



# Water Reuse Strategy

## Construction and Operations

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# Glossary/Abbreviations

Abbreviation	Definition
ANZECC	Australia and New Zealand Environment Conservation Council
CEMP	Construction Environmental Management Plan
CoA	Conditions of Approval
CSJ	CPB Samsung John Holland Joint Venture
CSWMP	Construction Soil and Water Management Plan
DPSP	Delivery Phase Sustainability Plan
EIS	Environmental Impact Statement
EPA	NSW Environment Protection Authority
EPL	Environment Protection Licence
ERSED	Erosion and Sediment
ESD	Ecologically Sustainable Development
MCC	Motorway Control Centre
POEO Act	Protection of the Environment Operations Act 1997
SMC	Sydney Motorway Corporation
SPIR	Submissions and Preferred Infrastructure Report
SSI	State Significant Infrastructure
SWTC	Scope of Works and Technical Criteria
WQMP	Water Quality Monitoring Program
WRS	Water Reuse Strategy
WTP	Water Treatment Plant

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# 1 Introduction

This Water Reuse Strategy (WRS, the Strategy) is required in accordance with Condition B21 of the Minister's Condition of Approval (CoA) for the WestConnex M4 East project (the project) which states:

*“The Proponent must prepare a Water Reuse Strategy which sets out feasible and reasonable options for the reuse of collected stormwater and groundwater during construction and operation of the SSI. The Water Reuse Strategy must include, but not be limited to:*

- (a) evaluation of all feasible and reasonable reuse options; and*
- (b) details on the preferred reuse option(s), including volumes of water to be reuse, proposed reuse locations and/or activities, proposed treatment (if required), and any additional licences or approvals that may be required; and*
- (c) a time frame for the implementation of the preferred reuse option(s).*

*Justification must be provided in the event that it is concluded that no feasible or reasonable reuse options prevail.*

*A copy of the Water Reuse Strategy must be submitted to the Secretary for approval prior to commencement of tunnelling works”.*

## 1.1 Purpose

The purpose of the Strategy is to:

- Detail the use of water on the project through both the construction and operational phases;
- Investigate and evaluate all feasible reuse options for stormwater and groundwater; and
- Address the requirements of the CoA.

## 1.2 Scope

This strategy addresses water use and reuse on the M4 East tunnel construction and operation. Water reuse is limited to groundwater and stormwater collected within the project boundaries and does not include the treatment and reuse of sewerage.

This Strategy addresses and details the following issues:

- Stormwater collection, management and discharge during surface works construction activities;
- Water use requirements for surface works;
- Groundwater management throughout the tunnelling works, including treatment, storage and discharge;
- Tunnelling works water requirements;
- Operational water.

## 1.3 Associated plans and reference documents

The Water Reuse Strategy is supported by the below-listed documents prepared as part of the planning, approvals and management processes of the project. This strategy will support these documents and in no way intends to replace or supersede existing documents. These documents include the following:

- M4 East Environmental Impact Statement;

- M4 East Construction Environmental Management Plan (M4E-ES-PLN-PWD-00233);
- Delivery Phase Sustainability Plan (M4E-PC-PLN-PWD-00225);
- Water Quality Monitoring Program (M4E-ES-PRG-PWD-00839);
- Environment Protection Licence 20734;
- Technical Report – Hydrogeological Model Report (M4E-PSM-TR-00-120-052007\_D\_00);
- Technical Report – Groundwater & Soil Salinity Report (M4E-PSM-TR-00-120-064001\_D\_00);
- T320 Tunnel Groundwater Control Systems (M4E-QA-SPC-PWD-00174-T-CS);
- M4 East Submissions Report.

## 2 Water Requirements

For the purpose of this strategy the water requirements have been separated between the construction and operational phases in line with the life-cycles phases of the asset. These phases have significantly different water requirements and access to water.

### 2.1 Construction water requirements

Large construction projects consume significant resources, in which water is no exception. The CPB, Samsung, John Holland Joint Venture (CSJ) recognises the importance of water to the environment and the wider community. It is an essential component to the project and required for a wide range of construction activities as well as to support the workforce. Water quality and availability is also one component of the construction works which presents both a risk and opportunity to the project works. Without sufficient volumes and quality of water the project would struggle to deliver its commitments. Similarly, too much water and poor water quality will also impact the delivery of the project.

Section 6.10.3 of the M4 East Environmental Impact Statement (EIS) identified a series of construction activities that would consume water and estimated the total quantity of potable and non-potable water used in the construction of the project at 1,300 megalitres. As the design has progressed and construction planning has advanced the water requirements for both surface and tunnelling works have become better defined. Through this definition CSJ have been able to assess the potential water saving activities and reuse options available throughout construction.

#### 2.1.1 Surface Works

CSJ has identified ten sites that are required to support construction of the project undertake construction of the tunnel. Table 1 outlines these sites and details the activities that will take place at each site during construction. Six of these sites will be compound sites, with site offices.

Table 1 Surface works sites and construction activities

Construction Site	Construction Activity
Homebush Bay Drive civil	Surface works support and spoil handling facility
Pomeroy Street civil	Dive structures and cut and cover sections and surface works support
Underwood Road tunnel and civil	Civil sites: declines, cut and cover and spoil management Tunnel site: shaft excavation and tunnel support site
Powells Creek civil	Surface works support
Concord Road civil and tunnel	Civil sites: Dive structures, cut and cover, surface works and spoil management

Construction Site	Construction Activity
	Tunnel site: construction access tunnels, spoil removal
Cintra Park tunnel	Construction access tunnel, tunnel support, spoil removal
Northcote Street tunnel	Construction access tunnel, tunnel support, spoil removal
Wattle Street and Walker Avenue civil	Ventilation shaft excavation, tunnel support, spoil management and ventilation facility building works Dive structures and cut and cover sections, spoil management and surface works support
Parramatta Road eastern civil site	Dive structures and cut and cover sections and surface works support

Additional to these compound sites, the project will also involve a series of surface works. Surface works will include activities such as widening and realignment of the existing M4 Motorway, construction of interchanges, surface road improvements, pedestrian and cycling facilities and installation of noise walls.

Surface works will use both potable and non-potable water for the following purposes:

- Dust suppression on bare surfaces and roads;
- General wash down and wheel wash (where present);
- Compaction;
- Concreting;
- General earthworks;
- Interchange works;
- Conditioning of fill material;
- Site amenities including toilets, showers, cleaning and drinking; and
- Establishment of landscaping.

The sites which have the highest demand for water on the surface will be the civil sites. This is a result of the increased amount of bare ground, plant movements and the use of water for compaction purposes. On these sites the water will be distributed in water carts to allow access to all areas of the site, as well as hoses at specific locations (i.e. wheel washes, concrete wash out, etc.).

Surface water consumption can vary significantly depending on the interaction between the weather, site materials and site activities. Water for office and amenities will be constant depending on the number of people on a particular site and the hours of operation. The amenities at the surface of the tunnelling sites will be operational 24hrs a day, 7 days a week for the duration of the project construction and the civil sites are only operational week days between 7am and 6pm, and Saturdays between 8am and 1pm.

## 2.1.2 Tunnelling Works

Tunnelling works will operate out of four compound sites along the route of the tunnel, utilising both potable and non-potable water from the above ground sites for use within the tunnels. There is significant demand for water within the tunnel operations due to its use in the road headers and drilling machinery. Water for the tunnel works will be sourced from suitable sized water mains on the surface at the four tunnelling compounds and piped continually into the tunnel to deliver water to the tunnelling equipment.

Even though the underground work is anticipated to be damp, water will also be used for dust suppression. The specific activities within the tunnel construction that consume water will be:

- Operation of road header machines;

- Operation of bolter machines;
- Surface preparation prior to shotcrete;
- Operation of the shotcrete rig;
- Dust suppression during tunnelling and fit out;
- Rock and concrete cutting during fit out; and
- Drinking water, wash and safety facilities.

Where water is used directly for the operation of machinery it will need to meet the water quality parameters and pressure specified set by the manufacture. Any deviation from these specifications can result in reduced operating performance and delays to the tunnel program.

The volume of water needed at each site will vary depending on the number of operating machinery and tunnelling conditions. Temporary water supply for tunnelling has been modelled on the maximum anticipated flow rates to ensure the water supply will be sufficient, but construction practices will be implemented to minimise water consumption and wastage.

## 2.2 Operational water requirements

Operational water requirements will not be as significant as the water required for construction. Water will be required for regular activities both within the tunnel and on the surface at the control centre. Section 5.8.3 of the EIS identifies operational activities that would consume water.

### 2.2.1 Control centre

The control centre will be the day to day location for staff who work on the M4 East operations contract. The centre will host the operations centre, maintenance workshop and general offices. Water within the control centre will be used for the following purposes:

- Site amenities including toilets, showers, cleaning and kitchen;
- Workshop water for maintenance and cleaning; and
- Garden and landscape maintenance.

Once established, the control centre is anticipated to consume a low volume of water dependant on the number of people at the site. Standard connections will be provided as part of the construction and water tanks are also proposed to reduce the demand on potable water.

### 2.2.2 Ventilation and surface facilities

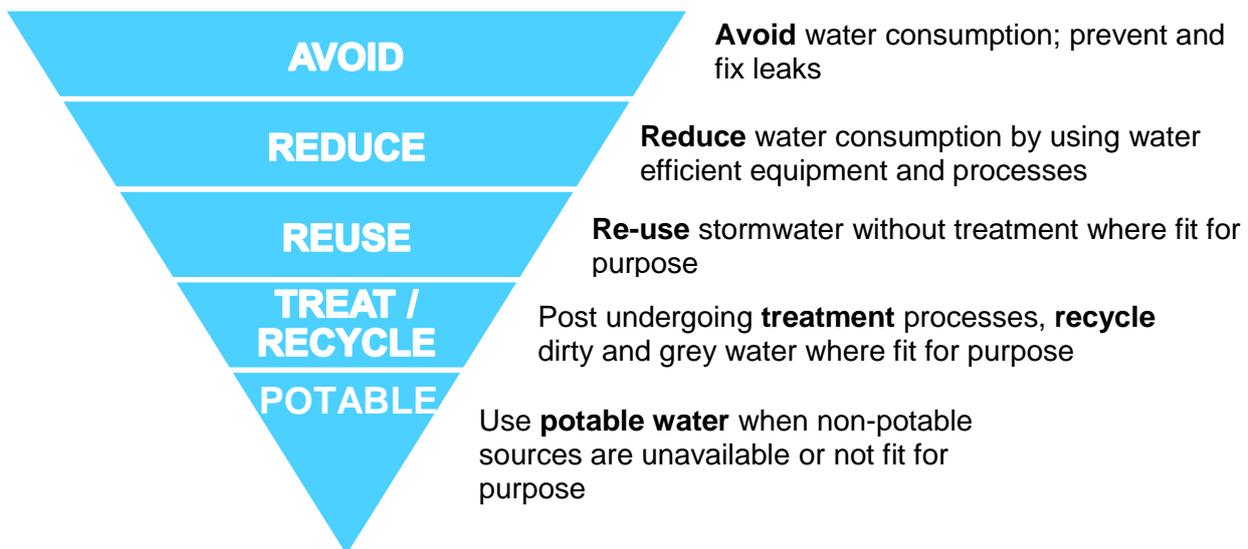
The tunnel is supported with a variety of surface structures including a water treatment plant, substations and vent facilities. Water will be required at these sites for maintenance activities and minor processes. Where water is necessary, standard connection to Sydney Water's network will be provided.

### 2.2.3 Tunnel operations

Water will be provided into the tunnel to service the fire systems. The fire system is designed to use a significant amount of water in a short amount of time, and this will only occur regularly in line with the testing requirements or in the case of an emergency. The fire system will be supplied through tanks on the surface and the only other water used within the tunnel for maintenance will be supplied through vehicle mounted tanks.

### 3 Water Sources

Throughout both the construction and operational phases of the project multiple water sources will be utilised for the purposes described in section 2. The Delivery Phase Sustainability Plan (DPSP) described the following strategy which CSJ will utilise throughout construction and the potential water reuse options available to the operators during the operation of the asset.



**Figure 1 Water Use and Sourcing Hierarchy**

Water will be sourced from the mains supply and a range of non-potable sources including:

- Stormwater harvesting;
- Onsite construction water treatment and reuse;
- Alternative sources of reclaimed water from the area, such as from Sydney Water;
- Groundwater.

Preference will be made for the use of non-potable water over potable water. The extent to which non-potable water sources can be used will be governed by workplace health and safety considerations, economic feasibility and the functional specifications of the design. The use of non-potable water is more likely to be feasible for temporary works, such as dust suppression, rather than permanent works. Reclaimed stormwater, recycled water and groundwater inflows will need to meet the guidelines set out in the tip sheet *Use of Reclaimed Water (RTA, 2006)*.

All concrete will arrive on site pre-mixed and the use of non-potable water for batching plant production will be encouraged where technically and economically feasible.

Treatment and re-use of non-potable water falls into two main categories:

- **Surface water re-use** – after primary treatment (settlement) stormwater can be stored on site and used for dust suppression and earthworks.
- **Groundwater water re-use** – groundwater collected within the tunnel during construction and operation will be pumped to the surface and treated to meet the discharge specifications of the applicable environment protection licence (EPL). Treated water will then be used for non-potable uses such as wash down, dust suppression and provided back into the tunnel for reuse.

There is a high priority during construction on reducing land take and the impact on properties. This in turn will minimise site capacity for containment and treatment, which may limit the above opportunities. Further feasibility will be conducted throughout detailed design and balanced against environmental, social and economic factors.

Other water efficiency initiatives applicable to both construction and operation phases will be assessed throughout the design.

### 3.1 Water sources for construction

Construction activities for both the surface works and tunnelling will make use of all available water sources in line with the necessary specifications.

#### 3.1.1 Surface water

The availability of surface water at all of the civil and surface works sites is highly uncertain and solely dependent on weather conditions. Due to space constraints on the compound sites, the ability to store surface water will be minimal and the sediment basins will only be able to be sized to meet the design criteria required in the EPL and Construction Soil and Water Management Plan (CSWMP) (ie 85<sup>th</sup> percentile 5 day rainfall event). All surface works sites have been assessed for the suitability of a sediment basin as part of the CEMP and CSWMP. Seven of the ten sites have been deemed suitable for stormwater harvesting through the installation of at least one sediment basin. The exact location, size and management of each sediment basin will be in accordance with the CSWMP and applicable erosion and sediment (ERSED) control plans.

All sediment basins on the M4 East sites will have the capability to reuse available water for non-potable purposes such as dust suppression and wash-down. Available water will be determined on a site by site basis. Water contaminated with signs of contaminants, such as oil and grease, will be determined unsuitable for construction reuse. Stormwater harvesting through the sediment basins will be the preferred water source for non-potable purposes, but is entirely dependent on the availability of surface water on the site and environmental conditions (i.e. storage capacity needed to forecast rain).

#### 3.1.2 Groundwater

Groundwater is water found below the subsurface which will enter the tunnel from the water table. Once tunnelling commences the groundwater and operational water will be combined together in the tunnel and pumped to the surface as one. This plan will refer to the combined water as “groundwater” and it will be treated at the surface with water treatment plants. There will be a total of four water treatment plants established to treat the groundwater in line with the EPL. It is anticipated that the treatment plants will be treating water at between 5 and 20L/s depending on location and the activities being undertaken in the tunnel. The amount of tunnel activity and the volume of natural groundwater infiltration into the tunnel will also determine the quality of water entering the tunnel sumps and being treated by the treatment plants. The treated water will meet the discharge limits set by the EPL, but will not meet the strict water quality parameters required for reuse within the tunnelling machinery.

The treated groundwater will be reused as detailed in section 4.

#### 3.1.3 Potable water

All of the M4 East construction sites will have access to potable water through either metered connections to the Sydney Water network or via water truck filled through metered standpipes. During construction, potable water will be the sole water source for the site accommodation (offices and amenities) and as feedwater to the tunnelling machinery.

Where it is not practicable to use treated groundwater or surface water, for uses such as wash down and dust suppression, potable water will be used. Such examples are varied and could be that potable is the only water available or the most reliable source for a given exercise.

## 3.2 Operational water sources

The demand for water during the operational phase of the project will be significantly lower than the construction phase. Although the water demand during operation will be lower, CSJ has committed in the Scope of Works and Technical Criteria (SWTC) to incorporate water efficiency within the design and investigating water reuse options to be utilised throughout the operational phase of the project. These opportunities are aimed at reducing the demand on potable water and the utilisation of water within the project.

The DPSP provided an indicative list of water reuse opportunities that will be investigated during the design process. These include:

- Harvesting and re-use of roof rainwater at Motorway Control Centre (MCC), ventilation stations
- Tunnel water re-use for tunnel wall wash down
- Supply non-potable water to Council for use at hockey fields and other parks nearby to WTP
- Filling point for Council/water carts/street cleaning operations
- Water efficient fixtures in MCC and Maintenance Facility

The EIS and Submissions Report also identified the need to consider the reuse of water within the project or local area in preference to the discharge to stormwater (OpRW2) and to investigate the use of reused water in the tunnel deluge system (OpRW3). These investigations will be detailed in section 4 of this Strategy.

### 3.2.1 Surface water

The final design includes several operational water basins for the purpose of managing stormwater run-off from the roads and landscapes. The water entering these basins will be coming off the road surface and therefore has a higher risk of being contaminated with oil and grease. The reuse of surface water is also limited by the onsite demand. As discussed in Section 2.2, the water requirements during operation will be minimal. The location of these basins also restricts to reuse this surface water and therefore there are no reasonable or practicable applications for surface water during the operational phase.

### 3.2.2 Groundwater

The tunnel will be built with a significant groundwater management system, including collection sumps, pumping systems and water treatment on the site at Cintra Park. The water will be treated prior to discharge and although the quantity of water will vary dependant on ground conditions, the water treatment facility will be sized to treat approximately 1.4ML of groundwater per day. The quality of the treated water will be in line with the ANZECC guidelines so that is suitable for discharge into the environment. Section 4 details the reuse options for groundwater during the operational phase.

### 3.2.3 Potable water

Potable water will be connected to the surface facilities such as the MCC, ventilation facilities, substations and water treatment facilities.

## 4 Feasible and Reasonable Evaluation

The design and construction teams were engaged to undertake a water reuse assessment throughout the construction and operational phase of the asset life. Table 2 below details the reuse options and provides an evaluation, taking into account the feasible and reasonable considerations for this project. The estimated volumes represent the theoretical water consumption assuming the water collected for reuse is of suitable water quality and adequately available. Surface water is entirely reliant on rainfall and has limited storage capacity dependant on the size of sediment basins.

Table 2 M4 East water reuse options

Reuse Option	Feasible and Reasonable Considerations	Site	Est. Reused Volume Reused/ day	Implementation Time
<b>Construction - Surface Works (including cut &amp; cover)</b>				
Concrete batching	All concrete will be batched off site. CSJ is working with the batching plants to utilise recycled water during batching as much as practicable.	All sites	0 kL site reuse	Commencement of construction
Dust suppression	Reused water will be preferred over potable water on all sites with reused water being treated to achieve suitable water quality requirements applicable to the task. This water will be sourced from sedimentation basins and on-site water treatment plants. All sites except Wattle Street will have a sedimentation basin or water treatment plant.	Homebush Bay Dr	50kL Surface water	Sediment basins and groundwater treatment plants will be operational in accordance with the erosion and sediment control plans.
General wash-down		Pomeroy St	10kL Surface water	
Wheel wash		Underwood Rd	10kL Surface & WTP	
Concrete cutting		Powells Cr	10kL Surface water	
Fill conditioning		Concord Rd	10kL Surface & WTP	
Compaction		Cintra Park	10kL Surface & WTP	
General earthworks		Northcote St	10kL WTP water	
Rock saw		Parramatta Rd Vent	10kL Surface water	
Landscaping		Wattle St	0	
		Parramatta Rd Civil	10kL WTP water	
Rainwater harvesting from acoustic sheds	Installing rainwater tanks on the acoustic sheds will not be necessary because the sites with acoustic sheds will have a continuous supply of reused water for non-potable uses.	Rainwater tanks not applicable	Not applicable	Not applicable
<b>Construction - Tunnelling</b>				
Road header	Water is an essential resource for tunnelling. It is	Not applicable	Potable water	Throughout tunnelling



Reuse Option	Feasible and Reasonable Considerations	Site	Est. Reused Volume Reused/ day	Implementation Time
Bolter machine Shotcrete machine	critical to both the underground equipment and keeping the tunnel safe for the workforce. An excellent quality of water and a very reliable volume of water is required to ensure the construction program is maintained without damage to the machinery or people. Potable water is the only water supply which can achieve these requirements.  Reusing treated groundwater was assessed to supplement the potable water supply. Mixing treated groundwater with potable water could reduce the demand on potable water. The treated water would need to be treated to a significant higher quality to ensure health and safety requirements are met. Such a treatment would also require a trade water licence to dispose of waste. Such a treatment would also be expensive to operate. These issues made this option not reasonable.			
Surface preparation Dust suppression Rock saw Rock breaking Surface trench excavation	Reused water will be sourced from the tunnel groundwater treatment plants to service these activities where volume is suitable. Groundwater will be treated achieve suitable water quality requirements applicable to the task.	Groundwater from tunnelling WTP at Underwood Rd, Concord Rd, Cintra Pk & Northcote St	Up to 150kL	Commencement of tunnelling
Irrigate local parks	It is feasible and reasonable to utilise the treated groundwater from construction activities to irrigate local parks utilising the Canada Bay Council stormwater harvesting system.  Continuing to work with Canada Bay Council to investigate water quality requirements and required volumes. If feasible, water could commence being shared before November 2016.	Cintra Park	Up to 50kL	November 2016

Construction – Tunnel fit out



Reuse Option	Feasible and Reasonable Considerations	Site	Est. Reused Volume Reused/ day	Implementation Time
Surface preparation	Reused water will be sourced from the tunnel groundwater treatment plants to service these activities where volume is suitable. Groundwater will be treated to achieve suitable water quality requirements applicable to the task.	Groundwater from tunnelling WTP at Underwood Rd, Concord Rd, Cintra Pk & Northcote St	Up to 50kL	Commencement of tunnel fit out
Dust suppression				
Rock saw				
Rock breaking				
Surface trench excavation				
<b>Tunnel Operation</b>				
Irrigate local parks	It is feasible and reasonable to utilise the treated groundwater from construction activities to irrigate local parks utilising the Canada Bay Council stormwater harvesting system.  Tunnel operator to work with Canada Bay Council to investigate water quality and volume requirements during the operation phase. If feasible, water reuse could commence at the start of the operational phase of the project.	Cintra Park	Up to 50kL	April 2019
Water supply for emergency deluge system	It is not considered feasible or reasonable to utilise the treated tunnel groundwater for the deluge system. The deluge tanks and system will not withstand the elevated salinity of the groundwater. The additional cost in a treatment, energy and maintenance to remove the salinity is not reasonable. The distance between the water treatment facility and the deluge tanks creates a significant engineering and financial barrier to reusing the treated groundwater for this purpose. The deluge tanks are located at the two ends of the tunnel and the treatment plant is at the middle..	Not applicable	Not applicable	Not applicable
Tunnel maintenance activities	The operational water treatment plant will have the ability to fill a water tanker to undertake tunnel maintenance activities. If water quality parameters are suitable for the task reused water will be able to be	Cintra Park	Up to 10kL	April 2019

Reuse Option	Feasible and Reasonable Considerations	Site	Est. Reused Volume Reused/ day	Implementation Time
	utilised.			
Rainwater harvesting from permanent buildings	The CSJ design team is considering the installation of rainwater tanks on the MCC and other permanent buildings throughout the project. All feasible options will be assessed using a cost benefit analysis as required under the SWTC.	Permanent structures	Currently in design	Currently in design
Council maintenance	Groundwater treated to the required quality applicable to it's end use can be utilised for council maintenance activities such as street sweeping and selected wash down.	Cintra Park	Up to 10kL	April 2019
Landscape watering	Surface water collected at the Homebush Bay Drive stormwater control basin will be suitable for irrigation of landscaping. Plant species used for landscaping will be drought tolerant and therefore the required volume would be minimal.	Homebush Bay Dr	Up to 5kL	April 2019
Water efficient fixtures in MCC and maintenance facility	CSJ is committed to installing water saving devices at the MCC and maintenance facility	MCC	Ongoing water savings	April 2019

## 5 Monitoring and reporting

The project has a sustainability target relating to the reused and treatment of water. To track the performance against this target the quarterly sustainability report provided to Sydney Motorway Corporation (SMC) includes the monthly volumes of potable water consumed and the volume water reused. The report separates the reused water volume into on-site and off-site to illustrate the different water reuse locations. A dewatering permit process and record forms have been established enable the recording of volumes of surface and groundwater reused on the construction sites. These permits will be the primary source of reused water data for the quarterly sustainability report. The quarterly sustainability report will be available on the project web site. Water discharged into the environment will be treated, recorded and reported in accordance with the EPL.

## 6 Licences and approval

The water reuse options identified within this document have been assessed against the current environment protection licence and approvals. A variation to the current project EPL has been submitted to the EPA to allow for discharge of groundwater from tunnelling water treatment plants. The on-site reuse of water proposed within this strategy does not require this variation, but it will allow for the operation of the water treatment plants and the utilisation of the treated water at Cintra Park by Council.

## 7 Conclusion

This strategy proposes reused water to be utilised in all phases of the project as detailed in Section 4. The water treatment plants at Underwood Rd, Concord Rd, Cintra Pk and Northcote St will supply treated water within the site for non-potable water uses in Table 3. There will also be a WTP at the Parramatta Rd ventilation facility site during surface works which will reuse treated water. At the peak of construction these water treatment plants are estimated provide as much as 200kL of water per day to the construction works. Sites which have sediment basins will also harvest stormwater though these basins for predominantly dust suppression. This will ease the pressures placed on potable water and provide water for non-potable water purposes such as irrigation, dust suppression and general excavation.

Table 3 Water reuse activities

Surface Works	Tunnelling	Tunnel fit-out	Operation
Dust suppression	Surface preparation	Surface preparation	Irrigate local parks
General wash-down	Dust suppression	Dust suppression	Tunnel maintenance activities
Wheel wash	Rock saw	Rock saw	Council maintenance
Concrete cutting	Rock breaking	Rock breaking	Landscape watering
Fill conditioning	Surface trench excavation	Surface trench excavation	
Compaction	Irrigate local parks		
General earthworks			
Rock sawing			



Surface Works	Tunnelling	Tunnel fit-out	Operation
Landscaping			

The full extent of water reuse will be dependent on a number of factors, including the presences of visual pollutants in surface water, as well as the demand and availability of water. Though there are no water quality criteria required for water reuse within the construction site, all reused water during construction will be treated to achieve the EPL discharge water quality requirements.

Environmental conditions such as rainfall and wind will dictate how much water will be needed and therefore the volumes used each month are likely to vary. A constant supply of treated groundwater will be available for use at the tunnelling compound sites that can be used both within the tunnelling operations and also on the surface. This water will be available as soon as the water treatment plants have been commissioned and will continue to provide water to Northcote, Cintra, Concord and Underwood sites for non-potable water requirements.

This strategy has also identified the option of providing treated groundwater from the Cintra Pk site for irrigation of local parklands during construction and operations. All water collected and being provided for reuse outside of the construction activities will be treated to achieve the ANZECC guidelines so that it is suitable for discharge into the environment. CSJ will continue to work with Canada Bay Council to investigate the potential of utilising treated groundwater within their stormwater harvesting irrigation network. The full demand for the treated groundwater and the potential impacts on their system needs further assessment prior to the introduction of the water. A decision about the use of treated water from tunnel construction is expected to be made before November 2016. The tunnel operator and council will also be able to utilise water from the Cintra Park WTP for maintenance activities within the tunnel and surrounding streets.