Scoping Report Upper South Creek Advanced Water Recycling Centre

July 2020

Sydney WATER

Table of contents

Figures

Tables

1 Executive summary

Sydney Water is Australia's largest water utility, supplying water, wastewater, recycled water and stormwater services to more than five million people in Greater Sydney, the Blue Mountains and the Illawarra. Our vision is to create a better life with world-class water services.

We are cognisant of the rapid growth in Western Sydney and share the Greater Sydney Commission's vision for Sydney's Parkland City to be a liveable, sustainable and productive region. While our Operating Licence requires us to provide wastewater services to Greater Sydney, including the Parkland City, we also see the immense opportunities presented by the principles of resource recovery and a circular economy. We continue to invest in new and innovative technologies that will help the Parkland City be a leader in sustainable development.

The Parkland City is forecast to experience rapid population growth in coming years, spurred by the development of the Western Sydney International Airport and surrounding Aerotropolis, and large investment in housing, job-creating industries, transport projects and other infrastructure.

As part of plans to service Western Sydney, Sydney Water is proposing to build the Upper South Creek Advanced Water Recycling Centre to collect wastewater from the South West and Western Sydney Aerotropolis Growth Areas, treat it to the highest standard to protect local waterways, provide recycled water for agribusiness, industry and non-potable household uses and maintain the potential for any further re-use opportunities in the future.

Sydney Water is planning to build and operate a wastewater treatment plant, known as the Upper South Creek Advanced Water Recycling Centre including:

- a wastewater treatment plant that includes production of:
    - high-quality treated water suitable for a range of uses including recycling and environmental flows
    - renewable energy
    - biosolids suitable for beneficial reuse
- new pipeline from the Water Recycling Centre to the Nepean River, to release excess treated water
- new infrastructure from the Water Recycling Centre to South Creek, to release excess treated water and wet weather flows
- new pipeline extension from the new Nepean River pipeline to the Warragamba River for environmental flows
- new pipeline from the Water Recycling Centre to Sydney Water's existing wastewater system to discharge brine.

Through this project, Sydney Water will provide opportunities to enhance the parkland landscape along the upper reaches of South Creek and contribute to the 'greening of the west'. Sydney Water

has a vision in to incorporate innovation and world-leading technologies to support resource recovery and circular economy initiatives at the Centre.

Sydney Water is requesting the project be declared critical State significant infrastructure because of its benefit to the economic prosperity, environmental value and social fabric of the region. We are pleased to submit this scoping report in accordance with the Department of Planning, Industry and Environment's requirements.

We have already initiated consultation with many government agencies and community stakeholders and look forward to further engagement with our customers and the community as we develop our Environmental Impact Statement (EIS).

2 Introduction

2.1 Overview

Sydney Water is proposing to build and operate a new wastewater treatment plant in Kemps Creek in Western Sydney, to be known as the Upper South Creek Advanced Water Recycling Centre. Together with the treated water and brine pipelines, these elements collectively are the 'project'.

The project is needed to provide wastewater services to the South West Growth Area (SWGA) and Western Sydney Aerotropolis Growth Area (WSAGA) and has been sized to service the projected 2056 population. Ultimately, it is expected the plant will treat up to 100ML of wastewater per day. Sydney Water is making a staged infrastructure application seeking approval for:

- a concept proposal for the project to build and operate a new wastewater treatment plant to treat up to its ultimate capacity, including associated treated water and brine pipelines
- a detailed approval for Stage 1 of the project to build and operate the wastewater treatment plant to treat up to 50ML of wastewater per day and build the associated treated water and brine pipelines to the ultimate capacity.

From day one, it is expected that the Water Recycling Centre will provide recycled water to customers in the area, however for the purpose of environmental assessment, such demands and their associated infrastructure, are not included in this application.

Figure 2-1 shows the location of the project in its regional setting and Figure 2-2 and Figure 2-3 show more detail of the local context. On these maps, infrastructure locations are indicative and will be refined during preparation of the Environmental Impact Statement (EIS).

Section 3 describes the project, including the concept and detailed proposals. Section 7 outlines our proposed investigations and assessments for the project.

2.2 Sydney Water's role

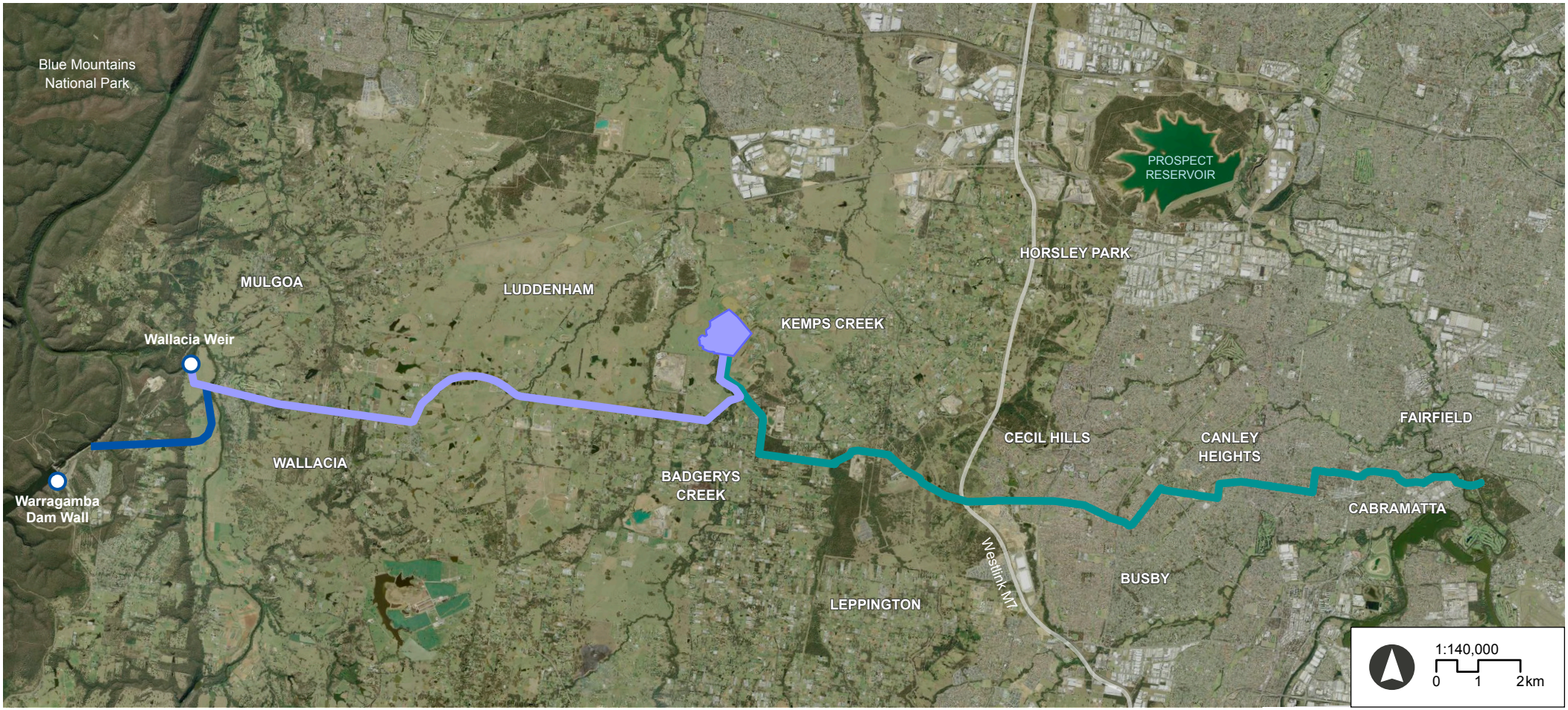
Sydney Water is a state-owned corporation, wholly-owned by the New South Wales Government. We are Australia's largest water utility, supplying water, wastewater, recycled water and stormwater services to more than five million people in Greater Sydney, the Blue Mountains and the Illawarra. Our area of operations covers about 12,700 km^2.

Sydney Water operates under an Operating Licence that sets out our operating standards and requirements and is subject to regular review. These requirements are underpinned by Sydney Water's corporate vision of 'creating a better life with world-class water services'.

For this project, Sydney Water will build, own and operate the proposed new infrastructure in order to provide continued wastewater services to customers in Western Sydney. We will work with partners from the private sector to deliver a leading-edge plant, ensuring environmental protection and customer service at the least lifecycle costs and best value for customers.

Upper South Creek Advanced Water Recycling Centre

Figure 2-1 Project overview



- Upper South Creek Advanced Water Recycling Centre
- Treated Water Pipeline
- Brine Pipeline
- Environmental Flows Pipeline

Projection: GDA 1994 MGA Zone 56
Project infrastructure locations are indicative and will be refined during design

Upper South Creek Advanced Water Recycling Centre

Figure 2-2 Local context (west)

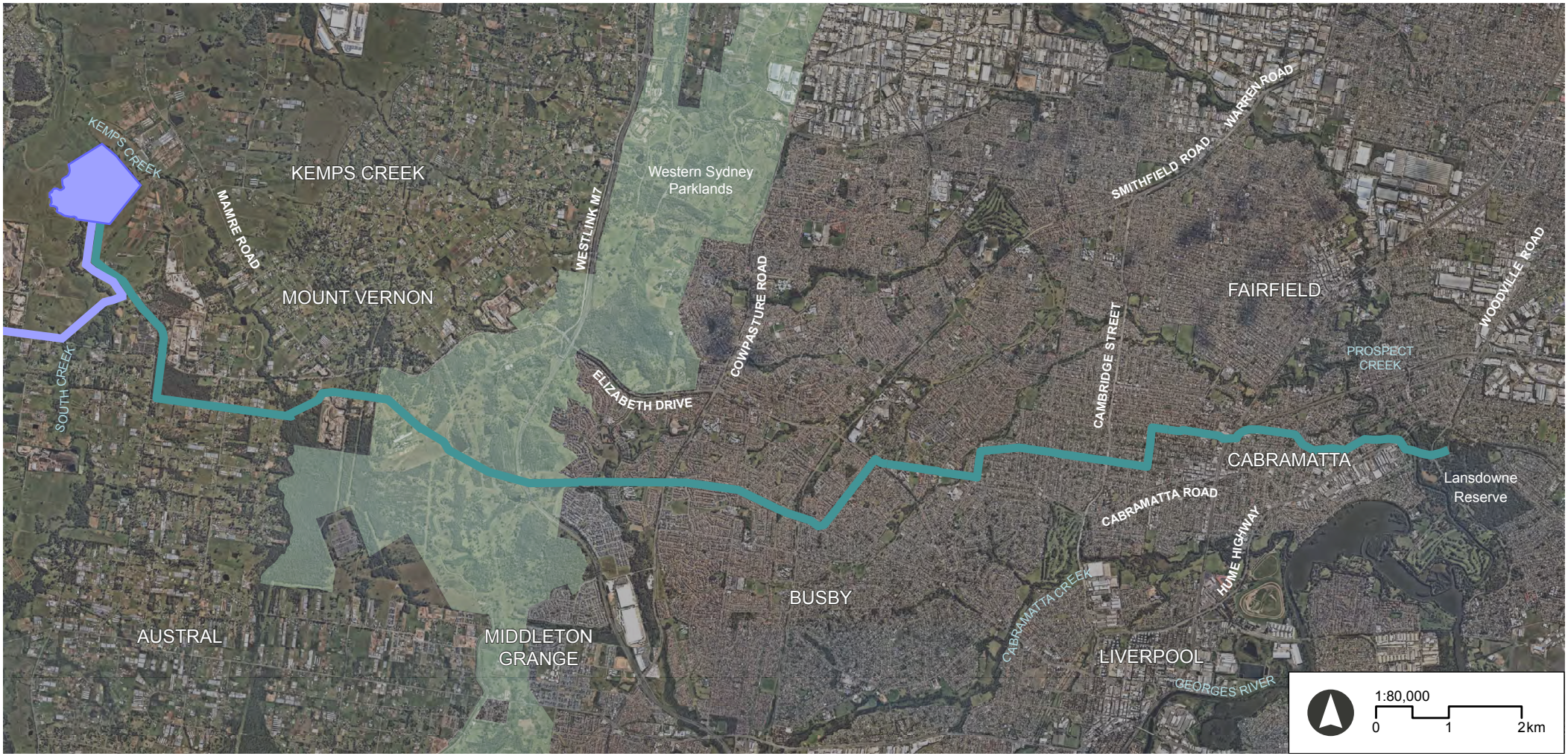
- Upper South Creek Advanced Water Recycling Centre
- Treated Water Pipeline
- Environmental Flows Pipeline
- Brine Pipeline
- Western Sydney Airport
- National Parks & Reserves

Projection: GDA 1994 MGA Zone 56

Project infrastructure locations are indicative and will be refined during design

Upper South Creek Advanced Water Recycling Centre

Figure 2-3 Local context (east)



- Upper South Creek Advanced Water Recycling Centre
- Treated Water Pipeline
- Environmental Flows Pipeline
- Brine Pipeline
- Western Sydney Airport
- National Parks & Reserves

Projection: GDA 1994 MGA Zone 56

Project infrastructure locations are indicative and will be refined during design

2.3 Sydney's wastewater network

Wastewater is produced as an output from residential, commercial and industrial facilities. In Greater Sydney, about 70% of wastewater is generated by households. It is collected in sinks, showers, laundries, toilets and other drains within buildings.

Sydney Water owns and manages a comprehensive wastewater system servicing over 1.8 million households and businesses, and about 5.1 million individual customers.

The Sydney Water-owned wastewater system consists of (Sydney Water, 2020a):

- about 26,000 km of pipes
- 689 wastewater pumping stations
- 16 wastewater treatment plants
- 14 water recycling plants.

Wastewater collected from houses and businesses is transferred by a collection network of pipelines to one of Sydney Water's 16 wastewater treatment plants. After screening and biological treatment, the treated water is typically released to the ocean, via one of three deep water ocean outfalls at North Head, Bondi and Malabar.

Alternatively, wastewater is treated at one of Sydney Water's water recycling plants where it is further cleaned and disinfected to provide recycled water suitable for industrial and agricultural use, irrigating playing fields, or for non-drinking household use. It may also be released to local waterways. Recycled water is not currently used to supplement Sydney's drinking water.

Sydney's wastewater system has evolved over time in response to population growth. The lower volume and density of people in parts of Western Sydney means that some areas, including the SWGA and WSAGA, have limited wastewater infrastructure and recycled water services. With interim servicing approaches expected to reach their limits by 2026, this project aims to meet long-term wastewater and recycled water service demands for the area well into the future.

2.4 Project need and benefits

The strategic context for the project is discussed in more detail in Section 4.

Planning for growth

The SWGA and WSAGA are priority growth areas as highlighted by the Greater Sydney Commission's (GSC's) *Western City District Plan* (Greater Sydney Commission, 2018a). Figure 2-4 shows the indicative servicing catchment for the Water Recycling Centre. Accordingly, Sydney Water intends to build a new wastewater treatment plant to service these priority growth precincts as part of its critical infrastructure planning for the future.

Growth will be stimulated by the new Western Sydney Airport, surrounding Aerotropolis, and investments in transport infrastructure, housing and jobs. Wastewater services will be required by mid-2025 to facilitate this growth.

Based on the Department of Planning, Industry and Environment's (DPIE's) population projections, the SWGA and WSAGA are projected to grow from about 25,000 people in 2018 to 142,000 people by 2026, 348,000 by 2036 and 645,000 by 2056.

At present, the SWGA and WSAGA are characterised by low density and rural development, and wastewater servicing is primarily at the individual property level (for example, septic tanks). Where development has progressed (for example, in Oran Park and Leppington), Sydney Water has built infrastructure to connect it to our existing plants in Liverpool and West Camden.

However, this is an interim servicing strategy only and in time these plants will have other growing populations to service. By 2026, they will no longer have capacity to cater for flows from SWGA and WSAGA.

The proposed wastewater treatment plant will adequately service these priority growth precincts. By staging the project commensurate with population projections, Sydney Water can service existing and new growth areas in a timely and cost effective way.

Protecting our waterways

Sydney Water plays a critical role in protecting the environment and contributing to healthy waterways. Working with the New South Wales Environment Protection Authority (EPA) to agree on the quality of treated water released into the environment via oceans, rivers and creeks, we strive to play a lead role in the development of thriving, liveable and sustainable cities.

In 2019, the EPA proposed a new regulatory framework for limiting nutrient loads in the Hawkesbury-Nepean River, to protect the environment in light of the considerable development expected in Greater Sydney.

Sydney Water is incorporating advanced water treatment processes (for example, reverse osmosis) into the project to produce water quality that meets the standards set by the new framework and creates an opportunity to provide environmental replacement flows to the Hawkesbury-Nepean. These advanced water processes will allow us to achieve significant environmental benefits for the region.

Greening the west

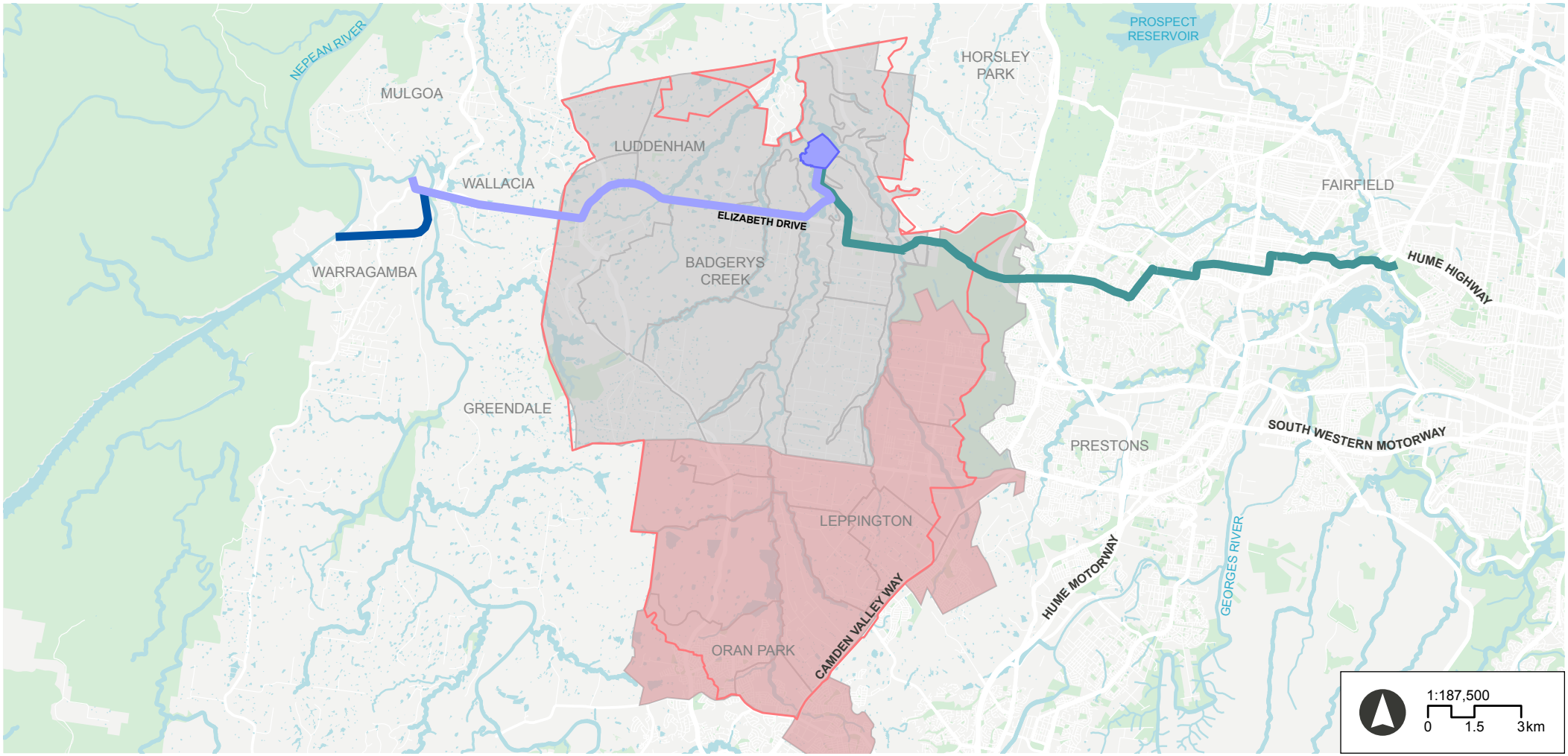
It is expected the project will become an important source of recycled water for new sustainable industries, agribusiness and greening the Parkland City as envisaged in the Greater Sydney Region Plan (Greater Sydney Commission, 2018b).

The project will make a significant contribution to the future South Creek spine through the Parkland City and will provide an opportunity to protect and enhance South Creek and contribute to the amenity of its place and surrounding parklands.

The Upper South Creek Advanced Water Recycling Centre will be a critical asset in Sydney Water's vision to transition to an integrated and sustainable water future where we leverage the economic value of water for shaping, building, greening and cooling the Parkland City.

Upper South Creek Advanced Water Recycling Centre

Figure 2-4 Indicative servicing catchment



Upper South Creek Advanced Water Recycling Centre

Treated Water Pipeline

Environmental Flows Pipeline

Brine Pipeline

National Parks & Reserves

Western Sydney Aerotropolis Growth Area

South West Growth Area

Indicative Servicing Catchment

Projection: GDA 1994 MGA Zone 56

Project infrastructure locations are indicative and will be refined during design

2.5 Project objectives

Sydney Water has developed project objectives shown in Figure 2-5 and described in Table 2-1.

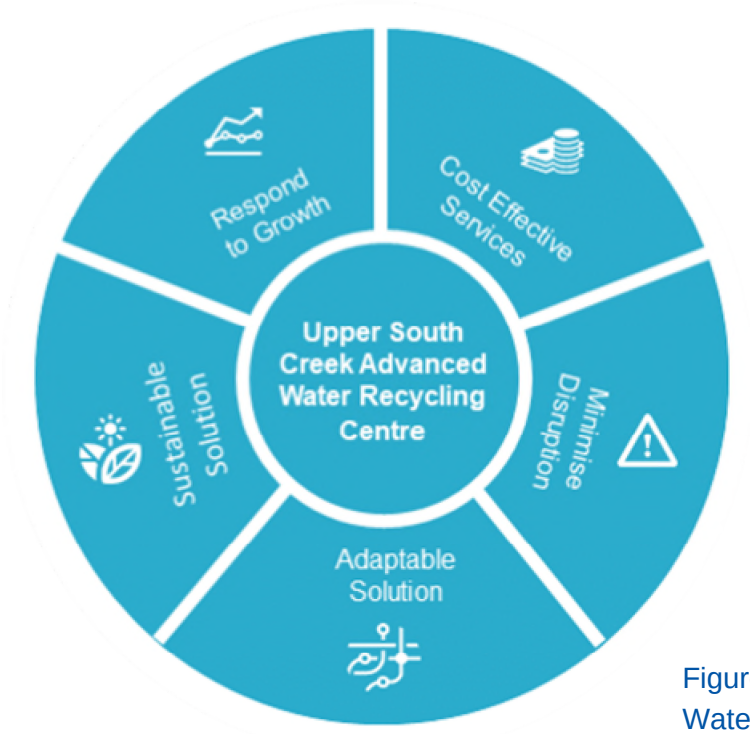


Figure 2-5 Upper South Creek Advanced Water Recycling Centre project objectives

Table 2-1 Upper South Creek Advanced Water Recycling Centre project objectives

Objective	Objective detail
Respond to growth	Respond to forecast growth in Western Sydney by ensuring wastewater services are available for at least 300,000 people in the SWGA and WSAGA by mid-2025.
Provide cost-effective service	Maintain community confidence in Sydney Water's ability to cost effectively deliver a secure wastewater treatment service whilst ensuring value-for-money for customers.
Minimise disruption	Plan, construct and operate the infrastructure required to deliver the service with minimum disruption to the community and minimal impact on the environment.
Sustainable solutions	Demonstrate leadership in integrated and sustainable water management by: • supplying recycled water for non-drinking purposes for use in homes and businesses, for agricultural purposes or irrigation of public open space • retaining water in the landscape to mitigate urban heating • circular economy approaches to waste management by explicitly adopting renewable energy solutions and resource reuse.
Adaptable solution	Support alternative futures, addressing a range of demand scenarios, environmental flow regimes, energy and resource recovery options, and stormwater and potable water supply-management solutions.

2.6 Alternatives considered

Sydney Water has progressively made decisions on a range of options for the project. The initial focus was for the servicing approach and effluent management pathways. Once the preferred option was determined, focus was given to more detailed decisions on pipelines and release locations. This section describes the main considerations in determining the preferred project.

2.6.1 Effluent management and servicing approach

The provision of wastewater services to Greater Sydney, including the Parkland City are requisites of Sydney Water's Operating Licence. In addition, the absence of wastewater services significantly inhibits growth and development, and contradicts the established Commonwealth, state and local government policy direction for growth in the region. Accordingly, the 'do nothing' scenario (continued on-site treatment) was not considered.

Options Sydney Water did consider for servicing the SWGA and WSAGA are shown in Table 2-2.

Table 2-2 Servicing approaches for SWGA and WSAGA

Option	Description
Base case Transfer wastewater to an existing wastewater system for ocean release.	This option would transfer wastewater to a new wastewater treatment plant that would then release a standard quality effluent via the wastewater network to the deep ocean outfall at Malabar. Extensive augmentation would be required in the Malabar network to meet Environment Protection Licence requirements. The option was ruled out because the upgrades required would be substantial, complex, costly and unlikely to be finished by 2025. The option does not include recycling and effectively takes an important source of non-potable water from the region. It would have limited benefit for environmental objectives of the west.
Option 1 Decentralised servicing	This option envisaged around 15 small scale water recycling plants being developed throughout the catchment area. Wastewater would be treated to a tertiary quality suitable for local reuse or discharge to waterways. The option would be designed to suit topography, minimise energy draw and allow investment to be effectively staged. This was ruled out as it did not constitute value for money, and poor economies of scale would limit opportunities in technology-driven recycling. It would also likely have greater impact on the local community during construction and operation.
Option 2 Centralised servicing	This considered options of one, two and three plants sited around the catchment to treat wastewater for much larger areas. Each option adopted advanced treatment as a core element to allow treated water to be released into waterways. While we found the 'three sites' option to be better value than Option 1, the 'single plant' option presented the lowest net present value and greatest value-for-money outcome. The advantages of the single treatment plant included the ability to minimise disruption to the community, maximise opportunities for bulk provision of recycled water in the future, and similarly provide the best opportunity for Sydney Water to pursue various modes of resource recovery, including biosolids management, energy generation and other resource recovery options.

Option	Description
	This option was confirmed as the preferred option by Sydney Water in 2019.

After confirming its preferred option, detailed decisions required included sites for land acquisition, options for pipeline alignment and discharge locations for treated water, brine and environmental flows. Further details of these decisions are provided below.

2.6.2 Water Recycling Centre site

Sydney Water investigated several site options for the Water Recycling Centre. Factors used to shortlist sites included size and cost of available land (including areas outside the one in 100-year flood level), proximity of waterways to release wet weather flows, risks associated with environmental, heritage and geotechnical constraints, compatibility with future surrounding land use or infrastructure, and the location of the site in the catchment to leverage catchment drainage.

The selected site is preferred because it:

- is in an area unlikely to be suitable for residential development given proposed adjacent land uses including the M12 motorway and the Western Sydney Airport, which minimise community exposure to potential disruptions such as truck movements, land acquisition, noise and odour
- has lower risk of being impacted by future transport corridor changes
- minimises the number of existing business interests impacted
- provides opportunity for future co-location of a resource recovery plant or other industries with waste or energy management synergies, given the proposed future adjacent industrial zoning.

2.6.3 Treated water pipeline and Nepean River release location

The treatment process would produce a high quality of treated water, which for the purpose of this application is assumed to be released to the Nepean River via the treated water pipeline. It is expected that some of the treated water will be reused in recycled water schemes. Nonetheless, the project allows for the full flow to be released to waterways when recycled water demand is reduced or has dropped to zero for any reason. This is an important allowance both for safe plant operations and completeness of environmental assessment. The key factors for selecting the treated water pipeline alignment and release location are described below.

Nepean River release location

- Waterways closer to the site, such as South Creek, were not chosen as the primary release location because they would not have capacity to carry the volumes of water released.
- Avoiding construction impacts on the Blue Mountains National Park and World Heritage Area on the eastern side of the Nepean River.
- Releasing water into the Yarramundi Zone 2 under the Hawkesbury-Nepean Nutrient Framework. This is the most appropriate location for the treated water release given nutrient

load caps on the river and the project's geographic location. Section 4.2.1 provides further context about the Hawkesbury-Nepean Nutrient Framework.

- Assessment of constructability factors such as topography, geotechnical and ground conditions and maintaining suitable construction access.
- Minimising terrestrial ecology and Aboriginal heritage impacts at Wallacia and Norton's Basin.
- Minimising energy requirements for pumping treated water.
- Minimising the risk of any increase in riverbank erosion.
- Consideration of potential community and recreation activities.

Treated water pipeline

- Working in with future or proposed transport infrastructure such as the M12 motorway, Northern Road and the utilities corridor along the future alignment of Elizabeth Drive.
- Considering likely future land use to avoid impact on future development where possible
- Following existing roads and easements where possible.
- Seeking opportunities to refine the alignment or construction methodology where practical to minimise terrestrial ecology and heritage impacts.

2.6.4 Environmental flows pipeline and Warragamba River release location

Sydney Water has identified the opportunity to provide very high-quality treated water to the Warragamba River to replace environmental releases from the dam and therefore reserve water in the dam for drinking water supply. Section 4 includes further context on this opportunity. The key factors for selecting pipeline alignments and release location are described below.

Warragamba River release location

- Locating it as close to the Warragamba Dam wall as possible to most effectively emulate environmental flow releases from the dam, while ensuring structural integrity of the dam wall and associated infrastructure.
- Assessment of constructability factors such as topography, geotechnical and ground conditions and maintaining suitable construction access.

Environmental flows pipeline

- All flows to this location would need to be subject to advanced treatment.
- Aligning with treated water pipeline where possible.
- Considering likely future land use to avoid impact on future development where possible
- Following existing roads where possible.
- Seeking opportunities to refine the alignment or construction methodology where practical to minimise terrestrial ecology and heritage impacts.

2.6.5 Brine pipeline and discharge location

The key factors for choosing pipeline alignments and discharge location include:

- Transferring to the closest coastal wastewater system without impacting system capacity
- Considering likely future land use to avoid impact on future development where possible
- Following existing local roads where possible
- Assessment of constructability factors such as topography, geotechnical and ground conditions and maintaining suitable construction access.
- Seeking opportunities to refine the alignment or construction methodology where practical to minimise terrestrial ecology and heritage impacts.

3 Project description

Sydney Water is planning to build and operate a wastewater treatment plant in Western Sydney, known as the Upper South Creek Advanced Water Recycling Centre including:

- a wastewater treatment plant that includes production of:
    - high-quality treated water suitable for a range of uses including recycling and environmental flows
    - renewable energy
    - biosolids suitable for beneficial reuse
- new pipeline from the Water Recycling Centre to the Nepean River, to release excess treated water
- new infrastructure from the Water Recycling Centre to South Creek, to release excess treated water and wet weather flows
- new pipeline extension from the new Nepean River pipeline to the Warragamba River for environmental flows
- new pipeline from the Water Recycling Centre to Sydney Water's existing wastewater system to discharge brine.

Figure 2-1 to Figure 2-3 show the key components of the project.

The concept component of the project comprises all the above elements, with the Water Recycling Centre sized to treat an average dry weather flow of up to 100ML/day, and to transport and release the equivalent volume through the pipelines.

Sydney Water is planning to deliver the project in stages with Stage 1 comprising:

- building and operating the Water Recycling Centre sized to treat an average dry weather flow of up to 50ML/day
- building all pipelines to their ultimate capacity, but only operating them to transport and release volumes produced by the Stage 1 Water Recycling Centre.

Sydney Water proposes that the EIS would address the concept and Stage 1 of the project.

3.1 Staging

Stage 1 of the project would have capacity to service an equivalent population of about 300,000 people. The Water Recycling Centre will need to be expanded in the future to accommodate future population growth to 2056. By staging the project, we will avoid investing in infrastructure before it is required.

The timing and scale of future stages will be phased to respond to key macro and micro drivers including population growth rate and the most efficient way for Sydney Water to optimise its

wastewater systems. However, based on current population growth projections, expansion will likely be required around 2034. Separate planning approval will be sought for any future expansions beyond Stage 1, in accordance with the staged approval.

The following sections focus on the project scope for the Stage 1 detailed approval. Where content is relevant to the concept proposal, this is included in bold text.

3.2 Water Recycling Centre

Table 3-1 summarises key features of the proposed Water Recycling Centre. Sydney Water will provide further detail in the EIS.

Table 3-1 Water Recycling Centre features

Feature	Detail
Location	Part Lot 21 DP 258414 in Kemps Creek. The project will be located on the 80ha site shown in Figure 2-1. Sydney Water is negotiating with the current landowner to purchase the site. It is likely that about half the site will be required for the main operational components of the Water Recycling Centre. **Concept proposal: Future expansion of the Water Recycling Centre up to 100ML/day will be accommodated on the same site.**
Local government area	Penrith
Capacity	Average dry weather flow of up to 50 ML/day. **Concept proposal: Average dry weather flow of up to 100ML/day.**
Servicing catchment	Figure 2-4 shows the indicative servicing catchment. The intention is to treat wastewater from the SWGA and WSAGA. Additional areas may be serviced over time, depending on growth and servicing efficiency analysis. **Concept proposal: Servicing catchment the same as described above, including the additional areas serviced over time.**
Wastewater treatment	The Water Recycling Centre will treat wastewater through an advanced treatment process. This includes: • inlet works for preliminary treatment • primary, secondary and tertiary wastewater treatment • advanced treatment including through reverse osmosis • disinfection systems • biosolids handling facilities • cogeneration for heat and energy production

Feature	Detail
	• odour control facilities • pipeline to South Creek for releases during wet weather • pumping stations to transfer treated water to the Nepean and Warragamba Rivers, and the brine to the Malabar system. **Concept proposal: equivalent treatment processes proposed for future stages. This could include different treatment technologies and components.**
Treatment levels	The Water Recycling Centre will produce treated water at three different quality levels: • advanced (very high-quality treated water - the highest level of treatment) • tertiary (high-quality treated water) • wet weather (lowest level of treatment). Different types of treated water will be released at different locations, typically: • advanced-quality water - preferentially used for dry weather releases to the Nepean River, environmental flows to the Warragamba River and wet weather releases to South Creek • tertiary-quality water – additional volumes released to the Nepean River • wet weather water - released to South Creek when inflows to the plant exceed the capacity of the tertiary treatment systems. The advanced and tertiary streams will also be suitable for a range of recycled water uses. The advanced treatment process produces brine as a by-product which will be transferred to Sydney Water's Malabar wastewater system. **Concept proposal: equivalent treatment levels proposed for future stages. This could include different treatment technologies.**
Materials and products	During construction, a range of construction materials and equipment will be required to build the Water Recycling Centre. During operation, a range of chemicals are used in the wastewater treatment process. In addition to treated water, key products from the Water Recycling Centre include: • biosolids - the solid parts of the incoming wastewater that are treated and dewatered then transferred off site for beneficial reuse.

Feature	Detail
	• energy - gas created from digesting the solid parts of the incoming wastewater is converted to energy for use on site to power some of the treatment processes. This is called co-generation. The electricity can also potentially be exported to the grid. The production of biosolids and energy from biogas via co-generation are common features of Sydney Water's existing wastewater treatment plants and water recycling plants. **Concept proposal: future stages are likely to require similar materials and products. Future treatment technologies could require different materials or produce different products.**
Landscaping to support a green Parkland City	The Water Recycling Centre site is larger than what is required for operational purposes. The project includes landscaping some of the non-operational areas consistent with the government's vision for parkland areas in the region. We are considering opportunities for how we integrate landscaping on the Water Recycling Centre site into the broader parkland areas. Landscaping on operational areas will also occur. **Concept proposal: some landscaping of operational areas is likely for future stages.**
Ancillary infrastructure	The Water Recycling Centre requires a range of ancillary infrastructure, such as an administration building, roads, connection to power, car parking, chemical storage and water detention and retention basins. We also plan to install roof-mounted and ground-mounted solar photovoltaics. As described in Section 3.7, some of this ancillary infrastructure will be excluded from Stage 1 and future stages scope. **Concept proposal: future stages will likely require ancillary infrastructure.**

3.3 Treated water pipelines

Table 3-2 summarises key features of the treated water pipelines including the Nepean River pipeline and the pipeline extension to the Warragamba River for environmental flows. The environmental flows pipeline remains subject to further Government decisions and analysis of the most effective way to manage Sydney's water supply. Although Sydney Water is seeking approval as part of this project, we will only progress to building and operating the infrastructure if it is consistent with future government decisions on water supply.

Table 3-2 Treated water pipeline features

Feature	Detail
Location	Treated water will be transferred to two different locations:

Feature	Detail
	• The Nepean River at Wallacia weir via a below ground pipeline about 16 km long. The pipeline will generally follow Elizabeth Drive, the Northern Road, Park Road and Silverdale Road. • The Warragamba River between Warragamba Dam and Warragamba weir via a below ground extension of about four kilometres from the main treated water pipeline, with some of the alignment along Silverdale Road and Bents Basin Road. Figure 3-3 shows indicative locations and routes, which may change as they are subject to ongoing concept design. The EIS may also assess releases to South Creek during dry weather, but only if it can be demonstrated they will have benefit to South Creek. Sydney Water is currently investigating this. Easements and land acquisition will likely be required in some locations. **Concept proposal: current expectation is that these release locations will continue to operate in future stages.**
Local government area	Penrith, Wollondilly, Liverpool
Pipeline size	Sydney Water will build the pipelines to accommodate all the flows from the Water Recycling Centre when it reaches an ultimate capacity of 100ML/day. This is to avoid the additional community and environmental disturbance that will occur if they needed to be duplicated in the future. **Concept proposal: no works required in future stages – all infrastructure built in Stage 1.**
Release approach and recycled water offtakes	The pipelines will release water via energy-dissipation structures to the Nepean and Warragamba Rivers. The Nepean River pipeline will be designed and built with recycled water offtakes to provide an opportunity for high-quality recycled water users such as data centres and agribusiness to access the water. Access to recycled water will be subject to establishing commercial agreements and separate planning approvals. The EIS will assess the impacts of releasing all advanced and tertiary water and wet weather flows to waterways. If recycled water schemes are developed and supplied by the Water Recycling Centre in the future, this will reduce the volume of water it releases to waterways. **Concept proposal: The concept will seek flexibility in release volumes and locations, with these addressed in the detailed proposals for future stages. Future stages may be 15 years away and we must remain adaptable to changes in recycled water demand, development of new industries and social and economic trends during that time.**

Feature	Detail
Materials and products	During construction, a range of materials and equipment will be required to build the pipelines. The main materials required for operation of the pipeline will be maintenance equipment and parts. The pipelines will transport treated water and will not produce any by-products. **Concept proposal: no works required in future stages – all infrastructure built in Stage 1.**
Ancillary infrastructure	The pipelines will be below ground. However, they have some above ground components including maintenance holes, valve pits and covers, scour chambers, ventilation structures, energy dissipation structures and headwalls. Depending on how design and hydraulic assessments progress, other above ground structures such as barometric loops may be required. **Concept proposal: no works required in future stages – all infrastructure built in Stage 1.**

3.4 Brine pipeline

Table 3-3 summarises key features of the brine pipeline.

Table 3-3 Brine pipeline features

Feature	Detail
Location	The Water Recycling Centre will produce a brine stream as a by-product of the reverse osmosis treatment process. This will be transferred to the Malabar wastewater system by a below-ground pipeline about 25 km long. Figure 2-3 shows indicative location and route. The brine pipeline will require easements in some locations. **Concept proposal: no works expected for future stages – all infrastructure built in Stage 1.**
Local government area	Penrith, Liverpool, Canterbury-Bankstown, Fairfield
Pipeline size future proofed	Sydney Water will build the pipeline to accommodate the expected flows from the Water Recycling Centre when it reaches an ultimate capacity of 100ML/day. This is to avoid the additional community and environmental disturbance that would occur if they needed to be duplicated in the future. **Concept proposal: no works expected for future stages – all infrastructure built in Stage 1.**
Materials and products	During construction, a range of materials and equipment will be required to build the pipelines. These will be documented in the EIS. The main materials required for operation of the pipeline will be maintenance

Feature	Detail
	equipment and parts. The pipelines will transport brine and will not produce any products. **Concept proposal: no works expected for future stages – all infrastructure built in Stage 1.**
Ancillary infrastructure	The pipeline will be below ground. However, they have some above ground components including maintenance holes and valve structures. Depending on how design progresses, there may be some other above ground structures such as barometric loops which will be identified in the EIS if needed. **Concept proposal: no works expected for future stages – all infrastructure built in Stage 1.**

3.5 Project timing

Table 3-4 summarises the indicative timing for Stage 1 of the project.

Concept proposal: Timing of future stages depends on population growth but next stage is expected to be required by 2034.

Table 3-4 Indicative timing for Stage 1

Project phase	Indicative timing
Submit EIS	Early 2021
Minister's approval	Late 2021
Start design and construction planning	Early 2022
Start construction	Mid 2022
Finish construction	Late 2024
Finish commissioning	Mid 2025
Start operation	Mid 2025

3.6 Project phases

This section describes the key project phases for Stage 1. The EIS will describe these in more detail.

3.6.1 Design

Sydney Water is currently progressing a reference design for Stage 1, a high-level concept to demonstrate feasibility of building the project to meet its objectives. We are working closely with other utility and infrastructure providers to ensure we factor in potential interactions with their existing or future assets. Sydney Water will engage a contractor to progress further design and construction of the project. The contractor's design may differ from the reference design. The EIS will seek flexibility for this, provided the contractors' design meets specified performance and impact outcomes. If the project is approved, we will require the contractor to demonstrate consistency of their design with the EIS and conditions of approval, or otherwise seek an approval modification.

3.6.2 Early works

Sydney Water may seek exclusion of some early works from the definition of construction so they could start once approval is granted. We will define these in the EIS however they are likely to include activities such as investigations, surveys, installing environmental controls and establishing site compounds.

3.6.3 Construction

Construction is expected to take about 30 months, with the Water Recycling Centre, treated water pipelines, and brine pipeline being built simultaneously. This includes landscaping of the non-operational parkland areas. The detailed construction program will be developed by the construction contractor. Typically, the key construction phases include site establishment, earthworks, civil works, mechanical and electrical installation and landscaping and restoration. Works and deliveries would be scheduled during standard hours but works outside these hours may be needed to minimise traffic impacts or undertake complex tunnelling.

Water Recycling Centre

We expect the entire Water Recycling Centre site to be impacted to build the project. Although the majority of infrastructure will be built in the construction period outlined in Table 3-4, Sydney Water may not install all process components when Stage 1 of the plant is first built. Some components may be progressively installed as wastewater flows to the plant increase over time.

Pipelines

The treated water and brine pipelines typically require an impact area up to 30 m wide along their full length. They will also require temporary ancillary facilities such as construction compounds, laydown areas and access roads. Sydney Water will seek some flexibility in the location of the impact area and temporary ancillary facilities to account for changes required as design and construction planning progress. Pipelines will be installed below ground, primarily by open trenching. Some sections of pipeline will be built using trenchless methods to avoid certain environmental constraints or existing infrastructure, or for safety or constructability reasons.

3.6.4 Commissioning

Before the new infrastructure is used, we will thoroughly test it through a commissioning period. Commissioning will be in accordance with manufacturers' commissioning recommendations and Sydney Water's standard operating procedures.

3.6.5 Operation

The Water Recycling Centre and pipelines will operate 24 hours a day, seven days per week and in accordance with Sydney Water's standard operating protocols. Some functions will be performed by on-site operators, others will be managed remotely. Sydney Water will carry out a range of monitoring, such as water quality monitoring, to ensure the plant is operating as predicted.

The project will operate in accordance with Sydney Water's operational management systems, or an equivalent operational management system if another party operates parts of the project. This is the same approach taken for other Sydney Water projects approved by the Minister for Planning and Public Spaces. This means that after initial operational verification of performance, the project largely operates under its Environment Protection Licence and standard operating systems, rather than having an additional operational plan regulated by DPIE.

3.7 Scope exclusions

This section applies to the concept proposal and Stage 1 of the project.

3.7.1 Wastewater network infrastructure

A wastewater network will be required to transfer wastewater from residences and businesses to the Water Recycling Centre for treatment. The wastewater network is excluded from the project scope because Sydney Water expects this system will be built progressively to integrate with future precinct planning and align with development. This means exact locations are not yet known and this network will therefore be subject to separate planning approvals. Sydney Water may include the sections of these pipelines located on the Water Recycling Centre site in the scope of this project. We will clarify this in the EIS.

3.7.2 Recycled water schemes

The Water Recycling Centre will produce very high-quality treated water that is suitable for a range of recycled water uses. However, recycled water schemes, associated additional facilities on the Water Recycling Centre site, and associated supply pipeline infrastructure are excluded from the project scope. Any future recycled water schemes will be subject to separate planning approvals.

Sydney Water has met with several organisations who are potential recycled water users in Western Sydney. We will continue to work with government agencies and potential recycled water users to investigate opportunities to beneficially use the treated water from the Water Recycling Centre. We are committed to working towards opportunities that enable the NSW Government's vision of a green Parkland City and our goal of an integrated water and wastewater network for Greater Sydney.

Having clarity now of future recycled water schemes would not remove the need for some waterway releases proposed in the project. Even if recycled schemes were in place, demand varies (for example, it is typically lower over winter). Sydney Water must maintain the ability to manage recycled water when supply exceeds demand, or if a recycled water scheme stops for any period of time.

3.7.3 Additional resource recovery

As the full solids digestion capacity of Stage 1 of the Water Recycling Centre will not be utilised initially, Sydney Water may consider opportunities to temporarily accept other wastes for co-digestion to produce energy. Sydney Water aspires to a separate Resource Recovery Plant co-located with the Water Recycling Centre to co-digest waste to generate energy. Both of these elements are excluded from the scope of this project and will be subject to further investigations and separate planning approval.

3.7.4 Access, utility connections and other infrastructure

The site will require connection of utilities such as electricity and water. These are outside the scope of this project and will be delivered under separate planning approvals.

An access road to the Water Recycling Centre site is required from Elizabeth Drive. Upgrade of the Clifton Avenue/Elizabeth Drive intersection is also proposed. These road works are outside the scope of this project and will be delivered by Sydney Water or Transport for NSW under separate planning approvals.

3.7.5 Site investigations

Site investigations will be required before a determination is made on this project by the Minister for Planning and Public Spaces. These will be subject to separate planning approvals if required.

The types of investigations include environmental and heritage studies, monitoring and testing, geotechnical and contamination investigations.

3.7.6 Property management

Sydney Water may need to carry out a range of property management activities on the Water Recycling Centre site before the project is approved and during operation. These are excluded from the project scope and will be subject to separate planning approvals if needed. The types of property management activities include:

- relocating/adjusting utility connections
- vegetation management
- vermin/animal control
- site drainage management
- establishing site security
- demolition works

- land remediation activities
- use of surplus land on the Water Recycling Centre site for other activities.

3.7.7 Minor works and maintenance

Sydney Water proposes that once Stage 1 is operational, any maintenance, replacement and repair of that infrastructure or any minor works or upgrades will be out of scope of the project and assessed in separate planning approvals if needed. Similarly, any activities or works that improve environmental performance or have neutral environmental impact will be excluded from the project scope.

4 Strategic context

4.1 Planning and infrastructure strategies and policies

In recent years, the Commonwealth and NSW Governments released several strategies and plans focusing on the need for a coordinated and integrated approach to achieve a liveable, productive and sustainable Western Sydney. This section outlines how the project will align to the Governments' key plans and commitments.

4.1.1 Greater Sydney and Western City District planning

The Greater Sydney Commission's Greater Sydney Region Plan (Greater Sydney Commission, 2018b) envisages the western city as Sydney's Parkland City, a liveable, sustainable, productive region that draws on its iconic landscapes, including the World Heritage-Listed areas around it.

The Western City District Plan (Greater Sydney Commission, 2018a) expands further on this vision and recognises that over the next 20 years the region will need to transform dramatically to accommodate its growing population. It anticipates that the new Western Sydney International (Nancy-Bird Walton) Airport, surrounding Aerotropolis, investments in housing, job-creating industries, transport and other infrastructure, will stimulate this growth.

Growth will be focused on several formally-recognised growth areas and precincts. Most relevant are the SWGA and WSAGA, to which this project provides critical enabling infrastructure.

The Water Recycling Centre is an important source of recycled water to support greening of the Parkland City, agribusiness and a range of sustainable industries. It will be a feature in the future South Creek spine through the Parkland City. This means it provides an opportunity to protect and enhance South Creek and contribute to the amenity of its place and surrounding parklands.

Table 4-1 lists the most relevant objectives from the Greater Sydney Region Plan and Western City District Plan and summarises how the project aligns with them.

Table 4-1 Project alignment with relevant objectives and planning priorities from Greater Sydney Region Plan and Western City District Plan

Objective	Project alignment
Greater Sydney Region Plan Objective 1 – Infrastructure supports the three cities. Western City District Plan Planning Priority W2 – Planning for a city supported by infrastructure.	The project provides essential infrastructure to support development of the Western Parkland City.
Greater Sydney Region Plan Objective 2 – Infrastructure aligns with forecast growth – growth infrastructure compacts (now called place-based infrastructure compacts)	Timing of project delivery is aligned with forecast population growth projections. Sydney Water works closely with the GSC on Place Infrastructure Compacts, including the one in development for the Western Sydney Aerotropolis.

Objective	Project alignment
Greater Sydney Region Plan Objective 3 – Infrastructure adapts to meet future needs.	Sydney Water is designing the project to provide flexibility for new and emerging Smart-city technologies. Staging the project provides greater adaptability for the future.
Greater Sydney Region Plan Objective 4 – Infrastructure use is optimised.	Sydney Water has to date optimised existing wastewater systems to service growth in Western Sydney. We will continue to take this approach with the infrastructure delivered as part of the project.
Greater Sydney Region Plan Objective 25 – The coast and waterways are protected and healthier Western City District Plan Planning Priority W12 – Protecting and improving the health and enjoyment of the District's waterways	Environmental flows to the Warragamba River have been proposed to contribute to a healthier Hawkesbury-Nepean. Sydney Water is also investigating whether there will be benefit in the project releasing very high-quality treated water to South Creek to improve waterway health.
Greater Sydney Region Plan Objective 26 – A cool and green parkland city in the South Creek corridor Western City District Plan Planning Priority W13 – Creating a Parkland City urban structure and identity, with South Creek as a defining spatial element.	Landscaping in non-operational areas of the Water Recycling Centre site will contribute to the parkland environment along South Creek. There are opportunities to use recycled water produced by the Water Recycling Centre to contribute to cooling and greening in the Parkland City.
Greater Sydney Region Plan Objective 34 – Energy and water flows are captured, used and re-used. Western City District Plan Planning Priority W19 – Reducing carbon emissions and managing energy, water and waste efficiently	The Water Recycling Centre will produce recycled water suitable for a range of uses, renewable energy that will contribute to its energy needs, and nutrient rich biosolids for reuse in applications such as agriculture. Sydney Water will also continue to explore carbon-neutral and carbon-reducing opportunities as part of its ongoing circular economy program.

4.1.2 Western Sydney City Deal

The Western Sydney City Deal (Commonwealth of Australia, Department of Infrastructure, Regional Development and Cities, and NSW Department of Premier & Cabinet, 2018) is a planning, investment and delivery partnership involving the Commonwealth and NSW governments, and the eight local governments of the District.

The Deal's 38 commitments lay the foundation for a liveable 30-minute city, with infrastructure and facilities that bring residents closer to jobs, services, education and the world.

Over the next 20 years, the Deal commits to build 184,500 houses and create 200,000 jobs. These commitments will add significantly to the demand on infrastructure, including wastewater. Place-

based Infrastructure Compacts will ensure clear coordination between the delivery of new housing and its supporting infrastructure. The project provides essential infrastructure to deliver the Deal's housing and job commitments.

As part of a commitment in the Western Sydney City Deal, the NSW Government and six local councils have formed the Western Sydney Planning Partnership to more efficiently coordinate rezoning of land. Sydney Water works closely with this partnership to help inform planning and infrastructure decisions.

4.1.3 Growth area precinct planning

The NSW Government has established a precinct planning process for identified priority growth areas. The Department of Planning, Industry and Environment is currently progressing strategic planning for the SWGA, focusing on precincts that have not yet been released for development.

The Western Sydney Planning Partnership is coordinating planning for the WSAGA and released the draft Western Sydney Aerotropolis Plan (Western Sydney Planning Partnership, 2019) for public comment in late 2019. The Western Sydney Aerotropolis Plan flags the need for the Upper South Creek Advanced Water Recycling Centre and associated wastewater servicing. Figure 4-1 shows the project's location in the Western Sydney Aerotropolis and the proposed zoning outlined in the draft Western Sydney Aerotropolis Plan.

4.1.4 NSW State Infrastructure Strategy

The NSW State Infrastructure Strategy (Infrastructure NSW, 2018) sets out the State government's infrastructure priorities for the next 20 years, for each of NSW's major geographic regions and for each infrastructure sector. Of relevance to the project is the need to:

- protect and enhance the South Creek Catchment
- ensure flexible and adaptable wastewater systems, resilient to climate change driven effects such as increased temperatures, increased rainfall intensity and sea level rise
- leverage developments in contemporary wastewater systems allowing for energy and nutrient recovery
- remove regulatory impediments to water recycling for nutrient management, water supply augmentation and realisation of a vegetated 'green' urban form in new development areas
- develop the South Creek Corridor Strategy (SCCS) to provide a coordinated framework for major infrastructure investment decisions that will support significant population growth in the corridor, underpin development of liveable and sustainable communities and provide regulatory certainty to test options for broad scale non-potable recycling of wastewater.

This project provides infrastructure that contributes significantly to achieving these priorities.

4.1.5 Sydney Water's Western Sydney Regional Master Plan

Sydney Water has developed a Western Sydney Regional Master Plan which re-imagines water in Western Sydney by starting a pathway towards an integrated and sustainable water future starting now through to 2056 (Sydney Water, 2020b). It guides Sydney Water's next steps in planning and

delivering for Western Sydney. The Master Plan covers a larger geographic area than the Upper South Creek Advanced Water Recycling Centre servicing catchment.

The Master Plan goes beyond essential water servicing, to consider, integrate and understand the economic value of water for shaping, building, greening and cooling a new Parkland City.

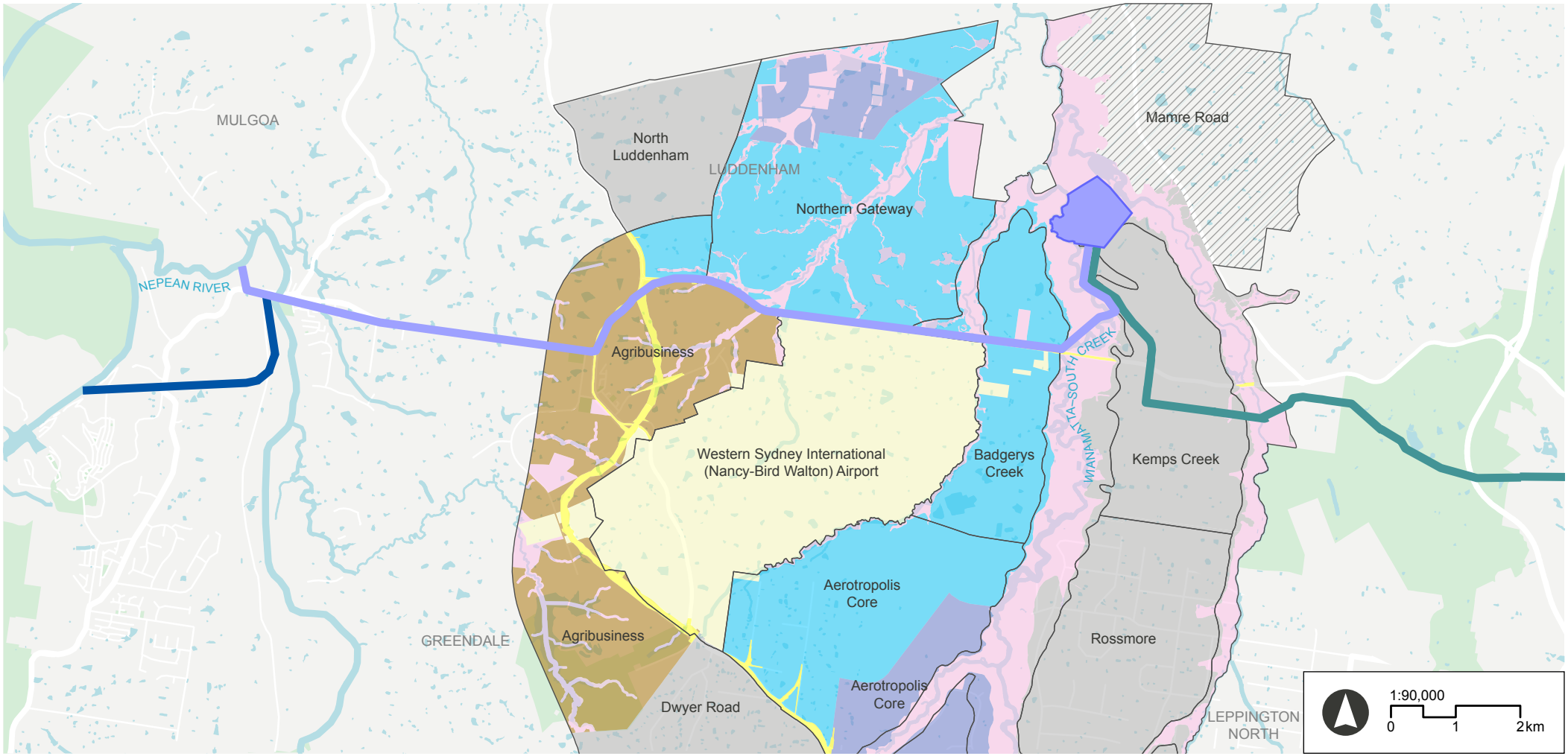
The Master Plan guides Sydney Water's current planning and investments to align with a Water Cycle City Approach. This involves reuse of wastewater and stormwater for non-potable uses to retain water in the local landscape. The Master Plan identifies the need for adaptability given ongoing macro impacts associated with growth, climate variability, technological advancements, catchment system responses to change and social and political environments.

Sydney Water will be adaptable to pathways such as a Water-Centric City (small scale servicing schemes) or a Water Resilient City (reuse of wastewater and stormwater for drinking purposes).

Although recycled water schemes are not part of the project scope, by producing recycled water the Water Recycling Centre opens opportunities for these schemes to be delivered by the public or private sector. The project does not preclude transition to a Water-Centric City pathway and is adaptable for a Water Resilient City pathway if either of these pathways eventuate in the future.

Upper South Creek Advanced Water Recycling Centre

Figure 4-1 Aerotropolis proposed zoning



Upper South Creek Advanced Water Recycling Centre
Treated Water Pipeline
Environmental Flows Pipeline
Brine Pipeline
National Parks & Reserves
Precincts

Agribusiness
Relevant LEP Zone
Enterprise
Environment & Recreation
Special Purpose 1
Special Purpose 2
Mixed Use
Mamre Road (Under WSEA SEPP)

***Land Use Zoning**

Projection: GDA 1994 MGA Zone 56
Project infrastructure locations are indicative and will be refined during design

4.2 Environment strategies and policies

Many environment strategies and policies apply across NSW in particular geographic regions and on specific issues. This section focuses on the strategies and policies of most relevance to this project and its potential impacts. Section 7 lists the key policies and guidelines relevant for each environmental aspect.

4.2.1 Hawkesbury Nepean nutrient framework

The EPA has developed a regulatory framework to manage nutrient load inputs to the Hawkesbury Nepean River from wastewater treatment plants (Environment Protection Authority, 2019). The objective is to meet the community's environmental values for the river and provide wastewater treatment plant operators with alternatives to meet those nutrient loads. The framework is planned to start in July 2024 or July 2025 and includes limits on nutrient concentrations, interim caps on nutrient loads and a framework for nutrient trading and offsets. Sydney Water is designing the project to be consistent with the framework.

4.2.2 Metropolitan Water Planning and environmental flows

The current *Water Sharing Plan for the Greater Sydney Metropolitan Region* (NSW Office of Water, 2011) specifies water releases from dams on the Nepean River to improve flows below water storage dams.

In the 2017 *Metropolitan Water Plan*, the NSW Government committed to a new environmental flow regime from Warragamba Dam to benefit the lower Warragamba and Nepean Rivers, and the upper section of the Hawkesbury River (Metropolitan Water, 2017).

Sydney Water has identified an opportunity for very high-quality treated water from the Water Recycling Centre to replace some of these dam releases. This could provide for some of the planned environmental benefits to the Hawkesbury-Nepean and retain the equivalent amount of water in the dam for drinking water purposes.

We have met with government agencies involved in metropolitan water planning and water sharing and reached in-principle support for this concept. Before this concept gains approval and is reflected in water-sharing instruments and Sydney Water's regulatory approvals, further government engagement is required.

4.2.3 Strategic biodiversity conservation

The area covered by *State Environmental Planning Policy (Sydney Region Growth Centres) 2006* is subject to biodiversity certification under the former *Threatened Species Conservation Act 1995* and to a strategic assessment under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) (more information at Environment, Energy and Science, 2020 and Department of Agriculture, Water and the Environment, 2020). These balance protection and management of vegetation with urban development and document assessment processes and offset requirements for development in the North West and South West Growth Centres. This biodiversity certification will remain in place.

The NSW Government is also developing a Cumberland Plain Conservation Plan (NSW Department of Planning Industry and Environment, 2020) across about 200,000 hectares in Western Sydney. The plan aims to avoid and minimise impacts on threatened species early in the strategic planning process and then offset remaining impacts through a conservation program. DPIE is currently preparing the plan, with a draft for public comment expected in 2020.

It is likely the project will impact on native vegetation during construction. The EIS will address the requirements of biodiversity certification where it is relevant to the project and consider the draft Cumberland Plain Conservation Plan if it is released or finalised before the EIS is submitted.

4.3 Existing environment

This section includes a brief description of the existing environment. Specialist studies for the EIS will characterise the existing environment in more detail. Earlier figures in this document show some of this existing environmental context.

4.3.1 Water Recycling Centre site

The Water Recycling Centre site is between South Creek and Kemps Creek, and close to the point at which they join Badgerys Creek. It is relatively flat and partially located below the 1 in 100 year flood level. The site has been largely cleared of native vegetation, with some remaining remnants along its boundaries. It is currently used for cattle activities and research.

The site is listed as an item of local heritage under Penrith Local Environmental Plan 2010, as the Fleurs Radio Telescope site (more information at NSW Office of Environment and Heritage, 2020). It was used for astronomical research between 1954 and 1988 and some evidence of its former use remains such as buildings, foundations and satellite dishes. The site is also likely to contain items of Aboriginal heritage, and previous investigations for other projects such as the M12 motorway have identified Aboriginal objects in the southern part of the site.

4.3.2 Treated water pipelines

The environment around the treated water pipelines has largely been cleared for rural residential uses. Some native vegetation remains including in road verges, with larger stands around Wallacia and Warragamba, near the Nepean River. Items of Aboriginal heritage and non-Aboriginal heritage remain along some sections of the alignments. The pipelines cross waterways including South Creek, Badgerys Creek, Oaky Creek, Cosgroves Creek, Nepean River and Megarritys Creek.

The treated water release location is on the Nepean River at Wallacia weir. The Blue Mountains National Park and World Heritage area is downstream, on both sides of the Nepean River. The environmental flows release location is on the Warragamba River upstream of the weir.

4.3.3 Brine pipeline

The environment through which most of the brine pipeline is located is heavily disturbed by existing residential development in suburbs such as Cecil Hills, Bonnyrigg, Mount Pritchard, Cabramatta, Canley Vale and Canley Heights. The section running through the suburb of Kemps Creek is rural residential. Some parkland areas and native vegetation remain in the vicinity including Western

Sydney Parklands, Kemps Creek Nature Reserve and Lansdowne Reserve. Part of Lansdowne Reserve is a Biobanking site. Items of Aboriginal heritage and non-Aboriginal heritage remain along some sections of the alignment. The pipeline crosses waterways including Kemps Creek, Clear Paddock Creek, Green Valley Creek, and Prospect Creek and the WaterNSW Upper Canal.

4.4 Surrounding land use

This section includes a brief description of the surrounding land use. Specialist studies for the EIS will characterise the surrounding land use in more detail. Earlier figures provided in Section 2 show some land use context. Figure 4-2 shows proposed transport corridors near the project.

4.4.1 Water Recycling Centre site

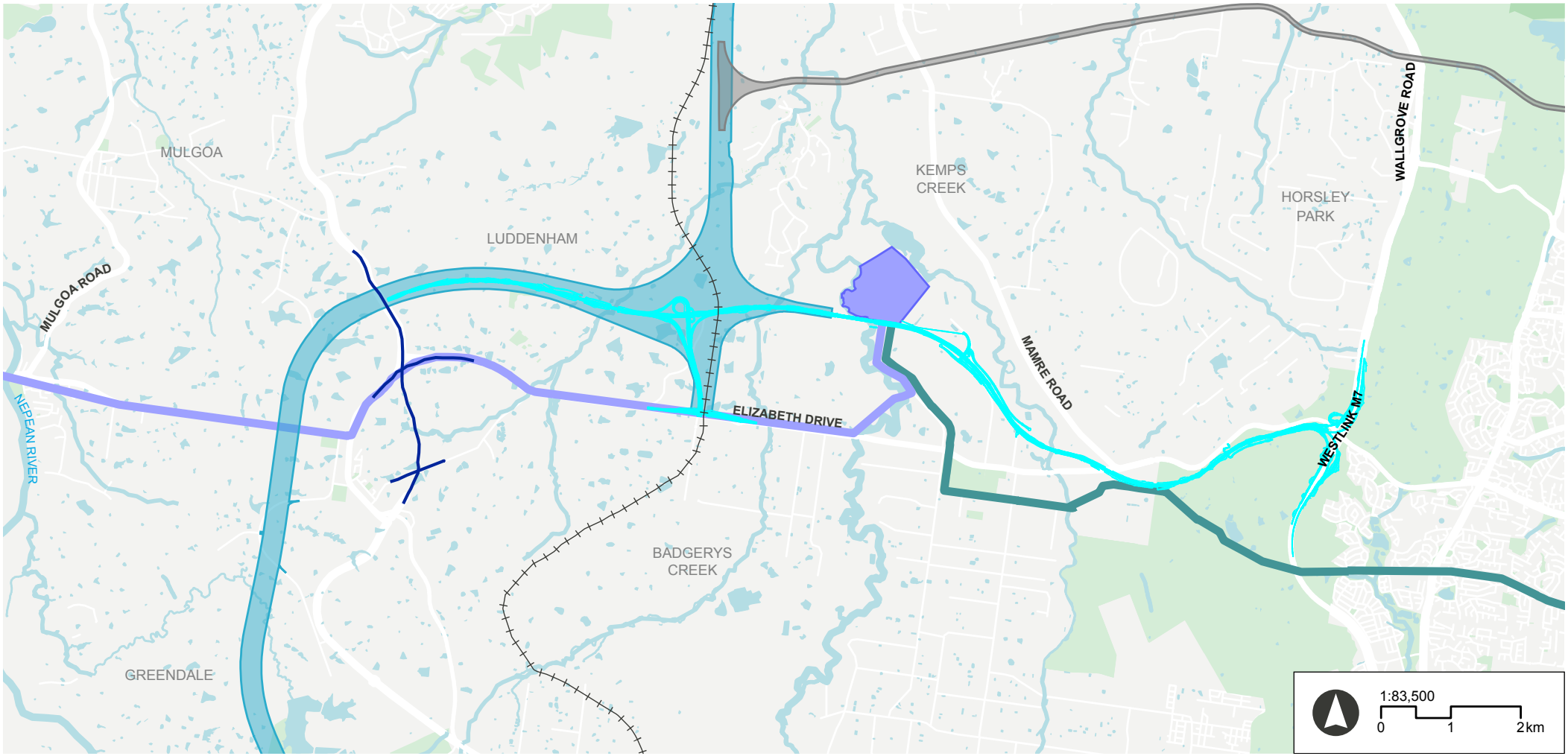
The land surrounding the Water Recycling Centre site is currently zoned for rural purposes. As part of developing the Western Sydney Aerotropolis, this zoning is expected to change over time. The draft Western Sydney Aerotropolis Plan (Western Sydney Planning Partnership, 2019) indicates the likely future zoning in the vicinity will be for flexible employment south of the Water Recycling Centre site and parkland along the creeks. The Water Recycling Centre site is in the Kemps Creek precinct, which is not currently in the first stage of precincts to be rezoned. This means it may be several years before rezoning occurs in this area.

The Water Recycling Centre site is adjacent to the proposed M12 motorway and Western Metro. The SUEZ Kemps Creek Resource Recovery Park is about 500m to the south-west. There are existing rural residential and agricultural land uses along Mamre Road and Clifton Avenue to the south and east of the site, with closest dwellings about 300-400 metres from the site. The closest dwellings in the Twin Creeks estate are about 800-900 metres north-west of the site.

The site is also beneath the flight path for the future Western Sydney Airport. This means a range of airport safety matters will be relevant for the project such as risk of increasing potential for bird strike and impacts of lighting or reflective surfaces.

Upper South Creek Advanced Water Recycling Centre

Figure 4-2 Proposed transport corridors



Upper South Creek Advanced Water Recycling Centre

Treated Water Pipeline

Brine Pipeline

National Parks & Reserves

M12

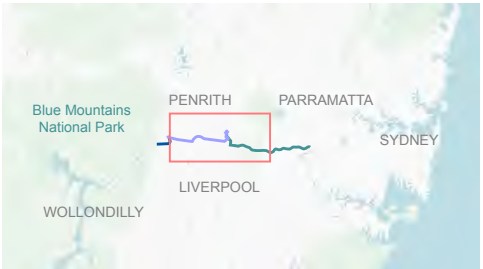
Northern Road Stage 6 Design

North South Rail Line

Western Sydney Freight Line

Outer Sydney Orbital Corridor

***Proposed Transport Infrastructure**



Projection: GDA 1994 MGA Zone 56

Project infrastructure locations are indicative and will be refined during design

4.4.2 Treated water pipelines

The treated water pipeline will primarily follow existing or future infrastructure corridors, including existing roads and easements. In the case of Elizabeth Drive, the pipeline will be located on private property to align with proposed future widening of Elizabeth Drive. Other proposed transport infrastructure in the vicinity includes the M12 Motorway, North-South Rail Link and Northern Road upgrade.

East from the Northern Road, the pipeline is within the Western Sydney Aerotropolis, so surrounding land use can be expected to change from the existing rural residential uses to a more urbanised landscape over time.

West from Park Road, the land is outside identified growth areas, so land use is expected to remain similar over time. Land uses in this area include rural residential areas, the townships of Wallacia and Warragamba and large areas of open space.

4.4.3 Brine pipeline

The brine pipeline will be located mainly in existing road corridors and through more populated residential, commercial and industrial areas. It will also cross some parkland areas including Western Sydney Parklands, Lansdowne Reserve, Mirambeena Regional Park, Shortland Brush and Lansvale Park. There is a range of major transport infrastructure along the pipeline alignment, including the M7 motorway, Liverpool to Parramatta transitway and T2, T3 and T5 rail lines.

Some sections of both the treated water and brine pipelines may be in private property which may require easements. Sydney Water will consult with relevant landowners where this is the case.

4.5 Community matters

Section 6 describes matters raised by the community and other stakeholders during consultation and engagement forums to date.

5 Statutory context

Table 5-1 describes the project's planning approval pathway.

Table 5-2 includes a preliminary list of other approvals that may be required for the project. The approvals are categorised as either:

- integrated with SSI approval: approvals that cannot be refused if the project is approved and must be substantially consistent with the approval (see sections 4.42 and 5.24 of the *Environmental Planning and Assessment Act 1979* (EP&A Act))
- other approvals: approvals that are not integrated into the State significant assessment process
- required if project not SSI: approvals that would have been required if the project was not a State significant project.

Further investigations as part of the EIS will confirm whether these approvals will be needed and identify any additional approvals.

Sydney Water has not identified any pre-conditions to exercising the power to grant approval or any mandatory matters that influence the setting of the SEARs.

Table 5-1 Planning approval pathway

Matter	Analysis
Power to grant approval	The project is State significant infrastructure under Schedule 3, section 1(1) of *State Environmental Planning Policy (State and Regional Development) 2011*. This is because Sydney Water would otherwise be the determining authority and has concluded that an EIS is required in accordance with section 5.7(1) of the EP&A Act. Sydney Water is also seeking a staged approval under section 5.20 of the EP&A Act and declaration of the project as critical State significant infrastructure under section 5.13 of the EP&A Act. The approval authority is the NSW Minister for Planning and Public Spaces.
Permissibility	No components of the project are prohibited. The project is permissible without development consent for the reasons described below. The project is a sewerage system under Division 18 of *State Environmental Planning Policy (Infrastructure) 2007* (Infrastructure SEPP). More specifically the pipeline components are classified as a sewage reticulation system and the Water Recycling Centre as a sewage treatment plant. This allows for a range of different uses of the treated water, including as recycled water. Sydney Water is a public authority so the project will be carried out in the prescribed circumstances in section 106(1) of the Infrastructure SEPP.

Matter	Analysis
	Pipelines Under section 106(3B) of the ISEPP, the pipelines are permissible without consent on any land and will be carried out in the prescribed circumstances. The project will not be in land reserved under the *National Parks and Wildlife Act 1974* so the limitations in section 106(3D) are not relevant. The pipelines will be in a range of land use zones which Sydney Water will describe in more detail in the EIS. Some sections of the pipeline alignment are near coastal wetlands mapped under *State Environmental Planning Policy (Coastal Management) 2018* (Coastal Management SEPP). If EIS investigations determine it is not feasible to avoid these coastal wetlands, section 10(2) of the Coastal Management SEPP provides that these sections of the pipeline require development consent and could therefore not be classified as State significant infrastructure. However, section 14(2) of *State Environmental Planning Policy (State and Regional Development) 2011* prevails to classify these sections of pipeline as permissible without consent and State significant infrastructure. **Water Recycling Centre** Under section 106(2) of the Infrastructure SEPP, the Water Recycling Centre is permissible without consent in a prescribed zone in the prescribed circumstances. The Water Recycling Centre site is zoned RU2 – Rural Landscape which is a prescribed zone under clause 105 of the Infrastructure SEPP. Sydney Water is working closely with the Western Sydney Planning Partnership to ensure any future rezoning is compatible with a sewage treatment plant.

Table 5-2 Approvals that may be required

Legislation	Approvals	Integrated with SSI approval	Other approvals	Required if project not SSI
NSW				
Protection of the Environment Operations Act 1997	Section 47 and 48 Environment Protection Licences	✓		
Coastal Management SEPP	Clause 10(1) development consent for impact on coastal wetland			✓
Roads Act 1993	Section 138 consent	✓		
National Parks and Wildlife Act 1974	Section 90 Aboriginal heritage impact permit			✓
Fisheries Management Act 1994	Section 205 (marine vegetation impacts), 219 (blocking fish passage)			✓
Biodiversity Conservation Act 2016	Section 5.11 and Section 5.16 (if impacts on Biodiversity Stewardship sites cannot be avoided)		✓	
Heritage Act 1977	Section 139 excavation permit; Section 60 approval to impact item listed on State heritage register			✓
Water Management Act 2000	Section 56 water access licence		✓	
Water Management Act 2000	Section 89 (water use approval), 90 (water management work approval), 91 (aquifer interference once provisions commence)			✓

Legislation	Approvals	Integrated with SSI approval	Other approvals	Required if project not SSI
Commonwealth				
Environment Protection and Biodiversity Conservation Act 1999	Based on early ecological investigations, it is likely that Sydney Water will refer the project to the Department of Agriculture, Water and the Environment for potential impacts on threatened ecological communities. Sydney Water will confirm this with DPIE as soon as possible.	N/A	N/A	N/A

6 Engagement during scoping

This chapter:

- summarises the stakeholder and community engagement activities and outcomes from December 2019 to April 2020
- summarises issues raised during that engagement
- outlines the ongoing community engagement plan.

The Community and Stakeholder Engagement Plan is included in Appendix A.

6.1 Community and Stakeholder Engagement Plan

The objectives of the Community and Stakeholder Engagement Plan are to:

- clearly communicate the project's intent, scope and design process
- engage with stakeholders early so that issues, concerns and motivations are clearly understood and issues mitigated wherever possible
- invite participation and feedback to inform the project and meet the requirements of the approvals process
- ensure that the community and all stakeholders are treated openly, honestly and with respect
- record and report engagement activities to support design decision-making and the assessment process.

6.2 Summary of engagement to date

Stakeholder engagement with local government, state government departments and agencies, developers and state-owned corporations commenced in December 2019. A consultation process for directly impacted major landowners in Kemps Creek commenced in December 2019 and is ongoing. Bespoke community consultation, through a range of engagement activities, started in January 2020. Figure 6-1 summarises the engagement to date.

6.2.1 Key stakeholder engagement and briefings

Engagement with key stakeholders and developers is focused on:

- project updates
- early stage timelines
- concerns or suggestions for improvement, including opportunities to coordinate work to reduce cumulative community impacts.

Figure 6-1 Summary of engagement to date

Sydney Water briefed key agency, landowners and utility stakeholders as shown in Table 6-1 and recorded the outcomes.

Table 6-1 Key stakeholders

Agencies	Commercial and industrial landowners and utilities
• Blacktown City Council • Canterbury-Bankstown City Council • Campbelltown City Council • Fairfield City Council • Liverpool City Council • Penrith City Council • Wollondilly Council • Western Sydney Planning Partnership Office • Department of Planning, Industry and Environment, including the Environment Protection Authority • Greater Sydney Commission • WaterNSW • Western Sydney Parklands Trust	• Mirvac • Clifton Avenue Holdings • Mamre Road residents • Sydney University • Endeavour Energy • Jemena • TransGrid

Agencies	Commercial and industrial landowners and utilities
• Western City and Aerotropolis Authority (WCAA) • Western Sydney Airport (WSA Co) • Transport for NSW including M12, RMS and Sydney Trains	

6.2.2 Planning focus meeting

DPIE held a planning focus meeting for the project on 21 May 2020. A range of government agencies attended including DPIE Biodiversity and Conservation, DPIE Water, EPA, Department of Primary Industries (Agriculture), Western Sydney Planning Partnership, WCAA, WaterNSW and Jemena. Sydney Water presented on the project and attendees could raise questions. Sydney Water will address matters raised in future consultation and in the EIS, as relevant.

6.2.3 Community engagement

Community notifications

In February, March and April 2020, we sent out notices of entry and community notifications about geotechnical and environmental investigation works. Technical teams distributed community contact cards if needed when they were on site.

Community focus group

In March we met with the Wallacia Progress Association. They provide bush care activities on a property owned by Penrith Council. They expressed a strong interest in the project and highlighted the bush care services they provide to Penrith Council.

Community information sessions

Sydney Water attended information sessions run by the Western Sydney Planning Partnership in January and February 2020 seeking feedback on the Western Sydney Aerotropolis Plan. Over 500 community members attended.

Online engagement tool

We have created a Sydney Water Talk website for release when we have more project detail. The website communication tools include news items, frequently asked questions, project timeline and a sign-up page for e-communications.

The feedback mechanisms are multi-channel and include a survey, comments section and a pin-drop feedback tool for maps. This has the added advantage of the community not needing to be physically present at a consultation in order to provide feedback.

Community contact and information points

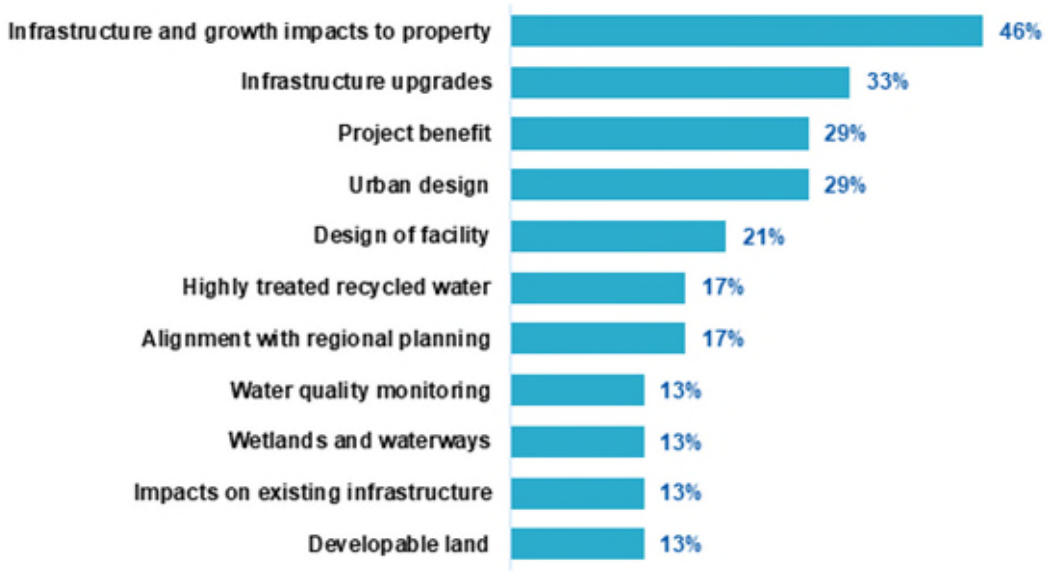
There are two key points of contact for community and stakeholders, including our staffed information line 1800 238 881 and our email address uppersouthcreek@sydneywater.com.au. Community members and stakeholders are encouraged to contact the project team to discuss any questions they may have.

6.2.4 Summary of key issues to date

Figure 6-2 summarises issues raised from community and stakeholder engagement to-date and more detail is presented below.

Figure 6-2 Key issues raised by stakeholders and the community to date

*Note, more than one concern or issue was registered per stakeholder—total does not equal 100%)



Property impacts, alternative Water Recycling Centre options and alternative pipeline options

Impacts to property and acquisition for the Centre site and pipeline alignments equated to 46 percent of issues raised. This included requests for more refined and detailed maps, particularly of investigations and timing, and further engagement to fully understand the impacts.

The issues raised about the early pipeline alignments reflect more specifically where the pipelines will be placed, any conflict with existing utility corridors or agency works.

Fairfield Council provided feedback on alignments for the brine pipeline relating to the preservation of areas that contribute to the blue and green grid of the Parkland City vision.

Between January and March 2020, five community enquiries came through the project phone-line from Cabramatta, Wallacia and Bonnyrigg suburbs relating to property impacts, the location of the investigation works and the notice of entry conditions.

Infrastructure upgrades and cumulative impacts

Coordinating concurrent infrastructure upgrades was also a common topic of feedback, comprising 33% of the issues raised, including the M12 motorway and Council road and bridge upgrades. Transport for NSW discussed the coordination of community engagement for all major projects in the area. It recommended coordination through the Western Sydney City Subcommittee for Communication and Engagement. Similarly, Western City and Aerotropolis Authority queried current discussions with government around a coordinated approach to the management of

waterway systems. We are working to achieve this with our agency partners as the project progresses.

Project benefit

Unprompted discussion around project benefit and positive sentiment was expressed by stakeholders and community. Their comments in this category focused around the potential supply and use of recycled water to the benefit of future Western Sydney. They also expressed positive feedback around the high level of treatment proposed, accounting for 29% of comments.

Urban design and design of future facility

Other top categories of feedback include the urban design (29%) and interest and suggestions on design of the Water Recycling Centre (21%). Feedback from Western Sydney Airport highlighted timely design and supply of services to assist with construction needs. Feedback related to the future facility layout, including road, visual amenity for neighbours and building locations.

Strategic context

Agencies and Councils were interested in alignment with regional planning (17%), such as road corridors, site masterplans and the GSC's vision for the Western Parkland City.

Public health risks from flooding and stormwater

The Wallacia Progress Association raised concerns about the risk of flooding to the Wallacia community, and the risks of stormwater to public health. It was noted Sydney Water is preparing assessments of flood risks and stormwater impacts of the project that will be included in the EIS.

Discharge to the rivers

The Wallacia Progress Association raised concerns about the location and volume of discharge to rivers. The group were particularly interested in the release points impacting vulnerable communities and how this would be addressed in the design. It was noted Sydney Water is preparing assessments that will consider impacts of waterway releases and socio-economic impacts for inclusion in the EIS.

Biodiversity

The Wallacia Progress Association raised concerns about the potential impacts to bush care sites in Penrith Council LGA and highlighted the Cumberland Plain Land Snail as an important species to be protected.

Project funding, timeframes and understanding the project

During the Western Sydney Planning Partnership information sessions, community members asked what a Water Recycling Centre is, and wanted to know about recycled water, and how the Water Recycling Centre will produce energy. Once Sydney Water explained the proposed high-treatment level and co-generation design this was met with acceptance.

Other community members questioned construction timeframes, how Sydney Water is funding the project, and if customer pricing would be impacted.

6.3 Next steps

Several community engagement activities and programs are planned, so that stakeholders and community can input into the reference design and EIS technical studies. More detail on the proposed future engagement is in Chapter 8, and the proposed Community and Stakeholder Engagement Plan is in Appendix A.

6.4 Evaluation of engagement

Engagement evaluation measures will be tracked and insights used to inform the planning and delivery of the project. Our objective is to respond quickly and with empathy to the expectations of our community and stakeholders.

Our evaluation includes:

- qualitative feedback from customers throughout the geotechnical and reference design process
- monitoring residential sentiment across the communities most affected (through Sydney Water's residential sentiment monitor), including sharing stakeholder insights and community feedback internally and externally at each major hold point
- tracking feedback from the annual stakeholder perception survey
- comparison of metrics through stakeholder engagement surveys before and after the project
- tracking compliments and complaints, seeking trends across the project and month-to-month
- feedback from the quarterly residential sentiment monitor
- conducting research with a sample of customers before, during and after the project
- working closely with our government agency partners to understand their overall data, trends and objectives
- regularly host and review progress meetings with construction work, councils and other agencies to understand what's occurring and when
- host a 'lessons learned' discussion after each major consultation stage to ensure project data and feedback is incorporated at each stage.

7 Proposed assessment

This section describes the proposed assessment approach for the different project stages. The EIS for which Sydney Water is currently requesting SEARs will include the concept proposal and Stage 1 assessments outlined in Sections 7.1 and 7.2. Future stages would be assessed in subsequent EISs as described in Section 7.3.

Appendix B includes a scoping worksheet in DPIE's template that summarises the impacts and assessment level for a range of matters.

7.1 Stage 1

The project is likely to impact environmental and social matters during construction and operation. The tables below summarise the scale and nature of potential impacts and the proposed assessment approach for each environmental/social aspect. Sydney Water is scoping investigations to be consistent with relevant elements of DPIE's Critical State Significant Infrastructure Standard SEARs (December 2015).

The key government plans, policies and guidelines that relate to each matter are listed below each table and Section 4 contains further information on the strategic context. Section 5 includes key statutory requirements and approvals.

The studies for each aspect will:

- seek flexibility to allow for design changes by the delivery contractor, provided they meet specified performance outcomes and/or impacts
- consider any cumulative impacts relevant to that aspect
- identify uncertainties and assumptions and how they will be managed
- specify the criteria used for evaluating impacts
- include mitigation measures if required to avoid or mitigate impacts.

At this stage, due to the confidential nature of the project, we have not been able to do specific and detailed community consultation. Any community views we have to date are outlined in Section 6.3 and will be captured in the EIS. We will consult the community during EIS preparation and incorporate any additional issues raised into the assessment.

7.1.1 Aboriginal heritage

Table 7-1 Scale and nature of likely Aboriginal heritage impacts and proposed assessment approach

Scale and nature of likely impacts	Summary of proposed assessment approach
Construction: Impacts on Aboriginal objects from ground disturbance across the Water Recycling Centre site and pipeline alignments. **Operation:** Impacts unlikely.	Desktop assessment and background cultural and archaeological research. Consult with Registered Aboriginal Parties. Test excavations under the Code of Practice for Archaeological Investigation of Aboriginal objects. Field assessment to verify known Aboriginal sites and identify areas with heritage potential. Develop methodology to avoid or mitigate impacts. Prepare Aboriginal cultural heritage assessment report.

Relevant government plans, polices and guidelines:

- Aboriginal cultural heritage consultation requirements for proponents 2010 (Department of Climate Change and Water, 2010)
- Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW (Department of Climate Change and Water, 2010)
- Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW (Office of Environment and Heritage, 2011).

7.1.2 Air quality

Table 7-2 Scale and nature of likely air quality impacts and proposed assessment approach.

Scale and nature of likely impacts	Summary of proposed assessment approach
Construction: Temporary dust generation and vehicle emissions across impact areas. **Operation:** Ongoing emissions from treatment processes at the Water Recycling Centre (for example, co-generation) and odour emissions (for example from biosolids handling). Impacts from pipeline operation unlikely.	**Construction:** Qualitative assessment, as potential impacts and mitigation measures well understood and routinely used on other projects. **Operation:** Characterise the existing environment. Identify the key air quality issues (dust, odour and other relevant air quality parameters). Collate data about expected project emissions.

Scale and nature of likely impacts	Summary of proposed assessment approach
	Develop an odour model for the Water Recycling Centre site. Establish appropriate odour guidelines and assess outputs from odour model against them. Analyse potential cumulative impacts in accordance with approved methods. Prepare air quality impact assessment report.

Relevant government plans, polices and guidelines:

- Approved Methods for the Sampling and Analysis of Air Pollutants in NSW (Department of Environment and Conservation, 2005)
- Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales (Environment Protection Authority, 2016)
- Technical Framework - Assessment and Management of Odour from Stationary Sources in NSW (Department of Environment and Conservation, 2006).

7.1.3 Aquatic ecology

Table 7-3 Scale and nature of likely aquatic ecology impacts and proposed assessment approach

Scale and nature of likely impacts	Summary of proposed assessment approach
Construction: Temporary direct impacts during pipeline construction underneath / across waterways and at water release locations. There is also the potential for indirect impacts from contaminated runoff entering waterways. **Operation:** Impacts from the ongoing releases of treated water to Nepean River, Warragamba River and South Creek from changes to water quality and the hydrological regime.	**Construction:** Less detailed assessment for construction as potential impacts and mitigation measures well understood and routinely used on other projects. Site investigations will be undertaken at waterway crossings where there will be a direct impact and at release points. **Operation:** Desktop and literature review. Site surveys and sampling on Nepean River, Warragamba River and South Creek. Assess impacts using results from water quality and hydrodynamic modelling. Prepare aquatic ecology impact assessment report.

Relevant government plans, polices and guidelines:

- Aquatic Ecology in Environmental Impact Assessment – EIA guideline (Marcus Lincoln Smith, 2003)
- NSW DPI Policy and Guidelines for Fish Habitat Conservation and Management (Update 2013) (Department of Primary Industries, 2013)
- Why do Fish Need to Cross the Road? Fish Passage Requirements for Waterway Crossings (NSW Fisheries, 2003).

7.1.4 Heritage (non-Aboriginal)

Table 7-4 Scale and nature of likely non-Aboriginal heritage impacts and proposed assessment approach

Scale and nature of likely impacts	Summary of proposed assessment approach
Construction: Potential impacts on built and archaeological heritage from ground disturbance along the pipeline routes. Impacts on the heritage-listed Fleurs Radio Telescope and archaeological heritage at the Water Recycling Centre site. **Operation:** Impacts unlikely.	Desktop assessment and background heritage and archaeological research. Field assessment to verify known heritage sites and identify areas with heritage potential. Prepare heritage impact assessment report.

Relevant government plans, polices and guidelines:

- Assessing Significance for Historical Archaeological Sites and Relics (Heritage Branch, Department of Planning, 2009)
- Guidelines for the preparation of Archaeological Management Plans (Heritage Branch, Department of Planning, 2009)
- Photographic Recording of Heritage Items using Digital Capture (Heritage Office, 2001, revised 2004, 2006).
- Statements of Heritage Impact (Heritage Office and Department of Urban Affairs & Planning, 1996, revised 2002)
- State Agency Heritage Guide (Heritage Office, 2005).

7.1.5 Health and safety

Table 7-5 Scale and nature of likely human health impacts and proposed assessment approach

Scale and nature of likely impacts	Summary of proposed assessment approach
Construction: Potential impacts to farm dams. **Operation**: Potential impacts from releases to waterways and changes to air quality from the Water Recycling Centre. Wastewater servicing creates positive health benefits by treating wastewater and facilitating economic growth in the region. Potential risk of construction near Warragamba Dam. Potential contribution to bird strike risk (airport flight path)	The assessment will draw on the results of studies from relevant specialist areas (for example, air quality, water quality) to prepare a consolidated health impact assessment report, including a SEPP 33 assessment. Assess how design has managed potential impacts on dams. Complete bird strike risk assessment.

Relevant government plans, polices and guidelines, including those relevant for other matters where the health impact assessment draws on other specialist areas:

- Environmental Health Risk Assessment, Guidelines for assessing human health risks from environmental hazards, and Australian Exposure Factors Guide, Commonwealth of Australia (enHealth, 2012)
- Health Impact Assessment Guidelines (enHealth, 2017)
- Health Impact Assessment (NSW Government Health, 2017)
- Health Impact Assessment: Main concepts and suggested approach. The Gothenburg Consensus Paper: WHO Regional Office for Europe (WHO European Centre for Health Policy, 1999)
- SEPP No. 33 - Hazardous and Offensive Development.

7.1.6 Hydrology, groundwater and flooding

Table 7-6 Scale and nature of likely hydrology, groundwater and flooding impacts and proposed assessment approach

Scale and nature of likely impacts	Summary of proposed assessment approach
Construction: Temporary impacts to hydrological regime within impact area for pipeline and Water Recycling Centre construction. **Operation – Water Recycling Centre site:** Ongoing impacts to hydrological regime (including stormwater, groundwater and flooding) on Water Recycling Centre site as a result of new structures being built. **Operation – waterway releases:** Ongoing changes to the hydrological regime of the Warragamba and Nepean Rivers from daily releases of treated water, including opportunity to contribute to environmental flows. Intermittent impacts on the hydrology of South Creek from the release of treated water during wet weather. Ongoing impacts on the hydrological regime if decision is made to include dry weather flows to South Creek. **Operation – Pipeline:** Brine releases to Malabar wastewater system – risk of releases during wet weather.	Desktop research and baseline data collection and model development to define hydrological, flooding and groundwater regime. **Construction:** Qualitative assessment for pipeline and Water Recycling Centre construction impacts (flooding and stormwater). Quantitative assessment for Water Recycling Centre using numerical groundwater model. **Operation – Water Recycling Centre site:** Develop hydrologic models (quantity and quality) and use to determine impacts to receiving environment. Assess impact using a numerical groundwater model and model impacts to the groundwater system. Qualitative assessment of impacts to groundwater quality. Assess flood impact by developing a hydraulic model to assess relative impacts resulting from the development. Model outputs will be validated with Penrith City Council hydraulic model. Assessment report to address impacts based on model outputs. **Operation – waterway releases:** Review current and future flows. Develop waterway values and objectives. Hydrodynamic and water quality modelling of Warragamba and Nepean Rivers and South Creek (using Sydney Water's existing models). Assess hydrological impacts to geomorphology, riparian vegetation, aquatic connectivity and water availability. Prepare associated assessment reports covering all the above items. Engage two independent experts to review approach and outputs for investigations relating to waterway releases. Assess brine impacts on wet weather overflows. Assess benefits of contributing to environmental flows.

Relevant government plans, polices and guidelines:

- Australian Rainfall and Runoff; A Guide to Flood Estimation (Geoscience Australia, 2019)
- Australian Runoff Quality (Institute of Engineers Australia, 2006)
- Controlled Activities Guidelines – various (NSW Office of Water)
- Floodplain Risk Management Guideline – Practical Considerations of Climate Change (Department of Environment and Climate Change, 2007)
- Hawkesbury-Nepean Valley Flood Strategy (various document), Infrastructure NSW
- Independent inquiry into the Hawkesbury Nepean River system: final report (Healthy Rivers Commission of NSW, 1998)
- Lower Hawkesbury-Nepean River Nutrient Management Strategy (Department of Agriculture and Water Resources, 2018)
- Managing Urban Stormwater, Soils and Construction Volume 1, 4th Edition (Landcom, 2004)
- Metropolitan Water Plan (Metropolitan Water, 2017)
- National Water Quality Management Strategy (Australian Government, 2018)
- NSW Aquifer Interference Policy (NSW Office of Water, 2012)
- NSW Floodplain Risk Management Guidelines and Floodplain Development Manual (Department of Infrastructure, Planning and Natural Resources, 2005)
- NSW Groundwater Protection Policy (Department of Land and Water Conservation, 1998)
- NSW Groundwater Dependent Ecosystems Policy (Department of Land and Water Conservation, 2002)
- NSW State Rivers and Estuaries Policy (NSW Water Resources Council, 1993)
- Neutral or Beneficial Effect on Water Quality Assessment Guideline (Water NSW (formerly Sydney Catchment Authority), 2015)
- Sydney Regional Environmental Plan No. 20 – Hawkesbury-Nepean River (No 2-1997)

7.1.7 Noise and vibration

Table 7-7 Scale and nature of likely noise and vibration impacts and proposed assessment approach

Scale and nature of likely impacts	Summary of proposed assessment approach
Construction: Temporary impacts to sensitive receivers along pipeline alignments and Water Recycling Centre site. **Operation:** Ongoing operational impacts from noise generating equipment at the Water Recycling Centre. Impacts from pipelines unlikely.	Desktop research on existing and future noise environment and current and potential future land uses. Use existing baseline noise data to establish noise criteria. Water Recycling Centre (quantitative). Undertake predictive modelling on proposed construction and operational activities. Pipelines (qualitative). Undertake predictive assessment based on proposed construction activities/methods and develop mitigation and management approach (buffer zones) for construction activities. Prepare noise and vibration impact assessment report.

Relevant government plans, polices and guidelines:

- Interim Construction Noise Guideline (Department of Environment and Climate Change, 2009)
- NSW '*Assessing Vibration; a technical guideline*' regarding human comfort and to BS 7385 and DIN 4150 for damage to buildings (Department of Environment and Conservation, 2006)
- NSW Road Noise Policy (Department of Environment, Climate Change and Water, 2011)
- NSW Noise Policy for Industry (Environment Protection Authority, 2017)
- Technical Basis for guidelines to Minimise Annoyance due to Blasting Overpressure and Ground Vibration (ANZECC, 1990).

7.1.8 Protected and sensitive lands

Table 7-8 Scale and nature of likely impacts on protected and sensitive lands and proposed assessment approach

Scale and nature of likely impacts	Summary of proposed assessment approach
Construction: Potential impacts on protected and sensitive lands through ground disturbance in impact areas. **Operation:** Impacts unlikely.	Identify protected and sensitive lands potentially impacted by the project. This will only cover any lands not captured by studies for other specialist areas. Assess potential impacts and document in chapter of EIS (no specialist report).

7.1.9 Socio-economic and land use

Table 7-9 Scale and nature of likely socio-economic and land use impacts and proposed assessment approach

Scale and nature of likely impacts	Summary of proposed assessment approach
Construction: Temporary impacts on private and public lands within impact area. **Operation:** Permanent impacts on private and public land from acquisition and/or permanent infrastructure placement. Operation expected to positively impact economic growth as the project facilitates development.	Review population and demographic indicators, local business/employment data and dwelling characteristics. Consider project alignment with relevant local, district, regional and state plans and strategies. Consider project alignment with socio-economic issues raised in community feedback. Consider how future growth or property development may interact with the project. Consolidate information from other specialist areas to determine potential cumulative impacts. Prepare socio-economic and land use impact assessment report.

The Roads and Maritime Practice Note: Socio-economic Impact Assessment (EIA-05) will be used as a reference document for the assessment approach.

7.1.10 Soils and contamination

Table 7-10 Scale and nature of likely soil and contamination impacts and proposed assessment approach

Scale and nature of likely impacts	Summary of proposed assessment approach
Construction: Impacts to the receiving environment resulting from disturbing contaminated land, erosion and salinity in the impact area. **Operation:** Water Recycling Centre - Potential impacts to the receiving environment, human health, and Water Recycling Centre infrastructure from existing contamination and salinity. Pipeline – Potential impacts to the receiving environment and pipeline infrastructure resulting from existing contamination and salinity.	Preliminary Site Investigation (PSI) including desktop study and site investigation. Detailed Site Investigation (DSI) including intrusive investigations and sample collection. Soil sample analysis for primary contamination parameters to inform baseline. Assess potential impacts and document in soils and contamination impact assessment report.

Relevant government plans, polices and guidelines:

- Guidelines for the NSW Site Auditor Scheme (Third Edition) (NSW EPA, 2017)
- Guidelines on the Duty to Report Contamination under the Contaminated Land Management Act 1997 (NSW EPA, 2015).

7.1.11 Sustainability and climate change

Table 7-11 Scale and nature of likely sustainability and climate change impacts and proposed assessment approach

Scale and nature of likely impacts	Summary of proposed assessment approach
Impacts to asset value, community and the environment if the financial, economic, social and environmental value for the life of the project is not optimised. Over their design life, assets will be subject to a changing climate so have potential vulnerability to future climate related risks.	Recommend an appropriate target rating using the Infrastructure Sustainability Council of Australia's (ISCA) Infrastructure Sustainability rating tool. Demonstrate how the project has addressed sustainability in design. Review local climate change projections relevant to the project. Desktop review of past and observed climate and natural hazard events for the site.

Scale and nature of likely impacts	Summary of proposed assessment approach
Potential contribution to climate change during construction and operation through energy use and emissions.	Climate change risk assessment to identify potential climate risks and assess against key vulnerabilities of the asset. Identify potential construction and operational carbon emissions. Prepare sustainability and climate change impact assessment report.

Relevant government plans, polices and guidelines:

- AS 5334-2013 Climate change adaptation for settlements and infrastructure − A risk-based approach, which follows ISO 31000:2009 Risk Management – Principles and guidelines
- Climate Change Impacts and Risk Management – A guide for business and development (Department of Environment and Heritage, 2006)
- Infrastructure Sustainability Council of Australia (ISCA) Infrastructure Sustainability (IS) Rating Tool
- NSW Climate Change Policy Framework (Office of Environment and Heritage, 2016)
- NSW Government Resource Efficiency Policy (Office of Environment and Heritage, 2019)
- Western City District Plan (Greater Sydney Commission, 2018).

7.1.12 Terrestrial biodiversity

Table 7-12 Scale and nature of likely terrestrial biodiversity impacts and proposed assessment approach

Scale and nature of likely impacts	Summary of proposed assessment approach
Construction: Impacts to terrestrial biodiversity (including State and Commonwealth listed threatened species) likely within the impact area. Possible indirect construction impacts from aspects such as noise and runoff. **Operation:** Impacts unlikely.	Desktop constraints assessment. Field investigation across impact areas to ground-truth desktop assessment and inform development of vegetation and habitat mapping and impact assessment. Prepare biodiversity impact assessment report.

Relevant government plans, polices and guidelines:

- Ancillary rules and guidelines: Impacts on threatened species and ecological communities excluded from application of variation rules; Reasonable steps to seek like-for-like biodiversity credits for the purpose of applying the variation rules; Biodiversity conservation actions; Areas of Outstanding Biodiversity Value
- EPBC Act environmental offsets policy, (Department of Sustainability, Environment, Water, Population and Communities, 2012)
- EPBC Act guidance documents for survey and assessment of matters of national environmental significance (various)
- Guidance to assist a decision-maker to determine a serious and irreversible impact (Department of Planning Industry and Environment, 2019)
- National Recovery Plans for Species and TEC, Conservation Advice and Listings (various)
- NSW Biodiversity Assessment Method (BAM), and additional survey guidelines (various)
- Significant impact guidelines - matters of national environmental significance (Department of the Environment, 2013)
- Threatened Biodiversity Survey and Assessment: Guidelines for Developments and Activities (Department of Environment and Conservation, 2004).

7.1.13 Traffic and transport

Table 7-13 Scale and nature of likely traffic and transport impacts and proposed assessment approach

Scale and nature of likely impacts	Summary of proposed assessment approach
Construction: Temporary impacts on surrounding transport network from construction traffic. **Operation:** Minor ongoing impacts to surrounding road network from traffic movements associated with the Water Recycling Centre. Negligible impacts associated with the pipeline.	Desktop background research and baseline survey supplemented with Transport for NSW SCATS data. Link assessment and intersection modelling to determine impacts for construction of pipeline and Water Recycling Centre. Link assessment and intersection modelling to determine impacts for operation of Water Recycling Centre. Prepare traffic and transport impact assessment report.

Relevant government plans, polices and guidelines:

- Future Transport Strategy 2056 (Greater Sydney Commission, 2018)
- Guide to Road Design (Austroads, 2015)

- Guide to Traffic Generating Developments – updated traffic surveys TDT 2013/04a (Roads and Maritime Services, 2013).

7.1.14 Urban design

Table 7-14 Scale and nature of likely urban design impacts and proposed assessment approach

Scale and nature of likely impacts	Summary of proposed assessment approach
Construction: Impacts unlikely. **Operation**: Water Recycling Centre - potential to permanently impact the visual amenity, character and quality of the surrounding environment. Pipelines – impacts unlikely.	Analysis of landscape context including vegetation, hydrology, topography, ecology, heritage. Develop a landscape strategy and conceptual architectural components to inform the built form. This will present an indication of these elements only and key principles to be taken forward. Urban design and landscaping will be further developed by the contractor.

Relevant government plans, polices and guidelines:

- A Liveability Framework for Sydney (Department of Planning and Environment and Greater Sydney Commission, 2017)
- Draft Greener Places Policy (NSW Government Architect, undated)
- Sydney Green Grid: Spatial Framework and Opportunities (NSW Government Architect, 2017)
- Premier's Priority 11: Greener Public Spaces
- Premier's Priority 12: Greening our City
- Technical guideline for Urban Green Cover in NSW (Office of Environment and Heritage, 2015)
- Western Sydney Aerotropolis Plan – draft for public comment (Western Sydney Planning Partnership, 2019)
- Western City District Plan (Greater Sydney Commission, 2018).

7.1.15 Visual amenity

Table 7-15 Scale and nature of likely visual impacts and proposed assessment approach

Scale and nature of likely impacts	Summary of proposed assessment approach
Construction: Temporary impacts from visible construction activities, including vegetation removal. **Operation:** Ongoing impacts to landscape character and visual amenity relating to above ground structures and vegetation removal, where revegetation on-site is not possible. Above ground structures are primarily on the Water Recycling Centre site but there will be some visible structures along the pipeline alignment.	Identify existing landscape character zones and values and key viewpoints. Visual impact assessment for each viewpoint including photomontages. Prepare visual impact assessment report.

7.1.16 Waste

Table 7-16 Scale and nature of likely waste impacts and proposed assessment approach

Scale and nature of likely impacts	Summary of proposed assessment approach
Construction: Generation of construction wastes such as spoil and building waste. **Operation:** Ongoing generation of operational wastes. Positive impact through beneficial re-use of biosolids.	Identify waste streams and estimate quantities. Impact assessment to quantify, characterise and classify wastes generated. Prepare waste impact assessment report.

Relevant government plans, polices and guidelines:

- Cleaning Up Our Act: The Future for Waste and Resource Recovery in NSW: Issues Paper (Department of Planning, Industry and Environment, 2020)
- Asbestos Waste Strategy 2019-2021 (Environment Protection Authority, 2019)
- Managing Urban Stormwater Soils and Construction Vol 1 and Vol 2A (Landcom 2004, 2008)
- Waste Avoidance Resource Recovery Strategy 2014-2021 (Environment Protection Authority, 2014)

- Waste Classification guidelines (Environment Protection Authority, 2014).

7.1.17 Water quality

Table 7-17 Scale and nature of likely water quality impacts and proposed assessment approach

Scale and nature of likely impacts	Summary of proposed assessment approach
Construction:	Review of available water quality data.
Temporary impacts to water quality within and adjacent to impact area for pipelines and Water Recycling Centre construction.	Baseline water quality monitoring. Limited data will be available for the EIS but will continue to support a pre-commissioning baseline condition.
Operation:	Development of waterway values and objectives.
Permanent impact on the water quality of the Nepean and Warragamba Rivers from the ongoing daily release of treated water.	Hydrodynamic and water quality modelling of Warragamba and Nepean Rivers and South Creek, to assess potential water quality impacts.
Intermittent impact on the water quality of South Creek from the release of treated water during wet weather. Ongoing impacts on the hydrological regime if decision is made to include dry weather flows to South Creek.	Prepare water quality impact assessment report. Engage two independent experts to review approach and outputs for investigations relating to waterway releases.

Relevant government plans, polices and guidelines:

- Australian and New Zealand Guidelines for Fresh and Marine Water Quality (Australian and New Zealand Environment and Conservation, and Agriculture and Resource Management Council of Australia and New Zealand 2000)
- Australian Drinking Water Guidelines 6, Version 3.5 (National Health and Medical Research Council 2011 updated 2018)
- Guidelines for managing risks in recreational water (National Health and Medical Research Council, 2008)
- Independent inquiry into the Hawkesbury Nepean River system: final report (Healthy Rivers Commission of NSW, 1998)
- NSW Water Quality and River Flow Objectives (https://www.environment.nsw.gov.au/ieo/)
- Regulating nutrients from sewage treatment plants in the Lower Hawkesbury Nepean River catchment (Environment Protection Authority, 2019) (Hawkesbury Nepean Nutrient Framework)
- Risk-based Framework for Considering Waterway Health Outcomes in Strategic Land-use Planning Decisions (Office of Environment and Heritage, 2017).

7.1.18 Cumulative impacts

Table 7-18 Scale and nature of likely cumulative impacts and proposed assessment approach

Scale and nature of likely impacts	Summary of proposed assessment approach
The project could contribute to cumulative impacts during construction and operation associated with the Western Sydney Airport, transport corridors and other areas as land is rezoned and released for development. **Construction**: Temporary: likely traffic and access, noise, vibration and visual impacts. Potential economic impacts. Reduced access to some parkland/reserves. Permanent: potential biodiversity impacts. Likely impacts on Aboriginal and non-Aboriginal heritage. **Operation:** Permanent: potential amenity impacts associated with air quality, visual (built environment) and noise. Potential impacts on waterways, risk of flooding. Potential economic opportunities.	Specialist studies will consider the potential for cumulative impacts, as identified in the scoping worksheet. The outputs will inform a consolidated cumulative impact assessment. Sydney Water will continue to engage with relevant major projects via established government frameworks to ensure effective engagement and cumulative impact mitigation.

7.2 Concept proposal

The key considerations for the concept proposal are demonstrating acceptability of the operational impacts of the ultimate project. Many of the impacts will be assessed in detail for Stage 1. The additional impacts for the ultimate concept relate to expanding the Water Recycling Centre to treat 100ML/day, and transporting and releasing the resulting treated water through the pipelines.

Table 7-19 considers the key potential operational impacts and how we propose to address them in this EIS. Acceptability of construction impacts will be assessed in the EISs for future stages.

Table 7-19 Operational impact assessment for concept proposal

Environmental aspect	Summary of proposed assessment approach
Air quality	Use the odour model developed for Stage 1 assessment to identify potential odour contours for the ultimate Water Recycling Centre. Provide brief assessment of acceptability of potential impact based on assumptions about future surrounding land use and sensitive receivers. This will provide an indicative assessment, given future technologies and receivers are unknown. Not relevant for pipelines given they will be built to ultimate capacity in Stage 1.
Biodiversity and heritage	No additional impacts expected. Stage 1 assessment will seek approval for all impacts on the Water Recycling Centre site, treated water pipelines and brine pipeline.
Flooding, surface hydrology and groundwater	The Stage 1 assessment will consider indicative layout, excavations and foundations for the ultimate Water Recycling Centre to ensure retention and detention designs are achievable on site when the Water Recycling Centre is expanded. Not relevant for pipelines given they will be built to ultimate capacity in Stage 1.
Health and safety	Identify the indicative chemicals and volumes required for the ultimate Water Recycling Centre. Provide a qualitative view on the potential impacts and risks. Not relevant for pipelines given they will be built to ultimate capacity in Stage 1.
Noise and vibration	Use the noise model developed for Stage 1 assessment to identify potential noise impacts for the ultimate Water Recycling Centre. Provide brief assessment of acceptability of potential impact based on assumptions about future surrounding land use and sensitive receivers. This will provide an indicative assessment, given future technologies and receivers are unknown. Not relevant for pipelines given they will be built to ultimate capacity in Stage 1.
Soils and contamination	Stage 1 assessment will collect information on contamination across the Water Recycling Centre site. Provide brief qualitative consideration of contamination risks in the areas likely to be used for expansion of the Water Recycling Centre.
Sustainability and climate change	Identify how design will ensure optimal sustainable outcomes in future stages are not precluded. Consider key elements of climate change risk for the ultimate Water Recycling Centre (for example flood risk).
Traffic and access	Estimate likely additional operational traffic movements for the expanded Water Recycling Centre and include brief qualitative impact assessment.

Environmental aspect	Summary of proposed assessment approach
	Not relevant for pipelines given they will be built to ultimate capacity in Stage 1.
Urban design and visual amenity	The landscape strategy, conceptual architectural components and photomontages developed for Stage 1 will also include the ultimate Water Recycling Centre. Not relevant for pipelines given they will be built to ultimate capacity in Stage 1.
Waterway impacts from releases (water quality, aquatic ecology, hydrology, geomorphology)	These impacts relate to the release of very high-quality treated water, high-quality treated water and wet weather flows to waterways. Sydney Water does not propose to consider this in detail in the EIS. It is unlikely when the Water Recycling Centre is expanded that all flows will be released to waterways. Given the Parkland City vision and Sydney Water's Western Sydney Regional Master Plan intentions for re-use, there is potential that water would be re-used, or partially reused, reducing the discharges to the river. However, given the uncertainties around development, recycled water demand and changing social and political environments, we need to be adaptable to a range of futures. On that basis, we propose that for any water produced by the Water Recycling Centre beyond Stage 1 volumes, its destination and associated impacts are addressed in the EISs for future stages.
Waste	Estimate likely additional operational waste volumes from the expanded Water Recycling Centre and include brief qualitative impact assessment.

No additional assessment is proposed for:

- protected and sensitive lands – no additional areas to be impacted by ultimate Water Recycling Centre
- socio-economic and land use impacts – no additional impacts beyond Stage 1.

7.3 Future stages

Although current planning indicates Sydney Water will need to ultimately expand the Water Recycling Centre to treat an average dry weather flow of up to 100ML/day, decisions as to the staging will be made in the future depending on macro and micro drivers including population growth rate and the most efficient way for Sydney Water to optimise its wastewater systems.

Potential impacts from future stages will require further assessment and approval in accordance with concept proposal and the requirements of any staged approval. We consider it likely that this further assessment would include:

- community and stakeholder consultation
- a review of the strategic and regulatory context at that time

- impact mitigation through smart design
- impact assessment, considering changing technologies, performance expectations and the surrounding environment and land use. The key impacts to be considered will likely be:
    - construction impacts – traffic; noise and vibration; waste; flooding, surface water and groundwater; soils and contamination
    - operational impacts – odour; noise and vibration; management of treated water; sustainability and climate change; waste; health and safety; flooding, surface water and groundwater; urban design and visual amenity.

8 Proposed engagement

Several community engagement activities and programs are planned, so that stakeholders and the community can input into the reference design and EIS technical studies. The high-level program is outlined in Table 8-1 below and will align with the broader project phases (see Table 3-4). The proposed Community and Stakeholder Engagement Plan is in Appendix A.

Due to the COVID-19 social distancing restrictions, Sydney Water will substitute virtual engagement activities for the in-person engagement originally planned. Examples include replacing face-to-face meetings with videoconferencing; replacing pop-up information sessions with videos or webinars; replacing physical display boards with images embedded in website or social media.

Table 8-1 Proposed high-level engagement program

Stage	Activities	Collateral
Reference design	• Stakeholder briefings and meetings. • Community group briefings and meetings. • Project information line and emails.	• Sydney Water website. • Community newsletter. • Calling cards. • Presentations including maps. • Sydney Water Talk updates. • Frequently asked questions.
EIS Preparation	• Pop up information sessions (online or in-person). • Stakeholder briefings and meetings. • Community group briefings and meetings. • Project information line and emails. • Conducting in-house market research on Western Sydney.	• Sydney Water website. • Community newsletter. • Sydney Water Talk content updates. • Presentations including maps. • Displays at key public centres.
EIS Exhibition	• Pop up information sessions for EIS exhibition. • EIS displays. • Stakeholder briefings and meetings. • Community group briefings and meetings. • Newspaper advertisements. • Project information line and emails.	• Sydney Water website. • Community newsletter. • Sydney Water Talk updates. • EIS display boards. • EIS exhibition postcard. • Digital copies of the EIS available on DPIE major projects portal.
Post-EIS	• Submissions analysis and scorecard report. • Stakeholder briefings and meetings. • Project information line and emails.	• Scorecard report. • Community newsletter. • Sydney Water Talk updates. • Digital copies of the submissions report and preferred infrastructure report on DPIE major projects portal.

9 References

Commonwealth of Australia, Department of Infrastructure, Regional Development and Cities, and NSW Department of Premier & Cabinet (2018) *Western Sydney City Deal*

Department of Agriculture, Water and the Environment (2020) Strategic assessment of the Western Sydney growth centres webpage https://www.environment.gov.au/protection/assessments/strategic/western-sydney-growth-centres

Environment Energy and Science (2020) Register of biodiversity certification orders webpage https://www.environment.nsw.gov.au/topics/animals-and-plants/biodiversity/biodiversity-certification/register-of-biodiversity-certification-orders

Environment Protection Authority (2019) *Regulating nutrients from sewage treatment plants in the Lower Hawkesbury Nepean River catchment*

Greater Sydney Commission (2018a) *Western City District Plan – connecting communities*

Greater Sydney Commission (2018b) *Greater Sydney Region Plan – A metropolis of three cities – connecting communities*

Infrastructure NSW (2018) *Building Momentum State Infrastructure Strategy 2018-2038*

Metropolitan Water (2017) *Metropolitan Water Plan*

NSW Department of Planning, Industry and Environment (2020) Cumberland Plain Conservation Plan webpage https://www.planning.nsw.gov.au/Policy-and-Legislation/Biodiversity/Cumberland-Plain-Conservation-Plan

NSW Office of Environment and Heritage (2020) State Heritage inventory listing https://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?id=2260832

NSW Office of Water (2011) *Water Sharing Plan Greater Metropolitan Region Unregulated River Water Sources - Background document*

Sydney Water (2020a) Sydney Water's wastewater network webpage http://www.sydneywater.com.au/SW/water-the-environment/how-we-manage-sydney-s-water/wastewater-network/index.htm

Sydney Water (2020b) *Western Sydney Regional Master Plan – Re-imagining water in Western Sydney*

Western Sydney Planning Partnership (2019) *Western Sydney Aerotropolis Plan – draft for public comment*

10 Glossary and abbreviations

Term / acronym	Description
DPIE	Department of Planning, Industry and Environment
EIA	Environmental Impact Assessment
EIS	Environmental Impact Statement
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999*
EP&A Act	*Environmental Planning and Assessment Act 1979*
EPA	Environment Protection Authority
GSC	Greater Sydney Commission
ha	Hectare (10,000 square metres)
m	Metre
ML/day	Megalitre (a million litres) each day
NSW	New South Wales
SEARs	Secretary's Environmental Assessment Requirements
SEPP	State Environmental Planning Policy
SWGA	South West Growth Area
WSAGA	Western Sydney Aerotropolis Growth Area

11 Appendices

Appendix A – Community and Stakeholder Engagement Plan

Community and Stakeholder Engagement Plan

Upper South Creek Advanced Water Recycling Centre project

Sydney WATER

Table of contents

1 Background

Sydney Water's vision is to create a better life for Sydney with world class water services.

By 2056, the Western Parkland City will be home to 1.5 million people. With soaring temperatures in Western Sydney, increasingly hot and dry conditions are expected in the coming decades. Increasingly water scarcity is a concern for this community. This means we need to think more carefully about planning our services for the future.

To support the Government's vision of a cool and green Parkland City, we have developed a regional masterplan – *Re-imagining water in Western Sydney*.

Re-imagining water in Western Sydney aligns with the vision articulated through the *Western Sydney Aerotropolis Plan (WSAP).* The WSAP sets out the strategic planning requirements across government, business and community for a greener and more liveable Western Parkland City and Western Sydney Airport. The Upper South Creek Advanced Water Recycling Centre will provide a sophisticated wastewater treatment plant and associated infrastructure, instrumental in assuring Western Sydney's future.

The centre supports the vision to create a water sensitive city. Designed to service Western Sydney Airport and South West Sydney, it's a wastewater treatment plant that produces renewable energy, bio-resources, and recycled water. It can produce highly treated water suitable for agriculture, a range of industrial uses, or for homes.

Sydney Water will bring together key state government agencies and developers with five Councils on this project. There are many other stakeholders to consider, including landowners and general community. This community and stakeholder engagement strategy guides us through the following stages:

- site investigation
- reference design
- EIS preparation
- EIS on exhibition
- response to EIS submissions.

This strategy provides careful recommendations about stakeholders and community.

2 Our community engagement values

2.1 Our approach

Our approach is in line with Sydney Water's 'Policy and Guidelines for Community and Stakeholder Engagement' and is also guided by the core values and codes of ethics of the International Association of Public Participation (IAP2). Our approach to community engagement will help in:

- identifying the value of Sydney Water's work with stakeholders and the community
- communicating the benefits of what we are doing in a way that demonstrates the 'value for the community'
- identifying issues likely to be of high community and stakeholder concern and determine the level of risk and appropriate mitigation
- ensuring positive relationships with stakeholders to help future phases of this project and other Sydney Water work.

To do this, our community engagement approach will:

- ensure community and stakeholder engagement happens early and continues throughout the project
- be sensitive to the needs of the community and ensure community and stakeholder feedback is documented and is considered
- communicate the preferred option to impacted stakeholders to help facilitate positive relationships in delivery
- make every effort to minimise the impact of our work
- ensure community and stakeholders have easy access to information tailored to their understanding
- respond to all community and stakeholder contact in a timely manner.

2.2 Our key messages

To provide engagement opportunities for stakeholders and community about the centre, our proposed key messages are aligned to the project objectives of responding to growth, providing cost effective services, minimising disruption, and delivering an adaptable, sustainable solution.

We're helping Western Sydney grow

- We know the Western Parkland City will be home to more than 1.5 million people by 2056 – the project will ensure services are in place in time to support this growing community.
- In the first stage of this project – to be completed by mid-2025 – we'll provide wastewater services for around 300,000 people in South Western and Western Sydney.

Providing cost effective services

- We'll work closely with our partners in government and private industry to get the best outcomes for all our 5 million customers.
- While we're staging this work, we'll design and build things to their ultimate size where it's cost effective, avoiding costly rework in the future and reducing community impact.

Delivering a sustainable solution

- With hotter, drier conditions expected in coming decades, we're planning a resilient system to build a liveable, green parkland city, creating a better life for our Western Sydney community.
- The Advanced Water Recycling Centre will produce high quality treated water suitable for a range of uses, including recycling and environmental flows. It will also produce renewable energy and biosolids, which are used by farmers to return valuable nutrients to the soil.
- We've heard from you that water shortages are real and concerning. We want to protect our customers and provide a resilient, adaptive service.
- Looking after the environment and water quality is important to us – that's why we're asking for your views and taking an open approach to developing our Environmental Impact Statement.

Delivering an adaptable solution

- We're taking an adaptive, staged approach to providing services for this growing community – in the first stage of this work, we'll deliver pipelines and an advanced water recycling centre, providing services for up to 300,000 people.
- We're designing this project to provide flexibility – so that we can adopt different, new technologies in the future as Western Sydney continues to grow.

Minimising disruption

- We'll design and build this project to minimise any impacts to the community, and we'll ask for feedback as we go along.
- This is a huge investment in Western Sydney – and there will be community impacts. We commit to working closely with our community to minimise this wherever we can.

2.3 Our evaluation

Measuring our success will be developed, tracked and adjusted throughout the project by using the following:

- We will monitor qualitative feedback from customers throughout the investigations and design process and monitor residential sentiment across the communities most affected.
- Conducting research with a sample of customers before, during and after the project.
- We will be working closely with our government agency partners to be across their overall data, trends and objectives.
- Regularly host and review progress meetings with construction work, Councils and other partner organisations to understand what's occurring and when.
- Host a 'lessons learned' discussion or documentation at the conclusion of each major stage to ensure project data and feedback is incorporated at each stage.

3 Stakeholder and community analysis

3.1 Stakeholder areas of interest

This is based on what we've heard from stakeholders on this project so far and other related projects in the lead up to EIS. We'll monitor, update and evolve these as the project progresses to future phases.

Stakeholder	Areas of interest	How these issues will be addressed
Infrastructure – Transport for NSW (includes RMS and Sydney Trains), Infrastructure NSW, Water NSW.	• Coordination of construction interface, for example, not digging up the same roads multiple times. • Alignment in Transport for NSW's existing and proposed infrastructure (M12, railways) needs to be considered. • Want the project to be value for money. • Collaborative approach to management of services that are shared.	• Making sure alignment of utilities within corridors is efficient. • Collaboration to site major infrastructure with minimal impact to proposed infrastructure layouts. • Minimal interruption to ongoing maintenance and management.
Utilities – Endeavour Energy, Jemena, National nBn Co, Telstra, TransGrid	• Planned designs, EIS and works impact on assets, if applicable. • Co-location of utility corridors	• Address accelerated timeframes through escalation to leaders and upper management to aid collaboration.
Local Governments – Liverpool City, Penrith City, Canterbury-Bankstown City, Wollondilly Shire, and Fairfield City Councils.	• Clear view of works planned, minimise impacts to future road projects and community assets. • Strong interest in timings and proposed mitigations by Sydney Water. • Interest in sub regional planning from Sydney Water.	• Alignments where possible to avoid known road upgrades and disruption to community facilities. • Design to minimise impact to assets under roads.
Developers and Landowners – Altis / Frasers, BHL, Celestino, ESR, Mirvac, Clifton Holdings, Coprad Pty Ltd (Now Stocklands), Lendlease, Luddenham	• Alignment for specific areas of the precinct. • Require wastewater services for release areas. • Interest in highly treated recycled water. • Servicing timing and interim solutions. • Potential acquisition of land.	• Collaboration to site major infrastructure with least impact to development layouts. • Partnering to develop mutually beneficial solutions and outcomes. • Provision of servicing timing and interim solutions.

Stakeholder	Areas of interest	How these issues will be addressed
Landowners Consortium, Suez, Sydney University.	• Timing of investigations and works.	
Minister's Office – Minister for Water, Property & Housing The Hon. Melinda Pavey MP.	• Interest in overall delivery of wastewater proposals. • Interest in resilience. • Encouraging more recycled water projects.	• Collaboration and alignment with overall project objectives.
Minister's Office – Minister for Western Sydney The Hon. Stuart Ayres MP.	• As portfolio is across Western Sydney, will have strong interest in this project.	• Needs to be kept updated on planning, EIS and delivery • Provision of services to meet growth projections.
Minister's Office – Minister for Planning The Hon Robert Stokes MP.	• Ultimate responsibility for approval of the EIS.	• Needs to be kept updated on planning, EIS and delivery as portfolio is across Planning.
Minister's Office – Minister for Finance and Small Business The Hon Damien Tudehope MP.	• Focused on shareholder return. • Financial viability of the project. • Deliver on-time and within budget.	• Demonstrate value for money, shareholder return and timely delivery within budget.
Local Members of Parliament – Member for Liverpool Paul Lynch, Member for Camden Peter Sidgreaves, Member for Mulgoa Tanya Davies, and Member for Cabramatta Nick Lalich.	• Strong interest impacts to electorate and constituents.	• Demonstrate customers are at the heart of what we do. • Provide evidence of informing constituents and mitigation of impacts.
Federal Government Agencies – Airservices Australia, Australian Civil Aviation Safety Authority, Department of Agriculture, Water and Environment, Department of	• Potential impacts on Commonwealth land or matters of national environmental significance. • General interest in infrastructure, flight path, safety for aircraft operations, planning and EIS. • Policy and procedures for bird strikes.	• Collaboration to site major infrastructure with least impact to proposed development.

Stakeholder	Areas of interest	How these issues will be addressed
Infrastructure, Transport, Regional Development and Communications.	• Visual impact from the air.	
NSW Government Agencies – including Department of Planning, Industry and Environment (DPIE), DPIE Heritage Branch DPIE Primary Industries branch, Environmental Protection Authority (EPA), Greater Sydney Commission (GSC), and NSW Health, Western Sydney Planning Partnership.	• Interested in a place-based and landscape-lead approach. • Release areas must be promptly serviced to meet NSW Government growth goals. • Obtaining appropriate environmental approvals e.g. Environmental Impact Assessment, Aboriginal Heritage Impact assessment. • Fulfilling plans for the Western Parkland City – ensuring we bring cooling and blue green grid to life, provide low carbon solutions and good quality waterways.	• Provision of wastewater services to meet DPIE growth projections for Western Sydney. • Early ecology and heritage studies commenced during planning to inform alignment and design. • Appropriate environmental approvals are being sought.
Existing and future customers – Western Sydney Parklands Trust, Sydney International Shooting Centre, Western Sydney Aerotropolis Growth Area (WSAGA), Western City & Aerotropolis Authority (WCAA), Western Sydney Airport	• Alignment of pipeline and cumulative impacts. • Transparency and ongoing collaboration • Value for money and interest in the Centre servicing the area • Policy and procedures around bird strikes. • See the project as an enabler for growth.	• Asset alignment to minimise proposed roads and existing infrastructure • Opportunity to co-locate pipeline next to existing pipelines. • Ensuring compatible delivery for airport operations. • Evidence of program of works in keeping with their plans.
Peak bodies, authorities and organisations – Aboriginal Land Councils, Western Sydney Region Organisation of Councils (WSROC).	• Confidence Sydney Water has addressed Aboriginal Heritage assessment in design and EIS and can proceed to delivery. • Interest in major projects occurring in Western Sydney. • Interest from a City Deal collaboration, strategic coordination perspective.	• Provide ongoing reassurances through design development and pipeline alignment. • Appropriate ongoing investigations early in the project.

3.2 Community areas of interest

This is based on what we've heard from the community about this project so far and other related projects. We'll monitor, update and evolve these as the project progresses to future phases.

Community	Areas of interest	How these issues will be addressed
Directly impacted private properties and residents	• Owners of land affected by noise, dust, access and inconveniences as a result of investigations or the work and cumulative impacts. • Owners of land affected by acquisition, investigations or work. • Timing of acquisition or easement processes. • What Sydney Water is doing to minimise impacts on neighbours.	• Demonstrate customers are at the heart of what we do • Design and plan project to minimise impacts. • Work with landowners to site infrastructure in locations that are unlikely to be developable in future • Provision of wastewater services to meet DPIE growth projections. • Minimise impacts and communicate transparently, early and often about these.
Community organisations and groups – chambers of commerce, progress associations, action groups, local interest groups.	• Updates on the planned work and overall benefits to the Western Sydney business community. • Strong interest in the future of the area as a good place to live and demonstrating good planning. • Concerns regarding traffic flow and diversions, noise, and air pollution, heritage, flooding, health and biodiversity impacts. • Concerns about the fast changes to their communities over a short period of time. • Concerned about environmental preservation in the area, quality and volume of environmental flows to creeks and rivers.	• Providing frequent updates and information to ensure updates are available at all stages of the project. • Provide early opportunities for feedback at design stages. • Communicate the provision of infrastructure to meet growth projections.

4 Communication and engagement tools

4.1 Tools

The table below lists the communications activities and tools that will be used throughout this project.

Type (what)	Purpose (why)	Timing (when)
Advertising	Informs about planning progress, community impact, and public meetings or displays.	Will be required for this project. Part of legislated process for Environmental Impact Statements or Aboriginal Heritage Assessments.
Calling cards / postcards	Informs the community of activities in the immediate area.	48 hours minimum. 7 days maximum.
Communications Pack- for key stakeholders	Communications pack customised for each stakeholder (styled as a fact sheet) around what the project is and what each job is, how it fits into the overall project. This can be carried by all staff and contractors when working in public.	For the life of the project. Updated as required.
Community information hotline	Free and accessible point of contact for enquiries and complaints.	For the life of the project.
Community audits	Make sure key procedures and policies have been complied with by contractors and staff.	Monthly and at the end of the planning phase of the proposal
Contractor identification	ID tags and uniforms used to identify staff and contractors when working in public.	Ongoing and mandatory. Ensure this is included in all communications.
Consultation Manager	Stakeholder management database that records all contact, enquiries and complaints concerning the proposal.	No later than 48 hours after contact.
Consultation Outcomes Report	Records the community and stakeholder views gained from public consultation.	14 days after the completion of work on planning.
Door knocks	Provides advice and information direct to stakeholders that will likely be impacted by work.	As needed.

Type (what)	Purpose (why)	Timing (when)
Fact Sheets	An external tool that can be used for door knocks or placed within communications pack for key stakeholders.	For the life of the project.
Focus Groups	If deeper customer insights are required on this project for customer preferences for example attitudes to recycled water, we recommend running focus groups to obtain qualitative feedback. These sessions will be managed online because of social distancing restrictions.	As needed.
Frequently asked questions (FAQs) / Key messages	Usually an internal tool that assists the proposal team and Sydney Water in responding to risks and issues that may have a reputational impact on the project.	Ongoing throughout planning and design.
Maps / diagrams	Visual explanation of the work and impacts.	As needed.
Meetings and minutes	Formal records of stakeholder and property owner discussions, to be shared by Sydney Water once approved. These sessions will be conducted online in line with social distancing.	No later than 10 business days after the meeting.
Notification pack	General pack for site inductions and contractors, based on FAQ, updated at each stage	Provided and updated at each stage.
Negotiation and engagement of property owners (if required)	To enter properties, especially private properties, negotiation of entry is required.	If property access is required.
Register of agreement with property owners (if required)	Records the agreement reached with property owners.	Once properties are identified. Recorded in Consultation Manager.
Notice of entry (if required)	This is the formal mechanism to obtain access to private property. Community Relations Team will phone or send letter in first instance requesting access before issuing a NOE.	48 hours, minimum. 7 days, maximum and ideal.
Ministerial requests	There have been several ministerial requests to date about this project. We will have good data processes and record keeping. We aim to keep our elected representatives up to date throughout this project.	Ongoing during planning, design and EIS stages.
MP and Council notification	Used to introduce the project during the planning phase and engage in information sharing to inform planning.	Ongoing during planning, design and EIS stages.

Type (what)	Purpose (why)	Timing (when)
7-day notification	Used for all site activities and include: • site inspections • why the investigations are being done, including benefits • where the investigations will occur • works hours and duration • impacts on the community • contact details.	7 days.
Phone calls	Used to make initial contact with property owners where possible. Issue of NOE is allowed once initial contact has been tried after multiple attempts	As required.
Pop Up Information Sessions	Used at key stages in the process for example exhibition of the EIS. Partner in with existing planned Sydney Water pop ups for example the Western Sydney Planning Partnership. These sessions will need to be done online in webinar format to comply with social distancing.	As needed.
Project update notification	Informs stakeholders of a change to the work's scope, hours or duration	48 hours minimum. 7 days if night work.
Pre construction customer agreement (PCCA)	Agreement between lessee and Sydney Water on the work being done on their property, including restoration. An abridged version of the PCCA (an investigation customer agreement) will be used if any geotechnical surveys are required on private property and only on identified sites.	2-3 weeks for stakeholder to review PCCA.
Presentation	Project presentation template used to present to key external stakeholders.	As needed.
Questions and Answers	Question and answer documents prepared for Pop Up information sessions.	At each stage.
Signage	Used to notify of works or traffic changes. Can be temporary (A-frames or variable message boards) or fixed (affixed to a pole or fence)	Likely not required for this stage of the proposal, but to be considered for later stages if there is significant disruption.
Site inductions	Project team and subcontractors are respectful towards the community and	As needed.

Type (what)	Purpose (why)	Timing (when)
	adhere to site standards and communication standards	
Site visits	On site meetings to inform and consult with government agencies, councils, special interest groups, and other stakeholders.	As needed.
Social media	Twitter, Facebook, LinkedIn, Instagram, Spotify.	May be used for this project, in conversation with the proposal manager.
Submissions	At the EIS exhibition stage, we may receive written posted or emailed submissions. We are prepared with a coding and categorising system for this.	EIS Exhibition Stage.
Thank you letters / close out letters	Expresses appreciation towards property owners for their cooperation and patience.	7 to 14 days after work is completed, once all investigations on impacted properties are completed.
WHIMS (What is happening in my suburb)	Sydney Water intranet tool to help direct customer enquiries to the right areas and respond to enquiries appropriately.	Enter high level information into WHIMS as part of SWGA.
Website updates	General text for the Sydney Water website. Potential to create a microsite specific to this project.	Once finer details are confirmed, recommend high level information only at this stage. Incorporate on new Western Sydney page. Create a new microsite or engagement site
Sydney Water Talk	Online engagement tool.	Will be used at the early, mid and late stages of this project to seek feedback from the community.

Appendix B – Scoping worksheet

This appendix includes a completed scoping worksheet using DPIE's template. We have completed the spreadsheet using the following approach:

- Most matters relevant to the project are covered by DPIE's standard matters. We added one matter - bird strike risk (airport flight path).
- The significance of impacts is noted as unknown for all matters. This is because details of project scope are still being refined and the results of further specialist work will inform this conclusion. Ultimately, some project impacts may be significant without mitigation and some may not be significant.
- For cumulative impacts, on some matters the EIS may include a brief consideration and for others, a more detailed assessment.
- Given community consultation on the project has not been widespread to date, we have taken a conservative approach and assumed community concern about all the impacts. Our consultation during EIS preparation will identify community concerns about project impacts and we will address any relevant concerns raised in the EIS.

Project : **Upper South Creek Advanced Water Recycling Centre**

MATTERS		IMPACTS		ASSESSMENT LEVEL	CUMULATIVE IMPACTS	COMMUNITY ISSUES	ASSESSMENT APPROACH	SCOPING REPORT
Potential matters that could be affected by the project		Is the project (without mitigation) likely to cause an impact?	Are the impacts (without mitigation) likely to be significant based on the magnitude of the impacts and/or sensitivity of receivers?	What level of assessment is required to assess impacts and determine mitigation measures?	Will cumulative assessment be required?	Did the community raise any concerns about the impacts?	Indicative approach to assessment in EIS	Where was this addressed in the Scoping Report?
Group	**Specific**	**Impact?**	**Significant Impact?**	**Assessment Level**	**Cumulative Impact?**	**Concerns?**	**Category**	**Section**
ACCESS	access to property	Yes	Unknown	Standard	No	Yes	Standard Assessment with focussed engagement	7.1.13
	parking	Yes	Unknown	Standard	No	Yes	Standard Assessment with focussed engagement	7.1.13, 7.1.14
	port / airport facilities	Yes	Unknown	Standard	No	Yes	Standard Assessment with focussed engagement	7.1.13
	road / rail network	Yes	Unknown	Detailed	Yes	Yes	Detailed Assessment and CIA with focussed engager	7.1.13
	other - please specify	N/A						
AIR	atmospheric emissions	Yes	Unknown	Detailed	Yes	Yes	Detailed Assessment and CIA with focussed engager	7.1.11
	gases	Yes	Unknown	Detailed	Yes	Yes	Standard Assessment with focussed engagement	7.1.2
	particulate matter	No				Yes		
	other - please specify							
AMENITY	noise	Yes	Unknown	Detailed	Yes	Yes	Detailed Assessment and CIA with focussed engager	7.1.7
	odour	Yes	Unknown	Detailed	Yes	Yes	Detailed Assessment and CIA with focussed engager	7.1.2
	vibration	Yes	Unknown	Detailed	Yes	Yes	Detailed Assessment and CIA with focussed engager	7.1.7
	visual	Yes	Unknown	Detailed	Yes	Yes	Detailed Assessment and CIA with focussed engager	7.1.14
	other - please specify							
BIODIVERSITY	conservation areas	Yes	Unknown	Standard	No	Yes	Standard Assessment with focussed engagement	7.1.8
	native vegetation	Yes	Unknown	Detailed	Yes	Yes	Detailed Assessment and CIA with focussed engager	7.1.12, 7.1.3
	native fauna	Yes	Unknown	Detailed	Yes	Yes	Detailed Assessment and CIA with focussed engager	7.1.12, 7.1.3
	other - please specify							
BUILT ENVIRONMENT	private property	Yes	Unknown	Standard	Yes	Yes	Standard Assessment and CIA with focussed engage	7.1.9, 7.1.14
	public domain	Yes	Unknown	Standard	Yes	Yes	Standard Assessment and CIA with focussed engage	7.1.9, 7.1.14
	public infrastructure	Yes	Unknown	Standard	No	Yes	Standard Assessment with focussed engagement	7.1.9
	other - please specify							
ECONOMIC	livelihood	Yes	Unknown	Detailed	Yes	Yes	Detailed Assessment and CIA with focussed engager	7.1.9
	natural resource use	No				Yes		
	opportunity cost	Yes	Unknown	Detailed	Yes	Yes	Detailed Assessment and CIA with focussed engager	7.1.9
	other - please specify							
HAZARDS & RISKS	biosecurity	Yes	Unknown	Standard	No	Yes	Standard Assessment with focussed engagement	7.1.12
	bush fire	Yes	Unknown	Detailed	No	Yes	Detailed Assessment with focussed engagement	7.1.12
	coastal hazards	No				Yes		
	dams	Yes	Unknown	Standard	No	Yes	Standard Assessment with focussed engagement	7.1.5
	dangerous goods	Yes	Unknown	Detailed	No	Yes	Detailed Assessment with focussed engagement	7.1.5
	environmental hazards	Yes	Unknown	Detailed	No	Yes	Detailed Assessment with focussed engagement	7.1.5
	floods	Yes	Unknown	Detailed	Yes	Yes	Detailed Assessment and CIA with focussed engager	7.1.6
	groundwater contamination	Yes	Unknown	Detailed	No	Yes	Detailed Assessment with focussed engagement	7.1.6
	hazardous / offensive development	Yes	Unknown	Detailed	No	Yes	Detailed Assessment with focussed engagement	7.1.5
	land contamination	Yes	Unknown	Detailed	No	Yes	Detailed Assessment with focussed engagement	7.1.10
	land movement	Yes	Unknown	Standard	No	Yes	Standard Assessment with focussed engagement	7.1.10
	waste	Yes	Unknown	Detailed	No	Yes	Detailed Assessment with focussed engagement	7.1.16
	bird strike risk (airport flight path)	Yes	Unknown	Detailed	No	Yes	Detailed Assessment and CIA with focussed engager	7.1.5
HERITAGE	Aboriginal cultural	Yes	Unknown	Detailed	Yes	Yes	Detailed Assessment and CIA with focussed engager	7.1.1
	historic	Yes	Unknown	Detailed	Yes	Yes	Detailed Assessment and CIA with focussed engager	7.1.4
	natural	Yes	Unknown	Detailed	Yes	Yes	Detailed Assessment and CIA with focussed engager	7.1.4
	other - please specify							
LAND	land capability	Yes	Unknown	Standard	No	Yes	Standard Assessment with focussed engagement	7.1.10
	soil chemistry	Yes	Unknown	Detailed	No	Yes	Detailed Assessment with focussed engagement	7.1.10
	stability / structure	Yes	Unknown	Detailed	No	Yes	Detailed Assessment with focussed engagement	7.1.10
	topography	Yes	Unknown	Standard	No	Yes	Standard Assessment with focussed engagement	7.1.10
	other - please specify							
SOCIAL	community services / facilities	Yes	Unknown	Detailed	No	Yes	Detailed Assessment with focussed engagement	7.1.9, 7.1.14
	health	Yes	Unknown	Detailed	No	Yes	Detailed Assessment with focussed engagement	7.1.5
	housing availability	No				Yes		
	safety	Yes	Unknown	Standard	No	Yes	Standard Assessment with focussed engagement	7.1.5
	social cohesion	No				Yes		
	other - please specify							
WATER	ground water quality	Yes	Unknown	Detailed	No	Yes	Detailed Assessment with focussed engagement	7.1.6
	hydrological flows (including flooding)	Yes	Unknown	Detailed	Yes	Yes	Detailed Assessment with focussed engagement	7.1.6
	surface water quality	Yes	Unknown	Detailed	Yes	Yes	Detailed Assessment with focussed engagement	7.1.6
	water availability	Yes	Unknown	Standard	Yes	Yes	Standard Assessment and CIA with focussed engage	7.1.6
	other - please specify							