

Clyde Barging Facility

Addendum Review of Environmental Factors: Temporary storage site

PROJECT: SYDNEY METRO CITY & SOUTHWEST - METRO TUNNELLING CONTRACT
FEBRUARY 2019



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Glossary of terms

Term/ acronym	Definition
Addendum REF	Addendum Review of Environmental Factors
Clyde Barging REF	SMCSWTSE-JCG-TPW-EM-RPT-097239-Clyde Barging REF FINAL and SMCSWTSE-JCG-TPW-EM-RPT-097256-Clyde Barging Facility Submissions Report which was approved by TfNSW on 24 April 2018 by its Sydney Metro Clyde Barging Facility Determination Report April 2018
Crown Lands and Water	Crown Lands & Water Division, Department of Industry (formerly DPI Water)
CNVIS	Construction Noise and Vibration Impact Statement
EIS	Sydney Metro City & Southwest Chatswood to Sydenham Environmental Impact Statement, May 2016
EPA	Environment Protection Authority
EPBC	<i>Environment Protection and Conservation Act, 1999</i> (national)
EPL	Environment Protection Licence under the POEO Act
EP&A Act	<i>Environmental Planning and Assessment Act 1979</i> (NSW)
EP&A Regulation	<i>Environmental Planning and Assessment Regulation 2000</i> (NSW)
ESCP	Erosion and Sedimentation Control Plan
ESD	Ecologically sustainable development
JHCPBG	John Holland CPB Ghella
ISEPP	State Environmental Planning Policy (Infrastructure) 2007
OEH	Office of Environment and Heritage
POEO Act	<i>Protection of the Environment Operations Act 1997</i> (NSW)
Project	Sydney Metro City & Southwest
Project Planning Approval	Critical State Significant Infrastructure Sydney Metro & Southwest Chatswood to Sydenham Infrastructure Approval dated 9 January 2017 (Application no. SSI 15_7400)
Proposal	Establishing and operating a temporary spoil stockpiling and general logistics management site (the temporary storage site) to support the approved barging facility at Clyde
REF	Review of Environmental Factors
SEPP	State Environmental Planning Policy
SIS	Species Impact Statement
Spoil	All material generated by excavation into the ground, including the excavation of station boxes and tunnels
Submissions	Sydney Metro City & Southwest Chatswood to Sydenham Submissions

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and Preferred Infrastructure Report	and Preferred Infrastructure Report, October 2016
Sydney Metro	The Proponent for the proposal
TfNSW	Transport for New South Wales
TSE Works	Tunnel and Station Excavation Works Package (Metro tunnelling contract)

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Executive summary

Project overview

Sydney Metro is Australia's biggest public transport project. It will transform Sydney, delivering more trains and faster services for customers across the network.

Sydney Metro City & Southwest extends the new metro network from the end of Sydney Metro Northwest at Chatswood, under Sydney Harbour, through the CBD, and west to Bankstown – a total of 66 kilometres of metro rail.

When services start in 2024, there will be a train at least every four minutes in the peak – customers won't need a timetable, they'll just turn up and go.

Sydney Metro is delivering the Project on behalf of the New South Wales (NSW) Government. John Holland CPB Contractors Ghella (JHCPBG) has been awarded the contract to build the twin tunnels from Chatswood to Sydenham and excavate six new stations (the Metro tunnelling contract).

The Chatswood to Sydenham component of the Project was approved on 9 January 2017 (SSI 15_7400) (Project Planning Approval). Condition E84 requires that opportunities to maximise tunnel spoil removal by non-road methods are investigated to minimise truck movements in town centres and the Sydney Central Business District (CBD). In order to meet the requirements of this Condition, a Review of Environmental Factors (REF) was prepared and publicly exhibited for the establishment and temporary use of a barging facility adjacent to the Parramatta River at Clyde. The Clyde Barging REF was approved by Sydney Metro (formerly a division within TfNSW) on 24 April 2018. Site establishment of the approved barging facility commenced in October 2018 and was completed late November 2018.

Temporary spoil stockpiling and general logistics storage

Following review of the barge unloading process and the logistics of removing spoil from barges during high tide movements, it was determined that a temporary spoil stockpiling and general logistics management site was required to support the ongoing Metro tunnelling contract (the proposal). An Addendum to the Clyde Barging REF has been prepared to assess the potential environmental impacts of establishing and operating this temporary storage site. The site is located in Viva Energy Australia's Clyde Terminal on Durham Street, Rosehill.

Site establishment works including installation of temporary fencing and minor levelling works would start in Q1 2019 (subject to approval) and take approximately two weeks to one month to complete.

Temporary storage would commence immediately following site establishment and be completed in approximately mid 2021.

Need for the proposal

In addition to plant and equipment including Tunnel Boring Machine (TBM) components, over 760,000 tonnes of excavated material is expected to be received at the Clyde Barging Facility from the Barangaroo and Blues Point worksites over the life of the Metro tunnelling contract. The Clyde Barging REF noted that the spoil would be transferred into truck and trailers for reuse at approved residential and commercial developments. The Clyde Barging

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REF noted that during operations barges would need to arrive in the daytime, evening and at night due to tides and other vessel movements. As such to ensure that tidal impacts on barging operations are addressed and to minimise impacts on the surrounding road network, particularly during the AM and PM peaks, a 24-hour operations strategy, seven days per week has been adopted.

Spoil is being reused in approved residential and industrial developments across Sydney. JHCPBG continues to review available sites to maximise spoil reuse, however, there are currently few sites with approval to accept spoil into the evening (6 pm to 10 pm).

JHPCBG is aware that there are a number of projects, which would require clean fill, scheduled to commence during the Metro tunnelling contract that are located in the immediate vicinity of the proposal, including:

- TfNSW's Parramatta Light Rail Depot located on Grand Ave (approved on 29 May 2018 SSI 8285)
- Viva Energy Australia's Clyde Western Remediation Project, which has been declared State Significant Development and for which an Environmental Impact Statement is currently being prepared for this project. It is located within 1.5km to the Clyde Barging Facility within the existing terminal site. If approved JHCPBG would discuss the clean fill requirements of that project with Viva.

The temporary use of the proposed site for spoil stockpiling and storage therefore also presents an opportunity to further reduce the impacts of spoil transportation by road including vehicle emissions and road traffic congestion.

Statutory and planning framework

The State Environmental Planning Policy (Infrastructure) 2007 (ISEPP) aims to facilitate the effective delivery of infrastructure across New South Wales. Clause 79 of the ISEPP permits development on any land for the purpose of a rail corridor to be carried out by or on behalf of a public authority without consent. Sydney Metro would obtain a short-term lease over the proposed worksite owned by Viva Energy Australia to support the delivery of the Metro tunnelling contract component of the Project. Development permissible without consent is required to be assessed under Division 5.1 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) and development consent from council is not required.

This Addendum to the Clyde Barging REF fulfils the requirements of Section 5.5 of the EP&A Act, and has been prepared in accordance with Clause 228 of the *Environmental Planning and Assessment Regulation 2000* and having regard to the relevant provisions within the *Environment Protection Conservation Act 1999* (EPBC Act).

The proposal will not impose significant impact on matters of national environmental significance or the environment of Commonwealth land within the meaning of the EPBC Act.

Key potential environmental impacts of the proposal

The key potential environmental impacts associated with the proposal would likely comprise:

- Construction noise and vibration – The proposal is located in an industrial area and the nearest residential receiver in Rydalmerie is located 550 metres from the site. The cumulative noise from deliveries and spoil haulage outside of standard construction hours is consistent with the approved Clyde Barging REF. A noise assessment has been completed and is included in Appendix A.

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- Construction traffic and transport – The use of the temporary storage site would result in plant and equipment and spoil being transported to and from the temporary storage site via Grande Avenue. Spoil from the barging facility would be transported using truck and trailers via Grande Avenue and back into Viva Energy’s site. This would not substantially alter the traffic impacts assessed in the approved Clyde Barging REF as the overall number of heavy vehicles would not change.
- Soil and water – Site establishment would involve minor earthworks and during operations stockpiles would require careful management. Suitable controls would be identified as part of detailed construction planning, and a site-specific Erosion and Sediment Control Plan would be prepared, implemented, and updated as construction progresses.
- Air quality – Site establishment, operations and decommissioning works all have the potential to generate dust and would generate vehicle emissions. A range of mitigation measures would be implemented to minimise air quality impacts.
- Flora and fauna – the proposal would not require any additional vegetation clearing.

These and other potential environmental impacts are assessed in detail in this Addendum REF.

Next steps

A range of stakeholder and community consultation activities will be undertaken to inform the community and stakeholders about the proposal and seek feedback – see Section 4.0 for more details.

Sydney Metro will exhibit the Addendum REF for two weeks between 15 February and 1 March 2019 to enable the community and stakeholders to consider the details of the proposal and its impacts as detailed in the Addendum REF and to provide written comments on the proposal.

At the close of the exhibition period, Sydney Metro will consider the issues raised in submissions received in response to the exhibition of the Addendum REF. A submissions report will be prepared to address and respond to the issues raised in submissions. This report, along with the Addendum REF and any other relevant information, will be used by Sydney Metro to assess and determine the proposal.

Should the proposal be approved, Sydney Metro will make the submissions report and any conditions of approval publicly available. The local community will be notified by way of community newsletters and the project website <https://www.sydneymetro.info/documents>.

Correspondence will also be sent to people that made a submission, which would include contact details for further information and an indication of the anticipated timing of construction work.

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1.0 Introduction

1.1 Overview

Sydney Metro is Australia's biggest public transport project. It will transform Sydney, delivering more trains and faster services for customers across the network.

Sydney Metro City & Southwest extends the new metro network from the end of Sydney Metro Northwest at Chatswood, under Sydney Harbour, through the CBD, and west to Bankstown – a total of 66 kilometres of metro rail.

When services start in 2024, there will be a train at least every four minutes in the peak – customers won't need a timetable, they'll just turn up and go.

Sydney Metro is delivering the Project on behalf of the New South Wales (NSW) Government. John Holland CPB Contractors Ghella (JHCPBG) has been awarded the contract to build the twin tunnels from Chatswood to Sydenham and excavate six new stations (the Metro tunnelling contract).

This Addendum REF has been prepared to address requirements under Division 5.1 of the *Environmental Planning and Assessment Act 1979* (EP&A Act). For the purposes of these works, Sydney Metro is the proponent and determining authority under Division 5.1 of the EP&A Act. The description of the proposal (Section 2.0) and associated potential environmental impacts (Section 5.0) have been undertaken in the context of clause 228 of the *Environmental Planning and Assessment Regulation 2000* and other relevant legislation, as set out in Section 3.0.

1.2 Background

1.2.1 Sydney Metro overview

Sydney Metro is one of Australia's biggest public transport projects and will deliver a step change in public transport in Sydney. Construction and planning of this 66 kilometre project is now well advanced. Sydney Metro forms part of the NSW Government's Sydney's Rail Future plan. This is a long-term plan to modernise Sydney's trains and is an integral component of the NSW Government's Long-Term Transport Master Plan. Sydney's new metro trains will be capable of carrying around 40,000 people per hour, compared with the current capacity of 24,000 people per hour on current suburban trains.

Stage 2 of Sydney Metro involves extending metro rail from Sydney's Northwest region, beneath Sydney Harbour, through new underground CBD stations and beyond to Bankstown. Services on Sydney Metro City & Southwest are expected to start in 2024.

The Project comprises two core geographic components:

- Chatswood to Sydenham – new 15.5 km twin tunnels from Chatswood, under Sydney Harbour through Sydney's CBD to Sydenham.
- Sydenham to Bankstown upgrade – proposed upgrade and conversion of the existing 13.5 km railway from Sydenham Station to Bankstown to metro standards.

The Metro tunnelling contract involves the design and construction of tunnels and underground station excavation, station structures at Barangaroo, cross passages and associated civil works from Chatswood to Sydenham (see Figure 1).

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Figure 1: Sydney Metro City & Southwest project and Metro tunnelling contract route overview

Sydney Metro City & Southwest will have the ultimate capacity to operate 30 trains an hour through the CBD – or one train every two minutes in each direction, with 98 per cent on-time running reliability.

Sydney Metro City & Southwest will provide a number of benefits, including doubling the number of train paths available from the north, strengthening connections and access across Sydney and its rail network, and improving the capacity, reliability and efficiency of the existing transport system. This will help to improve network resilience through the Sydney CBD and across Sydney Harbour, improve travel times, and reduce crowding at existing Sydney CBD stations, North Sydney and St Leonards.

In May 2016, an Environmental Impact Statement for the Chatswood to Sydenham component of the Project (the EIS) was placed on public exhibition for a period of 48 days (six weeks). A Submissions and Preferred Infrastructure Report on the Chatswood to Sydenham component (the SPIR) was prepared and publicly released in October 2016. The SPIR assessed the impacts of barging operations at Barangaroo and Blues Point, however a barge destination site was not identified or assessed.

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The Chatswood to Sydenham component of the Project was approved on 9 January 2017 (SSI 15_7400) (Project Planning Approval). Condition E84 requires that opportunities to maximise tunnel spoil removal by non-road methods are investigated to minimise truck movements in town centres and the Sydney Central Business District (CBD). In order to meet the requirements of this Condition, a Review of Environmental Factors (REF) was prepared and publicly exhibited for the establishment and temporary use of a barging facility adjacent to the Parramatta River at Clyde. The Clyde Barging REF was approved by Sydney Metro (formerly TfNSW) on 24 April 2018. Site establishment of the approved barging facility commenced in October 2018 and was completed in late November 2018.

1.3 Structure and content of this REF

The structure and content of the REF is outlined in Table 1.

Table 1: Structure and content of the REF

REF Section	Description
Section 1.0 – Introduction	Sets out the background of the proposal.
Section 2.0 – Description of the Proposal	Presents the need and justification for and a detailed description of the proposal, including elements of the Proposal and construction requirements.
Section 3.0 – Statutory and planning framework	Outlines relevant environmental planning instruments and policies, and provides an assessment of their relevance to the proposal.
Section 4.0 – Consultation	Summarises community and stakeholder consultation requirements during construction phases.
Section 5.0 – Environmental assessment	Presents an assessment of the potential impacts of the proposal on key environmental aspects, including traffic and transport, noise and vibration, biodiversity, soil and water, hazard and risk, waste management, historic and Aboriginal heritage, air quality, and sustainability.
Section 6.0 – Environmental management	Outlines the management and mitigation measures to be implemented during construction of the proposal to minimise and manage potential impacts identified in this Addendum REF.
Section 7.0 – Justification and conclusion	Summarises justification for the proposal and presents the conclusions of this Addendum REF.

This Addendum REF is supported by a noise and vibration assessment which is attached at Appendix A.

2.0 Description of the proposal

2.1 Strategic need for the proposal

In addition to plant and equipment including Tunnel Boring Machine (TBM) components, over 760,000 tonnes of excavated material is expected to be received at the approved Clyde Barging Facility from the Barangaroo and Blues Point worksites over the life of the Metro tunnelling contract. The approved Clyde Barging REF noted that the spoil would be transferred into truck and trailers for reuse at approved residential and commercial developments. The Clyde Barging REF noted that during operations barges would need to arrive in the daytime, evening and at night due to tides and other vessel movements. As such to ensure that tidal impacts on barging operations are addressed and to minimise impacts on the surrounding road network, particularly during the AM and PM peaks, a 24-hour operations strategy, seven days per week has been adopted.

Spoil is being reused in approved residential and industrial developments across Sydney. JHPCBG continues to review available sites to maximise spoil reuse, however, there are currently few sites with approval to accept spoil into the evening (6 pm to 10 pm).

JHPCBG is aware that there are a number of projects, which would require clean fill, scheduled to commence during construction the Metro tunnelling contract that are located in the immediate vicinity of the proposal, including:

- TfNSW's Parramatta Light Rail Depot located on Grand Ave (approved on 29 May 2018 SSI 8285)
- Viva Energy Australia's Clyde Western Remediation Project, which has been declared State Significant Development and for which an Environmental Impact Statement is currently being prepared for this project. It is located within 1.5km to the Clyde Barging Facility within the existing terminal site. If approved JHPCBG would discuss the clean fill requirements of that project with Viva.

The temporary use of the proposed site for spoil stockpiling and storage therefore also presents an opportunity to further reduce the impacts of spoil transportation by road including vehicle emissions and road traffic congestion.

2.2 Overview of the proposed works

The temporary storage area is located at 10D Grand Avenue Camellia (Lot 101 / DP 809340). The site is owned by Viva Energy Australia and located within the Parramatta Council Local Government Area and is zoned Heavy Industrial (IN3). Figure 2 provides a site locality plan.



Figure 2: Clyde storage site location

2.3 Work methodology

JHCPBG propose to temporarily stockpile up to a maximum of 200,000 m³ of spoil and manage plant and equipment within the proposed site (ie storage of equipment and materials required for worksites and /or removed from worksites).

An indicative construction plan is provided below, including indicative construction methods, staging, plant and equipment requirements and anticipated traffic management controls. The actual construction plan and method may vary from the description provided in this section due to the identification of additional constraints during pre-construction, ongoing detailed design refinements, agency and community feedback, and construction contractor requirements/limitations.

The construction stages and activities are summarised in Table 2, and Figure 3 provides an indicative site layout plan. Truck movements between Grand Avenue and James Ruse Drive are not shown on this Figure as they are already covered under the Clyde Barging REF,

Table 2: Proposed construction stages and key activities

Construction Stage	Description	Indicative timeframe
Stage 1: Site establishment	The following works would be required to establish the site: <ul style="list-style-type: none"> Service locating for live services and utilities 	Site establishment works would start in approximately Q1 2019 and take approximately

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Construction Stage	Description	Indicative timeframe
	<ul style="list-style-type: none"> • Installing fencing and environment controls including the soil and water management controls in accordance with the Managing Urban Stormwater: Soils and Construction Volume 1 (Landcom, 2004) and Managing Urban Stormwater: Soils and Construction Volume 2 (Department of Environment and Climate Change, 2008a). Measures would be designed as a minimum for the 80th percentile; 5-day rainfall event including a sediment basin. • Minor earthworks to level the loading area • Provision of temporary lighting plant • Erection of temporary site signage within the site boundary 	one month to complete
Stage 2: Use of the site	<p>Spoil would be transported to the site from the barge via truck and dogs and stockpiled:</p> <ul style="list-style-type: none"> • Stockpiles will be up to approximately 12 metres in height similar to existing material stockpiles in the area • Stockpiles would be stabilised by either: <ul style="list-style-type: none"> ○ Cover crop ○ Polymer straw or ○ Covering with geotextile <p>the site would also provide temporary and short term management of logistics from the Metro tunnelling contract worksites, including but not limited to storage of equipment and materials required for worksites and /or removed from worksites (e.g. ramps for cross passage excavation; storage of park equipment for reinstatement on completion of the Metro tunnelling contract).</p>	The site operations would commence following site establishment and be completed by approximately late 2020
Stage 3: Decommissioning	<ul style="list-style-type: none"> • Stockpiles would be removed using excavators/loaders to load truck and trailers and either reuse in: <ul style="list-style-type: none"> ○ The Clyde Western Remediation Project (subject to receipt of development consent) or ○ TfNSW Parramatta Light Rail Depot located on Grand Ave ○ Other approved residential and commercial developments • Removal of temporary fencing and other temporary infrastructure as agreed with Viva Energy Australia 	Three to six months works would be completed by approximately mid of 2021

It is noted that amenities already available adjacent to the site as part of the Viva Energy Australia’s facility including lunch room and toilet facilities would be utilised.

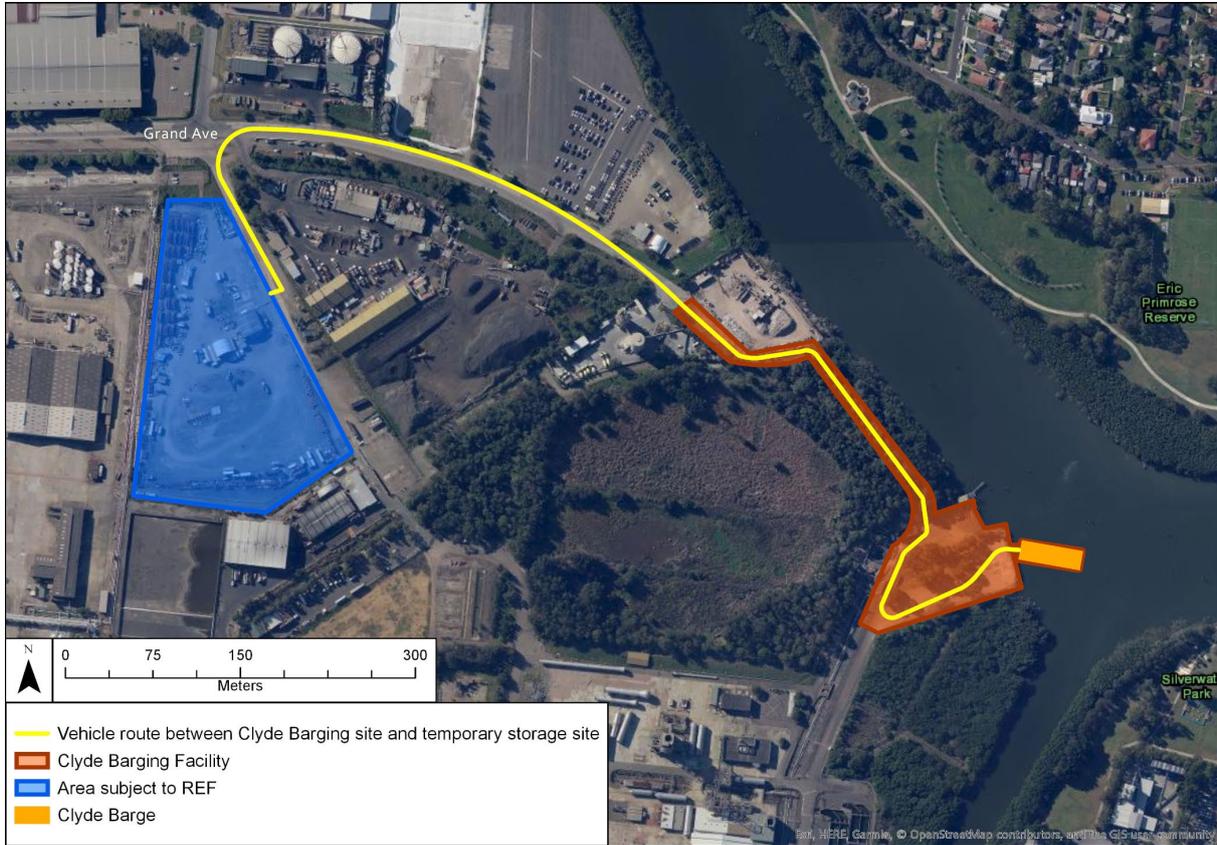


Figure 3: Indicative site layout plan

2.4 Hours of work

Site establishment would generally be undertaken Mondays to Fridays 7:00am to 6:00pm and Saturdays 8:00am to 1:00pm. There may be a need for works outside of these hours, particularly to coordinate with other vehicle movements.

To ensure that tidal impacts on barging operations are addressed and to minimise impacts on the surrounding road network, particularly during the AM and PM peaks, a 24-hour operations strategy, seven days per week has been adopted for the Clyde Barging Facility. During operations barges would need to arrive in the daytime, evening and at night due to high tides requirement and other vessel movements. Truck and Dogs would be used to transport spoil from the Clyde Barging Facility to the temporary storage site. Spoil would therefore be trucked to the temporary storage site 24 hours per day seven days per week as per the barge unloading schedule which is governed by the high tides schedule.

During decommissioning:

- If spoil is to be transported to the Clyde Western Remediation Project truck movements would be managed in accordance with the Development Consent for that project.
- If the spoil is to be transported off the Viva Energy Australia site, truck movements would be limited during peak road traffic periods to minimise road traffic congestion in the area. Truck movements would be maximised during daytime non-peak periods (10 am to 4pm),

however evening and night time haulage would be required consistent with the Clyde Barging Facility approval.

2.5 Plant and equipment

Indicative plant and equipment required during site establishment, operations and decommissioning includes:

- Light vehicles
- Road truck for deliveries
- Compressor
- Excavators
- Crane
- Water cart
- Graders
- Roller
- Truck and trailers.

Additional plant and equipment to that identified above may be needed. The requirement for additional equipment would be determined by JHCPBG to support the establishment, operation and decommissioning works.

2.6 Workforce

The workforce associated with the various elements of the proposal is anticipated to be as shown in Table 3.

Table 3: Anticipated workforce

Construction stage	Number of workforce (daytime)	Number of workforce (evening time)
Stage 1: Site establishment	10 workers	-
Stage 2: Use of the site	5-10 workers	5-10 workers
Stage 3: Decommissioning	10 workers	-

3.0 Statutory and planning framework

3.1 Overview

This section outlines the statutory requirements and environmental planning instruments relevant to the construction and operation of the proposal, and explains the environmental planning and approvals processes for the proposal.

3.2 NSW legislation and regulations

3.2.1 Environmental Planning and Assessment Act 1979

The EP&A Act regulates land use planning and development in NSW. The proposal constitutes an 'activity' for the purposes of Division 5.1 of the EP&A Act by reason of clause 79 of the ISEPP— refer to Section 3.3.2, below. As such, the proposal is permissible without development consent.

Sydney Metro is a determining authority in respect of the activity for the purposes of Division 5.1 of the EP&A Act. Section 5.5 of the EP&A Act requires Sydney Metro to examine and take into account to the fullest extent possible all matters affecting or likely to affect the environment by reason of that activity.

Given the proposal is to support the activities associated with the approved Clyde Barging Facility, the proposal is being assessed as an Addendum REF to the approved Clyde Barging REF.

Section 5.0 of this Addendum REF assesses the likely effect of the proposal on the environment and threatened species, populations and ecological communities. Having regard to the provisions of sections 5.5 and 5.6 of the EP&A Act, the proposal is not likely to significantly affect the environment or threatened species and therefore neither an EIS, nor a Species Impact Statement is required. Section 6.0 of this Addendum REF details appropriate mitigation measures to manage and minimise impacts on the environment. The process for determining the proposal under Division 5.1 of the EP&A Act is outlined in Figure 4.

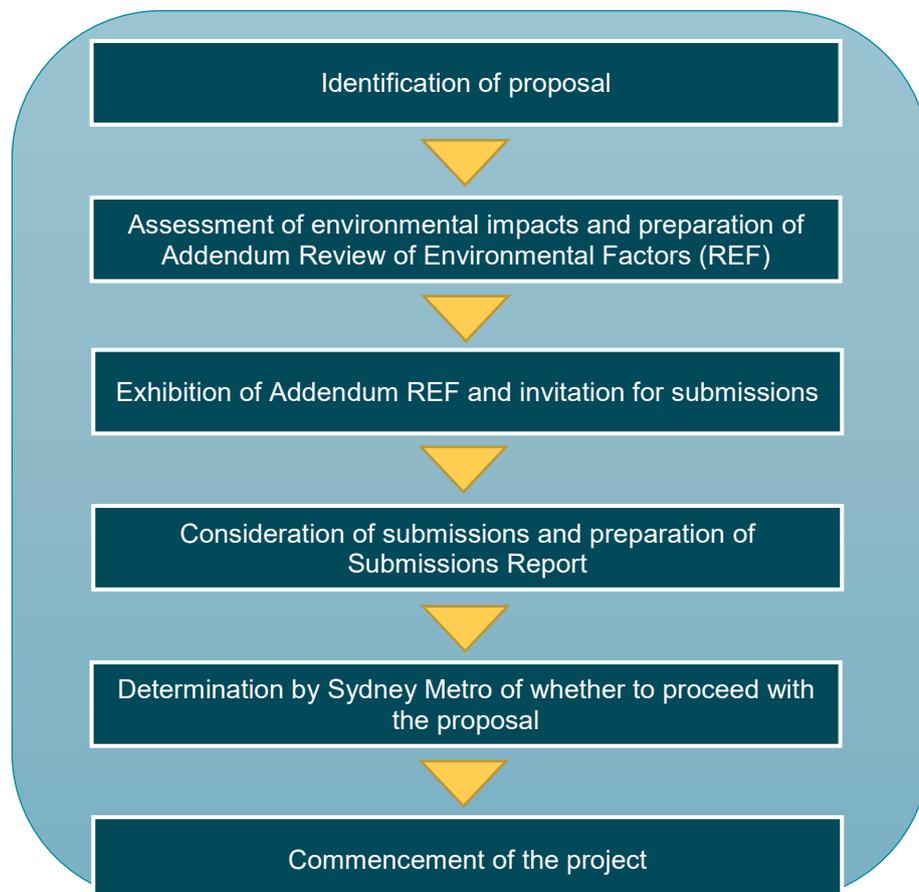


Figure 4: Planning approvals process for the proposal under the EP&A Act

3.2.2 Protection of the Environment Operations Act 1997

The *Protection of the Environment Operations Act 1997 (NSW)* (the POEO Act) provides a licencing regime for specific activities relating to air, water and noise pollution, and waste management. The (NSW) Environment Protection Authority (EPA) and local government, where relevant, administer the POEO Act.

Development under the EP&A Act also requires an environment protection licence (EPL) under the POEO Act if that development constitutes a scheduled activity as set out in Schedule 1 to the POEO Act.

Regardless of whether a licence for the proposal is required, the following restrictions during construction and operation of the proposal would apply under the general terms of the POEO Act:

- Works must not pollute the environment
- Waste must be classified, handled, transported and disposed of in an appropriate manner in accordance with the POEO Act and the Protection of the Environment Operation (Waste) Regulation 2014
- Environmental incidents involving actual or potential harm to human health or the environment must be notified to the EPA and other relevant authorities.

The proposal would be carried out under the existing Metro tunnelling contract's EPL No. 20971, with the site of the proposal premised under this licence.

3.2.3 Coastal Management Act 2016

The *Coastal Management Act 2016* reflects the natural, social, cultural and economic values of NSW coastal areas and promotes the principles of ecologically sustainable development in managing these values. The *Coastal Management Act 2016* divides the coastal zone into four coastal management areas, defined by the unique features of different local areas. These four areas are defined in the new Act as part of the pending Coastal Management State Environmental Planning Policy (SEPP).

The proposal is not located on land mapped as 'Coastal Wetlands' and 'Proximity Area for Coastal Wetlands' under the Coastal Management Act.

3.2.4 Biodiversity Conservation Act 2016

The *Biodiversity Conservation Act 2016* (NSW) (the BC Act) provides for the protection and conservation of threatened species, protected animals and plants, declared areas of outstanding biodiversity value, and ecological communities and their habitats in NSW. It is a defence to a prosecution for an offence under Division 1 of Part 2 of the BC Act if the activity is carried out by a determining authority under Division 5,1 of the EP&A Act.

Part 7 of the BC Act provides for the biodiversity assessment in relation to approvals under the EP&A Act. Section 7.8 of the BC Act states that, for the purposes of Division 5.1 of the EP&A Act, an activity is to be regarded as an activity likely to significantly affect the environment if it is likely to significantly affect threatened species. In that case, the EIS prepared under Division 5.1 of the EP&A Act must include or be accompanied by a species impact statement or a biodiversity development assessment report and certain concurrence requirements apply (see section 7.12).

Section 7.2 provides that an activity is "likely to significantly affect a threatened species" if it is likely to significantly affect threatened species or ecological communities, or their habitats, according to the test in section 7.3.

Section 7.3 sets out the test for determining whether proposed development or activity is likely to significantly affect threatened species. The proponent must take into account whether:

- a) In the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction,
- b) In the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:
 - i. Is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or
 - ii. Is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction,
- c) In relation to the habitat of a threatened species or ecological community:

- i. The extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and
 - ii. Whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and
 - iii. The importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality,
- d) Whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly),
- e) Whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process.

Potential impacts of the proposal on flora and fauna have been assessed as outlined in Section 5.3. This assessment concludes that there are no potential ecological impacts of the proposal. As such, preparation of a SIS is not required for the proposal.

3.2.5 Heritage Act 1977

The *Heritage Act 1977* (the Heritage Act) provides for the conservation of environmental heritage in NSW. Environmental heritage is defined as items that are of State and local importance. Heritage items usually have historical, scientific, cultural, social, archaeological, architectural, natural or visual value to the State or a particular local area. The Heritage Act protects heritage places, buildings, works, moveable objects, precincts and archaeological sites that are important to the people of NSW. Items that have particular importance to the State of NSW are listed on the State Heritage Register (SHR). Such items can include those of Aboriginal and non-Aboriginal heritage significance.

Under Section 139 of the Heritage Act, approval from OEH is required prior to the disturbance or excavation of land if a project will, or is likely to result in, a relic being discovered, exposed, moved, damaged or destroyed. Section 170 of the Heritage Act requires government agencies to maintain a heritage and conservation register (Section 170 register). These registers provide a list of government assets which may have State or local heritage significance.

No items of Commonwealth, National or State significance, are located on the site but a number of items of local heritage significance are located around the proposal site. Section 5.9 of this Addendum REF concludes that no impact to the local heritage items is likely and that an Unexpected Finds Procedure would be an appropriate mitigation strategy.

3.2.6 Roads Act 1993

Section 138 of the *Roads Act 1993* (the Roads Act) requires Sydney Metro to obtain consent from the relevant roads authority for the erection of a structure, or the carrying out of work in, on or over a public road, or the digging up or disturbance of the surface of a road. However, under Clause 5(1) in Schedule 2 of the Roads Act, public authorities do not require consent for works on unclassified roads. The proposal is not anticipated to impact a classified road. However ongoing consultation would be undertaken with Parramatta Council and Roads and Maritime as to the potential impacts that may occur to all of the roads along the proposed alignment and to identify any potential consent that may be required.

3.2.7 National Parks and Wildlife Act 1974 & National Parks and Wildlife Amendment Regulation 2010

The *National Parks and Wildlife Act 1974* (NSW) (NPW Act) provides for the management of all national parks, historic sites, nature reserves, reserves, Aboriginal areas and State game reserves. It also provides for the protection of Aboriginal places and objects throughout NSW. Under the Act it is an offence to knowingly destroy, deface or damage an Aboriginal object or place without consent.

When an activity is likely to impact upon an Aboriginal object or place, approval may be required. An Aboriginal Heritage Due Diligence Assessment was also carried out by AMBS for the Clyde Barging REF, and determined that there are no Aboriginal heritage items or places within the study area listed on the SHR and that an Unexpected Finds Procedure would be an appropriate mitigation strategy.

The *National Parks and Wildlife Amendment Regulation 2010* excludes activities carried out in accordance with the Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW from the definition of harm in the NPW Act, meaning that test excavations may be carried out in accordance with this Code of Practice, without requiring an AHIP. The Regulation also outlines Aboriginal community consultation requirements (Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010), and a Due Diligence Code of Practice which specifies activities that are low impact, thus providing a defence to the strict liability offence of harming an Aboriginal object.

Potential impacts of the proposal on Aboriginal relics have been assessed as outlined in Section 5.10. This assessment concludes that the site has been disturbed by previous uses and that an Unexpected Finds Procedure would be an appropriate mitigation strategy.

3.2.8 Water Management Act 2000

The subject site is located more than 40 metres from the Parramatta River, and therefore is not “waterfront land” under the *Water Management Act 2000* (WM Act). As such no approval under the WM Act is required.

3.3 Other relevant environmental planning instruments

3.3.1 Overview

The following environment planning instruments are considered relevant to the proposal:

- State Environmental Planning Policy (Infrastructure) 2007 (ISEPP)
- State Environmental Planning Policy – 33 Hazardous and Offensive Development (SEPP 33)
- Sydney Regional Environmental Plan (Sydney Harbour Catchment) 2005 (Harbour REP)
- Parramatta Local Environmental Plan 2011 (Parramatta LEP)

3.3.2 State Environmental Planning Policy – Infrastructure 2007

One of the aims of the Infrastructure SEPP is to provide a consistent planning framework for the delivery of infrastructure and the provision of services across NSW.

Part 3 of the ISEPP identifies the development controls for certain types of infrastructure or services, including port, wharf or boating facilities; railways; and road infrastructure facilities. The development controls specify the following planning categories:

- Development permissible without consent
- Development permissible with consent
- Exempt development
- Prohibited development
- Complying development.

Clause 79 of the ISEPP provides that development for the purpose of a railway or rail infrastructure facilities are permissible without the need for development consent under Part 4 of the EP&A Act, when undertaken by, or on behalf of a public authority.

Sydney Metro would obtain a short term lease over the worksite to support the delivery of the Metro tunnelling contract component of the Project. Development permissible without consent is required to be assessed under Division 5.1 of the *Environmental Planning and Assessment Act 1979* and development consent under the provisions of Part 4 of the EP&A Act is not required.

Part 2 of the ISEPP contains provisions for public authorities to consult with local councils and other public authorities prior to the commencement of certain types of development. Consultation, including consultation as required by the ISEPP (where applicable), is discussed in Section 4.0 of this Addendum REF.

3.3.3 State Environmental Planning Policy – 33 Hazardous and Offensive Development

This Policy aims, among other things, to ensure that in considering any application to carry out potentially hazardous or offensive development, the consent authority has sufficient information to assess whether the development is hazardous or offensive and to impose conditions to reduce or minimise any adverse impact.

“Potentially hazardous industry” means a development for the purposes of any industry which, if the development were to operate without employing any measures (including, for example, isolation from existing or likely future development on other land) to reduce or minimise its impact in the locality or on the existing or likely future development on other land, would pose a significant risk in relation to the locality:

- To human health, life or property; or
- To the biophysical environment

and includes a hazardous industry and a hazardous storage establishment (clause 3).

The site establishment and operational activities of the proposal were assessed against the criteria of the SEPP No.33. The proposal was determined not to meet the definition of a ‘potentially hazardous industry’ or ‘potentially offensive industry’. See Section 5.7 for details.

3.3.4 Sydney Regional Environmental Plan (Sydney Harbour Catchment) 2005

The Sydney Regional Environmental Plan (Sydney Harbour Catchment) 2005 (SREP) (a deemed SEPP) applies to all the waterways of Sydney Harbour, the foreshores and its wider

catchment as shown in the Sydney Harbour catchment map. The proposal is not within the Sydney Harbour catchment map and as such further consideration if this SREP is not required.

3.3.5 Parramatta Local Environmental Plan 2011

The proposal is located within the Parramatta Local Government Area (LGA), on land zoned as IN3 Heavy Industrial under the *Parramatta Local Environmental Plan 2011* (Parramatta LEP). The operation of the ISEPP means that the Parramatta LEP would not apply to the extent that it imposes controls that are inconsistent with the ISEPP, and permissibility for the proposal is provided under the provisions of the ISEPP. Notwithstanding, during the preparation of this REF, the provisions of the Parramatta LEP were considered.

Part 5, Clause 5.10 'Heritage Conservation' of the Parramatta LEP is consistent with current heritage best practice guidelines, and provides for the protection of heritage items, places, conservation areas, and archaeological sites. Schedule 5 'Environmental heritage' does not include any Aboriginal objects or places of heritage significance within the study area or its vicinity.

3.4 Commonwealth legislation

3.4.1 Environment Protection and Biodiversity Conservation Act 1999 (Cth)

The *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act) provides a legal framework to protect and manage nationally and internationally important flora, fauna, ecological communities and heritage places — defined in the EPBC Act as 'matters of national environmental significance'.

Under the EPBC Act, any action that has, would have, or is likely to have a significant impact on a matter of national environmental significance or on Commonwealth land, triggers the EPBC Act and may require approval from the Commonwealth Minister for Environment.

An action may include a project, development, undertaking, activity, or series of activities. If the Commonwealth Minister for Environment determines that an approval is required under the EPBC Act, the proposed action is deemed to be a 'controlled action'. It must then undergo assessment and approval under the EPBC Act before the action is carried out. The Act provides that a proponent of an action that may be, or is, a controlled action must refer the proposal to the Minister for the Minister's decision as to whether the action is a controlled action.

Potential impacts of the proposal on flora and fauna are assessed in Section 5.3 of this Addendum REF. The proposal is not likely to have a significant impact on matters of national environmental significance or the environment of Commonwealth land within the meaning of the EPBC Act.

3.5 Summary of legislative requirements

A summary of the potential licences, permits, approvals and notifications that may be required for the construction, maintenance and operation of the proposal are outlined in Table 4.

Addendum Review of Environmental Factors: Temporary storage site

Table 4: Summary of potential licences, permits and approvals

Legislation	Authority	Requirement	Comment
EP&A Act	Sydney Metro	Consideration: Clause 79 of the ISEPP outlines that development for the purpose of a railway and railway infrastructure facilities are permissible without the need for development consent under Part 4 of the EP&A Act when undertaken by a public authority. This REF fulfils the requirements of Section 5.5 of the EP&A Act, and has been prepared in accordance with Clause 228 of the <i>Environmental Planning and Assessment Regulation 2000</i> .	<p>This Addendum REF has been prepared to meet the assessment requirements under the EP&A Act.</p> <p>This Addendum REF has considered factors under clause 228 in Appendix A.</p>
ISEPP	City of Parramatta Council	<p>Notification: under Sections 13 to 15, 21 days notice is required for the following:</p> <ul style="list-style-type: none"> (a) Substantial impact on council related infrastructure. (b) Impacts to local heritage. (c) Works which may impact flood liable land. 	<p>The City of Parramatta Council has been notified of the amended proposal, however, notification and consultation under Section 13, substantial impact on council related infrastructure is not triggered by the proposal.</p> <p>Consultation with Council is not triggered under Section 14, as there are no potential impacts of the proposal on local heritage items. Similarly, Council consultation is not triggered under Section 15 as the proposal would not change flood patterns other than to a minor extent.</p>
POEO Act	EPA	Licence: The Metro tunnelling contract are consistent with the definition of Rail Systems Activities described in Schedule 1 of the POEO Act. The use of the area to temporarily store material can be managed under the current EPL, specifically Schedule #33 (Rail Systems Activities) as this includes “earthworks” under “ancillary work”.	John Holland has obtained EPL No. 20971 for the Metro tunnelling contract. The proposal would be premised under this EPL.

Addendum Review of Environmental Factors: Temporary storage site

Legislation	Authority	Requirement	Comment
Roads Act 1993	RMS	Approval: under Section 138, approval is required for road work on a Classified Road.	No road work is required as part of the proposal.

4.0 Consultation

4.1 Overview

This section summarises the community and stakeholder consultation planned with relation to the proposal, including engagement activities to support the Addendum REF exhibition and construction phase of the proposal. The Addendum REF exhibition period will include targeted consultation to provide an opportunity for stakeholders and the community to provide feedback on the proposal.

4.2 Consultation objectives

A communications and consultation strategy has been developed to support the Addendum REF if approved. Consultation activities to be undertaken aim to encourage stakeholder and community involvement in the proposal. The purpose of the consultation activities is to:

- Inform nearby residents, businesses, community and other stakeholders about the proposal
- Provide quality information about the nature of the works to be undertaken at the facility, timing and likely impacts
- Foster an understanding of the mitigation measures to manage impacts to the environment and community
- Provide the community and key stakeholders with avenues to obtain further information about the proposal and provide feedback

This Addendum REF will be publicly exhibited for a period of two weeks. Through this process the community and stakeholders will be invited to make submissions, raise issues, seek clarification or ask questions about any aspect of the proposal. All issues that are raised in the submissions will be considered and responded to in a report. Where required, community updates would be provided online and delivered to local residents.

4.3 Consultation strategy

4.3.1 Land owner

The temporary storage site would be located on land owned by Viva Energy Australia. A short term lease agreement would be entered into with Viva Energy Australia for the duration of the use of the site. Consultation with Viva Energy Australia has commenced.

4.3.2 Government agency consultation

No agency consultation is triggered under Division 1 of the ISEPP. The following government agencies have been consulted regarding the proposal:

- City of Parramatta Council
- NSW Environment Protection Authority
- NSW Roads and Maritime Services (RMS)
- Sydney Coordination Office (SCO)

4.3.3 Consultation during public exhibition

This Addendum REF will be placed on public exhibition from 15 February and 1 March 2019. During the exhibition period, written submissions will be accepted for consideration. Table 5 lists the key engagement tools and how they will be used to engage with the community and stakeholders during the public exhibition of the Addendum REF.

Table 5: Key community and stakeholder engagement tools and activities

Engagement tool	Activity
Proposal Website	sydneymetro.info/documents The Addendum REF and fact sheet will be available on the Sydney Metro website.
Fact sheet	A fact sheet will be prepared to summarise the proposal, provide information about the works and likely impacts, how to make a submission and details regarding the community information session. The fact sheet will be available on the project website.
Stakeholder briefings	Briefing sessions have been held with City of Parramatta Council, and EPA on the proposed works that are the subject of this Addendum REF. Further briefing sessions will be arranged as required. Ongoing liaison with the land owners, Viva Energy Australia, and RMS will continue during the Addendum REF exhibition.
Correspondence	All stakeholders and community members that made a submission on the approved Clyde Barging REF will receive a letter and fact sheet formally advising of the Addendum REF and offering a further briefing if required. All stakeholders that have registered to receive email updates in relation to works at the Clyde barging site will be advised of the Addendum REF, including a copy of the fact sheet.

The REF will be available on sydneymetro.info/documents

Community members and stakeholders are invited to submit their feedback on the proposal to Sydney Metro by emailing sydneymetro@transport.nsw.gov.au or writing to:

Sydney Metro
PO Box K659
Haymarket NSW 1240

Submissions should be clearly marked 'Comments on Addendum REF: Temporary storage site'.

During the exhibition period, community members and stakeholders can direct any enquiries to Sydney Metro:

Enquiries phone line: 1800 171 386
Email: sydneymetro@transport.nsw.gov.au

4.3.4 Submissions Report

Following the Addendum REF exhibition, a Response to Submissions Report will be prepared by Sydney Metro. This report will:

- Summarise the issues raised in the submissions
- Provide responses to each issue raised in the received submissions
- Describe the proposed modifications and describe and assesses the environmental impact of these changes
- Identify any proposed new or revised environmental safeguards and management measures.

Sydney Metro will write to individuals and organisations that have made submissions advising them that their submission will be addressed in the Response to Submissions Report. The Response to Submissions Report will be published on the Sydney website sydneymetro.info/documents

4.3.5 Ongoing or future consultation

Should Sydney Metro approve the proposal, ongoing consultation and communication activities would be undertaken with the land owner, surrounding residents and businesses, and key stakeholders as required. These activities would be undertaken by the Metro tunnelling contract, JHCPBG, in consultation with Sydney Metro.

5.0 Environmental assessment

5.1 Construction traffic and transport

5.1.1 Existing environment

Grand Avenue is located between James Ruse Drive and the Parramatta River and is an extension of Hassall Street. It is located within the industrial area of Rosehill and generally consists of one lane in each direction with parking unrestricted along its length. The speed limit along Grand Avenue is 60km/hr. Grand Avenue is a recognised B-Double route and services a number of industrial businesses, together with providing service entry to Rosehill Racecourse.

State roads located adjacent to Grand Avenue include James Ruse Drive, M4 Western Motorway, Great Western Highway and Victoria Road.

5.1.2 Potential impacts

The proposal does not involve any road works. The use of the temporary storage site would result in plant and equipment being transported to and from the temporary storage facility via Grande Avenue. Spoil from the barging facility would be transported using truck and trailers via Grande Avenue and into the temporary storage site and out via Grand Avenue. The total number of heavy vehicle movements remains unchanged to those assessed and approved in the Clyde Barging REF and detailed in the approved Construction Traffic Management Plan for the Clyde Barging REF. This proposal will not result in heavy vehicle movements greater than those assessed and as such there is no change to the traffic impacts assessed in the Clyde Barging REF.

5.1.3 Safeguards and management measures

Table 6 identifies environmental safeguards and management measures that would be implemented to address the potential traffic and transport impacts of the proposal.

Table 6: Construction traffic and transport safeguards and management

No.	Impact	Environmental safeguards and management measures	Responsibility	Timing
TM1	Construction traffic	The Project shall be carried out in accordance with the approved Construction Traffic Management Plan (CTMP) for the Clyde Barging Site	Construction Manager	During site establishment works and operations

5.2 Construction noise and vibration

A noise and vibration impact assessment prepared by Renzo Tonin and Associates is provided in Appendix A. A summary of this assessment is provided in this Section.

5.2.1 Existing environment

The worksite is located within an industrial area. The nearest residential receiver to the storage site is 39 John Street, Rydalmere, located 550 m from the site boundary. The site is surrounded by industrial receivers. The existing background noise is typical of the

surrounding industrial uses which includes the Viva Energy Australia’s terminal, waste and recycling facilities. There is also background noise generated by road traffic on the surrounding road network including the major arterial roads of James Ruse Drive and the M4 Motorway.

5.2.2 Potential impacts

Site establishment would generally be undertaken Mondays to Fridays 7:00am to 6:00pm and Saturdays 8:00am to 1:00pm. There may be a need for works outside of these hours, particularly to coordinate with other vehicle movements.

Potential noise emissions from the worksite have been assessed against the NSW ‘Interim Construction Noise Guideline’ (ICNG, 2009). The Noise Management Levels (NMLs) established in the Construction Noise and Vibration Impact Statement: Clyde Barging Site (TH511-02 01.13.02 F01 CLD CNVIS (r4)) have been adopted for this noise assessment.

The proposed timing and interrelationship of the works at the storage and barging sites means there is that activities at the two sites will be undertaken concurrently. Noise levels due to site establishment and delivery activities at the storage site comply with the daytime Noise Management Level at the nearest residential receivers. The cumulative noise impact of activities occurring concurrently at the barging and temporary storage sites is consistent with the approved Clyde Barging REF.

Noise level from spoil haulage and deliveries complies with the evening and day out-of-hours Noise Management Level. The noise level for these works during the night period is 2 dB(A) greater than the Noise Management Level. The cumulative noise from deliveries and spoil haulage outside of standard construction hours is consistent with the approved Clyde Barging REF. There is no significant change in noise impact at the nearest receivers due to spoil haulage activities at the barging and stockpiling sites.

Noise from construction traffic on Grand Avenue is below the Road Noise Policy criterion for local roads and is not predicted to have a significant impact on noise at residential receivers.

The noise mitigation measures detailed in Clyde Barging CNVIS are considered sufficient to manage the cumulative noise impact from both sites. No additional noise assessment or mitigation is considered necessary for the establishment and use of the temporary storage site. As such the preparation of a separate Construction Noise and Vibration Impact Statement will not be required for these works. Similarly, as the predicted noise level is less than the background noise level + 5 dB the works may be undertaken outside of standard construction hours and would not require out of hours works approval.

5.2.3 Safeguards and management measures

Table 7 identifies environmental safeguards and management measures that would be implemented to address the potential noise and vibration impacts of the proposal.

Table 7: Construction noise and vibration safeguards and management

No.	Impact	Environmental safeguards and management measures	Responsibility	Timing
NV1	Construction noise and vibration	Site establishment works would generally be undertaken Mondays to Fridays 7am to 6pm and Saturdays 8am to 1pm.	Site Supervisor	During construction

No.	Impact	Environmental safeguards and management measures	Responsibility	Timing
		Operations would occur 24 hours per day, seven days per week.		
NV2	Construction noise and vibration	The following noise management measures would be implemented: a) Community notification Site inductions and tool box talks would address behavioural practices to minimise noise generation	Project Environment Manager	Prior to and during construction
NV3	Construction noise and vibration	Given the low noise impacts no out of hours works approval process would be required, however attended noise monitoring would be undertaken during representative noise generating works.	Project Environment Manager	During the first month of operation

5.3 Flora and fauna

5.3.1 Existing environment

The site has been heavily modified by human activity. There is no vegetation within the site. The site was cleared of vegetation for the original construction of the Shell Clyde refinery in the 1920s, and is now mainly hardstand.

A constructed wetland is situated to the south east of the site. The wetland is surrounded by a band of vegetation with varying width dominated by Swamp Oaks and various Eucalypts. There are several records of NSW or Commonwealth listed Vulnerable or Endangered flora and fauna within the constructed wetland and surrounds areas. These records include the Green and Golden Bell Frog (GGBF) which is listed as Vulnerable under the EPBC Act and Endangered under the BC Act. There is no record of the GGBF being located within the subject site.

5.3.2 Potential Impacts

The site would not require any vegetation clearing to establish. As noted above there is no record of the GGBF being located within the subject site and it does not provide any suitable habitat for this species. As such there are no predicted direct impacts on flora or fauna associated with the proposal and it is concluded that preparation of a Species Impact Statement is not required.

5.3.3 Safeguards and management measures

Table 8 identifies environmental safeguards and management measures that would be implemented to address potential flora and fauna impacts of the proposal.

Table 8: Flora and fauna safeguards and management

No.	Impact	Environmental safeguards and management measures	Responsibility	Timing
FF1	Flora and Fauna	Any fauna that entered the site area would be relocated	Construction Manager	During site establishment works and operations

5.4 Soils and water

5.4.1 Existing environment

Soils

The topography of the property is generally flat to slightly undulating. Soils within the study area are classified as Disturbed Terrain, comprising a relatively level ground extensively disturbed by human activity through levelling. Dominant soils in the area comprise loose black sandy loam, and variable transported fill (Chapman and Murphy 1989:132:133).

Acid sulfate soils (ASS) are soils and sediments containing iron sulphides that, when exposed to oxygen, generate sulphuric acid and potentially toxic quantities of aluminium and other heavy metals. The sulfuric acid and heavy metals are produced in forms that can be readily released and absorbed into the environment, with potential adverse effects on the natural and built environment and human health. Department of Land and Water Conservation Acid Sulfate Soil Risk maps (Murphy, 1997) identify the proposed site as having a high probability of ASS within one metre of the ground surface.

Contamination

AECOM (2013) indicates that based on current and historical soil and groundwater conditions within the Viva Energy Australia facility, as well as boundary groundwater monitoring network, there is no groundwater affected by Contaminants of Concern (COCs) in concentrations above applicable EPA criteria migrating offsite, nor is it impacting adjacent sediments or river systems.

Catchment, surface water and flooding

The proposed site is located within the Parramatta River sub-catchment, one of eight sub-catchments in the Sydney catchment, and managed by the Sydney Metropolitan Catchment Management Authority. The Parramatta River is the main tributary of Sydney Harbour, extending from Blacktown Creek in the west to the confluence of the Lane Cove River in the east. The Parramatta River catchment area is over 257 km², with the estuary covering 12 km². It is one of the most urbanised catchments in Australia. Historical land uses have highly modified the nature of the estuary, with a range of sediments and pollutants impacting on water quality and habitat values.

Water quality within the Parramatta River sub-catchment is varied across location and over time (Laxton et al, 2008). There are a number of environmental concerns with regards to the general health of the Parramatta River including turbid water, sickness from primary contact with the water, excessive algal and weed growth, unhealthy fauna, gross pollutants in

waterways, oil and grease presence in the water and loss of creek habitats including vegetation and fauna shelters.

AECOM (2013) indicates that the proposed site lies within the 1:100 year flood event, and the Probable Maximum Flood area. Grand Avenue is largely unaffected by flooding. Viva Energy Australia’s facility currently has an extensive stormwater management system which was substantially upgraded in the mid-1990s. All Viva Energy storm water flows to one of two interceptor systems before either being released to Duck Creek via licensed discharge points, or alternatively proceeding through a biotreater for additional treatment prior to release into Duck Creek.

5.4.2 Potential impacts

With respect to contamination and ASS, site establishment works would only involve minimal excavation activities. It is therefore unlikely that ASS or groundwater would be encountered during these works. Any contaminated material encountered during the minor earthworks (eg sediment basin construction) will be assessed, classified, managed and disposed of in accordance with the NSW Waste Classification Guidelines.

Given the extent of existing hardstand and limited earthworks required to establish the site, the proposal would not result in significantly different volumes of stormwater runoff from the site area and is therefore not anticipated to increase flooding risks for surrounding areas.

The water discharged from the proposed site would continue to be heavily influenced by storm events. During site establishment, operations, in particular spoil stockpiling and decommissioning works there is potential for site runoff to contain elevated sediment levels. Suitable controls would be identified as part of detailed construction planning and may include installation of sediment fencing. These controls would be detailed in a site-specific Erosion and Sediment Control Plan which would be prepared, implemented and progressively updated.

5.4.3 Safeguards and management measures

Table 9 identifies environmental safeguards and management measures that would be implemented to address potential soil and water impacts of the proposal.

Table 9: Soil and water safeguards and management

No.	Impact	Environmental safeguards and management measures	Responsibility	Timing
SW1	Soils and water	A detailed Erosion and Sediment Control Plan (ESCP) would be prepared in advance of construction to detail mitigation measures and progressively updates as required during site establishment ad operations.	Project Environment Manager	Prior to and during construction
SW2	Soils and water	Erosion and sediment control measures would be implemented in accordance with Managing Urban Stormwater: Soils and Construction Volume 1 (Landcom, 2004) and Managing Urban Stormwater: Soils and Construction Volume 2 (Department of Environment and Climate Change,	Project Environment Manager	During construction

No.	Impact	Environmental safeguards and management measures	Responsibility	Timing
		2008a). Measures would be designed as a minimum for the 80th percentile; 5-day rainfall event.		
SW3	Soils and water	Fuels, oils and other potentially harmful substances would be stored when not in use in a bund sized to be at least 110% of the largest container to be stored.	Project Environment Manager	During construction
SW4	Soils and water	A site-specific Stockpile Management Procedure would be developed and implemented. It would identify short and long term stockpile management measures to reduce the risk of erosion	Project Environment Manager	Prior to and during construction
SW5	Soils and water	A Spill Management Procedure would be developed and implemented. It would identify spill management equipment to be kept onsite and procedures to be implemented in the event of a spill.	Project Environment Manager	Prior to and during construction

5.5 Waste management and recycling

5.5.1 Potential impacts

Site establishment would require a range of materials including aggregate. Opportunities to utilise recycled building material would be explored.

As noted in Section 2.3, amenities already available adjacent to the site as part of the Viva Energy Australia’s facility including lunch room and toilet facilities would be utilised.

The proposal supports the higher order reuse of spoil.

5.5.2 Safeguards and management measures

Table 10 identifies environmental safeguards and management measures that would be implemented to address potential waste management impacts of the proposal and ensure reuse of materials where practicable.

Table 10: Waste management and reuse

No.	Impact	Environmental safeguards and management measures	Responsibility	Timing
WM1	Waste management	A Waste and Recycling Management Procedure would be implemented during construction to correctly classify waste that is produced during construction for reuse, recycling or disposal to an appropriately licenced facility in accordance with EPA Waste Classification Guidelines.	Project Environment Manager	During construction

5.6 Land use, property and socio economic

5.6.1 Existing environment

The site is owned by Viva Energy Australia. The proposed worksite is largely level cleared area comprising of predominately compacted road base and a concrete hard stand with no vegetation.

The site is accessed via Grand Avenue via an existing internal access road which runs along the western boundary.

5.6.2 Potential impacts

This proposal is located on land zoned IN3 Heavy Industrial under the Parramatta LEP. The proposal is consistent with the objectives of this land use zoning.

The proposal would require the short-term lease of the approximately 25,000m² of land.

A workforce of approximately 10 people would be employed during site establishment and 5-10 people would be employed during operations as set out in Section 2.6. No specific safeguards and management measures are required.

5.7 Hazard and risk

5.7.1 Existing Environment

The proposed site is located within the existing Viva Energy Australia Clyde fuel storage terminal. The terminal currently receives, stores, and distributes finished petroleum products via a transfer pipeline from the Gore Bay fuel terminal. The area is a major distribution hub for petroleum products with the Clyde facility being one of the key fuel supply operations servicing NSW.

5.7.2 Potential Impacts

The operational activities of the proposal were assessed against the criteria of the SEPP No.33 – Hazardous and Offensive Development. The proposal was determined not to meet the definition of a ‘potentially hazardous industry’ or ‘potentially offensive industry’. The works are limited to minor site establishment, delivery truck arrivals and departures and plant and equipment and spoil unloading, stockpiling and loading into trucks. The stockpiles would be limited to 12 metres in height. JHCPBG’s safety risk assessment system would be applied and no additional mitigation measures or safeguards are considered necessary.

5.8 Air quality

5.8.1 Existing environment

The Bureau of Meteorology operates a network of stations around the country. The closest Bureau of Meteorology meteorological monitoring station to the proposed worksite is located at Parramatta North, approximately 5 kilometres to the north-west.

As noted above, the proposed site is located within an industrial area.

5.8.2 Potential impacts

Site establishment and operations all have the potential to generate dust and would generate vehicle emissions. The installation of aggregate following minor levelling during site establishment and appropriate stockpile management would minimise the potential for dust generation.

5.8.3 Safeguards and management measures

Table 11 identifies environmental safeguards and management measures that would be implemented to address potential air quality impacts of the proposal.

Table 11: Air quality safeguards and management

No.	Impact	Environmental safeguards and management measures	Responsibility	Timing
AQ1	Air quality	The engines of all on-site vehicles and plant would be switched off when not in use for an extended period	Site Supervisor	During construction
AQ2	Air quality	Plant would be well maintained and serviced to minimise emissions. Emissions from plant would be considered as part of pre-acceptance checks.	Site Supervisor	During construction
AQ3	Air quality	All road vehicles carrying loose or potentially dusty material to or from the site would be covered.	Site Supervisor	During construction

5.9 Historic heritage

5.9.1 Existing environment and potential impacts

The Shell Oil Refinery was established in 1928, and the company gradually expanded to acquire lands from the surrounding industrial landholders. The refinery continued operating until 2011, when it ceased operations as a refinery and is currently owned and operated by Viva Energy Australia as a fuel storage facility.

The proposed site is not listed on the National Heritage List, Commonwealth Heritage List or the State Heritage Register. It is not listed on the non-statutory Register of the National Estate or National Trust Register and there are no items within the near vicinity included on these lists or registers. However, surrounding the proposal site there are parts or sections of local heritage items including the tramway alignment listed on the Parramatta LEP and the Shell Oil Refinery Wharf, listed on the Harbour SREP.

No direct impacted to listed heritage items are predicted in delivering the proposal and therefore implementation of an Unexpected Finds Procedure would be an appropriate mitigation strategy.

5.9.1 Safeguards and management measures

Table 12 identifies environmental safeguards and management measures that would be implemented to address potential historic heritage impacts of the proposal.

Table 12: Historic heritage safeguards and management

No.	Impact	Environmental safeguards and management measures	Responsibility	Timing
HH1	Historic heritage	An Unexpected Finds Protocol would be implemented during construction	Project Environment Manager	During construction

5.10 Aboriginal heritage

5.10.1 Existing environment and potential impacts

No Aboriginal heritage sites have previously been recorded on AHIMS or any other statutory heritage register within the study area, and the nearest recorded AHIMS site is located approximately one kilometre east of the study area on the northern side of the Parramatta River. Past levelling and establishment of the fuel storage facility has resulted in the removal or extensive disturbance of natural soils with potential to retain Aboriginal heritage objects across the entire study area. The Aboriginal archaeological potential of the proposed site area is assessed as low.

An unexpected finds procedure would be implemented in the unlikely event that previously unrecorded items of Aboriginal heritage are recorded during ground disturbance works.

5.10.2 Safeguards and management measures

Table 13 identifies environmental safeguards and management measures that would be implemented to address potential Aboriginal heritage impacts of the proposal.

Table 13: Aboriginal heritage safeguards and management

No.	Impact	Environmental safeguards and management measures	Responsibility	Timing
AH1	Aboriginal heritage	An Unexpected Finds Protocol would be implemented during construction	Project Environment Manager	During construction

5.11 Visual impact

5.11.1 Existing environment

As noted in Section 5.2.1, the proposed worksite is located within an industrial area.

The proposed worksite is predominately compacted road base and a concrete hard stand with no vegetation. The nearest residential receiver to the temporary storage site is 39 John Street, Rydalmere, located 550 m from the site boundary.

5.11.2 Potential impacts

The proposal would not require any vegetation clearing and is located well within Viva Energy Australia's site. The plant and equipment and spoil stockpiles are in keeping with surrounding industrial land uses and any visual impact would be short term in nature.

5.11.3 Safeguards and management measures

Table 14 identifies environmental safeguards and management measures that would be implemented to address potential visual impacts of the proposal.

Table 14: Visual impact safeguards and management

No.	Impact	Environmental safeguards and management measures	Responsibility	Timing
VI1	Visual impacts	The worksite would be maintained in a clean and tidy condition	Site Supervisor	During construction

5.12 Sustainability

5.12.1 Sustainability Strategy

The Sydney Metro City & Southwest Sustainability Strategy 2017-24 (July 2017) outlines:

- What sustainability means for Sydney Metro
- Performance targets
- Initiatives and outcomes to be adopted across key policy areas
- Roles and responsibilities
- Compliance management and reporting.

This Strategy is being implemented in delivering the Metro tunnelling contract. No specific sustainability measures relevant to the establishment and temporary use of the proposed site have been identified.

5.13 Cumulative impacts

5.13.1 Potential impacts

Cumulative impacts have the potential to arise from the interaction of individual elements of the proposal and the additive effects of the proposal with other external projects. Under Clause 228 (2) of the EP&A Regulation, Sydney Metro is required to take into account potential cumulative impacts as a result of the proposal.

The proposal would require temporary use of the proposal site. Other locally occurring developments that could interact with the proposal were identified through a desktop review of publicly available information and liaison with Sydney Metro and Viva Energy Australia. The following developments and operations would occur near to and during the delivery of the proposal:

- JHCPBG’s Clyde barging facility which will operate in conjunction with the proposed storage site
- Viva Energy Australia’s fuel distribution facility which will continue to operate adjacent to the proposed storage site
- Viva Energy Australia’s decommissioning and terminal conversion project which will be undertaken adjacent to and during the delivery of the proposal

- TfNSW's Parramatta Light Rail which includes a Stabling and Maintenance Facility which is proposed to be located at 6 Grand Avenue. This project commenced enabling works in the late 2018 with construction due to commence at the latter half of the first quarter of 2019.

No significant cumulative impacts have been identified. Noise, vibration traffic and air quality impacts associated with the above proposals are expected to be identified and managed at a project level through implementation of appropriate mitigation. Due to the distance between work areas cumulative impacts are not expected.

5.13.2 Safeguards and management measures

Table 15 identifies environmental safeguards and management measures that would be implemented to address potential cumulative impacts of the proposal.

Table 15: Cumulative impacts safeguards and management

No.	Impact	Environmental safeguards and management measures	Responsibility	Timing
CI	Cumulative impacts	<p>Ongoing consultation with surrounding projects and developments to:</p> <p style="padding-left: 40px;">a) Increase awareness of construction timeframes and impacts</p> <p>Co-ordinate impact mitigation and management</p>	Construction Manager	During construction

6.0 Environmental management

6.1 Construction Environmental Management Plan

The proposal would be managed under the systems and tools set out in Part B JHCPBG's Construction Environmental Management Plan (CEMP) (SMCSWTSE-JCG-TPW-EM-PLN-002010) including:

- Leadership, accountability and culture
- Governance and planning
- Legal and other compliance monitoring
- Risk and opportunity management
- Change management
- Communication and consultation
- Training and competency
- Subcontractor management
- Incident management
- Emergency planning and response
- Document and record management
- Reporting, auditing, review and improvement

It is noted that updating the CEMP would not be required to implement the proposal.

The CEMP Sub Plans and Aspect specific management plans referenced in the CEMP would not apply to the proposal as the following site-specific documentation would be prepared to set out required environmental mitigation measures and controls:

- Site Environmental Plan
- Erosion and Sediment Control Plan

In addition to above, the site-specific environmental procedures developed as a result of the Clyde Barging REF will be implemented for this site.

The Construction Traffic Management Plan (CTMP) for the Clyde Barging Facility would be utilised for road based transport as the truck route and overall volume of trucks leaving via Grand Avenue has not changed as a result of this proposal and are consistent with the approved Clyde Barging REF and CTMP. Further consultation will be undertaken with RMS and SCO on this proposal and updates to the existing CTMP will be made if required following this consultation.

6.2 Management and mitigation measures

6.2.1 Construction management

Environmental management measures to be implemented during construction are shown in Table 16.

Table 16: Construction environmental management measures (compiled from Section 5.0 mitigation measures)

No.	Impact	Environmental safeguards and management measures	Responsibility	Timing
TM1	Construction traffic	The Project shall be carried out in accordance with the approved Construction Traffic Management Plan (CTMP)_for the Clyde Barging Site	Construction Manager	During site establishment works and operations
NV1	Construction noise and vibration	Site establishment works would generally be undertaken Mondays to Fridays 7am to 6pm and Saturdays 8am to 1pm. Operations would occur 24 hours per day, seven days per week.	Site Supervisor	During construction
NV2	Construction noise and vibration	The following noise management measures would be implemented: b) Community notification c) Site inductions and tool box talks would address behavioural practices to minimise noise generation	Project Environment Manager	Prior to and during construction
NV3	Construction noise and vibration	Given the low noise impacts no out of hours works approval process would be required, however attended noise monitoring would be undertaken during representative noise generating works.	Project Environment Manager	During the first month of operation
FF1	Flora and Fauna	Any fauna that entered the site area would be relocated	Construction Manager	During site establishment works and operations
SW1	Soils and water	A detailed Erosion and Sediment Control Plan (ESCP) would be prepared in advance of construction to detail mitigation measures and progressively updates as required during site establishment ad operations.	Project Environment Manager	Prior to and during construction
SW2	Soils and water	Erosion and sediment control measures would be implemented in accordance with Managing Urban Stormwater: Soils and Construction Volume 1 (Landcom, 2004) and Managing Urban Stormwater:	Project Environment Manager	During construction

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No.	Impact	Environmental safeguards and management measures	Responsibility	Timing
		Soils and Construction Volume 2 (Department of Environment and Climate Change, 2008a). Measures would be designed as a minimum for the 80th percentile; 5-day rainfall event.		
SW3	Soils and water	Fuels, oils and other potentially harmful substances would be stored when not in use in a bund sized to be at least 110% of the largest container to be stored.	Project Environment Manager	During construction
SW4	Soils and water	A site-specific Stockpile Management Procedure would be developed and implemented. It would identify short and long term stockpile management measures to reduce the risk of erosion	Project Environment Manager	Prior to and during construction
SW5	Soils and water	A Spill Management Procedure would be developed and implemented. It would identify spill management equipment to be kept onsite and procedures to be implemented in the event of a spill.	Project Environment Manager	Prior to and during construction
WM1	Waste management	A Waste and Recycling Management Procedure would be implemented during construction to correctly classify waste that is produced during construction for reuse, recycling or disposal to an appropriately licenced facility in accordance with EPA Waste Classification Guidelines.	Project Environment Manager	During construction
AQ1	Air quality	The engines of all on-site vehicles and plant would be switched off when not in use for an extended period	Site Supervisor	During construction
AQ2	Air quality	Plant would be well maintained and serviced to minimise emissions. Emissions from plant would be considered as part of pre-acceptance checks.	Site Supervisor	During construction
AQ3	Air quality	All road vehicles carrying loose or potentially dusty material to or from the site would be covered.	Site Supervisor	During construction
HH1	Historic heritage	An Unexpected Finds Protocol would be implemented during construction	Project Environment Manager	During construction
AH1	Aboriginal heritage	An Unexpected Finds Protocol would be implemented during construction	Project Environment Manager	During construction
VI1	Visual impacts	The worksite would be maintained in a clean and tidy condition	Site Supervisor	During construction

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No.	Impact	Environmental safeguards and management measures	Responsibility	Timing
CI	Cumulative impacts	<p>Ongoing consultation with surrounding projects and developments to:</p> <ul style="list-style-type: none"> b) Increase awareness of construction timeframes and impacts c) Co-ordinate impact mitigation and management 	Construction Manager	During construction
GM1	General Management	<p>The Project shall be carried out generally in accordance with the:</p> <ul style="list-style-type: none"> a) This Addendum Review of Environmental Factors including the Environmental Mitigation Measures (EMM) set out in this Addendum REF; b) The Clyde Barging REF including the EMM set out that REF; c) The TSE Site Specific Environmental Management Documents required under section 6.1 of this Addendum REF; and d) The TSE Community Communications Strategy (SMCSWTSE-JCG-TPW-SH-PLN-002040). 	<p>Project Environment Manager</p> <p>Senior Stakeholder and Community Manager</p>	During Construction
GM2	General Management	<p>The Environmental Representative (ER) allocated by Sydney Metro to the Metro tunnelling contract must:</p> <ul style="list-style-type: none"> a) receive and respond to communications from Sydney Metro in relation to the environmental performance of the temporary storage site; b) undertaking frequent inspections of site activities as required by Sydney Metro c) consider and recommend any improvements that may be made to work practices to avoid or minimise adverse impact to the environment and to the community; 	Project Environment Manager	During construction

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No.	Impact	Environmental safeguards and management measures	Responsibility	Timing
		<ul style="list-style-type: none"> d) review and endorse all documents required to be prepared under this Addendum REF and ensure they address any requirements in or under the approval. For documents requiring specialist review and/or endorsement the ER is not required to endorse the specialist content. e) regularly monitor the implementation of all documents required by this Addendum REF for implementation in accordance with what is stated in the document and the terms of the approval; reviewing corrective and preventative actions to ensure the implementation of recommendations made from the audits and site inspections; and f) consider any amendments to be made to the site specific management documents are consistent with the terms of the approval, if satisfied such amendment is necessary, endorse the amendment. This does not include any modifications to the terms of the approval. 		
GM3	General Management	<p>These EMMs do not relieve JHCPBG of the obligation to obtain all other licences, permits, approvals and landowner permissions from all relevant authorities or landowners as required under any other Act for the temporary storage site. JHCPBG shall comply with the terms and conditions of such licences, permits, approvals and permissions.</p>	Project Environment Manager	Prior to and during construction

6.3 Operational management

The proposal entails the temporary use of the worksite during construction of the Metro tunnelling contract. Spoil and plant and equipment would be transported to the site on trucks and temporarily stored. The site will be decommissioned and all spoil and plant and equipment removed.

The proposal therefore has no operational impacts.

6.4 Licencing and approvals

See Section 3.5 which includes a summary table.

7.0 Justification and conclusion

7.1 Justification

As set out in Section 2.1, in addition to plant and equipment including TBM components, over 760,000 tonnes of excavated material is expected to be received at the Clyde Barging Facility from the Barangaroo and Blues Point worksites over the life of the Metro tunnelling contract. The REF noted that the spoil would be transferred into truck and trailers for reuse at approved residential and commercial developments. The Clyde Barging REF noted that during operations barges would need to arrive in the daytime, evening and at night due to tides and other vessel movements. As such to ensure that tidal impacts on barging operations are addressed and to minimise impacts on the surrounding road network, particularly during the AM and PM peaks, a 24-hour operations strategy, seven days per week has been adopted.

Spoil is being reused in approved residential and industrial developments cross Sydney. JHCPBG continues to review available sites to maximise spoil reuse, however, there are currently few sites with approval to accept spoil into the evening (6 pm to 10 pm).

JHPCBG is aware that there are a number of projects, which would require clean fill, scheduled to commence during ongoing construction the Metro tunnelling contract that are located in the immediate vicinity of the proposal, including:

- TfNSW Parramatta Light Rail Depot located on Grand Ave (approved on 29 May 2018 SSI 8285)
- Viva Energy Australia's Clyde Western Remediation Project, which has been declared State Significant Development and for which an Environmental Impact Statement is currently being prepared for this project. It is located within 1.5km to the Clyde Barging Facility within the existing terminal site. If approved JHCPBG would discuss the clean fill requirements of that project with Viva.

The temporary use of the proposed site for spoil stockpiling and storage therefore also presents an opportunity to further reduce the impacts of spoil transportation by road including vehicle emissions and road traffic congestion.

7.2 Ecologically sustainable development considerations

Ecologically sustainable development (ESD) is development that improves the total quality of life, both now and in the future in a way that maintains the ecological processes on which life depends. The principles of ESD have been an integral consideration for the proposal. This includes the effective integration of economic and environmental considerations in all decision-making processes.

Schedule 2 of the (NSW) *Environmental Planning and Assessment Regulation 2000* (EP&A Regulation), outline the four principles of ecologically sustainable development (ESD). Sydney Metro is committed to ensuring that its projects are implemented in a manner that is consistent with the principles of ESD, which are:

- Precautionary principle — Where there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for not implementing mitigation measures or strategies to avoid potential impacts

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- Inter-generational equity — The present generation should ensure that the health, diversity and productivity of the environment are equal to or better for the future generations
- Conservation of biological diversity and ecological integrity — Preserving biological diversity and ecological integrity requires that ecosystems, species and genetic diversity within species are maintained
- Improved valuation and pricing of environmental resources — This principle establishes the need to determine economic values for services provided by the natural environment, such as the atmosphere's ability to receive gaseous emissions, cultural values and visual amenity.

JHCPBG is committed to ensuring that its activities are undertaken in a manner that is consistent with the four principles of ESD. These principles would be incorporated into JHCPBG's management systems for the proposal (discussed previously in Section 6.0).

Table 17 summarises how the four principles of ESD have been addressed through the proposal's design and assessment processes.

Table 17: Adherence to the principles of ESD

ESD Principle	Adherence
Precautionary principle	<p>A precautionary approach has been applied throughout the proposal's development.</p> <p>The options development and assessment, the design development and the REF process have sought to minimise the environmental impact of the proposal. There are no threats of serious or irreversible damage posed by this development. All of the environmental risks have been carefully and thoughtfully considered through the preparation of the Addendum REF and would be mitigated through the implementation of the environmental management system and measures set out in Section 6.0.</p>
Intergenerational equity	<p>The proposal would facilitate the construction of the Metro tunnelling contract which form part of the Sydney Metro City and Southwest Project. This Project will help to ensure that future generations have a safer, more comfortable and more reliable rail transport option, through increased reliability, and more frequent services.</p>
Conservation of biological diversity and ecological integrity	<p>The proposal involves the use of an existing facility and site establish works are limited. There are predicted to be no direct impacts on flora and fauna. Potential impacts have been assessed in detail and mitigation and management measures set out in Section 6.0.</p>
Improved valuation and pricing of environmental resources	<p>Environmental and social issues were considered in the strategic planning and establishment of the need for the proposal, and in consideration of various proposal options. The value placed on environmental resources is evident in the extent of the planning and environmental investigations and in the design of the proposed mitigation and safeguards.</p>

7.3 Objects of the EP&A Act

Table 18 identifies the objects of the EP&A Act and their relevance to the proposal

Table 18: Summary of Objects of the EP&A Act

Object	Comment
5(a)(i) To encourage the proper management, development and conservation of natural and artificial resources, including agricultural land, natural areas, forests, minerals, water, cities, towns and villages for the purpose of promoting the social and economic welfare of the community and a better environment.	Safeguard measures detailed in this Addendum REF would allow for the proper management, development and conservation of natural and artificial resources. The proposal would require minor ground disturbance. Social and economic impacts of the proposal have been assessed and are considered to be minor in nature.
5(a)(ii) To encourage the promotion and coordination of the orderly economic use and development of land.	The proposal allows for the temporary use of land not needed by Viva Energy Australia in the short term.
5(a)(iii) To encourage the protection, provision and co-ordination of communication and utility services.	Not relevant to the proposal
5(a)(iv) To encourage the provision of land for public purposes.	Not relevant to the proposal
5(a)(v) To encourage the provision and coordination of community services and facilities	Not relevant to the proposal
5(a)(vi) To encourage the protection of the environment, including the protection and conservation of native animals and plants, including threatened species, populations and ecological communities, and their habitats.	The proposal would not require any vegetation removal.
5(a)(vii) To encourage ecologically sustainable development.	Ecologically sustainable development is addressed in Section 7.2
5(a)(viii) To encourage the provision and maintenance of affordable housing.	Not relevant to the proposal
5(b) To promote the sharing of the responsibility for environmental planning between different levels of government in the State.	Not relevant to the proposal
5(c) To provide increased opportunity for public involvement and participation in environmental planning and assessment.	See community consultation strategy in Section 4.0.

7.4 EP&A Regulation considerations

Clause 228 of the EP&A Regulation states factors that must be taken into account when assessing the impact of an activity on the environment. Table 19 provides a summary checklist of matters that must be considered under Clause 228 of the EP&A Regulation.

Table 19: Clause 228 considerations

Ref	Clause 228 considerations	Impact
a	<p>Any environmental impact on a community?</p> <p>Construction of the proposal would result in some short-term negative impacts on traffic and noise and vibration.</p> <p>These impacts would be managed according to the safeguards outlined in Section 7.</p>	Short-term, minor, negative
b	<p>Any transformation of a locality?</p> <p>The proposal involves temporary storage of spoil and plant and equipment. The proposal would not transform the locality.</p>	Short term, minor, negative
c	<p>Any environmental impact on the ecosystems of the locality?</p> <p>The proposal would not require any vegetation removal. Safeguards detailed in this Addendum REF would minimise impacts on the ecosystems of the locality.</p>	Short-term, minor, negative
d	<p>Any reduction of the aesthetic, recreational, scientific or other environmental quality or value of a locality?</p> <p>The proposal is not anticipated to result in reduction of the aesthetic, recreational, scientific or other environmental quality or value of a locality.</p>	No impacts
e	<p>Any effect on a locality, place or building having aesthetic, anthropological, archaeological, architectural, cultural, historical, scientific or social significance or other special value for present or future generations?</p> <p>The proposal is not anticipated to result in any substantial effect on a locality, place or building having aesthetic, anthropological, archaeological, architectural, cultural, historical, scientific or social significance or other special value for present or future generations.</p>	No impacts
f	<p>Any impact on the habitat of protected fauna (within the meaning of the <i>National Parks and Wildlife Act 1974</i>)?</p> <p>The proposal would not require any vegetation removal. Safeguards detailed in this Addendum REF would minimise impacts on the habitat of protected fauna.</p>	Short-term, minor, negative
g	<p>Any endangering of any species of animal, plant or other form of life, whether living on land, in water or in the air?</p> <p>The proposal would not require any vegetation removal Safeguards detailed in this Addendum REF would minimise impacts on species of animal, plant or other form of life, whether living on land, in water or in the air.</p>	Short-term, minor, negative

Ref	Clause 228 considerations	Impact
h	<p>Any long-term effects on the environment?</p> <p>The proposal is temporary. Future use of the site by Viva Energy Australia would be addressed in separate environmental assessment(s).</p>	No impact
i	<p>Any degradation of the quality of the environment?</p> <p>The proposal has the potential to degrade the quality of the environment as a result of traffic, noise, water quality and air quality impacts. These impacts would be managed according to the safeguards outlined in Section 6.0.</p>	Short-term, minor, negative
j	<p>Any risk to the safety of the environment?</p> <p>Hazards and risks are assessed in Section 5.7. These impacts would be managed according to the safeguards outlined in Section 6.0.</p>	Short-term, minor, negative
k	<p>Any reduction in the range of beneficial uses of the environment?</p> <p>The proposal would be located within an industrial zone. The temporary use of the site does not limit the existing surrounding land uses.</p>	No impact
l	<p>Any pollution of the environment?</p> <p>The proposal has the potential to generate pollution as a result of traffic, noise, water quality and air quality impacts. These impacts would be managed according to the safeguards outlined in Section 6.0.</p>	Short-term, minor, negative
m	<p>Any environmental problems associated with the disposal of waste?</p> <p>Volumes of waste generated by the proposal would be readily managed through the application of standard mitigation measures outlined in Section 6.0. The proposal facilitates the higher order reuse of spoil.</p>	Short-term, minor, negative
n	<p>Any increased demands on resources (natural or otherwise) that are, or are likely to become, in short supply?</p> <p>The proposal would require resources such as aggregate and water, which are common construction materials. The proposal would not create a substantial demand on these resources.</p>	No impact
o	<p>Any cumulative environmental effect with other existing or likely future activities?</p> <p>Operation of the proposal may overlap with other local developments within the area and with the construction of the light rail. Given the nature of the proposal, cumulative impacts as a result of concurrent development is anticipated to be minor and would be managed according to safeguards outlined in Section 5.13.</p>	Short-term, minor, negative
p	<p>Any impact on coastal processes and coastal hazards, including those under projected climate change conditions?</p> <p>The proposal is temporary and does not involve any clearing of vegetation on the Parramatta River banks.</p>	Not impact

7.5 Consideration of matters of national environmental significance

Table 20 provides a summary checklist of matters of National Environmental Significance that were considered for the proposal under the EPBC Act.

Table 20: Checklist of EPBC Act Matters

Matter of national environmental significance	Impact
<p>World heritage properties</p> <p>There are no items within the proposal area listed on the World Heritage List.</p>	No impacts
<p>National heritage places</p> <p>There are no items within the proposal area listed on the National Heritage List.</p>	No impact
<p>Wetlands of international importance</p> <p>There are no wetlands of international importance in the proposal site or likely to be affected by the proposal.</p>	No impact
<p>Nationally threatened species and ecological communities</p> <p>The proposal would not require any vegetation removal.</p>	No impact
<p>Migratory species</p> <p>The proposal is not anticipated to impact any migratory species</p>	No impact
<p>Commonwealth marine areas</p> <p>Not relevant to the proposal.</p>	No impact
<p>The Great Barrier Reef Marine Park</p> <p>Not relevant to the proposal.</p>	No impact
<p>Nuclear actions (including uranium mining)</p> <p>Not relevant to the proposal.</p>	No impact
<p>A water resource, in relation to coal seam gas development and large coal mining development</p> <p>Not relevant to the proposal.</p>	No impact

7.6 Conclusion

The proposal to establish and operate a temporary spoil stockpiling and general logistics management site to support the ongoing Metro tunnelling contract at Clyde is subject to assessment under Division 5.1 of the EP&A Act.

The potential impacts of the proposal have been considered in accordance with the requirements of Section 5.5 of the EP&A Act and Clause 228 of the EP&A Regulation. Whilst some potentially negative impacts may result from the proposal, these impacts are not considered to be significant, as discussed in Section 5.0 of this Addendum REF. Section 6.0

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of this Addendum REF provides mitigation measures and management strategies that would be implemented to reduce potentially negative impacts and manage environmental impacts.

The proposal would be unlikely to cause a significant impact on the environment. Therefore, it is not necessary for an EIS to be prepared and approval to be sought from the Minister for Planning under Division 5.2 of the EP&A Act. A SIS is not required. The proposal is subject to assessment under Division 5.1 of the EP&A Act. Consent from Council under Part 4 of the EP&A Act is not required.

The proposal is not likely to have a significant impact on matters of National Environmental significance or the environment of Commonwealth land within the meaning of the EPBC Act.

8.0 Certification

This REF provides a true and fair review of the proposal in relation to its potential likely effects on the environment. It addresses to the fullest extent possible all matters affecting or likely to affect the environment as a result of the proposal.



Anne Andersen
Manager- Environment, Approvals, Sustainability and Interface
JHCPBG

14 February 2019

9.0 References

AECOM, November 2013, Clyde Terminal Conversion Project Environmental Impact Statement, prepared for the Shell Company of Australia, Sydney.

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Laxton, J. H. and Gittins, R. G. 2003, Water Quality of Upper Parramatta River – Analysis of Data Collected Between 1990 and 2002. Prepared for Upper Parramatta River Catchment Trust.

Parramatta Light Rail Stage 1 Westmead to Carlingford via Camellia Environmental Impact Statement including Technical Paper 1

Murphy CL, December 1997, Acid Sulfate Soil Risk map Prospect / Parramatta River 91 30N3, Department of Land and Water Conservation



Appendix A – Noise and vibration assessment

12 February 2019

TH511-02 01.13.04 F01 Clyde stockpiling site (r4).docx

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Sydney Metro City & Southwest – Metro tunnelling contract - Clyde Temporary Spoil Stockpiling and Logistics Management

1 Introduction

This memorandum has been prepared to address the noise impacts during establishing and operating a temporary spoil stockpiling and general logistics management site to support the ongoing construction of the Metro tunnelling contract (the proposal). The site is located in Viva Energy Australia's Clyde Terminal on Durham Street, Rosehill

2 Site layout and sensitive receiver locations

A Review of Environmental Factors for establishing and operating a barging facility at Clyde has been approved and the facility is currently in operation. A temporary spoil stockpiling and general logistics management site located on the corner of Thackery Street and Grand Avenue, within Viva Energy Australia's site at Clyde is required to support the operation of the barging facility, which is dependent on the tides.

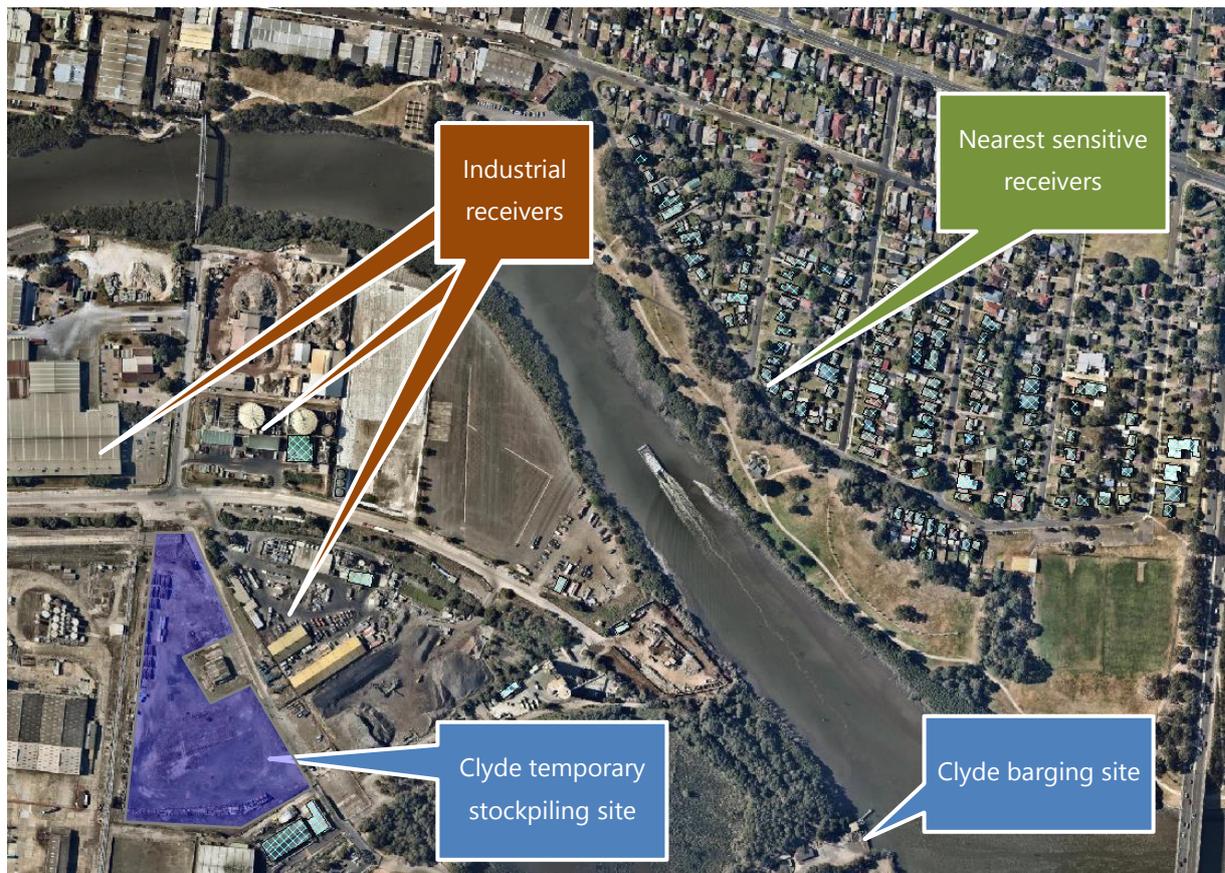
Figure 1 identifies the location of the temporary stockpiling site, the nearby Metro tunnelling contract Barging Receiving site and the nearest residential receivers.

The nearest residential receiver to the temporary stockpiling site is 39 John Street, Rydalmere, located 550 m from the site boundary. The site is surrounded by industrial receivers.

The Noise Management Levels established in the Clyde Barging Site CNVIS¹ have been adopted for this noise assessment.

¹ Construction Noise and Vibration Impact Statement: Clyde Barging Site (TH511-02 01.13.02 F01 CLD CNVIS (r5))

Figure 1 Clyde stockpiling site location and nearest sensitive receivers



3 Proposed construction activities

The proposed works include site establishment of the site and delivery of spoil and equipment for temporary stockpiling. The plant and equipment to be used during each construction scenario are detailed in Table 1. Site establishment works are scheduled to commence in 1st quarter of 2019 (subject to approval) to be carried out within standard daytime construction hours. Site establishment will take up to approximately one month.

Temporary stockpiling is scheduled to occur on completion of site establishment (subject to approval) for approximately 24 months. Decommissioning including removal of all temporary stockpiles and plant and equipment would take approximately three to six months and be completed by approximately mid 2021. These operations would be undertaken 24 hours per day seven days per week.

Table 1 List of plant and equipment with sound power levels used for noise modelling

Construction Scenario	Activities	Timing	Plant/ Equipment	Number of plant	Sound Power Level (Lw re: 1pW) L _{Aeq} , dB(A)
V01	Site Establishment	1 st quarter 2019	Excavator with bucket	1	103

Construction Scenario	Activities	Timing	Plant/ Equipment	Number of plant	Sound Power Level (Lw re: 1pW) L _{Aeq} , dB(A)
V02	Spoil stockpiling and equipment delivery and removal Decommissioning	1 st quarter 2019 – mid 2021	Grader	1	114
			Roller	1	112
			Water Cart	1	108
			Forklift (16T)	1	104
			Delivery trucks	10 per day	108
			Crane (Franna)	1	99
			Truck and trailers	As per Barging CNVIS (Ref 1)	108
Excavator	2	103			

4 Construction noise assessment

Table 2 provides a summary of the predicted noise levels from works at the temporary stockpiling site at the nearest residential receiver during standard construction hours.

Table 2 Summary of daytime noise levels from works at the temporary stockpiling site

NCA ID	Address	NML Day period	Standard hours noise levels – stockpiling site dB(A)	
			V01 Site Establishment	V02 Spoil Haulage, deliveries & decommissioning
CLD_03-60	39 John Street, Rydalmere	55	53	48

Day period: Standard construction hours (7am to 6pm Monday to Friday, 8am to 1pm Saturday)

Table 3 provides a summary of the predicted noise levels for works that may occur outside of standard construction hours at the stockpiling site.

Table 3 Summary of OOHW noise levels from works at the temporary stockpiling site

NCA ID	Address	NML Day OOH / Evening period	NML Night period	OOHW noise levels dB(A)
				V02 Spoil Haulage, deliveries & decommissioning
CLD_03-60	39 John Street, Rydalmere	50	45	47

Evening period: 6pm to 10pm Monday to Saturday

Day OOH period: 1pm to 6pm Saturday

Night period: 10 pm and 7 am Monday to Friday and 12 am to 8 am Saturday, Sunday and public holidays

From Table 2, it can be seen that noise levels from both site establishment and spoil stockpiling and equipment delivery activities comply with the daytime Noise Management Level (NML).

Table 3 shows that the noise level from spoil haulage and deliveries complies with the evening and day out-of-hours Noise Management Level (NML). The noise level for these works during the night period is 2 dB(A) greater than the Noise Management Level (NML).

The cumulative noise impacts of the Clyde temporary stockpiling site and barging receival site have been assessed in the Clyde Barging Site CNVIS. The noise levels during site establishment works at the worst-case sensitive receivers are consistent with the predicted noise levels in the approved Clyde Barging REF. There is no significant change in noise impact at the nearest receivers due to spoil haulage activities at the barging and stockpiling sites.

5 Cumulative traffic noise assessment

Construction traffic will access the barging site and the temporary stockpiling site via local roads. Truck and trailers will haul spoil between the two sites at Clyde and remove the spoil offsite via Grand Avenue. The cumulative noise impact of trucks accessing both sites has been assessed against the Road Noise Policy (RNP) criteria.

Approximately 63 truck and trailers will be required per day on average to haul spoil via Grand Avenue and 10 two-way truck movements per day to deliver equipment to the stockpiling site. During peak spoil generation periods there would be up to 161 truck movements per day (as approved under the Clyde Barging REF). The primary truck route for spoil haulage would be via Grand Avenue. The western end of Grand Avenue at the barging site entrance is 300 m from the nearest residential receiver (John Street). The truck route between the barging site, the temporary stockpiling site and James Ruse Drive is surrounded by only industrial receivers.

During the day period, up to 20 two-way truck movements would be required per hour (consistent with the approved Clyde Barging REF and CTMP). The predicted noise level from these truck movements is 52 dB(A) at the nearest sensitive receiver. This is below the Road Noise Policy (RNP) 55 dB(A) $L_{Aeq(1hour)}$ criterion for local roads during the day period.

During the night period, up to 5 two-way truck movements would be required per hour (consistent with the approved Clyde Barging REF and CTMP). The predicted noise level from these truck movements is 44 dB(A) at the nearest sensitive receiver. This is below the RNP 50 dB(A) $L_{Aeq(1hour)}$ criterion for local roads during the night period.

As a result, construction traffic on local roads is not predicted to have a significant impact on noise at residential receivers.

Notwithstanding this, the Heavy Vehicle Code of Conduct includes several measures, including limiting of compression braking, minimisation of vehicle idling, which will ensure that noise impacts of heavy vehicle traffic on surrounding streets are minimised.

6 Conclusion

This technical memorandum has been prepared to review the noise impacts from the temporary stockpiling and general logistics management site at Clyde.

Noise levels due to site establishment, spoil haulage and delivery activities comply with the daytime NML at the nearest residential receiver. Predicted noise levels from spoil haulage and deliveries comply with the evening and day out-of-hours NML and are 2 dB(A) greater than the night period NML.

Noise from construction traffic on Grand Avenue is below the RNP criterion for local roads and is not predicted to have a significant impact on noise at residential receivers.

The Clyde Barging CNVIS has been updated to include activities at the temporary stockpiling and logistics site. The updated CNVIS addresses the cumulative noise levels from both sites and recommends mitigation measures to reduce the noise impact at sensitive receivers.

Document control

Date	Revision history	Non-issued revision	Issued revision	Prepared	Instructed	Authorised
06.11.2018	Issued	0	1	H. Puckeridge	H. Puckeridge	C. Weber
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12.02.2019	TfNSW comments	-	4	H. Puckeridge	H. Puckeridge	T. Gowen

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APPENDIX A Glossary of terminology

The following is a brief description of the technical terms used to describe noise to assist in understanding the technical issues presented.

Adverse weather	Weather effects that enhance noise (that is, wind and temperature inversions) that occur at a site for a significant period of time (that is, wind occurring more than 30% of the time in any assessment period in any season and/or temperature inversions occurring more than 30% of the nights in winter).
Ambient noise	The all-encompassing noise associated within a given environment at a given time, usually composed of sound from all sources near and far.
Assessment period	The period in a day over which assessments are made.
Assessment point	A point at which noise measurements are taken or estimated. A point at which noise measurements are taken or estimated.
Background noise	Background noise is the term used to describe the underlying level of noise present in the ambient noise, measured in the absence of the noise under investigation, when extraneous noise is removed. It is described as the average of the minimum noise levels measured on a sound level meter and is measured statistically as the A-weighted noise level exceeded for ninety percent of a sample period. This is represented as the L90 noise level (see below).
Decibel [dB]	The units that sound is measured in. The following are examples of the decibel readings of every day sounds: 0dB The faintest sound we can hear 30dB A quiet library or in a quiet location in the country 45dB Typical office space. Ambience in the city at night 60dB CBD mall at lunch time 70dB The sound of a car passing on the street 80dB Loud music played at home 90dB The sound of a truck passing on the street 100dB The sound of a rock band 115dB Limit of sound permitted in industry 120dB Deafening
dB(A)	A-weighted decibels. The A-weighting noise filter simulates the response of the human ear at relatively low levels, where the ear is not as effective in hearing low frequency sounds as it is in hearing high frequency sounds. That is, low frequency sounds of the same dB level are not heard as loud as high frequency sounds. The sound level meter replicates the human response of the ear by using an electronic filter which is called the "A" filter. A sound level measured with this filter switched on is denoted as dB(A). Practically all noise is measured using the A filter.
dB(C)	C-weighted decibels. The C-weighting noise filter simulates the response of the human ear at relatively high levels, where the human ear is nearly equally effective at hearing from mid-low frequency (63Hz) to mid-high frequency (4kHz), but is less effective outside these frequencies.
Frequency	Frequency is synonymous to pitch. Sounds have a pitch which is peculiar to the nature of the sound generator. For example, the sound of a tiny bell has a high pitch and the sound of a bass drum has a low pitch. Frequency or pitch can be measured on a scale in units of Hertz or Hz.
Impulsive noise	Having a high peak of short duration or a sequence of such peaks. A sequence of impulses in rapid succession is termed repetitive impulsive noise.
Intermittent noise	The level suddenly drops to that of the background noise several times during the period of observation. The time during which the noise remains at levels different from that of the ambient is one second or more.
L _{Max}	The maximum sound pressure level measured over a given period.
L _{Min}	The minimum sound pressure level measured over a given period.

L ₁	The sound pressure level that is exceeded for 1% of the time for which the given sound is measured.
L ₁₀	The sound pressure level that is exceeded for 10% of the time for which the given sound is measured.
L ₉₀	The level of noise exceeded for 90% of the time. The bottom 10% of the sample is the L90 noise level expressed in units of dB(A).
L _{eq}	The "equivalent noise level" is the summation of noise events and integrated over a selected period of time.
Reflection	Sound wave changed in direction of propagation due to a solid object obscuring its path.
SEL	Sound Exposure Level (SEL) is the constant sound level which, if maintained for a period of 1 second would have the same acoustic energy as the measured noise event. SEL noise measurements are useful as they can be converted to obtain Leq sound levels over any period of time and can be used for predicting noise at various locations.
Sound	A fluctuation of air pressure which is propagated as a wave through air.
Sound absorption	The ability of a material to absorb sound energy through its conversion into thermal energy.
Sound level meter	An instrument consisting of a microphone, amplifier and indicating device, having a declared performance and designed to measure sound pressure levels.
Sound pressure level	The level of noise, usually expressed in decibels, as measured by a standard sound level meter with a microphone.
Sound power level	Ten times the logarithm to the base 10 of the ratio of the sound power of the source to the reference sound power.
Tonal noise	Containing a prominent frequency and characterised by a definite pitch.