location, when DP&I schedules the area for release.

3.11.7 Upgrade of Shellharbour WWTP

Issue - Insufficient detail on how the Shellharbour WWTP will be upgraded

No detail is provided on how the Shellharbour WWTP would be upgraded to accommodate a 10% increase in dry weather treatment capacity.

Response

Section 3.3.2 of the EA reflects that Sydney Water is seeking Concept Approval to upgrade the Shellharbour WWTP after 2031, if required. We would confirm details of the upgrade, such as the treatment technologies, closer to 2031. We would further investigate environmental impacts, before carrying out the upgrade.

3.11.8 Ancillary components such as vent shafts

Issue - The locations of proposed ancillary components such as vent shafts have not been nominated in the EA

SCC is concerned that the locations of proposed ancillary components such as vent shafts are not nominated in the EA. The location of these assets may affect urban design of future subdivisions and should be indicated in the EA.

Response

Section 7.4.3 of the EA includes information on vent shafts. It is not practical to define the exact locations of vent shafts, as these would be confirmed during detailed design. Vent shafts are common features of urban environments and their presence would have minimal impact on subdivision design.

3.11.9 Not possible to determine the potential impact in the concept area

Issue - The environmental impact of the application for which Sydney Water is seeking approval for is impossible to determine and does not comply with the DGRs

SCC considered that it is not possible to assess the impact of the Proposal as the assessment approach states that Sydney Water is seeking approval for:

a. The Proposal to be located anywhere within the field assessment area.

b. The Proposal to be located outside the field assessment area where environmental impacts are no greater than those in the EA; and

c. No additional environmental mitigation measures are required.

SCC considers the environmental impact of such an application would be virtually impossible to determine. This means that the EA and approval requested in this statement do not comply with the DGR's.

Response

The submission refers to text that was included in a draft version of the EA that was provided for SCC's comment and this text does not appear in the EA that was exhibited.

The Proposal must be flexible to incorporate a 35-year development horizon through to 2048. The EA assessed maximum impacts along pipeline corridors and within sites to accommodate possible changes to the Proposal, as it is optimised, during detailed design. In most instances a larger area than would actually be impacted has been assessed (referred to as the field assessment area), but there may also be changes that occur outside the Field Assessment area.

To provide some flexibility for site layouts and pipeline alignments to be refined, Sydney Water seeks approval for:

- the Proposal to be located anywhere within the field assessment area described in Chapter 6 of the EA; and
- the Proposal to be located outside the field assessment area where:
    - changes are consistent with the environmental objectives of the Proposal; and
    - environmental impacts are no greater than those described in this EA; and
    - no additional environmental mitigation measures are required.

We would conduct consistency assessments, if we refine components of the Proposal, during detailed design and we would only seek a modification to the approval, if the changes are found to be inconsistent with the Minister's approval and/or the potential impacts are predicted to be greater than those described in Chapter 6 of the EA.

3.11.10 Increased nutrient levels

Issue - The justification provided in the EA for the increase in nutrient level, based on unacceptable stormwater quality levels, is not considered to be satisfactory and optimum water quality should be sought

SCC does not consider it satisfactory to justify nutrient level increases based on unacceptable stormwater quality levels. Optimum water quality should be sought even though existing systems may have poor water quality. On-going improvements to stormwater quality are a desired outcome from SCC's perspective. This is particularly relevant for Lake Illawarra, which currently suffers from poor water quality and regular algal blooms. SCC, together with the LIA and WCC, contribute substantial amounts of rate payers' funds towards maintaining and improving the lake. A zero or reduced impact on the water quality within Lake Illawarra is SCC's preferred approach for new release urban areas within its catchment.

Response

This issue is discussed in Section 3.3 of this report, which responds to issues raised by LIA.

Sydney Water designed the Proposal to minimise impacts to Lake Illawarra as required by the DGRs. The EA determined that there would be no significant impacts to the receiving environment, or the environmental values of the Lake Illawarra catchment. The EA identifies that the existing environment appears to be resilient, and can assimilate pollutant loads reasonably well (as indicated in water quality results of Lake Illawarra compared with the LIA trigger values).

The DGRs required Sydney Water to minimise or prevent wastewater discharge or overflows to waterways. Sydney Water designed the Proposal to minimise discharges to the lake by carrying wastewater to coastal plants for treatment and effluent discharge to the ocean, rather than to inland treatment plants and effluent discharge to inland waterways, and potentially to the lake. The Proposal would also use leak-tight wastewater pipelines that significantly reduce wet weather inflow. Sydney Water would continue to monitor the system to comply with EPL requirements.

3.11.11 Impacts on Barrack Swamp and Little Lake

Issue - The EA does not adequately assess impacts on Barrack Swamp and Little Lake given it is a popular swimming and recreation area

SCC does not consider that impacts on Barrack Swamp and Little Lake are adequately addressed given the 14.01% increase in annual Total Nitrogen load and 10.19% increase in annual Total Phosphorous load in 2048. This is a popular swimming and recreation area and public health and amenity should be ensured.

Response

The EA does not state that there would be a 14.01% increase in annual Total Nitrogen or 10.19% increase in Total Phosphorous. The EA estimates that 14.01% of the annual load of Total Nitrogen would come from wet weather overflows in 2048, and therefore, about 86% of the Total Nitrogen in any year would come from diffuse stormwater sources. Similarly, an estimated 10.2% of Total Phosphorous would be from wet weather overflow sources, with the rest from stormwater.

The Proposal would comply with the requirements of the EPLs and nutrient loads from wastewater overflows would be small in comparison to those from stormwater. As compliance with an EPL ensures that '… the environmental impacts associated with the operation and management of sewer overflows will be properly addressed' (EPA 2000), Sydney Water considers that potential impacts associated with overflows have been minimised as required by the DGRs.

3.11.12 Impact of nutrient increase as a result of overflow on Lake Illawarra

Issue - The EA does not ensure the ongoing health and viability of Lake Illawarra

The possible impact of nutrient increase from overflow on Lake Illawarra is of concern to SCC. The EA does not, with any certainty or confidence, ensure the ongoing health and viability of the lake. This is relevant from a community recreational perspective as well as future commercial and tourism opportunities.

Response

This issue is discussed in Section 3.3 of this report, which responds to issues raised by LIA.

Sydney Water holds EPLs for the Wollongong and Shellharbour wastewater systems. Compliance with an EPL ensures that '… the environmental impacts associated with the operation and management of sewer overflows will be properly addressed' (EPA 2000). We believe the potential impacts of overflows from the Proposal are acceptable, as we designed the Proposal to comply with the requirements of existing EPLs that limit the concentration and loads of discharges and the overflow frequencies for the Wollongong and Shellharbour wastewater systems. Sydney Water would continue to monitor the performance of the systems and operate it to ensure that overflows comply with the EPLs.

As the Proposal would comply with the requirements of the EPLs, and nutrient loads from wastewater overflows would be small compared to those from stormwater, Sydney Water believes that potential impacts associated with overflows have been minimised as required by the DGRs and the Proposal does not jeopardise the ongoing health and viability of Lake Illawarra.

3.11.13 Impact of proposed vegetation removal and affected threatened species

Issue - The EA has not adequately assessed the vegetation removal or identified directly affected areas of EEC or threatened species

SCC considered that Sydney Water has not adequately addressed the environmental impacts of removing a proposed 3.4 ha of vegetation out of a total of 16 ha (that is 21.25%) or identified specific affected areas. Areas of affected EECs and threatened species affected need detailed assessment at this level of approval.

Response

Of about 800 ha of land assessed as part of the EA, 16 ha contains remnant native vegetation. Up to 3.38 ha of the remnant native vegetation could potentially be directly impacted at 14 separate locations. Potential impacts at the direct impact areas in the Project Approval area are assessed in Section 6.5.2 of the EA. We have done detailed assessments to address the DGRs including assessing the significance for threatened species and communities that could potentially be impacted by the Proposal (refer to Appendix E of the EA).

An ecological assessment was done as part of the Local Environmental Study for WDURA. This found that of the 3,874 ha assessed in the WDURA, there are about 430 ha of native vegetation. The Proposal would affect 3.38 ha of native vegetation, which represents less than one per cent of total native vegetation within the WDURA and AGAs.

3.11.14 The Statement of Commitments is ambiguous

Issue - More directed and measurable commitments should form part of the EA

SCC considered the Statement of Commitments to be ambiguous as it tends to refer to future studies, design, and mitigation plans that should form part of the EA. More directed and measurable commitments are preferred by SCC.

Response

Subject to the Minister for Planning and Infrastructure approving the Proposal, Sydney Water and parties acting on its behalf, would design, construct and operate the Proposal following the Statements of Commitments. Section 3.4 of the EA outlines the process we would implement during detailed design, to refine the Proposal and minimise potential environmental impacts. This would consider the management measures described in the EA, the Statement of Commitments, and the relevant recommendations in the technical reports appended to the EA.

The Proposal must be flexible to enable it to be optimised during detailed design and then efficiently delivered in stages over a 35-year development horizon. It must also have flexibility to accommodate adaptive management approaches that may incorporate refinements to further realise environmental benefits and objectives.

3.12 Submission 12 – NSW Environment Protection Authority

3.12.1 Wastewater partial treatment bypass and overflow events

Issue - It is not acceptable to design new wastewater networks that will result in breaches of current limits

The EPA considers that it is not acceptable for Sydney Water to design new wastewater networks that would breach current limits. The proponent should be required to address and mitigate any exceedances in the detailed design and planning stages.

The EPA notes that the primary disinfection units at Port Kembla WWTP are expected to exceed the EPA's current limits after 2031. Additional bypasses of appropriate treatment processes, which are considered breaches of conditions of the EPL for Port Kembla Waste Water Treatment Plant, as a result of the additional wastewater flows and infrastructure are not acceptable and should be considered in the detailed design and planning stages.

Response

The Proposal has not been designed to breach current EPL limits. The Proposal has been designed to comply with the requirements of existing EPLs that limit overflow frequencies. Sydney Water is required to monitor and report on overflow performance as part of its EPL reporting requirements. If monitoring indicates that the requirements of the EPLs are likely to be exceeded, we would investigate options to upgrade the systems to ensure continued compliance with the EPLs. Similarly, we would monitor the performance of Port Kembla WWTP for partial treatment bypasses and would upgrade the plant to ensure licence compliance.

3.12.2 Marine water quality impacts through discharge through deep ocean outfalls

Issue – there would be no construction activities in the marine environment

The EPA notes that Sydney Water does not anticipate any construction activities in the marine environment and that marine water quality impacts would be through the increase in the volume of effluent discharged from the wastewater treatment plants.

Response

Noted.

Issue - Modelling indicates that the outfall design for the Shellharbour WWTP does not enable good hydrodynamic mixing

The EPA has reviewed Sydney Water's modelling of the deep ocean outfalls at Port Kembla and Shellharbour WWTPs and believes that the modelling indicates that the outfall design for the Shellharbour WWTP does not enable good hydrodynamic mixing. This is because much of the initial momentum is lost in pits that existed in the original configuration of the outfall structure. The EA does not indicate whether this design was re-configured with the most recent augmentation of the WWTP. Sydney Water should confirm whether this is the case.

Response

Sydney Water based this modelling on the most recent upgrade of the Shellharbour WWTP. As described in Section 2.4.1 of Appendix C, the Shellharbour outfall lies about 120 m offshore from Barrack Point in water that is 8 m deep. Treated wastewater is discharged through a diffuser with 24 T-shaped outlet nozzles (48 outlet nozzles in total). The outlet nozzles rise above the pits to which the submission is referring to and the pits now play no part in the discharge of wastewater through the Shellharbour outfall.

Issue - Average dry weather flow limits are expected to be exceeded in the year 2048

The EPA notes that average dry weather flows for Port Kembla and Shellharbour WWTPs are expected to increase from 43 and 14 ML/day to 62.2 and 22.2 ML/day respectively in 2048. These flows exceed the current outfall design capacities of 59 and 20 ML/day respectively.

Response

It is assumed that the reference to 'Port Kembla' should be 'Wollongong'. Sydney Water currently reuses about 20 ML/day at Wollongong WRP. Assuming the same levels of reuse continue into the future, only 42.2 ML/day (62.2 ML/day minus 20 ML/day) of wastewater would be discharged through the outfall. This is well within the design capacity of 59 ML/day.

We recognise that the design capacity for Shellharbour WWTP may be exceeded at some stage before 2048. Sydney Water would monitor the performance of the WWTP and would examine the need to upgrade treatment plants or processes and seek relevant approvals, if planning closer to this date indicates that the design capacity would be exceeded.

Issue - Increases in the discharge volume is likely to reduce near field dilution

Any increase in discharge volume is likely to reduce near-field dilutions, increase the surface plume thickness and/or increase the dimensions of the plume.

Response

The submission implies that the EA hasn't considered change in volumes (flows) into the system. The modelling took into account changes in the volume of flows in the system, by examining different flow volumes associated with different population projections for different years. The Marine Water Quality Assessment (Appendix C of the EA) tabulates the average dry weather flows used for each scenario and describes how the variability around these flows is determined for input into the Monte Carlo simulations (refer to Section 2.4.2 of Appendix C).

Issue - The Wollongong WRP outfall is considered to have better dilution efficiency

Wollongong outfall has better dilution efficiency than the Shellharbour WWTP outfall, as the multi-port diffuser configuration uses the discharge flow momentum at depth, allowing three-dimensional mixing as the plume rises to the surface during the near-field phase of flow. However, as the outfall approaches capacity in 2048, the relatively shallow nature of the site could mean that the increased flow volume could have implications for the mixing ability of the current outfall design.

Response

It is assumed that the 'implications' the EPA is referring to is the coanda effect. As stated above, Sydney Water currently reuses about 20 ML/day from the Wollongong WRP. Assuming the same levels of reuse continue into the future, 42.2 ML/day of wastewater would be discharged through the outfall and this is well within the design capacity of 59 ML/day. As a result, discharge through the outfall in 2048 would be about 70% the design capacity, meaning it is unlikely that the Proposal would adversely affect the mixing ability of the outlet. Output from the CORMIX model explicitly addresses the coanda and boundary effects. The CORMIX model output did not indicate coanda or any other bottom boundary related issues would occur for any scenario.

Issue - Definition of the mixing zones for discharge plumes

The EA does not clearly define the mixing zone for discharge plumes (that is, hydrodynamic, density, temperature, effluent concentration or distance parameters), but alludes to the initial dilution phase as being defined by the salinity reaching 35.5 (+/- 0.25 std dev.).

Response

The 'mixing zone' and the 'initial dilution zone' are defined in the Glossary of Appendix C. These definitions are similar to those recognised by, and used in, the CORMIX model (pages ix and x of the CORMIX manual). Section 2.6 of Appendix C – *Prediction of Marine Impacts* clearly defines the mixing zone:

> 'When the salinity of the wastewater/seawater mixture lies in the range 35.5 +/- 0.25 psu, the mixing process is essentially complete. The edge of the initial mixing zone has been reached'.

The maximum modelled concentrations of substances at the edge of the initial mixing zones are provided in Table 7 of Attachment C.

Issue - The majority of mixing occurs in the near-field zone

For an outfall, the majority of mixing occurs in the relatively controllable near-field zone where turbulent mixing is driven by the characteristics of the discharge (that is, volume, velocity, density). Generally, initial mixing in a hydrodynamic sense refers to the distance driven near-field where, if contaminants are not met at end of pipe, the discharge structure can be designed to maximise dilution in the near-field. The EPA generally expects that guideline criteria are met within the near-field zone where dilutions are relatively controllable.

Response

As indicated in the glossary provided in Appendix C (*Prediction of Marine Impacts*) of the EA, the 'initial mixing zone' and the edge of the 'near-field zone' are not the same. The initial mixing zone is defined as:

> 'the zone surrounding the outfall where the wastewater plume mixes with receiving waters. The initial mixing zone may extend beyond the near-field model (initial dilution zone)'.

The near-field mixing zone is defined as:

> 'A zone close to the outfall where strong initial mixing of the discharged fluid occurs as a result of the different densities and speeds between the discharged fluid and the receiving waters. For outfalls located in deeper waters (eg Wollongong) the majority of the plume dilution occurs in the near-field zone.'

The statement in the submission that most mixing occurs in the near-field zone only applies to outfalls in deep waters. It does not apply to an outfall like Shellharbour WWTP, where the water depth is only about 8 m. When plumes from the Shellharbour outfall reach the sea surface (that is, the end of the near-field zone), the buoyant mixing is incomplete. In this case, most mixing occurs outside the near-field zone.

Issue - Modelling effluent constituents

It is not clear what modelling was done for effluent constituents. The EA states that modelling was not carried out for those constituents that met the guideline criteria, however, the EPA notes that modelling (mixing zone/initial mixing modelling) was done.

Response

As noted in Section 3.3 of Appendix C of the EA, the concentration of many substances in the treated wastewater is expected to be low and in many cases much less than the *ANZECC (2000) guidelines*. If the maximum concentration of these substances, divided by the minimum modelled dilution, was less than the guideline value, that substance would always meet the guidelines. In other words, if the most restrictive criteria resulted in meeting the guidelines, all other scenarios would meet the guidelines and so we did not consider modelling necessary.

Table 7 of Appendix C of the EA lists the constituents that we did model and indicates that the maximum concentration of all substances at the edge of the respective initial mixing zones is within the relevant *ANZECC (2000) guidelines*.

Issue - Was near-field or far-field modelling carried out

Sydney Water should clarify whether near-field or far-field modelling was carried out, as modelling by the EPA indicated that the initial mixing zones all lie in the far-field, well beyond the near-field.

Response

As described in Section 2.5 of Appendix C of the EA, the CORMIX model was selected as the plume dispersion model for use on the Proposal. CORMIX includes both a near-field model (CORJET) and a far-field model (FFLOCATR). These two models are applicable to different

phases of the movement of the wastewater and reflect the different physical processes that dilute the wastewater plume.

The initial mixing zone and the near-field zone are not the same. The initial mixing zone often lies beyond the boundary of the near-field and this is the case for the Wollongong and Shellharbour outfalls.

Issue - Modelling scenarios should be run to target the mean, median, maximum, 75th percentile and 90th percentile conditions

Randomly selected effluent flow and effluent quality data were used in the modelling. The EPA considers this to be unusual, and expects that scenarios should be run targeting mean, median, maximum, 75th percentile and 90th percentile conditions or choosing values that would be expected to produce a 'worst case scenario' outcome. A random selection may result in a set of uncharacteristic starting conditions for the model. The EPA considers that the randomly chosen values driving the model should be presented in the context of how the outfall operates on a day-to-day basis.

Response

The modelling approach used to assess marine water quality impacts was presented to EPA/DECC on 18 May 2011 and the EPA was provided with an opportunity to comment on the modelling approach that would be used in the EA. At that time, no issues were raised on the selected modelling approach.

Sufficient data from the wastewater is not available to input into the model as the model requires hourly input data, and concentrations of contaminants in the wastewater are measured monthly (or thereabouts). A statistical technique called 'bootstrapping' was used to generate a synthetic data set (based on real data). By using measured concentrations of contaminants in the wastewater data, statistical distributions are generated. For each hour in the model run, one datum is randomly selected from this distribution. As the random selections are from a distribution based on real data, the 'starting conditions will not be uncharacteristic'. This process is outlined in more detail in Appendix C of the EA.

Testing perturbations by integrating inputs for scenarios is normal practice and is recommended in the CORMIX model output (refer to the CORMIX design recommendations attached to each output). The median, maximum, 75th percentile and 90th percentile conditions can be interpreted from the exceedance plots provided in the Marine Water Quality Assessment (Appendix C of the EA). As the data is (generally) not normally distributed, the median provides a better estimate of central tendency than the mean.

Sydney Water does not believe that ocean currents, stratification, wastewater flow and concentrations of contaminants have a particular relationship. So, we do not consider that randomly selecting a combination of conditions is likely to result in a set of uncharacteristic starting conditions for the model.

Issue - Ammonia levels in the coastal zone may be above ANZECC (2000) default trigger values

The EA states that ammonia concentrations would not cause problems at Wollongong as the ammonia is converted to nitrogen as part of the treatment process. The EPA assumes that the EA is referring to N_2 gas and that there would be no ammonia residual in the effluent.

If the ambient environment currently exceeds the guidelines, then any contribution of total nitrogen or ammonia will increase the concentration of ammonia in the coastal zone.

Response

Sydney Water acknowledges that the ambient environment exceeds the ANZECC (2000) default trigger values, and that any contribution of total nitrogen or ammonia from any source would increase the concentration of ammonia in the coastal zone. This may suggest that the ANZECC (2000) default trigger values are not appropriate for this region. ANZECC (2000) recognises that oxidised nitrogen and ammonia concentrations are elevated along the NSW coast due to frequent upwelling events (footnote to Table 3.3.2 in ANZECC).

Issue - There are some inaccuracies in the use of guideline criteria

The EPA notes some inaccuracies around the use of guideline criteria in the modelling results:

- ANZECC Aquatic Ecosystem Protection Trigger (2000) for ammonia (NH_3) is 20 ug/L not 500 ug/L, as indicated in Table 6.4.
- The criteria for total suspended solids in the guidelines is 0.5 mg/L, however the EA uses 3 mg/L (converted from a range of 0.5–10 NTU).

Response

These corrections are noted. This does not change the modelling results.

3.12.3 Impact on inland water quality

Issue - Confidence levels should be provided for pollutant loads

The EPA commented that Sydney Water should provide some measure of confidence around the modelled estimate of stormwater and wastewater loads of nutrients, faecal coliforms and total suspended solids.

Response

In response to this submission, the estimated stormwater loads were recalculated using confidence intervals provided in the following documents:

- Fletcher, T., Duncan, H., Poelsma, P and Lloyd, S. 2004, *Stormwater Flow and Quality and the Effectiveness of Non-proprietary Stormwater Treatment Measures - A Review and Gap Analysis*, Cooperative Research Centre for Catchment Hydrology
- Bartley, R., Speirs W.J., Ellis, T.W. and Waters, D.K. 2012, *A review of sediment and nutrient concentration data from Australia for use in catchment water quality model*, Martine Pollution Bulletin 65:101-116
- Marston 1993*, Diffuse Source Nutrient Generation Rates in the Hawkesbury-Nepean Basin,* Technical Memorandum 93/3, Division of Water Resources, CSIRO Australia.

Confidence intervals have also been applied to wastewater loads (refer to Table 3-1).

We recalculated the pollutant contribution generated from stormwater and wastewater on a sub-catchment scale, based on an annual average rainfall of 1,191 mm. Figures 3-5 to 3-8 present the expected variations for total suspended solids, faecal coliforms, total nitrogen (TN) and total phosphorus (TP).

Nutrient and total suspended solid loads from stormwater generally show greater variance than loads generated from wastewater. Similarly, the contribution of nutrients and total suspended solid loads within each sub-catchment is noticeably greater from stormwater compared to wastewater.

Faecal coliform levels vary more in wastewater compared to stormwater and can range between $1e^6$-$1e^8$ cfu/100 ml.

Table 3-1 Typical wastewater concentrations and ranges

Indicator	Typical (adopted) concentration	Range
TSS	300 mg/L	200–350 mg/L
TN	55 mg/L	45–65 mg/L
NOx	0	0
Ammonia	37 mg/L	32–42 mg/L
TP	10 mg/L	8–12 mg/L
FRP	9 mg/L	7–10 mg/L
FC	$1e^{7}$cfu/100 ml	$1e^{6}$-$1e^{8}$ cfu/100 ml

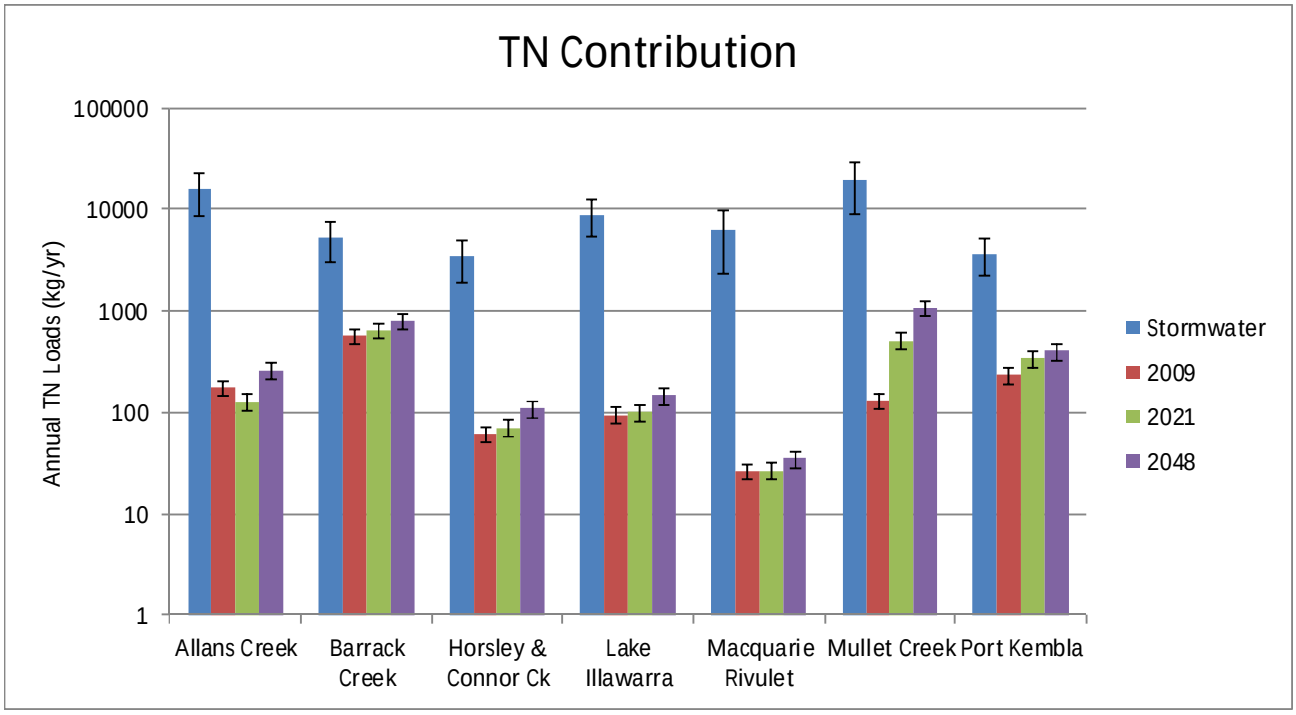

Figure 3-5 Contribution (and range) of annual TN loads from stormwater and overflows in 2009, 2021 and 2048 per sub-catchment (based on rainfall of 1,191 mm/yr)

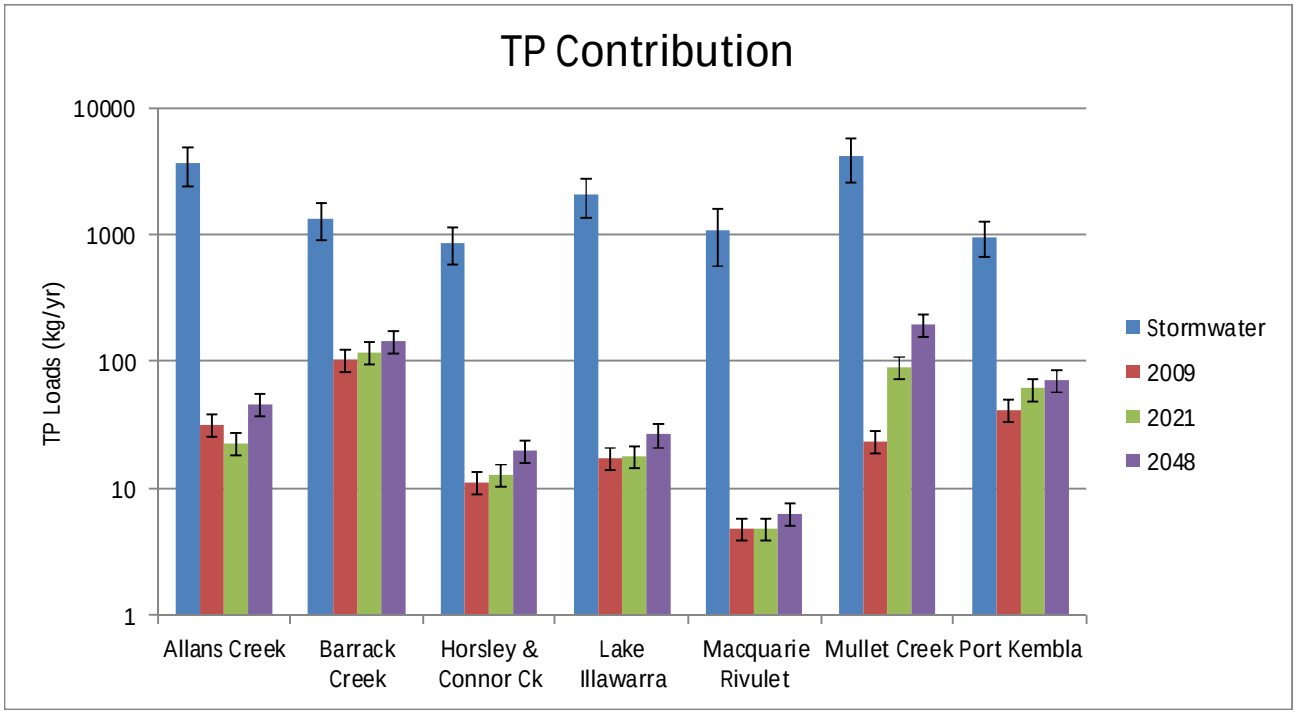

Figure 3-6 Contribution (and range) of annual TP loads from stormwater and overflows in 2009, 2021 and 2048 per sub-catchment (based on rainfall of 1,191 mm/yr)

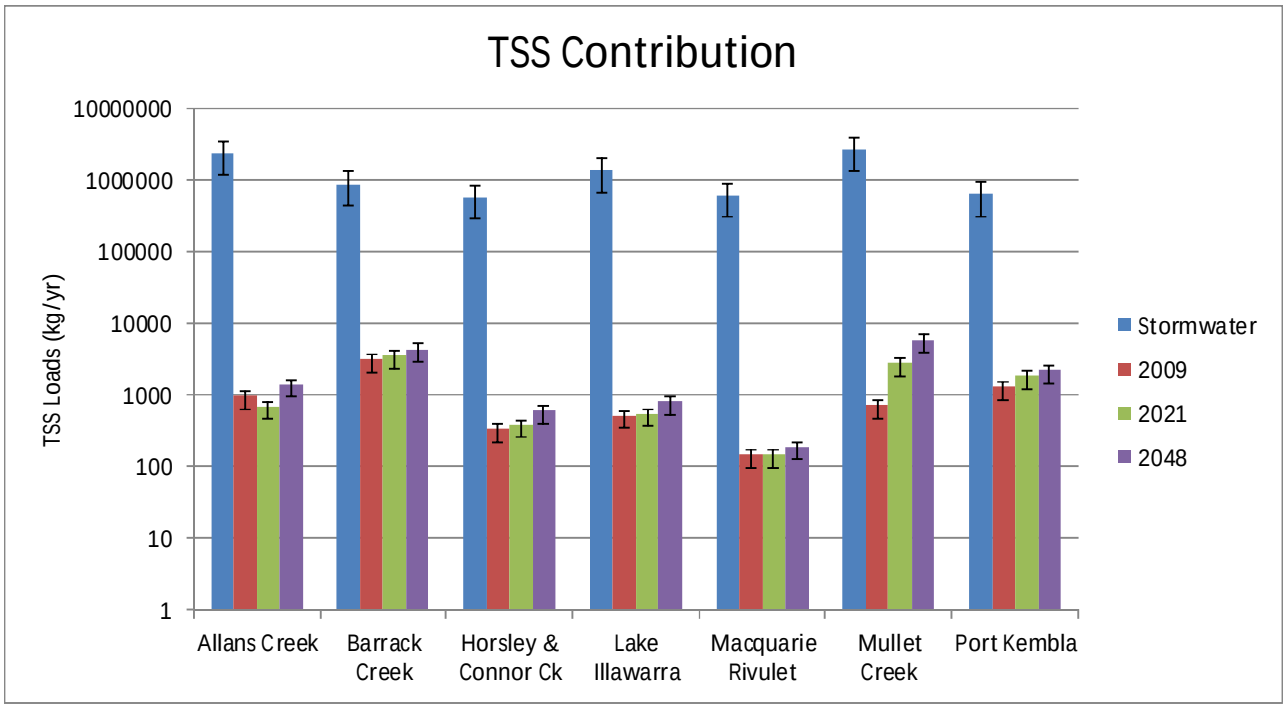

Figure 3-7 Contribution (and range) of annual TSS loads from stormwater and overflows in 2009, 2021 and 2048 per sub-catchment (based on rainfall of 1,191 mm/yr)

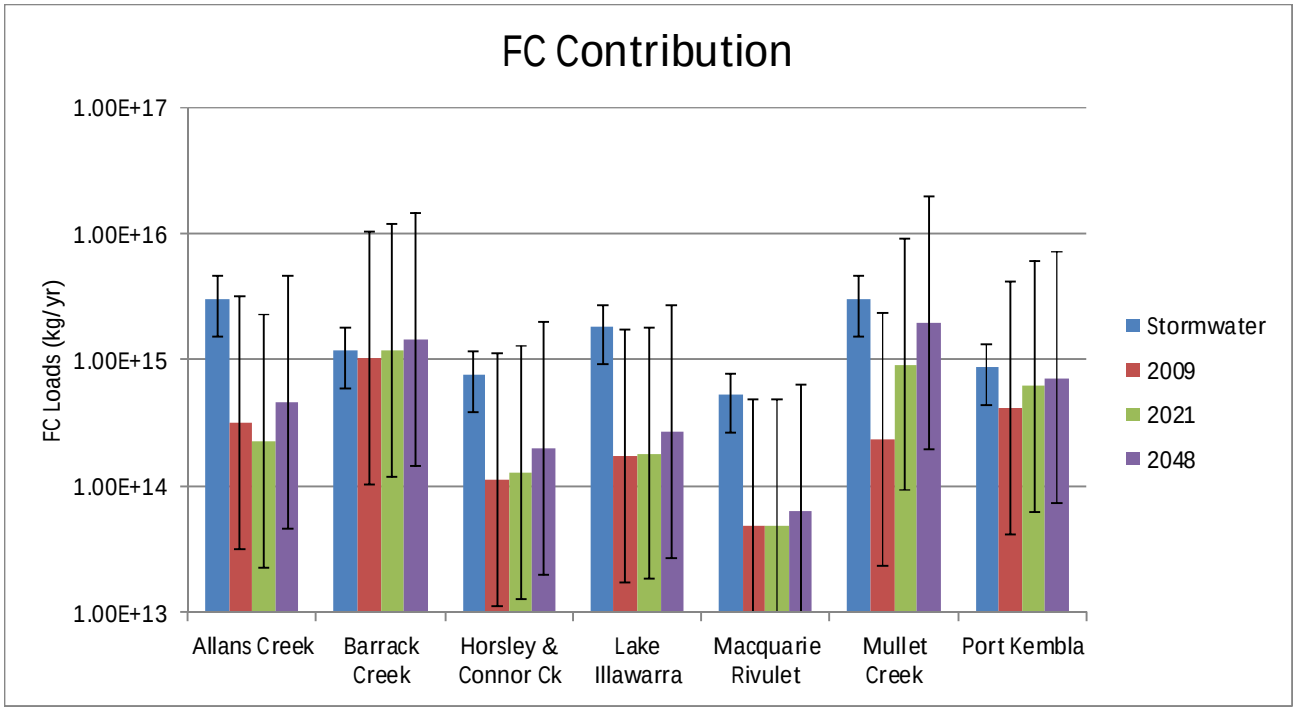

Figure 3-8 Contribution (and range) of annual FC release from stormwater and overflows in 2009, 2021 and 2048 per sub-catchment (based on rainfall of 1,191 mm/yr)

Issue - The proportion of stormwater and wastewater overflow load estimates for nutrients that are biologically available should be defined

Sydney Water should define the proportion of stormwater and wastewater overflow load estimates for nutrients that are biologically available (eg ammonium, oxidised nitrogen and filterable reactive phosphorus). Wastewater is expected to have a higher proportion of biologically available nutrients compared to stormwater.

Response

Sydney Water calculated the proportion of biologically available nutrients in wastewater loads, based on typical concentrations found in wastewater (Table 3-1). Event loads for ammonium and filterable reactive phosphorus from directed overflows were considered to be high and highest priorities are shown in Figure 3-9 and Figure 3-10. The results are similar to those reported in the EA (Appendix C of Appendix D) as directed overflows that have the greatest volume per event. Total nitrogen and total phosphorus loads also have the greatest proportion of ammonia and filterable reactive phosphorus. The key difference is that the majority of total phosphorus and total nitrogen is represented by bioavailable forms as ammonium and filterable reactive phosphorus.

Wastewater typically contains no oxidised nitrogen as it is in a reducing environment (lack of oxygen) when it is within the pipelines. As total nitrogen within wastewater is represented by organic and ammoniacal nitrogen, un-oxidized nitrogen has not been considered. Once wastewater is discharged into the environment, the process of oxidation depends on a range of conditions, including the nature of the receiving environment and presence of suitable bacteria.

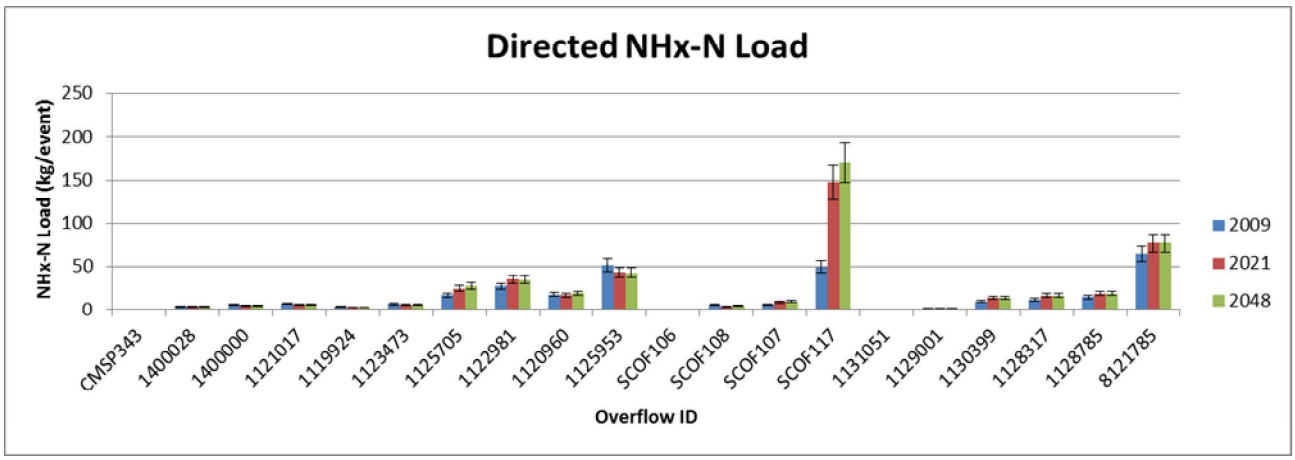

Figure 3-9 Ammonium loads per event at high and highest priority directed overflows

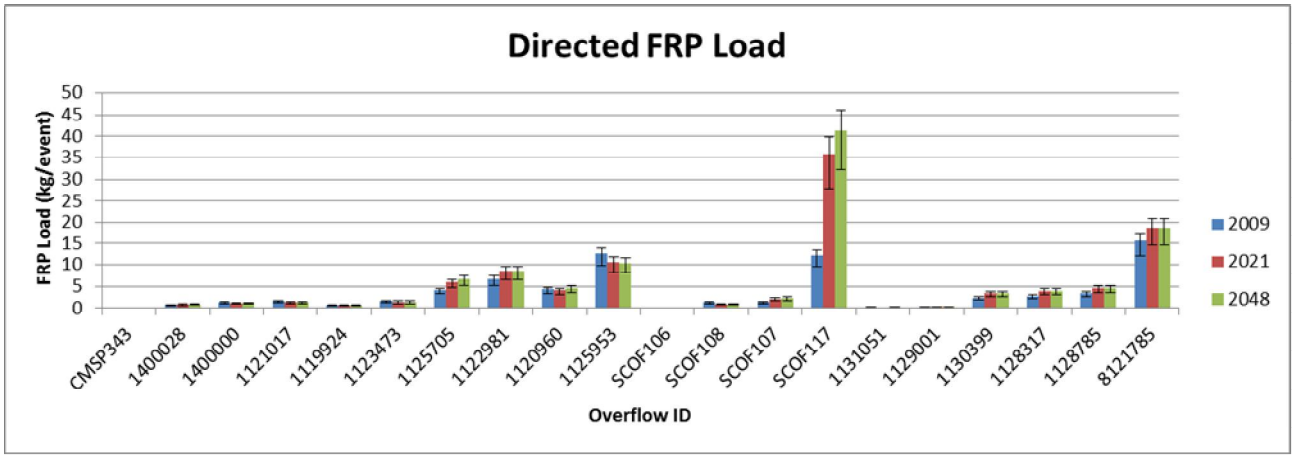

Figure 3-10 Filterable reactive phosphorus loads per event at high and highest priority directed overflows

We calculated the loads of biologically available nutrients in stormwater and compared them to wastewater. Figures 3-11 to 3-13 display the annual pollutant contribution from stormwater and wastewater on a sub-catchment scale for ammonia, filterable reactive phosphorus and oxidised nitrogen. Overall, stormwater contributes greater loads of ammonium and filterable reactive phosphorus compared to wastewater. The confidence levels also indicate that stormwater loads show greater variation.

As there is no oxidised nitrogen present in wastewater oxidised nitrogen loads within each sub-catchment are attributable to stormwater.

Figure 3-14 and Figure 3-15 display the ratio of pollutant contribution on a sub-catchment scale. The ratio of pollutant contribution of ammonium and filterable reactive phosphorus within each sub-catchment from wastewater is generally a small proportion of overall loads.

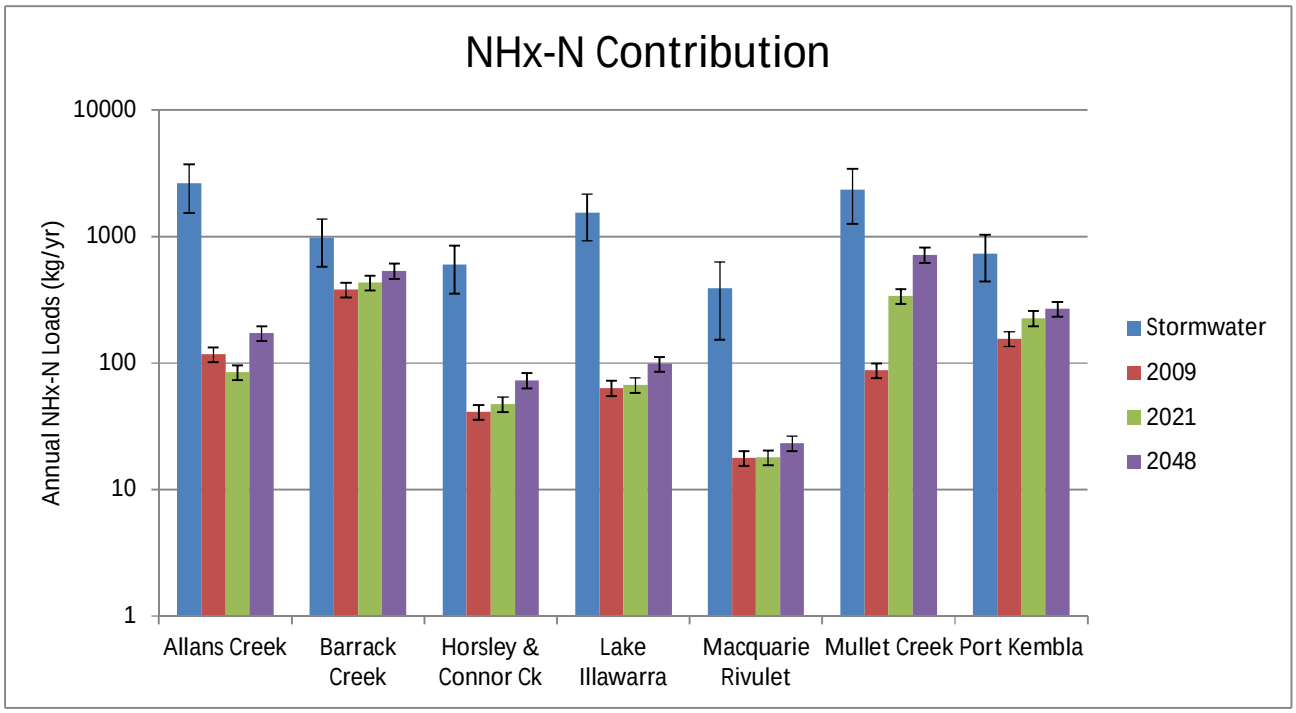

Figure 3-11 Contribution (and range) of annual ammonium loads from stormwater and overflows in 2009, 2021 and 2048 per sub-catchment

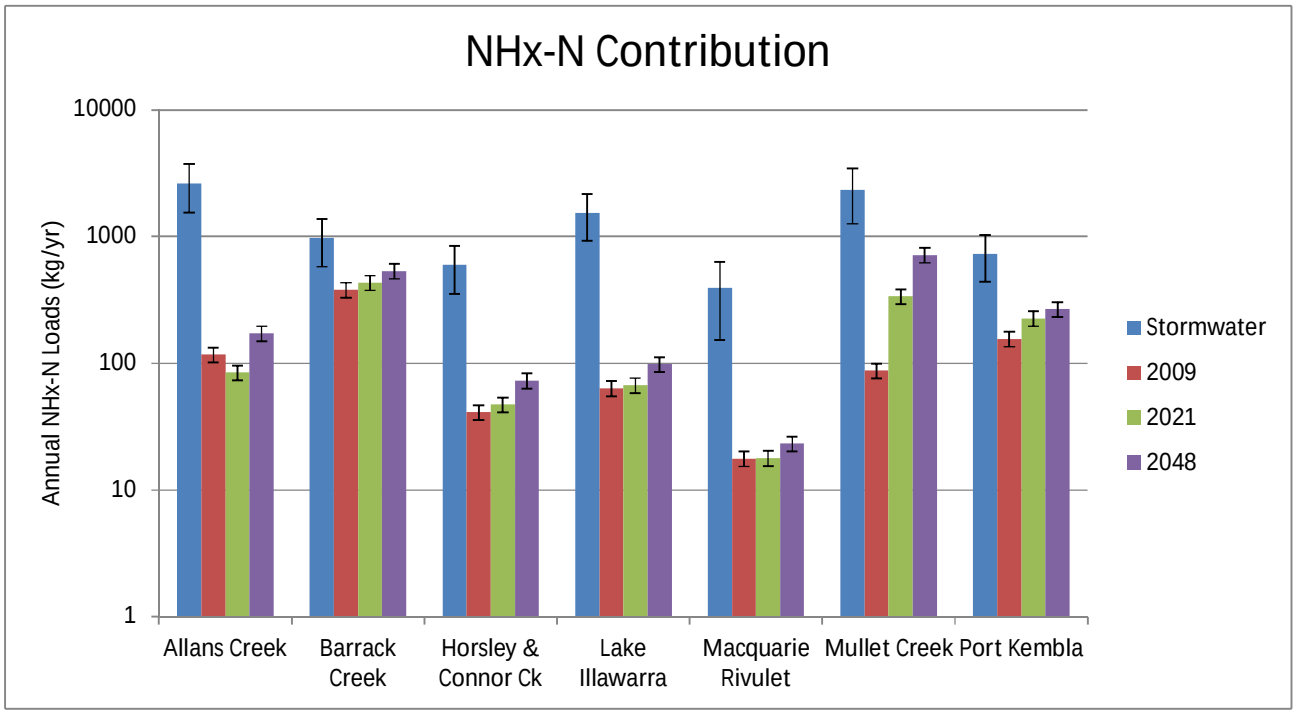

Figure 3-12 Contribution (and range) of annual oxidised nitrogen release from stormwater and overflows in 2009, 2021 and 2048 per sub-catchment

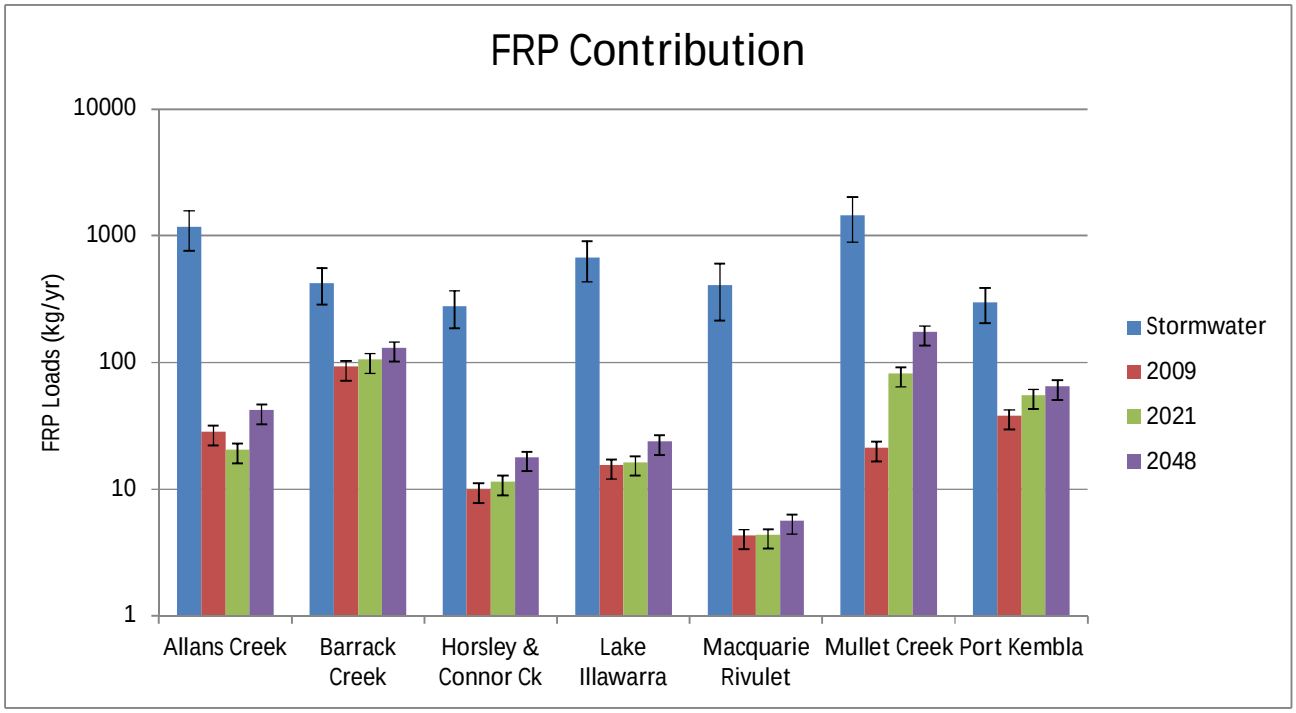

Figure 3-13 Contribution (and range) of annual FRP loads from stormwater and overflows in 2009, 2021 and 2048 per sub-catchment

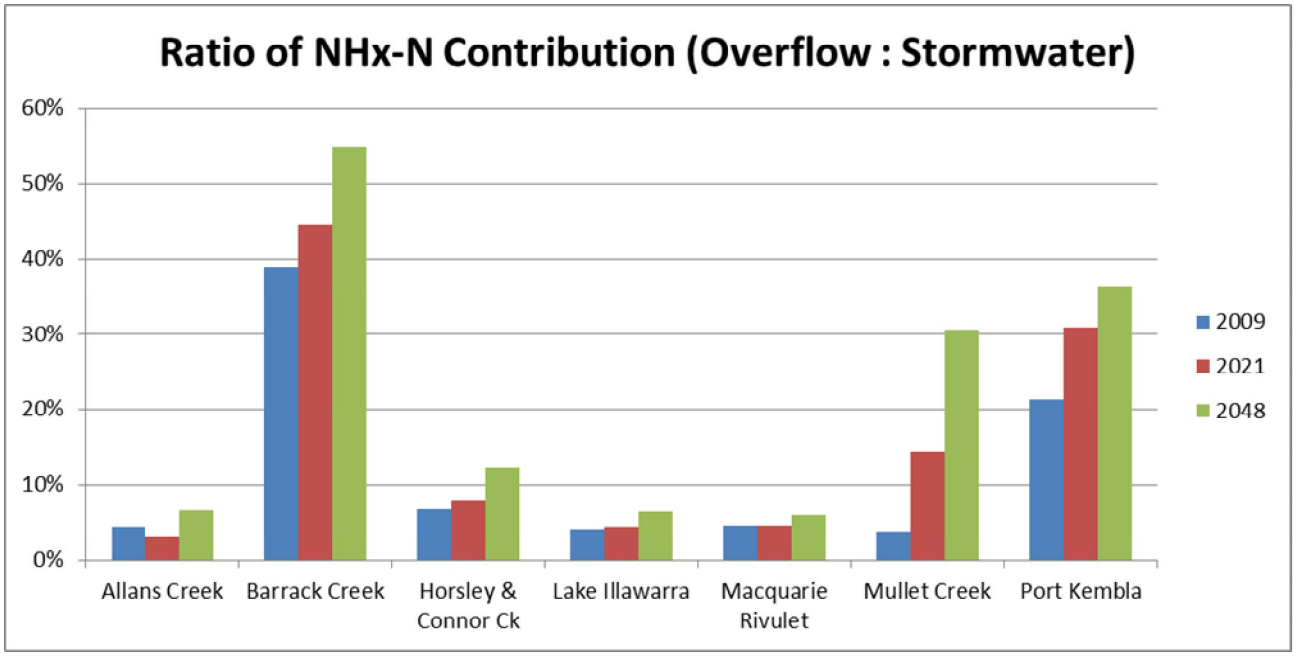

Figure 3-14 Ratio of ammonium contribution from overflows and stormwater (2009, 2021 and 2048) (based on rainfall of 1,191 mm/yr)

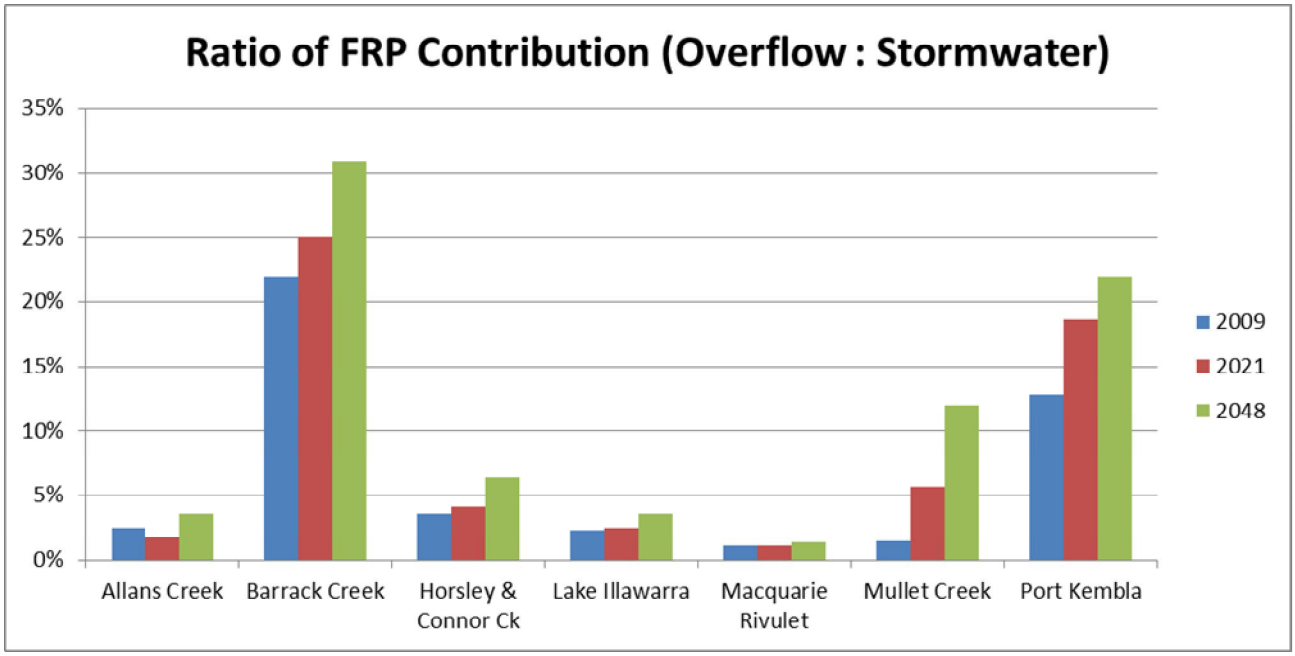

Figure 3-15 Ratio of FRP contribution from overflows and stormwater (2009, 2021 and 2048)

Issue - Concern regarding the assimilative capacity of Lake Illawarra

Information should be provided to support the statement that the assimilative capacity of the receiving environment is 'fairly resilient'. The EPA considers it likely that impacts such as algal blooms and aquatic weeds would occur as a result of development in the WDURA and AGAs.

Response

The assimilative capacity of Lake Illawarra was assumed to be fairly resilient based on the review of water quality data and reports. The draft *Condition Assessment of Lake Illawarra (LIA 2010)* reports that since 2005 the aesthetic condition has improved, particularly since the lake was opened to the ocean. While nutrient concentrations do not currently meet the default trigger values for protection of slightly disturbed estuarine aquatic ecosystems recommended by ANZECC/ARMCANZ (2000), they generally meet the LIA derived trigger values, which are indicative of existing water quality.

Over recent times, concentrations of nutrients (total nitrogen and total phosphorus) and chlorophyll-a have decreased, as have the numbers of bacterial organisms, although at times all of these indicators have been recorded in high concentrations or numbers. Poorest water quality generally follows rainfall, and is largely attributable to stormwater run-off from a variety of catchment land uses surrounding the lake. Despite this, the lake is showing improved clarity and a reduction in malodorous conditions, algal blooms and fish kills, which could be attributed to the lakes ability to assimilate the loads of nutrients it currently receives (LIA 2010).

3.12.4 Noise and vibration

Issue - Operational noise levels

The noise and vibration assessment indicates that operational noise criteria can be satisfied at all locations by providing appropriate noise mitigation measures during the design phase. Item 24 of the Statement of Commitments should clearly reflect this.

Response

Subject to the Minister for Planning and Infrastructure approving the Proposal, Sydney Water and parties acting on its behalf, would design, construct and operate the Proposal according to the finalised Statement of Commitments. Section 3.4 of the EA outlines the process that would be implemented, during optimisation of detailed design, to refine the Proposal and minimise potential environmental impacts. This would consider the management measures described in the EA, the Statement of Commitments, and the relevant recommendations in the technical reports appended to the EA.

Issue - The construction noise management levels would be exceeded

The EPA notes that the assessment predicts significant exceedances of Noise Management Levels of up to 40 dB and higher to the surrounding community, due to airborne noise from construction works and requests Sydney Water to develop and implement a construction noise and vibration management plan, before construction commencing.

The EPA considers that the paramount issues would be:

- effective communication with the affected community
- the need for clear justification and prior approval to carry out any construction works outside the recommended standard hours defined in Section 2.2 of the *Interim Construction Noise Guideline (ICNG, DECC 2009)*
- the early erection of temporary noise barriers
- the need to minimise any truck movements outside standard hours.

Response

As outlined in Section 6.9.3 of the EA, many of the construction noise and vibration impacts have been assessed without mitigation measures. Table 6-40 of the EA lists general construction noise management measures that would be implemented where practical to minimise impacts to sensitive receivers. Sydney Water would consider these during the detailed design and construction phases to minimise noise and vibration impacts. We expect that impacts from noise and vibration would not be significant, if appropriate mitigation measures are implemented.

We would develop and implement a Community and Stakeholder Engagement Plan, throughout the construction phase of the Proposal. The plan would detail the consultation approach with the community. All communication processes during construction and operation of the Proposal would follow guidelines set out in Sydney Water's *Customer Contract* and *Community and Stakeholder Engagement Policy*.

Issue - Construction hours

Construction activities should be limited to the recommended standard hours defined in Section 2.25 of the ICNG, and not limited to 'daylight' hours as proposed in Table 34 and 36 of the noise and vibration assessment.

Response

As outlined in Section 6.9.3 of the EA, most construction work is likely to occur during standard hours stipulated in the ICNG, which are 7 am to 6 pm, Monday to Friday; and 8 am to 1 pm on Saturdays.

3.12.5 Geology, soils and contamination

Issue - contamination status of identified sites

The EPA agrees with the general assessment of the contamination status of the 12 identified sites in Table 3 of Appendix H of the EA.

Response

We note that EPA agrees with the status of the 12 contaminated sites identified in the EA.

Issue - Geotechnical considerations

The greatest impacts identified are the geotechnical considerations (land degradation and watercourse management) rather than soil, fill or groundwater contamination. The EPA generally agrees that groundwater impacts are not anticipated to be great and that significant environmental impacts are unlikely, if the recommended management and mitigation measures are successfully implemented.

Response

We note that EPA generally agrees that groundwater impacts are not anticipated to be great and that significant environmental impacts are unlikely, if the recommended management and mitigation measures are successfully implemented.

3.13 Submission 13 – Wollongong City Council

3.13.1 EA is satisfactory

Issue - The EA is considered to be satisfactory

The EA and appendices have been reviewed and assessed on environmental grounds and found to be satisfactory.

Response

Noted.

3.13.2 EA should be flexible to accommodate new procedures and techniques

Issue - The EA should be a flexible and evolving document, which is able to accommodate new procedures and techniques

As the Proposal would be carried out over a 35-year period, and as technology is rapidly evolving and changing, the present assessment should not be considered as a fixed and unchangeable program. WCC considered that the EA should be a flexible and evolving document that is able to accommodate new procedures and techniques, wherever an improvement in wastewater treatment and transfer can be achieved.

Response

The EA has been prepared to provide flexibility to enable Sydney Water to optimise the Proposal during detailed design and we acknowledge WCC's support for this flexibility.

As indicated in Section 3.4.1 of the EA, Sydney Water would select the final design after considering environmental issues, constructability and operational requirements. We would complete a consistency assessment to determine whether the impacts associated with the final design are greater than those described in Chapter 6 of the EA. This would identify whether any site-specific mitigation measures would be required, additional to those detailed in the EA.

3.13.3 Nutrient increase in coastal waters and inland waters at the completion of the project in 2048

Issue - The Proposal would result in an exceedance of nutrients and suspended solids in Wollongong and Shellharbour coastal waters and inland waters and Lake Illawara in 2048

The Proposal is predicted to result in an exceedance of nutrients and suspended solids in Wollongong and Shellharbour coastal waters and inland waters and Lake Illawarra in 2048. During Sydney Water's presentation and meeting with WCC, the issue of overflow control and offline containment of wastewater during extreme wet weather was discussed. Sydney Water indicated that although containment technology is available, the cost of implementing this technology would make the Proposal financially unviable.

Response

Sydney Water holds EPLs for the Wollongong and Shellharbour wastewater systems. Compliance with an EPL ensures that '… the environmental impacts associated with the operation and management of sewer overflows will be properly addressed' (EPA 2000). Sydney Water believes the potential impacts of overflows from the Proposal are acceptable, as we designed the Proposal to comply with the requirements of existing EPLs that limit the concentration and loads of discharges and the overflow frequencies. Sydney Water would continue to monitor the performance of the systems and operate it to ensure that overflows comply with the EPLs. If monitoring indicates that the requirements of the EPLs are likely to be exceeded, we would investigate options to upgrade the systems to ensure continued compliance with the EPLs.

3.13.4 Under-boring techniques should be considered for pipeline construction across all wetlands, drainage lines and creeks

Issue - Preferable that under-boring or tunnelling techniques are applied to all wetlands, drainage lines and creeks when pipelines are laid

Sydney Water proposes using under-boring or tunnelling techniques for some wetlands, Category 2 and 3 drainage lines or streams. WCC considers it preferable that these techniques be systematically applied to all wetlands, drainage lines and creeks when pipelines are laid.

Response

As described in Section 3.3 of the EA, most drinking water pipelines are likely to be located in existing or future road verges and pathways and wastewater pipelines would generally be laid next to drainage lines and creek lines to allow wastewater to be transported by gravity. Sydney Water constructs wastewater pipelines according to the WSAA standards, and where practical, we would avoid wetlands, waterways and floodways, swamps, estuaries, sand dunes, and foreshore areas.

Sydney Water's standard business practices involve route and location feasibility studies, during detailed design. For the Proposal, these studies would consider site-specific issues and could include:

- geotechnical and contamination surveys
- geomorphological assessments
- identification of the location of existing underground services
- condition surveys
- other minor surveys and tasks required to optimise and finalise alignments, design and constructability.

The outcome of additional surveys or investigations would influence which watercourses are under-bored and which are trenched. In general, it is anticipated that creek crossings would be under-bored if the localities have features such as dynamic watercourses, perennial streams, highly erodible soils, and sensitive riparian corridors (including Category 1 waterways). Trenching is likely to be the preferred construction method to cross minor creeks that are shallow, ephemeral, highly disturbed and weed infested.

As detailed in Section 6.5.2 of the EA, mitigation measures would be implemented to minimise soil erosion and sedimentation and temporary diversion or partial bunding of these minor streams to allow for connectivity of flows and fish passage. This means direct impacts from trenching in wetlands, drainage lines and creeks are unlikely to be significant.

3.13.5 Shallow unconfined aquifers and their connection to riparian corridors should be protected

Issue - The protection of shallow unconfined aquifers and their connection to riparian corridors should be ensured

Council's Environmental Strategy and Planning division endorses the protection of shallow unconfined aquifers and their connection to riparian corridors should be ensured to prevent interruption of the base flow and maintain humidity in the riparian corridors.

Response

As outlined in Section 6.8.2 of the EA, construction activities may intercept the shallow aquifer, however, Sydney Water expects changes to recharge and evapotranspiration rates to be low, because the construction footprint of the Proposal (including reservoirs and pumping stations) is small. We would implement mitigation measures during construction, to minimise groundwater inflow into excavations.

3.13.6 Measures to reduce erosion, construction noise and vibration and site rehabilitation

Issue - The proposed measures to reduce soil erosion, noise and vibration during construction and site rehabilitation are satisfactory

WCC considered that the proposed measures to reduce soil erosion, noise and vibration during construction are satisfactory, as are the proposed measures for site rehabilitation.

Response

Noted.

3.13.7 Loss of endangered ecological communities should be offset

Issue - The loss of endangered ecological communities should be compensated by applying biobanking principles

Any losses to endangered ecological communities should be compensated for, by applying biobanking principles for the entire proposed development area.

Response

As detailed in Section 6.5.2 of the EA, Sydney Water estimates that about 3.4 ha of native vegetation in total would be impacted for the Concept Area as a worst case scenario. Of this, only 0.96 ha of EEC is expected to be impacted in the Project Approval area.

As detailed design of the infrastructure progresses, pipeline alignments and/or infrastructure would be positioned to further avoid and/or minimise direct impacts on native vegetation, wherever technically feasible. We would continue to investigate, involving consultation with planning authorities such as councils, to confirm the location of road corridors. This means the area of native vegetation including endangered ecological communities that would be impacted may be less than indicated in the EA.

As outlined in Section 6.5.2 of the EA, once the extent of native vegetation to be impacted by the Proposal has been confirmed, Sydney Water would determine whether offsetting is required.

3.13.8 Design and flooding

Issue - No objections raised regarding stormwater and flooding

Council raised no objections to the design as it relates to stormwater and flooding subject to Sydney Water adhering to the draft the Statement of Commitments.

Response

Noted.

3.13.9 Consultation with council

Issue - Sydney Water should consult with council to ensure pipelines are placed within the correct road alignment

The WDURA would undergo significant development over the next 30 to 50 years, with a number of new roads, substantial road upgrades and realignments proposed. It is therefore essential that the proponent consults the Design and Technical Services Manager of WCC before carrying out the staged works to ensure that the pipelines are placed within the correct position with regard to the future final alignments of the road networks.

Response

Sydney Water is currently optimising the pipeline alignments. This involves confirming the road alignments in consultation with WCC. This process is outlined in Section 3.4.1 of the EA and would ensure that the pipeline alignments consider future final alignments of roads.

3.13.10 Stakeholder consultation meetings

Issue - Council wish to be included in stakeholder and community consultation meetings

The WCC Divisions of Infrastructure, City Works and Regulation and Enforcement must be included in any stakeholder or community consultation meetings. Sydney Water is requested to supply names and contact numbers of the contractors' representative for emergency situations and after hours contact. Details of the program of works should be supplied to council's Infrastructure, City Works and Regulation and Enforcement Divisions.

Response

As discussed in Section 8.4 of the EA, Sydney Water would continue to consult with key agencies including WCC before construction starts and during the construction stages. All communication processes, during construction and operation of the Proposal, would follow guidelines set out in Sydney Water's *Customer Contract* and *Community and Stakeholder Engagement Policy*.

3.13.11 Interruption to pedestrian and vehicle traffic

Issue - Consent should be obtained for any proposed interruption to pedestrian and vehicle traffic

Sydney Water's contractors should obtain consent, under Section 138 of the *Roads Act 1993* from WCC before the start of any works or any proposed interruption to pedestrian/vehicular traffic. Sydney Water should submit a Traffic Control Plan for approval and pay the appropriate fees a minimum of five working days before the expected implementation. The traffic control plan would satisfy the requirements of the latest version of *Australian Standard AS1742 –Traffic Control Devices for Works on road*s and the *RTA Traffic Control at Worksites Manual.*

Response

As outlined in Section 5.3 of the EA, under Clause 5(1) of Schedule 2 of the *Roads Act 1993*, a public authority does not require consent under Section 138 to exercise its functions in, on or over an unclassified road. As a result, Sydney Water does not require WCC's approval under Section 138 of the *Roads Act 1993* to complete the Proposal. However, Sydney Water would continue to consult WCC regarding works in roads that are under its control.

3.13.12 Works outside normal construction hours

Issue - Works (other than emergency works) should not be carried out outside normal construction hours

Sydney Water's contractors should not carry out any works other than emergency procedures to control dust or sediment laden run-off outside normal working hours, namely 7 am to 5 pm Monday to Friday and 8 am to 4 pm Saturday.

Response

As outlined in Section 6.9.3 of the EA, most construction work would occur during standard hours stipulated in the Interim Construction Noise Guideline (that is, 7 am to 6 pm, Monday to Friday; and 8 am to 1 pm on Saturdays). Any works required outside the standard construction hours would follow the requirements of the Interim Construction Noise Guideline.

3.13.13 Infrastructure location

Issue - Pipelines should be located in the road reserve and not the carriageway and other infrastructure should not be located within the road reserve

Water and wastewater mains should be located within the footpath area of the road reserve and not within the carriageway except where crossings are planned. Other infrastructure, such as reservoirs and pumping stations should not be located within the road reserve, but within newly created lots in private property with easements or within public reserves.

Response

The issue raised by WCC has been addressed by implementing Sydney Water's standard design procedures. As described in Sections 3.3 and 4.4 and of the EA, water and wastewater pipeline locations have been located and designed according to the *Water Supply Code of Australia* (WSAA 2002a) and *Sewerage Code of Australia* (WSAA 2002b). Water pipelines are located 2.6 m from the property line in the footway of the road reserve and wastewater pipelines in the road reserve would be located clear of the carriageway.

The preferred location of new reservoirs is on existing Sydney Water property to minimise the impact to the environment, stakeholders and the cost of land acquisition. New reservoirs may be

located on land that is currently private property. Proposed new reservoir locations consider the impact to the environment and stakeholders in the area.

The preferred location for a pumping station is in an area that has minimal impact to stakeholders and the environment, while also providing the lowest cost of transporting wastewater. Pumping stations are not typically located within road reserves.

3.13.14 Restoration of council managed land

Issue - Restoration on council managed land should be carried out to council's satisfaction

All restoration works within road reserves, footpaths and public reserves etc should be carried out to council's satisfaction and according to council's standard guidelines. Asphalt restoration of road crossings should extend beyond the vertical alignment of the trench.

Response

As noted in Section 3.4.2 of the EA, in locations where infrastructure such as roads or footpaths would be impacted, restoration would involve reinstating the road or footpath following Sydney Water's standard practices.

3.13.15 Road crossings along council managed roads

Issue - Minimisation of road crossings and under-boring of all road crossings must be considered as the primary objective

Under-boring all road crossings must be used as the primary objective before alternative methods such as open trenching are implemented. During detailed design, Sydney Water should try to minimse the number of road crossings required.

Response

Sydney Water would determine the construction method during optimisation of the detailed design and would consider many different factors, as outlined in Section 3.4.1 of the EA. As outlined in Section 7.2.2 of the EA, under-boring techniques would be used where pipelines cross major roads, such as the Princes Highway, to avoid traffic diversions and delays in these areas.

Appropriate construction methodologies for road crossings would be developed and implemented in consultation with the relevant council and/or RMS.

3.13.16 Vehicular access along council managed footpaths

Issue - Vehicular access across footpaths should be designed according to council's standards

Where vehicular access is required to service new infrastructure, Sydney Water should construct new concrete vehicular crossings to service this infrastructure across the footpath area of the road reserve, according to council's current policies. Sydney Water should arrange for a qualified concrete contractor to carry out the works. A copy of the approval should be submitted to council before work commences.

Response

Sydney Water would design permanent access points across footpaths to comply with council's requirements.

We would continue to consult with key agencies including WCC before construction starts and during the construction stages. All communication processes while we are constructing and

operating the Proposal would follow guidelines set out in Sydney Water's *Customer Contract* and *Community and Stakeholder Engagement Policy*.

3.13.17 Opportunity to comment

Issue - Opportunity to provide comment as the project evolves

WCC understands that there would be further opportunity to provide comment as this important critical infrastructure project assessment process evolves.

Response

As discussed in Section 8.4 of the EA, Sydney Water would continue to consult with key agencies including council, before construction starts and during the construction stages. All communication processes during construction and operation of the Proposal would follow guidelines set out in Sydney Water's *Customer Contract* and *Community and Stakeholder Engagement Policy*.

3.13.18 Proposed development placed within road reserves

Issue - No objections to the proposed development placed within road reserves

Council raises no objections to the proposed development, subject to the water pipes being placed within the road reserves, where possible.

Response

Water and wastewater pipeline locations have been located and designed according to the *Water Supply Code of Australia* (WSAA 2002a) and *Sewerage Code of Australia* (WSAA 2002b). We are currently optimising the pipeline alignments and will ensure that we consider the future final alignments of roads in pipeline alignments ..

3.14 Submission 14 – DPI - Fisheries NSW

3.14.1 No net impacts on receiving waterways

Issue - Waterways within the Proposal area that drain into Lake Illawarra have the potential to be impacted by the Proposal

Fisheries NSW notes that parts of Dapto Creek, Mullet Creek, Reed Creek, Robins Creek, Marshall Mount Creek and Macquarie Rivulet and their tributaries are within the proposed development area, which drain to Lake Illawarra and could be impacted by the Proposal. It is Fisheries NSW policy that all developments should aim to achieve no net impacts on receiving waterways.

Response

The DGRs required Sydney Water to minimise or prevent wastewater discharge or overflows to waterways. We have designed the Proposal to minimise discharges to Lake Illawarra, by carrying wastewater to treatment plants that discharge effluent to the ocean, rather than to treatment plants that discharge effluent to inland waterways, potentially including the lake. The Proposal would also use leak-tight wastewater pipelines that significantly reduce wet weather inflow. Sydney Water would continue to monitor the system to comply with EPL requirements.

As discussed in Section 3.3, we designed the Proposal to minimise operational impacts on Lake Illawarra, as required by the DGRs. The EA concluded that there would be no significant impacts to the receiving environment, or the environmental values of the Lake Illawarra catchment.

The receiving environment appears to be resilient and can assimilate pollutant loads reasonably well, as indicated in water quality results of Lake Illawarra, compared to the LIA trigger values.

Sydney Water's standard business practices involve route and location feasibility studies, during detailed design. For the Proposal, these studies would consider site-specific issues and could include, for example:

- geotechnical surveys
- geomorphological assessments
- locating existing underground services
- condition surveys
- other minor surveys and tasks required to optimise and finalise alignments, design and constructability.

The outcome of additional surveys or investigations would influence which watercourses are under-bored and which are trenched.

We would identify opportunities to reduce impacts during the optimisation of the detailed design and would consider the mitigation measures detailed in Chapter 6 of the EA, the Statement of Commitments, and relevant recommendations detailed in Appendices C – I of the EA. This would minimise the potential for adverse impacts on creeks, rivers and riparian areas.

Sydney Water agrees with Fisheries NSW that development should aim to minimise impacts on waterways and as such, we have adopted the measures in the Statements of Commitments to ensure this occurs.

3.14.2 Recommended conditions

Issue - Fisheries NSW has no objections to the Proposal but provides recommendations for approval

Overall, Fisheries NSW has no objection to approving the Proposal as outlined in the EA (including the Statement of Commitments), but makes the following comments and recommendations:

a. Fisheries NSW recommends under-boring for all water and wastewater pipeline crossings of major waterways mapped as key fish habitat by Fisheries NSW (3rd order and above) including Dapto Creek, Mullet Creek, Reed Creek, Robins Creek, Marshall Mount Creek and Macquarie Rivulet.

b. Fisheries NSW notes that Sydney Water will determine the final construction methodology for each creek crossing, during the detailed design and recommends that Sydney Water consult with Fisheries NSW about the waterway crossing methodologies and site-specific mitigation measures to be used for all waterways identified as key fish habitat.

c. Fisheries NSW recommends that Sydney Water design and construct any proposed new or upgraded temporary access road crossings of according to the Fisheries *NSW Policy and Guidelines for Fish Friendly Waterway Crossings* (2004) and *Why Do Fish Need to Cross the Road? Fish Passage Requirements for Waterway Crossings* (2004). Sydney Water should submit the design of any road crossings of the key fish habitat waterways listed above to Fisheries NSW for approval before construction.

d. Fisheries NSW concurs with the proposed safeguards and mitigation measures to minimise environment impacts, in particular, those related to marine and inland water quality, flora and fauna, soils and groundwater, and flooding, detailed in Sections 6.3, 6.4, 6.5, 6.8 and 6.12 of the EA.

Response

Sydney Water notes Fisheries NSW's agreement to the proposed safeguards and mitigation measures to minimise environmental impacts.

In response to item (a), Sydney Water would select the construction method at each creek crossing following consideration of environmental, engineering and operational constraints (refer to Section 3.4.1 of the EA). Site-specific evaluations would focus on sensitive locations. We anticipate that creek crossings would be under-bored if the localities have features like dynamic watercourses, perennial streams, highly erodible soils, and sensitive riparian corridors (including Category 1 waterways).

This would reduce the risk of erosion and sedimentation and associated impacts on water quality and hydrology. Trenching is likely to be the preferred construction method to cross minor creeks that are shallow, ephemeral, highly disturbed and weed infested.

In response to items (b) and (c), Sydney Water would consult with Fisheries NSW according to the requirements of the *Fisheries Management Act 1994.* Before carrying out or authorising any dredging or reclamation work, as defined under section 198A of the *Fisheries Management Act 1994,* Sydney Water will:

- give the Minister for Primary Industries written notice of the proposed work
- consider any matters concerning the proposed work that are raised by the Minister for Primary Industries within 28 days of giving the notice (or such other period as is agreed between the Minister for Primary Industries and Sydney Water).

Permanent access tracks across waterways would not be required. Any temporary crossings of waterways would be designed and constructed according to the Fisheries *NSW Policy and Guidelines for Fish Friendly Waterway Crossings* (2004) and *Why Do Fish Need to Cross the Road? Fish Passage Requirements for Waterway Crossings* (2004) and other relevant guidelines.

3.15 Submission 14 – DPI - NSW Office of Water

3.15.1 Stability of pipelines at watercourse crossings

Issue - Requested clarification for timing of route feasibility studies

The EA notes that Sydney Water would do route and feasibility studies during detailed design, and when determining the design of watercourse crossings, would consider the potential for the bed and banks of watercourses to scour and migrate. The NSW Office of Water asks when Sydney Water would provide the route and location feasibility studies.

Response

Sydney Water expects to do route and feasibility assessments during 2014.

As discussed in Section 8.4 of the EA, Sydney Water would continue to consult with key agencies, including NSW Office of Water, before construction starts and during the construction stages. However, Sydney Water does not intend to provide NSW Office of Water with copies of the feasibility studies. All communication processes during construction and operation of the Proposal will follow guidelines set out in Sydney Water's *Customer Contract* and *Community and Stakeholder Engagement Policy*.

3.15.2 Bank erosion and channel migration

Issue - Sydney Water must demonstrate that the watercourse crossing method for the pipelines would cause minimal harm to the watercourses

Sydney Water must demonstrate that the watercourse crossing method for the pipelines would cause minimal harm to the watercourses and waterfront land post-construction and meet the following criteria:

- The watercourses would remain in their current state of stability or have their stability improved in the long-term and, where possible, bed and bank stability of any affected watercourse will be enhanced and improved to mimic a naturalised state.

Response

Sydney Water's standard business practices involve doing route and location feasibility studies during detailed design. For the Proposal these studies would consider site-specific issues and could include:

- geotechnical and contamination surveys
- geomorphological assessments
- identifying the location of existing underground services
- condition surveys
- other minor surveys and tasks required to optimise and finalise alignments, design and constructability.

The outcome of additional surveys or investigations would influence which watercourses are under-bored and which are trenched.

The design of watercourse crossings would consider the potential for the bed and banks of watercourses to scour and migrate, as this would influence the depth of cover required over pipelines and the location of launch and receival pits for locations that would be under-bored (refer to Section 3.4.1 of the EA).

During the design process, we would identify opportunities to reduce potential environmental impacts and would consider the mitigation measures detailed in Chapter 6 of the EA, the Statement of Commitments and relevant recommendations detailed in Appendices C – I. This would avoid or otherwise minimise potential impacts on higher risk issues identified in the EA including watercourse crossings.

In locations where construction would impact the bed or banks of watercourses, restoration would include site-specific requirements to stabilise the bed or bank. We would restore the area as soon as practical, to ensure stream banks are appropriately re-instated to their pre-works condition (refer to Section 3.4.2 of the EA).

Issue - It is unclear if an additional assessment is proposed to identify other high risk watercourses

The EA states that site-specific evaluations would focus on sensitive locations such as dynamic watercourses and refers to the possibility of additional watercourses with risks similar to the four high constraint sites that have been identified. The technical report recommends a fluvial geomorphological assessment for the watercourses in the study areas. It is unclear if an additional assessment is proposed to identify other high risk watercourses.

The following condition of approval is recommended:

- Before starting construction, Sydney Water must do a fluvial geomorphological assessment of all watercourses to be affected by pipeline construction. The assessment is to identify:
    - the appropriate watercourse crossing methodology for the pipelines
    - where trenching or under-boring is proposed, the depth of scour should be determined, and crossings designed to be deeper than the identified scour depth
    - appropriate setback distances of the pipeline alignment from the watercourses where it is proposed to run parallel to the watercourses.

Response

Sydney Water does not support the NSW Office of Water's recommended conditions of approval. Doing a fluvial geomorphological assessment of all watercourses affected by pipeline construction, before starting construction, would be out of context with the Proposal's planning sequence. This would also be well beyond the scope of assessment needed to inform the design.

As indicated in Section 6.1.1 of the EA, specialist technical assessments were performed for some environmental issues during the initial stages of the Proposal, including the Geology, Soils and Groundwater Assessment (Appendix H of the EA).

The technical reports identified constraints and developed recommendations to minimise potential impacts associated with those constraints. These recommendations were developed in isolation and did not consider the context of other environmental issues, or engineering and operational limitations. We adopted this approach, because during preparation of the EA, the Proposal was at the planning stage and we intended to optimise the design was intended during subsequent phases, staged to meet the development timeframes set by the DP&I.

Most of the Proposal is located within the Coastal Plain and pipelines would typically cross watercourses within the lower reaches. Four watercourses in the Proposal area are identified as being high risk due to geomorphological issues (refer to Section 6.8.2 of the EA) and are also mapped as Category 1 watercourses (refer Section 6.5 of the EA). Category 1 watercourses would generally be under-bored.

Sydney Water's standard business practices involve route and location feasibility studies, during detailed design. For the Proposal, these studies would consider site-specific issues including geomorphological assessments and other minor surveys and tasks required to optimise finalise alignments, design and constructability.

The outcome of additional surveys or investigations would influence which watercourses are under-bored and which are trenched. The additional surveys would also help optimise the design, in terms of:

- pipe burial depths for any water crossings (considering the potential for the bed and banks to scour)
- the locations of launch and receival points for under-boring (considering potential for channel migration)
- appropriate set back distances for pipelines, if they run parallel to watercourses.

If additional watercourses are considered to present risks similar to those described in the EA as high risk areas, they would be managed similarly, with the principle mitigation measure being to avoid higher risk areas (see Section 3.4.1 of the EA).

3.15.3 Impacts to riparian land

Issue - Exit and entry points for under-boring and underground infrastructure should be located outside the riparian corridors and not just the 'top of bank'

The EA states that ‘where possible the exit and entry points for under-boring would be located outside the top of bank’ and also ‘where possible the exit and entry points would be located outside the riparian corridors’. Clarification is required on this.

The Office of Water supports under-boring, commencing from the outer edge of the riparian land (rather than from top of bank) to avoid impacts on the waterway/ aquatic environment and any existing native riparian vegetation or rehabilitation of riparian vegetation.

The submission also notes that underground infrastructure should be located outside the riparian corridors and not just the 'top of bank' except where it can be demonstrated that they can be located without adversely impacting any existing native riparian vegetation (particularly any threatened species or community) or the future rehabilitation of fully vegetated riparian corridors.

Response

The location of launch and receival pits for watercourses that would be under-bored would depend on a number of design, construction, operational and environmental constraints that would need to be considered as a whole, before construction. We would do site-specific evaluation and consider the location of the pits on a case-by-case basis.

We have designed the proposed pipeline alignments to avoid threatened vegetation communities and sensitive riparian and aquatic environments wherever practical. We have done desktop studies and field assessments to confirm alignment adjustments for wastewater pipelines to avoid sensitive environments.

Based on the field assessments, riparian corridors in the Proposal area generally occur as eroded and largely cleared creeks within farmland and provide limited habitat for fauna. They are highly disturbed, with most occurring within grazed paddocks on private property (refer to Section 6.5.1 of the EA).

We would identify further opportunities to reduce impacts during the optimisation of the detailed design and would consider the mitigation measures detailed in Chapter 6 of the EA, the Statement of Commitments, and relevant recommendations detailed in Appendices C – I of the EA including sensitive riparian corridors and associated ecological risks.

This would minimise the potential for adverse impacts on creeks, rivers and riparian areas. We will select the final design after considering environmental issues, constructability and operational requirements.

Issue - Pipeline corridor width is recommended to be limited to 6 m through native riparian vegetation and rehabilitated to emulate the local native vegetation

For riparian corridors that are to be conserved and rehabilitated, The Office of Water recommends that these areas are minimally disturbed and any areas of disturbance are rehabilitated to emulate the local native vegetation community of the area. If the construction footprint is to be 6 to 10 m wide, it recommends the extent of direct impact is limited to 6 m (rather than 10 m) through native riparian vegetation.

The following condition of approval is recommended:

- The project is to avoid or minimise disturbance of riparian corridors that are to be conserved and rehabilitated in the West Dapto release area. Where disturbance is unavoidable, disturbed areas are to be rehabilitated to emulate the local native vegetation community of the area.

Response

Sydney Water does not support the NSW Office of Water's recommended condition of approval. The proposed pipeline alignments have been designed to avoid sensitive riparian and aquatic environments wherever possible. This has been achieved through desktop studies during the design phase and field assessment by a specialist aquatic ecologist to confirm alignment adjustments to avoid sensitive environments.

Sydney Water would identify further opportunities to reduce potential environmental impacts during the optimisation of the detailed design and would consider the mitigation measures detailed in Chapter 6 of the EA, the Statement of Commitments, and relevant recommendations detailed the Flora, Fauna and Ecological Assessment (Appendix E of the EA). This would avoid or otherwise minimise potential impacts on higher risk issues including sensitive riparian corridors and associated ecological risks.

The width of the construction corridor would depend on a number of site-specific construction and design constraints that must be considered on a case-by-case basis, during optimisation of the design. Construction corridors will generally be narrower than 10 m where vehicle access is available to the worksite, such as along a road.

Where no access is available, the construction corridor tends to be wider to allow for vehicle access. Where Sydney Water cannot avoid native riparian vegetation, we would implement appropriate mitigation measures to minimise impacts on the vegetation (refer Section 6.5 of the EA).

We would appropriately stabilise and/or rehabilitate all construction sites and locations post-construction. We would revegetate along pipeline corridors in a manner that ensures the vegetation does not affect the operation or maintenance of the pipeline, restricting plant species to groundcover and shrub species with root systems that are unlikely to affect on the pipelines.

Issue - The Office of Water supports locating access tracks outside the riparian corridors

The Office of Water supports the locating of access tracks outside the riparian corridors, but where this will not be the case, it recommends that the area of disturbance is minimised.

Response

Where permanent access tracks are required, they would preferably be constructed outside riparian areas. This may not be possible where access to wastewater infrastructure may be required. In these instances, access tracks would be designed to minimise impacts on riparian areas (refer to Section 6.5 of the EA) and would consider the mitigation measures detailed in Chapter 6, the Statement of Commitments, and relevant recommendations detailed in Appendices C – I. This would avoid or otherwise minimise potential impacts on riparian vegetation.

Issue - The potential impact on the future rehabilitation of fully vegetated riparian corridors must be assessed

Sydney Water must assess the potential impact on the future rehabilitation of fully vegetated riparian corridors. It is not clear if riparian land affected by the Proposal can be rehabilitated in the future with fully structured riparian vegetation, if the pipelines are located under these areas and permanent access tracks are located in the riparian areas.

Response

We completed the flora and fauna impact assessment on the basis that restoration along pipeline corridors would include revegetation with suitable groundcover species selected to match the existing vegetation of the area disturbed (refer to Section 3.4.2 of the EA). The disturbed areas would not be rehabilitated with fully structured vegetation as it is Sydney Water's standard practice not to replant large tree species above pipelines for pipeline integrity

3.15.4 Watercourse monitoring

Issue - Watercourse crossings proposed to be trenched must be monitored to assess the impact of the construction work on the watercourse stability

Watercourse crossings proposed to be trenched must be monitored before, during and after construction to assess the impact of the construction work on the watercourse stability and to ensure the watercourses are rehabilitated to a standard equal to or better than the existing condition. This should include monitoring and maintaining any bank stabilisation and stream bed and bank rehabilitation. The rehabilitation must be monitored, until all crossing sites are identified as stable by an independent suitably qualified certifier.

A maintenance period of five years is recommended after final planting of native riparian vegetation. The rehabilitation of other non-native vegetation in riparian areas should be maintained until it is established and the area has been certified as stable by a suitably qualified independent certifier.

The following condition of approval is recommended:

- Before starting construction, Sydney Water should develop a monitoring to demonstrate the ongoing stability of watercourse crossings and rehabilitation of disturbed areas. The monitoring program is to:
    - provide for monitoring before, during and after construction, for a period of five years, or until disturbed areas are certified as stable
    - include monitoring and maintaining any bank stabilisation and stream bed and bank rehabilitation.

Response

Sydney Water does not support the NSW Office of Water's recommended condition of approval. Sydney Water's standard business practices involve route and location feasibility studies during detailed design.

For the Proposal, these studies would consider site-specific issues including geomorphological assessments and other minor surveys and tasks required to optimise finalise alignments, design and constructability.

The outcome of additional surveys or investigations would influence which watercourses are under-bored and which are trenched.

The additional surveys would also assist in optimising the design, in terms of:

- pipe burial depths for any water crossings (considering the potential for the bed and banks to scour)
- the locations of launch and receival points for under-boring (considering potential for channel migration)
- appropriate set-back distances for pipelines, if they run parallel to watercourses.

If additional watercourses are considered to present risks similar to those described in the EA as high risk areas, they would be managed similarly, with the principle mitigation measure being to avoid higher risk areas (see Section 3.4.1 of the EA).

Rehabilitating all construction sites and disturbed surfaces is a central part of the construction process. We would appropriately stabilise and/or rehabilitate all construction sites and locations, post-construction. We would develop site-specific rehabilitation measures during the detailed design process and may include maintenance and monitoring programs (refer to Section 3.4.1 of the EA).

Following construction, we would restore the area as soon as practical to ensure stream banks are appropriately re-instated to their pre-works condition and disturbed riparian zones are revegetated. For locations where the bed or banks of watercourses would be impacted by construction, restoration would include site-specific requirements to stabilise the bed or bank (refer to Section 3.4.2 of the EA). We would tailor the rehabilitation and revegetation strategy to the requirements of specific sites, during the detailed design phase.

Restoring pipeline corridors would include revegetating with suitable groundcover species and using temporary erosion and sediment controls as required. Groundcover plant species would be selected to match the existing vegetation of the area that is disturbed.

Sydney Water does not propose an ongoing monitoring program because our principal mitigation measure is to avoid higher risk watercourses and restore sections of the riparian corridor that are disturbed, using techniques based on Sydney Water's extensive experience constructing pipelines in riparian areas.

3.15.5 Wetlands

Issue - It is recommended the pipeline routes avoid wetland areas

The EA states that wastewater pipelines would be designed to avoid wetlands and swamps as much as possible and indicates coastal freshwater lagoons should be avoided where practical and technically feasible. It is recommended the pipeline route avoids wetland areas. If this is not possible, these areas should be under-bored instead of using open trenching to minimise impacts.

Response

The Proposal addresses the intent of the issue raised by the NSW Office of Water. As described in Section 3.3 of the EA, most drinking water pipelines are likely to be located in existing or future road verges and pathways and wastewater pipelines would generally be laid next to drainage lines and creek lines to allow wastewater to be transported by gravity. We would construct wastewater pipelines according to the WSAA standards (2012b), and where practical would avoid wetlands, waterways and floodways, swamps, estuaries, sand dunes and foreshore areas.

Sydney Water's standard business practices involve route and location feasibility studies during detailed design. For the Proposal, these studies would consider site-specific issues and could include:

- geotechnical and contamination surveys
- geomorphological assessments
- identification of the location of existing underground services
- condition surveys
- other minor surveys and tasks required to optimise and finalise alignments, design and constructability.

The outcome of additional surveys or investigations would influence which watercourses and wetlands are under-bored and which are trenched.

In general, we anticipate that creek crossings would be under-bored, if the localities have features such as dynamic watercourses, perennial streams, highly erodible soils, and sensitive riparian corridors. Trenching is likely to be the preferred construction method to cross minor creeks that are shallow, ephemeral, highly disturbed and weed infested.

3.15.6 Licensing requirements

Issue - The volume of groundwater to be extracted during construction should be considered to determine if a licence is required from the Office of Water.

The EA notes if groundwater is encountered during construction it would be pumped out. Sydney Water needs to quantify the amount of water to be taken to determine if a licence is required from the Office of Water.

The following condition of approval is recommended:

- Prior to commencement of construction, a water licence must be obtained for any dewatering activity undertaken.

Response

Sydney Water does not support the NSW Office of Water's recommended condition of approval.

Dewatering of trenches is generally done to manage rainwater ingress and not groundwater. There is the potential for groundwater to be encountered in some locations. Details about the amount of groundwater that may be encountered is not available at this time. The amount of groundwater encountered during the excavation of trenches would be considered during the optimisation of the detailed design of the pipelines. Sydney Water would consult with NOW at this time to determine if a licence is required depending on the geotechnical information and the trench depth.

In general, wastewater pipeline trenches are relatively shallow and would be backfilled at the end of the day and therefore groundwater ingress is expected to be relatively minimal. As noted in the EPA submission, the EPA generally agrees that groundwater impacts are not anticipated to be great and that significant environmental impacts are unlikely if the recommended management and mitigation measures are successfully implemented.

The main approvals ordinarily required under the *Water Management Act 2000* for the Proposal are under sections 89 (water use approvals) and 90 (water management work approval). These approvals are not required for a project approved under the former Part 3A of the EP&A Act.

3.16 Submission 14 – DPI - Catchments and Lands Division

3.16.1 Consultation with Crown Lands for infrastructure within Crown Lands

Issue - Sydney Water should consult with Crown Lands Division for any infrastructure proposed within Crown Lands

If Crown land is sought for the location of the proposed works, a condition for approval should be that Sydney Water consults with the DPI Crown Lands Division before finalising any alignments and associated infrastructure.

Response

Sydney Water agrees with the intent of Catchment and Crown Lands' condition of approval. However, the Proposal would not impact on Crown land and therefore consultation with DPI Catchment and Lands Division is not required. As such, Sydney Water considers that the recommended condition is not necessary.

Sydney Water would do consistency assessments if components of the Proposal are refined during optimisation of the detailed design. Should any infrastructure be located within Crown land, we would consult with the Crown Lands Division of DPI before construction.

As discussed in Section 8.4 of the EA, Sydney Water would continue to consult with key agencies before construction starts and during the construction stages. If Crown land would be impacted, we would consult the Catchment and Lands Division. All communication processes during construction and operation of the Proposal would follow guidelines set out in Sydney Water's *Customer Contract* and *Community and Stakeholder Engagement Policy*.

4. Statement of Commitments

The DGRs for the EA require Sydney Water to develop Statement of Commitments that identifies measures for environmental mitigation, management and monitoring for the Proposal.

Chapters 6, 7 and 8 of the EA identify most of these measures in the context of the impact assessment. The measures are consolidated into the Statement of Commitments outlined in Table 4-1. There have been no changes to the Statement of Commitments documented in the EA because:

- they are considered to be sufficient to manage potential environmental impacts that may occur as a result of the Proposal
- they provide flexibility to enable further opportunities to be considered during detailed design to reduce potential environmental impacts and this would consider the mitigation measures detailed in Chapter 6 of the EA, and relevant recommendations detailed in Appendices C – I of the EA. This would avoid or otherwise minimise potential impacts on higher risk issues identified in the EA
- the Proposal must be flexible to enable it to be optimised during detailed design and then efficiently delivered in stages over a 35-year development horizon. It must also have the flexibility to accommodate adaptive management approaches that may incorporate refinements to further realise environmental benefits and objectives.

Subject to the Minister for Planning and Infrastructure approving the Proposal, Sydney Water and parties acting on its behalf, would design, construct and operate the Proposal according to the Statement of Commitments. Section 3.4 of the EA outlines the process we would implement, during the design process, to optimise the Proposal and minimise potential environmental impacts. This includes the management measures described in Chapters 6, 7 and 8 of the EA, the Statement of Commitments, and the relevant recommendations in the technical reports appended to the EA.

Table 4.1 describes the phase(s) of the Proposal in which each commitment applies. As the Proposal is likely to be staged over several decades, further definition of the Proposal phases is included below:

- **Design**: includes concept design and detailed design before and during construction.
- **Pre-construction**: the pre-construction phase may involve establishing and investigating activities determined to have minimal environmental impact. This may include but not be limited to:
    - survey
    - acquisitions
    - fencing
    - investigative drilling or excavation
    - building/road dilapidation surveys
    - minor vegetation removal except where threatened species or ecological communities will be affected establishing site compounds.
- **Construction**: includes physical work relating to the Proposal. Commissioning activities are also considered to be part of the construction phase.
- **Operation**: includes the operating the Proposal, but does not include commissioning, trials of equipment or temporary use of parts of the Proposal during construction.

Table 4-1 Statement of Commitments for the Proposal

Number	Commitment	Project phase
Water quality, soils and groundwater		
1.	Erosion and sedimentation control will be managed using measures developed in accordance with *Managing Urban Stormwater, Soils and Construction* (Volume 1, Landcom 2004 and Volume 2A, DECC 2008).	Pre-construction and construction
2.	Groundwater encountered during construction will be pumped out of the work area into a contained area, tested and if necessary appropriately treated, prior to re-use, appropriate discharge or disposal.	Construction
3.	ASS will be managed in accordance with the Acid Sulfate Soils Management Advisory Committee: Acid Sulfate Soils Assessment Guidelines (ASSMAC, 1998).	Design and construction
4.	The Proposal will be designed and operated to meet wastewater system EPLs.	Design and operation
Riparian and aquatic habitats		
5.	Detailed design will consider how impacts to riparian and aquatic habitats can be avoided or minimised by: • placing pipeline alignments outside the 'top of bank' • utilising existing and/or proposed road infrastructure to cross watercourses • avoiding farm dams and freshwater lagoons • applying pipeline construction methods for watercourse crossings in accordance with the objectives of with the DIPNR (2004) Riparian Corridor Management Study.	Design and construction
6.	Sydney Water will design and construct the Proposal's wastewater pipelines using techniques to minimise inflow/infiltration.	Design and construction
Terrestrial flora and fauna		
7.	Detailed design will consider how impacts to native vegetation can be avoided or minimised by: • placing pipelines to have the least impact to native vegetation and avoid EECs and significant hollow-bearing trees • using construction methods that avoid and minimise impacts.	Design and Construction
8.	Construction management measures will be developed and implemented to minimise impacts to flora and fauna.	Construction
9.	Sydney Water will progressively rehabilitate work sites following completion of construction.	Construction
Aboriginal heritage		
10.	Sydney Water is committed to avoiding impacts on items of Aboriginal cultural heritage significance where practicable.	Design and construction
11.	Where it is not practicable to avoid impacts, management measures will be implemented to mitigate impacts.	Design and construction
12.	Sydney Water will undertake on-going consultation with RAPs.	Design and construction
13.	Procedures will be implemented to ensure planned maintenance activities are undertaken in a manner that minimises impact on the Aboriginal heritage items.	Operation

Number	Commitment	Project phase
Non-Aboriginal heritage		
14.	Where practicable, the pipelines will be re-located to avoid areas of non-Aboriginal heritage value.	Design and construction
15.	Where impacts on unlisted items of possible non-Aboriginal heritage significance are unavoidable, specific mitigation measures will be followed for each item.	Design and construction
16.	Relevant construction personnel will be inducted on actions to take if previously unrecorded non-Aboriginal heritage items are found.	Construction
17.	Procedures will be implemented to ensure maintenance activities are undertaken in a manner that minimises impact on the non-Aboriginal heritage items.	Operation
Air quality		
18.	Potential impacts from dust generation will be managed through standard industry suppression measures.	Construction
19.	Odour management will be undertaken in accordance with Sydney Water's existing procedures. Odour complaints will be registered and investigated. Engineering, operational, and other odour reduction measures will be implemented where verified odour complaints are received about odours from the wastewater system.	Operation
Noise and vibration		
20.	Mitigation measures will be used to reduce the construction noise impact on sensitive receivers. Including limiting noise work to less sensitive time periods, selecting low noise plant equipment and using quieter construction methods where practicable.	Construction
21.	Where vibration from construction activities may impact on residents, the activities will be managed in accordance with the British Standard BS 6472 – 1992 and AS 2436-1981.	Construction
22.	Where vibration from construction activities may impact on nearby structures, the activities will be managed in accordance with British Standard 7385:Part 1 – 1993 Evaluation and Measurement for Vibration on Buildings.	Construction
23.	For historic buildings, which have a higher sensitivity to vibration, the guidelines within the *German Standard DIN 4150 - Part 3* will be adhered to.	Construction
24.	Development of the detailed design will include industry standard noise treatments to control operational noise levels.	Design
Hazards and risks		
25.	Fuel and chemical storage areas will be maintained within bunded facilities that conform with relevant standards and codes, primarily *AS 1940: The Storage and Handling of Combustible and Flammable Liquids and Dangerous Goods Storage Codes.*	Construction
Consultation		
26.	During construction, communities will be informed prior to the start of any works in their area and will be notified at regular intervals throughout the construction process.	Construction
Traffic, transport and access		
27.	Road closures will be developed and implemented in consultation with the relevant road authorities (council and/or the RMS).	Pre-construction and construction
28.	Appropriate construction methodologies for road crossings will be developed and implemented in consultation with the relevant council and/or the RMS.	Design, pre-construction and construction

Number	Commitment	Project phase
29.	Where there is a potential to impact on access to private property or pedestrian pathways, property owners, the local community and councils will be informed appropriately. Mitigation measures may include providing alternative access, reinstating access at the end of each day, and reinstating impacted areas to their original condition.	Construction and operation
Waste generation and management		
30.	Excavated spoil will be reused on site for backfilling, landscaping and other uses. Where spoil is unsuitable for reuse, spoil would be classified according to the DECCW *Waste Classification Guidelines* (DECCW 2009a) and disposed of at an appropriately licensed facility.	Construction
31.	Where relevant, soil contamination studies will be carried out prior to construction. Soils will be analysed for a broad range of potential contaminants to provide an indication of potential waste classification *Waste Classification Guidelines* (DECCW 2009a). Excavated contaminated soil will be disposed of at an appropriately licensed facility.	Pre-construction and construction
32.	All wastes generated by the construction and operation of the Proposal will be classified and disposed in accordance with *Waste Classification Guidelines* (DECCW 2009a).	Construction and operation
Energy and greenhouse gas emissions		
33.	All vehicles and equipment will be adequately maintained and operated to ensure efficient operation to minimise energy use and greenhouse gas emissions.	Construction
34.	The project will be implemented in accordance with Sydney Water's policy on energy efficiency and greenhouse gas mitigation.	Operation
Visual amenity		
35.	Areas disturbed by pipeline construction will be progressively rehabilitated.	Construction
36.	Visual impacts of reservoirs and ventilation shafts will be minimised through painting the structures a dark 'bush green' colour, which has been chosen as the colour most compatible with the surrounding environment.	Construction
Land use and services		
37.	Relevant service providers will be consulted during detailed design to identify interactions and develop procedures to be implemented to minimise service interruptions. This will involve confirming any requirements or standards that will apply if it is determined that existing utilities or services need to be temporarily or permanently relocated. Inspections will be undertaken before construction starts in each location to confirm that there are no services in the area that were previously unknown.	Design, pre-construction and construction

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Water Services Association of Australia (WSAA) 2002b, *Sewerage Code of Australia, Sydney Water Edition, WSA 02-2002b*

Appendix A
Submissions

Appendix A – Submissions

Submissions can be viewed on the Major Projects Assessment Database on the Department of Planning and Infrastructure's website.

http://majorprojects.planning.nsw.gov.au/index.pl?action=list_submissions&job_id=3541

#1

NSW GOVERNMENT

Heritage Council of New South Wales

3 Marist Place
Parramatta NSW 2150

Locked Bag 5020
Parramatta NSW 2124
DX 8225 PARRAMATTA

Telephone: 61 2 9873 8500
Facsimile: 61 2 9873 8599

heritage@heritage.nsw.gov.au
www.heritage.nsw.gov.au

PCU038021

Contact: Katrina Stankowski
Phone: (02) 9873 8569
Fax: (02) 9873 8550
Email: Katrina.Stankowski@heritage.nsw.gov.au
File No: 12/06271
Job ID: A1081756
Your Ref: MP09_0189

Belinda Scott
A/Team Leader - Water
Infrastructure Projects
Department of Planning & Infrastructure
GPO Box 39
SYDNEY NSW 2001

Dear Ms Scott

Reference is made to the your letter (received by this Branch on the 7th of September) requesting comments on the Environmental Assessment for the water and wastewater servicing of the West Dapto urban release area and adjacent growth areas (MP 09_0189) that is currently on public exhibition. It is noted that comments on this Major Project were previously provided in April 2012.

Accompanying your letter was a copy of the Sydney Water Environmental Assessment (EA) titled '*Water and Wastewater Servicing of the West Dapto Urban Release Area and Adjacent Growth Areas* (four volumes) dated September 2012.

This major project covers the provision of water and wastewater services to an area of 420 hectares to service approximately future 30,000 dwellings as part of the West Dapto Urban Release Area and Adjacent Growth Areas in the Illawarra Region. This area currently contains approximately 144 non-indigenous heritage sites of varying levels of significance and the project has the potential to directly impact six sites and potentially impact 56 sites including cemeteries, State significant homesteads and important sites relating to the regions agricultural and dairying history.

It is noted that in regards to this heritage, the EA states that "*a number of Aboriginal heritage and non-Aboriginal heritage sites may be impacted by construction of the Proposal. Sydney Water intends to avoid these sites if feasible. However, given the extent of the sites and design limitations on water and wastewater systems, avoidance is unlikely to be practical in all cases. Where sites cannot be avoided through construction methodologies or design alterations, Sydney Water has developed mitigation measures to minimise impacts… For non-Aboriginal heritage sites, mitigation measures may include undertaking further assessment of heritage significance and test excavation*" (page 240).

Accordingly, having considered the above documents and the information contained within them the following comments are provided:

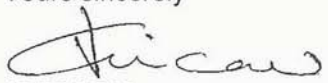
1. This project would have a range of impacts on a wide range of heritage including two items which have been assessed as being of State significance – Avondale Homestead and Marshal Mount Homestead, Garden & Outbuildings. The Heritage Branch considers that these impacts are not acceptable.
    - In regards to Avondale Homestead it is noted that this impact relates to water pipes placed in a road corridor proposed by Wollongong City Council which "would pass either through or just south of the main building" (Table 6-28, page 157). The EA also states that this pipeline would only be constructed in this location if Council obtains approval for this road alignment. If Council revises the road alignment, Sydney Water would refine the alignment of the water pipeline such that it remains within the road corridor.
    - In regards to Marshal Mount Homestead, Garden & Outbuildings this impact relates to a water pipeline which is planned to be constructed along Marshall Mount Road which may directly impact the gardens and one outbuilding.

- It is noted that the EA report and its Appendix G (Non-Aboriginal Heritage Assessment) contain different information in regards to Marshall Mount Homestead. The EA states that the works are "unlikely to impact on elements such as the gardens and outbuildings that contribute to the heritage significance of this item" (page 152) while the Non-Aboriginal Heritage Assessment states that a "water pipeline is planned to be constructed along Marshall Mount Road. If constructed along the south-east side of the Marshall Mount Road there is the possibility of direct construction impacts on the gardens and on one outbuilding" (Appendix 1- Summary table of sites and management recommendations).

2. As Sydney Water has shown in the EA it is willing to refine the alignment of the water pipeline which will impact on Avondale, it is considers that Sydney Water should not wait for Wollongong Council to make a decision about the proposed road, but should recognise the outstanding heritage significance of Avondale (as assessed in the EA) and redesign the project to ensure that there are no impacts to Avondale.
3. Sydney Water should also ensure that the gardens and outbuildings of Marshall Mount Homestead are not impacted during works.
4. Based on the wide ranging impacts on heritage across the project area the proposed Draft Statement of Commitments (DSoC) (numbered 14-17) are not considered adequate. They will not be capable of mitigating the large number of impacts this project will have on non-indigenous heritage.
5. Based on the impacts identified in the AECOM non-Indigenous Heritage report the it is considered that if Major Project 09_0189 is approved, conditions of Approval must be included (in addition to the four existing DSoC) that state:
    - Each non-Indigenous heritage item identified as being of local or above significance which is to be directly or indirectly impacted by this project must be managed in accordance with the individual and specific recommendations made for each item within Appendix 1 (Summary Table of Sites and Management Recommendations) of the Non-Indigenous Heritage Assessment and Impact Management' dated September 2012.
    - In cases where further archaeological testing or salvage excavation is proposed to minimise project impacts, the chosen Excavation Director must demonstrate in writing that they meet the Heritage Council Excavation Directors Criteria for excavation at these sites. This submission must be sent to the Heritage Branch, Office of Environment & Heritage for comment prior to any archaeological works commencing.
    - Should the layout proposed for the Water and Wastewater Pipelines change during the life time of the project and additional heritage items will be impacted by this change, a Heritage Impact Assessment must be undertaken to identify these impacts and provide mitigation measures to offset them.
    - A Historic Heritage Construction Management Plan must be undertaken prior to works commencing to guide the management and protection of heritage items during construction, particularly in relation to vibration impacts. This Plan must be sent to the Heritage Branch, Office of Environment & Heritage for approval prior to any archaeological works commencing.

If you have any questions regarding the above advice, please feel free to contact Katrina Stankowski at Katrina.Stankowski@heritage.nsw.gov.au.

Yours sincerely



18/09/2012

Vincent Sicari
Manager – Conservation Team
Heritage Branch
Office of Environment & Heritage
As Delegate of the NSW Heritage Council

Catchment Management Authority
Southern Rivers

#2

10/10/2012
OUT/NOWRA/OCT-12/05

PCU038764

Belinda Scott
Senior Planning Officer
Department of Infrastructure and Planning
GPO Box 39
Sydney NSW 2001

Re: Environmental Assessment for Water and Wastewater Servicing of the West Dapto Urban Release Area

Dear Belinda,

Thank you for the opportunity to comment on this important Environmental Assessment. Southern Rivers Catchment Management Authority is currently not in a position to provide a detailed response due to the conflicting statutory priority of Catchment Action Plan (CAP) review. The CAP is a whole of government document that provides the strategic direction for natural resource management in the region. The proposed development should be consistent with the priorities outlined in the current CAP.

As a minimum Southern Rivers CMA suggests that infrastructure be located such that it does not adversely impact on the creeks and rivers of the project area or on the associated riparian zones. Impacts on Threatened Species, Populations and Ecological Communities as identified in table 6-19 of the Environmental Assessment should be minimised, with the location of proposed infrastructure located outside of existing habitats.

Please contact Jason Carson on 4429 4446 if you require any further information.

Yours sincerely,

Chris Presland
Landscape Manager
Shoalhaven/Illawarra

Department of Planning
Received
15 OCT 2012
Scanning Room

Southern Rivers Catchment Management Authority
5 O'Keefe Avenue, Nowra NSW 2541 | PO Box 309, Nowra NSW 2541
Telephone: 02 4429 4444 | Facsimile: 02 4429 4458 | Website: www.southern.cma.nsw.gov.au

NSW GOVERNMENT | Lake Illawarra Authority

#3

Contact: Garry Clarke
(p) 42759470

Infrastructure Projects
NSW Department of Planning and Infrastructure
GPO Box 39
SYDNEY NSW 2001

25 October 2012

Attention: Belinda Scott

Dear Belinda,

Environmental Assessment for Water and Wastewater Servicing of the West Dapto Urban Release Area and Adjacent Growth Areas 09-0189

The Lake Illawarra Authority (LIA) has reviewed the relevant sections of the Environmental Assessment (EA) for the above project submitted by Sydney Water. The LIA seeks to ensure the long term sustainability of Lake Illawarra by ensuring, as a minimum, no reduction of existing environmental qualities and an improvement to the lake environment where practical.

The LIA holds a strong view that all proposals for urban growth should target "no net increase in pollutants" for wastewater and stormwater impacts on the Lake.

The LIA has concerns with the long term operation of the proposal. The EA does not demonstrate preservation of existing environmental qualities, nor provide adequate commitment to potential mitigation measures.

In overview the LIA's concerns are:

- The Director General's requirements regarding inland water quality have not been adequately addressed.
- The EA seeks approval of infrastructure that will increase the release of nutrients into Lake Illawarra.
- The existing Environmental Protection Licence (EPL) for the wastewater system will permit an increase in nutrient release to Lake Illawarra.
- The EA does not commit to the monitoring of future impacts of wastewater overflow on inland waterways.
- Sensitivity analysis should be undertaken to assess potential impacts on inland water quality.

State Office Block, 84 Crown Street, Wollongong NSW 2500 (PO Box 867, Wollongong 2520)
Telephone: (02) 4275 9471 Facsimile: (02) 4225 0480

Director General's Requirements

The EA addresses the impacts on Lake Illawarra and its sub-catchments under the heading "Inland Water Quality". The DG's requirements included the need to:

a) Assess water quality impacts during the operation of the system.
b) Identify wet weather effluent storage requirements.
c) Identify measures to prevent or minimise sewerage overflows and subsequent impacts on waterbodies.

The intent of the DG's requirements is to assess and minimise impacts, particularly long term operational impacts, on sensitive downstream waterways including Lake Illawarra. The EA provides an assessment of operational water quality impacts at a qualitative level; detailed quantitative modelling has not been undertaken. The EA and the Draft Statement of Commitments do not indicate any need for specific mitigation measures, despite an identified increase in nutrient levels in Lake Illawarra. In the LIA's view, the DG's requirements have not been satisfactorily addressed; the applicant should commit to mitigation measures to avoid nutrient increases, or undertake more detailed studies to quantitatively demonstrate the impact of increased pollutant loads on inland waterways.

Increased Nutrient Loading

The EA identifies increased nutrient loads in Lake Illawarra during the long term operation of the system.TP is predicted to increase 3% above existing levels. TN which is likely to be the limiting nutrient is predicted to increase 4% above existing levels. The EA does not make any commitment to reduce these pollutant loads. The EA does not provide a comprehensive assessment of the long term impacts of increased pollutant loading on Lake Illawarra.

The LIA holds a strong view that it is appropriate to target a "no net increase in nutrients" approach. This is particularly the case given the long term impacts of the proposal and the degree of uncertainty that should be prudently applied to modelling predictions.

The EA correctly indentifies that stormwater runoff is a major contributor to existing pollutant loads in Lake Illawarra. However, this does not in any way justify the proposed increase in pollutant loading from the sewerage system. Preservation of the environmental qualities of Lake Illawarra, dictates that a target of "no net increase" in pollutants be adopted for all elements of the West Dapto Growth area. This should include the proposed wastewater system and the future stormwater management system.

Existing Environment Protection Licence

The LIA notes that the current EPL's for the sewerage system will permit increased release of nutrients and pollutants into Lake Illawarra. This is a cause for great concern. Consequently, commitments in the EA to comply with the current EPL will not necessarily ensure the long term sustainability of the environment of Lake Illawarra.

The Director General should impose a Condition of Consent, or seek a binding formal commitment that Sydney Water will progressively improve the performance of the infrastructure system to further mitigate the proposed increased nutrient loading in Lake Illawarra. This is particularly important since the EA does not demonstrate the long term sustainability of Lake Illawarra's water quality.

Future Monitoring

The EA does not appear to make satisfactory commitments regarding the monitoring of impacts from wastewater overflow. The LIA notes that the applicant's Draft Statement of

Commitments, is silent over the issue of future monitoring. Consequently, any approval of the proposal should be subject to a Condition of Consent requiring future monitoring of wastewater overflow impacts on inland waterways.

As an example in Appendix D, page 110 the EA states (with respect to overflow into Mullet Creek) "This volume of discharge to Mullet Creek and subsequently into Lake Illawarra is unlikely to be sustainable. The potential for eutrophication of Mullet Creek and Lake Illawarra would appear to be high." Clearly, future monitoring of impacts of wastewater overflows is essential to inform the need for future mitigation measures. Similarly, the LIA believes that some existing wastewater overflows are directed to areas of the Lake including Koona Bay and Koonawarra Bay that have little assimilative capacity due to very shallow water depths. These examples further reinforce the need for monitoring of sewerage overflow impacts, particularly given the fact that discharges are projected to increase.

Additional Sensitivity Analysis

Sensitivity analysis is important to test assumptions and increase awareness of potential risks. The LIA recommends that sensitivity analysis should be undertaken on two modelling inputs that potentially effect the wastewater overflow predictions and the water quality predictions; these inputs being assumed rainfall and wet weather infiltration into the wastewater system.

The EA adopts a mean rainfall of 815mm derived from a 10 year data set for Albion Park. The adopted rainfall seems far too low. The LIA understands a data set of approximately 100 years is available for Albion Park. A long term data set that will have higher rainfall and more statistical validity should be modelled as a sensitivity analysis. The EA contends that the adopted rainfall provides a conservative outcome. Nevertheless, a sensitivity analysis will test system performance including sewerage overflow under more valid rainfall assumptions.

The EA indicates that wet weather infiltration into the wastewater system can be a significant contributor to wet weather sewerage overflows. The EA assumes the use of leak tight pipes with low infiltration rates in the order of 1% as a means to minimise wet weather infiltration. It is not clear if leak tight pipes have been assumed for the entire system serving West Dapto or only the components of the system covered by the EA. The LIA notes that the long term performance of leak tight pipes may reduce over time and that the overall wastewater system serving West Dapto may have conventional wastewater pipes. The LIA recommends a sensitivity analysis on the impact of "conventional/non leak tight pipes". This sensitivity run will test system performance including sewerage overflow under a scenario that should be considered prior to the application being determined.

The LIA is concerned that higher rainfall and increased wet weather infiltration may significantly increase sewerage overflow. These scenarios are not improbable and should be objectively tested by sensitivity analysis, prior to the application being determined.

Should you require any further information please contact Mr Garry Clarke on 42759472 or email garry.t.clarke@lands.nsw.gov.au.

Yours faithfully

For: Brian Dooley
Executive Officer

#4

WEST DAPTO URBAN RELEASE AREA and ADJACENT GROWTH AREAS

Proposed water and wastewater services

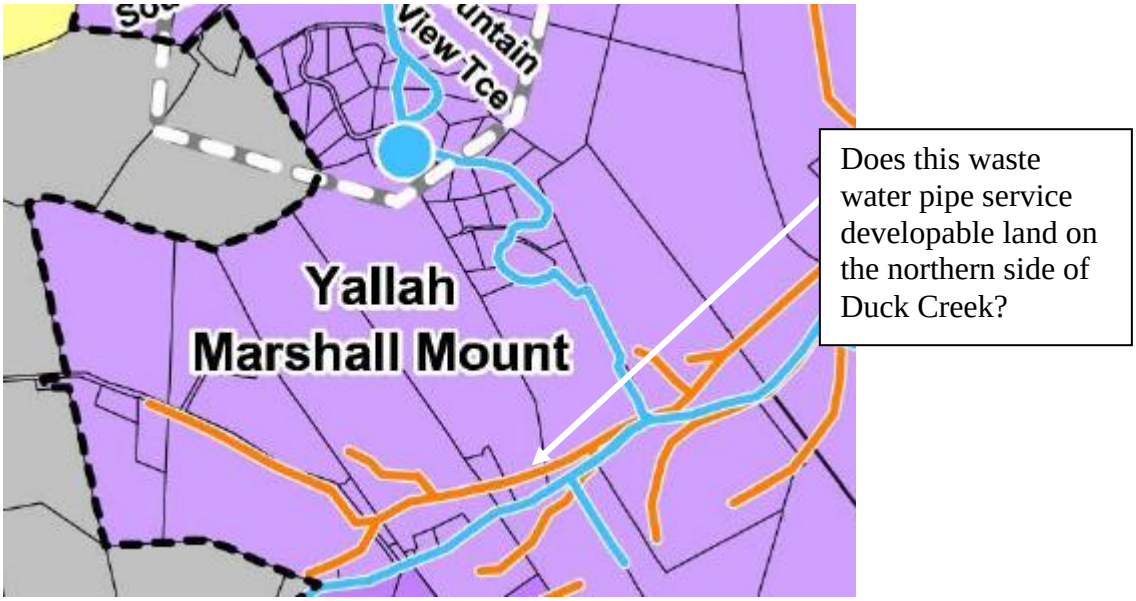
We are writing to comment on the Environmental Assessment of the proposed water and waste water services for West Dapto Urban Release Area and Adjacent Growth Areas.

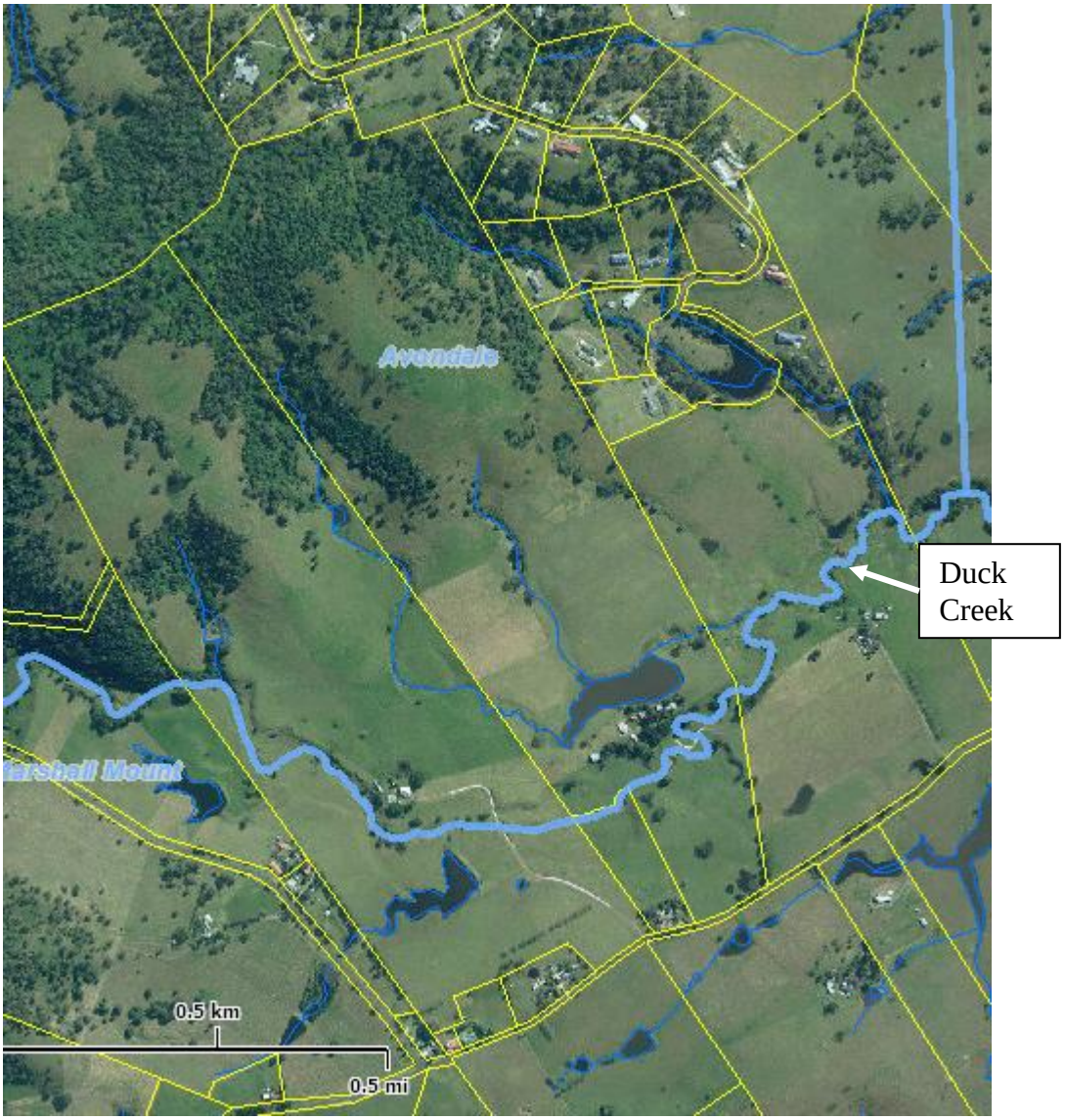
In particular we are interested in the specific trunk infrastructure that is proposed to be located on our property 386 Marshall Mount Road, Marshall Mount.

The proposed waste water pipeline shown on page 2 of the WDURA Fact Sheet, dated May 2011 is indicated to be located near the southern boundary of our property, on the southern side of Duck Creek. We are concerned that this location fails to service developable land located on the northern side of Duck Creek.

We think extending this pipeline to North Marshall Mount Road on the northern side of Duck Creek will better service this area of Yallah/Marshall Mount. We consider that locating the waste water pipeline along the creekline would allow for gravity assisted discharge, whilst avoiding impact upon developable land.

We request comment from you about planned development servicing for our property as part of this consultation.




Avondale
Duck Creek
0.5 km
0.5 mi

If you require further information about this submission please contact by email heather.finch@bigpond.com or phone 42562033.

Regards,
Garry and Heather Finch
386 Marshall Mount Road
Marshall Mount NSW 2530

#5

Swati Sharma - Submission Details for Lawson Fredericks (support)

From: Lawson Fredericks <lawson@miltonbrook.com.au>
To: <swati.sharma@planning.nsw.gov.au>
Date: 29/10/2012 10:45 AM
Subject: Submission Details for Lawson Fredericks (support)
CC: <assessments@planning.nsw.gov.au>

NSW Planning & Infrastructure

Confidentiality Requested: no

Submitted by a Planner: no

Disclosable Political Donation: no

Name: Lawson Fredericks
Email: lawson@miltonbrook.com.au

Address:
13 Broughton Ave

Tullimbar, NSW
2527

Content:
Miltonbrook Project Management is acting on behalf of 3 landholders (Castagna, Hill & Heininger) located at the corner of Yallah & Marshall Mount Roads, Yallah, to assist them through the current rezoning process with the aim to achieve a zoning that will facilitate the development of a relatively compact urban village, which includes a town centre at the intersection of Yallah & Marshall Mount Roads.
Sydney Waters exhibited plans include provision of water & wastewater services to this most southern precinct (Yallah/Marshall Mount) of the WDURA. The exhibited plans appear to be very generalized and and as a result we can see the need for Sydney Water to be granted considerable flexibility in any approval as a result of this application.
Further, as Wollongong City Council is still completing the detailed strategic planning for this precinct, the final location of trunk infrastructure & pumping stations may need to be adjusted. For example, we can see the need for the WWPS on Marshall Mt Rd (Hrs Colleen Heiningers land) to be shifted north closer to the confluence of Duck & Heininger Creeks, in order for the pump station to be at the bottom of the urban catchment.
We therefore request that Sydney Water be given the flexibility to adjust their plans as planning detail is finalized, but in consultation with those landholders that will be directly affected.
Lawson Fredericks
Project Manager
Miltonbrook Project Management Pty. Ltd
Mob: 0418 264 810
E-mail : lawson@miltonbrook.com.au

IP Address: mail.miltonbrook.com.au - 203.45.8.35
Submission: Online Submission from Lawson Fredericks (support)
https://majorprojects.affinitylive.com?action=view_diary&id=43239

Submission for Job: #3542 09_0189 , Concept Plan
https://majorprojects.affinitylive.com?action=view_job&id=3542

Site: #2121 Water and Wastewater Servicing of the West Dapto Urban Release Area and Adjacent Growth Areas
https://majorprojects.affinitylive.com?action=view_site&id=2121

Lawson Fredericks

E : lawson@miltonbrook.com.au

#6

NSW GOVERNMENT | Office of Environment & Heritage

Your reference:
Our reference: Doc12/37193
Contact: Rachel Lonie , 9995 6837

Director, Infrastructure Projects
Department of Planning and Infrastructure
GPO Box 39
Sydney NSW 2001

Attention: Swati Sharma

Dear Director

I refer to your correspondence received 5th September 2012 seeking comment from the Office of Environment and Heritage (OEH) on the Environmental Assessment (EA) for the Water and Wastewater Servicing of the West Dapto Urban Release Area and Adjacent Growth Areas (09_0189).

OEH has reviewed the documents and provides detailed comment in Attachment 1. OEH considers that biodiversity offsets are required and specifically requests that the biodiversity offsets be secured prior to any vegetation being cleared.

If you have any queries regarding this matter please contact Rachel Lonie (02) 9995 6837 (note working days are generally Monday and Wednesday only).

Yours sincerely

Lou Ewins 26/10/12

LOU EWINS
Manager, Planning and Aboriginal Heritage
Regional Operations Metropolitan
Office of Environment and Heritage

ATTACHMENT 1

Office of Environment and Heritage (OEH) Comment on the Environmental Assessment for Water and Wastewater Servicing of the West Dapto Urban Release Area and Adjacent Growth Areas (09_0189)

1. Biodiversity

1.1 Assessment of Impacts

The Environmental Assessment (EA) states that the majority of proposed water pipelines will be located in future road verges and pathways. Proposed wastewater pipelines will generally be laid adjacent to drainage lines and creek lines while rising wastewater pipelines will generally be laid within road reserves.

The EA states that environmentally sensitive locations such as stands of native vegetation, habitats for threatened species, steep slopes, waterways, wetlands, and Aboriginal relics and sacred sites are to be avoided "where possible". Boring is proposed where there are environmental constraints such as major creek crossings and where ground conditions permit. OEH supports such an approach.

OEH compared vegetation mapping (Native Vegetation of the Illawarra Escarpment and Coastal Plain) to the pipeline easement data provided by the Proponent Sydney Water Corporation. It was assessed that the following areas will be impacted by the project:

Veg Community	Ha
Acacia Scrub	0.38
Coastal Grassy Red Gum Forest (Illawarra Lowlands Grassy Woodland EEC)	5.39
Floodplain Wetland	0.31
Lowland Woollybutt-Melaleuca Forest (Illawarra Lowlands Grassy Woodland EEC)	4.60
Moist Box-Red Gum Foothills Forest	0.42
Riparian River Oak Forest	0.81

These areas differ from the areas identified in Appendix E - Flora and Fauna Report (F&F report). OEH considers the discrepancies could be explained by clearing since the mapping was done, more detailed information from ground truthing and under boring as proposed to avoid impacts.

A review of the data overlaid on the imagery currently available (2009 ADS40) indicates that there are no sites where there are significantly greater impacts than the report describes. OEH concludes that the report has identified the potential impacts of the project where infrastructure is proposed.

Should additional areas be impacted that have not been assessed (for example if the routes are varied) these will require additional offsetting.

1.2 Offsetting

The F&F report (p. 86) states that offsetting is not considered necessary as the impacts are low in the context of the region and the likely impacts to follow when the area is developed. OEH does not consider this to be an acceptable reason to avoid offsetting.

There are precedents such as the South West Rail Link where offsets were required for the accumulated impacts of a linear infrastructure project within a highly disturbed and fragmented landscape to be heavily developed in the future.

OEH provided comment on the draft Environmental Assessment Requirements (EARs) in November 2009 that offsets should be considered. Offsets should be required for all native vegetation types impacted by the

proposal, not just the Illawarra Lowlands Grassy Woodland endangered ecological community (EEC), as the other vegetation communities are habitat for threatened species, especially fauna. This loss of habitat needs to be appropriately offset.

The OEH *Interim Policy on Assessing and Offsetting Biodiversity Impacts of Part 3A, State Significant Development (SSD) and State Significant Infrastructure (SSI) Projects* is being trialled in partnership with Department of Planning and Infrastructure (DP&I). The policy acknowledges that these projects do not necessarily have to meet the maintain or improve (MoI) standard of Biobanking, but adopts the Biobanking Assessment Methodology (BBAM) for quantifying the offsets that would be required if a MoI were to be met. The policy then provides a structured approached to determining how projects may meet alternative standards.

OEH notes that ELA have conducted a number of Biobanking plots for this project, but that the data is not provided. It is recommended that the Proponent use the data available to determine the credits generated and either:

- Purchase and retire that number and type of credits at a biobanking site; or
- Use the Credit Converter (http://www.environment.nsw.gov.au/resources/biocertification/Creditconverter.xls) to determine the number of hectares of offset that is required to be secured for this project to meet the maintain or improve standard (assuming red flags would be waived).

DP&I should then assess the project under Section 4.2 of the policy to determine if red flags should be waived and a Tier 2 'No Net Loss' outcome can be obtained.

If a Tier 2 outcome cannot be obtained, then OEH will assess the project under Tier 3 ('Mitigated Net Loss' outcome) and provide requirements for how this standard can be met.

Biodiversity offsets should be secured prior to any vegetation being cleared.

2. Aboriginal Cultural Heritage

Previous advice from OEH regarding the Aboriginal Cultural Heritage Assessment dated April 2012 stated that the assessment of Aboriginal Heritage for the concept and project approval was adequate, but that, contrary to the recommendations in the assessment report, OEH did not wish to be notified of the commencement of the testing and salvage programme as OEH is not the consent authority. Instead, all notifications should be provided to the consent authority.

OEH notes that Section 18.2 of the July 2012 version of the Aboriginal Cultural Heritage Assessment and Impact Management report now states that all notifications will be made to DP&I. OEH considers that this is the appropriate notification procedure as DP&I is the relevant consent authority in this instance.

The draft Statement of Commitments (SoCs) state that Sydney Water is committed to avoiding impacts on items of Aboriginal cultural heritage significance "where practicable" (SoC 10) and where not practicable that management measures will be implemented to mitigate impacts (SoC 11). OEH considers that the Proponent should clearly identify the proposed mitigation measures that will be implemented should impacts occur.

3. Floodplain Risk Management

It is noted that Sydney Water are seeking *Concept Approval* for all new trunk drainage infrastructure required to service West Dapto and Adjacent Growth Areas (including Calderwood, North Macquarie and Tullimbar) as well as *Project Approval* for specific components required for the early release areas including Kembla Grange, Sheaffes/Wongawilli and West Horsley precincts as well as the construction of reservoirs and pipelines for the Marshall Mount Reservoir site.

Floodplain risk management (FRM) advice relating to the West Dapto Water and Wastewater proposal was previously provided to DP&I from the then DECCW on the EARs for DGR's in October 2009. It is noted that several specific requirements relating to flooding were incorporated in the DGR's.

Sydney Water is now seeking Concept Approval and site specific Project Approval from DP&I for the construction of critical infrastructure in floodplain areas which have the potential to be impacted by or cause an impact on flooding.

Consistent with prior advice OEH maintains that DP&I, as the approval authority for this proposal, considers and is satisfied in its determination over the following matters:

- the impact of flooding on the development (including the implications of inundation of electrical components of extreme floods up to the PMF on shut-down);
- the impact of the development on flood behaviour (particularly for creek crossings of pipes) including any management measures to mitigate adverse flood impacts;
- the impact of flooding on the safety of people/users of the development including flood hazard on access routes and access requirements in times of flood;
- the full range of flood events, up to and including the probable maximum flood (PMF) including availability and function of water and wastewater services during and after all floods including those greater than the 1% Annual Exceedence Probability (AEP) event;
- the implications of climate change (sea level rise and increased rainfall intensity) and cumulative development impacts on flooding and estimated flood planning levels;
- the development control plans or policies of Wollongong City Council (WCC) and Shellharbour City Council (SCC) in relation to the management of flood risk; and
- the best available flood information for the area from WCC and SCC.

From the flooding information provided in section 6.12 of the EA, it is unclear as to whether adequate consideration has been given to these issues in their entirety, particularly with regard to events greater than the 1% AEP event to the PMF. The EA also shows the water and wastewater infrastructure components crossing flood affected areas identified as '100-year flood zone' in multiple locations. It is unclear as to why the analysis did not consider flood events greater than the 1% AEP, including potential impacts of flood behaviour on the infrastructure or resulting from the infrastructure in flood events to the PMF noting that this consideration was identified in the DGR's. Water and wastewater infrastructure are considered critical utilities and failure due to flooding has the potential to cause significant economic, social and environmental impacts including disruption to the recovery process after a flood event. In the subject area, there may not be a large cost differential to afford protection against failure and/or damages in events larger than the 1% AEP event. These events could have significant consequences and therefore should be considered in planning for this infrastructure.

It is also noted that floodplain areas within the suburbs of Calderwood and North Macquarie to Tullimbar, mainly within the SCC local government area, have not been identified in the analysis. Without an understanding of the extent, behaviour and impacts of flooding in these floodplains over all flood events, it is unclear as to how the proposal will deal with the potential impacts associated with flooding in these areas. It should be noted that SCC has recently commenced the Macquarie Rivulet flood study in conjunction with WCC which covers the watercourses draining to Macquarie Rivulet including Marshall Mount Creek within the proposed EA area.

Given the potential impacts associated with provision of this infrastructure, it is recommended that DP&I consult with both WCC and SCC as the authorities responsible for floodplain risk management in their local government areas.

Through the floodplain management program OEH has assisted WCC in completing its Mullet Creek Floodplain Risk Management Study and Plan in addition to the Macquarie Rivulet Flood Study currently under development. The information and models available in these areas would provide invaluable information to the Proponent and consent authority in its current considerations.

In summary, OEH understand that the DoPI as the approval authority is responsible for ensuring that flood risk management matters are adequately addressed in determining this proposal. The proposal for critical water and sewerage infrastructure in this area has the potential for adverse flood impacts, significant losses and flood recovery impacts can be mitigated with adequate consideration of potential flood risks in the planning and design of the works. These considerations should ensure that the infrastructure meets the operational needs of the future community to a satisfactory standard for the full range of potential flood events, including the potential impacts of climate change and does not result in any otherwise avoidable impacts or liabilities associated with flood related issues. It is presently unclear whether the flood risk management issues identified above have been addressed in the EA.

Should DP&I require any further advice on flood risk management matters, it should not hesitate to contact the OEH.

Our Ref: STH12/00044
Contact: Andrea Boes 4221 2771
Your Ref: 09_0189

Transport
Roads & Maritime
Services

#7

Department of Planning & Infrastructure
GOP Box 39
Sydney NSW 2001

29 OCT 2012

Attention: Belinda Scott

WOLLONGONG CITY COUNCIL – DEVELOPMENT PROJCET 09_0189 – ENVIRONMENTAL ASSESSMENT FOR WATER AND WASTEWATER – WEST DAPTO URBAN RELEASE AREA AND ADJACENT GROWTH AREAS – EXHIBITION OF EA

Dear Sir/Madam

Reference is made to your letter dated 4 September 2012 regarding the subject development project forwarded to Roads and Maritime Services (RMS) for consideration.

RMS has reviewed the information provided and considers that the following comments for your consideration:

RMS notes that the exact locations of pipelines, pumping stations and reservoirs have not yet been determined. Classified roads likely to be affected include the Princes Highway, Tongarra Road/Illawarra Highway and the F6 Southern Freeway.

Generally, RMS does not allow longitudinal or transverse utilities within the road formation as this may, over time, compromise the function of the pavement. Therefore, any option that does not impact on an RMS asset would be preferable. The following general conditions would apply to the subject project as well as other site specific conditions that may be added in the future depending on the infrastructure design and specific location.

- Any infrastructure should be designed with the aim of making it maintenance free for the duration of its design life.
- Any longitudinal trenching would need to be at a minimum of 0.6m depth whilst in the road reserve, as close to the road boundary as possible and not within 3.0m of the road formation or drainage structures.
- No transverse trenching of any RMS maintained road will be permitted without exhausting every other option. Geotechnical reports may be required to ascertain why an underbore is not possible.
- The pits for any bores would need to be located outside the road reserve wherever possible. Where this is not practical, they are to be no closer than 3.0m from the seal of the road for both the exit and entry holes. The depth would need to be not less than 1.2m below the road surface level to the top of the pipe or concrete.
- All buried pipes must be maintenance free, e.g., sleaved.

- Any areas within the road reserve of a classified road that are disturbed by works related to the project would need to be restored to their original condition upon completion of the work. All restoration work would need to be carried out to the satisfaction of RMS.
- The developer will need to apply for, and obtain a Road Occupancy Licence (ROL) from RMS' Traffic Operations Unit (TOU) prior to commencing works within the road reserve of a State Road or any other works that impact a travel lane of a State Road or impact the operation of traffic signals on any road.
- For works within the road reserve of a State Classified road, RMS will be exercising its powers under Section 64 of the Roads Act, 1993 to become the roads authority. Given this, Section 138 consent under the Roads Act, 1993 would need to be obtained from the RMS prior to construction. In this regard, detailed design plans and specific locations of the relevant pipelines, pumping stations and reservoirs should be sent to Peter Arrighi at peter.arrighi@rms.nsw.gov.au.

If you have any questions please contact Andrea Boes on 4221 2771.

Yours faithfully

Joanne Parrott
Road Safety and Traffic Manager
Network Management, Southern Region

Swati Sharma - Submission Details for David Ball (support)

#8

From: David Ball <davidballvet@hotmail.com>
To: <swati.sharma@planning.nsw.gov.au>
Date: 29/10/2012 3:36 PM
Subject: Submission Details for David Ball (support)
CC: <assessments@planning.nsw.gov.au>
Attachments: Wastewater submission OEH 29.10.12.PDF

NSW GOVERNMENT Planning & Infrastructure

Confidentiality Requested: no

Submitted by a Planner: no

Disclosable Political Donation: no

Name: David Ball
Email: davidballvet@hotmail.com

Address:
27 North Marshall Mount Road

Marshall Mount, NSW
2530

Content:
SUPPORT, BUT WITH QUALIFICATIONS

We approve Sydney Water's Environment Assessment prepared in support of the Concept Plan to construct and operate water and wastewater infrastructure to service the new development in West Dapto Urban Release Area and Adjacent Growth Areas.

Information prepared by Sydney Water summarises the benefits of the proposal as including:
* a secure water supply
* a reticulated wastewater service that protects public health
* protection of catchment and river health
* affordable and efficient water and wastewater services to meet the NSW Government's devel opment timeframes and support the orderly roll-out of land releases and infrastructure.

The planning for water and wastewater infrastructure covers the last remaining significant urban release areas in the Illawarra and should, in our opinion make provision for the possibility to increase housing densities beyond the current NSW Government time frames. Urban capable land is becoming a scarce resource.
In particular, we believe the trunk infrastructure required to extend the existing waste water systems to the Yallah/Marshall Mount precinct should be reconsidered because increased densities, beyond current estimates, could be supported by the sustainable design concept envisaged for this precinct.

We are concerned that the exhibited SW plans overlook some vital planning and development issues, and we therefore ask that the points in our attached submission be considered before designs and plans for trunk wastewater infrastructure are finalised.

IP Address: cpe-121-222-215-114.lnse1.woo.bigpond.net.au - 121.222.215.114
Submission: Online Submission from David Ball (support)
https://majorprojects.affinitylive.com?action=view_diary&id=43277

Submission for Job: #3541 09_0189 , Project Application
https://majorprojects.affinitylive.com?action=view_job&id=3541

Site: #2121 Water and Wastewater Servicing of the West Dapto Urban Release Area and Adjacent Growth Areas
https://majorprojects.affinitylive.com?action=view_site&id=2121

David Ball

E : davidballvet@hotmail.com

#8

David and Judith Ball
27 North Marshall Mount Road
Marshall Mount NSW 2530

29th October, 2012

Department of Planning and Infrastructure
GPO Box 39
SYDNEY NSW 2001

Re: West Dapto Urban Release Area and Adjacent Growth Areas
Proposed Water and Wastewater Services.
Environmental Assessment Report.
Reference: 09 _ 0189

SUPPORT WITH QUALIFICATION

Dear Sir or Madam

WEST DAPTO URBAN RELEASE AREA and ADJACENT GROWTH AREAS

Proposed water and wastewater services

We approve Sydney Water's Environment Assessment prepared in support of the Concept Plan to construct and operate water and wastewater infrastructure to service the new development in West Dapto Urban Release Area and Adjacent Growth Areas.

Information prepared by Sydney Water summarises the benefits of the proposal as including:

- *a secure water supply*
- *a reticulated wastewater service that protects public health*
- *protection of catchment and river health*
- *affordable and efficient water and wastewater services to meet the NSW Government's development timeframes and support the orderly roll-out of land releases and infrastructure.*

The planning for water and wastewater infrastructure covers the last remaining significant urban release areas in the Illawarra and should, in our opinion make provision for the possibility to increase housing densities beyond the current NSW Government time frames. Urban capable land is becoming a scarce resource.
In particular, we believe the trunk infrastructure required to extend the existing waste water systems to the Yallah/Marshall Mount precinct should be reconsidered because increased densities, beyond current estimates, could be supported by the sustainable design concept envisaged for this precinct.

We are concerned that the exhibited SW plans overlook some vital planning and development issues, and we therefore ask that the following points be considered before designs and plans for trunk wastewater infrastructure are finalised.

1 **There exists an apparent discrepancy in discharge loads to wastewater trunk pipelines servicing Yallah/Marshall Mount precinct.**
- Two wastewater trunk pipelines are planned west of the proposed wastewater pumping station.
- These two wastewater trunk pipelines will carry very different discharge loads because of the numbers of lots they will service.
- The wastewater trunk pipeline servicing the western end of Marshall Mount Road and North Marshall Mount Road will carry at least four times the discharge load.
- For this reason and others detailed below, the wastewater trunk pipeline servicing the western end of Marshall Mount Road and North Marshall Mount Road should be extended to North Marshall Mount Road.

2 **Densities in the Precinct are likely to increase over time**
- As housing has become less affordable, people have changed their housing expectations, resulting in more people living under the same roof and in higher density housing.
- Between 2006 and 2011, people per occupied dwelling in Sydney rose from 2.81 to 2.88.
- Wollongong LGA is subject to the same housing pressures.
- Housing within low density zonings will house increasing numbers of people and the discharge loads from those zonings will be higher than current data would indicate.
- Over time, it is reasonable to assume that current estimates will almost certainly be revised upwards, and some areas zoned low density will be rezoned to allow a medium density component
- Absence of appropriately sized waste water infrastructure could restrict the ability of planners, in the future, to reassess zonings in response to changing needs.

3 **Planning for the Yallah/Marshall Mount precinct is holistic and seeks to deliver a sustainable best practice outcome.**
- Council has made considerable investment in design, consultation, studies and Bio-certification in order to ensure certainty and to streamline delivery.
- The development of the precinct is envisioned over a 25 - 50 year time scale.
- Major infrastructure needs to support the development, not only within that planning time frame, but beyond then.
- Planning over the precinct must facilitate the most efficient and effective delivery of infrastructure.

4 **Development of the Town Centre will follow the development of the larger, low density lots.**
- It is vital that the densities for Marshall Mount create a balance which will support a wide range of services at an intensity which will meet local needs, without requiring local residents to travel to meet those needs.
- In order to establish the new Town Centre, there will need to be development on a number of fronts within the precinct, not just starting at the Town Centre.
  Until there is a town, a town house will not be an attractive place to live.

- In the early stages of development it will be the more traditional satellite, low density housing that will create the support for the Town Centre.
- It is therefore most likely that initial development will follow current road infrastructure, ie along Marshall Mount and North Marshall Mount Roads, where development will be more financially viable.
- Strong uptake of the larger, low density lots is essential in order to support development of commercial mixed use and denser residential options at the Town Centre.
- Location of water and waste water infrastructure should facilitate the 'doughnut' evolution of development in the precinct.

5 **Marshall Mount Road and North Marshall Mount Road intersection will become a major intersection with the development of Calderwood Urban Development Project.**
- Marshall Mount Road and North Marshall Mount Road intersection will be the northern Access Point to Calderwood Urban Development Project. This new road will link North Marshall Mount Road through Calderwood Urban Development Project to the Illawarra Highway.
- This intersection is a significant Heritage precinct with Marshall Mount School, Marshall Mount Hall and Marshall Mount House (nearby) located within it.
- Over the life of the development of Yallah/Marshall Mount, it can be envisaged that this Heritage precinct and Access point would offer unique development opportunities in sympathy with these significant Heritage buildings.
- Waste water trunk infrastructure should extend to North Marshall Mount Road in order to support development in this Heritage precinct.

6 **Management of work on private property**
- The *Sydney Water Act* gives Sydney Water powers of entry onto private property to construct new infrastructure.
- Developers do not have the same power of entry.
- Extension of the trunk waste water line servicing Marshall Mount and North Marshall Mount Roads would minimize access problems where lead-in pipelines and reticulation pipes pass through a number of properties.
- Easements designed for lead-in and reticulation pipelines are essential to minimize access problems.

Yours faithfully

David Ball

Judith Ball

Comments on this project

To whom it may concern;

The proposal 09-0189, for Water and Wastewater Servicing of the West Dapto Urban Release Area, is general principle is supported.

As the owner of a property I have grave concerns concerning the proposed trunk sewer and water main alignments.

These concerns are:
* Prior to detail design, Sydney Water needs to consult with the landowners/developers on the final alignment of infrastructure. These alignments must take into account proposed future development boundaries/proposals, have sufficient servicing depths and connection points at optimal locations.
* Trunk main does not impede or limit the potential developable land area. If it does, then Sydney Water compensates landowners to the final developable yield cost of land.
* Trunk main does not impose buffers or limitations on land development.
* Sydney Water Design must account for future service to be constructed in same corridor. Example, services along Wongawilli road must account for the culvert upgrade widening and substantial stormwater drainage that is required to be installed as part of the Wongawilli Road upgrade. This will minimise potential risk to trunk main from future construction works as well as future infrastructure construction costs.
* Appropriate insurance and public liability of all construction works occurring on Private land. This covers and identifies owners of private land of these works.
* Future construction works to ensure no disruption to business activities or endangering livestock located on private property.

Ensure all design of services around and in our property have consultations with our engineers, minimising any future impacts.

Kind Regards

#10

Swati Sharma - Submission Details for anthony bennett (support)

From: anthony bennett <berryvet@ymail.com>
To: <swati.sharma@planning.nsw.gov.au>
Date: 29/10/2012 4:25 PM
Subject: Submission Details for anthony bennett (support)
CC: <assessments@planning.nsw.gov.au>

NSW GOVERNMENT Planning & Infrastructure

Confidentiality Requested: no

Submitted by a Planner: no

Disclosable Political Donation: no

Name: anthony bennett
Email: berryvet@ymail.com

Address:
84 queen st

berry, NSW
2535

Content:
I approve of the plans but with comments.

It is important that the trunk waste water pipe, servicing the Western end of Marshall mt road and north Marshall Mt rd, is extended to North Marshall Mt Rd and sized adequately so that it is not the limiting factor in future planning decisions.

Given the geography of the Wollongong LGA, it is important that optimal use is made of all available urban capable land.

IP Address: - 220.157.93.85
Submission: Online Submission from anthony bennett (support)
https://majorprojects.affinitylive.com?action=view_diary&id=43293

Submission for Job: #3541 09_0189 , Project Application
https://majorprojects.affinitylive.com?action=view_job&id=3541

Site: #2121 Water and Wastewater Servicing of the West Dapto Urban Release Area and Adjacent Growth Areas
https://majorprojects.affinitylive.com?action=view_site&id=2121

anthony bennett

E : berryvet@ymail.com

All communication addressed to:
General Manager
Shellharbour City Council
Locked Bag 155, Shellharbour City Centre, NSW 2529

PHONE: 02 4221 6111
FAX: 02 4221 6016
DX 26402 Shellharbour City Centre
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WEB: www.shellharbour.nsw.gov.au

29 October 2012

Ms Belinda Scott
Department of Planning & Infrastructure
GPO Box 39
Sydney NSW 2001

Environmental Assessment for Water and wastewater servicing of the West Dapto urban release area and adjacent growth areas (09_0189)

Dear Belinda,

Thankyou for the opportunity to comment on the above mentioned Environmental Assessment (EA). It should be noted that the comments provided are the opinion of the council officers and have not been formally endorsed by Council.

I have reviewed the exhibited Environmental Assessment and would like to re-iterate a number of concerns that were raised in my previous correspondence dated 3 April 2012 that appear to have not been adequately addressed in the EA. In this regard I would like to offer the following comments:

- The EA appears to have been prepared for the purpose of concept approval only. There is limited reference to the project approval application. In this regard, insufficient detail and impact assessment has been provided to enable an informed opinion of the suitability of the proposed development.

- The EA lacks certainty and frequently uses the term indicative. In this regard there are no set locations of infrastructure works, delineation of construction techniques (e.g. trenching/ under-boring), no set monitoring regimes, and no emergency or management plan should the system prove to be detrimental to the environment.

- The EA appears to have not allowed for the creation of employment lands at Kembla Grange and Tallawarra. In this regard the impact of increased trade waste on overflow points and receiving waters should be addressed.

- The EA is ambiguous and often uses the word 'may'. (eg. p8, 1st paragraph). The application should outline exactly what is being applied for and clearly outline a staging strategy.

- The proposal area is inclusive of the wider Calderwood Valley area. Only a portion of this has had any assessment undertaken to determine suitability for urban

development (i.e. Calderwood Concept Plan Approval Area). It would appear premature to design or seek approval for a servicing strategy and subsequent infrastructure provision for this area prior to more detailed assessment.

- The proposed Calderwood reservoir has not been raised previously with Council at any discussions with either Sydney Water or the Department of Planning. Shellharbour Council may raise concerns regarding its location and possible impacts on various aspects of the environment.

- No detail is provided on how the Shellharbour WWTP will be upgraded to accommodate a 10% increase in dry weather treatment capacity.

- Locations of proposed ancillary components such as vent shafts have not been nominated. These may affect urban design of future subdivisions and should be indicated in the EA.

- Page 73 - Assessment approach: states that Sydney Water is seeking approval for:

    - The proposal to be located anywhere within the Field Assessment Area.

    - The proposal to be located outside the Field Assessment Area where environmental impacts are no greater than those in the EA and;

    - No additional environmental mitigation measures are required.

  The Environmental Impact of such an application would be virtually impossible to determine. In this regard the EA and Approval requested in this statement do not comply with the DGR's.

- The justification of nutrient level increase based on unacceptable stormwater quality levels is not considered to be satisfactory. Optimum water quality should be sought even though existing systems may have poor water quality. On-going Improvements to stormwater quality are also a desired outcome from Councils perspective. This is particularly relevant for Lake Illawarra which currently suffers from poor water quality and regular algal blooms. Council, in conjunction with the LIA and Wollongong City Council, have in the past and currently, contribute substantial amounts of rate payers' funds towards the maintenance and improvement of the Lake. A zero or reduced impact on the water quality within Lake Illawarra would be councils preferred approach for new release urban areas within its catchment.

- Impacts on Barrack Swamp and Little Lake are not adequately addressed given the 14.01% increase in annual TN load and 10.19% increase in annual TP load in 2048. This is a popular swimming and recreation area and public health and amenity should be ensured.

- The possible impact of nutrient increase as a result of overflow on Lake Illawarra is of great concern to Council. The EA does not with any certainty or confidence ensure the ongoing health and viability of the Lake. This is relevant from a community recreational perspective as well as future commercial and tourism opportunities.

- The Environmental Impacts of the proposed vegetation removal of 3.4ha out of a total of 16ha i.e. 21.25% have not been adequately addressed nor specific affected areas identified. Areas of affected EEC's and threatened species affected need detailed assessment at this level of approval.

- The statement of commitments is ambiguous and tends to refer to future studies, design, and mitigation plans that actually should form part of the EA. More directed and measurable commitments are preferred.

In conclusion, Council would like to thankyou again for the opportunity to comment on the EA and flag our initial concerns. If you require any additional information or wish to discuss any of the points raised in this submission please do not hesitate to contact me on (02) 4221 6127

Yours sincerely

Cheryl Lappin
Senior Strategic Planner

NSW EPA

Your Reference: 09_0189
Our Reference: DOC12/38941
Our Contact: Mark Hanemann 9995 6845

Ms Belinda Scott
Senior Planning Officer
Infrastructure Projects
Department of Planning
GPO Box 39
SYDNEY NSW 2001

Dear Ms Scott

I refer to your letter dated 4 September 2012 requesting the Environment Protection Authority (EPA) provide advice on the Environmental Assessment (EA) for *Water and Wastewater Servicing of the West Dapto Urban Release Area and Adjacent Growth Areas.*

The EPA has reviewed the EA and has identified a number of matters of concern in relation to the proposal, particularly in relation to:

- predicted exceedances of the licence limits currently in place for wet weather overflows from the Shellharbour sewerage system; and
- predicted significant exceedances of identified noise goals, even with noise mitigation measures in place.

Full details of the matters identified for consideration by the Department of Planning and Infrastructure when developing conditions of approval for the project are provided at **Attachment 1**.

If you have any queries in relation to this letter, please contact Mark Hanemann, Acting Head Metropolitan Infrastructure (Water) on 9995 6845 or mark.hanemann@epa.nsw.gov.au

Yours sincerely

Howard 29/10/12.

GISELLE HOWARD
Director Metropolitan
Environment Protection Authority

Encl. *Attachment 1 - EPA Comments on EA for Water and Wastewater Servicing of the West Dapto Urban Release Area and Adjacent Growth Areas*

PO Box 668 Parramatta NSW 2124
Level 7, 79 George St Parramatta NSW 2150
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ATTACHMENT 1
EPA COMMENTS ON EA FOR WATER AND WASTEWATER INFRASTRUCTURE IN THE WEST DAPTO URBAN RELEASE AREA

Waste water partial treatment, bypass and overflow events

The EPA notes that hydraulic modelling of the proposed sewerage systems indicate that wet weather overflows from the Shellharbour system are predicted to exceed the limits currently in place for wet weather overflows in Sydney Water's environment protection licence.

In order to meet limits on wet weather overflows set by the EPA under the *Protection of the Environment Operations Act 1997*, Sydney Water is required to undertake improvements works in Wollongong, in the Bellambi and Port Kembla systems. These works are to be completed by June 2013 and the EPA expects that Sydney Water will comply with the wet weather overflow limits for those systems. The EPA considers that it is not acceptable for Sydney Water to design new sewerage networks that will results in breaches of current limits. The proponent should be required to address and mitigate any exceedances in the detailed design and planning stages.

The EPA notes that the primary disinfection units at Port Kembla Sewage Treatment Plant (STP) are expected to exceed the EPA's current limits after 2031. Additional bypasses of appropriate treatment processes, which are considered breaches of conditions of the environment protection licence for Port Kembla Waste Water Treatment Plant as a result of the additional sewage flows and infrastructure are not acceptable and should be considered more thoroughly through detailed design and planning stages of the proposed development.

Marine water quality impacts through discharge through the deep ocean outfalls

The EPA notes that Sydney Water does not anticipate to be undertaking any construction activities in the marine environment and that any marine water quality impacts will be through the increase in effluent discharged from the sewage treatment plants.

The EPA has undertaken a review of the modelling of the deep ocean outfalls at Port Kembla and Shellharbour STPs carried out by the proponent.

The modelling indicates that the Shellharbour outfall design does not enable good hydrodynamic mixing, as much of the initial momentum is lost in pits that existed in the original configuration of the outfall structure. The Environmental Assessment (EA) does not indicate whether this design was re-configured with the most recent augmentation of the plant. Sydney Water should confirm whether this is the case.

The EPA notes that average dry weather flows for Port Kembla and Shellharbour STPs are expected to increase from 43 and 14 ML/day to 62.2 and 22.2 ML/day respectively in 2048. These flows exceed the current outfall design capacities of 59 and 20ML/day.

Any increase in volume is likely to reduce near-field dilutions, increase the surface plume thickness and/or increase the dimensions of the plume.

Wollongong outfall has better dilution efficiency as the multi-port diffuser configuration utilises the discharge flow momentum at depth, allowing three-dimensional mixing as the plume rises to the surface during the near-field phase of flow. However, as the outfall approaches capacity in 2048, the relatively shallow nature of the site could mean that the increased flow volume could have serious implications for the mixing ability of the current outfall design.

The EA does not clearly define the mixing zone for these discharge plumes (i.e. hydrodynamic, density, temperature, effluent concentration or distance parameters), but alludes to the initial dilution phase as being defined by the salinity reaching 35.5 (±0.25 std dev). For an outfall, the majority of mixing occurs in the relatively controllable near-field zone where turbulent mixing is driven by the characteristics of the discharge (i.e. volume, velocity, density). Generally, initial mixing in a hydrodynamic sense refers to the discharge driven near-field where, if contaminants are not met at end of pipe, the discharge structure can be designed to maximise dilution in the near-field. The EPA generally expects that guideline criteria are met within the near-field zone where dilutions are relatively controllable.

It is not clear what modelling was undertaken by the proponent for effluent constituents. The EA states that modelling was not carried out for those constituents that met the guideline criteria; however the EPA notes that modelling (mixing zone/initial mixing modelling) was done. The proponent should clarify whether near-field or far-field modelling was carried out, as modelling undertaken by the EPA indicated that the initial mixing zones all lie in the far-field, well beyond the near-field.

Randomly selected effluent flow and effluent quality data were used in the modelling. The EPA considers this to be unusual, expecting scenarios should be run targeting mean, median, maximum, 75th percentile and 90th percentile conditions or choosing values that would be expected to produce a 'worst case scenario' outcome. A random selection may result in set of uncharacteristic starting conditions for the model. The EPA considers that the randomly chosen values driving the model should be presented in the context of how the outfall operates on a day-to-day basis.

The EA states that ammonia concentrations will not cause problems at Wollongong as the ammonia is converted to nitrogen as part of the treatment process. The EPA assumes that the EA is referring to N2 gas and that there will be no ammonia residual in the effluent. If the ambient environment currently exceeds the guidelines, then any contribution of total nitrogen or ammonia will increase the concentration of ammonia in the coastal zone.

The EPA also notes some inaccuracies around the use of guideline criteria in the modelling results –

- ANZECC Aquatic Ecosystem Protection Trigger (2000) for ammonia (NH3) is 20µg/L not 500µg/L, as indicated in Table 6.4.
- The criteria for total suspended solids in the guidelines is 0.5mg/L however the EA uses 3mg/L (converted from a range of 0.5 – 10 NTU).

Impact on inland water quality

The EA considers potential operational impacts of the proposal on inland waterways within the development areas, concluding that there will be only a relatively minor increase in nutrient and total suspended solids loads due to changes to proposed

wastewater overflow infrastructure, and that the increased loads from sewage overflows would not be significant. The EA indicates that this is because the contribution of contaminant loads from sewage is relatively small compared to current loads from urban stormwater runoff.

The EPA considers that some points in the EA should be expanded in order to support the above conclusion –

- Some measure of confidence should be provided around the modelled estimate of stormwater and wastewater loads of nutrients, faecal coliforms and total suspended solids.
- The proportion of stormwater and wastewater overflow load estimates for nutrients that are biologically available should be defined (e.g. ammonium, oxidised nitrogen and filterable reactive phosphorus). Wastewater is expected to have a higher proportion of biologically available nutrients.
- Information should be provided to support the notion that the assimilative capacity of the receiving environment is fairly resilient. The EPA considers it likely that impacts such as algal blooms and aquatic weeds would occur as a result of development in the West Dapto Urban Release Area and Adjacent Growth Areas; and
- The EA has not considered the combined contaminant loads of sewage overflows and stormwater inputs from the broader development proposal. The combined load impacts on the aquatic ecology should be considered for the WDURA and AGA.

Noise and vibration assessment

The noise and vibration assessment indicates that operational noise criteria can be satisfied at all locations with the provision of appropriate noise mitigation measures during the design phase. Item 24 of the Statement of Commitments should clearly reflect this.

The EPA notes that the assessment predicts significant exceedances of Noise Management Levels of up to 40 dB and higher to the surrounding community due to airborne noise from construction works. Highly significant exceedances of the identified noise goals in particular are predicted, even with noise mitigation measures in place. A suite of noise and vibration mitigation and management measures are proposed in the EA to address the expected impacts. Prior to commencement of construction, a detailed Construction Noise and Vibration Management Plan should be developed and implemented by the proponent.

It should be clearly acknowledged, however, that the implementation of the Construction Noise and Vibration Management Plan will not, in many cases, be able to reduce the impacts from the works to a level that even approaches the relevant construction noise and vibration goals. The EPA considers that the paramount issues will be –

- effective communication with, and management responses to the concerns of, the affected community;
- the need for clear justification and prior approval to carry out any construction works outside the recommended standard hours defined in Section 2.2 of the Interim Construction Noise Guideline (ICNG);
- the early erection of temporary noise barriers; and
- the need to minimise any truck movements outside standard hours.

Construction activities should be limited to the recommended standard hours defined in Section 2.2 of the Interim Construction Noise Guideline (ICNG), and not be limited to 'daylight' hours as proposed in Table 34 and Table 36 of the noise and vibration assessment.

Contaminated sites

The EPA agrees with Coffey's general assessment of the contamination status of the 12 identified sites in Table 3 of Appendix H of the environmental assessment.

The greatest impacts identified by Coffey are geotechnical considerations (land degradation and watercourse management) rather than soil, fill or groundwater contamination. The EPA generally agrees that "groundwater impacts are not anticipated to be great" and the overall assessment of significant environmental impacts are unlikely if the recommended management and mitigation measures are successfully implemented.

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wollongong
city of innovation

WOLLONGONG CITY COUNCIL

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016

Attention: Ms Belinda Scott
Infrastructure Projects
Department of Planning & Infrastructure
GPO BOX 39
SYDNEY NSW 2001

APPLICATION	**MP-2009/189**
Date	7 November 2012

Dear Ms Scott

Subject: - Exhibition of Environmental Assessment for Water and Wastewater Servicing of the West Dapto Urban Release Area and Adjacent Growth Areas (09_0189)

I refer to the above proposal, to Council's letter of response to the initial project application dated 13 April 2012 and thankyou for providing Council with the further opportunity to comment.

Please find attached Council's response to the Environmental Assessment exhibition.

Should you require any further assistance with regard to this matter please contact Geoffrey Hunt – Senior Development Project Officer direct on (02) 4227 7332.

Yours faithfully

David Farmer
General Manager
Wollongong City Council

enc

Wollongong City Council Response to the Environmental Assessment Exhibition for Water and Wastewater Servicing of the West Dapto Urban Release Area and Adjacent Growth Areas (09_0189)

Environment Strategy and Planning (ESP)

The Environmental Assessment for Water and Wastewater Servicing of West Dapto Urban Release Area and Adjacent Growth Areas has been prepared by Sydney Water and comprises four volumes with the inclusion of Appendices A to D. The reports have been reviewed and assessed on environmental grounds and found to be satisfactory.

As the proposed project will be carried on over a 35 year period and as the technology is rapidly evolving and changing the present assessment should not be considered as a fixed and unchangeable program of works. The environmental assessment should be a flexible and evolving document that is able to accommodate new procedures and techniques wherever an improvement in wastewater treatment and transfer can be achieved.

The following key issues: marine water quality, inland water quality, fauna and flora, soil and groundwater, noise and vibration, air quality , aboriginal and non-aboriginal heritages, flooding have been raised in the Director-General requirements.

Environmental issues to be considered by Sydney Water

During dry weather, the treated wastewater from the proposed development area will be discharged via ocean outfall, and under wet weather conditions, partially treated and untreated wastewater will be also discharged via ocean outfall at Shellharbour.

According to the numerical modelling undertaken to predicate exceedance of suspended solids and nutrients (total nitrogen and total phosphorous) in Wollongong and Shellharbour coastal waters, the mixing zone of the ocean outfall, indicates that at the completion of the project in 2048 there would be increases above the current levels for these parameters.

It is also expected that the levels of nutrients (TN and TP) levels in the inland waters and Lake Illawarra as the ultimate receiving system will be higher due to an increase in the number of direct and uncontrolled overflow points. The proposed development area will have a total of 49 points of directed overflows and 621 points of uncontrolled overflows, which all fall within the Port Kembla, Wollongong and Shellharbour wastewater treatment systems.

During a presentation and meeting of Council staff with Sydney Water Corporation (SWC) at the SWC head office in Parramatta, the issue of overflow control and offline containment of wastewater during extreme wet weather events was discussed. SWC indicated that although containment technology is available, the cost of implementing such technology would make the project financially unviable.

SWC proposes under boring or tunnelling techniques for some wetlands, and Category 2 and 3 drainage lines or streams to avoid disturbance of the existing natural systems. It would be preferable that the technique be systematically applied to all wetlands, drainage lines and creeks when drinking water or wastewater pipelines are laid.

The protection of shallow unconfined aquifers and their connection to riparian corridors should be ensured to prevent interruption of the base flow and maintain humidity in the riparian corridors. Council's ESP division endorses

The proposed measures to reduce disturbance, soil erosion, noise and vibration during the construction phases are satisfactory as are the proposed measures for site rehabilitation.

Any losses to Endangered Ecological Communities should be compensated for by the application of Bio-Banking principles for the entire proposed development area.

Design -Stormwater and Flooding

No objections raised subject to the proponent adhering to the draft statement of commitments as identified in the report.

Council Infrastructure and Traffic

The West Dapto urban release area will be undergoing significant development over the next 20-30 years with a number of new roads, substantial road upgrades and realignments proposed. It will therefore be essential that the proponent consults the Design and Technical Services Manager of Council prior to carrying out the staged works to ensure that the pipelines are placed within the correct position with regard to the future final alignments of these roads.

The Wollongong City Council Divisions of Infrastructure, City Works and Regulation and Enforcement must be included in any stakeholder or community consultation meetings. Sydney Water is requested to supply the names and contact numbers of the Contractor's representative for emergency situations and after hours contact. Details of the Programme of Works should be supplied to Council's Infrastructure, City Works and Regulation and Enforcement Divisions.

Sydney Water contractors should obtain consent, under Section 138 of the Roads Act from Wollongong City Council's Regulation and Enforcement Division prior to any works commencing or any proposed interruption to pedestrian and/or vehicular traffic within the road reserve caused by the construction of this development. A traffic control plan prepared and implemented by a suitably qualified person should be submitted for approval and the appropriate fees paid a minimum of five working days prior to the expected implementation. The traffic control plan should satisfy the requirements of the latest version of Australian Standard AS1742 – Traffic Control Devices for Works on Roads and the RTA Traffic Control at Worksites Manual.

Note: This includes temporary road closures for the delivery of materials, plant and equipment, concrete pours etc should apply to Council's Regulation and Enforcement Division and obtain consent to carry out the restoration works, prior to the works commencing.

Sydney Water Contractors should not carry out any work other than emergency procedures to control dust or sediment laden runoff outside the normal working hours, namely, 7.00 am to 5.00 pm, Monday to Friday and 8.00 am to 4.00 pm Saturday.

Water and sewer mains should be located within the footpath area of the road reserve and not within the road carriageway except where road crossings are planned and inevitable. Water and sewer infrastructure such as reservoirs and pumping stations and should not be located within the road reserve but located within newly created lots in private property with easements or within public reserves.

All restoration works within road reserves, footpaths and public reserves etc should be carried out to Council's satisfaction and in accordance with Council's standard document, "Specification for Work within Council's Road Reserve." Asphalt restoration of road crossings should extend beyond the vertical alignment of the trench.

Under boring all road crossings must be used as the primary objective before alternative methods such as open trenching is implemented. During the design phase of the project, consideration should be given to minimise the number of road crossings required.

Where vehicular access is required to service any new infrastructure, the applicant should construct new concrete vehicular crossings to service this infrastructure across the footpath area of the road reserve in accordance with Council's current policies and standards. The applicant should arrange, through Council's Regulation and Enforcement Division for a Council qualified concrete contractor to carry out the works.

A copy of the approval should be submitted to Council prior to works commencing. The entire length of any vehicular crossings should be constructed:

a) to Council's currently adopted standard drawings;
b) for the full width of the footpath; and
c) by one of Council's qualified concrete contractors at the developer's expense.

Council understands that there will be further opportunity to provide comment as this important critical infrastructure project assessment process evolves.

Council Property

No objections are raised to the proposed development subject to the water pipes where possible, being placed within the road reserves.

NSW GOVERNMENT | Department of Primary Industries

PCU012779

OUT12/30355

- 5 DEC 2012

Department of Planning
Received
10 DEC 2012
Scanning Room

Ms Belinda Scott
Infrastructure Projects
NSW Department of Planning and Infrastructure
GPO Box 39
SYDNEY NSW 2001

Dear Ms Scott

Water and Wastewater Servicing of the West Dapto Urban Release Area and Adjacent Growth Areas (09_0189)
Response to exhibition of Environmental Assessment

I refer to your letter of 4 September 2012 requesting advice from the Department of Primary Industries in respect to the above matter.

Comment by Fisheries NSW
Fisheries NSW advises the comments and recommended conditions on any proposed approval, as detailed in Attachment A.

For further information please contact Dr. Trevor Daly, Fisheries Conservation Manager – South Coast (Batemans Bay office) on 4478 9103 or at trevor.daly@dpi.nsw.gov.au.

Comment by NSW Office of Water
The NSW Office of Water advises the comments and recommended conditions on any proposed approval, as detailed in Attachment B.

For further information please contact Janne Grose, Planning and Assessment Coordinator (Penrith office) on 4729 8262 or at: Janne.Grose@water.nsw.gov.au.

Crown land issues
It is possible that Crown land may be sought for location of proposed works as detailed alignments are resolved. A condition on any approval should be that Sydney Water is to make early contact with Crown Lands, prior to any finalisation of exact alignments, if this is proposed.

For further information, please contact Scott Mullen, Project Manager Regional and Strategic Projects (Parramatta office) on 8836 5317 or: Scott.Mullen@lands.nsw.gov.au.

NSW Department of Primary Industries
Level 6, 201 Elizabeth Street, Sydney NSW 2000
PO Box K220, Haymarket NSW 1240
Tel: 02 8289 3999 Fax: 02 9286 3208 www.dpi.nsw.gov.au ABN: 72 189 919 072

Other comment
It is noted that the Lake Illawarra Authority has made a separate submission on this application.

Yours sincerely

Phil Anquetil
Executive Director Business Services

Attachment A

Water and Wastewater Servicing of the West Dapto Urban Release Area and Adjacent Growth Areas (09_0189)
Response to exhibition of Environmental Assessment (EA)
Comment by Fisheries NSW

Fisheries NSW is responsible for ensuring that fish stocks are conserved and that there is "no net loss" of key fish habitats upon which they depend. To achieve this, the Department ensures that developments comply with the requirements of the *Fisheries Management Act 1994* (namely the aquatic habitat protection and threatened species conservation provisions in Parts 7 and 7A of the Act respectively) and the associated *Policy and Guidelines for Aquatic Habitat Management and Fish Conservation (1999)*.

Fisheries NSW notes that parts of Dapto Creek, Mullet Creek, Reed Creek, Robins Creek, Marshall Mount Creek and Macquarie Rivulet and their tributaries are located within the proposed development area, which drain to Lake Illawarra and have the potential to be impacted by the proposed development. It is Fisheries NSW policy that all developments should aim to achieve no net impacts on receiving waterways.

Overall, Fisheries NSW has no objection to approval of the proposal as outlined in the Environmental Assessment (including Statement of Commitments) but makes the following comments and recommendations:

1. Fisheries NSW recommends that any project approval require that under-boring (micro tunnelling and horizontal directional drilling) is used for all water and wastewater pipeline crossings of major waterways mapped as key fish habitat by Fisheries NSW (3rd order and above) including Dapto Creek, Mullet Creek, Reed Creek, Robins Creek, Marshall Mount Creek and Macquarie Rivulet.
2. Fisheries NSW notes that the final construction methodology for each creek crossing will be determined during the detailed design (EA p.136). Fisheries NSW recommends the proponent be required to consult with Fisheries NSW with regard to the waterway crossing methodologies and site-specific mitigation measures to be used for all those waterways we have identified above as key fish habitat.
3. Fisheries NSW recommends that any proposed new or upgraded temporary access road crossings of waterways must be designed and constructed in accordance with the Fisheries NSW *Policy and Guidelines for Fish Friendly Waterway Crossings* (2004) and *Why Do Fish Need to Cross the Road? Fish Passage Requirements for Waterway Crossings* (2004). These documents are available at www.dpi.nsw.gov.au, under 'Aquatic Habitats' and 'Publications'. The design of any road crossings of the key fish habitat waterways listed above should be submitted to Fisheries NSW for approval prior to construction.
4. Fisheries NSW concurs with the proposed safeguards and mitigation measures to minimise environment impacts, in particular those related to marine and inland water quality, flora and fauna, soils and groundwater, and flooding, detailed in sections 6.3, 6.4, 6.5, 6.8 and 6.12 of the EA.

End Attachment A

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Attachment B

Water and Wastewater Servicing of the West Dapto Urban Release Area and Adjacent Growth Areas (09_0189)
Response to exhibition of Environmental Assessment (EA)
Comment by NSW Office of Water

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1. Comment and advice.

1.1 Stability of the pipelines

Pipeline depth at watercourse crossings
The Office of Water previously recommended:

- the EA needs to address the pipeline depth at the watercourse crossings; and
- scour calculations for bankful flow need to be undertaken (where there is a channel and there is no bedrock or clay) to determine the appropriate burial depth of the pipelines at the watercourse crossings.

Section 3.4.1 of the EA notes route and feasibility studies will be undertaken during detailed design, and the design of watercourse crossings would consider the potential for the bed and banks of watercourses to scour and migrate (page 40). Clarification is required as to when the route and location feasibility studies are to be provided.

The applicant needs to demonstrate the watercourse crossing method for the pipelines will have caused minimal harm to the watercourses and waterfront land post construction and meet the following criteria:

- The watercourses will remain in their current state of stability or have their stability improved in the long term and where possible bed and bank stability of any affected watercourse will be enhanced and improved to mimic a naturalised state.

Bank erosion and Channel Migration
The Office of Water's previous submission raised concern that the GSGA report identified numerous watercourse constraints and recommended that the EA address these. Section 6.8.2 of the EA confirms that for most of the proposal the pipelines would cross watercourses that are generally stable, with low potential for channel migration. It indicates four watercourses have been identified as being high risk with the potential to erode but design and construction techniques would mitigate potential impacts. The section notes site specific evaluations would focus on sensitive locations such as dynamic watercourses and refers to the possibility of additional watercourses with risks similar to the four high constraint sites. It is unclear if an additional assessment is proposed to identify other high risk watercourses. The GSGA recommends a fluvial geomorphological assessment is undertaken of the watercourses in the study area (Table 7.1, page 76). It is recommended the applicant demonstrates the watercourses and any waterfront land will remain in their current state of stability or have their stability improved.

1.2 Watercourse crossings

Section 3.4.2 of the EA notes the specific creek lines to be trenched would be assessed as part of the detailed design process and would take into account potential geomorphological impacts on the watercourses and riparian land (page 41). The detailed design process needs to demonstrate the watercourses will be minimally harmed and will not be less stable in the long term (and where possible more stable) than if the trenching does not occur.

Section 6.5.2 of the EA states that "*where possible the exit and entry points for under boring would be located outside the top of bank*" (page 136) whereas Section 6.8.2 indicates that where possible the exit and entry points would be located outside the riparian corridors (page 170). Clarification is required on this. The Office of Water supports underground boring commencing from the outer edge of the riparian land (rather than from top of bank) to avoid impacts on the waterway/ aquatic environment and any existing native riparian vegetation or rehabilitation of riparian vegetation.

Pipeline corridor widths
In the submission of 16 April 2012, the Office of Water sought clarification on the proposed construction footprint width at the watercourse crossings. Section 3.4.2 of the EA notes the construction footprint for the pipeline corridors is expected to typically be between 6 m and 10 m wide (page 42) and Section 6.5.2 notes a management measure may include limiting the extent of direct pipeline construction impact to a maximum width of 10m through native vegetation (page 137). For those riparian corridors that are to be conserved and rehabilitated in the West Dapto Release Area, it is recommended these areas are minimally disturbed (particularly where there is remnant native vegetation) and any areas of disturbance are rehabilitated to emulate the local native vegetation community of the area.

If the construction footprint is to be between 6-10 m wide, it is recommended the extent of direct impact is limited to 6 m (rather than 10m) through native riparian vegetation.

Access Tracks
It is noted permanent access tracks are not required across waterways (see Section 6.5.3, page 138). Section 6.5.2 of the EA includes a mitigation measure that where practical and feasible permanent access tracks required for maintenance purposes will be located outside riparian corridors. The Office of Water supports the locating of access tracks outside the riparian corridors but where this will not be the case, it is recommended the area of disturbance is minimised.

1.3 Riparian Land

Section 6.5.2 of the EA notes the potential impacts of constructing the proposal are likely to be limited to removing native vegetation at 14 specific locations (page 126) but the potential impact on the future rehabilitation of fully vegetated riparian corridors also needs to be assessed. It is not clear if riparian land affected by the proposal can be rehabilitated in the future with fully structured riparian vegetation if the pipelines are located under these areas and permanent access tracks are located in the riparian areas.
Section 6.5.2 includes a mitigation measure to "place alignments outside the 'top of bank' where pipelines run parallel to watercourses" and notes this allows for the potential establishment of riparian vegetation (page 136). Where possible, underground infrastructure should be located outside the riparian corridors and not just the 'top of bank' except where it can be demonstrated they can be located without adversely impacting any existing native riparian vegetation (particularly any threatened species or community) or the future rehabilitation of fully vegetated riparian corridors.
If pipelines are to be located within the riparian corridors it needs to be demonstrated that the project will not adversely effect existing native riparian vegetation or the rehabilitation of riparian land with fully structured riparian vegetation.

1.4 Watercourse Monitoring

Any watercourse crossings proposed to be trenched need to be monitored to assess the impact of the construction work on the watercourse stability. There is a need to monitor before construction commences (to provide a bench mark data), during and following construction until certified as stable to ensure the watercourses are rehabilitated to a standard equal to or better than the existing condition.

The monitoring program should include monitoring and maintenance of any bank stabilisation and

stream bed and bank rehabilitation. The rehabilitation will need to be monitored until all crossing sites are identified as stable by an independent suitably qualified certifier.

Monitoring should be undertaken for the rehabilitation of native riparian vegetation. A maintenance period of 5 years is recommended after final planting. The rehabilitation of other non native vegetation in riparian areas should be maintained until it is established and the area has been certified as stable by a suitably qualified independent certifier.

1.5 Wetlands

Section 3.3.2 of the EA states the wastewater pipelines would be designed to avoid wetlands and swamps as much as possible and Section 6.5.2 indicates coastal freshwater lagoons should be avoided where practical and technically feasible (page 136). It is recommended the pipeline route avoids wetland areas. If this is not possible, these areas should be underbored instead of using open trenching to minimise impacts.

1.6 Licensing requirements

Section 6.8.2 of the EA notes if groundwater is encountered during construction it would be pumped out. The proponent needs to quantify the amount of water to be taken to determine if a licence is required from the Office of Water.

Table 10.1 Draft Statement of Commitments

The Office of Water's submission on the ToA made recommendations in relation to the draft Statement of Commitments, these recommendations are reiterated.

2. Recommended Conditions of Approval

1. Prior to commencement of construction, a water licence must be obtained for any dewatering activity undertaken.

2. Prior to commencement of construction, a fluvial geomorphological assessment must be undertaken of all watercourses to be affected by pipeline construction. The assessment is to identify:
   - the appropriate watercourse crossing methodology for the pipelines;
   - where trenching or underboring is proposed, the depth of scour should be determined, and crossings designed to be deeper than the identified scour depth.
   - appropriate setback distances of the pipeline alignment from the watercourses where it is proposed to run parallel to the watercourses.

3. The project is to avoid or minimise disturbance of riparian corridors that are to be conserved and rehabilitated in the West Dapto release area. Where disturbance is unavoidable, disturbed areas are to be rehabilitated to emulate the local native vegetation community of the area.

4. Prior to commencement of construction, a monitoring program is to be developed to demonstrate the ongoing stability of watercourse crossings and rehabilitation of disturbed areas. The monitoring program is to:
   - Provide for monitoring prior to, during and after construction, for a period of 5 years, or until disturbed areas are certified as stable.
   - Include the monitoring and maintenance of any bank stabilisation and stream bed and bank rehabilitation.

End Attachment B

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Appendix B

Director-General's Environmental Assessment requirements

Appendix B - Director-General's Environmental Assessment Requirements

NSW GOVERNMENT | Planning & Infrastructure

Contact: Belinda Scott
Phone: (02) 9228 6472
Fax: (02) 9228 6455
Email: Belinda.Scott@planning.nsw.gov.au

Our ref.: MP 09_0189

Dr Judy Hansen
General Manager, Sustainability Division
Sydney Water Corporation
Parramatta NSW 2124

Attention: Murray Johnson

Dear Dr Hansen

Subject: Director-General's Requirements for Water and Wastewater Servicing for the West Dapto Urban Release Area and Adjacent Growth Areas (MP 09_0189)

In reference to your request, to amend the Director General's Requirements (DGRs) made at the meeting held on the 6 June 2011, the DGRs have been amended.

I have attached a copy of the amended Director-General's Requirements (DGRs) for the preparation of an Environmental Assessment for the project.

The DGRs have been prepared based on the information you have provided to date. Please note that under section 75F(3) of the *Environmental Planning and Assessment Act 1979*, the Director-General may alter these requirements at any time. If you do not submit an Environmental Assessment for the project within 2 years, the DGRs will expire.

Prior to exhibiting the Environmental Assessment that you submit for the project, the Department will review the document to determine if it adequately addresses the DGRs. The Department may consult with other relevant government authorities in making this decision. Please provide 5 hard copies and 5 electronic copies [1] of the Environmental Assessment to assist this review.

If the Director-General considers that the Environmental Assessment does not adequately address the DGRs, the Director-General may require you to revise the Environmental Assessment. Once the Director-General is satisfied that the DGRs have been adequately addressed, the Environmental Assessment will be made publicly available for at least 30 days.

Your contact officer for this proposal, Belinda Scott, can be contacted on (02) 9228 6472 or via email at Belinda.Scott@planning.nsw.gov.au. Please mark all correspondence regarding the proposal to the attention of the contact officer.

Yours sincerely,

Sam Haddad
Director General 4/7/2011

[1] File parts must be no greater than 5Mb each. File parts should be logically named and divided.

ATTACHMENT 1
Director-General's Requirements
Section 75F of the *Environmental Planning and Assessment Act 1979*

Director-General's Requirements

Section 75F of the *Environmental Planning and Assessment Act 1979*

Application number	MP09_0189
Project	Concept Plan Application: construction, operation and maintenance of drinking water, and wastewater infrastructure to service the West Dapto Urban Release Area and adjacent growth areas, including the following key components: ▪ new trunk pipelines for drinking water and wastewater; ▪ new pumping stations for drinking water and wastewater and upgrades to existing pumping stations; ▪ transfer of wastewater flows from the new growth areas to Wollongong or Shellharbour Sewage Treatment Plants for treatment and either reuse or ocean discharge; ▪ potential amplification and / or upgrades to Wollongong and Shellharbour Sewage Treatment Plants; and ▪ at least one and potentially two new water reservoirs. Project Application: to construct infrastructure related to the initial release Precincts (e.g. Kembla Grange, Sheaffes/Wongawilli) to be identified in the Environmental Assessment.
Location	The West Dapto Release Area is located wholly in the Wollongong LGA, however some components of the project are located in the Shellharbour LGA to the South.
Proponent	Sydney Water Corporation
Date issued	4 July 2011
Expiry date	4 July 2013
General requirements	The Environmental Assessment (EA) must include: ▪ an **executive summary**; ▪ a **detailed description** of the project including construction methods, location and alignment of project components, operation details including treatment technology and water quality standards to be applied, means of minimising wet weather infiltration, water demand management measures and interfaces with existing sewage treatment infrastructure, energy requirements and any staging. This should include a discussion on the uncommitted capacity of the Wollongong and Shellharbour Sewage Treatment Plants and their capacity to serve the proposed development;

	▪ consideration of any **relevant statutory provisions** including the consistency of the project with the objects of the *Environmental Planning and Assessment Act 1979* and permissibility*;* ▪ an assessment of the **environmental impacts** of the project, with particular focus on the key assessment requirements specified below; ▪ a **draft Statement of Commitments** detailing measures for environmental mitigation, management and monitoring for the project; ▪ **justification** for undertaking the project with consideration of the environmental, social and economic benefits and impacts of the proposal; and ▪ **certification by the author** of the Environmental Assessment that the information contained in the Assessment is neither false nor misleading.
Key issues	▪ **Strategic and Project Justification –** the Environmental Assessment shall clearly outline the strategic context of the project, having regard to existing and future development of West Dapto. Discuss how the project relates to relevant strategic and statutory planning documents including the following: the *Illawarra Regional Strategy* (2007); the *West Dapto Release Area Review Planning and Infrastructure Report* (Growth Centres Commission, 2008); the *Sydney Water Integrated Servicing Strategy*, the *Lake Illawarra Estuary Management Study and Strategic Plan* (March 2006) the *Illawarra Regional Environmental Plan No. 1*, and relevant local environmental plans including *draft Wollongong Local Environmental Plan (West Dapto) 2009*. The Environmental Assessment must describe the need for and objectives of the project; alternatives considered (including an assessment of the environmental costs and benefits of the project relative to alternatives) and provide justification for the preferred project. ▪ **Water Quality, Hydrology and Soils** – the Environmental Assessment shall include an assessment of water quality impacts arising from the construction and operation of the project taking into account applicable NSW Government policies. With respect to construction, risks associated with laying pipelines, including across watercourses, acid sulphate soils, salinity, erosion and sedimentation controls and management of any discharges from the project to prevent impacts to nearby watercourses, groundwater and water bodies should be addressed. ▪ Potential impacts to riparian areas should consider the *Riparian Corridor Management Study* (DIPNR 2004). The EA should include an assessment of the potential flood risks associated with the project including a risk screening of proposed water infrastructure development areas against the benchmarks identified in the *Draft NSW Coastal Planning Guideline: Adapting to Sea Level Rise* (DOP,

	2009). The assessment should include the full range of flood events including probable maximum flood and proposed mitigation measures with respect to operation. ▪ Details on the impacts and management of wastewater and infrastructure must be addressed, including • frequency and volume of overflow for dry and wet weather and pollutant load; • location of infrastructure within riparian areas including reference to the *Riparian Corridor Management Study* (DIPNR 2004); • the quality of the treated wastewater in dry and wet weather; • impacts from effluent discharge from Wollongong and or the Shellharbour Sewage Treatment Plants, particularly beyond currently approved levels; and • identification of wet weather effluent storage requirements. ▪ Assess appropriate wastewater treatment technology for the removal/reduction of key pollutants and consider options to reduce readily bio-available forms of nutrients. Demonstrate how treated wastewater discharged to waterways will meet *ANZECC 2000* water quality criteria for relevant chemical and no-chemical parameters. ▪ Measures to prevent or minimise sewage discharge or overflows and subsequent impacts to nearby watercourses, groundwater and water bodies shall be addressed. ▪ **Human Health** – the Environmental Assessment should address the human health impacts arising from the waste water infrastructure and processes including effluent disposal. The assessment should be undertaken in accordance with the *Guidelines for Managing Risks in Recreational Water* (NHMRC, 2008). ▪ **Flora and Fauna -** The Environmental Assessment should include a flora and fauna impact assessment taking into consideration impacts on any threatened species, populations, ecological communities and/or critical habitat and any relevant recovery plan in accordance with the *Guidelines for Threatened Species Assessment* (DEC & DPI, 2005) and with consideration to the *Illawarra Escarpment and Coastal Plain - Bioregional Assessment* (DEC July 2003). This assessment shall include a description of actions to avoid impact in the first instance and then mitigate impacts or compensate for unavoidable impacts. The EA should address key threatening processes, justify the need for clearing any vegetation and/ or habitat features and include an evaluation of potential impacts on waterways, aquatic ecosystems or riparian zones, including any in stream stormwater basins, potential for weed infestation and impacts to fish passage. Offsets should be considered for clearing of native vegetation consistent with “improve or maintain principles”. Sufficient details must be provided to demonstrate the availability of viable and achievable options to offset the impacts of the project. Where the

	proposal would be located adjacent to DECCW estate, the EA must identify management implications on DECCW estate from edge effects such as weed and pest management consistent with the *Guidelines for Developments Adjoining DEC Land* and identify all reasonable and feasible measures to minimise impact. ▪ **Aboriginal and Non-Aboriginal Cultural Heritage Impacts** – the Environmental Assessment shall include an assessment of Aboriginal and non-Aboriginal heritage values that may be impacted by the project with details on any subsurface archaeological investigations undertaken for potential archaeological deposits. Consideration should be given to the significance of the impacts of the project and any mitigation measures. The assessment must address the information and consultation requirements of the draft *Guidelines for Aboriginal Cultural Heritage Assessment and Community Consultation* (DEC, 2005*)*. ▪ **Air Quality**– the Environmental Assessment shall include an assessment of the air quality impacts associated with the operation of the project, particularly where operation is required beyond currently approved levels at the Wollongong and Shellharbour Sewage Treatment Plants, with specific reference to odour impacts. The analysis should be prepared in accordance with the *Approved Methods for the Modelling and Assessment of Air Pollutants in NSW* (DEC, 2005), *Assessment and Management of Odour from Stationary Sources in NSW* (DEC, 2001) and *Technical Notes: Draft Policy: Assessment and Management of Odour from Stationary Sources in NSW* (DEC, 2001). ▪ **Noise and Vibration –** the Environmental Assessment shall include an assessment of noise and vibration impacts during construction and operation and in a cumulative context with existing development. Construction traffic noise must also be addressed. The assessment must take into account the following guidelines, as relevant: *Interim Noise Construction Guidelines (DECC 2009)*, *Environmental Criteria for Road Traffic Noise* (EPA, 1999), *Industrial Noise Policy* (EPA, 2000) and *Assessing Vibration: A Technical Guideline* (DECC, 2006). ▪ **Hazards and Risk** – the Environmental Assessment shall include an assessment of the hazards and risk associated with the project including details of hazardous materials used or kept on the premises during the construction and operation phases, particularly any additional risk at the Wollongong or Shellharbour Sewage Treatment Plants. The assessment must refer to the Department's Guideline *Applying SEPP 33* (DUAP, 1994). If relevant, a *Preliminary Hazard Analysis* in accordance with the Department's Hazardous Industry Planning Advisory Paper No.6, *Guidelines for Hazard Analysis* must be included as part of the Environmental Assessment. ▪ **Environmental Risk Analysis–** notwithstanding the above key assessment requirements, the Environmental Assessment shall include an environmental risk analysis to identify potential environmental impacts associated with the project (construction and

	operation), proposed mitigation measures and potentially significant residual environmental impacts after the application of proposed mitigation measures. Where additional key environmental impacts are identified through this environmental risk analysis, an appropriately detailed impact assessment of this additional key environmental impact must be included in the Environmental Assessment.
Consultation	You should undertake an appropriate and justified level of consultation with relevant parties during the preparation of the Environmental Assessment, including: ▪ local, State or Commonwealth government authorities and service providers such as the Department of Health, the NSW Office of Water, the Department of Environment, Climate Change and Water, the Lake Illawarra Authority, the Department of Industry and Investment, the Southern Rivers Catchment Management Authority, Roads and Traffic Authority, and Shellharbour and Wollongong City Councils. ▪ specialist interest groups, including local Aboriginal land councils; and ▪ the local community, including affected landowners. The Environmental Assessment must describe the consultation process, document all community consultation undertaken to date and identify the issues raised (including where these have been addressed in the Environmental Assessment).

Contact us

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