durecon ARUP Castle Hill Water Recycling Plant / Rouse Hill Water Recycling Plant Compliance Upgrades

TRAFFIC AND TRANSPORT TECHNICAL REPORT



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Table of Contents

Conten	nt and chapter structure	0
Glossa	ry of terms and abbreviations	1
1	Introduction	2
1.1	Project description	2
1.2	Document purpose	2
1.3	Legislative and Policy context	2
2	Methodology	
2.1	Methodology structure	3
2.2		3
3 3.1	Existing environment Castle Hill Water Recycling Plant	4 4
3.1	1.1 Existing road network	4
3.1	.2 Public transport	6
3.1	.3 Active transport	8
3.2	Rouse Hill Water Recycling Plant	11
3.2	2.1 Existing road network	11
3.2	2.2 Public transport	13
3.2	2.3 Active transport	14
3.3	Other infrastructure schemes	17
3.3	3.1 Castle Hill Water Recycling Plant	17
3.3	3.2 Rouse Hill Water Recycling Plant	
4 4 1	Transport impact assessment	19 19
4.2	Construction vehicle access routes	19
4 2	21 Castle Hill Water Recycling Plant	19
4.2	2 Rouse Hill Water Recycling Plant	20
4 3	Construction workers and vehicles	21
4.3	3.1 Vehicle types	21
4.3	3.2 Traffic generation	22
4.4	Construction worker parking	
4.4	1 Castle Hill Water Recycling Plant	
4.4	1.2 Rouse Hill Water Recycling Plant	
4.5	Castle Hill Water Recycling Plant construction impact assessment	
4.5	5.1 Impacts on road network performance	
4.5	5.2 Impacts on parking and access	
4.5	5.3 Impacts on the public transport network	
4.5	5.4 Impacts on the active transport network	23
4.6	Rouse Hill Water Recycling Plant construction impact assessment	24
4.6	5.1 Impacts on road network performance	
4.6	5.2 Impacts on parking and access	
4.6	5.3 Impacts on the public transport network	25

4.6	.4 Impacts on the active transport network	
4.7	Operational impacts	25
5	Proposed mitigation measures	26
5.1	Castle Hill Water Recycling Plant	
5.2	Rouse Hill Water Recycling Plant	27

Content and chapter structure

The chapter structure and associated content is outlined in Table 1.

Table 1: Content and chapter structure

Chapter		Content
1.	Introduction	Outlines the project description, purpose of this document and relevant legislation and policy.
2.	Methodology	Sets out the methodology used to assess the transport impacts of the project on the surrounding environment during construction and operation.
3.	Existing environment	Details the existing environment surrounding the project. All modes of transport are addressed in this section, including private vehicles, public transport, cycling and walking. This chapter also highlights any future infrastructure schemes that need to be considered as part of this study.
4.	Transport impact assessment	The impact assessment uses the methodology outlined in chapter two to assess any impacts of the project during construction and operation. This chapter assesses the impacts upon all modes, including private vehicles, public transport, cycling and walking. Key impacts are defined at the end of this chapter.
5.	Proposed mitigation measures	Following the identification of any key issues, mitigation measures during construction and operation are presented. These mitigation measures are proposed to reduce the impacts of the construction and operational phases on the surrounding transport network.

Glossary of terms and abbreviations

Term	Meaning
СТМР	Construction Traffic Management Plan
DCP	Development Control Plan
DPIE	Department of Planning, Industry and Environment
HV	Heavy Vehicle
LGA	Local Government Area
LV	Light Vehicle
NHVR	National Heavy Vehicle Regulator
NSW	New South Wales
REF	Review of Environmental Factors
RMS	Roads and Maritime Services
ROL	Road Occupancy Licence
RTA	Roads & Traffic Authority
SCATS	Sydney Coordinated Adaptive Traffic System
SSCTMP	Site Specific Construction Traffic Management Plan
TfNSW	Transport for New South Wales
The project	Castle Hill and Rouse Hill Water Recycling Plant Upgrade
WRP	Water Recycling Plant

1 Introduction

1.1 Project description

Castle Hill Water Recycling Plant (WRP) and Rouse Hill WRP provide wastewater services for Sydney's North West. Together with Riverstone Waste Water Treatment Plant (WWTP), the three plants form the North West Treatment Hub, servicing the North West Growth Area (NWGA) and development along the Metro Northwest Growth Corridor (MNGC).

Castle Hill WRP and Rouse Hill WRP are operating at capacity and upgrades to these plants are required to ensure licence conditions are met. This includes meeting nutrient concentration limits in treated wastewater at Castle Hill and meeting compliance requirements for wet weather overflows at Rouse Hill.

The need to upgrade treatment processes at Caste Hill and Rouse Hill WRP is on the critical path with completion to meet compliance requirements set for 2024.

1.2 Document purpose

This report is one of a number of technical reports that have been developed to support the Review of Environmental Factors (REF) for the project. This report outlines the traffic and transport impacts associated with the project and any mitigation measures to be implemented during construction and operation to address the impacts identified.

1.3 Legislative and Policy context

The legislation and policy included in Table 2 has been considered as part of this Traffic and Transport technical report:

Table 2: Legislation and policy

Legislation and policy relevant to the Traffic and Transport technical report					
Legislation/Policy	Description	Relevance			
Guide to Traffic Generating Development (Roads & Traffic Authority, 2002) (RTA)	The Guide examines how to assess traffic generating developments and identify impacts upon the wider transport network. The level of assessment can vary depending on the type of development.	This project will generate traffic relating to construction and operation works. Therefore, this Guide has been used as it provides the appropriate methodology for assessing all types of traffic generating development.			
Guide to Traffic Management Part 12: Traffic Impacts of Developments (Austroads, 2009)	The document guides planners and engineers who design, develop and manage a variety of land use developments in identifying and managing the impacts on the transport network arising from these developments.	This project is a traffic generating development. Therefore, this Guide has been used as it provides the appropriate methodology for assessing all types of traffic generating developments.			

2 Methodology

2.1 Methodology structure

To assess the impact of the project on the transport and traffic network, the following methodology has been used:

- Review available data and documentation to understand the transport requirements of the project in construction and operation.
- Review other infrastructure schemes that overlap with the programme for the project and their likely cumulative impact on the surrounding road network.
- Liaise with the Sydney Water project team to derive robust assumptions for the traffic generation of the project in construction and operation.
- Identify key routes to be used by construction and operational vehicles and assess the potential traffic impacts.
- Identify any impacts to public transport, walking and cycling.
- Classify the significance of all identified impacts.
- Develop mitigation measures to manage the identified impacts.

2.2 Project location

The Castle Hill WRP is located at 190 Wrights Road, Castle Hill. The Rouse Hill WRP is located on Mile End Road, Rouse Hill.

The site locations and surrounding land use are shown in Figure 1.



Figure 1 Project location Source: SIX Maps (2021)

3 Existing environment

3.1 Castle Hill Water Recycling Plant

3.1.1 Existing road network

The Castle Hill WRP is linked to the wider road network via a sealed internal access road and an unsealed fire trail track (shown in Figure 2). The internal access road connects to Wrights Road via a bridge over Cattai Creek. This bridge has a 30 tonne weight limit and a width of approximately 3.5 metres. The fire trail track connects to Drawbridge Place north east of the WRP and is only used for emergency access to the site. A culvert under the fire trail track has a load limit of 30 tonnes. This unsealed track has significant grade changes and is currently only suitable for all-wheel drive vehicles.

The internal access road and bridge over Cattai Creek are shown in Photograph 1. The fire trail track and culvert load limit are shown in Photograph 2.



Figure 2 Local access roads to the Castle Hill WRP Source: SIX Maps (2021)



Photograph 1 Internal access road and bridge over Cattai Creek Source: Site visit (July 2021)



Photograph 2 Fire trail track and culvert load limit Source: Site visit (July 2021)

Wrights Road is a local road that connects to a range of residential streets and Windsor Road at its western end. Unrestricted on-street kerbside parking is provided on both sides of Wrights Road between Morris Grove and the Castle Hill WRP access road. Windsor Road is a four-lane north-south arterial road that connects Northmead to Windsor. This road carries high traffic volumes, is a tertiary freight route and provides access to strategic centres including Baulkham Hills, Castle Hill and Norwest.

The fire trail track connects to Drawbridge Place which is a residential cul de sac. Unrestricted on-street parking is provided on both sides of Drawbridge Place and many other connecting local streets. Further east, Gilbert Road is a connector road that links these local roads with the wider arterial road network, including Showground Road to the south.



The wider road network surrounding the Castle Hill WRP is shown in Figure 3.

Figure 3 Road network surrounding the Castle Hill WRP Source: Google Maps (July 2021)

3.1.2 Public transport

The Hills Showground metro station is located approximately two kilometres south of the Castle Hill WRP and is served by the Metro North West Line. The Metro North West Line runs at a frequency of up to once every four minutes at peak times and provides direct connections to Rouse Hill, Castle Hill, Epping, Macquarie Park, North Ryde and Chatswood.

Several bus stops are located near the Castle Hill WRP on Ridgecrop Drive (approximately 300 metres east of the site), Wrights Road (approximately 900 metres west of the site) and Green Road (approximately 900 metres west of the site). These bus stops service seven bus routes and a summary of these routes is shown in Table 3.

The public transport network surrounding the Castle Hill WRP is shown graphically in Figure 4.

Table 3: Bus routes near Castle Hill WRP

Route number	Route name	Nearest bus stop	Peak hour frequency (buses/hour)
601	Rouse Hill Station to Parramatta via Hills Showground	Green Road at Wrights Road (900 metres)	4
603	Rouse Hill Station to Parramatta via Glenhaven	Ridgecrop Drive near Drawbridge Place (300 metres)	3
610X	Kellyville to City QVB via Lane Cove Tunnel (Express Service)	Green Road at Wrights Road (900 metres)	6
626	Kellyville Station to Pennant Hills via Cherrybrook	Wrights at Green Road (900 metres)	2
633	Rouse Hill to Pennant Hills via Kellyville & Castle Hill	Green Road at Wrights Road (900 metres)	2
651	Rouse Hill Station to Epping via Castle Hill	Green Road at Wrights Road (900 metres)	2
715	Rouse Hill Station to Seven Hills via Kellyville & Norwest	Green Road at Wrights Road (900 metres)	2

Source: Transport for NSW (2021)



Figure 4 Public transport network surrounding Castle Hill WRP Source: Transport for NSW (2021)

3.1.3 Active transport

Given the residential nature of the uses surrounding the site pedestrian volumes are generally low on surrounding streets. Footpaths are provided on one or both sides of Wrights Road and Ridgecrop Drive.

Several off-road unsealed walking tracks are provided parallel to the Cattai Creek and Castle Hill Creek and connect to recreational parks including Castle Glen Reserve, Fred Caterson Reserve and Elizbeth Chaffee Reserve. These tracks are used by a moderate number of walkers, particularly on the weekends. An example of a walking track adjacent to the Castle Hill WRP is shown in Photograph 3.

These tracks can also be accessed from the Castle Hill WRP internal access road where a portion of carriageway is marked for use by walkers. Pedestrians may cross Cattai Creek via the vehicle bridge (shown in Photograph 1) or a separate pedestrian bridge (shown in Photograph 4).



Photograph 3 Walking track south of Castle Hill WRP Source: Site visit (July 2021)



Photograph 4 Pedestrian bridge over Cattai Creek from internal access road

Source: Site visit (July 2021)

The cycling network surrounding the site is shown in Figure 5 and several off-road shared paths are located around the Castle Hill WRP. West of the site, a shared path is provided on the northern side of Wrights Road (shown in Photograph 5) which connects to the wider regional cycling network via Windsor Road and Green Road. To the north and south of the site, shared paths are also provided along sections of Cattai Creek and Castle Hill Creek.



Figure 5 Cycling network around the Castle Hill WRP Source: Cycleway Finder (Transport for NSW, 2021)



Photograph 5 Shared path on the northern side of Wrights Road Source: Site visit (July 2021)

3.2 Rouse Hill Water Recycling Plant

3.2.1 Existing road network

All operational vehicles and staff currently access the Rouse Hill WRP using Mile End Road. The primary access road provides a link to the south east corner of the site. A secondary access road for construction vehicles runs adjacent to Second Ponds Creek and connects to Withers Road (shown in Figure 6). This is an unsealed road with varying widths that narrows along certain sections, meaning large vehicles travelling in opposing directions may struggle to pass safely. The secondary access road is shown in Photograph 6. Sight distances for vehicles exiting onto Withers Road are reduced due to the gradient of Withers Road and vegetation bordering the road (shown in Photograph 7).



Figure 6 Local access roads to the Rouse Hill WRP Source: SIX Maps (2021)



Photograph 6 Unsealed secondary access road Source: Site visit (July 2021)



Photograph 7 Sight line for vehicles exiting the secondary access road onto Withers Road Source: Site visit (July 2021) Mile End Road is a connector road that links to residential land uses and the wider arterial road network via Windsor Road at its south western end. Withers Road is also a connector road that provides access to a range of uses between North Kellyville and Rouse Hill.

The wider road network surrounding the Rouse Hill WRP is shown in Figure 7.



Figure 7 Road network surrounding the Rouse Hill WRP

3.2.2 Public transport

The Rouse Hill metro station is located approximately 2.5 kilometres south of the Rouse Hill WRP and is served by the Metro North West Line. Several bus stops are located near the Rouse Hill WRP on Mile End Road (approximately 400 metres east) and Milford Drive (approximately 600 metres east). These bus stops service four bus routes and a summary of these routes and frequencies is shown in Table 4.

The public transport network surrounding the Castle Hill WRP is shown graphically in Figure 8.

Table 4: Bus routes near Rouse Hill WRP

Route number	Route name	Nearest bus stop	Peak hour frequency (buses/hour)
617	Rouse Hill to Kellyville Station	Mile End Road near Money Close	2
633	Rouse Hill to Pennant Hills via Kellyville & Castle Hill	Mile End Road near Money Close	2
735	Rouse Hill Station to Blacktown	Milford Drive near Mile End Road	2
746	Riverstone to Rouse Hill	Milford Drive near Mile End Road	2

Source: Transport for NSW (2021)



Figure 8 Public transport network surrounding Rouse Hill WRP

Source: Transport for NSW (2021)

3.2.3 Active transport

Pedestrian activity around the Rouse Hill WRP is low given the site is predominately bordered by open space with an industrial estate on its southern eastern side. Footpaths are provided on one or both sides of Mile End Road but not on either side of Withers Road. Pedestrian access is not permitted via the secondary access road (shown in Photograph 8). However, it was observed on site that that pedestrians occasionally walk using the secondary access road as it is directly adjacent to Russell Reserve.

The cycling network is shown in Figure 9 and several off-road shared paths are located around the Rouse Hill WRP. A shared path is provided on the western side of Mile End Road, north of the Rouse Hill WRP access road. A shared path is also provided along the eastern side of Second Ponds Creek south of Withers Road, which connects to the wider regional cycling network via Windsor Road (shown in Photograph 9).



Photograph 8 Pedestrian access not permitted on secondary access road to Rouse Hill WRP Source: Site visit (July 2021)



Figure 9 Cycling network around the Rouse Hill WRP Source: Cycleway Finder (Transport for NSW, 2021)



Photograph 9 Shared path south of Withers Road Source: Site visit (July 2021)

3.3 Other infrastructure schemes

Several infrastructure schemes are planned or ongoing in the vicinity of the sites. Where publicly available information was available on the expected transport impact of these schemes they have been considered within this assessment.

3.3.1 Castle Hill Water Recycling Plant

Information was available for the following schemes near the Castle Hill WRP:

- Samuel Gilbert Public School Redevelopment; and
- Expansion of the Museums Discovery Centre.

The location of these schemes is shown in Figure 10. The construction phases of these schemes are expected to overlap with the construction phases of the Castle Hill WRP. Construction vehicles relating to these developments could use routes similar to the project.



Figure 10 Other infrastructure schemes

3.3.1.1 Samuel Gilbert Public School Redevelopment

Samuel Gilbert Public School is located approximately 750 metres east of the Castle Hill WRP with frontages to both Gilbert Road and Ridgecrop Drive. The redevelopment of the school involves alterations and additions to accommodate an increase in students from 780 to 1,000.

The scheme was approved in February 2020 and therefore construction is expected to occur over the coming years which will overlap with the project timelines. Construction traffic relating to this scheme is expected to use Gilbert Road and Ridgecrop Drive.

The Traffic and Transport Impact Statement stated that the Samuel Gilbert Public School Redevelopment is expected to generate small amounts of construction vehicle traffic that could be accommodated adequately by the surrounding road network.

3.3.1.2 Expansion of the Museums Discovery Centre

The Expansion of the Museums Discovery Centre involves the construction and use of a new building at the Museum Discovery Centre to accommodate the relocation of the Powerhouse Museum. The Museum Discovery Centre is located approximately 1.8 kilometres southwest of the Castle Hill WRP with frontages to both Windsor Road and Showground Road.

The scheme is expected to commence construction in 2021 and take approximately 18 to 24 months to complete. Construction of the scheme is expected to generate between 40 to 50 vehicles per day. Construction traffic relating to this scheme is expected to use Windsor Road and Showground Road.

3.3.2 Rouse Hill Water Recycling Plant

Construction of the Sydney Water MNGC is expected to overlap with the construction phases of the Rouse Hill WRP. Construction vehicles relating to these developments could use routes similar to the project.

It is noted that 2 Money Close, approximately 250 metres south of the site, is currently being redeveloped into Money Business Park. Money Business Park will consist of 22 commercial units and a cafe. However, construction is expected to be completed in December 2021 and is not expected to overlap with construction of the project.

3.3.2.1 Sydney Water Metro Northwest Growth Corridor

The Sydney Water MNGC includes the trenching of three rising mains into the Rouse Hill WRP and construction is expected to occur between 2022 and mid-2024. The scheme also includes the construction of a Sludge Transfer System from Castle Hill to Rouse Hill and construction is expected to occur between 2022 and late 2023. Construction traffic relating to both works is expected to use Mile End Road and access the Rouse Hill WRP via the primary access from Mile End Road.

Construction of both works would require the excavation of Mile End Road, which would be coordinated as one trench to minimise impacts. A separate REF is currently being undertaken which would consider traffic associated with the Sludge Transfer System along with the impacts identified in this REF.

4 Transport impact assessment

Construction and operational impacts on road network performance, parking and access, public transport and active transport are detailed below. All impacts have been classified according to the levels of significance outlined in Table 5.

Table 5 Impact classifications

Classification	Impact
Low	Minimal impact
Medium	Likely impacts to the transport network; however, generally more localised. Recommended that these impacts be monitored prior to the implementation of mitigation measures
High	Impacts may cover larger areas on the road network. Will require further mitigation measures

4.1 Construction hours

All construction activities would be undertaken during the following hours:

- Monday to Friday: 7 am to 6 pm
- Saturday: 8 am to 1 pm
- No work on Sundays or public holidays

4.2 Construction vehicle access routes

For both sites we have developed potential routes for construction traffic from the nearest arterial route. This exercise considered the vehicle types, suitability of surrounding roads and access points to each site.

4.2.1 Castle Hill Water Recycling Plant

From the arterial road network, vehicles accessing the Castle Hill WRP would travel via Windsor Road to the existing gate on Wrights Road using the bridge over the Cattai Creek.

An alternate access will be used from the east of the Castle Hill WRP. Vehicles would access the Castle Hill WRP via Gilbert Road, Ridgecrop Drive, Drawbridge Place and the existing fire trail track to the site. However, this would require the track to be regraded to achieve suitable road and safety conditions for construction traffic.

The potential construction vehicle routes to and from the Castle Hill WRP are shown in Figure 11.



Figure 11 Construction vehicle routes to and from the Castle Hill WRP

4.2.2 Rouse Hill Water Recycling Plant

From the arterial road network, vehicles accessing the Rouse Hill WRP would travel via Windsor Road and Mile End Road to the secondary access road on Withers Road (directly west of the Rouse Hill Rural Fire Brigade). Due to the poor sight distances for vehicles exiting the secondary access road onto Withers Road, it is recommended that vehicles only turn left onto Withers Road to reduce the safety risk. Consideration may also be given to left-in only access via Annangrove Road for vehicles entering the Rouse Hill WRP via the secondary access road.

The primary access road on Mile End Road may also be occasionally used by vehicles. However, use of the primary access would be discouraged during construction to minimise impacts to typical operation of the Rouse Hill WRP and cumulative impacts with the Sydney Water MNGC.

The proposed construction vehicle route to and from the Rouse Hill WRP is shown in Figure 12.



Figure 12 Construction vehicle routes to and from the Rouse Hill WRP

4.3 Construction workers and vehicles

4.3.1 Vehicle types

A range of construction vehicle types are expected to be used throughout the construction phase and the vehicles to be used by the Contractor are not limited to those listed in this section:

- Light vehicles
- Utility vehicles
- Truck and Dog
- Concrete trucks
- Excavators
- Small rigid vehicles
- Heavy rigid vehicles

4.3.2 Traffic generation

Given the similarity between the projects at both WRPs they are expected to generate similar levels of traffic. Typical construction would involve up to 40 workers on each site. This may increase to up to 50 workers during peak construction periods.

The forecast number of peak construction movements at each site during construction is summarised in Table 6. It should be noted these are peak values and vehicle movements are expected to be lower than these values for the large periods of the construction phase. Light vehicle movements are predominately driven by the number of workers on site.

Vehicle type		Time period	Peak hour movements (inbound and outbound) ¹
Light vehicle	AM peak	6:45 am to 7:45 am (one hour)	50 movements per hour (inbound only)
	PM peak	4:30 pm to 6:30 pm (two hours)	25 movements per hour (outbound only)
Heavy vehicle	AM peak	7 am to 12 pm	20 movements per hour (total inbound and outbound)

 Table 6: Summary of peak construction traffic generation

¹Inbound movements correspond to vehicles entering the site. Outbound movements correspond to vehicles leaving the site.

4.4 Construction worker parking

4.4.1 Castle Hill Water Recycling Plant

Within the Castle Hill WRP, approximately 30 off-street parking spaces would be provided for construction workers. Short-term parking for heavy vehicles would be provided within the Castle Hill WRP.

4.4.2 Rouse Hill Water Recycling Plant

Within the Rouse Hill WRP, the number of car parking spaces would be determined during construction planning. However, all construction worker parking would be accommodated on-site or on the grass adjacent to the secondary access road, minimising impacts to surrounding local streets.

4.5 Castle Hill Water Recycling Plant construction impact assessment

4.5.1 Impacts on road network performance

As discussed in Section 4.3.2, the peak period of construction traffic will occur in the AM peak hour. Peak construction periods are expected to generate 50 inbound light vehicle movements and 20 heavy vehicle movements in the AM peak hour. As discussed in Section 3.3, traffic generated by nearby infrastructure schemes is expected to be relatively minor.

Given the low existing traffic volumes on Wrights Road, construction traffic generation is expected to have a negligible impact on the road network performance. Windsor Road would also be used, which is an arterial road that carries high volumes of traffic. Hence, the relatively small increase in construction traffic is not expected to detrimentally impact Windsor Road.

Construction traffic accessing the fire trail track would also use Showground Road and Gilbert Road. These roads are arterial roads that carry high volumes of traffic. Hence, the relatively small increase in construction traffic is not expected to detrimentally impact these roads. Ridgecrop Road and Drawbridge Place would also be used. However, given the low existing traffic volumes on these roads, construction traffic generation is expected to have a negligible impact on the operation of these roads.

Therefore, impacts on the surrounding road network relating to construction traffic are expected to be minimal.

4.5.2 Impacts on parking and access

As discussed in Section 4.4, approximately 30 off-street parking spaces would be provided within the Castle Hill WRP. However, where this provision cannot accommodate all construction workers, workers may be required to park on the surrounding road network. This equates to a moderate impact of between 10 and 20 vehicles parking on the surrounding road network.

4.5.3 Impacts on the public transport network

Windsor Road, Showground Road, Gilbert Road, Wrights Road and Ridgecrop Drive are used by buses and also form part of the proposed construction vehicle route. Minimal impacts on bus services are expected given the low volumes of traffic being generated. No impacts are anticipated on the operation of bus stops.

4.5.4 Impacts on the active transport network

The walking track to the west of the Castle Hill WRP would need to be closed temporarily to accommodate construction of new infrastructure and installation of electrical lines. This is expected to result in a maximum closure of 18 months between July 2022 to December 2023. Pedestrians would be able to use an alternative track along the eastern side of the Castle Hill WRP, with an additional travel distance of approximately 150 metres (shown in Figure 13). Given the existing moderate pedestrian volumes on this walking track, impacts are expected to be moderate.

Furthermore, heavy vehicles movements would be generated during the morning school drop-off period between 8 am and 9:30 am. Heavy construction vehicles are proposed to travel near William Clarke College and Samuel Gilbert Public School located on Wrights Road and Gilbert Road/Ridgecrop Drive respectively.



Figure 13 Detour along the eastern side of the Castle Hill WRP

4.6 Rouse Hill Water Recycling Plant construction impact assessment

4.6.1 Impacts on road network performance

As discussed in Section 4.3.2, the peak period of construction traffic will occur in the AM peak hour. Peak construction periods are expected to generate 50 inbound light vehicle movements and 20 heavy vehicle movements in the AM peak hour. As discussed in Section 3.3, traffic generated by nearby infrastructure schemes is expected to be relatively minor.

Impacts to roads that form part of the proposed construction vehicle route are expected to be minimal. Windsor Road is an arterial road that is suited to carrying high volumes of traffic and heavy vehicles. Therefore, the relatively small increase in construction traffic is not expected to significantly increase traffic volumes on Windsor Road. Furthermore, given the low existing traffic volumes on Withers Road and Mile End Road, construction traffic generation is not expected to have a detrimental impact.

Poor sight distances for vehicles exiting the secondary access road onto Withers Road poses a safety risk, particularly for heavy vehicles with slower acceleration speeds.

4.6.2 Impacts on parking and access

As discussed in Section 4.4, all construction worker parking at the Rouse Hill WRP would be accommodated on-site. Therefore, no impacts to parking on surrounding roads are expected.

4.6.3 Impacts on the public transport network

Windsor Road, Withers Road and Mile End Road are used by buses and also form part of the proposed construction vehicle route. Minimal impacts on bus services are expected given the low volumes of traffic being generated. No impacts are anticipated on the operation of bus stops.

4.6.4 Impacts on the active transport network

Pedestrian access is not permitted on the secondary access road to the Rouse Hill WRP. However, site visit observations identified that pedestrians occasionally use this access. Therefore, additional construction vehicles may conflict with pedestrians. Given low existing pedestrian volumes on this walking track, impacts are expected to be moderate.

Furthermore, heavy vehicle movements would be generated during the morning school drop-off period between 8 am and 9:30 am. These vehicles are proposed to travel near Rouse Hill Public School, which is located on Mile End Road.

4.7 Operational impacts

During operation, traffic generation would be limited to chemical deliveries at each site. It is expected that up to 10 heavy vehicles would access each site per day, which equates to an average of one heavy vehicle per hour. Operational vehicles would use the vehicle access routes described in Section 4.2.

Operational traffic generation is expected to be similar to the volumes of traffic generated by both plants. Therefore, in operation the upgraded plants are expected have a negligible impact on surrounding road network performance. Similarly, impacts on public transport and active transport are expected to be negligible during operation. No changes to parking or access are expected during operation as parking would be accommodated on-site.

5 Proposed mitigation measures

This section outlines potential mitigation measures required to minimise the impacts of the project throughout the construction and operational phases. All proposed mitigation measures should be developed further by the appointed contractor as part of their detailed Construction Management Plan.

5.1 Castle Hill Water Recycling Plant

The impacts and proposed mitigation measures relating to the Castle Hill WRP are summarised in of the Table 7.

Table 7: Mitigation and effectiveness – Castle Hill WRI	Table '	7:	Mitigation	and	effectiveness -	Castle	Hill	WRP
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Project specific mitigation measured	ures – construction and	operation	
Potential Impact	Impact significance	Mitigation measure	Impact significance following mitigation
Impacts of construction vehicles on surrounding road network performance, particularly Windsor Road	Low	Prepare and implement Traffic and Pedestrian Management Plan prior to construction. Construction traffic movements scheduled outside of peak periods where possible.	Low
Limited access to Castle Hill WRP from Drawbridge Place due to challenging grades and a culvert on the fire trail track	Medium	Fire trail track to be regraded to achieve suitable and safe conditions	Low
Parking of construction workers on surrounding streets due to insufficient capacity within the site	Medium	Encourage and facilitate carpooling to reduce the number of parking vehicles (for example, implement systems and processes for workers to carpool). Encourage public transport use where feasible, including the Sydney Metro North West Line and local bus routes	Low
Temporary disruption to unsealed walking track near Castle Hill WRP during construction	Medium	Prior to closure, use signage and notifications to ensure pedestrians are aware of the closure. During closure, use wayfinding to alert pedestrians of detours via Gilbert Road and Ridgecrop Drive. Use signage to alert pedestrians and cyclists of construction trucks using the fire trail track, which will remain open. Install pedestrian chicanes at the fire trail track crossing to improve crossing safety.	Low
Conflict between heavy vehicles and schoolchildren on Wrights Road, Gilbert Road and Ridgecrop Drive	Medium	Minimise construction traffic movements through school zones during pick up and drop off times	Low

5.2 Rouse Hill Water Recycling Plant

The impacts and proposed mitigation measures relating to the Rouse Hill WRP are summarised in of the Table 8.

Table 8: Mitigation and effectiveness – Rouse Hill WRP

Project specific mitigation measures – construction and operation			
Potential Impact	Impact significance	Mitigation measure	Impact significance following mitigation
Impacts of construction vehicles on surrounding road network performance, particularly Windsor Road	Low	Prepare and implement Traffic and Pedestrian Management Plan prior to construction. Construction traffic movements scheduled outside of peak periods where possible. Discourage use of the primary access from Mile End Road to minimise impacts to typical operation and cumulative impacts of the Sydney Water MNGC.	Low
Impacts to safety due to poor sight distance for vehicles exiting the secondary access road onto Withers Road	Medium	Left-out only for vehicles leaving the Rouse Hill WRP via the secondary access road. Use signage to alert vehicles on Withers Road of the informal access. Consider left-in only access for vehicles entering the Rouse Hill WRP via the secondary access road.	Low
Conflict between heavy vehicles and pedestrians on secondary access road to Rouse Hill WRP	Medium	Use signage to alert pedestrians of heavy vehicle access	Low
Conflict between heavy vehicles and schoolchildren on Mile End Road	Medium	Minimise construction traffic movements through school zones during pick up and drop off times	Low