

14 September 2021

P00598C Adelaide Street Land Fill TMP

Raymond Terrace Parklands
PO Box 342
Earlwood NSW 2206

Attn: Adam Liw

Dear Adam,

Proposed Bulk Earthworks for Rehabilitation of Disused Quarry, 251 Adelaide Street, Raymond Terrace, NSW.

Further to your recent email regarding the proposed bulk earthworks programme at 251 Adelaide Street Raymond Terrace we have undertaken consultation with Transport for New South Wales and provide the following assessment of the proposed importation of 90,000 tonnes of fill to the site.

This assessment has been prepared in accordance with the Austroads Guidelines and with consideration to the RMS Guide to Traffic Generating Developments and the Port Stephen Development Control Plan 2014 to meet the requirements of the SEARS issued for the project (**Attachment A**).

Site Location & Context

The subject site is located at 251 Adelaide Street with frontage to Adelaide Street only as shown in Figure 1. The site is vacant being a disused sand mine now filled with water.

The surrounding land use comprises mostly residential land to the north with the sewer works to the east and Windeyers Creek to the south and west.

An existing unsealed driveway off Adelaide Street previously provided access to the site when used as a sand quarry by ROCLA.

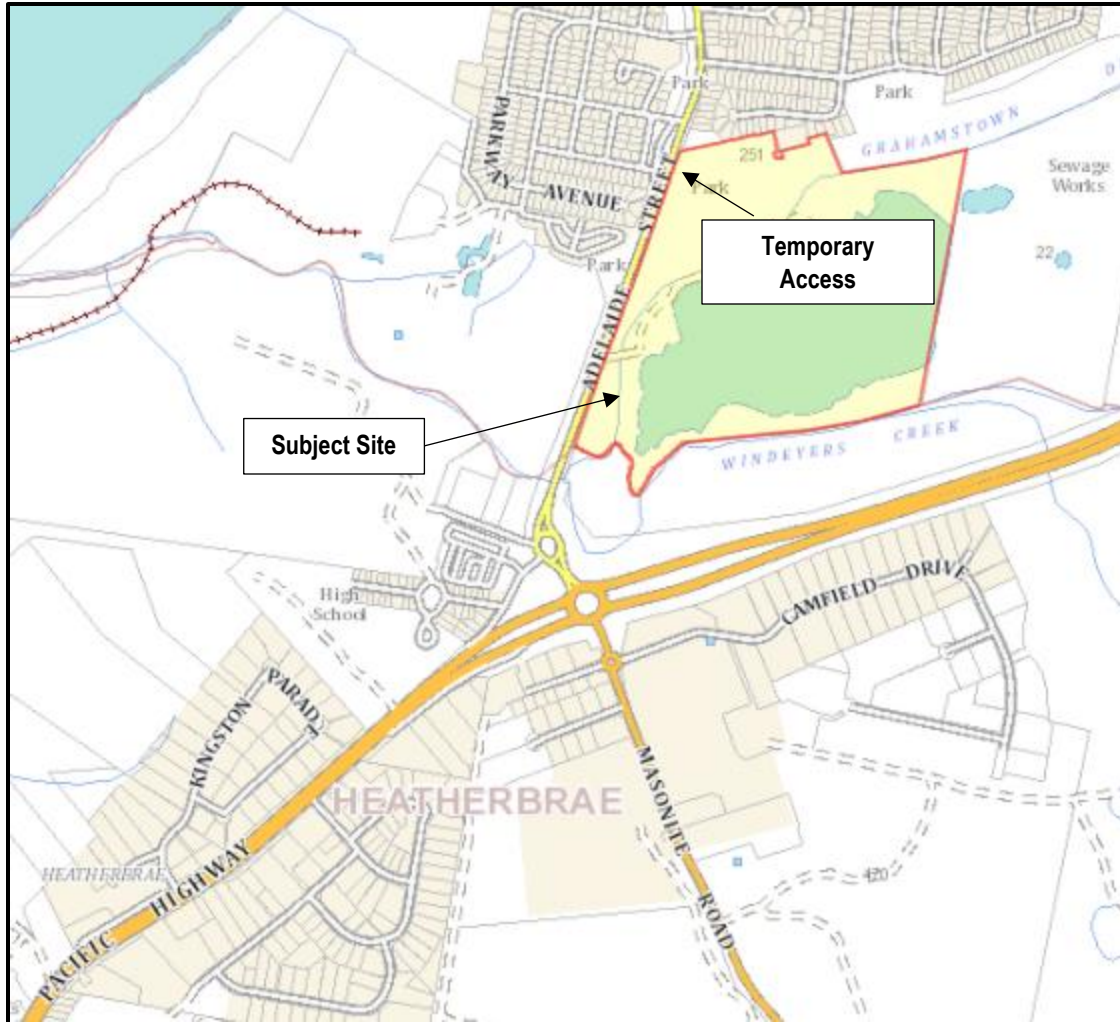


Figure 1 - Location of the subject site in the context of the surrounding road network.

Road Hierarchy

The main road through the locality is **Adelaide Street** which provides an important connection between Raymond Terrace and the Pacific Highway to the north and south. Previously functioning as part of the Pacific Highway it now carries local traffic as well as some minor regional traffic from the various towns and villages to the north west of Raymond Terrace. North of William Bailey Street, Adelaide Street forms part of the state road network carrying a wide range of vehicles up to and including B-double combinations. South of William Bailey Street, and in the locality of the subject site, Adelaide Street functions as a local collector road. Port Stephens Council is the road authority.

Adjacent to the subject site, Adelaide Street provides a generally north-south orientation with a straight alignment and a single lane of travel in each direction. It has a width of approximately 7.5 metres with sealed 2 metres shoulders to each side and grass verges. The posted speed limit along Adelaide Street is 50km/hr adjacent to the site. There is no street lighting.

There is an off-road shared pathway along the western side of Adelaide Street that cater for pedestrian and cyclist movements in this location with a pedestrian crossing 38 metres north of the site.

Adelaide Street connects with the broader regional road network (**Pacific Highway**) via a two-lane circulating roundabout approximately 550 metres to the south. In the vicinity of the subject site, the Pacific Highway forms a dual lane divided carriageway comprising two through lanes in each direction separated by a central median. The Pacific Highway has a posted speed limit of 100km/hr, increasing to 110km/hr to the north of the Adelaide Street roundabout. This state classified road provides a major road corridor along the eastern seaboard between Sydney and Brisbane.

Roadworks & Traffic Management Works

No roadworks or traffic management works are currently occurring in the immediate locality of the site and there are no works currently proposed.

To the south of the area, it is planned that the M1 Pacific Motorway to Raymond Terrace be extended to bypass Hexham and Tomago. The road alignment will also bypass the existing Adelaide Street/Pacific Highway roundabout with a new Raymond Terrace interchange proposed to the northwest of this part of the road. (**Attachment B**). The planning and funding for this road upgrade is progressing however no timeframe is currently available for this construction work to commence.

Existing Traffic Volumes and Road Operation

As part of the project work, a traffic survey was completed at the site entry on Adelaide Street to observe the current operation and determine the existing traffic volumes. This survey was completed during a typical weekday morning (7:00am to 9:00am) and afternoon (3:00pm – 5:00pm) on Tuesday 15th December 2020 with the results summarised below.

Table 1 Two way peak traffic flows on Adelaide Street

	Northbound	Southbound	Two-Way
AM Peak 8am-9am	592	617	1209
PM Peak 3.00pm-4.00pm	827	568	1395

As shown above, the current two-way traffic flows on Adelaide Street were 1209 vehicles per hour (vph) during the morning peak, which were reasonably balance in both directions and 1395 vph during the afternoon peak with a more pronounced flow northbound. In the morning peak, there is a slight bias in traffic travelling southbound towards the M1 Pacific Motorway whilst northbound traffic has a destination towards local shopping and commercial elements within the Raymond Terrace town centre. The opposite applies in the afternoon. Peak hour flows typically represent 8-12% of daily traffic flows, and as such daily flows on Adelaide Street could be in the order of 13,000 vehicles per day (vpd). Daily traffic flows would be reasonably balanced over the day.

Allowing the mid-block flow per lane of an undivided urban road to be 900 vph in the peak hour Adelaide Street is operating well within its current capacity. The peak hour flows per direction for a Level of Service (LoS) C is 600 vehicles with LoS D at 900 vehicles per hour. Thus, Adelaide Street is currently operating at Level of Service D during the peak directional flows (southbound in the AM/northbound in the PM) and the upper limit of LoS C for the alternate flow. Observations on site during the critical peak periods show that there are regular gaps in the traffic to assist with turning movements to and from adjoining properties and roads.

The roundabout controlled intersection of the Pacific Highway and Adelaide Street was observed during the peak periods. Generally, this roundabout operates well with low delays as drivers slow to negotiate the intersection. These delays can create some queuing due to the high volume of northbound traffic and significant queuing occurs in this location during holiday periods. Due to the high volume of through traffic northbound on the Pacific Highway queues can also occur on Adelaide Street. Right turning southbound traffic from the highway and through traffic provide some gaps in this northbound flow allowing for vehicle to exit Adelaide Street. Queues on Adelaide Street were observed and timed on site for the period 8am-8.45am and during this period most queues on Adelaide Street were 6 vehicles and cleared in less than 30 seconds. Longer queues occurred three times through the observation period with each of these taking 90 seconds for the back of queue to clear the roundabout. Similar queues occur in the afternoon and are also impacted by school pick up and drop off traffic (Hunter River High School) for the 20-30 minutes particularly in the afternoon.

The Project Update summarising the key issues for the EIS for the M1 Pacific Motorway extension states that “*once complete, the extension would remove up to 25,000 vehicles a day from key congestion and merge points along this corridor*”. When this important road link is constructed and operating, the roundabout at the southern end of Adelaide Street will operate to a much higher standard with much lower delays accordingly and will improve access for the local traffic connecting to Raymond Terrace.

Heavy Vehicle Flows

Observations on site indicate that there is a reasonable volume of heavy vehicle movements along Adelaide Street in the vicinity of the site (9% in the AM and 6% in the PM) with heavy vehicles flows primarily consisting of local deliveries and buses towards the Raymond Terrace town centre and construction trucks and similar medium sized trucks outbound towards the Pacific Highway.

Adelaide Street in this locality does not encourage through movements for heavy vehicles with the majority of heavy vehicles (outside of Raymond Terrace) travelling along the Pacific Highway or for destinations to the west via William Bailey Drive and Seaham Road.

Crash History & Traffic Safety

A review of crash statistics published online by Transport for New South Wales indicates that there were no accidents recorded on Adelaide Street in the immediate locality of the site over the 5 year period between 2015 and 2019. There have been a number of collisions at the roundabout intersection at the Pacific Highway reflecting the high traffic volumes in this location. The majority of these have been minor associated with either rear end or some off road collisions not uncommon at roundabouts. The extension of the M1 Pacific Motorway will see a significant reduction in traffic flows at this location and in turn it would be expected a reduction in accidents.

Scope of Proposed Works

The proposal involves the importation of 90,000-100,000m³ of fill to the site.

The proposed works include the provision of a temporary access to the north of the site, adjacent to the northwest corner which shall be compacted gravel and clay. **(Attachment C)**.

It is anticipated that the fill program will be undertaken over a 12 month period with the site commencing operation within 3 months of approval.

Review of Traffic

Traffic Generation

Equipment required for the project will include:

A. Infill

- a. (50) tippers and dogs entering the site and exiting the site per day 5 1/2 days per week with no work on Sundays or public holidays.
- b. Bulldozer and excavator to be delivered to the site at the start, to be stored on site and removed at the end of the fill period.

B. Compacting of driveways with some minor earthworks at the stormwater drainage lines at the western side of the site:

- a. Profile Compactor
- b. Track Loader

C. Site levelling:

- a. Two D9 Track Type Tactor.
- b. 30 T Excavator.

Separate to the movement of heavy vehicles into and from the site at the start and finish of each stage, the general operation of the site fill will see up to 50 truck (tipper) and dogs access the site each day (50 inbound, 50 outbound) with these movements being spread throughout the day. The site is anticipated to operate over a 12 month period.

Truck movements would typically occur during normal construction hours (i.e. 7am-6pm Monday-Friday, 8am to 1pm Saturday) giving an average of 5 truck per hour entering and exiting the site (5 inbound and 5 outbound). There may be periods where additional heavy vehicles shall access the site however it is considered that these additional movements would be minimal and are offset by reduced truck movements at other times throughout the day.

Access Route

Excavated natural material shall be sourced from various projects located throughout New South Wales. Heavy vehicles shall travel to the site using the M1 Pacific Motorway to access Adelaide Street at the Heatherbrae exit and shall then return along the reverse route.

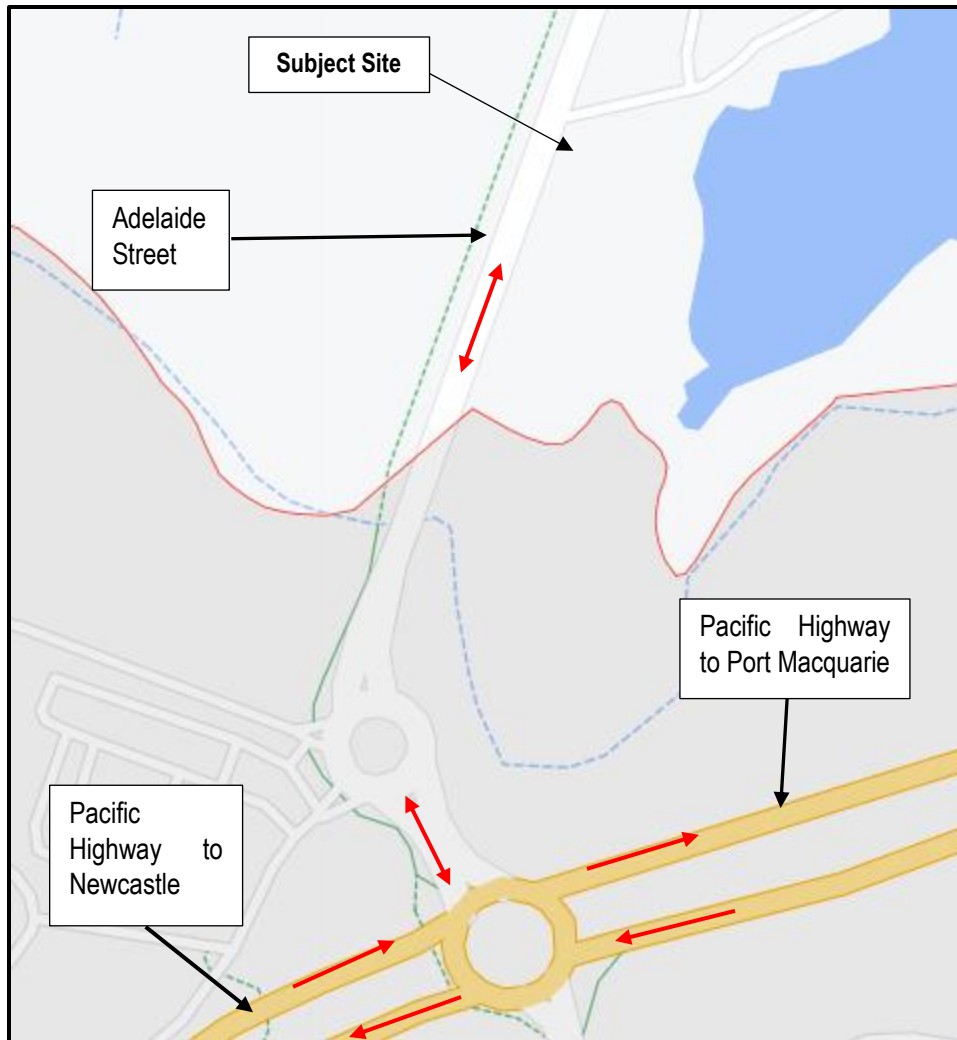


Figure 2 - Vehicle Movement Diagram showing Access Route(s)

Impact of Traffic

There is minimal construction required for the site with the majority of traffic associated with the import of the landfill material to the site. As outlined above, there may be the need to bring in some earthmoving equipment prior to the commencement of operation however once on site this shall typically remain. The construction phase shall also allow for a temporary access to be provided to the northwest corner of the site to allow for the efficient filling and leveling of the site.

Allowing for the above access route, the proposed bulk earthworks could see an average of 5 additional heavy vehicles (truck and dog combinations) travelling in each direction on Adelaide Street (south of the subject site) per hour with up to 100 heavy vehicle movements per day (50 each way) throughout the day.

This represents a 7-8% increase over the existing traffic flows on Adelaide Street with one additional heavy vehicle on average every 10-15 minutes (each direction). Heavy vehicles flows over this 950m to the Pacific Highway will increase to between 12-15% of traffic volumes. Adelaide Street previously operated as part of the Pacific Highway and carried high levels of heavy vehicles. Accordingly, it is considered that these additional vehicles will have a minimal impact

upon the operation of this road which traverses non-residential land. The infill works is anticipated to be undertaken over a 12 month period and so shall be a short term project.

The impact of 50 additional trucks on the Pacific Highway will represent less than 0.2% of either the northbound or southbound traffic volumes (2019 AADT) and so shall have a minimal impact on the operation of this highway. The impact of these additional trucks will be for short period only (12 months). There is therefore no requirement for a detailed assessment of the traffic impacts nor consideration for road upgrades in association with this project.

Material being imported to the site will be dependent upon market forces however the majority of these truck movements are anticipated to approach from the south and so turn left at the roundabout intersection of the Pacific Highway and Adelaide Street and return by turning right at this roundabout. Trucks approaching from the north will turn right at the roundabout and return by turning left. The left turn movement has little impact on the overall operation of this roundabout. The right turn from Adelaide Street to the Pacific Highway does not impact the northbound traffic however does require southbound traffic to give way. With an average of 5 trucks exiting per hour, or one every 10-15 minutes, the impact on this southbound traffic will be minimal.

As noted above, queues were observed at the roundabout of the Pacific Highway and Adelaide Street. As delays on the highway are primarily associated with vehicles slowing to negotiate the roundabout and Adelaide Street queues greater than 60 seconds are infrequent, the impact of 5 additional trucks and dog combinations across an hour will have a minimal and acceptable impact on this queue. Outside of the peak hours this intersection operates with minimal delays and significantly greater efficiency.

As the number of truck arrivals or departures will be on average one every 10-15 minutes there will be minimal queuing at the access point. The access shall be wide enough to allow two truck combinations to pass concurrently avoiding the need for an entering combination to need to wait for the access to clear. The Drivers Code of Conduct will require trucks to travel on the road network with suitable time gaps to avoid the need for more than one vehicle to arrive at the entry at any one point in time.

Light vehicle movements associated with the site will be minimal, associated with staff for operation and maintenance of earthmoving equipment and may be 2-3 light vehicles inbound at the start of the day and outbound at the end.

Review of Access

Access to the site shall be provided via a temporary access in the northwest corner of the site. The site historically had an unsealed access off Adelaide Street which provided access to the sand quarry operated by ROCLA. The temporary access shall be located more than 100m into the 50km/hr zone with road users having sufficient distance to have reduced speed. The driveway will be wide enough to allow for the two-way movement of truck and dog combinations to ensure free flow into the site with no delays for entering vehicles. Due to the traffic demands for the project and the desire not to drive through the centre of Raymond Terrace, this access shall operate as a right in left out only for the heavy vehicles associated with the land fill operations whilst all movements shall be required for the low number of light vehicles associated with staff movements.

The Drivers Code of Conduct shall direct all drivers to approach the site from the south and depart to the south and not to travel to the north.

All vehicles shall enter and exit the site in a forward direction.

The operation of the access as a right in left out only sees no demand for heavy vehicles to interact with the pedestrian crossing to the north of the subject site.

Temporary signage under a Traffic Control Plan shall be provided on the approaches (Adelaide Street) to warn drivers of turning trucks as well as on Kent Street to advise motorists of Turning Trucks on Side Road. Motorists along these roads are typically local and will become familiar with the arrangements during this period. There is no requirement for speed reductions.

Sight Distances

Australian Standard AS2890.2:2002 Parking Facilities (Off-Street Commercial Vehicle Facilities) specifies the minimum sight distance requirements for a commercial vehicle to find a safe gap in the oncoming traffic prior to exiting onto the frontage road. The values provided are based on the Minimum Gap Sight Distance (MGSD) described by the Austroads Guide to Road Design - Part 4A: Unsignalised and Signalised Intersections. For a frontage road speed of 50km/hr the distance along the frontage road is 69 metres for a 5sec gap and 111 metres for an 8 sec gap.

Adelaide Street provides a straight and level alignment with sight lines for drivers exiting the site extend to the right (north) to more than 225 metres and in the order of 375 metres to the left (south). As the access will allow for right in and left out only for the heavy vehicles the sight line to the north is critical. This distance exceeds the required sight distance for drivers exiting this access.

The Safe Intersection Sight Distance is the minimum which should be provided on the major road at any intersection and should be applied to the following cases to ensure that adequate visibility is provided between:

- vehicles approaching on the major road and vehicles turning right from the major road for basic right-turn (BAR) treatments (i.e. no right-turn lane provided)
- vehicles turning right from the major road and oncoming major road vehicles at all types of right-turn treatments, including those on divided roads.

The SISD for a 50km/hr road frontage is 90 metres minimum, 97 metres desirable. The sight distance approaching the access exceeds this in both directions.



Photo 1 - View looking south showing approach along Adelaide Street with site on left of photo in distance

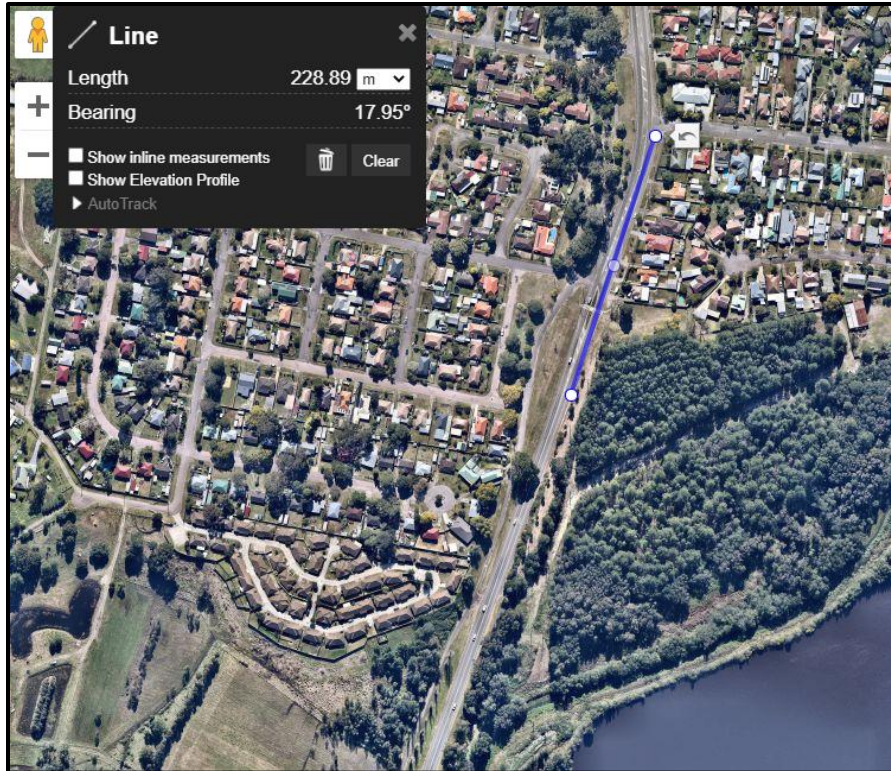


Photo 2 – Sight distance north along site frontage exceeding 225 metres in this location



Photo 3 – Sight distance along site frontage to south of access exceeding 375 metres in this location

Requirement for Turn Treatments

Given the very low traffic volumes associated with the proposed landfill site (1 entering every 10-15 minutes) and the short period for the fill works (estimated to be 12 months) no turn treatments are proposed for the access. The temporary access shall provide sufficient width to allow for the swept paths of truck and dog combinations. The right turn into the site will be for laden trucks and the left turn out for unladen trucks.

The forward visibility for trucks approaching the site exceeds 375 metres with truck drivers able to adjust their speed on approach to select a suitable gap in approaching traffic to reduce delays in turning into the site. The access is within the 50km/hr speed zone. Should a truck need to prop to undertake this turn, vehicles behind will have in excess of 300 metres to adjust their speed or if necessary, stop while the truck completes its turn into the site.

Visibility for drivers turning out of the site access exceeds 225 metres to the north which exceeds the requirement based on the posted speed limit of 50 km/h. It also exceeds the requirement for a 70km/hr frontage road speed, allowing for motorists approaching the 70km/hr zone to be accelerating in this location. Thus, the access can operate in a safe manner with unladen trucks able to select a suitable gap in the traffic flow to exit the site and accelerate to the road speed whilst vehicles approaching from the north will have adequate forward visibility to see a truck exiting the site and adjust their speed if necessary. The increase in the posted speed to 70km/hr from the urban 50km/hr speed occurs some south of the temporary site access. Signage shall be provided on the approaches to warn drivers of turning trucks.

It is therefore considered that the temporary intersection of Adelaide Street and the site access is acceptable for the low volume of trucks accessing and exiting the site. Road safety will be enhanced with installation of "Trucks Turning Ahead " signs for the duration of the landfill project (12 months). These signs would be provided in advance of the access for drivers travelling in both directions as well as on Kent Street. Also, the regular trimming of vegetation at the site access and within the sight triangles can enable visibility to be maintained for all road users.

Site Access Layout

The temporary unsealed access shall provide an appropriate width to ensure that Truck and Dog combinations can enter and exit the site in a forward direction. Details shall be provided to Council prior to the commencement of fill importation to the site.

A truck shakedown facility shall be incorporated into the exit to prevent material being tracked onto Adelaide Street.

Conclusion

Overall, the above assessment has demonstrated that the proposed importation of fill will have a minor and acceptable impact upon the surrounding road network, with traffic generated by these works being well within the capacity of Adelaide Street and the broader road network (Pacific Highway).

The key element of this project will be the provision of safe and suitable temporary access for Truck and Dog combinations, which is proposed to occur via a new access point in the northwest corner of the site off Adelaide Street. Given the relatively low number of trucks required to access the site per day, and the short period for the importation of fill, no upgrades are proposed to Adelaide Street.

The bulk earthworks shall see up to 50 heavy vehicles inbound and outbound a day however these shall be dependent upon the availability of material to be imported from various sites to provide for this fill. The existing access layout at Adelaide Street is considered appropriate however should be enhanced with "Trucks Turning Ahead" signage and the maintenance of vegetation at the access for the duration of the landfill project, anticipated to be 12 months.

The temporary site access provides acceptable sight distances which satisfy the requirements for travel speeds of 50 km/hr along the site frontage. Sight lines also satisfy the requirements for a 70km/hr zone allowing for motorists accelerating in this location.

Please do not hesitate to contact me on 4032 7979 should you have any queries or concerns.

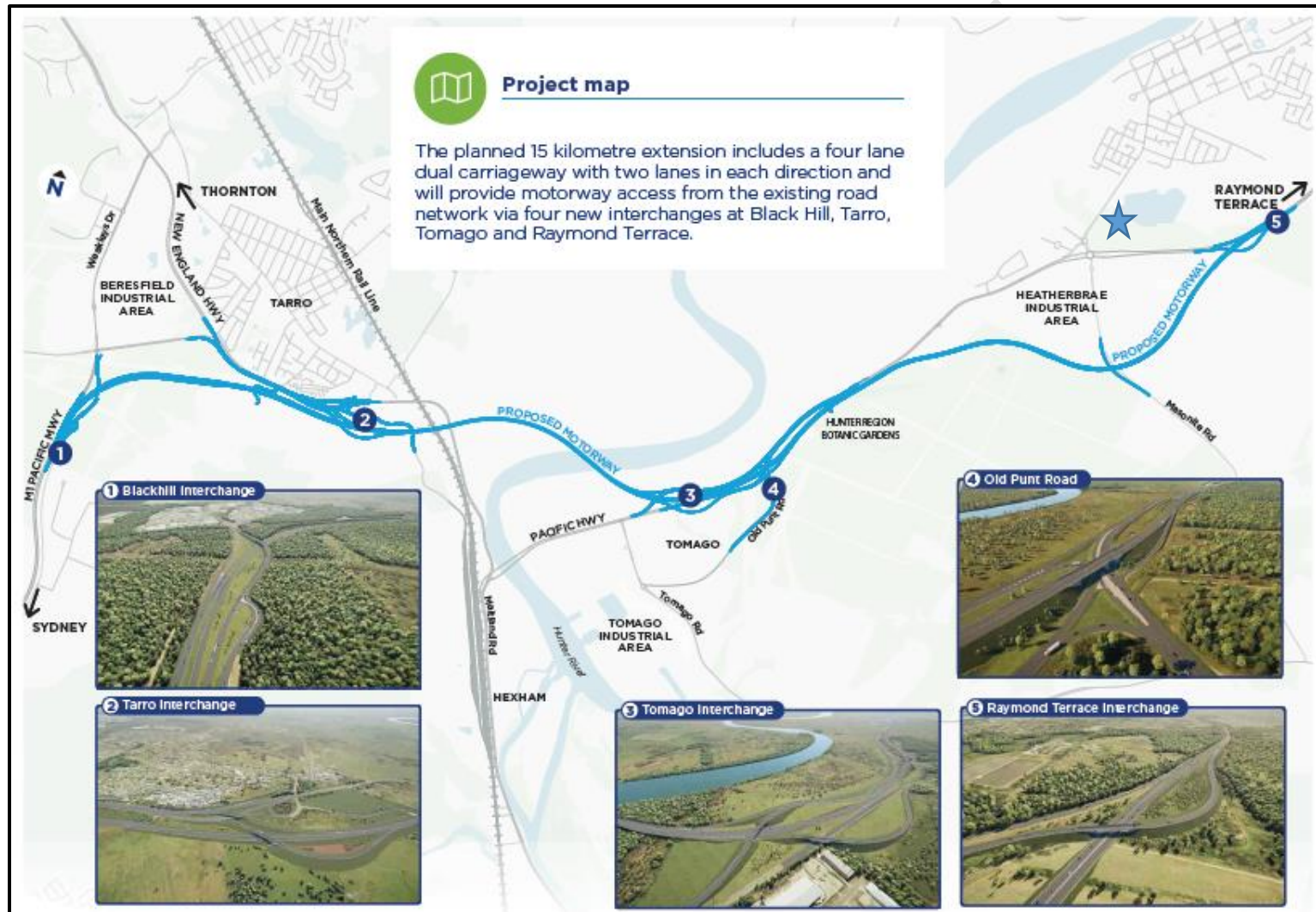
Yours sincerely,

Sean Morgan
Director

Attachment A – SEARS

SEARS	
Details of road transport routes and access to the site	Pages 1,4,6 and 7
Road traffic predictions for the development during construction	Page 4
An assessment of impacts to the safety and function of the road network and the details of any road upgrades required for the development	Pages 5 and 6
Transport for NSW	
A traffic and transport study shall be prepared in accordance with the Roads and Maritime Services NSW's Guide to Traffic Generating Developments 2002 and is to include (but not be limited to) the following:	
Assessment of all relevant vehicular traffic routes and intersections for access to / from the subject properties including details and a justification of the proposed access to, from and within the site, including intersection location, design and sight distance.	Pages 2 and 3
Current traffic counts for all of the traffic routes and intersections.	Page 3
The anticipated additional vehicular traffic including haul routes and heavy vehicle type generated from the proposed earthworks component of the project.	Page 4
The distribution on the road network of the trips generated by the proposed development. It is requested that the predicted traffic flows are shown diagrammatically to a level of detail sufficient for easy interpretation.	Pages 5 and 6
Consideration of the traffic impacts on existing and proposed intersections, in particular, the intersection of Adelaide Street and the Pacific Highway, and the capacity of the local and classified road network to safely and efficiently cater for the additional vehicular traffic generated by the earthwork activities. The traffic impact shall also address the cumulative traffic impact of other proposed developments in the area.	Pages 5 and 6
Identify the necessary road network infrastructure upgrades that are required to maintain existing levels of service on both the local and classified road network for the development. In this regard, preliminary concept drawings shall be submitted with the EIS for any identified road infrastructure upgrades. However, it should be noted that any identified road infrastructure upgrades will need to be to the satisfaction of Transport for NSW and Council.	Page 5 No upgrades required
Traffic analysis of any major / relevant intersections impacted, using SIDRA or similar traffic model, including: <ul style="list-style-type: none"> - Current traffic counts and 10 year traffic growth projections - With and without development scenarios - 95th percentile back of queue lengths - Delays and level of service on all legs for the relevant intersections - Electronic data for Transport for NSW review. 	Page 6 No SIDRA modelling required due to low hourly traffic flows generated by proposal. 10 additional trips per hour represent 0.2-0.5% increase in flows on the Pacific Highway
Any other impacts on the regional and state road network including consideration of pedestrian, cyclist and public transport facilities and provision for service vehicles.	No impact

Attachment B – M1 to Raymond Terrace Extension (★ subject site)



Attachment C – Concept plan for temporary access to site

