

North West Growth Centre water related services for first release precincts

Modification Assessment Report

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Report Endorsement

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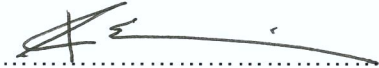
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Glossary and abbreviations

AHIA	Aboriginal Heritage Impact Assessment
AHIMS	Aboriginal Heritage Information Management System
AHMS	Archaeological and Heritage Management Solutions
BCO	Biodiversity Certification Order
CPW	Cumberland Plain Woodland
DP&I (formerly DoP)	NSW Department of Planning and Infrastructure (formerly NSW Department of Planning)
DN	Nominal Diameter (of pipelines)
EA	Environment Assessment
EEC	Endangered Ecological Community
ENV	Existing Native Vegetation
EP&A Act	<i>Environmental Planning and Assessment Act 1979</i>
EPBC Act	Commonwealth <i>Environment Protection and Biodiversity Conservation Act 1999</i>
FRP	First release precincts
GCC	NSW Growth Centre Commission
L/s	Litres per second
MCoA	Minister's Conditions of Approval
NWGC	North West Growth Centre
OEH (formerly DECCW and DECC)	NSW Office of Environment and Heritage (formerly the NSW Department of Environment, Climate Change and Water and prior to that the NSW Department of Environment and Climate Change)
PPR	Preferred Project Report
Project	The project as approved by DP&I – North West Growth Centre water related services for first release precincts (MP07 0125)
Modification Proposal	The scope of works in this application for modification.
RAP	Registered Aboriginal Party
RBMs	Relevant Biodiversity Measures
SGTF	Shale Gravel Transition Forest
SPS	Sewage Pumping Station
TSC Act	Threatened Species Conservation Act 1995
WPS	Water Pumping Station
WWTP	Waste Water Treatment Plant (formerly Sewage Treatment Plant (STP))

1 Introduction

1.1 Background

The North West and South West Growth Centres are to contain approximately 66,000 and 115,000 new dwellings respectively, to cater for 30 to 40 per cent of Sydney's growth over the next 30 years. Sydney's Growth Centres play a key role in Sydney's Metropolitan Strategy.

Six precincts within the North West Growth Centre (NWGC) - North Kellyville, Riverstone, Riverstone West, Alex Avenue, Area 20 and Colebee - were the first precincts released by the NSW Government (known as the first release precincts). To facilitate the planned development within these precincts, new infrastructure for water related services is required.

Sydney Water is responsible for providing the new water related infrastructure to service the first release precincts with the exception of the Colebee Precinct, and has undertaken the necessary planning. To service the first release precincts, Sydney Water has proposed to provide a range of new drinking water, recycled water and wastewater infrastructure, in addition to upgrading and amplifying elements of its existing infrastructure in the region (the Project).

The delivery of this infrastructure is staged to meet development rates and demand for housing. The first package of works was completed in August 2011 to service parts of North Kellyville, Riverstone and Alex Avenue. Construction for the second package of works, which includes infrastructure to service areas of the first release precincts and second release precincts is planned to commence late 2012. This will include components described in this report subject to the Minister for Planning and Infrastructure's approval of the Modification Application.

1.2 Existing approval

Sydney Water's Project to provide water related services for first release precincts of the NWGC was granted approval by the then Minister for Planning in November 2008 under the now repealed Part 3A of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

The Environmental Assessment (EA) for the Project was prepared in line with the requirements of the Director-General of the former NSW Department of Planning (DOP) issued on 17 October 2007. In March 2008, the DOP placed the EA for the Project on public display. Community and government stakeholders were also notified and invited to make submissions on the Project as described in the EA.

The Preferred Project Report (PPR) responded to issues raised in the submissions received. Responses to the submissions drew on the findings of the EA, new information gained since the preparation of the EA and changes in response to public inputs. The PPR was submitted to DOP on 16 July 2008.

The Minister for Planning granted approval for the Project on 18 November 2008 subject to a number of conditions (the Minister's Conditions of Approval). In accordance with transitional arrangements, following Part 3A's repeal, modifications to the Project will continue to be assessed under Part 3A and the Minister for Planning and Infrastructure remains the approval authority.

1.3 Scope of modification

This application for modification seeks approval for additional and relocated water related services for the North West Growth Centre first release precincts. The changes comprise the:

- addition of wastewater lead-in pipelines
 - o from the Chain of Ponds Wastewater Carrier to Hamilton Street (WWL4-6);
 - o from the Chain of Ponds Carrier through to Crown Street (WWL7);
- realignment of the Chain of Ponds wastewater Carrier at four locations (A, B, C and D);
- relocation of Sewage Pumping Station 1154 (SP1154) and associated lead-in pipeline;
- addition of a wastewater pipeline from SP1154 site (Chapman Road) to Riverstone WWTP (Rising Pipeline 3);
- relocation of a water pipeline from Hobart Street to Crown Street, including small section along Hamilton Street; and
- addition of a relatively small section of water pipeline at the northern end of Edmund Street
- ancillary pipeline structures, which may include maintenance structures, vent shafts and valves.

The proposed changes to the Project are listed in Table 1 and shown in Figure 1, Figure 2 and Figure 3 in later sections of this report.

This modification also proposes to update the Statement of Commitments (SOCs) to align with the Statement of Commitments proposed for the water related services for North West Growth Centre – second release precincts. Sydney Water's Proposal to service the second release precincts is a transitional Part 3A project. That project is currently under assessment by the Department of Planning and Infrastructure.

For the purposes of this report the proposed changes to the Project are called the Modification Proposal.

1.4 Current modification and consistency assessment

Section 75W of the EP&A Act caters for proposed changes and modifications to approved projects under the former provisions of Part 3A and Part 5 Division 4. Section 75W(2) provides that a proponent may request the Minister to modify the Minister's approval for a project but also provides that 'approval for a modification is not required if the infrastructure as modified will be consistent with the existing approval'. Section 75W(4) provides that the Minister may modify the approval, with or without conditions.

A preliminary consistency assessment indicated that the Modification Proposal is not consistent with the existing approval as it is not consistent with the approved Project as described in the EA and PPR (see Appendix A). As a result, this environmental assessment of the Modification Proposal has been prepared to support the modification application.

1.5 Environmental assessment

The application for modification has been prepared to seek approval of the proposed changes to the Project compared with those described in the EA, PPR and Minister's Conditions of Approval, assess potential environmental impacts and identify additional mitigation measures.

Sydney Water has prepared this report to support the application for modification. This report:

- describes the proposed changes to the Project and the justification for change (section 2);
- identifies the environmental issues and assesses the potential environmental impacts of the change relative to those of the approved Project (section 3);
- summarises mitigation measures for the Modification Proposal, in addition to those identified in the EA (section 3.9); and
- outlines consultation that has occurred and future consultation for the Modification Proposal, in particular with community or stakeholders now impacted as a result of this Modification Proposal (section 4).

This report considers whether the proposed changes are anticipated to result in any material changes to environmental impacts by considering the same key issues that were addressed in the EA and the PPR, and whether any additional key issues are raised as a result of these proposed changes.

This report does not include a section on legislative and planning framework as Chapter 5 of the EA generally applies. However section 1.4 above outlines the modification process under the EP&A Act and relevant updates to the legislative and planning framework are addressed in section 3 under the appropriate environmental issue. For example, section 3.2 addresses approval of the Sydney Growth Centres Strategic Assessment Program under the *Environment Protection and Biodiversity Conservation Act 1999*.

2 Project description and rationale for change

2.1 Description of approved project

Chapter 4 of the Preferred Project Report (PPR) defines the project for which Sydney Water sought approval and states that:

“The Preferred Project consists of construction and operation (including commissioning and maintenance) of water related services (including drinking water, recycled water and wastewater infrastructure) for the First Release Precincts in Sydney’s North West Growth Centre. There are six First Release Precincts, namely North Kellyville, Riverstone, Riverstone West, Alex Avenue, Area 20 and Colebee. Sydney Water is responsible for providing water related infrastructure to all these precincts, with the exception of Colebee.

The Project components include:

- *new drinking water trunk and major reticulation pipelines;*
- *new recycled water trunk and major reticulation pipelines;*
- *new wastewater gravity and rising pipelines;*
- *a new sewage pumping station (SPS);*
- *upgrade of an existing SPS;*
- *new water pumping stations (WPSs) for drinking and recycled water;*
- *new surface and elevated reservoirs for drinking water and recycled water;*
- *upgrade and amplification of the existing Riverstone Sewage Treatment Plant (STP); and*
- *new recycled water treatment facilities at the existing Quakers Hill STP.”*

Sydney Water considers the proposed changes are consistent with this overall project description.

2.2 Description of the proposed modification

The Modification Proposal involves construction and operation (including maintenance) of additional drinking water and wastewater infrastructure to service the first release precincts, not previously assessed in the EA or PPR. The project phases (pre-construction, construction, commissioning and operation) and associated activities for this Modification Proposal are consistent with those described in section 3.3 of the EA.

It is planned that components of the Modification Proposal will be delivered as part of the next package of works (known as package 2), in conjunction with infrastructure to service part of the second release precincts. Subject to approval, construction is anticipated to commence late 2012 and be completed mid 2014. This timeframe is later than the indicative date of 2010/11 to 2011/12 given in section 3.3.2 of the EA.

Table 1 summarises the Modification Proposal relative to the approved Project. Figure 1, Figure 2 and Figure 3 illustrate the infrastructure components of the Modification Proposal.

Table 1 Summary of proposed changes ‘the Modification Proposal’ compared to the approved Project.

Proposed Change	Project as described in the PPR or as approved by Minister’s Conditions of Approval	Proposed change related to this application for modification	Indicative pipe length (km) and pipe diameter (mm)
Relocation of SP1154	The proposed site for the new SPS (SP1154) is located off Old Hawkesbury Road on privately owned land and would need to be acquired by Sydney Water (Figure 3.9 of the EA). SP1154 would have an initial capacity of 450 litres per second (L/s), increasing to 1,200 L/s and would pump directly to Riverstone Wastewater Treatment Plant (WWTP), via a rising pipeline.	Relocation of SP1154 to privately owned land on Chapman Road, Vineyard. The site would need to be acquired by Sydney Water. Sydney Water is currently consulting this landowner (refer to section 4 for details). A small pumping station is still proposed at the approved SPS site off Old Hawkesbury Road. SP1154 would have an initial capacity of 25 L/s and ultimate capacity of 650 L/s this is a smaller pump station than the approved SP1154. The site infrastructure would need to be elevated approximately three metres above the existing ground level to avoid a 1 in 100 year flood event. A 3-D diagram depicting the anticipated layout and appearance of SP1154 has been developed and is presented in Figure 11. The EA did not specify the proposed height of the SPS, however further design identified the original approved SP1154 site would have been required to be elevated approximately five metres. SP1154 would pump directly to Riverstone WWTP via a rising pipeline (see Rising Pipeline 3 below).	NA

Proposed Change	Project as described in the PPR or as approved by Minister's Conditions of Approval	Proposed change related to this application for modification	Indicative pipe length (km) and pipe diameter (mm)
Rising Pipeline 3 (RM3)	Not previously included in EA or PPR. RM1 and RM2 were described in the EA and PPR to connect SP1154 at its former location to Riverstone STP. RM1 or RM2 may be required to transfer flows from a smaller pumping station at this site.	RM3 is proposed to connect the proposed relocated SP1154 off Chapman Rd to Riverstone WWTP. RM3 will be constructed predominantly by trenching along road verges, from the proposed location of SP1154 along Chapman Road and Boundary Rd, then south down O'Connell Street, along Otago Street then north west into the Riverstone WWTP. Major road crossings and all rail crossings will be underbored. There are no creek crossings.	2.7 km; 450mm
Wastewater lead-in pipeline (WWL4-6)	Not previously included in EA or PPR.	A wastewater lead-in pipeline (WWL4-6) to service Riverstone Scheduled Lands. It connects to Chain of Ponds Carrier, immediately north of 683 and 703 Windsor Road, Vineyard. It continues south west through private property, along the road verge and then is to be underbored (350 metres) beneath a conservation area adjacent to Sydney St, Riverstone to connect to upstream infrastructure in Hamilton Road, Riverstone. The conservation area is discussed in section 3.2. The bored section of the pipeline will be constructed to be maintenance free, and will require two launch pits outside the conservation area on its northern and southern boundary as shown on Figure 3. The dimensions of the launch shafts will be approximately 6m x 2m and will accommodate the boring activities in addition to material and spoil handling. No vegetation is to be removed within the conservation area	1.85 km; 225mm to 300mm
Wastewater lead-in pipeline (WWL7)	Not previously included in the EA or PPR.	A wastewater lead-in pipeline (WWL7) to service Riverstone Scheduled Lands is to be constructed between the Chain of Ponds Carrier to a connection point located on Crown Street, Riverstone.	0.34 km; 225mm

Proposed Change	Project as described in the PPR or as approved by Minister's Conditions of Approval	Proposed change related to this application for modification	Indicative pipe length (km) and pipe diameter (mm)
Realignment of the Chain of Ponds Carrier in four locations (A, B, C and D)	The Chain of Ponds Carrier (shown in Figure 3.9 of EA) is a gravity wastewater pipeline and would follow the Killarney Chain of Ponds Creek.	No significant change. The Chain of Ponds Carrier will remain a gravity pipeline and will continue to follow the Killarney Chain of Ponds Creek with four minor realignments between Bandon Road in the north (A) and immediately north of Junction Road in the south (D).	1.26 km (cumulative); 650mm to 1000mm
Crown Street and Hamilton Street water pipeline	Not previously included in EA or PPR.	A water pipeline along Hamilton Street, between the intersections with Hobart Street and Crown Street. A water pipeline along Crown Street, between the intersection with Edmund Street and Hamilton Street. This pipeline was re-routed from Hobart Street during the planning phase to avoid the conservation area. The pipelines are to be trenched along the road verges.	1.15 km; 500mm to 600mm
Edmund Street water pipeline extension	Not previously included in EA or PPR. The Edmund Street water pipeline as described in the EA and PPR is a 1.1km pipeline from Garfield Road to Hobart Street.	Extension of the Edmund Street water pipeline between Hobart Street and Loftus Street. Despite being located partially within a conservation area, the pipeline will be located on an unsealed road verge for the majority of its length and this section will be trenched. The northern most section will cross a small creek and this section will be underbored so that no vegetation classed as RBM 12 and within the conservation area is cleared.	0.28 km; 450mm
Update of the Statement of Commitments	Section 5 of the PPR details the Statements of Commitment (SOCs) for the Project.	A revised Statement of Commitments that aligns with those listed in the water related services for North West Growth Centres second release precincts.	NA

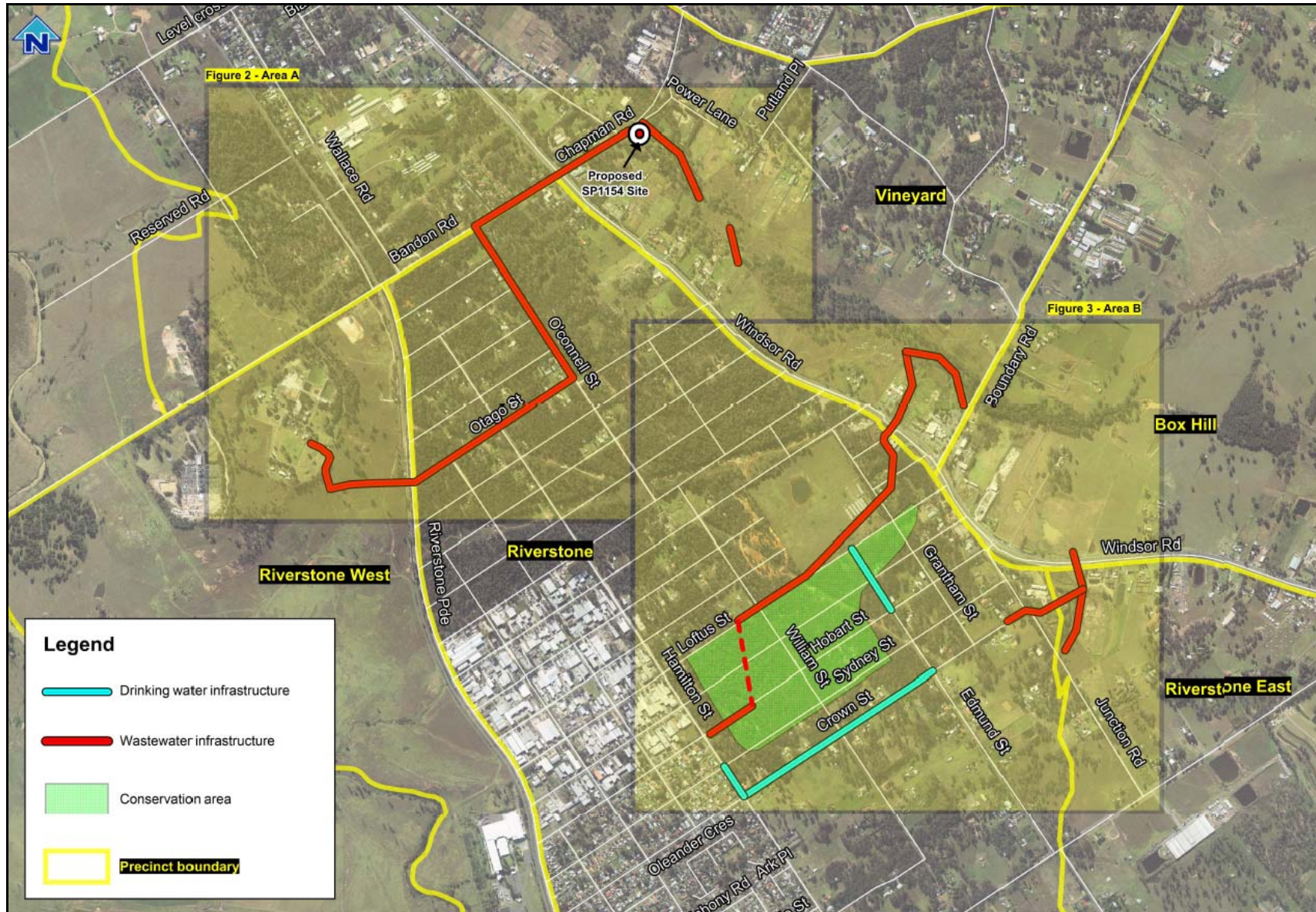


Figure 1 Location of additional drinking water and wastewater infrastructure - 'the Modification Proposal'

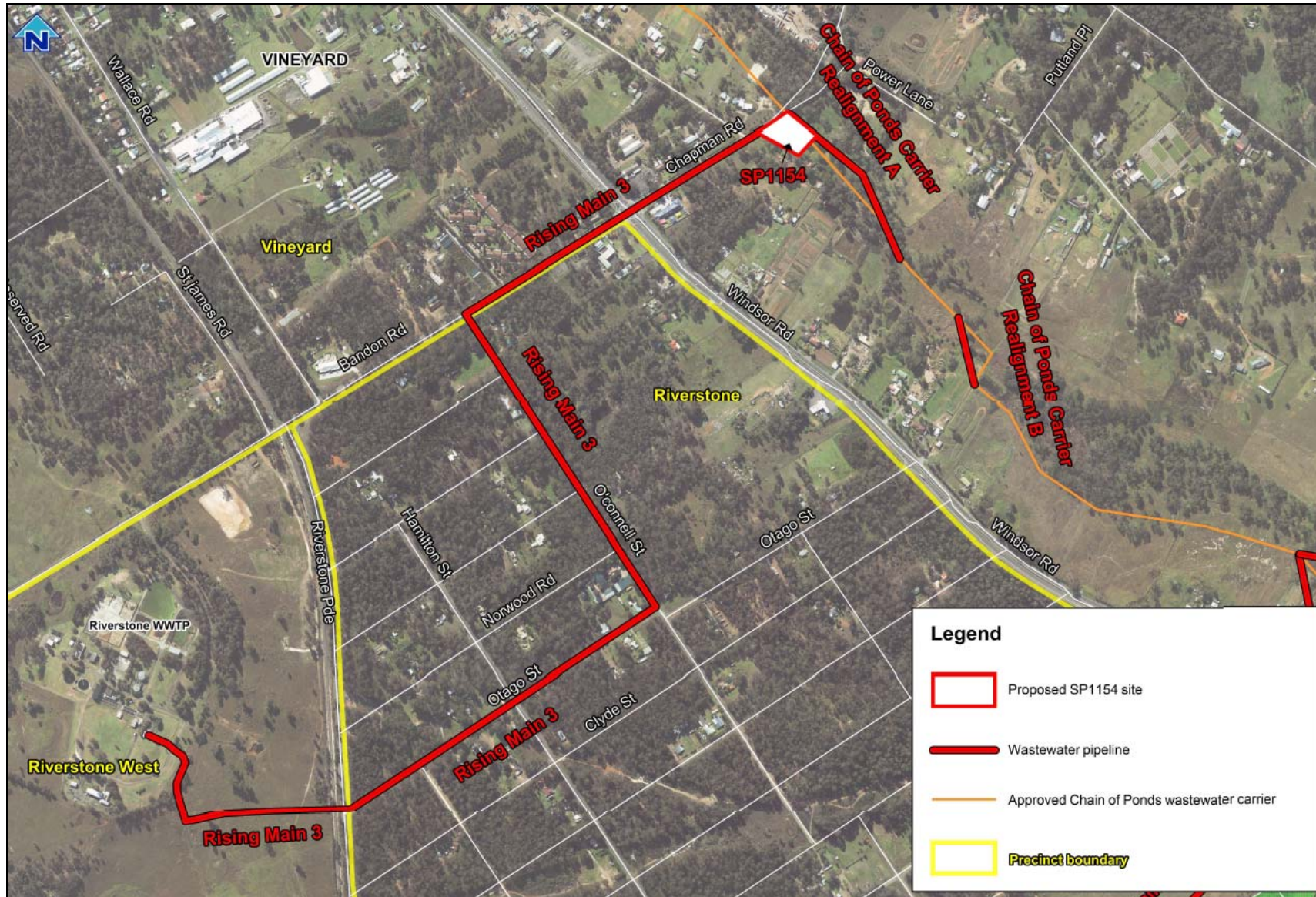


Figure 2 The Modification Proposal – Area A

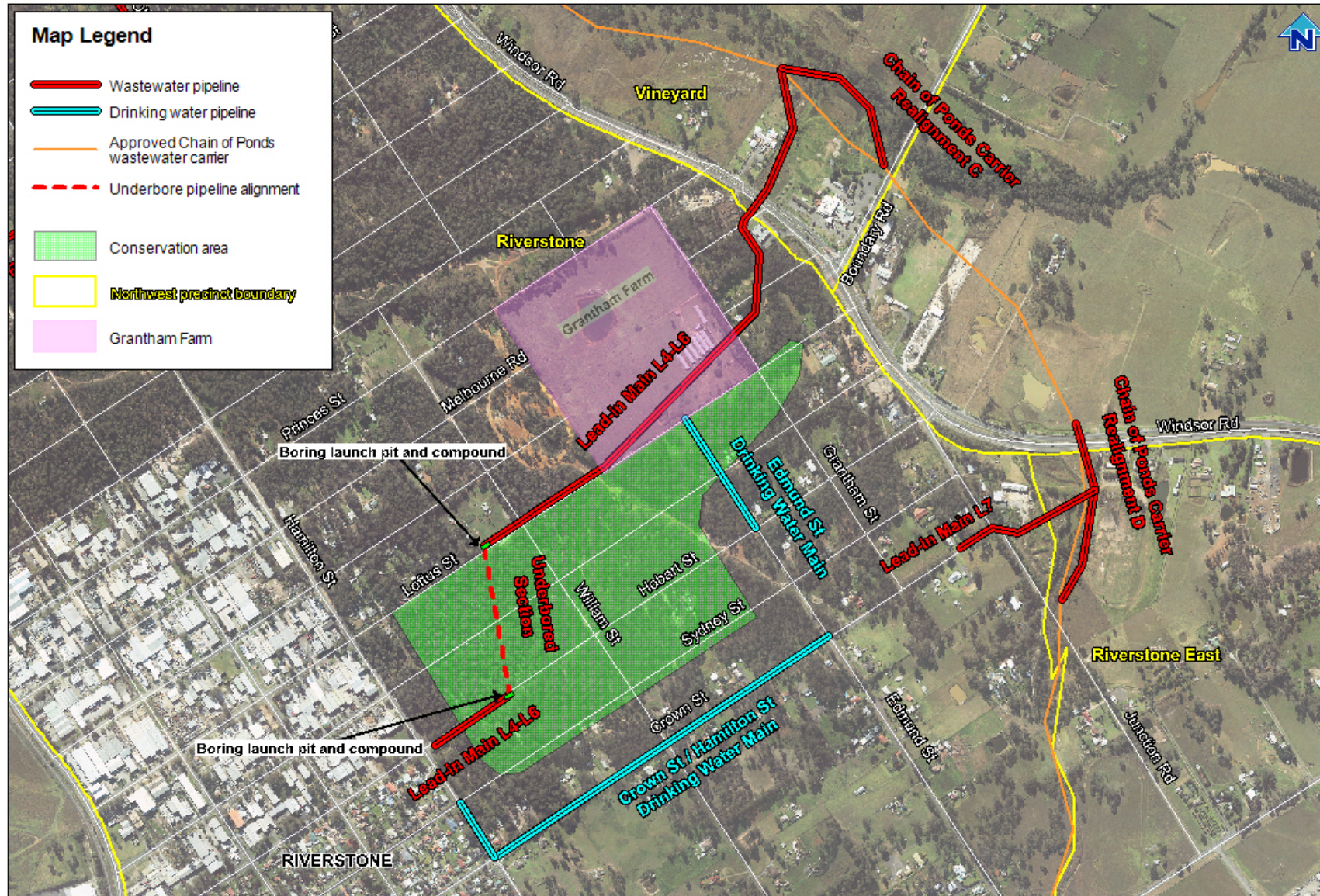


Figure 3 The Modification Proposal – Area B

2.3 Rationale for change and consideration of alternatives

The Modification Proposal, as summarised in Table 1, is required as part of the overall servicing strategy of the North West Growth Centre first release precincts and is consistent with the objective detailed in the EA:

“The key driver for the Project is the need to supply water related services to allow development of the First Release Precincts. The Project also responds to recent initiatives of the NSW Government, in particular the *2006 Metropolitan Water Plan*.”

The key drivers for the changes described in the Modification Proposal are identified in Table 2 below, followed by consideration of the alternatives for each change.

Table 2 Key Drivers for Change to the approved Project

Proposed Change	Reason for Change
Relocation of SP1154	To address changes in expected development rates
Rising Pipeline 3 (RM3)	To address changes in expected development rates
Wastewater lead-in pipeline (WWL4-6)	To facilitate servicing of the scheduled lands in Riverstone
Wastewater lead-in pipeline (WWL7)	To facilitate servicing of the scheduled lands in Riverstone
Realignment of the Chain of Ponds Carrier in four locations(A, B, C and D)	To minimise environmental impacts and address topographical constraints
Crown Street and Hamilton Street water pipeline	To minimise environmental impacts
Edmund Street water pipeline extension	To facilitate servicing of the scheduled lands in Riverstone
Update of the Statement of Commitments	To align with the SOCs with NWGC second release precincts Project, as infrastructure from each Project will be delivered in combined packages of works.

Various alternatives for the drinking water and wastewater infrastructure were considered during the Modification Proposal's planning and assessment phase. The assessment of options considered environmental costs and benefits by setting mandatory and desirable criteria across a range of environmental, public health, social, operational and regulatory requirements.

Each option was assessed against the following criteria:

- competitive cost
- customer acceptability
- minimise energy use
- effective effluent management (wastewater options)
- ability to accommodate water sensitive urban design

- flexibility to accommodate changes in rates of development
- ease of implementation
- efficiency of land use.

The preferred option for each infrastructure component was selected through an option evaluation process, and forms this Modification Proposal.

2.3.1 Drinking water pipeline options

Where possible, it is preferable for drinking water pipelines to be installed in road reserves. The preferred alignment of the pipeline within the road reserve is consistent with the guidelines outlined in the *Water Supply Code of Australia (WSA) 03-2003* (WSAA 2003). This minimises the need to install infrastructure in public reserves and private land. Drinking water pipeline alignments have been adjusted where possible to minimise environmental impacts. For example, a drinking water pipeline that was proposed for Hobart Street, Riverstone was relocated to Crown Street to avoid the proposed conservation area adjacent to Sydney Street, and allow construction of the pipeline within an existing road verge. However the extension of the Edmund Street drinking water pipeline must run through the conservation area as shown in Figure 3 to service the scheduled lands area. This pipeline will be trenched along the road verge, and underbored beneath vegetation and the drainage line.

2.3.2 Wastewater pipeline options

Wastewater pipelines are constructed in low-lying areas and in the vicinity of waterways. Due to the design requirements of gravity wastewater systems, locating wastewater pipelines away from waterways is not always feasible. As with drinking water pipeline, the wastewater pipeline alignment has been adjusted where possible to minimise environmental impacts, such as avoiding patches of ENV. While creek crossings will be necessary in a number of locations, the alignment has been selected to avoid areas of higher ecological and indigenous heritage value.

The realignment of the Chain of Ponds Carrier sections A to D is to remove topographical constraints and minimise impacts on vegetation. For example, Alignment C has been relocated to an existing track around a dam.

A wastewater lead-in pipeline is required to service the Riverstone Scheduled lands area (Lead in main L4-L6). As shown in Figure 3, part of this pipeline runs through a proposed conservation area (zoned E2 Conservation and also listed under RBM 12 of the Biodiversity Certification Order (BCO) for the Sydney Region Growth Centres SEPP 2006).

Given the conservation status of this area, Sydney Water considered several options for locating the pipeline outside this conservation area. However, these were not feasible because the pipeline location is constrained by set start and end points. Connecting these points via routes outside the conservation area is not feasible because it would require construction through high points in the landscape, meaning the pipeline would be so deep as to be impractical to construct. The option through the conservation area has been refined to minimise impacts as far as practicable by:

- Aligning the pipeline to minimise its length through the conservation area, despite it being preferable for topographic reasons to follow the riparian corridor.
- Constructing the pipeline by underboring rather than trenching through the conservation area. The alignment of the upstream section along Hobart Street (including the launch pit) is on an unsealed

road. The pipeline in this area is proposed to be trenched, as the vegetation has already been removed.

No vegetation will be cleared within the conservation area to construct this option.

2.3.3 Wastewater pumping station SP1154

Following a review of the anticipated wastewater demand areas and the capacity of the proposed SP1154, it was decided to relocate SP1154 (as approved in the EA) to an upstream location (approximately 1.3km south) at Chapman Road, Vineyard (see Figure 2).

The pump station will now be closer to the released land within the Riverstone precinct, and to the Riverstone WWTP. This better responds to the predicted timing of land development in the area, as the Vineyard precinct is not anticipated to need infrastructure services for up to 14 years. The relocation will also result in shorter pipelines, which will reduce impacts. The approved SP1154 site, as proposed in the EA, may still be used for a smaller pumping station in the future, as the Vineyard precinct develops.

Four sites were considered for SP1154 on the southern side of Chapman Road between Chain of Ponds Creek and Windsor Road. Factors that were considered in determining the preferred location included ecological impact (removal of vegetation), Aboriginal heritage impact, impact on surrounding land-uses and potential sensitive receivers, constructability and cost.

With all factors considered, the preferred site was the eastern-most site which presented the least impact on ecological issues, and was determined to have no identifiable impacts on Aboriginal heritage following a site walk-over and assessment. It is also situated furthest from the child care centre (Fit Kidz Learning Centre, at 551 Windsor Road, Vineyard, approximately 200m from the site). In addition, the site is within the riparian zone, which has limited development opportunities for the land owner. However the site was deemed suitable for a pumping station from a construction and cost perspective, with modification of the site's ground level to elevate site infrastructure above the 1 in 100 year flood event level.

2.3.4 Statements of Commitment

In addition to changes considered for the infrastructure components of the Modification Proposal, changes to the Statements of Commitment are also proposed in order to simplify and provide consistency with the EA for the North West Growth Centre (NWGC) second release precincts which is currently being assessed by DP&I.

With the exception of the commitments relating to recycled water infrastructure (which applies to the first release precincts only), Sydney Water proposes that the Statements of Commitment for the second release precincts (as per the Submissions Report dated February 2012) be applied to the Project.

A Statements of Commitment comparison table has been prepared and included as Appendix B of this report. The table compares the Statements of Commitment for the approved Project, the NWGC second release precincts Modification Proposal, and the proposed revision for the Project. These revised Statements of Commitment are provided in Appendix C to replace Tables 5-1 and 5-2 in the PPR.

2.4 Legislative Framework

Since the preparation and submission of the EA and PPR, a new environmental planning instrument (EPI), the State Environmental Planning Policy (Infrastructure) 2007 (Infrastructure SEPP) came into force under the EP&A Act. One of the aims of the Infrastructure SEPP is to identify permissibility for different types of infrastructure development. The Modification Proposal is permissible without consent due to the operation of a number of provisions of the Infrastructure SEPP.

Clauses 106 and 125 of the Infrastructure SEPP apply to the Proposal by identifying development for sewerage systems and water supply systems that are permitted without consent. All the wastewater infrastructure in the Proposal falls within the definition of a 'sewage reticulation system' under clause 106, which means the proposed works are permissible without consent on any land, except land reserved under *National Parks and Wildlife Act 1974* (where it must be authorised under the Act). The Proposal will not impact on any land currently reserved under the *National Parks and Wildlife Act 1974*.

All the drinking water pipelines within the Proposal fall within the definition of 'water reticulation systems'. Accordingly, under clause 125 these works are permissible without consent on any land.

In the absence of the Infrastructure SEPP, the Proposal's components located within the NWGC would be permissible without consent by virtue of clause 18A of the State Environmental Planning Policy (Sydney Region Growth Centres) 2006 (Growth Centres SEPP). Clause 18A provides that development for public utility undertakings (other than electricity generating works or water recycling facilities) may be carried out without consent on land to which the SEPP applies. The Proposal does not include facilities for water recycling.

In the absence of either the Infrastructure SEPP or the Growth Centres SEPP, the permissibility of Proposal components would be determined by the existing local environmental plans (LEPs). The Proposal is located within 3 local government areas (LGAs) being The Hills Shire Council, Blacktown City Council and Hawkesbury City Council. The LEPs of these three LGAs adopt the Environmental Planning and Assessment Model Provisions 1980 including clause 35(a).

Draft LEPs apply in the Hills Shire and Hawkesbury local government areas. The draft LEPs are yet to be formally made under the EP&A Act, and therefore do not presently have statutory force. However, the draft LEPs adopt the new standard template which includes compulsory clauses stating that the Plan does not restrict or prohibit, or enable the restriction or prohibition of, the carrying out of any development, by or on behalf of a public authority, that is permitted to be carried out with or without development consent, or that is exempt development, under the Infrastructure SEPP.

The applicable existing and draft LEPs are listed in Table 3, with the relevant land use zones and associated development controls for the Modification Proposal.

Table 3 Summary of existing and draft LEPs, land use zones and development controls

Local government area	Local Environmental Plan	Applicable land use zone(s)	Development control (permissibility)	Drinking water	Wastewater pipelines	SP1154
The Hills Shire	Baulkham Hills LEP 2005	1(a) Rural 1(a)	Public utility undertakings - development with consent	-	✓	-

Local government area	Local Environmental Plan	Applicable land use zone(s)	Development control (permissibility)	Drinking water	Wastewater pipelines	SP1154
	Draft The Hills LEP 2010	RU2 Rural landscape	Sewage and water reticulation systems - Development without consent under Infrastructure SEPP	-	✓	-
Blacktown	Blacktown LEP 1988	1(a) General Rural Zone	Development with consent	✓	✓	-
		R2 Low density residential	Development without consent under Infrastructure SEPP	✓	✓	-
		R3 Medium density residential	Development without consent under Infrastructure SEPP	-	✓	-
		IN2 Light industrial	Development without consent under Infrastructure SEPP	-	✓	-
		E2 Environmental conservation	Development without consent under Infrastructure SEPP	✓	✓	-
Hawkesbury	Hawkesbury LEP 1989	1 Rural living	Public utility undertakings – development without consent	-	✓	-
	Draft Hawkesbury LEP 2011	RU4 Rural small holdings	Development without consent under Infrastructure SEPP	-	✓	-

Note: '-' is used where Proposal components are not proposed within the listed land use zones

As outlined above, the permissibility provisions of the Infrastructure SEPP override the provisions of the LEPs where there is an inconsistency. As a result the Proposal and all its components are permissible without consent under the EP&A Act.

3 Environmental Issues

This section assesses environmental impacts of the Modification Proposal for the environmental issues as identified in the Project's EA.

Some of the environmental impacts of the Modification Proposal are substantially the same as those assessed in the EA and PPR for the Project. In these instances, no additional site specific assessment was undertaken and the mitigation measures listed as Statements of Commitment will effectively manage the environmental impacts. These issues are aquatic ecology, traffic, transportation and access, waste generation and management, hazards and risks, energy and greenhouse gas emissions, and social impacts. In addition, human health is not a relevant issue as there are no recycled water components in this Modification Proposal. These issues will not be discussed further in this section.

For each issue that is identified as an issue for this Modification Proposal, the existing environment and the potential impacts of the Modification Proposal are described. This section also compares the impacts of the Modification Proposal with those of the approved Project. Generally the impacts identified for the Modification Proposal can be effectively managed by the mitigation measures identified in the EA. However two additional mitigation measures are proposed (see Table 8), and have been included in the revised Statements of Commitment in Appendix C.

3.1 Water quality and hydrology

3.1.1 Existing environment

The first release precincts lie within the catchments of Cattai Creek and South Creek. The Riverstone precinct falls within the South Creek catchment with associated sub-catchments being Killarney Chain of Ponds Creek and Eastern Creek.

Eastern Creek is located to the west of the precinct, and is the major tributary of South Creek. There are a number of land uses that influence the water quality of the creeks and tributaries in the catchment. These include rural (such as grazing and market gardens), intensive agriculture (such as poultry farming), and both urban and industrial land uses. Eastern Creek also receives tertiary treated effluent from Riverstone and Quakers Hill Wastewater Treatment Plants (WWTPs).

As described in the Box Hill Riparian Assessment (Ecological Australia, 2011), Killarney Chain of Ponds is currently a semi-permanent watercourse. It was a former chain of pond morphology, but has been subject to modification due to post settlement land uses. It is considered to be in poor condition with active erosion over much of its length. Other watercourses in the area are considered to be ephemeral and of moderate to poor condition.

For further detail about specific pollutants (including all forms of nitrogen, phosphorus and chlorophyll-a) and characteristic concentration levels, refer to section 6.2.1 of the EA.

3.1.2 Construction impacts and mitigation measures

The construction of the Modification Proposal has the potential to impact water quality and hydrology as a result of:

- increased erosion and sedimentation from construction sites

- discharge of dirty or contaminated water from construction sites
- effects of flooding on construction activities

Disturbance, excavation and stockpiling of soils will be required for the construction of all Modification Proposal components. If not properly managed, disturbed soils can be eroded by runoff from the construction sites into surrounding stormwater systems and waterways causing impacts changes to water quality such as sedimentation and eutrophication. The construction of wastewater pipelines and SP1154 have the highest erosion and sedimentation risk during construction, as they are generally located adjacent to creeks and may involve creek crossings through soils with a high erosive potential. The Modification Proposal requires a minimum of two creek crossings associated with the realignment of the Chain of Ponds Carrier sections A and B (Refer to Figure 2). The realignment of the Carrier results in no additional creek crossings compared to the approved alignment.

Sydney Water will implement appropriate mitigation measures as outlined in the EA and PPR and those listed in the Statements of Commitment to manage water quality and hydrology including:

- 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)*
- All creek crossings by pipelines would be underbored except where underboring would cause more impacts than trenching. Appropriate sedimentation and erosion controls would be developed and implemented for underboring sites.

Shallow groundwater may be encountered after rainfall and adjacent to creek and drainage lines during construction. The management and mitigation controls associated with the potential interception, treatment and discharge of groundwater is detailed in section 3.5 of this document. The management of water discharges from construction sites, including commissioning, is described in the EA.

Due to the proximity of some of the Modification Proposal components to waterways, in particular the sections of realignment for the Chain of Ponds wastewater carrier and SP1154, flooding could potentially impact on construction activities. The main potential impacts of flooding during construction are increased erosion of soils from disturbed areas and sedimentation of waterways. Some impacts on construction materials and equipment may also occur, but only in severe flooding events. It is considered unlikely that the Modification Proposal will affect flooding behaviour in the area. Control and mitigation measures for soils and groundwater are to be implemented as per the EA, with the requirement for any additional measures detailed in section 3.5.

The potential impacts to water quality and hydrology associated with construction of the Modification Proposal are unlikely to be significant given that they can be effectively managed by implementing the relevant Statements of Commitment and compliance with the Minister's Approval. Sydney Water considers that no additional mitigation measures are required.

3.1.3 Operational impacts and mitigation measures

The operational impacts of overflows from the wastewater transport system are discussed in detail in the EA. Sydney Water has agreed acceptable wet weather overflow frequencies for each of its wastewater systems as specified in the Environmental Protection Licences granted under the *Protection of the Environment Operations Act 1997*. Infrastructure components including pumping stations are designed to meet these requirements and Sydney Water is required to maintain the wastewater system over time to ensure that this acceptable frequency of overflows is not exceeded.

The Modification Proposal is located close to waterways that will periodically experience flooding. SP1154 will be located in flood prone land, but the infrastructure will be elevated above the 1 in 100 flood level. During operation, the Modification Proposal will have negligible impact on existing flooding behaviour. SP1154 will be designed in consideration of flood water movement and water sensitive urban design principles to minimise change to flooding behaviour. The approved SP1154 site was also located on flood prone land.

Operational impacts associated with drinking water pipelines are primarily associated with pipe failure or breaks and disinfecting pipelines during maintenance and commissioning. All routine maintenance and commissioning activities are undertaken in accordance with Sydney Water's operational procedures and discharge protocols. Therefore, impacts on water quality and hydrology are expected to be minimal. Operational impacts to water quality and hydrology can be effectively managed by implementing the relevant Statements of Commitment and compliance with the Minister's Approval. Sydney Water considers that no additional mitigation measures are required.

3.2 Terrestrial flora and fauna

3.2.1 Assessment Overview

Flora and fauna impacts of the Modification Proposal were assessed by literature and database reviews and field surveys. The field surveys were conducted by *Cumberland Ecology* on 1 and 2 June 2011 with some additional changes in the design of the proposed alignment being assessed in the field on the 28 October 2011. The surveys assessed the extent and condition of vegetation communities present and flora and fauna habitat across the Field Assessment Area (a 20 metre wide survey corridor for all pipeline alignments and within the site boundaries for SP1154).

3.2.2 Existing environment

The EA and PPR identified the general condition of vegetation communities and habitats within the Project area, which is also applicable to the Modification Proposal area. The condition of these vegetation communities is generally poor and parts of the Project area have been highly disturbed and have severe weed infestation (including noxious weeds). In large parts of the Project area, vegetation has been previously cleared for the purpose of rural development and construction of vehicle tracks and roads. However, there are some good stands of native vegetation particularly along creek lines, adjacent to road reserve corridors and within areas reserved for open space or recreational uses. This includes an area of vegetation in the north of the Riverstone precinct that has been zoned E2 Conservation and mapped to be retained under Relevant Biodiversity Measure (RBM) 12 of the Growth Centres Biodiversity Certification Order. This area is shown as a conservation area in Figure 3.

The vegetation communities identified in the general area are typical of those documented for the Cumberland Plain Region. Three native vegetation communities were found to occur in the Modification Proposal's Field Assessment Area:

- Cumberland Plain Woodland;
- Shale Gravel Transition Forest;
- River-flat Eucalypt Forest;

Figure 4 and Figure 5 show the location and condition of the native vegetation communities identified during these surveys for the north and south of the assessment area respectively. The ecological impact assessment report is included in Appendix D.

The road reserve corridors and pathways where the drinking water pipelines would be located have mostly been previously cleared. These areas contain very few native plants and do not contain sufficient floristic diversity or structural integrity to be classified as native vegetation communities.

No threatened flora were recorded within the Field Assessment Area for the preferred alignments, however potential habitat for a number of species occurs. *Epacris purpurascens* var. *purpurascens* and *Grevillea juniperina* ssp. *Juniperina* were recorded during the previous assessment for the EA and PPR in the wider first release precinct areas.

No additional threatened fauna species were recorded during the field surveys. Fauna species listed in the EA that occur in the area (eight species) or have a potential to occur (seven species) also apply to this Modification Proposal. There is potential habitat for the Cumberland Plain Land Snail across the Field Assessment Area, but generally this is highly disturbed and does not provide optimal conditions for this species. There is also potential Green and Golden Bell Frog habitat adjacent to the wastewater pipeline (WWL7) in a small artificial waterway. For further detail about previous terrestrial flora and fauna assessment findings, refer to section 6.4 of the EA.

3.2.3 Construction Impacts and mitigation measures

The Modification Proposal will require the removal of vegetation for trenching and construction activities. The impact assessment considers the worst-case scenario for direct impact on vegetation by assuming:

- for SP1154, all vegetation on site will be removed.
- for all pipeline alignments, a 10 metre-wide corridor of vegetation will be removed (unless underboring is proposed).

Conservation area

One key potential impact is construction works through the conservation area adjacent to Sydney Street Riverstone. Impacts on vegetation in this conservation area will be avoided by using underboring techniques instead of trenching. This will require launch pits at each end of the bore, which will be located in already cleared areas. These launch pits can both be accessed via existing roads. The depth required for the bore is still being determined as design progresses, but is expected to range from about 1.2 metres at the Hobart Street launch pit to about 11 metres below the ground surface at the Loftus Street launch pit.

The vegetation in the conservation area above the bore is Cumberland Plain Woodland (listed under the *Threatened Species Conservation Act 1995* and *Environment Protection and Biodiversity Conservation Act 1999*). The vegetation is generally in good condition but has been disturbed in areas by clearing of access tracks and stockpiling of materials. Given the depth of the bore and identified Statements of Commitment to manage erosion, sedimentation and groundwater, for construction works adjacent to the conservation area, underboring beneath the conservation area is not expected to have any impact on the vegetation community above. The underbored section of pipe will also be maintenance free, which will also avoid impacts to vegetation during operation.

No vegetation is to be cleared within the Conservation Area, and therefore no Plan of Management is required by Relevant Biodiversity Measure (RBM) 12 of the Biodiversity Certification Order..

Vegetation communities

Table 4 below indicates the maximum direct impacts on vegetation as a result of the Modification Proposal. The Ecological Impact Assessment identified that the Field Assessment Area contains 2.35 ha of Endangered Ecological Communities (EECs), and up to 0.8 ha of this vegetation will be removed during construction. Tables E-1 to E-4 of the Ecological Impact Assessment (Appendix D) also include a breakdown of these impacts by infrastructure component.

Sydney Water is committing to avoid all vegetation within the conservation area at Riverstone. This will be achieved by confining trenched pipelines to existing unsealed roads, and underboring beneath all areas of vegetation. This has reduced the area of vegetation to be impacted by the Modification Proposal. The calculations in Table 4 are updated from those in the Ecological Impact Assessment (Appendix D), as Sydney Water will not be clearing vegetation in the Conservation Area.

Sydney Water amended its design to avoid some identified vegetation communities following initial field assessments. As detailed design of the infrastructure progresses, designs will be amended further to avoid or minimise impacts where possible. This means that the extent of impact may be lower than the maximum indicated in Table 4.

During construction, removal of vegetation will be avoided where possible and mitigation measures as outlined in the EA will minimise impacts to remaining vegetation.

Table 4 Potential direct impact of the Modification Proposal on Endangered Ecological Communities in the Field Assessment Area by Carrier

Infrastructure Component	Vegetation community	Non-certified (ha)	Certified (ha)	Total (ha)
Edmund St Drinking Water Pipeline	Shale Gravel Transition Forest (TSC listed)	-	0.004	0.004
Wastewater lead-in mains L4-L6 (outside conservation area)	Cumberland Plain Woodland (EPBC listed)**	-	0.092	0.092
	Cumberland Plain Woodland (TSC listed – additional to above)*	0.082	0.088	0.170
Wastewater lead-in mains L7	Cumberland Plain Woodland (TSC listed)	-	0.016 [#]	0.016
Rising Main Pipeline 3	Shale Gravel Transition Forest (EPBC listed)**	-	0.184	0.184
	Shale Gravel Transition Forest (TSC listed-additional to above)*	-	0.005	0.005
	Cumberland Plain Woodland (TSC listed)	-	0.009	0.009
SP1154 Site	Cumberland Plain Woodland (TSC listed)	0.041	-	0.041
Chain of Ponds Carrier Realignment	Cumberland Plain Woodland (TSC listed)	0.010 [^]	-	0.010
	River Flat Eucalypt Forest	0.269 [^]	-	0.269
	Total***	0.40	0.40	0.80

Notes: * All EPBC Act listed Cumberland Plain Woodland (CPW) and Shale Gravel Transition Forest (SGTF) also qualify as the TSC Act listed communities. TSC Act listed communities include low condition vegetation that does not meet the condition criteria to conform to this community under the EPBC Act.

**The calculated SGTF impacts include the additional clearance associated with the Crown St water main which is not included in the body of the Ecology Impact Assessment (Cumberland Ecology, Jan 2012) but is included in Appendix E to that report.

***Total numbers rounded to two decimal places.

[^] The vegetation to be impacted by the Chain of Ponds Carrier Realignment has already been offset.

[#] Does not meet the classification of ENV.

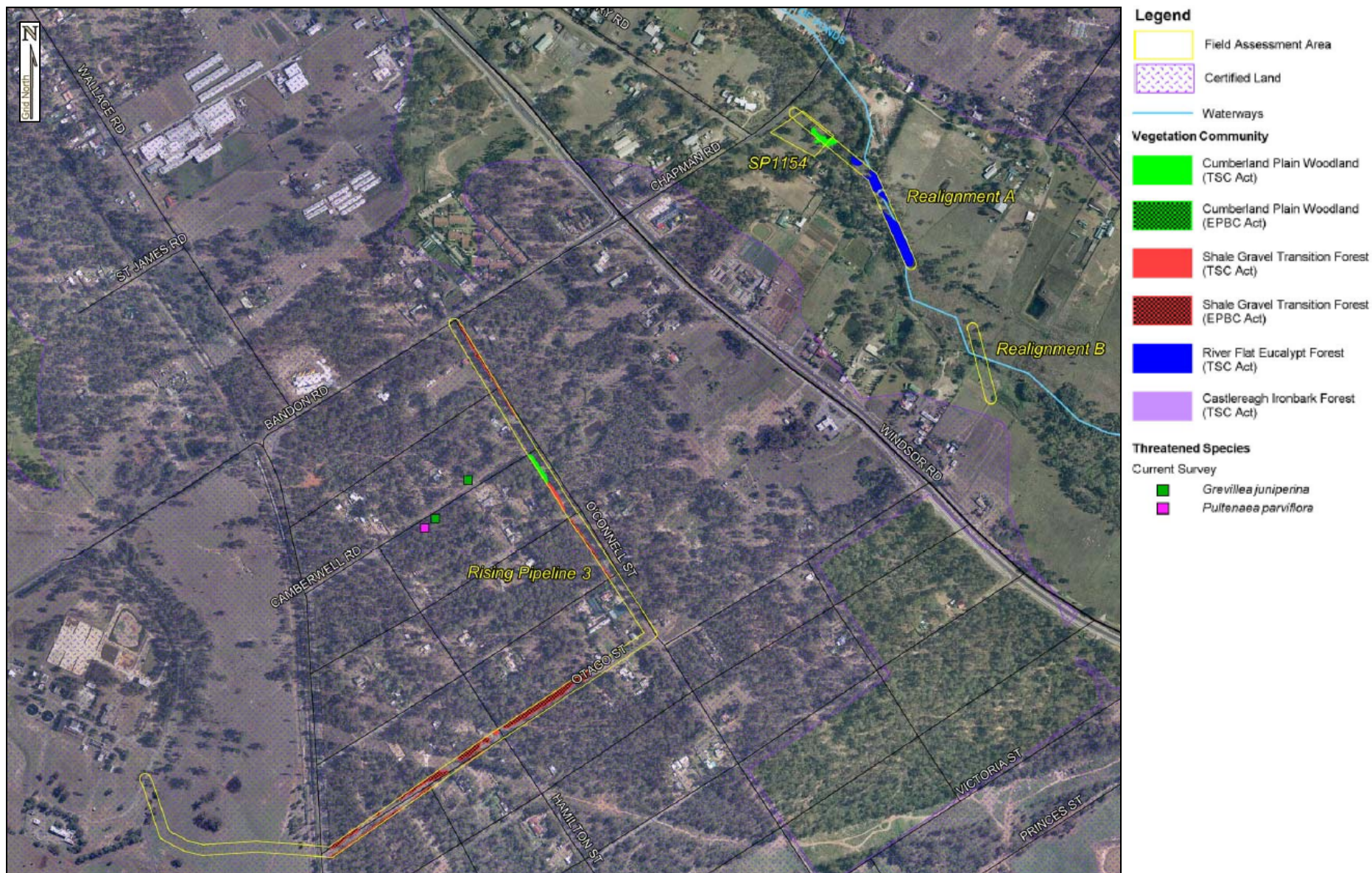


Figure 4 Detailed vegetation map of the field assessment area – North

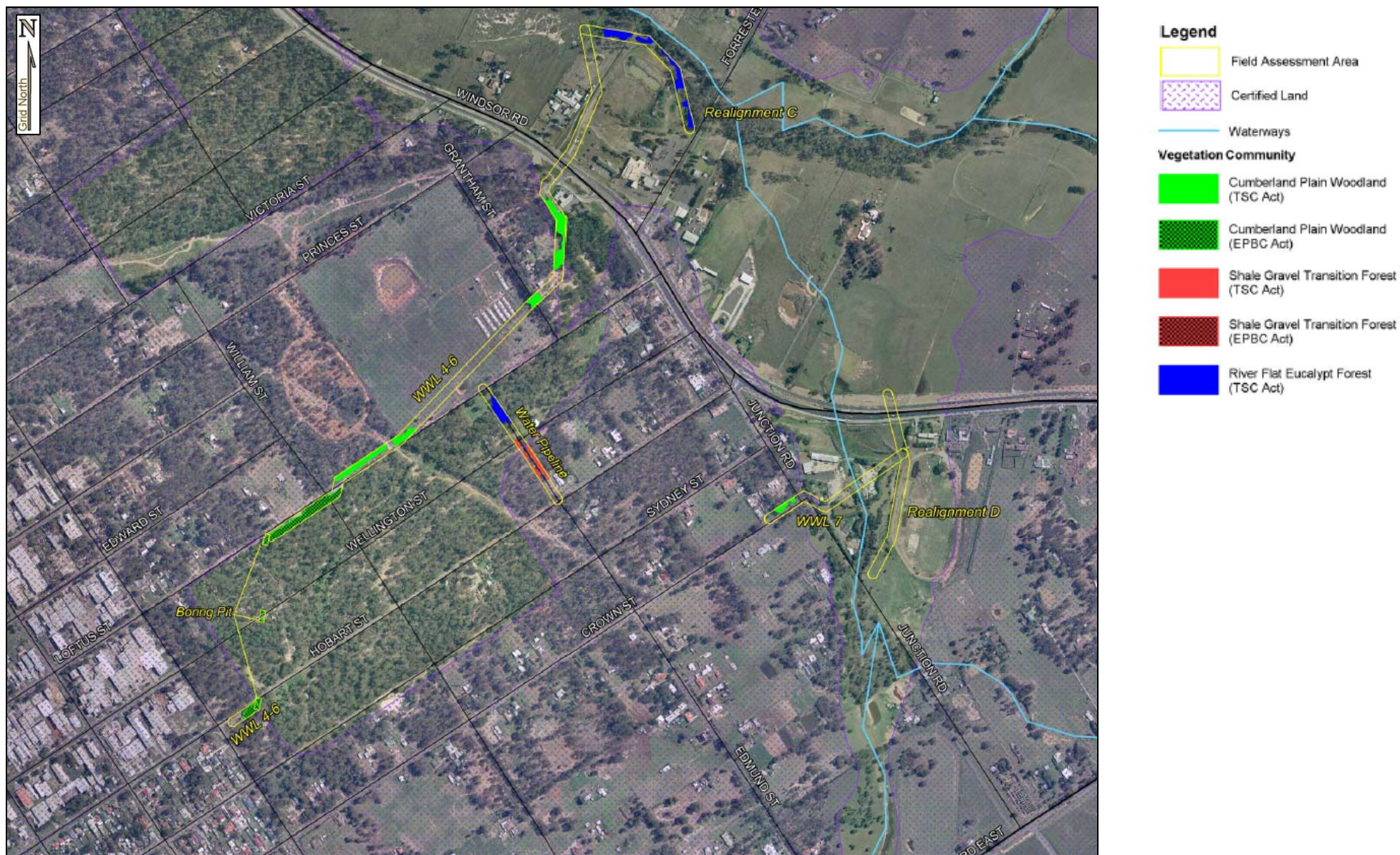


Figure 5 Detailed vegetation map of the field assessment area – South

Direct impacts on existing native vegetation (ENV)

Under the Biodiversity Certification Order (BCO), native vegetation in the Growth Centre may be classified as existing native vegetation (ENV) if it meets certain patch size and condition criteria. All areas of ENV within the field assessment area are presented in figures D4 and D5 of Appendix D for the north and south respectively. Some of the native vegetation within the Field Assessment Area occurs as small isolated patches and does not conform to the definition of ENV. All EECs listed in Table 4 (except for 0.01 ha of Cumberland Plain Woodland (TSC Listed) certified vegetation) conform to the definition of ENV. In accordance with the BCO, any ENV removed in non-certified areas must be offset.

Under the approved Project, Sydney Water committed to offsetting 2.58 ha to counterbalance the loss of ENV vegetation in non-certified areas. Sydney Water secured a larger offset of 3.19 ha at Riverstone WWTP prior to construction commencing for Package 1 of the project. The EA (Table 6.15) also identified 0.73 ha of vegetation outside the NWGC precincts that may be impacted. This was vegetation outside the first release precincts, but not outside the NWGC. Sydney Water has now calculated that 0.59 ha of this vegetation is non-certified ENV in the second release Vineyard Precinct, and would be impacted through construction of the approved Chain of Ponds Carrier alignment (as shown in Figure 3.9 of EA) in Package 2. Therefore Sydney Water should have provided an offset for the loss of 3.17 ha of ENV. As Sydney Water has already secured an offset of 3.19 ha all impacts to non-certified ENV for the approved Project have been offset.

The Modification Proposal will have some additional impact to vegetation compared to the approved Project. Table 4 lists the infrastructure components that will require vegetation clearing. The table shows that up to 0.8 ha of vegetation will be impacted as a result of this Modification Proposal, and up to 0.4 ha is located in non-certified areas. The realigned sections of the Chain of Ponds Carrier, will impact 0.28 ha of non-certified ENV, however, this will not result in increase in impact to what is already offset for the original alignment in the approved Project. The realigned carrier will impact up to 0.56 ha compared to 0.59 ha for the approved alignment. Therefore up to 0.12 ha of ENV in non-certified areas must be offset for this Modification Proposal (see *Biodiversity Offset Strategy* in section 3.2.5).

Although there will be a small loss of critically endangered vegetation communities, these generally suffer from weed infestation, are generally highly disturbed, and occur as small patches of vegetation in a rural residential (soon to be become urban) landscape. This limits their conservation significance and the role that they might play in the preservation of threatened species associated with them.

An area of better quality woodland occurs around Sydney Street and Loftus Street, which is zoned environmental conservation and will be retained and protected in the long term. Mitigation measures to avoid impacts in this area have been discussed above and mitigation measures as outlined in the EA will minimise impacts to remaining vegetation. This is considered sufficient to address the impacts to this vegetation that will occur as a result of the Modification Proposal.

Indirect impacts on existing native vegetation

Indirect impacts to ENV may occur where fragmentation of vegetation occurs as a result of vegetation removal for the construction of infrastructure, and fragmented areas of vegetation can no longer be considered ENV due to no longer meeting connectivity or minimum patch size criteria of 0.5 ha.

Figures 4, 5 and 6 show an existing level of ENV fragmentation as a result of road corridors, urban development and discontinuous vegetation patches along riparian corridors. These figures also show where the Field Assessment Area overlaps areas of ENV, and where this would result in fragmentation of non-certified ENV. Generally, the Modification Proposal does not result in fragmentation below the minimum patch size of 0.5 ha. However, as shown in Figure 7, there are a few sections on the Chain of Ponds Carrier where vegetation removal would result in patches of ENV in non-certified areas no longer meeting the minimum size criteria. The total area of these patches is 0.86 ha.

Fragmentation of ENV due construction of infrastructure will be temporary as Sydney Water has committed to restoring directly impacted areas (SOC 12 and 13) which will mitigate the long-term impact of the Modification Proposal's contribution to fragmentation of ENV in the area. Therefore the Modification Proposal is unlikely to significantly increase the existing level of ENV fragmentation

Threatened flora

No threatened plants were detected within the Field Assessment Area for the Modification Proposal.

The Modification Proposal will involve removing up to 0.8 ha of potential woodland habitat for threatened plants (see Table 4**Error! Reference source not found.**), which generally follows roadsides or occurs as narrow linear remnant vegetation along disturbed creeks. The condition of these areas is typically low and heavily impacted by weeds, soil modification and dumping. The Field Assessment Area is not known to provide key habitat for any of these species and is not considered to be important to their long-term survival. A number of conservation reserves occur nearby that provide good quality potential habitat for these species, and in some cases, support important populations.

The mitigation measures outlined in the EA will effectively manage potential habitat for threatened flora.

Threatened fauna

No threatened fauna were detected during field surveys within the Field Assessment Area for the Modification Proposal.

The removal of up to 0.8 ha of native woodland vegetation will result in a minor loss of potential foraging, roosting and breeding habitat for all fauna species associated with these woodland communities, including a number of threatened fauna species (EPBC Act and TSC Act) known to occur in the locality of the Field Assessment Area.

Areas that do not comprise native vegetation generally occur as exotic grassland or shrubs which would provide minor foraging and sheltering opportunities for common fauna as they tend to occur in the most disturbed areas.

Very little suitable habitat for the Green and Golden Bell Frog occurs within the Field Assessment Area, with pipeline corridors generally avoiding water bodies. However, Wastewater Pipeline (WWL7, near Junction Road) is adjacent to a small area of artificial waterway that may provide some habitat for this species. The minor loss of some potential foraging and shelter habitat for the Green and Golden Bell Frog is not considered to be significant as suitable habitat occurs adjacent to the Field Assessment Area and across the Riverstone area in general.

As outlined in the EA, any pipes left on site should be capped or covered overnight to prevent fauna (particularly Green and Golden Bell Frogs) from sheltering in them. In addition to this measure a suitably qualified ecologist should carry out a pre-clearance survey in the Wastewater Pipeline L7 (Junction Road) area immediately before any clearance works take place. A methodology for this should be included in the Flora and Fauna Management Plan required under the Condition of Approval 6.2 for the project.

Habitat for the Cumberland Plain Land Snail is considered to be marginal across most of the Field Assessment Area due to the highly disturbed nature of much of the site. However, the vegetation within the proposed conservation area adjacent to Sydney Street is likely to provide suitable habitat for this species. Sydney Water has committed to avoiding all vegetation in this conservation area, and therefore, should have no impact on the Cumberland Plain Land Snail or impact the long-term viability of this species.

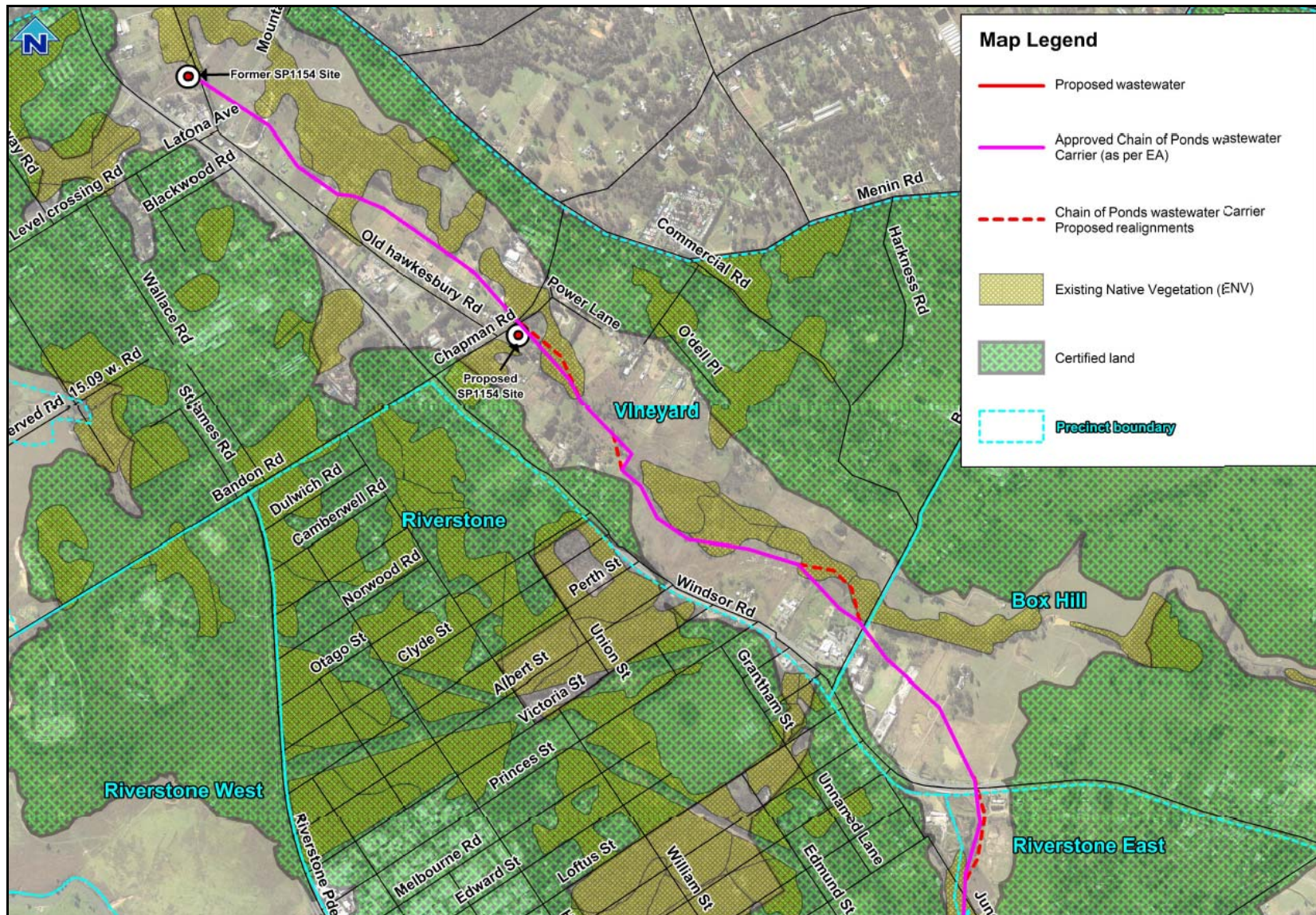


Figure 6 The Chain of Ponds Wastewater Carrier and existing native vegetation.

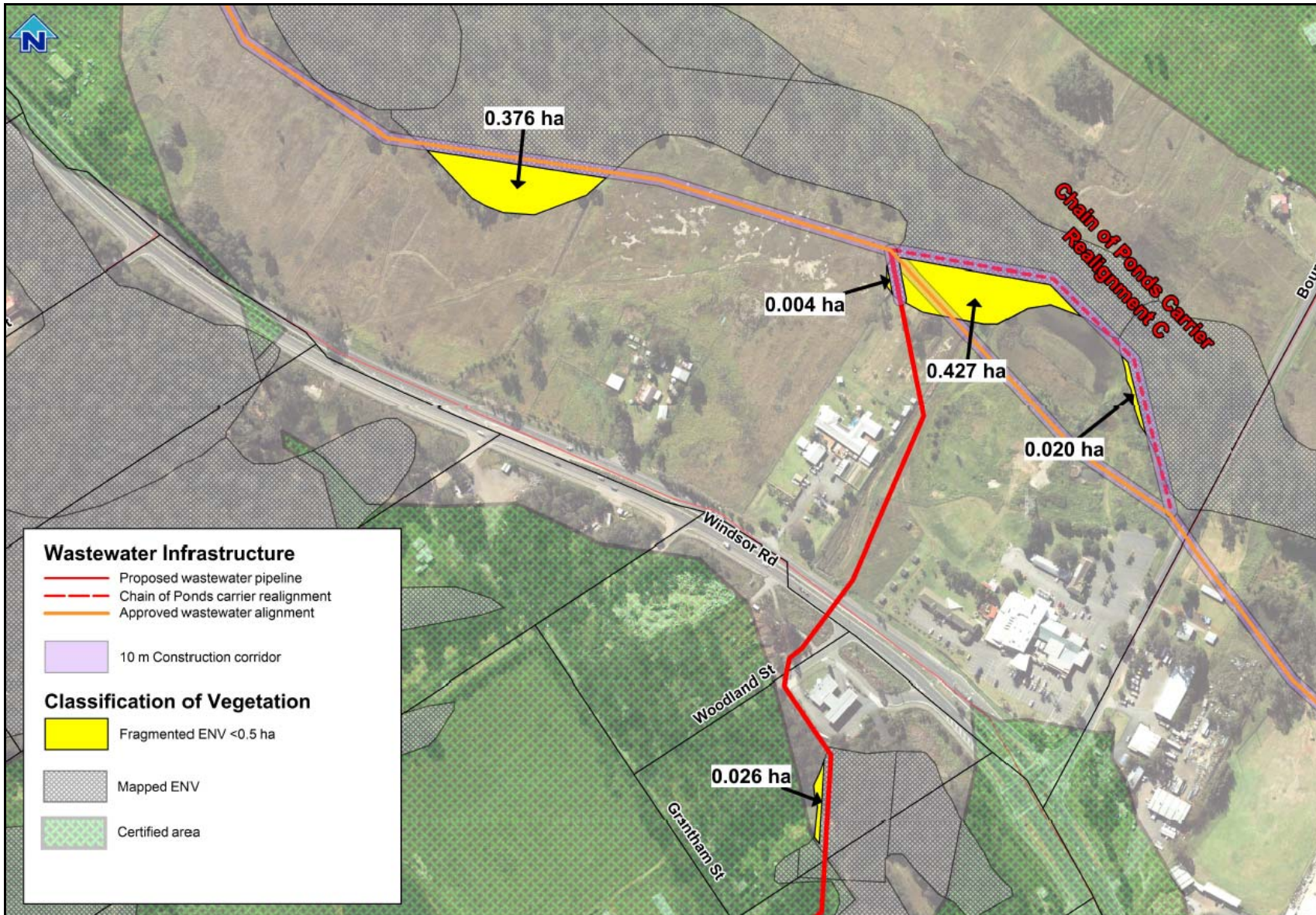


Figure 7 Extent of indirect impacts through fragmentation of ENV for the Modification Proposal

3.2.4 Comparison of Direct Impacts to those outlined in the previously approved Environmental Assessment

Partial re-alignment of Existing Corridors

The minor pipeline re-alignment changes (A to D of the Chain of Ponds Creek Carrier) will result in 0.27 ha of River Flat Eucalypt Forest and 0.01 ha of Cumberland Plain Woodland to be directly impacted by the Modification Proposal. This is not considered to be significant, as there is no net increase in vegetation impact as a result of these realignments, and these areas occur as small scattered patches in highly disturbed areas subject to weed infestation and dumping. The partial re-alignment of pipeline corridor is therefore not considered to alter the findings of the previous flora and fauna impact assessment that determined that no significant impact would occur as a result of the Project. The loss of this vegetation has already been offset as discussed in section 3.2.3.

Additional Corridors/Infrastructure

The additional infrastructure for this Modification Proposal will result in the further loss of up to 0.8 ha of native vegetation occurring as scattered patches across the Field Assessment Area. Table 4, (and Tables E.1 and E.2 in Appendix D) show the breakdown of vegetation loss by carrier /infrastructure site and Figures D.1 and D.2 in Appendix D illustrate the scattered nature of the vegetation to be removed. 0.7 ha of this vegetation qualifies as ENV under the Biodiversity Certification Order (refer to Tables E.3 and E.4 in Appendix D). Sydney Water will provide an offset for ENV removed within non-certified areas. Therefore Sydney Water will offset 0.12 ha of non-certified ENV in addition to the offset already provided for the first release precincts.

Threatened species assessments

Although 7-part tests (Assessment of Significance) are not required for Part 3A projects, the EA included these assessments for all threatened flora and fauna species listed under the TSC Act to ensure that all impacts had been assessed in detail. No significant changes to impacts have been detected during the current assessment for the Modification Proposal. Therefore the 7-Part Tests completed for the original EA are still considered applicable to all relevant TSC Act list threatened flora and fauna species.

3.2.5 Biodiversity Offset Strategy

Maximum direct loss of native vegetation for the Modification Proposal includes up to 0.8 ha of TSC Act listed native vegetation of which 0.4 ha is non-certified ENV. Sydney Water proposes to offset the impacts summarised in Table 5, in accordance with the relevant Biodiversity Measures 8 and 9 of the Biodiversity Certification Order.

Table 5 ENV offset calculations for the Modification Proposal

Offset Description	Reference	Area
Impact on non-certified ENV in field assessment area for the Modification Proposal	Table 4 Figure 5	0.4 ha
Impact on non-certified ENV for the realignment of Chain of Ponds Carrier (to be deducted from impact for the Modification Proposal, as already offset)	Table 4 Section 3.2.3 Figure 6	0.28 ha
Total Offset for this Modification Proposal		0.12 ha

Sydney Water has secured an offset of 3.19 ha at Riverstone WWTP, for vegetation to be cleared as a result of the Project. An additional 0.12 ha will be required for this Modification Proposal. Sydney Water is developing a Biodiversity Offset Strategy for the water related services for NWGC – second release precincts Proposal. Sydney Water will incorporate the offsets in Table 5 as part of that strategy and in accordance with SOC 14 (Appendix C) will negotiate and secure offsets before construction commences on works that will remove non-certified ENV.

Up to 0.5 ha of EPBC Act listed vegetation will be removed as a result of the Modification Proposal. Since the Minister for Planning's approval for the Project, the Sydney Growth Centres Strategic Assessment Program 'the Program' has been endorsed, and all associated actions approved by the Federal Minister for Sustainability, Environment, Water, Population and Communities. This effectively results in the Biodiversity Certification Order extending to EPBC Act listed species and communities. Therefore, the need for site by site approvals under the EPBC Act for the approved actions is no longer needed, as long as the actions are consistent with the endorsed Program. As previously discussed, this Modification Proposal is considered to be consistent with RBM 11 of the BCO as Sydney Water will only clear vegetation in non-certified areas for essential infrastructure, and will offset this impact in accordance with RBM 8. Therefore no further action is required under the Commonwealth EPBC Act. Operational Impacts and mitigation measures

The pipeline corridors and the new SP1154 site will be appropriately stabilised and restored following completion of construction. Operation of the Modification Proposal is likely to have minimal direct impacts on terrestrial flora and fauna. The aspects of operation with the potential to impact terrestrial flora and fauna include:

- routine maintenance and repairs of pipelines, involving access and maintenance of structure / infrastructure
- wastewater overflows and leaks from maintenance structures and wastewater pipes.

Potential impacts associated with routine maintenance are likely to be very minor and may involve some disturbance of vegetation by workers and equipment, and some excavation to gain access to underground components and pipelines. Such work will be subject to Sydney Water's existing environmental procedures for maintenance works and when required, future repairs to sites and pipelines will be subject to further environmental assessment by Sydney Water.

Wastewater overflows and leaks from the wastewater system have the potential to impact on native vegetation and fauna habitats by increasing soil nutrient concentration and encouraging weed growth. Flows occurring during less severe rain events will be contained wholly within the system. The wastewater system will be designed with the objective of no dry weather overflows reaching waterways, as previously discussed in section 6.23 of the EA. The low frequency and volume of the overflows in wet weather events are unlikely to result in significant impact on terrestrial flora and fauna.

3.3 Indigenous (Aboriginal) Heritage

3.3.1 Assessment methodology

Two indigenous heritage assessments were carried out for this Modification Proposal:

- *Aboriginal Heritage Part 3A Preliminary Assessment or Due Diligence Advice – Riverstone Additional Options, Archaeological and Heritage Management Solutions (August 2011).*
- *Aboriginal Heritage Impact Assessment for Sydney Water for the Additional Water Related Infrastructure for the North West Growth Centre – First Release Precincts, Archaeological and Heritage Management Solutions (Jan 2012).*

Consultation and communication with all registered Aboriginal parties is detailed further within section 4.3.4 of this document and within the *Aboriginal Heritage Impact Assessment* (AHMS 2011) in Appendix E.

3.3.2 Existing environment

The majority of the land within the Field Assessment Area has been subject to extensive historical land use impacts including road building, clearing, and industrial, rural and residential development. These have significantly reduced the number of available intact areas (natural ground surfaces and / or soil profiles) that may contain the tangible remains of traditional Aboriginal subsistence activities.

Previous assessments for Sydney Water projects in the NWGC identified that 208 Aboriginal objects, sites and places had been previously registered within the NW Desktop Assessment Area (AHMS 2010, 2011 and 2011a). Of these, six were believed to be located within the area of the Modification Proposal.

The Field Assessment Area included a 20 metre wide survey corridor for all pipeline alignments and within the site boundaries for SP1154. Field survey in this area did not identify any new sites and verified the accuracy of the six sites identified as being potentially impacted by the Modification Proposal. The Aboriginal Heritage Impact Assessment (AHMS, 2012) attached in Appendix E verified that three of these sites are on land potentially impacted by the Modification Proposal. The three sites include an artefact scatter in the vicinity of a proposed pipeline in Riverstone Precinct, whilst the other two of these sites are unlikely to remain in their registered locations close to land directly impacted by the Modification Proposal. Based on previously recorded information and observations made during the Field Assessment these three sites have been assessed as having low scientific (archaeological) significance due to their lack of research potential and poor integrity.

3.3.3 Construction impacts and mitigation measures

The Aboriginal Heritage Impact Assessment (AHIA) identified three sites of low significance that have the potential to be impacted by the Modification Proposal. To ensure impacts on these items are minimised, the mitigation measures in section 8.2 of the AHIA (Appendix E) will be implemented. These are included in revised Statements of Commitment 24 and 25 (Appendix C).

3.3.4 Operational impacts and mitigation measures

The Modification Proposal will require routine maintenance and repair during operation, which will require access to maintenance structures. As these areas would have been disturbed during construction, any further impacts on Aboriginal heritage are considered unlikely. Where maintenance occurs in areas of low

disturbance or in the vicinity of identified objects, sites and places, due diligence measures will be satisfied prior to undertaking the works.

3.4 Non-indigenous heritage

3.4.1 Existing environment

The non-indigenous heritage study completed for the EA was undertaken by the Growth Centres Commission in 2007 (GCC, 2007b in Sydney Water 2008a). The study identified 31 listed non-indigenous heritage sites within the Riverstone area. Of these 31 sites, one (the Riverstone Railway Station and Yard Group) is of State heritage significance and listed on the State Heritage Register, while the remaining are variously listed on the State Heritage Inventory, the Blacktown LEP, SREP 19, and State Agencies s.170 heritage registers. There are no items on the National Heritage List, Commonwealth Heritage List, Australian Heritage Places Inventory, Register of the National Estate or World Heritage List located in the Riverstone area.

Of the listed non-indigenous heritage sites identified, there are none that are located within the vicinity of the proposed pipeline alignments and infrastructure locations. A desktop register search in 2011 did not identify any new listings in the vicinity of the Modification Proposal.

The former Grantham Farm (shown in Figure 3) which is not currently listed on any heritage register was identified as a site having potential for archaeological significance and is located in the vicinity of the Modification Proposal. Grantham Farm, located in Riverstone, is bordered by Grantham Street to the east, Loftus Street to the south and Princes Street to the north. The sites of the former buildings on Grantham Farm are considered to have heritage value based on their potential to retain subsurface archaeological materials rather than their condition or the surface expression of archaeological material. The remains of two dwelling sites are situated on the property. One, probably dating from the 1940s, is situated adjacent to William St and consists of a brick chimney, house debris, exotic plantings, a concrete block out building and the remnants of a hay shed and stock yards. The second is situated roughly in the centre of the property near the existing large earth dam. Much of the extant material dates from 20th century dwellings (GCC 2007b in Sydney Water 2008a).

For further detail about non-indigenous heritage issues and the existing environment within the Project area, refer to section 6.6 of the EA.

3.4.2 Construction impacts and mitigation measures

The Modification Proposal would not directly impact any non-indigenous heritage items or places. In addition, all previously located non-indigenous heritage items are at least 50 metres from the Modification Proposal and therefore should not be impacted by vibrations.

The proposed alignment of the wastewater pipeline WWL4-L6 runs through the eastern and south-eastern boundary of the property curtilage of Grantham Farm. As identified above, both potential dwelling site remains are more than 150 metres from the Modification Proposal and impacts are therefore expected to be negligible. No additional mitigation measures to those identified in the EA were identified.

3.4.3 Operational impacts and mitigation measures

The pipelines and associated infrastructure would require maintenance during the operation. Maintenance works are unlikely to negatively impact on any items of non-indigenous heritage.

3.5 Soils and groundwater

3.5.1 Existing environment

The soil landscape identified in the EA for the area specific to the Modification Proposal is generally the Blacktown soil landscape, with the area around the proposed location for SP1154 and the Chain of Ponds Carrier realignments being dominated by the South Creek soil landscape. The characteristics of these soil landscapes are presented in Table 6.

Table 6 Existing soil landscapes relevant to the Modification Proposal

Soil Landscape	Description
Blacktown	The soils are strongly acid and hard setting, and have low fertility, high aluminium toxicity, localised salinity and sodicity, low wet strength, low permeability, and low available water holding capacity.
South Creek	Characterised by alluvial sediment, loams and clays. A dynamic landscape with many areas of erosion and deposition. Soils are characterised by high erodibility, a hard setting surface, strong acidity, low fertility, localised shrink-swell, and salinity.

Salinity mapping by the Department of Water and Energy (Sydney Water, 2008a) shows areas of moderate salinity potential in elevated areas of the Blacktown soil landscape. This mapping also shows areas of high salinity potential in conjunction with the South Creek soil landscape unit. This corresponds with areas of known salinity which have been identified in the vicinity of First Ponds Creek at the point where it crosses Windsor Road, in the north-eastern part of the Riverstone Precinct and on either side of First Ponds Creek on the eastern boundary of the Riverstone Precinct.

Analysis of soils in the Project area (Sydney Water 2008a) found topsoils to be acidic with local areas of high shrink-swell potential (often characterised by high clay levels). Areas of sodic and saline soils were found on the mid and upper hill slopes while low-lying areas consisted of saline soils with elevated sulphate and chloride levels. These findings are also relevant across the Modification Proposal area.

Recent groundwater investigations undertaken in the NWGC second release precincts EA (Sydney Water, 2011) identified shallow groundwater tables of depths of one to four metres within the South Creek soil landscape and these conditions are expected to exist throughout the wider NWGC. Most groundwater is relatively saline due to the geological characteristics of the area (Sydney Water 2008a).

For further detail about soil and groundwater issues and the existing environment within the Project area, refer to section 6.7 of the EA and section 3.8 of the NWGC second release precincts Submissions Report 2012.

3.5.2 Construction impacts and mitigation measures

It is anticipated that groundwater will be encountered during construction, particularly after rainfall and adjacent to creek and drainage lines. As noted in the revised Statement of Commitment No. 23, this water 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. If necessary, a number of boreholes with pumping apparatus

would be established around the construction area to inhibit groundwater flow. At this stage, it is not possible to determine the likely volumes of groundwater that will be encountered during construction.

The main approvals ordinarily required under the *Water Management Act 2000* for the Modification Proposal are under sections 89 (water use approval) 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. Part 3A continues to apply to a transitional Part 3A project. Sydney Water as a public authority is exempt from controlled activity approvals under section 91 of the *Water Management Act 2000*, for all activities carried out in, on or under waterfront land (cl. 38 of the *Water Management (General) Regulation 2011*).

Disturbance, excavation and stockpiling of soils would be required for the construction of all components of the Modification Proposal. Appropriate mitigation measures have been identified in the EA, and Sydney Water has committed to developing and implementing appropriate and standard erosion and sedimentation mitigation measures as detailed in *Managing Urban Stormwater: Soils and Construction* (Landcom 2004). The relocation of the proposed SP1154 site approximately 1.3km south of the original location (Old Hawkesbury Road, Vineyard), is not expected to have a significant impact on soils and groundwater. The impacts at this new location (Chapman Road, Vineyard), are expected to be minimal and of similar scale to those assessed in the EA.

Therefore, providing mitigation measures are implemented and maintained as per the EA, soil and groundwater impacts associated with the construction of the Modification Proposal are expected to be minimal.

3.5.3 Operational impacts and mitigation measures

The Modification Proposal will require maintenance during operation of the pipelines and associated infrastructure. Appropriate and standard erosion and sedimentation mitigation measures as detailed in *Managing Urban Stormwater: Soils and Construction* (Volume 1, Landcom 20004 and Volume 2A, DECC 2008) will be implemented to ensure any future maintenance activities have minimal impact.

3.6 Air quality / odour

3.6.1 Existing environment

The existing environment for air quality and odour within the Project area, which includes the Modification Proposal area, is described in section 6.11 of the EA.

3.6.2 Construction impacts and mitigation measures

Excavation of trenches, construction traffic, and wind erosion of cleared areas and stockpiles may impact air quality through dust generation.

As similar to the risks / impacts identified in the EA and PPR, construction of the pipelines would involve only minimal surface disturbance at any one time as the excavation works and rehabilitation would happen progressively.

Construction of SP1154 could generate dust through:

- site clearing (approximately 3,500m²)

- importation of required fill material to achieve an approximate elevation of three metres for the majority of the site
- excavations associated with the wet-well and inlet maintenance hole for incoming sewers.

These impacts will be of very similar scale to those assessed and detailed in the EA and PPR. The Modification Proposal therefore presents no additional impacts associated with the construction of SP1154.

The potential impacts from construction activities on dust generation are considered to be minor and will be managed through typical dust suppression measures as identified in the EA and PPR including water suppression, covering of vehicle loads and minimising ground disturbance where possible. Vehicle emissions are also a source of airborne particulates. All site vehicles will be maintained to ensure that particulate emissions are minimised. The proximity of the proposed site to adjacent residences or sensitive receivers is comparable to the approved SP1154 site. No additional air quality impacts are expected.

No odour impacts are expected during construction.

3.6.3 Operational impacts and mitigation measures

Wastewater flows generated as a result of the Modification Proposal will be transferred and treated at Riverstone WWTP. Sydney Water does not expect any additional odour impacts at this WWTP beyond those previously assessed.

Operation of the wastewater pipelines has the potential to generate local odour impacts, if they are not properly designed and operated. Odours generally occur when the wastewater becomes anaerobic (that is, lacking oxygen) due to poor venting or stagnant conditions in the pipelines (ie low or no flows).

Designing pipelines with adequate grades to optimise self-cleansing and slime control at ultimate flows and adequate natural ventilation should significantly reduce the risk of gas generation and odour emissions. Chemical dosing is proposed at SP1154 for the initial stages of development when flows are lower and self-cleansing is not fully achieved. In the future it is likely that residences will be built in close proximity to ventilation shafts. However the increased population will result in increased flows in the wastewater pipelines, which further reduces the risk of odour.

The flow design capacity and throughput for SP1154 at the proposed Chapman Road site (this modification) are the same as those that were proposed and assessed for the Old Hawkesbury Road option and therefore no additional operational odour impacts are anticipated. Odour management will be achieved through appropriate design of associated pipework and infrastructure to ensure optimal retention times and self-cleansing capabilities of the pipelines. The relocation of SP1154 is to ensure adequate flow is maintained in the wastewater system, based on development projections and locations, which will minimise odour impacts. The receivers identified in Figure 10 below, are not expected to be impacted by odour. Odour management will be carried out in accordance with Sydney Water's existing procedures. Odour complaints will be registered and investigated. Engineering, operational or other odour reduction measures will be implemented where verified odour complaints are received about odours from the wastewater system.

3.7 Noise and Vibration

3.7.1 Existing environment

In general terms the Project area and surrounding environment are dominated by natural sounds from surrounding bushland and intermittent traffic noise from nearby roads and rail. Windsor Road extends from north to south primarily along the eastern boundary of the Modification Proposal area with several other tributary roads including Bandon Road and Riverstone Parade contributing the existing noise in the area. Similarly, the railway line extends north to south primarily along the western boundary of the Modification Proposal area.

In addition, Riverstone industrial area is located to the west of the Modification Proposal area, bordered by Victoria Street and Hobart Street to the north and south respectively, and Riverstone Parade and Hamilton Street to the west and east respectively, and Riverstone WWTP is located approximately 300m to the west of Riverstone Parade off Bandon Road.

There is a range of noise receivers along the proposed pipeline routes and in the vicinity of the pumping station sites that may potentially be affected by noise during construction of the Modification Proposal. These include:

- residential areas
- recreational areas
- educational centres
- commercial premises.

The main noise receivers for pipeline construction activities and construction of SP1154 include the surrounding rural residential areas in Riverstone and Vineyard. A childcare centre, *Fit Kidz Learning Centre* is located approximately 200 metres southwest of the SP1154 site, and Vineyard Public School is located 250 metres west. Figures 8, 9, and 10 show the closest residential receivers and their proximity to SP1154. Acoustic assessments were completed by Renzo Toni and Associates as part of the Approved Environmental Assessment (Appendix G of the EA) and included assessment of the approved SP1154 site at Old Hawkesbury Rd. This site and receivers are comparable to the new site and receivers at Chapman Rd and both sites are located in the same Noise Catchment Area (NCA 1), which is dominated by traffic noise from Windsor Rd. The monitoring location is considered to be representative of the noise catchment area. Therefore the results from the original EA have been used to assess construction and operation impacts of the new proposed site below.

For further detail about potential noise and vibration issues and the existing environment within the Project area, refer to section 6.6 of the EA.

3.7.2 Construction impacts and mitigation measures

The proposed construction works would involve the use of equipment such as front-end loaders, bulldozers, rock breaker, tracked excavators dump trucks and backhoes. Receivers would be affected by construction noise and vibration associated with the following activities:

- vehicle and staff movements
- generator operation

- delivery and removal of materials
- use of equipment for boring, excavation and rock breaking
- use of equipment for the clearing of vegetation
- installation of the pipes, pumps and other pump station facility equipment
- general construction activities.

The proximity of some properties to the work sites and low ambient noise levels in the immediate surrounding area means that some short term and localised disturbances could occur. Of particular note are receivers in close proximity to the SP1154 site:

- the child care facility, *Fit Kidz Learning Centre*, located at 551 Windsor Road, Vineyard, approximately 200 metres west south-west of the proposed SP1154 site
- residential properties located adjacent to the south-eastern boundary of the proposed SP1154 site at 26 and 28 Chapman Road, Vineyard.

Whilst the construction noise associated with SP1154 will be audible at these locations (shown in Figure 10), noise impacts are expected to be short term and minimal. Construction impacts will be minimised through the implementation of the mitigation measures set out in the EA

Vibration impacts may also result from drilling, boring and rock breaking activities associated with excavation and horizontal directional drilling. Such potential vibration impacts would be limited to the duration of the construction works. Vibration generated by construction activities may exceed the OEH criteria for human comfort due to truck movements and when large excavators are in use close to residential locations (generally within 30 metres) but is not expected to cause structural damage.

Where vibration impacts may impact on sensitive receivers, measures will be taken to reduce the impact of vibration. These measures are listed in the EA.

3.7.3 Operational impacts and mitigation measures

The main component of the Modification Proposal that would generate noise and vibration during operation will be SP1154. The main source of noise from this facility would include the pumps and ventilation fans. No other components are expected to generate noise during operation.

The infrastructure and capacity of the proposed SP1154 are comparable to that previously approved under the EA for the SP1154 site further north. The original site also has similar sensitive receivers and existing noise sources at comparable distances (residential residences within 100 metres of the site). Noise modelling for the previously approved SPS site was completed for impacts on nearby receivers (R5), and monitoring point (M5) in the Acoustic Assessment by Renzo Tonin & Associates, Appendix G of the EA. These results of this assessment are presented in Table 7 below.

Table 7 Predicted noise levels at representative receiver locations for SP1154 in operation

Period	Intrusive criteria dB(A)	Amenity criteria dB(A)	Predicted noise level dB(A)		
			Calm and isothermal	Slight wind	Moderate temperature inversion
Day	51	55	45	45	-
Evening	51	45	45	45	-
Night	45	40	45	45	45

The results in Table 7 show the predicted noise impacts that can be expected from the operation of the pump station at the Chapman Road site and it should be noted that the modelling of noise from the operational site was based on a typical worst case scenario where all plant and equipment would be operating at the same time.

The results of the noise modelling indicate that the predicted noise levels generated by the pump station would comply with the intrusive noise criteria during all weather conditions and for all periods of the day. The results also predict that, with the exception of the night time period, the noise generation would also comply with the amenity criteria, with the night time prediction exceeding by 5 dB(A). Sleep disturbance modelling was also completed for the previously approved pump station site. The modelling for sleep disturbance predicted a noise level of 49 dB(A), complying with the sleep intrusiveness criteria for that location of 55 dB(A). The proposed pumping station at Chapman Rd is smaller in capacity than the original proposed pumping station; therefore noise will not be expected to exceed that predicted in the EA.

If a smaller pumping station is built in the future at the original pump station site, the noise impacts would be less than previously assessed due to the reduced size of the plant. The distance between the two sites would not result in any cumulative noise impacts in the area.

During the final selection of mechanical plant and equipment, appropriate noise control treatments would be chosen, including:

- installation of commercially available silencers
- installation of acoustic screens and barriers between plant and sensitive neighbouring premises
- installation of partially-enclosed or fully enclosed acoustic enclosures around mechanical plant and the pump station.

Periodic maintenance and inspections would not typically result in significant noise generation and would be managed through Sydney Water's standard management procedures.

Although the operational noise associated with SP1154 may be audible at nearby receivers at times, noise impacts are expected to be minimal and compliant with sleep disturbance criteria. Operational impacts will be further minimised through the implementation of the mitigation measures set out in the EA, and Sydney Water will follow its standard procedures for receiving and managing complaints in accordance with the Sydney Water Customer Contract.

3.8 Visual amenity

3.8.1 Existing environment

As outlined in the EA, the pipeline routes pass through areas with both urban and rural visual components, including some more densely populated residential and commercial areas. The pipelines will be located in existing road reserve corridors or cleared land where possible. The visual environment along these routes ranges from small-scale closed landscapes with isolated pockets of vegetation, to cleared flat open parkland and open pasture. Wastewater pipelines that lie adjacent to creeks would be located in some areas with existing dense vegetation.

The proposed SP1154 site is located on cleared flood prone land in proximity to residences and commercial premises off Chapman Road.

3.8.2 Construction impacts and mitigation measures

The pipelines will be located primarily along roads or creeks. Construction equipment will be visible to adjacent properties and road users. Along creeks, visibility of construction sites will vary depending on the distance, screening vegetation and fences. Due to the relatively rapid rate of pipeline construction, the visual impact of construction activities will only be for a short period in any one area, which means anticipated visual impacts will be minimal. Areas disturbed by pipeline construction will be progressively rehabilitated, further reducing any visual impacts. Machinery will be used and stored ensuring minimal disturbance to residents.

Construction compounds will need to be established along pipeline routes and at the SP1154 site. Each compound will only be required during construction. The visual impact from construction compounds will therefore be temporary and hoardings or temporary screening will be erected to further decrease visual impact where appropriate. The size and number of the compounds will be minimised where possible and good housekeeping practices will be employed on site to minimise visual impacts.

At the relocated site for SP1154, the Modification Proposal will involve the excavation and construction of site foundations (three metres above existing ground surface level) and a wet well,. It will also include installation of pumps, chemical dosing unit, electrical switch room, electrical substation and space for a future emergency generator. In addition, construction works will have a visual impact on surrounding residences (as shown in Figures 8 to 10) due to the storage of equipment. Similar to compound sites above, impacts will be minimised through the implementation of the general mitigation measures as detailed in the EA and PPR, including the use of suitable screening and the application of good housekeeping at all times.

3.8.3 Operational impacts and mitigation measures

The majority of the pipeline infrastructure will be underground and will have no visual impact during operation. There will be some surface infrastructure associated with the pipelines such as ventilation shafts, maintenance structures, valves and overflow structures. These will be designed to minimise their visual impact including painting ventilation shafts a dark 'bush green' colour.

The pumping station site, SP1154, will be elevated approximately three metres above the existing ground surface level and therefore the structures on the surface will be visible to surrounding residents and from Chapman Road. The above ground structures associated with the pump station will include an electrical

switchroom, a chemical dosing unit and a vent shaft. An emergency generator may also be installed in the future.

There are three residential premises within the vicinity of the proposed pump station site which will be impacted visually by the Modification Proposal. These residences, shown in Figure 10, will experience differing views of the pump station site depending on the final topography and vegetation screening of the site. The SPS will also be visible to users of Chapman Road.

Visual impacts of the site will be minimised through painting the structures a colour consistent with the natural surrounds, likely to be similar to a dark 'bush green' colour, which has been used previously on Sydney Water structures and was chosen as being the colour most compatible with the surrounding environment.

A landscape plan will be developed, this plan will outline how visual impacts can be further minimised, such as through planting of vegetation. Future planning for urban development in the area may also take into consideration the planting of vegetation buffers and other visual filters in or adjacent to properties which will have a view of the pump station site. A 3D impression of the pump station site and indicative landscaping is presented in Figure 11.

Stakeholder consultation will also continue with affected residents as detailed further in section 4 of this report.



Figure 8 View south towards house No. 26 and 28 Chapman Rd with shaded area depicting approximate area to be occupied by the site for SP1154.

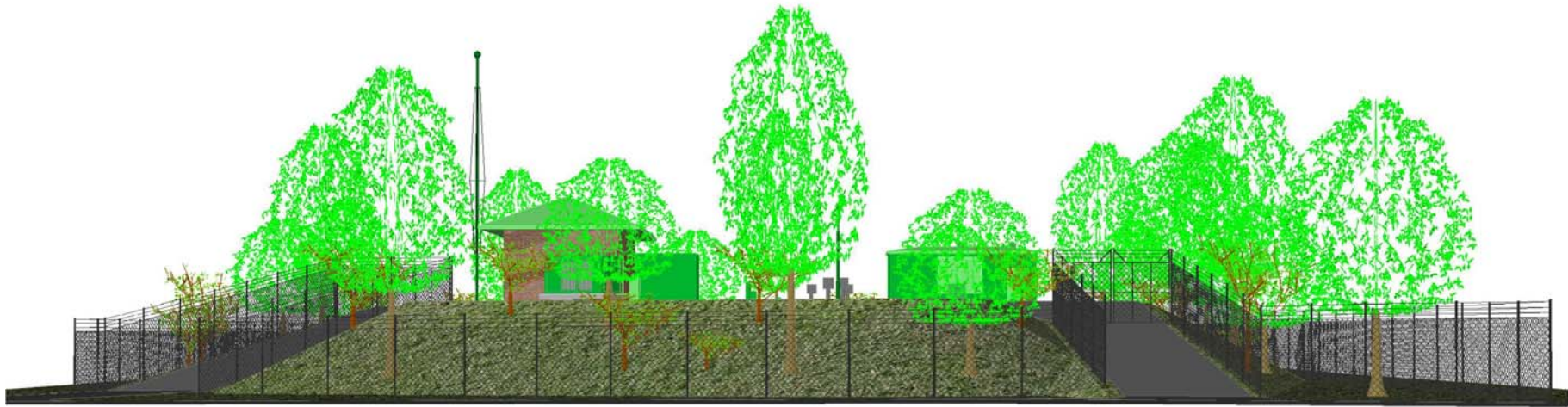


Figure 9 View from northern SPS site boundary, west towards Chapman Rd, showing closest residences on Old Hawkesbury Rd (within 100 metres of the SP1154 site)



Figure 10 Receivers of potential noise and visual impacts associated with SP1154.

Perspective view from 100 metres north west



Perspective view from 100 metres south



Figure 11 3D impression of SP1154.

3.9 Environmental Impact Gap Analysis and Mitigation Measures

This section outlines the potential impacts of the Modification Proposal compared to those identified for the approved Project. The comparison includes the key potential environmental aspects assessed in the EA and PPR that were deemed to be relevant to the Modification Proposal. Table 8 summarises the relative change in environmental impacts associated with the Modification Proposal that were identified in section 3.

A number of the environmental impacts identified, can be effectively managed consistent with the mitigation measures as listed in the EA, PPR and MCoA are implemented. These are listed and additional mitigation measures have also been included, where required.

Table 8 Change in environmental impact due to the proposed amendments

Aspect	Relative change in environmental impact	Mitigation measures required
Water quality and hydrology	No additional impacts	No additional mitigation measures
Terrestrial flora and fauna	Up to 0.4 ha of <i>Existing Native Vegetation</i> (ENV) is to be impacted within non-certified areas, including approximately 0.22 ha of EPBC Act listed vegetation, as a result of the Modification Proposal. 0.12ha of this vegetation has not been offset as part of the approved Project.	MCoA 2.8 and SOC 15 in Appendix C apply. This means that Sydney Water will offset 0.12ha of vegetation to in accordance with the BCO prior to impact.
	Minimal loss of potential foraging, sheltering and suboptimal breeding habitat for the <i>Green and Golden Bell Frog</i> near Junction Road at Wastewater Pipeline L7 and the realignment of Chain of Ponds carrier, section D.	New SOCs 20 and 21 have been included in Appendix C to minimise potential impacts on GGBF in these areas. These commit to pre-clearance surveys prior to works and capping of pipes in potential GGBF habitat.
Indigenous (Aboriginal) heritage	There is the potential to impact three indigenous sites of low significance, as a result of the Modification Proposal. The impacts can be effectively managed with the existing mitigation measures listed in the EA.	SOCs 22 to 25 in Appendix C apply to minimise potential impact on Indigenous (Aboriginal) heritage sites, objects and places.
Non-indigenous heritage	The Modification Proposal will not impact potential heritage values of Grantham Farm.	SOCs 26 to 29 in Appendix C apply to minimise the potential impact on items and places of non-indigenous heritage significance.
Soils and	No additional impacts	No additional mitigation measures.

Aspect	Relative change in environmental impact	Mitigation measures required
groundwater		
Air quality / odour	No additional impacts	No additional mitigation measures.
Noise and vibration	Sensitive receivers have changed, however impacts are considered comparable. No additional impact.	SOCs 55 to 60 in Appendix C apply to minimise the potential for impacts associated with noise and vibration.
Visual amenity	Sensitive receivers have changed, however impacts are considered comparable. Long-term visual impacts to property owner and adjacent residences to proposed SP1154 site and reduced impact to adjacent residences at original SP1154 site. These new impacts are not considered significant, if the existing mitigation measures listed in the EA are implemented to address visual amenity	SOCs 67 to 73 in Appendix C apply to minimise visual impacts at the proposed SP1154 site. This means that a vegetation landscape plan will be developed and implemented to screen the site, and the structures would be painted a dark “bush green.” SOCs 74 to 77 in Appendix C ensure effective communication with affected community.

4 Stakeholder engagement and consultation

4.1 Development of servicing strategy

Sydney Water consulted key government agencies in 2006 and 2007 as part of preparing its water related servicing strategy for the North West Growth Centre (NWGC). This included one-on-one briefings and two inter-agency workshops. The first workshop identified key issues for developing the strategy. The second workshop agreed on assessment criteria and involved selecting a preferred servicing strategy from four shortlisted options. For a list of agency consultation, please see the complete Environmental Assessment (EA).

4.2 Other NWGC water related services

Sydney Water has completed construction of the first stage of work described in the North West Growth Centre EA for providing water related services for the first release precincts. Sydney Water also prepared an EA for infrastructure to service the North West Growth Centre second release precincts in 2011.

Throughout our work in the North West Growth Centre local communities have been kept informed through:

- community information sessions
- letters
- newsletters
- one on one meetings
- local community information lines
- text messages
- email
- the Sydney Water website
- advertisements and project signage.

The community and stakeholders will continue to be kept informed of progress as work in the North West Growth Centre continues.

4.3 Consultation during preparation of the modification

4.3.1 Government agencies

Sydney Water has consulted Blacktown City Council, Hawkesbury City Council, Roads and Maritime Services (RMS) and Railcorp during infrastructure design for this Modification Proposal. This is to ensure

that the location of infrastructure is compatible with other infrastructure services. Sydney Water will continue to consult with these agencies during detailed design and construction, and seek the relevant approvals and permits prior to construction.

Sydney Water has also consulted with DP&I (Strategies and Land Release) and Office of Environment and Heritage (OEH), regarding vegetation impacts and its proposed Biodiversity Offset Strategy. This included the possible location of infrastructure within the conservation area adjacent to Sydney Street Riverstone. Sydney Water acknowledges that it is DP&I and OEH's preference that no vegetation clearing or works be undertaken in the conservation area. Sydney Water has therefore committed to avoiding removal of vegetation in this conservation area by underboring the pipeline, and installing a maintenance free pipe beneath the conservation area. Sydney Water is preparing a Biodiversity Offset Strategy, for the North West Growth Centres second release precinct Proposal, and the offset for this Modification Proposal will be included in the strategy. The Biodiversity Offset Strategy will be developed in consultation with DP&I and OEH, and offsets will be secured prior to clearing of this vegetation.

4.3.2 Community

Sydney Water developed a Community and Stakeholder Relations Plan for the planning stage of its next stage of works in the North West Growth Centre (known as Package 2). This Plan is part of a wider package of work, and includes details of the consultation approach with both the community and key stakeholders for this proposed project modification. The Plan aims to ensure stakeholders and the wider community are appropriately consulted and informed about the Modification Proposal.

Stakeholders and the community have been able to contact the project team by email, phone or in writing.

Stakeholders and the community have been kept informed by Sydney Water through the following mechanisms:

- Sydney Water's website sydneywater.com.au contains up to date information about Sydney Water's plans to service the North West Growth Centre under 'Major Projects'. The website provides:
 - o details and key milestones
 - o information on community consultation
 - o estimated timeframes for construction
 - o contact information
 - o information and summary booklets
 - o detailed maps of the Modification Proposal and location of infrastructure
 - o question and answer sheets about:
 - i. the Environmental Assessment process
 - ii. construction impacts
 - iii. connecting to the water and wastewater network.
- More than 200 letters and notices of entry for environmental surveys were distributed to potentially affected properties located within 25 metres of any proposed infrastructure.
- In November 2011, letters were sent to the owners of the proposed wastewater pumping station site.

- In December 2011, Sydney Water met with the owners of the proposed wastewater pumping station site to discuss our Modification Proposal.
- In February 2012, letters were sent to the neighbours of the proposed relocated SP1154 site. This included a 3D image (as shown in Figure 11) of the proposed site layout and how it might look. In addition, Sydney Water will meet with interested neighbours to get their opinion about screening of the proposed site.
- Most information distributed included information on how to obtain a translator in seven community languages.

4.3.3 Issues raised in community consultation

Most enquiries from the community were about the availability of services in the area and timeframes for delivery. Community members also raised specific issues about their own property.

The issues raised by community members can be divided into three key concerns:

- the location of proposed infrastructure including the proposed relocated pumping station and pipelines
- access to private property for survey and construction work. Section 10.3 of the EA describes Sydney Water's process for accessing private property.
- impacts to private property, section 10.3 of the EA also discusses the process for managing these impacts.

4.3.4 Aboriginal community

At the commencement of a previous Aboriginal Heritage Impact Assessment (AHIA) for proposed infrastructure for the NWGC and SWGC (AHMS, 2011), Aboriginal consultation was initiated in accordance with the draft Guidelines for Aboriginal Cultural Heritage Impact Assessment and Community Consultation (DEC, 2005), which, in turn, refer to the Interim Community Consultation Requirements for Applicants (DEC, 2004).

In April 2010, DECCW, now known as Office of Environment and Heritage (OEH), released new consultation requirements, *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (DECCW, 2010). These requirements were adopted for the remainder of the assessment as detailed further in Appendix E.

In summary, the consultation involved written request for registered Aboriginal party (RAP) information, contact by telephone for organisations known to be involved in cultural heritage for the area and newspaper advertising which led to the registration of interest for all interested individuals / organisations. These RAPs were consulted throughout preparation of that AHIA.

Consultation for this Modification Proposal followed on from the consultation described above. Information regarding this Modification Proposal and a proposed assessment methodology was provided to the RAPs on 15 November 2011. This included information about modifications or additions to the Project and advice that an AHIA for this additional infrastructure would be undertaken.

A period of 28 days was provided for comments in accordance with the consultation requirements (DECCW, 2010). Generally, responses endorsed the proposed AHIA methodology or identified minor points of concern that were integrated into the field assessment where possible.

Field assessment participation

In addition to the information provided above, all RAPs were afforded the opportunity to participate in the field assessment for the AHIA for this modification assessment report.

Field assessment for this AHIA was undertaken on 1 December 2011. A total of six RAPs attended the field assessment. An additional component of field survey was undertaken on 14 December 2011, because access to all areas was not possible on 1 December.

Table 9 presents a summary of the RAPs present during the field assessments for the Modification Proposal. Some RAPs chose not to participate in the field assessments or were ineligible to do so due to safety and insurance requirements. However, all RAPs have been consulted during the preparation of the AHIA. Information regarding RAPs who attended previous field assessments can be found in the relevant report (AHMS, 2011).

Table 9 RAP field assessment involvement for the Modification Proposal

Registered Aboriginal Party (RAP)	Personnel
Darug Aboriginal Cultural Heritage Assessments	Gordon Morton
Tocomwall/Yarrowalk	Danny Franks
Darug Custodian Aboriginal Corporation	Leanne Watson Rhiannon Wright Libby Coplin
Darug Tribal Aboriginal Corporation	John Reilly
Darug Land Observations	Gordon Workman Gary Marshall
Ngunawal Heritage Aboriginal Corporation	Dean Delponte

Impacts and mitigation options

Section 4.3.6 of the DECCW 2010 Requirements specifies that RAPs must be involved with the development of impact mitigation management options identified in an AHIA. While this AHIA is specific to the Modification Proposal, its impact mitigation recommendations and options are the same as those developed for the NWGC second release precincts AHIA (AHMS, 2011). The RAPs were involved in developing these mitigation measures.

Report review

This draft AHIA for the Modification Proposal was provided to all RAPs for a period of 28 days commencing on 17 January 2012 finishing on 15 February 2012. All comments received were supportive of the report and its findings. The RAPs requested continual consultation on the Modification Proposal.

Further details of the Aboriginal community consultation activities for the Modification Proposal are provided in Appendix E, including a communications log and responses received from all RAPs.

4.4 Future consultation

4.4.1 Before construction

If the Modification Proposal is approved and before construction starts, Sydney Water will provide affected community members with the opportunity to discuss measures to minimise local impacts and restoration. This could include issues such as:

- access to private property
- impacts to private property, including the removal of trees and value of property
- local amenity
- safety
- traffic management
- landscaping following completion of construction.

Sydney Water would also continue to consult with relevant agencies about detailed designs and any approvals required before construction starts.

4.4.2 During construction

During construction, Sydney Water would ensure that:

- impacts to private property are mitigated through appropriate consultation
- the community and stakeholders are made aware of construction work and potential impacts
- the community is provided with timely, accurate and easily accessible information about the Modification Proposal
- there is a high level of responsiveness to community enquiries and concerns
- areas are appropriately restored.

A Community and Stakeholder Relations Plan would be developed for the construction phase of the Modification Proposal. The Plan would detail the consultation approach with the community and key stakeholders. All communication processes during construction and operation of the Modification Proposal would follow guidelines set out in Sydney Water's Customer Contract and Community and Stakeholder Engagement Policy. Communications with stakeholders and the community would focus on:

- opportunities for the community to provide input on mitigation measures for construction, operation or restoration, particularly where construction is happening on private property
- methods to inform the community of the progress and performance of the project and issues of interest to the community
- notification of construction activities to potentially affected local community and stakeholders
- processes to receive and manage complaints
- consultation with directly and indirectly affected property owners
- induction and training of construction personnel in communication requirements
- protocols to notify stakeholders of relevant activities and any incidents should they occur.

5 Conclusion

This application for modification seeks approval for additional and relocated water related services for the North West Growth Centre first release precincts as detailed in Table 1. This application also seeks a change to the Statements of Commitment as listed in the Preferred Project Report (PPR) to maintain consistency and alignment with the Statements of Commitment as set out for the North West Growth Centre second release precincts. Revised Statements of Commitment are listed in Appendix C.

The Modification Proposal is required as part of the overall servicing strategy of the North West Growth Centre first release precincts and therefore is generally consistent with the objectives of the approved Project. The Modification Proposal is required to address changes in expected development progression, minimise environmental impacts and topographical constraints and facilitate development of the scheduled lands in Riverstone. However a preliminary consistency assessment indicated that the Modification Proposal is not consistent with the Project as described in the EA and PPR (see Appendix A).

Under the former Part 3A, section 75W of the EP&A Act provides for the Minister for Planning and Infrastructure to modify a project approval, with or without conditions. Sydney Water has assessed the environmental impacts associated with the proposed change and concluded that overall, there will be minor additional ecological impact associated with vegetation removal and some potential for visual impact associated with the relocation of SP1154.

Vegetation impacts will be compensated by providing biodiversity offsets (SOC 14), and visual impacts will be mitigated through existing SOCs 68 to 78, including ongoing consultation and engagement with the property owner and neighbours of the proposed SP1154 site, and preparation of a landscape management plan.

The changes to the Project are not considered significant modifications to the nature of the Project. The types of activities and the impacts that would occur during the construction and operation of the Project with the proposed modifications would be substantially the same as the approved Project as described in the EA and PPR. It is considered that the proposed modifications to the approved Project will not substantially increase the overall impact of the Project.

The Modification Proposal is consistent and can be carried out in accordance with the requirements of the Minister's Conditions of Approval. However, Sydney Water has identified that condition 1.1 and 2.8 should be updated to include a reference to this modification.

6 References

Department of Environment and Conservation (DEC), 2004. *Interim Community Consultation Requirements for Applicants*.

Department of Environment and Conservation (DEC), 2005. *Guidelines for Aboriginal Cultural Heritage Impact Assessment and Community Consultation*.

Department of Environment and Conservation (DEC), 2009. *Environmental Guidelines: Assessment, Classification and Management of Liquid and Non-liquid Wastes*.

Department of Environment, Climate Change and Water (DECCW), 2009. *Waste Classification Guidelines*.

Department of Environment, Climate Change and Water (DECCW), 2010. *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010*.

Ecological Australia, 2011. *Box Hill Precinct Planning Study: Riparian Assessment*

NSW Government, 2006. *2006 Metropolitan Water Plan*. Sydney Australia.

Sydney Water, 2008a. *North West Growth Centre water related services for first release precincts – Environment Assessment*.

Sydney Water, 2008b. *North West Growth Centre water related services for first release precincts – Preferred Project Report*.

Sydney Water, 2009. *Discharge Protocols Standard operating procedure*.

Sydney Water, 2011, *Water related services for the North West Growth Centre – second release precincts – Environmental Assessment*.

Sydney Water, 2012. *Water related services for the North West Growth Centre – second release precincts – Submission Report*.

APPENDIX A Summary of Consistency Assessment with the Project Approval

Consistency Assessment – Minister's Condition of Approval		Consistent with CoA		Notes
		Yes	No	
1.0 Administrative conditions				
Terms of Approval				
1.1	The Proponent shall carry out the project generally in accordance with the: a) Major Projects Application 07-0125	X		The Proposal consists of the construction and operation of water related infrastructure including a sewage pumping station (SP1154), wastewater carriers and drinking water pipelines. These infrastructure elements are addressed in the Major Project Application and therefore this Proposal is considered consistent with the intention of the application.
	b) the EA		X	The Project was described in Section 3.2.1 of the EA. Further detail of individual infrastructure components are provided for each of the First Release Precincts for the remainder of Section 3 of the EA. Whilst the individual components and locations of this modification are not discussed in the EA, they remain generally consistent with the key elements of the Project described in 3.2.1. Specifically the Proposal includes components not described in the EA, these are: • relocation of SP1154 and sections of the Chain of Ponds Carrier, with similar impacts as described in the EA. • additional wastewater and drinking water pipelines • revision of the Statements of Commitment The Project phases (construction, commissioning and operation), of the Proposal are consistent to those described in section 3.3 of the EA. This includes construction methodology, which will utilise a combination of open trenching and horizontal boring construction methods and the industry standard for commissioning and operation. The timeframe of the works to be undertaken would vary to those detailed in the EA. The EA gave an indicative timeframe for the delivery of package 2 as 2010/11 to 2011/12 compared with the revised timeframe of 2012/13 to 2013/14 as described in this Modification.

Consistency Assessment – Minister's Condition of Approval		Consistent with CoA		Notes
		Yes	No	
	c) the Preferred Project Report (PPR);		X	Section 4 of the PPR defined the Project for which Sydney Water sought approval. This was based on the Project described in Section 3 of the EA as refined and changed by the PPR. The changes made within the PPR remained substantially unchanged when compared to the Project description within the EA, with the exception of several changes to the alignment of pipelines, the addition of an overflow pipe, the expansion of the Cudgegong Rd reservoir site and the relocation of a pumping station. Therefore, similar to the consistency assessment for the EA above (Condition 1.1 (b)), the individual components and construction methodology for this modification are deemed to remain generally consistent with the key elements of the PPR and do not pose any significant increase in the overall environmental impact of the Project.
1.1 (Cont.)	d) the letter from Sydney Water Corporation to the Department of Planning, Dated 15 March 2010 titled <i>Project Number 07_0125 Modification to North West Growth Centre water related services for first release precincts: request for modification, and associated documents including modification application 07_0125 MOD2 and Reed NWGC First Release Precincts - Package 1 Works Consistency Assessment WL11 - INLET MAIN - Sunnyholt Rd to Newbury Ave, Stanhope Gardens;</i>	X		Not relevant to the Proposal.
	e) the conditions of this approval	X		The Project Approval includes a number of conditions with which the Project must comply. These conditions relate to requirements such as environmental monitoring, auditing, etc. The proposed modification is considered generally consistent with the existing conditions of the Project Approval with the exception of the need to include reference to this application for modification within Condition 1.1. Consistency with each Conditions of Approval is assessed in more detail below.
1.2	In the event of an inconsistency between: a) the conditions of this approval and any document listed from condition 1.1 a) to 1.1d) inclusive, the conditions of this approval shall prevail to the extent of the inconsistency; and b) any document listed from condition 1.1 a) to 1.1 d) inclusive, and any other document listed from condition 1.1a) to 1.1d) inclusive, the most recent document shall prevail to the extent of the inconsistency.	X		Administrative only.
1.3	The Proponent shall comply with any reasonable requirement(s) of the Director-General arising from the Department's assessment of: a) any reports, plans or correspondence that are submitted in accordance with this approval; and b) the implementation of any actions or measures contained in these reports, plans or correspondence.	X		Sydney Water to maintain compliance.
Limits of Approval				
1.4	This approval shall lapse five years after the date on which it is granted, unless the works the subject of this approval are physically commenced on or before that time.	X		Not applicable as construction works have commenced.

Consistency Assessment – Minister's Condition of Approval		Consistent with CoA		Notes
		Yes	No	
1.5	The Proponent shall ensure that all licences, permits and approvals are obtained and maintained as required throughout the life of the project. No condition of this approval removes the obligation for the Proponent to obtain, renew or comply with such licences, permits or approvals. The Proponent shall ensure that a copy of this approval and all relevant environmental approvals are available on the site at all times during the project.	X		Sydney Water to ensure that all licences, permits and approvals are obtained and maintained as required, including for those works covered by the Proposal.
2.0 SPECIFIC ENVIRONMENTAL CONDITIONS				
<i>Noise Impacts</i>				
	<i>Construction Noise</i>			
2.1	Unless otherwise specified in an approved Construction Noise and Vibration Management Plan for the project (refer to condition 6.2(b) of this approval), the Proponent shall only undertake construction activities associated with the project that would generate an audible noise at any sensitive receivers during the following hours: a) 7:00 am to 6:00 pm, Mondays to Fridays, inclusive; b) 8:00 am to 1:00 pm on Saturdays; c) at no time on Sundays or public holidays. This condition does not apply in the event of a direction from police or other relevant authority for safety reasons, to prevent environmental harm or risk to life.	X		Sydney Water to maintain compliance.
	<i>Operation Noise and Vibration</i>			
2.2	The Proponent shall take all reasonable measures to minimise noise emissions and vibration from all plant and equipment operated on the site such that they do not exceed noise and vibration criteria derived by application of the NSW Industrial Noise Policy (DECC, 2000) and Assessing Vibration: A Technical Guideline (DECC, 2006).	X		Sydney Water to maintain compliance.
<i>Air Quality Impacts</i>				
	<i>Dust Generation</i>			
2.3	The Proponent shall construct and operate the project in a manner that minimises dust emissions from the site, including wind-blown and traffic-generated dust. All activities on the site shall be undertaken with the objective of preventing visible emissions of dust from the site. Should such visible dust emissions occur at any time, the Proponent shall identify and implement all practicable dust mitigation measures, including cessation of relevant works, as appropriate, such that emissions of visible dust cease.	X		Sydney Water to maintain compliance.
	<i>Odour</i>			
2.4	The Proponent shall not cause or permit the emission of offensive odours from the site in accordance with the provisions of section 129 of the Protection of the Environment Operations Act 1997.	X		Sydney Water to maintain compliance.
<i>Traffic and Transport Impacts</i>				
2.5	Where directional drilling/boring is proposed under roads or where trenching is proposed to cross roads or where trenching is proposed to occur within the road reserve in close proximity to the road pavement, prior to the commencement of construction of pipelines, the Proponent shall prepare a report which shall address to the reasonable satisfaction of the relevant road authority, the following matters:	X		Sydney Water to maintain compliance.

Consistency Assessment – Minister's Condition of Approval		Consistent with CoA		Notes
		Yes	No	
	a) detailed plans of the pipeline including vertical and horizontal alignment; b) plant and equipment proposed to be used and construction compound locations; c) construction schedule and hours of construction; d) mitigation measures proposed to reduce impacts to traffic and pedestrian safety; and e) indicative maintenance arrangements during operation. A separate report may be prepared for each stage of the Project.			
2.6	The Proponent shall ensure that all pipeline crossings of roads are constructed using construction methods and depth cover determined in consultation with the relevant road authority.	X		Sydney Water to maintain compliance.
2.7	The Proponent shall ensure that any measures to restore roads are undertaken in a timely manner, in accordance with the requirements and to the satisfaction of the relevant road authority and at the full expense of the Proponent.	X		Sydney Water to maintain compliance.
Ecological Impacts				
2.8	Prior to the commencement of construction, the Proponent shall offset vegetation impacted by the project in accordance with the EA and the Preferred Project Report, to the satisfaction of DECC. Details of the arrangements, including evidence of DECC's satisfaction with the arrangements, shall be submitted to the Director-General prior to the commencement of the construction.		X	The Proposal will impact vegetation that requires offsetting, as discussed in section 3.2 of this Modification Assessment Report. Therefore, Condition 2.8 of the Project Approval requires the addition of a reference to this modification application. To specify that: <i>the Proponent shall offset vegetation impacted by the project in accordance with the EA, PPR and modification (No.3), to the satisfaction of DECC.</i>
Heritage Impacts				
2.9	The Proponent shall prepare a report which investigates options for the relocation of the Project to avoid any adverse impact on the A7 archaeological complex identified in the EA. The report must include a preferred option with appropriate justification and evidence of consultation with the DECC. The report must be submitted for the approval of the Director-General at least one month prior to the commencement of construction of the First Ponds Creek Carrier as described in the documents listed under condition 1.1 of this approval.	X		Not applicable. The scope of the Proposal does not impact on the A7 archaeological complex identified in the EA and PPR.
Soil and Water Quality Impacts				
2.10	Except as may be expressly provided by an Environment Protection Licence for the project, the Proponent shall comply with section 120 of the Protection of the Environment Operations Act 1997 which prohibits the pollution of waters.	X		Sydney Water to maintain compliance.
Waste Generation and Management				
2.11	All waste materials removed from the site shall only be directed to a waste management facility lawfully permitted to accept the materials.	X		Sydney Water to maintain compliance.
2.12	The Proponent shall maximise the treatment, reuse and/or recycling on the site of any excavated soils, slurries, dusts and sludges associated with the project, to minimise the need for treatment or disposal of those materials outside the site.	X		Sydney Water to maintain compliance.
2.13	The Proponent shall not cause, permit or allow any waste generated outside the site to be received at the site for	X		Sydney Water to maintain compliance.

Consistency Assessment – Minister's Condition of Approval		Consistent with CoA		Notes
		Yes	No	
	storage, treatment, processing, reprocessing, or disposal on the site, except as expressly permitted by a licence under the Protection of the Environment Operations Act 1997, if such a licence is required in relation to that waste.			
2.14	The Proponent shall ensure that all liquid and/or non-liquid waste generated and/or stored on the site is assessed and classified in accordance with Environmental Guidelines: Assessment, Classification and Management of Liquid and Non-Liquid Wastes (DEC, 2004), or any future guideline that may supersede that document.	X		Sydney Water to maintain compliance.
3.0 ENVIRONMENTAL MONITORING AND AUDITING				
<i>Noise Monitoring</i>				
3.1	Within 90 days of the commencement of operation of the pumping stations and the Cudgegong Road Reservoir Site, or as may be otherwise agreed by the Director-General, and during a period in which the pumping stations and the Cudgegong Road Reservoir Site are operating under design loads and normal operating conditions, the Proponent shall review the noise emission performance of the pumping stations and the Cudgegong Road Reservoir Site. The review shall include, but not necessarily be limited to: a) methodologies for noise monitoring; b) location of noise monitoring; c) frequency of noise monitoring; d) identification of monitoring sites at which pre-operational and operational noise levels can be ascertained; and e) details of any entries in the Complaints Register (condition 5.3 of this approval) relating to noise impacts. A report providing the results of the program shall be submitted to the Director-General and the DECC with 28 days of completion of the testing required under this condition.	X		Sydney Water to maintain compliance.
3.2	In the event that the program undertaken to satisfy condition 3.1 of the approval indicates that the operation of the pumping stations and Cudgegong Road Reservoir Site, under design loads and normal operating conditions, will lead to greater noise impacts than permitted under condition 2.2 of this approval, then the Proponent shall provide details of remedial measures to be implemented to reduce noise impacts to levels required by that condition. Details of the remedial measures and a timetable for implementation shall be submitted to the Director General for approval within such period as the Director-General may require, and be accompanied by evidence that the DECC is satisfied that the remedial measures are acceptable.	X		Sydney Water to maintain compliance.
4.0 COMPLIANCE TRACKING				
4.1	The Proponent shall develop and implement a Compliance Tracking Program to track compliance with the requirements of this approval. The Program shall include, but not necessarily limited to: a) provisions for periodic review of the compliance status of the project against the requirements of this approval; b) provisions for periodic reporting of compliance status to the Director-General; c) a program for independent environmental auditing at least annually, or as otherwise agreed by the Director-General, in accordance with ISO 19011:2002 - Guidelines for Quality and/ or Environmental Management Systems Auditing; and d) mechanisms for rectifying any non-compliance identified during environmental auditing or review of compliance.	X		Sydney Water to maintain compliance. Depending on the outcome of the modification application, the <i>Compliance Tracking Program</i> will be updated to include any changes in Conditions of Approval and the revised Statements of Commitment.
5.0 COMMUNITY CONSULTATION				

Consistency Assessment – Minister's Condition of Approval		Consistent with CoA		Notes
		Yes	No	
5.1	Subject to confidentiality, the Proponent shall make all documents required under this approval available for public inspection on request.	X		Sydney Water to maintain compliance.
<i>Complaints Procedure</i>				
5.2	Prior to the commencement of construction of the project, the Proponent shall ensure that the following are available for community complaints for the life of the project (including construction and operation): a) a telephone number on which complaints about construction and operational activities at the site may be registered; b) a postal address to which written complaints may be sent; and c) an email address to which electronic complaints may be transmitted. The telephone number, the postal address and the email address shall be published in a local newspaper circulating in the local area prior to the commencement of construction and prior to the commencement of operation. This information shall also be provided on the Proponent's website.	X		Sydney Water to maintain compliance.
5.3	The Proponent shall record details of all complaints received through the means listed under condition 5.2 of this approval in an up-to-date Complaints Register. The Register shall record, but not necessarily be limited to: a) the date and time, where relevant, of the complaint; b) the means by which the complaint was made (telephone, mail or email); c) any personal details of the complainant that were provided, or if no details were provided, a note to that effect; d) the nature of the complaint; e) any action(s) taken by the Proponent in relation to the complaint, including any follow-up contact with the complainant; and f) if no action was taken by the Proponent in relation to the complaint, the reason(s) why no action was taken. The Complaints Register shall be made available for inspection by the Director-General upon request.	X		Sydney Water to maintain compliance.
6.0 ENVIRONMENTAL MANAGEMENT				
Construction Environmental Management Plan				
6.1	The Proponent shall prepare and implement a Construction Environmental Management Plan (CEMP) to outline environmental management practices and procedures to be followed during construction of the project. The CEMP shall be consistent with Guideline for the Preparation of Environmental Management Plans (DIPNR, 2004) and shall include, but not necessarily be limited to: a) a description of all relevant activities to be undertaken on the site during construction; b) statutory and other obligations that the Proponent is required to fulfil during construction including all relevant approvals, consultations and agreements required from authorities and other stakeholders, and key legislation and policies; c) details of how the environmental performance of the construction works will be monitored, and what actions will be taken to address identified potential adverse environmental impacts. In particular, the following environmental performance issues shall be addressed in the Plan:	X		Sydney Water to maintain compliance. A separate CEMP will be written for package 2 works and submitted to DP&I for approval prior to construction commencing.

Consistency Assessment – Minister's Condition of Approval		Consistent with CoA		Notes
		Yes	No	
	i) measures to monitor and manage dust emissions; ii) measures to monitor and minimise soil erosion and the discharge of sediment and other pollutants to lands and/ or waters during construction activities; iii) measures to monitor and control noise emissions during construction works; iv) measures to minimise the impact of construction on local flora and fauna; d) a description of the roles and responsibilities for all relevant employees involved in the construction of the project; e) the additional studies listed under condition 6.2 of this approval; and f) complaints handling procedures during construction. A separate CEMP may be prepared for each stage of the project. The relevant CEMP shall be submitted for the approval of the Director-General no later than one month prior to the commencement of any relevant construction works associated with the project, or within such period otherwise agreed by the Director-General. Construction works shall not commence until written approval has been received from the Director-General.			
6.2	As part of the Construction Environmental Management Plan required under condition 6.1 of this approval, the Proponent shall prepare and implement the following: a) a Flora and Fauna Management Plan to manage flora and fauna impacts during construction. The Plan shall be prepared in consultation with the DECC and shall include, but not necessarily be limited to: i) details of all potentially affected threatened flora and fauna species; ii) specific management procedures for the Cumberland Plain Land Snail, Eastern Freetail-bat, Yellow-bellied Sheath-tail-bat, Eastern False Pipistrelle, and Little Bentwing-bat; and iii) general management procedures for the construction of pipelines within vegetated corridors, and the rehabilitation of any disturbed vegetation. b) a Construction Noise and Vibration Management Plan to manage noise and vibration impacts during construction and to identify all feasible and reasonable noise and vibration mitigation measures. The Plan shall include, but not necessarily be limited to: i) details of all potentially affected sensitive receivers; ii) the construction noise and vibration objectives identified in the EA for construction periods greater than 26 weeks; iii) where the objectives are predicted to be exceeded, an analysis of feasible and reasonable noise and vibration mitigation measures that will be implemented to reduce construction noise and vibration impacts; and iv) procedures for notifying residents of construction activities that are likely to affect their noise and vibration amenity. c) a Traffic Management Plan to manage traffic conflicts that may be generated during construction of the project. The Plan shall address the requirements of the relevant road authority and shall include, but not necessarily be limited to: i) details of how construction of the project will be managed in proximity to local and regional roads; ii) details of traffic routes for heavy vehicles, including any necessary route or timing restriction for	X		Sydney Water to maintain compliance. Sydney Water to include mitigation measures for the Green and Golden Bell Frog added to the revised Statements of Commitment, SOC 19 and SOC 20. Refer to Appendix D.

Consistency Assessment – Minister's Condition of Approval		Consistent with CoA		Notes
		Yes	No	
	oversized loads; and iii) demonstration that all statutory responsibilities with regard to road traffic impacts have been complied with. d) a Heritage Management Plan to manage impacts on Aboriginal Heritage during construction. The Plan shall include, but not necessarily be limited to: i) details of pre-construction consultation with relevant Aboriginal communities, the results of this consultation, and the procedures for ongoing consultation during construction; and ii) details of heritage management procedures during construction. e) a Soil and Water Management Plan to manage soil and water impacts, to minimise soil erosion and the discharge of sediments and other pollutants to lands and/or waters during construction, in accordance with Landcom's Managing Urban Stormwater: Soils and Conservation.			
Operation Environmental Management Plan				
6.3	The Proponent shall prepare and implement an Operation Environmental Management Plan to detail an environmental management framework, practices and procedures to be followed during operation of the project. The OEMP shall be consistent with Guideline for the Preparation of Environmental Management Plans (DIPNR 2004) and shall include, but not necessarily be limited to: a) identification of all relevant statutory and other obligations that the Proponent is required to fulfil in relation to operation of the project, including all relevant approvals, licences, approvals and consultations; b) a description of the roles and responsibilities for all relevant employees involved in the operation of the project; c) overall environmental policies and principles to be applied to the operation of the project; d) relevant standards and performance measures to be applied to the project, and a means by which environmental performance can be periodically reviewed and improved, where appropriate; e) management policies to ensure that environmental performance goals are met and to comply with the conditions of this approval; and f) the additional studies listed under condition 6.4 of this approval. A separate Operation Environmental Management Plan (OEMP) may be prepared for each stage of the project. The relevant OEMP shall be submitted for the approval of the Director-General no later than one month prior to the commencement of operation of the project, or within such period otherwise agreed by the Director-General. Operation shall not commence until written approval has been received from the Director-General.	X		Sydney Water to maintain compliance.
6.4	As part of the Operation Environmental Management Plan required under condition 6.3 of this approval, the Proponent shall prepare and implement the following: a) an Odour Management Plan to outline measures to minimise impacts from the project on local and regional air quality. The Plan shall include, but not necessarily be limited to: i) identification of all major sources of odour that may be emitted from the project; ii) monitoring for odour emissions from the project, in accordance with any requirements of the DECC; iii) pro-active management and response mechanisms for odour emissions, with specific reference to measures to be implemented and actions to be taken to minimise and (where practicable) prevent	X		Sydney Water to maintain compliance.

Consistency Assessment – Minister's Condition of Approval		Consistent with CoA		Notes
		Yes	No	
	potential odour impacts on surrounding land uses as a consequence of meteorological conditions, upsets within the project, or the mode of operation of the project; iv) provision for review of air quality monitoring data, with comparison of monitoring data with that assumed and predicted in the documents listed under condition 1.1 of this approval, including verification of air quality modelling and predictions, as may be relevant; v) plans for regular maintenance of process equipment to minimise the potential for odour emissions; vi) a contingency plan should an incident, process upset or other initiating factor lead to elevated odour impacts, whether above normal operating conditions or environmental performance goals/limits. b) a Noise Management Plan to detail measures to mitigate and manage noise during operation of the pumping stations and Cudgegong Road Reservoir Site. The Plan shall include, but not necessarily be limited to: i) identification of noise-generating activities and/or sources in relation to the pumping stations and Cudgegong Road Reservoir Site; ii) identification of all relevant receivers and the applicable criteria at those receivers commensurate with the noise limits referred to in condition 2.3 of this approval; iii) procedures to ensure that all reasonable and feasible noise mitigation measures are applied during operation of the pumping stations and Cudgegong Road Reservoir Site; and iv) procedures to generate suitable documentation for environmental auditing, that demonstrates that best practice noise control operations are being implemented.			
7.0 ENVIRONMENTAL REPORTING				
<i>Incident Reporting</i>				
7.1	Within 24 hours of any incident or potential incident with actual or potential significant off-site impacts on people or the biophysical environment, a report shall be supplied to the Department outlining the basic facts. A further detailed report shall be prepared and submitted following investigations of the causes and identification of necessary additional preventive measures. That report must be submitted to the Director-General no later than 14 days after the incident or potential incident. The Proponent shall maintain a register of accidents, incidents and potential incidents. The register shall be made available for inspection at any time by the Director-General.	X		Sydney Water to maintain compliance.
7.2	The Proponent shall meet the requirements of the Director-General to address the cause or impact of any incident, as it relates to this approval, reported in accordance with condition 7.1 of this approval, within such period as the Director-General may require.	X		Sydney Water to maintain compliance.
<i>Summary</i>				
	The proposed change is consistent with the requirements in the Minister's Conditions of Approval	X		The Proposal is consistent with the requirements of the Minister's Conditions of Approval. Sydney Water has identified that condition 1.1 and 2.8 should be updated to include reference to this modification.
	The proposed activity is consistent with the objectives of the project	X		The Proposed activity is consistent with the key driver for the project to supply water related services to first release precincts and with the objectives

Consistency Assessment – Minister's Condition of Approval		Consistent with CoA		Notes
		Yes	No	
				as described in section 2.1.4 of the EA.
	The proposed change is consistent with the description of the approved project		X	Generally consistent however lacks the detail of specific components of the Proposal.
	The proposed change is consistent with the described impacts of the project		X	The described Project impacts are generally consistent and similar in scale to the Proposal, however specific impacts such as additional vegetation removal and the potential for visual impacts need to be addressed further in more detail.
	No new conditions are required – the proposed change is consistent and can be managed by the current conditions	X		No new conditions are required. However, condition 1.1 and 2.8 should be updated to include reference to this modification.
	In assessing the impacts, the proposed change is consistent with the approved project in terms of: - there are no significant impacts - the proposed impacts similar or less in scale to the approved impacts - there will be no new receivers affected by an impact who were not previously impacted - there are no new impacts		X	Whilst there are no significant impacts anticipated, there will be additional impact on existing native vegetation and there is also the potential for noise and visual impacts on several new receivers, in particular as a result of relocation of SP1154.
Conclusion				
	Consistent with EIA documents		No	The Proposal remains generally consistent with the objectives and scale of environmental impact assessed for the Project in the EA and PPR as detailed above. This report describes the additional infrastructure components in Table 1, compared to the approved Project. This modification application also proposes a revised Statements of Commitment, to those listed in the PPR.
	Consistent with Minister's Conditions of Approval		No	The Proposal is generally consistent with the Minister's Conditions of Approval. However, there are two conditions that should be updated to reference this Modification to ensure impacts of this Proposal are addressed. This includes 1.1 and 2.8 as mentioned above.
	Is preparation of an Environmental Impact Assessment Addendum and modification to the Project Approval required?	Yes		This report includes an environmental assessment that identifies environmental issues associated with the proposal and assesses whether the existing mitigation measures of the EA are sufficient to minimise and effectively manage the potential impacts or whether additional mitigation measures are required. This report supports the modification application.

APPENDIX B Statements of Commitment comparison table

NWGC 1 st Release SOC			NWGC 2 nd Release SOC			Proposed change
Environmental issue		Project Phase	Environmental issue		Project Phase	
Water Quality, Hydrology and Aquatic Ecology						
1	A monitoring program to assess the impacts of the Project on river health (eg. water quality, flow, fish migration, macrophytes, macroinvertebrate communities and ecotoxicity testing) would be undertaken in conjunction with NSW State Government agencies. This would complement the Integrated Water Monitoring Framework for the Hawkesbury-Nepean River. Details of the monitoring program would be determined in consultation with relevant government authorities/stakeholders (including the DECC, DWE & DPI).	Pre-Construction, Construction and Operation	NA	NA	NA	No change
2	Groundwater encountered during construction would be pumped out of the work area and would be treated prior to discharge. If necessary a number of boreholes with pumping apparatus would be established around the construction area to inhibit groundwater flow.	Construction	23	Any 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	Replace wording with 2 nd Release SOC 23 Move to Soils and Groundwater for consistency
3	Erosion and sedimentation control would be managed using measures developed in accordance with <i>Managing Urban Stormwater: Soils and Construction</i> (Landcom 2004). An Erosions and Sediment Control Sub-plan would be prepared prior to construction.	Construction	1	Erosion and sedimentation control will be managed using measures developed in accordance with <i>Managing Urban Stormwater, Soils and Construction</i> (Volume 1, Landcom 2004 and Volume 2A, DECC 2008).	Construction	Replace wording with 2 nd Release SOC 1 Remove reference to sub-plan which is included in MCoA.
4	All creek crossings by pipelines would be underbored except where underboring would cause more impacts than trenching. Appropriate sedimentation and erosion controls would be developed and implemented for underboring sites.	Construction	2	All creek crossings by pipelines would be underbored except where underboring would cause more impacts than trenching. Appropriate sedimentation and erosion controls would be developed and implemented for underboring sites.	Construction	No change

NWGC 1 st Release SOC's			NWGC 2 nd Release SOC's			Proposed change
Environmental issue		Project Phase	Environmental issue		Project Phase	
5	The storage of large quantities of fuels on or around the site would generally be avoided and vehicles and equipment would be refuelled off site. Where on-site refuelling is unavoidable, mini-tankers would be used. Mini-tankers would be required to follow standard procedures and have a spill kit to minimise the risk and impact of spills.	Construction	24	The storage of large quantities of fuels on or around the site will generally be avoided and vehicles and equipment will be refuelled off site. Where on-site refuelling is unavoidable, mini-tankers will be used. Mini-tankers will be required to follow standard procedures and have a spill kit to minimise the risk and impact of spills.	Construction	Move to Soils and Groundwater for consistency
6	Any fuels and chemicals required to be stored on site would be stored in accordance with relevant standards in bunded or contained areas and a spill kit would be provided at all locations where fuels are used.	Construction and Operation	25	Any fuels or chemicals will be stored, handled and disposed of to meet relevant standards. Bunded or contained areas and a spill kit will be provided as appropriate.	Construction and operation	Replace wording with 2 nd Release SOC 25 Move to Soils and Groundwater for consistency
7	For the Rouse Hill and Riverstone wastewater systems, the design and operational criteria for wet weather overflows would meet the requirements of the current respective Environmental Protection Licences, namely 12 and 14 overflow events every 10 years, respectively.	Design and Operation	3	For the Rouse Hill and Riverstone wastewater systems the Proposal will be designed to operate within the licence requirements of no more than 12 and 14 overflow events per 10 years, respectively.	Design and operation	Replace wording with 2 nd Release SOC 3
8	The wastewater system would be designed and operated with the objective of having no dry weather overflows.	Design and Operation	4	The wastewater system will be designed and operated with the objective of having no dry weather overflows reaching waterways.	Design and operation	Replace wording with 2 nd Release SOC 4
9	The upgraded and amplified Riverstone STP would meet the existing conditions for bypasses during large wet weather events as detailed in the Environmental Protection Licence for the Riverstone system.	Design and Operation	NA	NA	NA	No change

NWGC 1 st Release SOC's			NWGC 2 nd Release SOC's			Proposed change
Environmental issue		Project Phase	Environmental issue		Project Phase	
10	Outlets for discharge of water would be constructed so as to minimise potential destabilisation and scouring. This would involve the construction of appropriate headwalls, dissipaters and bank stabilisation techniques.	Design and Operation	NA	Not used	NA	No change
NA	NA	NA	6	Sydney Water will design wastewater pipeline maintenance structures to minimise potential for floodwaters to enter wastewater pipelines. Where possible, they will be located to minimise environmental impact.	Design	Add 2 nd release SOC 6.
11	During the detailed design phase further consultation would be undertaken with relevant Councils and other agencies for input to the design aspects such as the integration of Water Sensitive Urban Design (WSUD) principles and the future amenity of the area.	Design	NA	Not used	NA	No change

NWGC 1 st Release SOC's			NWGC 2 nd Release SOC's			Proposed change
Environmental issue		Project Phase	Environmental issue		Project Phase	
12	Discharge of water from the Cudgegong Road Reservoir Site reservoirs would comply with Sydney Water's discharge protocol standard operating procedure (SOP) (Sydney Water 2006). The purpose of this protocol is to provide guidelines for Sydney Water, which: - meet Sydney Water's obligation to provide water which satisfies public health requirements - permit essential activities to take place, in a cost effective manner - demonstrate leadership in water conservation by minimising the wastage of water, and supporting the principles of Ecologically Sustainable Development (ESD) - minimise the impact on the environment and receiving waters - satisfy the requirements of the regulator for the environment, DECC.	Operation	5	Discharge of water from the Box Hill Reservoir will comply with Sydney Water's discharge protocol standard operating procedure (Sydney Water 2009c).	Operation	Replace wording with 2 nd Release SOC 5 but with reference to Cudgegong Road Reservoir Site reservoirs
Terrestrial Flora and Fauna						
13	To be consistent with the relevant Priority Actions all works would adhere to best-practice management to minimise impacts.	Design and Construction		Not Used		Remove 1 st Release SOC's 13, 14, 16, 17, 19 and 20 and replace with 2 nd Release SOC's 7 and 8

NWGC 1 st Release SOC's			NWGC 2 nd Release SOC's			Proposed change
Environmental issue		Project Phase	Environmental issue		Project Phase	
14	The following mitigation measures would be implemented as part of the Project to ensure that the impacts on flora and fauna are minimised: ▶ The pipeline route would avoid the majority of hollow-bearing trees. ▶ The extent of the direct pipeline construction impact would be limited to a maximum width of 10 m. ▶ At creek crossings, where pipelines would be underbored, bore shaft launch and exit pads would be located on adjacent cleared land. ▶ A range of standard mitigation measures such as weed control, exclusion fencing, minimisation of soil disturbance and site staff education would be implemented.	Design and Construction	7	Detailed design will consider how impacts to native vegetation can be avoided and minimised, with a focus on non-certified areas. Where practical, this will include: • placement of pipelines along the route that results in the least impact to native vegetation and to avoid significant hollow-bearing trees • refinement of infrastructure site design to avoid native vegetation • use of construction methods that avoid and minimise impacts where appropriate (eg. underboring instead of open trenching).	Design	Remove 1 st Release SOC's 13, 14, 16, 17, 19 and 20 and replace with 2 nd Release SOC's 7 and 8
15	To minimise the impacts on the threatened species <i>Epacris purpurascens</i> var. <i>purpurascens</i> or <i>Grevillea juniperina</i> ssp. <i>Juniperina</i> the following mitigation measures would be implemented: ▶ No works would be undertaken within 5 m of the threatened flora species. ▶ Exclusion fencing would be erected around threatened flora species and maintained in place until such time as construction works are completed. ▶ Manual digging would be undertaken in the vicinity of the threatened species.	Construction	NA	NA	NA	No change -site specific

NWGC 1 st Release SOC			NWGC 2 nd Release SOC			Proposed change
Environmental issue		Project Phase	Environmental issue		Project Phase	
16	The extensive weed infestations recorded in the Project area would be managed and controlled to avoid the spread of weeds during construction to improve the region's biodiversity.	Construction		See below – 2 nd Release SOC 8		Remove 1 st Release SOC 13, 14, 16, 17, 19 and 20 and replace with 2 nd Release SOC 7 and 8

NWGC 1 st Release SOC			NWGC 2 nd Release SOC			Proposed change
Environmental issue		Project Phase	Environmental issue		Project Phase	
17	General mitigation measures would be implemented to minimise the impact on all native vegetation and vegetation communities, such as temporary fencing to mark designated work areas, locating construction facilities in already cleared lands and restoring all impacted areas to pre-works condition where possible.	Construction	8	Management measures will be developed and implemented to minimise impacts to flora and fauna, including: - limiting the extent of the direct pipeline construction impact to a maximum width of 10 metres through native vegetation - protecting and physically delineating areas of native vegetation that are not to be removed - protecting hollow-bearing trees where practical. Where impacts cannot be avoided, Sydney Water will keep an inventory of those to be removed and implement suitable mitigation measures (eg. erection of nest boxes in adjacent habitat, and placement of the cut tree and any other fauna habitat elements in suitable adjacent habitat) - having an ecologist on site prior to and during native vegetation removal (to assist in delineating the 10 metre construction corridor, mark any hollow-bearing trees, check vegetation for fauna prior to removal, carry out any necessary fauna rescue and supervise vegetation removal) - washing down all equipment at an appropriate depot prior to commencement of native vegetation removal (to minimise weed or pathogen spread) - appropriate soil stockpiling, locating construction facilities and vehicle turning areas in already cleared lands where practical, removal of noxious weeds, decreasing barriers for movement of native fauna where possible, staff training, and restoring impacted areas to pre-works condition where practical.	Construction	Remove 1 st Release SOC
						13, 14, 16, 17, 19 and 20 and replace with 2 nd Release SOC
						7 and 8

NWGC 1 st Release SOC			NWGC 2 nd Release SOC			Proposed change
Environmental issue		Project Phase	Environmental issue		Project Phase	
18	The pipeline routes and disturbed ground would be revegetated with local native species following completion of construction.	Construction	9	During the detailed design phase, Sydney Water will identify areas requiring post-construction rehabilitation, with the following areas taking priority: - creek crossings and riparian corridors where native vegetation communities occur - sites in non-certified areas identified as being in moderate condition and that form part of a larger patch of vegetation - vegetation along Guntawong Road to prevent indirect impacts to vegetation within the adjacent Rouse Hill Regional Park.	Design	Remove 1 st Release SOC 18, 27 and 28 and replace with 2 nd Release SOC 9 (removing last dot point) and 10
19	Standard mitigation measures would be implemented to minimise the impacts on fauna species including retaining hollow bearing trees, clearly marking trees near the construction site that are to be retained, minimising open trenches and checking all trees for sheltering animals prior to removal.	Design, Pre-Construction and Construction		See above – 2 nd Release SOC 8		Remove 1 st Release SOC 13, 14, 16, 17, 19 and 20 and replace with 2 nd Release SOC 7 and 8
20	A protocol/procedure would be developed for the clearing of trees to minimise the impact on sheltering animals. The protocol/procedure would include details such as time of removal (seasonal and day), checking trees for sheltering animals, the presence of an appropriate specialist on-site during the removal of any trees and animal rescue practices.	Pre-Construction and Construction		See above – 2 nd Release SOC 8		Remove 1 st Release SOC 13, 14, 16, 17, 19 and 20 and replace with 2 nd Release SOC 7 and 8
21	To mitigate the impacts on the threatened fauna at the Cudgegong Reservoir site, a strategy would be developed including: - timing of construction to ensure clearing is not undertaken in breeding, roosting and torpor times for the microchiropteran bats; - translocation of individual Cumberland Plain Land Snails.	Construction	NA	NA	NA	No change – site specific

NWGC 1 st Release SOC			NWGC 2 nd Release SOC			Proposed change
Environmental issue		Project Phase	Environmental issue		Project Phase	
22	Offsets for the loss of any non-certified lower long term management viability (LMV) vegetation in the North West Growth Centre and Ecologically Endangered Communities outside the North West Growth Centre would be developed with consultation between Sydney Water, the Growth Centres Commission and DECC, and where appropriate local councils, and private landholders.	Design and Pre-Construction		See below – 2 nd Release SOC 11 and 12		Remove 1 st Release SOC 22 and replace with 2 nd Release SOC 11 and 12
23	Sydney Water would provide an offset for the loss of 2.58 hectares of existing vegetation in the non-certified areas of the Project.	Design and Pre-Construction	11	Sydney Water will provide suitable offsets for the loss of existing native vegetation within the non-certified areas of the NWGC, in accordance with the relevant biodiversity measures in the Biodiversity Certification Order (DECC 2006). Offsets will be determined in consultation with DP&I (Strategies and Land Release) and OEH.	Design and pre-construction	Replace wording with 2 nd Release SOC 11
NA	NA	NA	12	Sydney Water will provide offsets for the loss of native vegetation outside the NWGC. Offset ratios will be consistent with RBM 8 of the Biodiversity Certification Order. Offsets will be determined in consultation with OEH and will not necessarily be offset within the Growth Centre.	Design and pre-construction	No change
24	The protection applied to the offset would meet the definition of protection in the Biodiversity Certification Order.	Design, Construction and Operation		See above – 2 nd Release SOC 11		Remove 1 st Release SOC 24 and replace with 2 nd Release SOC 11
25	When required, future repairs to pipelines would be subject to further environmental assessment by Sydney Water and would be carried out in accordance with an approved Construction Environmental Management Plan.	Operation	13	When required, future repairs to sites and pipelines would be subject to further environmental assessment by Sydney Water.	Operation	Replace wording with 2 nd Release SOC 13

NWGC 1 st Release SOC's			NWGC 2 nd Release SOC's			Proposed change
Environmental issue		Project Phase	Environmental issue		Project Phase	
26	All recommendations in the flora and fauna assessments undertaken for the EA that are applicable to the Project would be applied.	Design, Pre-Construction and Construction	NA	Not Used	NA	Remove
27	Prior to commencement of construction at the Cudgegong Road Reservoir Site a detailed Flora and Fauna Management Strategy would be prepared. This strategy would incorporate the mitigation measures specified in the Species Impact Statement prepared for the site.	Pre-Construction	NA	Not Used	NA	No Change – site specific
28	A Flora and Fauna Management Sub-plan would be prepared as part of the Construction Management Plan prior to commencement of construction. This Sub-plan would outline details such as a replanting strategy and threatened species management measures. Approval would be sought from the DECC for these management plans. The replanting strategy would outline the indigenous plants that could be used and aim to achieve the reestablishment of the natural structure of the original vegetation.	Pre-Construction	10	Sydney Water will prepare and implement post-construction management plans for rehabilitation areas, including: - weeding activities and protocols for the removal of noxious weeds - stabilisation measures for creek beds and banks - natural regeneration or re-planting activities using local indigenous flora, where their use is compatible with future maintenance requirements, and with the aim of achieving the reestablishment of the natural structure of the original native vegetation - on-going monitoring and management activities.	Post-construction	Remove 1 st Release SOC's 18 and 28 and replace with 2 nd Release SOC's 9 and 10

NWGC 1 st Release SOC				NWGC 2 nd Release SOC		Proposed change
Environmental issue		Project Phase		Environmental issue	Project Phase	
Indigenous Heritage						
29	Prior to the commencement of construction works, collection of artefacts, in conjunction with Aboriginal stakeholders, would be undertaken where items of low Aboriginal heritage significance would be impacted upon. For sites or PADs of moderate to high heritage significance excavations would be undertaken. In undertaking the test excavations a "landscape" or 'regional" approach would be implemented.	Pre-Construction	17	General mitigation measures listed in Section 6.4.2 will be implemented throughout the design, construction and operation of the Proposal, as appropriate.	Design, pre-construction, construction and operation	Remove 1 st Release SOC 29 and replace with 2 nd Release SOC 16 and 17. The general mitigation measures listed in 6.4.2 (2 nd release EA) are listed in 7.2 of the AHIA (2012) see Appendix F. To be referenced in the revised SOC.
30	All test excavations would involve the identification, assessment, recording and salvage of any archaeological remains that are found. Further consultation with Aboriginal stakeholders would be undertaken as appropriate.	Pre-Construction	NA	See above and below – 2 nd Release SOC 16 and 17	NA	Remove 1 st Release SOC 30 and replace with 2 nd Release SOC 16 and 17

NWGC 1 st Release SOC			NWGC 2 nd Release SOC			Proposed change
Environmental issue		Project Phase	Environmental issue		Project Phase	
31	Mitigation measures would be implemented to ensure that impacts on known sites/PADs are avoided. Specifically these measures would include: - marking sites/PADs as 'work exclusion zones' on concept and working drawings - enclosing sites/PADs with temporary protective barriers during the entirety of the construction period to direct construction work away from these areas and prevent inadvertent damage by construction activities including work vehicles and construction staff - Sydney Water personnel and contractors involved in construction would be made aware of the locations of all relevant sites/PADs.	Pre-Construction	16	If micro-tunnelling, under-boring or similar is not possible, and for areas that may be disturbed, Sydney Water will develop appropriate mitigation measures in consultation with a heritage professional and relevant Registered Aboriginal Parties (RAPs). Mitigation measures will correlate with the extent of the proposed impact and the significance of the potentially impacted Aboriginal objects, sites and places. Mitigation measures may include: - for surface sites or sites with a surface expression – spatial recording, using a differential Global Positioning System (GPS) or Total Station (with sub-metre accuracy), followed by collection of the Aboriginal objects - for subsurface sites or sites with a subsurface expression – a program of testing and/or salvage excavations, using current archaeological practices. Archaeological monitoring may also be appropriate in certain circumstances - appropriately recording all cultural materials and impacts using photographs, sketches and written description before, during and after implementation of mitigation measures - undertaking an appropriate level of post-excavation analysis and reporting, in accordance with the general mitigation measures listed in Section 6.4.2.	Pre-construction and construction	Remove 1st Release SOC 31 and replace with 2nd Release SOC 16 The last dot point in 2nd release SOC 16 to be updated to refer to section 7.2 of AHIA (AHMS 2012).
NA	NA	NA	14	During detailed design and construction, Sydney Water will consider options to avoid adversely impacting identified Aboriginal objects, sites and places. Where feasible, works impacting identified objects, sites or places will not occur unless they are directly related to, and for the express purpose of, their conservation, care and maintenance.	Design and construction	Covers first point in 1st Release SOC 31. Remove 1st Release SOC 31 and replace with 2nd Release SOC 14 and 16

NWGC 1 st Release SOC			NWGC 2 nd Release SOC			Proposed change
Environmental issue		Project Phase	Environmental issue		Project Phase	
32	In areas of significance disturbance would be minimised as much as possible by the use of appropriate boring techniques, in combination with traditional trenching techniques, for the installation of pipelines. Consideration would be given to pipeline realignment where practical. The use of boring techniques would involve the construction of launch pads and shafts, from which the boring equipment operates to install the pipeline, but would not involve construction of long lengths of trench. The most suitable strategy would be chosen following design finalisation, further investigations and appropriate consultation with Aboriginal stakeholders.	Design and Construction	15	If it is not possible to avoid impacting identified Aboriginal objects, sites or places, micro-tunnelling and/or under-boring construction techniques or similar will be considered. These techniques mainly occur beneath significant soil layers and material and/or avoid material of significance, although some disturbance associated with entry and exit points will be required.	Design and construction	Remove 1 st Release SOC 32 and replace with 2 nd Release SOC 14, 15 and 16
33	In the event that previously undiscovered Aboriginal objects (or potential Aboriginal objects) are discovered during construction, all works in the vicinity of the find would cease and the Sydney Water Project Environmental Representative (PER) would be informed to determine the subsequent course of action. The PER would, if required, notify the DECC to obtain advice on how to proceed. The NSW Police and NSW Coroner's Office would also be contacted should skeletal remains be identified. Works would not recommence until any DECC or other requirements have been met.	Construction	NA	Not used	NA	Remove 1 st Release SOC 33 and replace with 2 nd Release SOC 16 and 17 Incorporated in SOC 17, reference to be updated to 7.2 of AHIA (AHMS, 2012)

NWGC 1 st Release SOC			NWGC 2 nd Release SOC			Proposed change
Environmental issue		Project Phase	Environmental issue		Project Phase	
34	The pipelines would require maintenance during the operation of the Project. Should potential impacts on Aboriginal heritage arise, standard operating procedures would be implemented to ensure the maintenance activities would have no impact.	Operation	NA	See above – 2 nd Release SOC 17	NA	Included in general mitigations measures referred to in 2nd release SOC 17. Remove 1st Release SOC 34 and replace with 2nd Release SOC 17, update reference to section 7.2 of AHIA (AHMS,2012)
35	All recommendations in the Aboriginal heritage assessments, including those provided by representatives of the Aboriginal community, that are applicable to the Project would be applied.	Design, Pre-Construction, Construction and Operation	17	See above – 2 nd Release SOC 17	NA	Remove 1 st Release SOC 35 and replace with 2nd Release SOC 14, 15, 16 and 17.

Non-Indigenous Heritage

NWGC 1 st Release SOC			NWGC 2 nd Release SOC			Proposed change
Environmental issue		Project Phase	Environmental issue		Project Phase	
36	Construction activities would be managed to avoid structural damage to heritage items as a result of vibration, including implementation of the following measures: - Where possible, safe working distances between heritage structures and vibratory plant/activities would be maintained in accordance with German Standard DIN 4150 Part 3 1986. - Where vibratory plant or activities are to be undertaken within 50 m of a heritage item, an assessment of potential vibration impacts would be undertaken prior to construction to determine the vibration levels likely to be experienced at the heritage structures during construction. - Where the potential vibration levels experienced at the heritage structures are likely to exceed 3 mm per second, smaller sized or non-vibratory machinery would be selected so that vibration levels do not exceed 3 mm per second. - Where significant vibration potentially would impact a heritage item, vibration monitoring would be carried out during construction to identify if safe vibration limits (3 mm per second) are being maintained. - All construction personnel would be inducted on the potential to find previously unrecorded non-Indigenous heritage items during the construction works. - If an item (or suspected item) of non-Indigenous heritage is discovered during works, all work in the vicinity of the find would cease and the Project Environmental Representative (PER) would be notified to determine the appropriate course of action.	Construction		See below – 2 nd release SOC 40, 41 and 42	Construction	Remove 1st Release SOC 36 and replace with 2nd Release SOC 20, 40, 41 and 42. Move vibration management recommendations to Noise and Vibration for consistency

NWGC 1 st Release SOC's			NWGC 2 nd Release SOC's			Proposed change
Environmental issue		Project Phase	Environmental issue		Project Phase	
37	To minimise impact on the section of Old Windsor Road at Kellyville, which is listed on the Register of the National Estate, the drinking water pipeline would be underbored where it crosses Old Windsor Road at Bella Vista.	Design and Construction	NA	NA	NA	No change – site specific
NA	NA	NA	18	For listed items the primary recommendation is to avoid items where possible and monitor items in the vicinity of the works. Detailed design will consider how impacts can be avoided and minimised. Where impacts are unavoidable, specific mitigation measures will be followed for each item (as identified in Table 6-16, Section 6.8.2).	Design and Construction	No change - site specific
NA	NA	NA	19	Where impacts on unlisted items of potential non-Aboriginal heritage significance are unavoidable, specific mitigation measures will be followed for each item (as identified in Table 6-17, Section 6.8.2).	Design and Construction	No change - site specific
NA	Not used	NA	20	All construction personnel will be inducted on the potential to find previously unrecorded non-Aboriginal heritage items during the construction works.	Construction	Add to 1 st Release
NA	Not used	NA	21	In the event that non-Aboriginal heritage items not identified are discovered, work in the immediate vicinity would cease and the Sydney Water Project Environmental Representative (PER) would be informed to determine the subsequent course of action. An archaeologist may be contacted to assess the item. If the item is a relic, notification under s146 of the <i>Heritage Act 1977</i> applies and the Heritage Council would be notified. Further action such as archaeological evaluation and excavation may be required prior to continuation of construction.	Construction	Add to 1 st Release

NWGC 1 st Release SOC			NWGC 2 nd Release SOC			Proposed change
Environmental issue		Project Phase	Environmental issue		Project Phase	
38	The pipelines would require maintenance during the operation of the Project. Standard operating procedures would be implemented to ensure the maintenance activities would have no impact on the items of non-Indigenous heritage.	Operation	22	The Proposal will require maintenance during operation. Standard operating procedures will be implemented to ensure any maintenance activities will have no impact on the non-Aboriginal heritage items.	Operation	No change
Soils and Groundwater						
NA	Not used	NA	23	Any 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	2 nd Release SOC 23, 24 and 25 to be added to 1 st Release soils and groundwater SOC and removed from water quality and hydrology
NA	Not used	NA	24	The storage of large quantities of fuels on or around the site will generally be avoided and vehicles and equipment will be refuelled off site. Where on-site refuelling is unavoidable, mini-tankers will be used. Mini-tankers will be required to follow standard procedures and have a spill kit to minimise the risk and impact of spills.	Construction	As above – 2 nd Release SOC 23, 24 and 25
NA	Not used	NA	25	Any fuels or chemicals will be stored, handled and disposed of to meet relevant standards. Bunded or contained areas and a spill kit will be provided as appropriate.	Construction and operation	As above – 2 nd Release SOC 23, 24 and 25

NWGC 1 st Release SOC's			NWGC 2 nd Release SOC's			Proposed change
Environmental issue		Project Phase	Environmental issue		Project Phase	
39	Any areas identified as affected by soil salinity would be appropriately managed during construction, and potential impacts mitigated.	Construction	26	Any areas identified as affected by soil salinity will be appropriately managed during construction, and potential impacts mitigated, including: - the use of salt resistant construction methods and materials - no reuse of excavated saline soils for backfilling.	Design and Construction	Replace wording with 2 nd Release SOC 26, add 1 st dot point from 1 st Release SOC 43 and remove 1 st Release SOC 46
40	Recycled water total dissolved solids (TDS) levels would be monitored and managed at a level to minimise the risk of significant salinity impacts from irrigation.	Operation	NA	NA	NA	No change
41	A groundwater monitoring program for the Project would be developed in conjunction with other relevant stakeholders such as the DWE, and implemented by Sydney Water.	Operation	NA	NA	NA	No change
42	Recycled water users would be informed of the specific environmental and human health risks associated with irrigating with recycled water.	Operation	NA	NA	NA	No change
43	Sydney Water would ensure that: - infrastructure, especially the pipelines, would not impact on natural surface and sub-soil drainage, and where appropriate would improve drainage - the existing and potential salinity of soils and groundwater would be considered to ensure the appropriate materials and other features are incorporated to mitigate against the corrosive impacts of high salinity.	Design	NA	Covered in 2 nd Release SOC 26	NA	Incorporate first dot point in 1 st Release SOC 39 and remove

NWGC 1 st Release SOC			NWGC 2 nd Release SOC			Proposed change
Environmental issue		Project Phase	Environmental issue		Project Phase	
44	Further detailed geotechnical investigations would be carried out during the detailed design stage. Areas where electro-magnetic survey results indicated high salinity (greater than 100 dS/m) would be investigated further, prior to land development, to confirm salinity levels and associated risks.	Design	NA	Not used	NA	No change
45	Soil samples would be collected and analysed to confirm the findings of the Phase 1 contamination assessment as part of the detailed geotechnical investigations prior to construction.	Design	34	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 <i>Waste Classification Guidelines</i> (DECCW 2009a). Excavated contaminated soil will be disposed of at an appropriately licensed facility.	Pre-construction	Replace wording with 2 nd Release SOC 34 Move to Waste Generation and Management for consistency.
46	During detailed design, Sydney Water would ensure that the existing and potential salinity of soils and groundwater would be considered to ensure that appropriate materials and other features are used to mitigate against the corrosive impacts of high salinity.	Design		See above – 2 nd Release SOC 26		Incorporate in updated 1 st Release SOC 39 and remove
Human Health						
47	Recycled water would be provided to meet the standard of urban non-potable reuse as defined by the <i>Natural Resource Management Ministerial Council, Environmental Protection and Heritage Council, Australian Health Ministers Conference - National Guidelines for Water Recycling: Managing Health and Environmental Risks (2006)</i> .	Operation	NA	NA	NA	No change– move Human health to end of SOC

NWGC 1 st Release SOC			NWGC 2 nd Release SOC			Proposed change
Environmental issue		Project Phase	Environmental issue		Project Phase	
48	Prior to operation of the Project a Recycled Water Quality Management Plan (RWQMP) would be prepared based upon the risk management framework approach outlined by the <i>National Guidelines for Water Recycling – Managing Health and Environmental Risks</i> (2006) and using actual tertiary treated wastewater data from the STPs. Sydney Water, in consultation with the Department of Health, has initiated the development of a RWQMP for several recycled water services, including the Rouse Hill RWP. The Quakers Hill RWP would also be addressed as it becomes operational. Detailed information on each of the recycled water systems would be included; in particular, how risks to human health would be reduced and the results of validation.	Operation	NA	NA	NA	No change– move Human health to end of SOC

NWGC 1 st Release SOC			NWGC 2 nd Release SOC			Proposed change
Environmental issue		Project Phase	Environmental issue		Project Phase	
49	Sydney Water would apply the following risk management practices to limit exposures to recycled water: - installation regulations and codes of practice that include systematic processes to reduce the probability of cross-connections - materials codes and regulations that easily discriminate drinking and recycled water plumbing - regulations that limit the legal installation and modification of plumbing systems to licensed individuals - education on recycled water use and the need to avoid creating cross-connections - opportunities to apply pressure differentials in certain situations to ensure that if cross-connections occur, they are from higher to lower quality water - installation of backflow prevention systems to reduce the extent of hydraulic influence from any cross-connections that do occur - operational checking and connection auditing.	Design and Operation	NA	NA	NA	No change– move Human health to end of SOC
Traffic, Transport and Access						
50	Disturbances to traffic and access would be minimised whenever and wherever practical.	Construction		Not used		Remove and replace with 2 nd Release SOC 27, 28 and 30

NWGC 1 st Release SOC			NWGC 2 nd Release SOC			Proposed change
Environmental issue		Project Phase	Environmental issue		Project Phase	
51	Impacts on traffic, transport and access as a result of construction of the Project would be managed with standard mitigation and management controls. These controls would be prepared in consultation with relevant stakeholders, including Councils, RTA and RailCorp. Impact mitigation and management measures would be implemented to address road closures, access to properties, closure (permanent or temporary) and diversions of pedestrian pathways, provisions for temporary access and re-instatement.	Pre-Construction and Construction	27	Impact mitigation and management measures will be implemented to address road closures, access to properties, closure (permanent or temporary) and diversions of pedestrian pathways, provisions for temporary access and re-instatement.	Pre-construction and construction	Replace with 2 nd Release SOC 27
52	Further assessment would be undertaken before construction commences at the Riverstone STP so that appropriate traffic management controls can be developed and incorporated into the Construction Environmental Management Plan.	Pre-Construction	NA	NA	NA	No change - site specific
53	Road closures would be developed and implemented in consultation with the relevant roads authorities (Council and/or RTA).	Pre-Construction and Construction	28	Road closures will be developed and implemented in consultation with the relevant road authorities (Council and/or Roads and Maritime Services (RMS)).	Pre-construction and construction	Update wording to reflect RTA name change.

NWGC 1 st Release SOC			NWGC 2 nd Release SOC			Proposed change
Environmental issue		Project Phase	Environmental issue		Project Phase	
54	Where pipelines cross roads, they would be constructed by one of the following approaches: ▶ open trenching and temporary partial road closures during normal construction hours (generally for roads with low traffic volumes) ▶ open trenching and temporary partial road closures outside normal construction hours (generally for roads with moderate traffic volumes) ▶ underboring techniques, such as thrust boring or microtunnelling (generally for roads with high traffic volumes), which would avoid the need for road closures. Underboring techniques would be used where pipelines cross major intersections 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 RTA.	Design, Pre-Construction and Construction	29	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	Replace with 2 nd Release SOC 29
55	Councils, property owners and local community members would be informed of any potential loss of access and appropriate measures to either provide alternative pedestrian access ways or reinstate access at the end of each work day would be negotiated. Any access ways affected by construction would be reinstated to their original condition. Measures to manage closures and diversions of pedestrian pathways would be carried out in consultation with the relevant local Council(s).	Construction	30	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 as appropriate. Mitigation measures will include providing alternative access, reinstating access at the end of each day, and reinstating impacted areas to their original condition.	Construction and operation	Replace with 2 nd release SOC 30

NWGC 1 st Release SOC's			NWGC 2 nd Release SOC's			Proposed change
Environmental issue		Project Phase	Environmental issue		Project Phase	
56	Appropriate temporary access requirements would be negotiated with property owners for the construction period. Any areas affected by the temporary construction access requirements would be reinstated to their original condition.	Construction	NA	Not used	NA	Remove 1 st Release SOC 56 and replace with 2 nd Release SOC 27 and 30.
57	Proposed future road widening of Schofields Road would be taken into account during the detailed design of the revised drinking water pipeline route. The pipeline route would be located appropriately so as not to interfere with future road widening works.	Design		NA	NA	No change - site specific
58	RailCorp has a staged consultation and approval framework for such works and Sydney Water would meet RailCorp's requirements. Actions that would be undertaken by Sydney Water would include providing RailCorp with engineering and construction information on the rail line undercrossings (including concept and detailed designs) for their review and approval. This consultation and design finalisation process would take into consideration any future upgrades or expansion of the rail network, including the future Richmond rail line duplication works between Quakers Hill and Vineyard.	Design		NA	NA	No change - site specific
59	Ongoing consultation with the Transport Construction Authority (TCA) would be undertaken regarding the construction and location of Project components relative to the proposed North West Rail Link, including where TCA is proposing to cross Windsor and Rouse Road, to determine the preferred location and design of pipelines in consideration of the costs of any future relocation requirements.	Construction	31	Sydney Water will continue to consult with the Transport Construction Authority (TCA) and RailCorp about construction work at Railway Terrace, Schofields, including the exact location and design of the rail crossing at Schofields.	Design	No change - site specific

NWGC 1 st Release SOC's			NWGC 2 nd Release SOC's			Proposed change
Environmental issue		Project Phase	Environmental issue		Project Phase	
60	Where maintenance or emergency activities require a road closure or the temporary loss of access to a property, Sydney Water's standard operational procedures in managing these activities would be implemented.	Operation	NA	Not used	Not used	Remove 1 st Release SOC 60, and replace with 2 nd Release SOC 27
Waste Generation and Management						
61	Detailed measures to manage, reduce, reuse, recycle and for disposal of construction waste would be developed and applied to the Project.	Construction	32	Detailed measures to manage, reduce, reuse, recycle and for disposal of construction waste will be developed and implemented to the Proposal.	Construction	No change
62	Wherever possible, suitable excavated spoil would be reused on site for backfilling, landscaping and other uses. If suitable spoil was unable to be reused on-site, opportunities for off-site reuse would be investigated. If reuse opportunities were unable to be identified or the spoil was unsuitable for reuse due to its geotechnical or contamination characteristics, spoil would be classified according to <i>Environmental Guidelines: Assessment, Classification and Management of Liquid and Non-liquid Wastes</i> (DEC 1999) and disposed of at an appropriately licensed facility.	Construction	33	Wherever possible, suitable excavated spoil will be reused on site for backfilling, landscaping and other uses. If suitable spoil cannot be reused on-site, opportunities for off-site reuse will be investigated. If reuse opportunities were unable to be identified or the spoil was unsuitable for reuse due to its geotechnical or contamination characteristics, spoil will be classified according to <i>Waste Classification Guidelines</i> (DECCW 2009a) and disposed of at an appropriately licensed facility.	Construction	No change
63	Assessments of the North Kellyville, First Ponds Creek and Level Crossing Wastewater Carriers for soil contamination would be conducted later, during the detailed design for these components of the Project.	Design and Pre-Construction	NA	Not used	NA	Remove 1 st Release SOC 63. Incorporated in 1 st Release SOC 64.

NWGC 1 st Release SOC			NWGC 2 nd Release SOC			Proposed change
Environmental issue		Project Phase	Environmental issue		Project Phase	
64	Appropriate studies and assessments would be undertaken to further identify and manage potentially contaminated soils during construction. Sampling of soils at depths relative to the construction zone would be undertaken during geotechnical testing prior to construction. Soils would be analysed for a broad range of potential contaminants to confirm the findings of the desk-top study, provide an indication of potential waste classification against DECC's <i>Environmental Guidelines: Assessment, Classification and Management of Liquid and Non-liquid Wastes</i> (DEC 1999) for off-site disposal purposes and determine any other mitigation measures that would be required. Consideration would be given to where soil characteristics might exacerbate soil contamination impacts.	Pre-Construction	34	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 <i>Waste Classification Guidelines</i> (DECCW 2009a). Excavated contaminated soil will be disposed of at an appropriately licensed facility.	Pre-construction	Replace with 2 nd Release SOC 34
65	All wastes generated by the construction and operation of the Project would be classified and disposed in accordance with the <i>Environmental Guidelines: Assessment, Classification and Management of Liquid and Non-liquid Wastes</i> (DEC 1999).	Construction and Operation	35	All wastes generated by the construction and operation of the Proposal will be classified and disposed in accordance with <i>Waste Classification Guidelines</i> (DECCW 2009a).	Construction and operation	Replace wording with 2 nd Release SOC 35
66	Organic wastes produced through vegetation clearing would be minimised where possible and opportunities for mulching and composting would be investigated.	Construction	NA	Not used	Not used	Remove 1 st Release SOC 66. Incorporated in 1 st Release SOC 61.

NWGC 1 st Release SOC			NWGC 2 nd Release SOC			Proposed change
Environmental issue		Project Phase	Environmental issue		Project Phase	
67	Cutting heads and drilling equipment used for boring beneath sensitive environmental areas, creeks or roads could be lubricated using bentonite slurry. The slurry would be reused in the drilling process, although small quantities of this liquid waste may be produced and would require disposal. Liquid and non-liquid waste would be classified and managed in accordance with DECC's <i>Environmental Guidelines: Assessment, Classification and Management of Liquid and Non-liquid Wastes</i> (DEC 1999). Wastewater from the dewatering of excavated areas would be discharged and disposed of in accordance with the POEO Act.	Construction	NA	Not used	Not used	Remove 1 st Release SOC 67. Incorporated in 1 st Release SOC 65.
68	Detailed measures to manage, reduce, reuse, recycle and dispose of construction waste would be contained in the Construction Environmental Management Plan.	Pre-Construction and Construction	NA	Not used	Not used	Remove 1 st Release SOC 68. Incorporated in 1 st Release SOC 61.
69	Biosolids generated by Riverstone STP would continue to meet the Grade B stabilisation criteria (Sydney Water 2004) and would be 100 per cent beneficially reused as part of the Bio-Soil Program operated by Sydney Water.	Operation	NA	NA	NA	No change
70	There would be an increase in other general wastes generated by Riverstone STP (eg. waste from workers amenities, general maintenance waste, grit and screenings), however, the quantities would be relatively small and would be managed according to Sydney Water's standard operating procedures and policies.	Operation	NA	NA	NA	Remove 1 st Release SOC 70. Incorporated in 1 st Release SOC 65.

NWGC 1 st Release SOC			NWGC 2 nd Release SOC			Proposed change
Environmental issue		Project Phase	Environmental issue		Project Phase	
Air Quality						
71	The potential impacts from construction activities on dust generation would be managed through typical dust suppression measures contained in the Construction Environmental Management Plan.	Construction	36	Potential impacts from dust generation will be managed through typical dust suppression measures.	Construction	Replace wording with 2 nd Release SOC 36
72	Any complaints relating to odour from vent stacks or SPSS would be dealt with promptly and the problem rectified.	Operation	NA	Not used	Not used	Remove 1 st Release 72, incorporated in 1st Release SOC 73.
73	Odour management would continue to be undertaken in accordance with Sydney Water's existing procedures. Odour complaints would be registered and investigated. Engineering, operational or other odour reduction measures would be implemented where verified odour complaints are received about odours from the sewerage system.	Operation	37	Odour management will continue to be undertaken in accordance with Sydney Water's existing procedures. Odour complaints will be registered and investigated. Engineering, operational or other odour reduction measures will be implemented where verified odour complaints are received about odours from the wastewater system.	Operation	Change 'sewerage system' to 'wastewater system'
74	Vegetation would be planted along the eastern boundary of the Riverstone STP, within land owned by Sydney Water. This vegetation would provide a buffer between the STP and other land.	Operation	NA	NA	NA	No change

NWGC 1 st Release SOC's				NWGC 2 nd Release SOC's		Proposed change
Environmental issue		Project Phase		Environmental issue	Project Phase	
Noise and Vibration						
75	Mitigation measures would be developed prior to construction to specify how noise and vibration impacts on the community would be minimised. This would be achieved through the implementation of noise control measures, such as those outlined in Australian Standard 2436-1981 " <i>Guide to Noise Control on Construction, Maintenance and Demolition Sites</i> ". Typical mitigation measures would include: use of acoustic barriers, location of plant, specified working hours, monitoring and modification of construction techniques.	Construction	38	Physical and management measures will be used to reduce the construction noise impact on sensitive receivers. Typical physical noise mitigation measures, such as those outlined in Australian Standard 2436-1981 <i>Guide to Noise Control on Construction, Maintenance and Demolition Sites</i> , include noise control kits for plant equipment, noise screens and acoustic enclosures for stationary plant. Typical management measures include limiting noise work to less sensitive time periods, selecting low noise plant equipment and using quieter construction methods where possible.	Construction	Replace with 2 nd Release SOC 38 wording
NA	Not Used	NA	39	Construction work will be limited to standard working hours (DECC 2009a): • 7am to 6pm, Monday to Friday • 8am to 1pm, Saturday • No work on Sundays or public holidays. Out of hours work will only occur in accordance with an approved EMP	Construction	No change. Included in 2 nd Release SOC 38 above. \
76	Where vibration from construction activities may impact on residents, the activities would be managed in accordance with the British Standard BS 6472 (1984 to 1992), the International Standard ISO 2631:2-1989 and the Australian Standard AS 2670.2-1990.	Construction	40	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	Replace with 2 nd Release SOC 40 wording
77	Where vibration from construction activities may impact on nearby structures, the activities would be managed in accordance with British Standard 7385:Part 1-1993 <i>Evaluation and Measurement for Vibration on Buildings</i> .	Construction	41	Where vibration from construction activities may impact on nearby structures, the activities will be managed in accordance with British Standard 7385: Part 1 – 1993 <i>Evaluation and Measurement for Vibration on Buildings</i> .	Construction	No change

NWGC 1 st Release SOC's			NWGC 2 nd Release SOC's			Proposed change
Environmental issue		Project Phase	Environmental issue		Project Phase	
78	For historic buildings, which have a higher sensitivity to vibration, the guidelines within the German Standard DIN 4150:Part 3-1986 would be adhered to.	Construction	42	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	Replace with 2 nd Release SOC 42 wording.
79	Additional noise attenuation would be provided on noise generating infrastructure at the Cudgegong Road Reservoir Site to reduce noise levels at residential receivers to acceptable levels.	Design		NA	NA	No change – site specific
80	During the final selection of mechanical plant and equipment, appropriate noise control treatments would be chosen, including: - installation of commercially available silencers - installation of acoustic screens and barriers between plant and sensitive neighbouring premises - installation of partially enclosed or fully enclosed acoustic enclosures around mechanical plant and pumping stations.	Design	NA	Not used	Not used	No change
81	The Construction Noise Management Plan, as provided in Appendix G to the EA, would be further developed for the Project prior to construction and would include detail provided in the DECC's submission. The plan would be included as a Sub-plan to the Construction Environmental Management Plan.	Pre-Construction	NA	Not used	Not used	Remove 1 st release SOC 81. Incorporated in 1 st Release SOC 75..
82	Periodic maintenance and inspections would typically not result in significant noise generation and would be managed through Sydney Water's standard management procedures.	Operation	NA	Not used	Not used	Remove 1 st Release SOC 82. Part of standard Sydney Water management measures.

NWGC 1 st Release SOC's				NWGC 2 nd Release SOC's			Proposed change
Environmental issue		Project Phase		Environmental issue	Project Phase		
Hazards and Risks							
83	Any fuel or chemicals used during construction would be stored to meet relevant standards in bunded or contained areas.	Construction		Not used (addressed in 2 nd Release SOC's 24 and 25)			Remove 1 st Release SOC 83. Incorporated in 1 st Release SOC's 5 and 6.
84	The storage of fuels on or around the site would generally be avoided and vehicles and equipment would be refuelled off site. Where on site refuelling is unavoidable, mini-tankers would be used. Mini-tankers would be required to follow standard procedures to minimise the risk of explosion or fire.	Construction		Not used (addressed in 2 nd Release SOC's 24 and 25)			Remove 1 st Release SOC 84. Incorporated in 1 st Release SOC's 5 and 6.
85	All class 8 storage areas would be maintained within bunded facilities that conform with relevant standards and codes, primarily <i>AS1940: The Storage and Handling of Combustible and Flammable Liquids and dangerous Goods Storage Codes</i> . Separate bunded areas would be constructed for each type of chemical and would drain to a sump, not to stormwater drains.	Design and Operation	43	All class 8 storage areas will be maintained within bunded facilities that conform with relevant standards and codes, primarily <i>AS 1940: The Storage and Handling of Combustible and Flammable Liquids and Dangerous Goods Storage Codes</i> .	Design and Operation		Replace with 2 nd Release SOC 43 wording
86	All chemical unloading areas would be capable of collecting and containing spills. All drains in the unloading area would be directed to a sump and not to stormwater.	Design and Operation	NA	NA	NA		No change

NWGC 1 st Release SOC's			NWGC 2 nd Release SOC's			Proposed change
Environmental issue		Project Phase	Environmental issue		Project Phase	
87	The following studies would be completed during final design and prior to operation to assess the effectiveness of design features and safeguards in relation to the Preliminary Hazard Analysis assumptions and recommendations: ▶ Fire Safety Study ▶ Hazard and Operability Study ▶ Emergency Response Planning ▶ Final Hazard Analysis ▶ Safety Management System assessment ▶ Hazard Audit.	Design and Pre-Construction	NA	NA	NA	No change – site specific
88	There is potential for contaminated firewater to flow off site at the STPs, resulting in environmental damage. To minimise the risk of this occurrence, the site first flush retention system would have capacity to contain a minimum of 10 times the capacity of the largest tank. This would ensure the firewater is retained on site in accordance with the applicable Australian Standards.	Design	NA	NA	NA	No change

NWGC 1 st Release SOC's			NWGC 2 nd Release SOC's			Proposed change
Environmental issue		Project Phase	Environmental issue		Project Phase	
89	Other recommendations of the PHA that would be implemented include: - spill kits would be installed adjacent to the acid alkali storage and use areas to provide rapid response in the event of a spill during storage and handling - an emergency response plan would be developed for the sites, which should be developed in accordance with the requirements of "HIPAP No.1, Emergency Planning Guidelines" - the emergency response plan would include procedures for response to spills and a schedule for emergency response drills and training - review of OH&S regulations would be undertaken to ensure sites are compliant with section 6A of the regulation.	Operation	NA	NA	NA	No change - site specific
Energy and Greenhouse Gas Emissions						
90	All vehicles, machinery and water-related infrastructure would be adequately maintained and operated to ensure efficient operation to minimise energy use and greenhouse gas emissions.	Construction and operation	44	All vehicles and machinery and water related infrastructure will be adequately maintained and operated to ensure efficient operation to minimise energy use and greenhouse gas emissions.	Construction and operation	No change
Visual Amenity						
91	Areas disturbed by pipeline construction would be progressively rehabilitated, further reducing any visual impacts. Machinery would be used and stored so as to minimise disturbances to residents.	Construction	45	Areas disturbed by pipeline construction will be progressively rehabilitated. Machinery will be used and stored to minimise disturbances to residents.	Construction	Replace with 2 nd Release SOC 45 wording

NWGC 1 st Release SOC			NWGC 2 nd Release SOC			Proposed change
Environmental issue		Project Phase	Environmental issue		Project Phase	
92	Hoardings or temporary screening would be erected to decrease visual impact of construction compounds. Good housekeeping practices would be employed on site to minimise visual impacts.	Construction	46	Hoardings or temporary screening will be erected around construction compounds, the Nelson WPS site and the Box Hill Reservoir site where appropriate. Good housekeeping practices will be employed on site.	Construction	No change
93	Screening or vegetation along the fence line would be used to obscure construction works at the STPs and reservoir site and further reduce the visual impact of construction.	Construction	NA	NA	NA	No change – site specific
94	At the STP, pumping stations and Cudgegong Road Reservoir Site existing vegetation would be maintained where possible and where appropriate additional plantings would be undertaken along site boundaries to obscure views of infrastructure from sensitive receivers. Site facilities (including fencing) would be designed to minimise visual impact.	Operation	47	The Nelson WPS site and Box Hill Reservoir site will be appropriately landscaped (including potential retention of some existing vegetation) at the completion of construction.	Operation	No change – site specific
95	Visual impact of the reservoirs would be minimised through painting the structures dark “bush green” which has been chosen as the colour most compatible with the surrounding environment.	Operation	48	Visual impact of the reservoir site and any 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.	Operation	Revise wording in 1 st Release SOC to include pump stations and ventilation shafts
96	Overshadowing from elevated reservoirs on surrounding properties would be addressed during the design phase when the location and structural features of the reservoirs would be considered to minimise this impact.	Design	49	Placement of the elevated reservoir will take into consideration overshadowing, with the aim of placing it in a location that will result in the majority of winter shadow being cast back onto the reservoir site.	Design	Replace with 2 nd Release SOC 49 wording

NWGC 1 st Release SOC			NWGC 2 nd Release SOC			Proposed change
Environmental issue		Project Phase	Environmental issue		Project Phase	
97	A vegetation management plan and landscape plan would be prepared for each of the STP, pumping station and reservoir sites which would provide for the following: ▶ protection of existing vegetation during construction, including temporary fencing, minimising vehicle movements and preventing stockpiling under tree canopies ▶ erosion control plans, where required ▶ reuse of topsoil ▶ recommendations for additional screen planting, including use of native and where possible endemic plant species.	Design, Construction and Operation	NA	Not used	NA	No change
Social Impacts						
98	During construction, communities would be informed prior to the start of any works in their area and would be notified at regular intervals throughout the construction process.	Construction	50	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	No change
99	Sydney Water would ensure that: ▶ the community and stakeholders, including Blacktown City Council, have a high level of awareness of all processes and activities associated with the Project ▶ timely and accurate information is provided and easily accessible ▶ there is a high level of responsiveness to issues and concerns raised by the community.	Construction	51	Sydney Water will ensure that: • the affected community members and stakeholders have a high level of awareness of all processes and activities associated with the Proposal • timely and accurate information is provided and easily accessible • there is a high level of responsiveness to issues and concerns raised by the community.	Construction and operation	No change

NWGC 1 st Release SOC			NWGC 2 nd Release SOC			Proposed change
Environmental issue		Project Phase	Environmental issue		Project Phase	
100	Communication processes outlined in the EA would be developed and implemented throughout the delivery of the Project. These would include: - opportunities for the community to provide input on mitigation measures for construction or operations - methods to inform the community of the progress and performance of the Project and issues of interest to the community - notification of construction activities to potentially affected local residents, councils and businesses - processes to receive and manage complaints in accordance with the Sydney Water customer contract - consultation with affected property owners - provision of information regarding the specific environmental and human health risks associated with irrigating with recycled water - induction and training of construction personnel in communication requirements - protocols to notify stakeholders of relevant activities and any incidents should they occur.	Design, Pre-Construction, Construction and Operation	52	Communication processes outlined in the EA will be developed and implemented for the Proposal. These will include: - opportunities for the community to provide input on mitigation measures for construction or operation - methods to inform the community of the progress and performance of the Proposal and issues of interest to the community - notification of construction activities to potentially affected local residents, councils and businesses - processes to receive and manage complaints in accordance with the Sydney Water customer contract - consultation with affected property owners - induction and training of construction personnel in communication requirements - protocols to notify stakeholders of relevant activities and any incidents should they occur.	Design, pre-construction, construction and operation	Replace with 2 nd Release SOC 52 wording
Land use and services						
NA	Not used	NA	53	Sydney Water will consult with Office of Environment and Heritage (OEH) about construction and maintenance impacts of pipelines located in the proposed extension to Rouse Hill Regional Park.	Design	No change - site specific

NWGC 1 st Release SOC				NWGC 2 nd Release SOC		Proposed change
Environmental issue		Project Phase		Environmental issue	Project Phase	
Proposal description						
NA	Not used	NA	54	Changes to the Proposal outside the Field Assessment Area will only occur: a) to reduce impacts to biodiversity, heritage or human amenity; or b) to avoid engineering (eg geological, topographical) constraints; and c) after consultation with any potentially affected landowners and relevant agencies.	Design, pre-construction and construction	Add to 1st Release SOC
NA	Not used	NA	55	On request, Sydney Water will provide details to DP&I of any change to the Proposal and corresponding environmental assessment that demonstrates the change is consistent with the EA and has a neutral or positive outcome relative to the impacts described in the EA.	Design, pre-construction, construction, and operation.	Add to 1st Release SOC
NA	NA	NA	56	Sydney Water will monitor flows and connections to its wastewater system to ensure that connections do not result in flows exceeding the approved capacity of 14.2 ML/day (until additional capacity is approved and amplified) at Riverstone WWTP.	Operation	No change

APPENDIX C Revised Statements of Commitment

NWGC water related services for first release precincts - Revised Statements of Commitment

SOC #	Environmental Aspect	Project Phase
	Water Quality, Hydrology and Aquatic Ecology	
1	A monitoring program to assess the impacts of the Project on river health (eg. water quality, flow, fish migration, macrophytes, macroinvertebrate communities and ecotoxicity testing) would be undertaken in conjunction with NSW State Government agencies. This would complement the Integrated Water Monitoring Framework for the Hawkesbury-Nepean River. Details of the monitoring program would be determined in consultation with relevant government authorities/stakeholders (including the DECC, DWE & DPI).	Pre-Construction, Construction and Operation
2	Erosion and sedimentation control will be managed using measures developed in accordance with <i>Managing Urban Stormwater, Soils and Construction</i> (Volume 1, Landcom 2004 and Volume 2A, DECC 2008). Each creek crossing will be assessed on a case by case basis to determine potential impact. The assessment will include identification of geomorphic character, behaviour, condition and recovery potential.	Construction
3	All creek crossings by pipelines would be underbored except where underboring would cause more impacts than trenching. Appropriate sedimentation and erosion controls would be developed and implemented for underboring sites.	Construction
4	For the Rouse Hill and Riverstone wastewater systems the Project will be designed to operate within the licence requirements of no more than 12 and 14 overflow events per 10 years, respectively.	Design and Operation
5	The wastewater system will be designed and operated with the objective of having no dry weather overflows reaching waterways.	Design and Operation
6	The upgraded and amplified Riverstone STP would meet the existing conditions for bypasses during large wet weather events as detailed in the Environmental Protection Licence for the Riverstone system.	Design and Operation
7	Outlets for discharge of water would be constructed so as to minimise potential destabilisation and scouring. This would involve the construction of appropriate headwalls, dissipaters and bank stabilisation techniques.	Design and Operation
8	During the detailed design phase further consultation would be undertaken with relevant Councils and other agencies for input to the design aspects such as the integration of Water Sensitive Urban Design (WSUD) principles and the future amenity of the area.	Design
9	Sydney Water will design wastewater pipeline maintenance structures to minimise potential for floodwaters to enter wastewater pipelines. Where possible, they will be located to minimise environmental impact.	Design

SOC #	Environmental Aspect	Project Phase
10	Discharge of water from the Cudgegong Road Reservoir Site reservoirs will comply with Sydney Water's discharge protocol standard operating procedure (Sydney Water 2009c).	Operation
	Terrestrial Flora and Fauna	
11	Detailed design will consider how impacts to native vegetation can be avoided and minimised, with a focus on non-certified areas. Where practical, this will include: • placement of pipelines along the route that results in the least impact to native vegetation and to avoid significant hollow-bearing trees • refinement of infrastructure site design to avoid native vegetation • use of construction methods that avoid and minimise impacts where appropriate (eg. underboring instead of open trenching).	Design and Construction
12	Management measures will be developed and implemented to minimise impacts to flora and fauna, including: • limiting the extent of the direct pipeline construction impact to a maximum width of 10 metres through native vegetation • protecting and physically delineating areas of native vegetation that are not to be removed • protecting hollow-bearing trees where practical. Where impacts cannot be avoided, Sydney Water will keep an inventory of those to be removed and implement suitable mitigation measures (eg. erection of nest boxes in adjacent habitat, and placement of the cut tree and any other fauna habitat elements in suitable adjacent habitat) • having an ecologist on site prior to and during native vegetation removal (to assist in delineating the 10 metre construction corridor, mark any hollow-bearing trees, check vegetation for fauna prior to removal, carry out any necessary fauna rescue and supervise vegetation removal) • washing down all equipment at an appropriate depot prior to commencement of native vegetation removal (to minimise weed or pathogen spread) • appropriate soil stockpiling, locating construction facilities and vehicle turning areas in already cleared lands where practical, removal of noxious weeds, decreasing barriers for movement of native fauna where possible, staff training, and restoring impacted areas to pre-works condition where practical.	Construction
13	During the detailed design phase, Sydney Water will identify areas requiring post-construction rehabilitation, with the following areas taking priority: • creek crossings and riparian corridors where native vegetation communities occur • sites in non-certified areas identified as being in moderate condition and that form part of a larger patch of vegetation	Design

SOC #	Environmental Aspect	Project Phase
14	Sydney Water will prepare and implement post-construction management plans for rehabilitation areas, including: - weeding activities and protocols for the removal of noxious weeds - stabilisation measures for creek beds and banks - natural regeneration or re-planting activities using local indigenous flora, where their use is compatible with future maintenance requirements, and with the aim of achieving the reestablishment of the natural structure of the original native vegetation - on-going monitoring and management activities.	Post-construction
15	Sydney Water will provide suitable offsets for the loss of existing native vegetation within the non-certified areas of the NWGC, in accordance with the relevant biodiversity measures in the Biodiversity Certification Order (DECC 2006). Offsets will be determined in consultation with DP&I (Strategies and Land Release) and OEH.	Design and pre-construction
16	To minimise the impacts on the threatened species <i>Epacris purpurascens</i> var. <i>purpurascens</i> or <i>Grevillea juniperina</i> ssp. <i>Juniperina</i> the following mitigation measures would be implemented: - No works would be undertaken within 5 m of the threatened flora species. - Exclusion fencing would be erected around threatened flora species and maintained in place until such time as construction works are completed. - Manual digging would be undertaken in the vicinity of the threatened species.	Construction
17	Prior to commencement of construction at the Cudgegong Road Reservoir Site a detailed Flora and Fauna Management Strategy would be prepared. This strategy would incorporate the mitigation measures specified in the Species Impact Statement prepared for the site.	Pre-Construction
18	To mitigate the impacts on the threatened fauna at the Cudgegong Reservoir site, a strategy would be developed including: - timing of construction to ensure clearing is not undertaken in breeding, roosting and torpor times for the microchiropteran bats; - translocation of individual Cumberland Plain Land Snails.	Construction
19	When required, future repairs to sites and pipelines would be subject to further environmental assessment by Sydney Water.	Operation
20	A suitably qualified ecologist will carry out a pre-clearance survey for the presence of the Green and Golden Bell Frog where potential habitat has been identified immediately before any vegetation clearance s takes place.	Pre-construction

SOC #	Environmental Aspect	Project Phase
21	Where there is potential Green and Golden Bell Frog habitat any pipes left on site where will be capped/covered overnight to prevent fauna from sheltering in them.	Construction
	Indigenous Heritage	
22	During detailed design and construction, Sydney Water will consider options to avoid adversely impacting identified Aboriginal objects, sites and places. Where feasible, works impacting identified objects, sites or places will not occur unless they are directly related to, and for the express purpose of, their conservation, care and maintenance.	Design and construction
23	If it is not possible to avoid impacting identified Aboriginal objects, sites or places, micro-tunnelling and/or under-boring construction techniques or similar will be considered. These techniques mainly occur beneath significant soil layers and material and/or avoid material of significance, although some disturbance associated with entry and exit points will be required.	Design and construction
24	If micro-tunnelling, under-boring or similar is not possible, and for areas that may be disturbed, Sydney Water will develop appropriate mitigation measures in consultation with a heritage professional and relevant Registered Aboriginal Parties (RAPs). Mitigation measures will correlate with the extent of the proposed impact and the significance of the potentially impacted Aboriginal objects, sites and places. Mitigation measures may include: • for surface sites or sites with a surface expression – spatial recording, using a differential Global Positioning System (GPS) or Total Station (with sub-metre accuracy), followed by collection of the Aboriginal objects • for subsurface sites or sites with a subsurface expression – a program of testing and/or salvage excavations, using current archaeological practices. Archaeological monitoring may also be appropriate in certain circumstances • appropriately recording all cultural materials and impacts using photographs, sketches and written description before, during and after implementation of mitigation measures • undertaking an appropriate level of post-excavation analysis and reporting, in accordance with the general mitigation measures listed in Section 7.2 of <i>Aboriginal Heritage Impact Assessment for additional water related infrastructure for NWGC first release precincts (AHMS, 2012)</i> .	Pre-construction and construction
25	General mitigation measures listed in 7.2 of the <i>AHIA</i> (AHMS 2012) will be implemented throughout the design, construction and operation of the Project, as appropriate.	Design, pre-construction, construction and operation

SOC #	Environmental Aspect	Project Phase
	Non-Indigenous Heritage	
26	To minimise impact on the section of Old Windsor Road at Kellyville, which is listed on the Register of the National Estate, the drinking water pipeline would be underbored where it crosses Old Windsor Road at Bella Vista.	Design and Construction
27	All construction personnel will be inducted on the potential to find previously unrecorded non-Aboriginal heritage items during the construction works.	Construction
28	In the event that non-Aboriginal heritage items not identified are discovered, work in the immediate vicinity would cease and the Sydney Water Project Environmental Representative (PER) would be informed to determine the subsequent course of action. An archaeologist may be contacted to assess the item. If the item is a relic, notification under s146 of the <i>Heritage Act 1977</i> applies and the Heritage Council would be notified. Further action such as archaeological evaluation and excavation may be required prior to continuation of construction.	Construction
29	The pipelines would require maintenance during the operation of the Project. Standard operating procedures would be implemented to ensure the maintenance activities would have no impact on the items of non-Indigenous heritage.	Operation
	Soils and Groundwater	
30	Any 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
31	The storage of large quantities of fuels on or around the site will generally be avoided and vehicles and equipment will be refuelled off site. Where on-site refuelling is unavoidable, mini-tankers will be used. Mini-tankers will be required to follow standard procedures and have a spill kit to minimise the risk and impact of spills.	Construction
32	Any fuels or chemicals will be stored, handled and disposed of to meet relevant standards. Bunded or contained areas and a spill kit will be provided as appropriate.	Construction and operation
33	Any areas identified as affected by soil salinity will be appropriately managed during construction, and potential impacts mitigated, including: - the use of salt resistant construction methods and materials - no reuse of excavated saline soils for backfilling - infrastructure, especially the pipelines, would not impact on natural surface and sub-soil drainage, and where appropriate would improve drainage	Design and Construction
34	Recycled water total dissolved solids (TDS) levels would be monitored and managed at a level to minimise the risk of significant salinity impacts from irrigation.	Operation

SOC #	Environmental Aspect	Project Phase
35	A groundwater monitoring program for the Project would be developed in conjunction with other relevant stakeholders such as the DWE, and implemented by Sydney Water.	Operation
36	Recycled water users would be informed of the specific environmental and human health risks associated with irrigating with recycled water.	Operation
37	Further detailed geotechnical investigations would be carried out during the detailed design stage. Areas where electro-magnetic survey results indicated high salinity (greater than 100 dS/m) would be investigated further, prior to land development, to confirm salinity levels and associated risks.	Design
	Traffic, Transport and Access	
38	Impact mitigation and management measures will be implemented to address road closures, access to properties, closure (permanent or temporary) and diversions of pedestrian pathways, provisions for temporary access and re-instatement.	Pre-construction and construction
39	Road closures will be developed and implemented in consultation with the relevant road authorities (Council and/or Roads and Maritime Services (RMS)).	Pre-construction and construction
40	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 as appropriate. Mitigation measures will include providing alternative access, reinstating access at the end of each day, and reinstating impacted areas to their original condition.	Construction and operation
41	Further assessment would be undertaken before construction commences at the Riverstone STP so that appropriate traffic management controls can be developed and incorporated into the Construction Environmental Management Plan.	Pre-Construction
42	Appropriate construction methodologies for road crossings will be developed and implemented in consultation with the relevant Council and/or the Roads and Maritime Services (RMS).	Design, Pre-Construction and Construction
43	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 as appropriate. Mitigation measures will include providing alternative access, reinstating access at the end of each day, and reinstating impacted areas to their original condition.	Construction and operation
44	Proposed future road widening of Schofields Road would be taken into account during the detailed design of the revised drinking water pipeline route. The pipeline route would be located appropriately so as not to interfere with future road widening works.	Design

SOC #	Environmental Aspect	Project Phase
45	RailCorp has a staged consultation and approval framework for such works and Sydney Water would meet RailCorp's requirements. Actions that would be undertaken by Sydney Water would include providing RailCorp with engineering and construction information on the rail line undercrossings (including concept and detailed designs) for their review and approval. This consultation and design finalisation process would take into consideration any future upgrades or expansion of the rail network, including the future Richmond rail line duplication works between Quakers Hill and Vineyard.	Design
46	Ongoing consultation with the Transport Construction Authority (TCA) would be undertaken regarding the construction and location of Project components relative to the proposed North West Rail Link, including where TCA is proposing to cross Windsor and Rouse Road, to determine the preferred location and design of pipelines in consideration of the costs of any future relocation requirements.	Construction
	Waste Generation and Management	
47	Detailed measures to manage, reduce, reuse, recycle and for disposal of construction waste would be developed and applied to the Project.	Pre-construction and Construction
48	Wherever possible, suitable excavated spoil would be reused on site for backfilling, landscaping and other uses. If suitable spoil was unable to be reused on-site, opportunities for off-site reuse would be investigated. If reuse opportunities were unable to be identified or the spoil was unsuitable for reuse due to its geotechnical or contamination characteristics, spoil would be classified according to <i>Environmental Guidelines: Assessment, Classification and Management of Liquid and Non-liquid Wastes</i> (DEC 1999) and disposed of at an appropriately licensed facility.	Construction
49	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 <i>Waste Classification Guidelines</i> (DECCW 2009a). Excavated contaminated soil will be disposed of at an appropriately licensed facility.	Design and Pre-Construction
50	All wastes generated by the construction and operation of the Project will be classified and disposed in accordance with <i>Waste Classification Guidelines</i> (DECCW 2009a).	Construction and Operation
51	Biosolids generated by Riverstone STP would continue to meet the Grade B stabilisation criteria (Sydney Water 2004) and would be 100 per cent beneficially reused as part of the Bio-Soil Program operated by Sydney Water.	Operation

SOC #	Environmental Aspect	Project Phase
	Air Quality	
52	Potential impacts from dust generation will be managed through typical dust suppression measures.	Construction
53	Odour management will continue to be undertaken in accordance with Sydney Water's existing procedures. Odour complaints will be registered and investigated. Engineering, operational or other odour reduction measures will be implemented where verified odour complaints are received about odours from the wastewater system.	Operation
54	Vegetation would be planted along the eastern boundary of the Riverstone STP, within land owned by Sydney Water. This vegetation would provide a buffer between the STP and other land.	Operation
	Noise and Vibration	
55	Physical and management measures will be used to reduce the construction noise impact on sensitive receivers. Typical physical noise mitigation measures, such as those outlined in Australian Standard 2436-1981 <i>Guide to Noise Control on Construction, Maintenance and Demolition Sites</i> , include noise control kits for plant equipment, noise screens and acoustic enclosures for stationary plant. Typical management measures include limiting noise work to less sensitive time periods, selecting low noise plant equipment and using quieter construction methods where possible.	Construction
56	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
57	Where vibration from construction activities may impact on nearby structures, the activities will be managed in accordance with British Standard 7385: Part 1 – 1993 <i>Evaluation and Measurement for Vibration on Buildings</i> .	Construction
58	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
59	Additional noise attenuation would be provided on noise generating infrastructure at the Cudgegong Road Reservoir Site to reduce noise levels at residential receivers to acceptable levels.	Design

SOC #	Environmental Aspect	Project Phase
60	During the final selection of mechanical plant and equipment, appropriate noise control treatments would be chosen, including: • installation of commercially available silencers • installation of acoustic screens and barriers between plant and sensitive neighbouring premises • installation of partially enclosed or fully enclosed acoustic enclosures around mechanical plant and pumping stations.	Design
	Hazards and Risks	
61	All class 8 storage areas will be maintained within bunded facilities that conform with relevant standards and codes, primarily <i>AS 1940: The Storage and Handling of Combustible and Flammable Liquids and Dangerous Goods Storage Codes</i> .	Design and Operation
62	All chemical unloading areas would be capable of collecting and containing spills. All drains in the unloading area would be directed to a sump and not to stormwater.	Design and Operation
63	The following studies would be completed during final design and prior to operation to assess the effectiveness of design features and safeguards in relation to the Preliminary Hazard Analysis assumptions and recommendations: • Fire Safety Study • Hazard and Operability Study • Emergency Response Planning • Final Hazard Analysis • Safety Management System assessment • Hazard Audit.	Design and Pre-Construction
64	There is potential for contaminated firewater to flow off site at the STPs, resulting in environmental damage. To minimise the risk of this occurrence, the site first flush retention system would have capacity to contain a minimum of 10 times the capacity of the largest tank. This would ensure the firewater is retained on site in accordance with the applicable Australian Standards.	Design

SOC #	Environmental Aspect	Project Phase
65	Other recommendations of the PHA that would be implemented include: - spill kits would be installed adjacent to the acid alkali storage and use areas to provide rapid response in the event of a spill during storage and handling - an emergency response plan would be developed for the sites, which should be developed in accordance with the requirements of "HIPAP No.1, Emergency Planning Guidelines" - the emergency response plan would include procedures for response to spills and a schedule for emergency response drills and training - review of OH&S regulations would be undertaken to ensure sites are compliant with section 6A of the regulation.	Operation
	Energy and Greenhouse Gas Emissions	
66	All vehicles, machinery and water-related infrastructure would be adequately maintained and operated to ensure efficient operation to minimise energy use and greenhouse gas emissions.	Construction and operation
	Visual Amenity	
67	Areas disturbed by pipeline construction will be progressively rehabilitated. Machinery will be used and stored to minimise disturbances to residents.	Construction
68	Hoardings or temporary screening would be erected to decrease visual impact of construction compounds. Good housekeeping practices would be employed on site to minimise visual impacts.	Construction
69	Screening or vegetation along the fence line would be used to obscure construction works at the WWTPs and reservoir site and further reduce the visual impact of construction.	Construction
70	At the WWTP, pumping stations and Cudgegong Road Reservoir Site existing vegetation would be maintained where possible and where appropriate additional plantings would be undertaken along site boundaries to obscure views of infrastructure from sensitive receivers. Site facilities (including fencing) would be designed to minimise visual impact.	Operation
71	Visual impact of the reservoirs, pump stations and ventilation shafts would be minimised through painting the structures dark "bush green" which has been chosen as the colour most compatible with the surrounding environment.	Operation
72	Placement of the elevated reservoir will take into consideration overshadowing, with the aim of placing it in a location that will result in the majority of winter shadow being cast back onto the reservoir site.	Design

SOC #	Environmental Aspect	Project Phase
73	A vegetation management plan and landscape plan would be prepared for each of the STP, pumping station and reservoir sites which would provide for the following: • protection of existing vegetation during construction, including temporary fencing, minimising vehicle movements and preventing stockpiling under tree canopies • erosion control plans, where required • reuse of topsoil • recommendations for additional screen planting, including use of native and where possible endemic plant species.	Design, Construction and Operation
	Social Impacts	
74	During construction, communities would be informed prior to the start of any works in their area and would be notified at regular intervals throughout the construction process.	Construction
75	Sydney Water will restore private properties impacted by construction or maintenance activities to pre-works condition, where practical, and subject to restrictions on building over constructed pipelines as listed in Section 6.14.3 This will be done in consultation with the landowners directly impacted by the Proposal.	Pre-construction, construction and operation
76	Sydney Water would ensure that: • the community and stakeholders, including Blacktown City Council, have a high level of awareness of all processes and activities associated with the Project • timely and accurate information is provided and easily accessible • there is a high level of responsiveness to issues and concerns raised by the community.	Construction

SOC #	Environmental Aspect	Project Phase
77	Communication processes outlined in the EA will be developed and implemented for the Project. These will include: • opportunities for the community to provide input on mitigation measures for construction or operation • methods to inform the community of the progress and performance of the Project and issues of interest to the community • notification of construction activities to potentially affected local residents, councils and businesses • processes to receive and manage complaints in accordance with the Sydney Water customer contract • consultation with affected property owners • induction and training of construction personnel in communication requirements • protocols to notify stakeholders of relevant activities and any incidents should they occur.	Design, Pre-Construction, Construction and Operation
	Human Health	
78	Recycled water would be provided to meet the standard of urban non-potable reuse as defined by the <i>Natural Resource Management Ministerial Council, Environmental Protection and Heritage Council, Australian Health Ministers Conference - National Guidelines for Water Recycling: Managing Health and Environmental Risks (2006)</i>.	Operation
79	Prior to operation of the Project a Recycled Water Quality Management Plan (RWQMP) would be prepared based upon the risk management framework approach outlined by the <i>National Guidelines for Water Recycling – Managing Health and Environmental Risks (2006)</i> and using actual tertiary treated wastewater data from the STPs. Sydney Water, in consultation with the Department of Health, has initiated the development of a RWQMP for several recycled water services, including the Rouse Hill RWP. The Quakers Hill RWP would also be addressed as it becomes operational. Detailed information on each of the recycled water systems would be included; in particular, how risks to human health would be reduced and the results of validation.	Operation

SOC #	Environmental Aspect	Project Phase
80	Sydney Water would apply the following risk management practices to limit exposures to recycled water: • installation regulations and codes of practice that include systematic processes to reduce the probability of cross-connections • materials codes and regulations that easily discriminate drinking and recycled water plumbing • regulations that limit the legal installation and modification of plumbing systems to licensed individuals • education on recycled water use and the need to avoid creating cross-connections • opportunities to apply pressure differentials in certain situations to ensure that if cross-connections occur, they are from higher to lower quality water • installation of backflow prevention systems to reduce the extent of hydraulic influence from any cross-connections that do occur • operational checking and connection auditing.	Design and Operation
	Project description	
81	Changes to the Project outside the field assessment area will only occur: a) to reduce impacts to biodiversity, heritage or human amenity; or b) to avoid engineering (eg geological, topographical) constraints; and c) after consultation with any potentially affected landowners and relevant agencies.	Design, pre-construction and construction
82	On request, Sydney Water will provide details to DP&I of any change to the Project and corresponding environmental assessment that demonstrates the change is consistent with the EA and has a neutral or positive outcome relative to the impacts described in the EA.	Design, pre-construction and construction.

APPENDIX D Ecological Study

Cumberland Ecology (January 2012) *Ecological Impact Assessment: amendments to the approved EA for the provision of drinking water and wastewater related services for the First Release Precincts of the North West Growth Centre*

APPENDIX E Aboriginal Heritage Studies

Archaeological and Heritage Management Solutions (August 2011) *Aboriginal Heritage Part 3A Preliminary Assessment or Due Diligence Advice – Riverstone Additional Options*

Archaeological and Heritage Management Solutions, (February 2012) *Aboriginal Heritage Impact Assessment - Additional Water Related Infrastructure for the North West Growth Centre – First Release Precincts*

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