



Integrated Management System

Sydney Metro

Addendum Review of Environmental Factors (REF)- Buchanan Precast Facility

SM-17-00079110

Sydney Metro Integrated Management System (MBoK)

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Glossary

Abbreviation	Definitions
Aurecon	Aurecon Australasia Pty Ltd
BC Act	<i>Biodiversity Conservation Act 2016</i> (NSW)
CTMP	construction traffic management plan
dB(A)	A-weighted decibels
DECCW	NSW Department of Environment, Climate Change and Water
EIS	environmental impact statement
EMP	Environmental Management Plan
EP&A Act	<i>Environmental Planning and Assessment Act 1979</i> (NSW)
EP&A Regulation	<i>Environmental Planning and Assessment Regulation 2021</i> (NSW)
EPA	NSW Environment Protection Authority
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i> (Cth)
ha	hectare
ICNG	Interim Construction Noise Guideline
L_{Aeq(15minute)}	The 'energy average noise level' considered over a 15-minute period. This parameter is used to assess potential construction noise impacts
L_{A90}	The 'background noise level' in the absence of construction activities. This parameter represents the average minimum noise level during the daytime, evening, and night-time periods respectively
L_{AFmax}	The maximum noise level measured during a monitoring period, using 'fast' weighting
LEP	Local Environmental Plan
LGA	local government area
Matters of NES	Matters of National Environmental Significance
NES	national environmental significance
NML	noise management level
NPfi	Noise Policy for Industry
NSW	New South Wales
NVIA	Noise and Vibration Impact Assessment
PCTs	plant community types
Proponent (the)	Sydney Metro
proposed change (the)	Extension of the operation and construction hours of the approved Project
the site	The area that would be directly impacted by the Project (including the proposed change)
REF	Review of Environmental Factors
RNP	NSW Road Noise Policy
SEPP	State Environmental Planning Policy
Study area	The study area encompasses the Proposal site and the area that may be indirectly impacted by the Proposal. This area can vary in size depending on the environmental issue being discussed (e.g. biodiversity, heritage etc.) and the specific area for each issue is described in the relevant section.



Abbreviation	Definitions
Transport	Transport for NSW
WSA	Western Sydney Airport

1. Introduction

1.1. Background and approved Project

Sydney Metro (as 'the Proponent' and determining authority) approved the re-establishment and operation of a precast facility (the approved Project) at a pre-existing site located on George Booth Drive, Buchanan, in the Cessnock Local Government Area (LGA) (the Proposal site). This was approved through the Buchanan Precast Facility Review of Environmental Factors (14th September 2022) (the approved REF).

The approved Project is required to produce precast concrete viaduct and bridge elements to support the construction of the Sydney Metro – Western Sydney Airport (SM-WSA) project, subject of a separate approval (SSI 10051 – approved 23 July 2021). The use of the facility would be temporary and is expected to operate for approximately two years. Once the precast activities required for SM-WSA are completed, the use of the facility would cease.

The approved REF included the following:

- Re-establishment of the precast facility, including removal of five trees and other vegetation
- Extension of the existing precast yard shed and hardstand to accommodate construction of precast concrete segments
- Extension of the existing storage/laydown area
- Installation of site office facilities including amenities
- Re-establishment of the existing on-site carpark facilities and internal roads (where required)
- Reconnection of the ancillary supporting infrastructure, including utilities, lighting and signage
- Production and dispatch of precast concrete segments
- Site decommissioning, including the removal of the site office, plant and equipment.

Since determination of the approved REF, an addendum REF was prepared following ongoing design development and construction planning. The changes involved in the addendum REF included the following:

- Removal of the existing precast yard shed extension and hardstand extension from the scope of works
- Construction, use, and decommissioning of a temporary shed

- A hard stand extension south of the location in the approved REF
- Clearing of additional Grey gum (*Eucalyptus punctata*) trees taking the total removal of trees to seven (as well as other vegetation).

The addendum REF was determined on 27 October 2022 and will be referred to as the approved addendum REF hereafter. As such, the approved REF and addendum REF will be referred to as the 'approved Project'.

Additional consultation and further consideration of the *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act) Matters of National Environmental Significance (Matters of NES) was not required due to the minor nature of the change in the approved addendum REF.

Hours of operation

The approved REF stated for construction:

"Construction of the Proposal would occur during standard construction hours including:

- *Monday to Friday: 7am to 6pm*
- *Saturday: 8am to 1pm*
- *No work on Sundays or Public Holidays"*

Section 5.3.4 of the approved REF indicates *"any other work undertaken outside of standard construction hours would be in accordance with the NSW Interim Construction Noise Guideline 2009 and the Sydney Metro Construction Noise and Vibration Standard"*, and Table 3.1 in the Noise and Vibration assessment included in the approved REF identifies Rating Background Noise Levels (RBL's) for all time periods (day, evening and night).

Mitigation Measure NV6 (Construction hours and scheduling) stated:

"Construction and operation would be carried out during standard construction hours, unless approved in accordance with the project Environmental Management Plan developed in accordance with mitigation measure G1.

Work generating high noise levels should be scheduled during less sensitive time periods, such as after 8 am".

The approved REF stated for operation:

"Operation of the Proposal would occur during standard construction hours including:

- *Monday to Friday: 7am to 6pm*
- *Saturday: 8am to 1pm*
- *No work on Sundays or Public Holidays.*

The dispatch of precast components is proposed to be undertaken prior to 6pm on weekdays. Heavy vehicle deliveries would be scheduled to be evenly dispersed and are not expected to leave the precast yard outside of standard construction hours. Any other work undertaken outside standard construction hours (including if OSOM loads are required which cannot access the local road network) would be in accordance with the NSW Interim Construction

Noise Guideline 2009 (ICNG) (NSW EPA, 2009) and the Sydney Metro Construction Noise and Vibration Standard.”

This addendum REF has been prepared to address a proposed change to out of hours works for construction and operation of the approved Project.

1.2. Description of the proposed change and justification

Construction

The approved Project stated construction would be carried out during standard construction hours, without the ability to enable the use of out of hours work procedure outlined within the Project's Environmental Management Plan.

Construction activities associated with the approved Project and the proposed change include:

- Vegetation clearing (expected to be the loudest construction activity)
- Site leveling
- Shed construction and laydown areas.

The proposed change is seeking to allow out of hours works during construction, as required, in accordance with the out of hours works procedure in the approved Project's Environment Management Plan. This Plan requires an activity specific noise and vibration assessment developed in accordance with the Sydney Metro Construction Noise and Vibration Standard prior to approval. As such, no additional construction out of hours works impact assessment has been included within this addendum REF.

The ability to undertake various construction activities out of hours allows for urgent works to be undertaken to keep the precast facility functioning efficiently throughout operation.

Operation

The approved Project stated, operation would be carried out during standard construction hours, as outlined in section 1.1.

The proposed change is seeking to extend operation hours from the approved Project into the evening, night and weekend periods¹.

The proposed change would be wholly within the approved Project site as described in the approved REF and shown in Figure 1-1 and the workforce and equipment / machinery to be used would remain consistent with that previously assessed by the approved REF.

Activities that may be carried out outside standard hours include:

- Oversized load deliveries, up to eight deliveries per night.
- Survey works and mould stripping works
- Concreting works, clean up and curing tasks.

¹ Under the EPA's Noise Policy for Industry (NPfI) (2017), 'evening' is described as the period from 6pm to 10pm Monday to Sunday and 'night' is the period from 10pm to 7am from Sunday/Monday to Thursday/Friday, and from 10pm to 8am Friday/Saturday and Saturday/Sunday.

It was originally identified in the SM-WSA Environmental Impact Statement (EIS) (section 8.9.5 – construction hours) that activities at the tunnel and viaduct segment production and storage facility, including transport of material to support segment production and segment deliveries would be required outside of standard hours. The EIS also identified that the delivery of oversized materials outside of approved hours may be required for safety reasons.

This proposed change was identified through further construction planning and out of hours works are now required to support the timely delivery of viaduct segments from the Hunter Region to Sydney for the SM-WSA project.

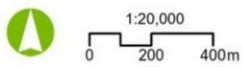
A supporting noise and vibration impact assessment is provided in Section 4.1.

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— Traffic route to Hunter Expressway
■ Site Boundary



Buchanan Precast Facility Addendum Review of Environmental Factors
Projection: GDA 1994 MGA Zone 56 **FIGURE: Proposal Site**

Figure 1-1: Proposal site

1.3. Purpose of the report

This addendum REF has been prepared by Aurecon Australasia Pty Ltd (Aurecon) on behalf of Sydney Metro.

This addendum REF is to be read in conjunction with the approved REF and the approved addendum REF for the Project. The purpose of this addendum REF is to describe the proposed change, to document and assess the likely impacts of the proposed change on the environment, and to detail any additional mitigation and management measures to be implemented.

The description of the proposed change and assessment of associated environmental impacts has been undertaken in the context of section 171 of the Environmental Planning and Assessment Regulation 2021 (EP&A Regulation), the *Biodiversity Conservation Act 2016* (BC Act), and the Australian Government's EPBC Act.

In doing so, the addendum REF helps to fulfil the requirements of section 5.5 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) including that Sydney Metro examine and take into account to the fullest extent possible, all matters affecting or likely to affect the environment by reason of the activity.

The findings of the addendum REF will be considered when assessing:

- Whether the Proposal is likely to have a significant impact on the environment and therefore require an environmental impact statement to be prepared and approval sought under Division 5.2 of the EP&A Act
- Whether the Proposal is “likely to significantly affect threatened species” (as defined in section 7.2 of the BC Act), and therefore require a species impact statement or, if Sydney Metro elects, a biodiversity development assessment report to be prepared under Part 7 of the BC Act
- The potential for the Proposal to significantly impact a Matter of National Environmental Significance or Commonwealth land and the need to make a referral to the Commonwealth Minister for the Environment and Water for a decision by the Minister on whether assessment and approval is required under the EPBC Act (refer to Section 2 below).

2. Statutory planning framework

The *Environmental Planning and Assessment Act* (EP&A Act) 1979 is the main legislation regulating land use planning and development assessment in NSW. The applicable planning approvals pathway for a development under the EP&A Act is generally dependent on the development's size, environmental impact and capital cost, as well as relevant planning provisions in environmental planning instruments, including SEPPs and LEPs.

The Proposal as described in the approved REF is categorized as development for the purpose of a rail infrastructure facility and is being carried out on behalf of a public authority (Sydney Metro) under 2.91 of the *Transport and Infrastructure State Environmental Planning Policy*. As such the approved REF, approved addendum REF and this addendum REF are permissible without consent. The approved Project and the proposed change are not considered state significant infrastructure or state significant development and is not an exempt development. The Proposal can be assessed under Part 5 of the EP&A Act.

This addendum REF assesses potential environmental impacts of the proposed change having regard to the provisions of Section 5.5 of the EP&A Act. In accordance with section 5.5 of the EP&A Act, Sydney Metro must examine and take into account to the fullest extent possible all matters affecting or likely to affect the environment by reason of the proposed activity. This addendum REF has been prepared in accordance with section 171 of the EP&A Regulation.

Sydney Metro is the determining authority for the proposed change. Due to the minor nature of the change, no further consideration of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) Matters of National Environmental Significance or the *Biodiversity Conservation Act 2016* (BC Act) is required.

Section 4 presents the environmental impact assessment for the proposed change.

3. Consultation

This section summarises the completed and planned community and stakeholder engagement activities in relation to the proposed change. The Sydney Metro – Western Sydney Airport Overarching Community Communications Strategy outlines the processes implemented to inform and engage with the local community and key stakeholders.

3.1. Targeted Consultation

During development of this addendum REF targeted consultation was undertaken with the property owner of the residences where modelling indicated that the proposed change may exceed Project noise trigger levels.

A lease agreement has been entered into with the property owner and Sydney Metro for the duration of the use of the site as per the approved Project and initial feedback is that there had not been any noise impacts experienced from previous construction and operation activities at the precast yard including out of hours works. It is understood that the level of use of the facility during the evening and night periods and on weekends associated with this proposed change will not be substantially different to the previous operations experienced by the landowner.

A summary of consultation is provided below in Table 3-1.

Table 3-1: Summary of consultation on the proposed change, to date

Address	Engagement Type	Date of Consultation	Consultation Details
<p>█████ George Booth Drive, Buchanan</p> <p>(Representing three of the closest receivers</p> <p>█████</p> <p>█████</p> <p>█████ George Booth Drive, Buchanan</p>	Phone Call	24 May 2023	<p>CPBUI Community Place Manager contacted stakeholder to enquire about their previous experiences with the Buchanan precast facility when it was operating outside of standard construction hours</p> <p>Feedback:</p> <ul style="list-style-type: none"> The receiver has not experienced any impact from previous projects or any impact from the current SCAW activities The receiver cannot hear the current work The receiver made no objection to additional out of hours works

3.2. Further consultation

Sydney Metro will continue to engage with community and stakeholders during construction and operation of the Proposal as per the Sydney Metro – Western Sydney Airport Overarching Community Communication Strategy.

Ongoing consultation for the addendum REF would be carried out by CPBUI and include the following:

- Ongoing consultation with relevant stakeholders, including Cessnock City Council
- Informing and updating Cessnock City Council and the relevant property owners of

any changes to operational noise impacts and identified sensitivities receivers (residents and businesses) via a project factsheet. The factsheet will summarise the proposed change to out of hours works and will provide contact details should the receivers have further questions about the change.

Community members and stakeholders can direct any enquiries to the contractor by a 24-hour phone line: 1800 717 703.

4. Environmental Impact Assessment

This section provides a description of the potential environmental impacts associated with the construction and operation of the proposed change. Specific safeguards and management measures are provided in this section and in Section 5 to minimise potential impacts.

4.1. Construction noise and vibration

The approved REF discusses the noise impacts associated with construction during standard construction hours. Construction activities associated with the approved Project and the proposed change include:

- Vegetation clearing (expected to be the loudest construction activity)
- Site leveling
- Shed construction and laydown areas.

The impact assessment in section 7.2.5 of the approved REF found that noise levels that would be generated during typical construction activities are within the NML for the Project. Marginal exceedances may occur during high impact activities such as vegetation clearing with chainsaws.

Section 5.3.4 of the approved REF indicates “any other work undertaken outside of standard construction hours would be in accordance with the NSW Interim Construction Noise Guideline 2009 and the Sydney Metro Construction Noise and Vibration Standard” and Table 3.1 in the Noise and Vibration assessment included in the approved REF identifies Rating Background Noise Levels (RBL’s) for all time periods (day, evening and night).

In accordance with the Environmental Management Plan, any proposed out of hours construction activities would be subject to an activity specific noise and vibration assessment developed in accordance with the Sydney Metro Construction Noise and Vibration Standard prior to approval.

Any assessed impacts to nearby sensitive receivers would be managed in accordance with the EMP as specified in mitigation measure NV5.

Mitigation measure NV6 has been amended as shown in section 4.3 and section 5.1 to address construction noise management (and to remove an incorrect reference to operation hours) so that urgent construction works can occur outside standard hours if required.

4.2. Operational noise and vibration

The operational noise and vibration impacts from the approved Project are discussed in section 7.2 of the approved REF and chapter 3 of the approved addendum REF. An Addendum Noise and Vibration Impact Assessment (NVIA) (Renzo Tonin & Associates, 2023) was prepared to support this addendum REF. The assessment is provided in Appendix A.

4.2.1. Location of activities and operating hours

The proposed change would be undertaken within the existing Project footprint. This footprint along with the nearest sensitive receivers assessed in the NVIA are shown in Figure 4-1.

The proposed change would extend operation hours outlined in the approved REF (October 2022) into the evening, night and weekend periods. The working hours assessed in the NVIA are as follows:

(Uncontrolled when printed)

- Weekend Day: 1pm to 6pm Saturday, 8am to 6pm Sunday and Public holidays
- Evening: 6pm to 10pm Monday to Sunday
- Night: 10pm to 7am Sunday/Monday to Friday/Saturday, and 10pm to 8am Saturday/Sunday.

The proposed changes are summarised in **Table 4.1**. The extent of the operation activities that would be undertaken during the evening and night has been limited as much as practicable.

Table 4-1 Summary of operational works under this addendum REF

Activity	Aspect	Operational hours	Indicative timing
Precast Yard operation	Oversize load deliveries	Evening/ Night	May-23 to May-25
	Survey works and mould stripping works	Night	May-23 to May-25
	Concreting works, clean up and curing tasks	Evening/Night	May-23 to May-25

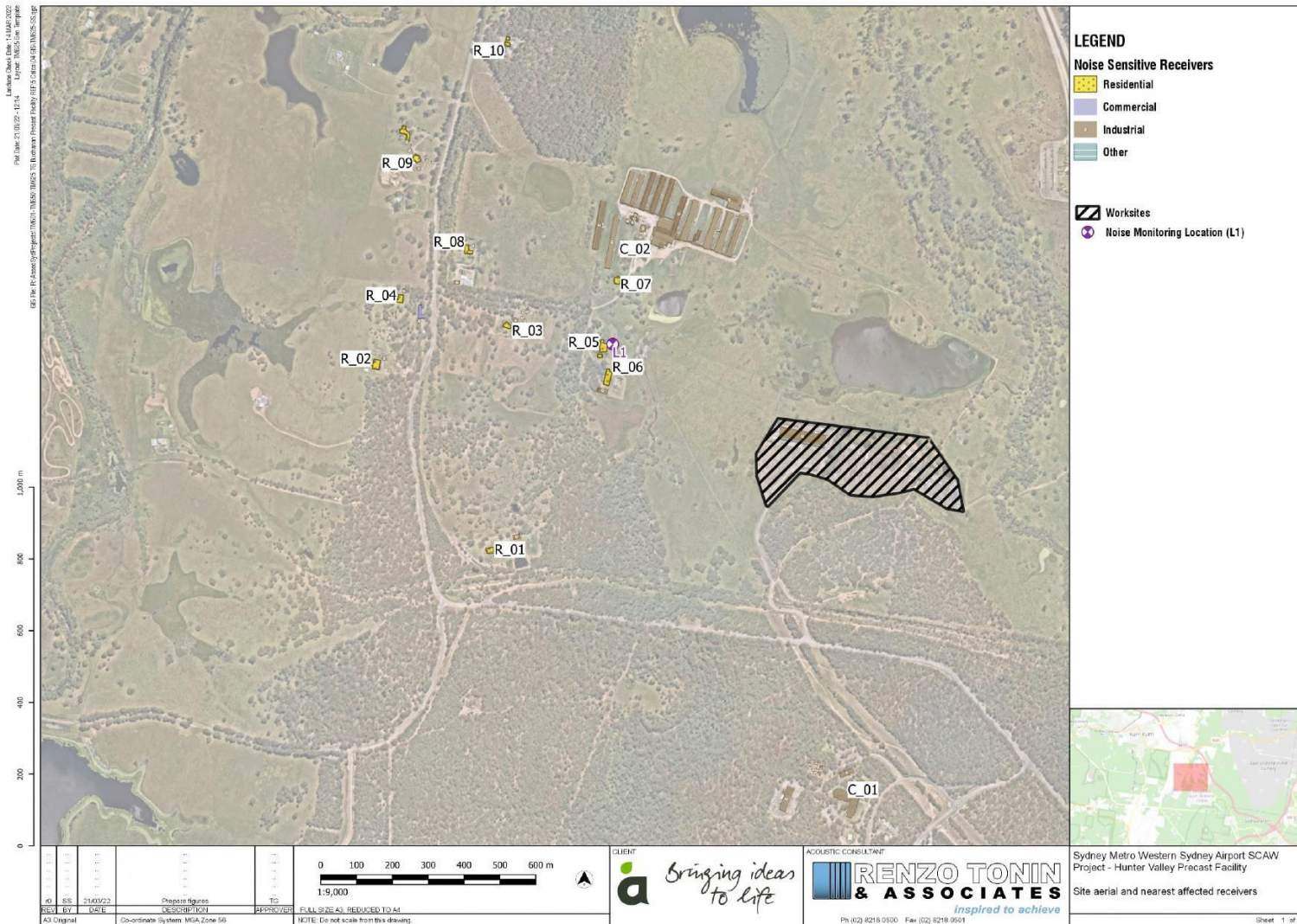


Figure 4-1 Noise Sensitive Receivers (Renzo Tonin & Associates, 2023)

4.2.2. Criteria and operational noise objectives

The Proposal operational noise trigger level and EPA’s Noise Policy for Industry (NPfI) site requirements are presented below in Table 4-2.

Table 4-2 NPfI site requirement and project noise trigger level (PNTL)

Receiver location	Time of day	L _{Aeq, 15min} NPfI site requirement, dB(A)	
		Intrusive	Amenity
Nearest residential receivers	Day (including weekend days)	44	48
	Evening	44	43
	Night	41	38
Industrial premises	When in use	-	68

Note: The controlling noise trigger level is **bolded**. Grey text indicates assessment period not applicable to this assessment.

In accordance with the NPfI, a detailed maximum operational noise level event assessment should be undertaken where the subject development night-time noise levels at a residential location exceed:

- L_{Aeq,15min} 40dB(A) or the prevailing RBL plus 5dB, whichever is the greater, and/or
- L_{AFmax} 52dB(A) or the prevailing RBL plus 15dB, whichever is the greater.

Where there are operational noise events found to exceed the initial screening level, further analysis is undertaken to identify:

- The likely number of events that might occur during the night assessment period,
- The extent to which the maximum noise level exceeds the rating background noise level.

The sleep disturbance noise levels for the project are presented in Table 4-3

Table 4-3 NPfI sleep disturbance assessment levels

Receiver type	Assessment level L _{Aeq,15min}	Assessment level L _{AFmax}	Receiver type
Residential	36 + 5 = 41	52	Residential

Operation related traffic noise objectives are set using the NSW Road Noise Policy (RNP). The NVIA assesses the noise impact on existing residences caused by additional traffic generated by a new land use development at night. George Booth Drive is considered a sub-arterial road. Therefore, the NVIA assessment adopts the category 3 night criterion of 55 dB(A) L_{Aeq,(9hour)}.

The nearest residential or other sensitive receiver is located more than 400 metres from the Approved Project. At this distance, the risk of vibration impact from the proposed change is assessed as negligible. Thus, the NVIA deemed that no further assessment of vibration impacts is required.

4.2.3. Operational noise impacts

Predicted L_{Aeq} noise levels from the sites are presented in Table 4-4 for all receivers. The

predictions are representative of noise levels during weekend, evening and night time operations.

Table 4-4 Predicted operational noise levels (weekend day, evening and night period)

Receiver ID	Address	Predicted noise level - dB(A), $L_{Aeq,(15min)}$			NPfI project noise trigger level - dB(A), $L_{Aeq,(15min)}$		
		Weekend day	Evening	Night	Weekend day	Evening	Night
R_01	[REDACTED]	41	39	35	44	43	38
R_02	[REDACTED]	32	30	-	44	43	38
R_03	[REDACTED]	40	40	35	44	43	38
R_04	[REDACTED]	30	-	-	44	43	38
R_05	[REDACTED]	45	44	39	44	43	38
R_06	[REDACTED]	47	46	42	44	43	38
R_07	[REDACTED]	46	46	42	44	43	38

Note: **Bold** text indicates an exceedance of the project noise trigger level '-' indicates predicted noise level is less than 30 dB(A)

Based on the above results, the significance of the residual operational noise level is considered marginal. At some times, there may be minor exceedances of up to 3 dB(A) of the evening noise trigger level, depending on what plant/ equipment are operating at the time. Predicted noise levels at night are within 4 dB(A) of the night noise trigger level, and within 1 dB(A) of the intrusiveness level.

Properties where exceedances are predicted to occur are owned by the owner of the land leased by the precast facility. Consultation with the affected landowner on 24th May 2023 found that there have not been any perceived noise impacts at present or from previous use of the precast yard when it operated out of hours for other projects (e.g. Hunter Expressway). The level of use of the facility during the proposed evening and night periods and on weekends would not be substantially different to the previous operations experienced by the landowner.

Predicted L_{Amax} noise levels from the sites are presented in Table 4-5 for most affected receivers. The predictions are representative of noise levels during the night operations.

Table 4-5 Predicted operational noise levels (sleep disturbance)

Receiver ID	Address	Predicted noise level - dB(A)		Sleep Disturbance Assessment Level - dB(A)	
		LAeq,15min	L _{Amax}	LAeq,15 min	L _{Amax}
R_01	[REDACTED]	35	42	41	52
R_03	[REDACTED]	35	35	41	52
R_05	[REDACTED]	39	40	41	52
R_06	[REDACTED]	42	43	41	52
R_07	[REDACTED]	42	43	41	52

Note: **Bold** text indicates an exceedance of the project noise trigger level

'-' indicates predicted noise level is less than 40 dB(A)

From the above results, there may be minor exceedances of the sleep disturbance $L_{Aeq(15min)}$ assessment level at some times, depending on what plant/ equipment are operating at the time. Instantaneous noise sources (L_{Amax}) are below the screening level. The significance of the residual noise level is considered negligible.

Residences where the exceedances are predicted are owned by the owner of the land leased by the precast facility. In the event of complaints, mitigation measures such as staggered operation of equipment can be considered. Retrofitting noise walls or other physical noise barriers have been reviewed and are not considered a feasible recommendation. Therefore, they are not recommended to be implemented.

Section 3.3.2 of the NVIA (2023) summarises traffic noise modelling data of the existing road network both with and without the proposed change. The predicted road traffic noise levels associated with the proposed change are assessed to be below the RNP noise criteria and therefore, traffic associated with the pre-cast facility is considered to have minimal impact on traffic noise generated to residences on George Booth Drive and are found to satisfy the traffic noise criteria (Night criterion: 55 dB (A) $L_{Aeq(9hour)}$ as per section 2.5.3 of the NVIA (2023).

Noise management measures are presented below in section 4.3 and chapter 7.

4.3. Noise and vibration mitigation and management

The following changes to the mitigation and management measures have been identified, they are shown bolded and underlined. A full list of environmental safeguards and management measures is provided in Section 5.

Table 4-6 Proposed changes to existing noise mitigation and management measures

Mitigation measure	Action required	Details
NV6	Construction hours and scheduling	Construction works and operation would be carried out during standard construction hours, <u>unless approved by Sydney Metro in accordance with the project Environmental Management Plan developed in accordance with mitigation measure G1.</u> Work generating high noise levels should be scheduled during less sensitive time periods, such as after 8 am.
NV9	<u>Use and siting of plant</u>	<u>Plant and equipment operating during the night period (10pm to 7am Monday to Friday and 8am on Saturday) will be located inside the precast shed and stationary plant such as compressors shielded by fixtures within the facility, where practicable.</u>
NV10	<u>Consultation on out of hours operations</u>	<u>Consultation would be undertaken with affected receivers prior to commencement of out of hours operation of the precast facility.</u>
NV11	<u>Manage night heavy vehicle movement within the site</u>	<u>During the night period (10pm to 7am Monday to Friday and to 8am on Saturday), heavy vehicle movement on site (excluding concrete agitators) must occur on the southern side of the existing precast shed.</u>

4.4. Other potential environmental impacts

Table 4.7 provides an assessment of the potential environmental impacts of the proposed change considering the impacts reviewed as part of the approved Project.

Table 4.7: Potential environmental impacts of the proposed change

Environmental factor	Nature and extent of impacts
Transport	<p>The impacts to traffic and transport from the approved Project are discussed in section 7.1 of the approved REF and chapter 3 of the approved addendum REF.</p> <p>Extending operation hours would have a minor increase in heavy and light vehicle usage during night periods on and on weekends. Up to eight additional oversized load deliveries may be needed per night. Given the existing road network (George Booth Drive is a sub-arterial road) and the low number of daily oversize overmass (OSOM) vehicle movements, it is expected that the traffic impact of additional heavy vehicles would be minimal. The noise impacts as a result of the increase in vehicles is discussed in section 4.1.3</p> <p>Overall, the transport impacts of the proposed change are expected to be negligible and can be managed in accordance with the existing mitigation measures.</p>
Biodiversity	<p>Biodiversity impacts were assessed in Section 7.3 of the approved REF and in Chapter 3 of the approved addendum REF.</p> <p>Extended operating hours may have minor impacts on the surrounding fauna in the area, due to light and noise impacts. However, the impact to biodiversity would be generally consistent with the approved REF and approved addendum REF. The impact of noise and vibration for extended hours on biodiversity is expected to be negligible.</p> <p>The proposed change would not involve any change to the clearing of vegetation and/or habitat as determined in the approved REF and the approved addendum REF.</p>

Environmental factor	Nature and extent of impacts
Landscape and visual character	<p>Landscape and visual character impacts were assessed in Section 7.4 of the approved REF and in Chapter 3 of the approved addendum REF.</p> <p>Overall, the landscape and visual character impacts of the proposed change would be negligible.</p> <p>Mitigation measures would be consistent with the approved REF and approved addendum REF and are discussed in Section 5.1. No change to the approved Project.</p>
Historical heritage	<p>The proposed change would be undertaken within the footprint of the approved REF and approved addendum REF with no greater impact to historic heritage than that predicted in the approved Project. No change to the approved Project.</p>
Aboriginal heritage	<p>The proposed change would be undertaken within the footprint of the approved REF and approved addendum REF with no greater impact to Aboriginal heritage than that predicted in the approved REF. No change to the approved Project.</p>
Property, land use and socio-economic	<p>No change to the approved Project.</p>
Soils and surface water quality	<p>No change to the approved Project.</p>
Air quality	<p>Air quality impacts were assessed in section 7.9 of the approved REF and chapter 3 of the approved addendum REF.</p> <p>The equipment / machinery would remain consistent with that previously assessed in the approved Project. Particulate (dust) and gaseous (vehicle exhaust and volatile organic compounds) emissions are expected during operation of approved Project. While there is not expected to be an increase in air quality impacts, the particulate and gaseous emissions may be emitted for extended periods due to the extension of the operating hours proposed. The resulting air quality impacts of the proposed mitigation are expected to be negligible.</p> <p>Mitigation measures would be consistent with the approved REF and approved addendum REF and are discussed in Section 5.1.</p>
Resource use and waste management	<p>No change to the approved Project.</p>
Sustainability, climate change and greenhouse gases	<p>No change to the approved Project.</p>
Cumulative impacts	<p>No change to the approved Project.</p>

5. Environmental management

This section identifies a number of safeguards and mitigation measures to minimise adverse impacts that could arise as a result of the proposed change. Mitigation measures discussed in this section would be applied through the duration of construction and operation of the proposed change.

5.1. Summary of environmental safeguards and management measures

The proposed change is subject to compliance with the mitigation measures in Table 5-1 below.

Changes to the mitigation measures are required as a result of the revised scope of works. Where these changes or additional mitigation measures have been identified, they are shown bolded and underlined in Table 5-1. Further changes to the mitigation measures were not required given the scope of the proposed change are still wholly located within the existing approved footprint and impacts can be adequately addressed through existing mitigation measures and conditions.

Table 5-1: Construction environmental management measures

Ref	Issue	Mitigation measure
General		
G1	Environmental management	<p>An Environment Management Plan (EMP) will be prepared in accordance with the CEMF, CNVS, CTMF and submitted for review and endorsement of the Sydney Metro Environment Manager prior to commencement of the activity.</p> <p>As a minimum, the EMP will address the following:</p> <ul style="list-style-type: none"> any requirements associated with statutory approvals details of how the project will implement the identified safeguards outlined in the REF issue-specific environmental management plans roles and responsibilities communication requirements induction and training requirements procedures for monitoring and evaluating environmental performance, and for corrective action reporting requirements and record-keeping procedures for emergency and incident management procedures for audit and review. <p>The endorsed EMP will be implemented during the undertaking of the activity.</p>
G2	General notification	All businesses, residential properties and other key stakeholders (e.g. schools, local councils) affected by the activity will be notified at least seven days prior to commencement of the Proposal.
G3	General environmental awareness	All personnel working on site will receive training to ensure awareness of environment protection requirements to be implemented during the project. This will include up-front site induction and regular "toolbox" style briefings.

Ref	Issue	Mitigation measure
Transport		
T1	Traffic management	<p>A Construction Traffic Management Plan (CTMP) will be prepared in accordance with the Sydney Metro Construction Traffic Management Framework. The CTMP will include:</p> <ul style="list-style-type: none"> • Confirmation of haulage routes • Measures to manage Oversize Overmass deliveries, if required • Measures to manage heavy vehicle movements • Measures to maintain access to local roads and properties • Site specific traffic control measures (including signage) to manage and regulate traffic movement • Measures to maintain pedestrian and cyclist access • Requirements and methods to consult and inform the local community of impacts on the local road network • Access to construction sites including entry and exit locations and measures to prevent construction vehicles queuing on public roads • A response plan for any construction traffic incident • Consideration of other developments that may be under construction to minimise traffic conflict and congestion that may occur due to the cumulative increase in construction vehicle traffic • Monitoring, review and amendment mechanisms.
T2	Traffic management	<p>Heavy vehicle movements to and from the Proposal site would be scheduled to minimise traffic disruption to the surrounding road network.</p> <p>This may include, but is not limited to:</p> <ul style="list-style-type: none"> • Scheduling the movement of construction material, equipment and waste to occur outside of peak periods (during standard construction hours) where practical • Scheduling heavy vehicle deliveries to be evenly dispersed as far as practical to minimise convoying or platoons and queuing outside the Proposal site
T3	Traffic incidents	In the event of a traffic-related incident, coordination would be carried out with Transport Coordination and/or other parts of Transport for NSW.
T4	Emergency vehicles access	Access to properties for emergency vehicles would be provided at all times
T5	Road safety	All trucks would enter and exit the Proposal site in a forward direction, where feasible and reasonable to minimise collision and safety risks
T6	Road safety	The loading and unloading of trucks would be planned to ensure each individual truck haulage capacity is fully utilised to reduce the total number of truck movement
T7	Road safety	All loading /unloading activities would occur within the Proposal site
T8	Road safety	Public roads and access points would not be obstructed by any materials, vehicles, skip bins or the like, under any circumstances
T9	Road safety	All vehicles transporting loose materials would have the entire load covered and/or secured to prevent any large items, excess dust or dirt particles depositing onto the roadway during travel to and from the Proposal site
T10	Road safety	All vehicles leaving the site would be checked that they are clean of materials that may fall on the roadway before they are allowed to leave the site
T11	Staff parking	All staff parking would be provided on-site and not on surrounding local streets

Ref	Issue	Mitigation measure
Noise and vibration		
NV1	Noise impacts during works	During construction, receivers that would potentially be affected by noise from the works would be appropriately notified before the relevant works start. Notification will be delivered to sensitive receivers at least 7 days prior to commencement of works.
NV2	Noise exceedances at receivers	Attended noise monitoring is to be undertaken to verify that noise levels resulting from works are in accordance with the levels predicted in this noise and vibration assessment report, subject to obtaining the property owner/occupier's consent to access the property (where required). Noise monitoring is recommended to be conducted at CT3/1416 George Booth Drive, Buchanan - within 30 metres of the building, on the side closest to the precast facility. If the standard mitigation measures are not found to be adequate, further mitigation measures would be considered and implemented where feasible and reasonable
NV3	At source noise impacts	The following at-source control measures are recommended to reduce potential noise impacts: <ul style="list-style-type: none"> • Sound Power or Sound Pressure Levels compliant plan and equipment • Equipment selection • Use and siting of plant • Non-tonal reversing alarms • Minimise disturbance arising from delivery of goods • Reduce noise from mobile plant through additional fittings • Limit use of engine compression breaks • Limit equipment in use
NV4	Noise barriers	Any buildings or structures on site shall be used as a noise barrier, where practicable to provide shielding to the nearest affected receivers.
NV5	Noise impacts during works	The EMP would include a relevant section for construction noise and vibration management which must be prepared in accordance with the Sydney Metro Construction Noise and Vibration Standard. The EMP would be regularly updated to account for any changes in noise management issues and strategies.
NV6	Construction hours and scheduling	Construction works and operation would be carried out during standard construction hours, <u>unless approved in accordance with the project Environmental Management Plan developed in accordance with mitigation measure G1.</u> Work generating high noise levels should be scheduled during less sensitive time periods, such as after 8 am.
NV7	Site inductions	All employees, contractors and subcontractors are to receive an environmental induction. The induction must at least include: <ul style="list-style-type: none"> • Noise and vibration mitigation measures • Permissible hours of work • Limitations to noise generating activities with special audible characteristics • Location of nearest sensitive receivers • Construction employee parking areas • Designated loading/unloading areas and procedures • Site opening/closing times • Environmental incident procedures • Behavioural practices (no dropping of materials from height, excessive revving of engines etc).

Ref	Issue	Mitigation measure
NV8	Verification monitoring	A noise monitoring program should be carried out for the duration of works in accordance with the EMP and any approval conditions.
NV9	<u>Use and siting of plant</u>	<u>Plant and equipment operating during the night period (10pm to 7am Monday to Friday and to 8am on Saturday) will be located inside the precast shed and stationary plant such as compressors shielded by fixtures within the facility, where practicable.</u>
NV10	<u>Consultation on out of hours operations</u>	<u>Consultation would be undertaken with the affected receivers prior to commencement of out of hours operation of the precast facility.</u>
NV11	<u>Manage night heavy vehicle movement within the site</u>	<u>During the night period (10pm to 7am Monday to Friday and to 8am on Saturday), heavy vehicle movement on site (excluding concrete agitators) will occur on the southern side of the existing precast shed.</u>
Biodiversity		
B1	Potential fauna impact	Employment of a fauna spotter/catcher experienced in native fauna identification for pre-clearance works, to avoid direct impacts to species. Clearing works will be undertaken in accordance with the CEMF. Species identified as likely to occur within the Proposal site include snakes.
B2	Potential impacts to adjacent vegetation	Avoid impacts to adjacent vegetation, including exclusion zones around trees to be retained (including a buffer for the tree root zone) and vegetation around dams.
B3	Unexpected threatened species	An unexpected threatened species finds procedure is to be contained in the EMP and followed if a threatened species is encountered that has not previously been identified and assessed in the environmental assessment.
B4	Biosecurity risk	Biosecurity risks (i.e. weeds) must be managed in accordance with the Biosecurity Act 2015: <ul style="list-style-type: none"> • Machinery, vehicles, and footwear to be cleaned and washdown procedure adhered to, prior to moving to a new location from site • Disposal of sealed bagged weeds to a licenced waste disposal facility.
Historical heritage		
NA1	Historic heritage	An unexpected heritage finds procedure is to be contained in the EMP and followed in the event that any unexpected heritage items, archaeological remains or potential relics of Historical origin are encountered.
Aboriginal heritage		
AH1	Aboriginal heritage	An unexpected heritage finds procedure is to be contained in the EMP and followed in the event that any unknown or potential Aboriginal object/s, including skeletal remains are encountered.
Property, land use and socio-economic		
P1	Property, land use and socio-economic	Storage of plant and equipment is to be undertaken only within the previously disturbed footprint of the precast yard and within the footprint of the land leased by the Proposal for the precast facility.
Soils and surface water quality		
SW1	Soil and water management	Environmental safeguards (e.g. sediment fences, sumps) are to be inspected and repaired to consistent with the Blue Book – “Managing Urban Stormwater: Soils and Construction” (4 th Edition Landcom, 2004).

Ref	Issue	Mitigation measure
SW2	Contaminated land	An EMP will be prepared and implemented prior to construction. The EMP will include an Unexpected Contaminated Land Finds Protocol, or similar, which would document the process for the investigation, remediation and/or management of contamination if identified during the works. If contaminated areas are encountered during construction, appropriate control measures will be implemented to manage the immediate risks of contamination. All other works that may impact on the contaminated area will cease until the nature and extent of the contamination has been confirmed and any necessary site-specific controls or further actions identified in consultation with the Sydney Metro Environment Manager and/or EPA.
SW3	Accidental spills	A site-specific emergency spill plan will be developed and include spill management measures. The plan will address measures to be implemented in the event of a spill, including initial response and containment, notification of emergency services and relevant authorities (including Sydney Metro and/or EPA).
SW4	Storage of substances	Storage of fuels, oils and other potentially harmful substances are to be stored in appropriately bunded areas.
SW5	Elevated pH run off	Bunded areas will be available to collect concrete waste to ensure that runoff leaving the site would not pollute nearby land or waterways.
Resource use and waste management		
L1	Resource use and waste management	An EMP will be prepared and implemented prior to construction. The PEMP would detail risks and standard management measures to reduce impacts on resource use and waste management.
Air quality		
AQ1	Air quality management	An EMP will be prepared and implemented prior to construction. The EMP would detail risks and standard management measures to reduce impacts on air quality.
Sustainability, climate change and greenhouse gases		
S1	Sustainability management	An EMP will be prepared and implemented prior to construction. The EMP would detail risks and standard management measures to reduce impacts on resource use and waste management.
Cumulative impacts		
C1	Cumulative construction impacts	<p>Consultation will be undertaken with surrounding projects or developments if they occur during construction to:</p> <ul style="list-style-type: none"> • Increase awareness of construction timeframes and impacts • Coordinate impact mitigation and management (e.g. respite periods)

6. Conclusion

The proposed change to the Buchanan Precast Facility is subject to assessment under Division 5.1 of the EP&A Act. This addendum REF has considered and assessed the potential impacts and potential benefits of the proposed change in accordance with section 171 of the EP&A Regulation (refer to Section 7 of the approved REF and Section 4 of this addendum REF) and concluded that:

- The proposed change is not "likely to significantly affect the environment" for the purposes of Division 5.1 of the EP&A Act
- The proposed change is not "likely to significantly affect threatened species" for the purposes of Part 7 of the Biodiversity Conservation Act 2016.

Consequently, no environmental impact statement, no species impact statement or biodiversity development assessment report is required to be prepared under Division 5.1 of the EP&A Act or Part 7 of the BC Act. It is also considered that the proposed change does not trigger the need for referral or approval under the Commonwealth EPBC Act.

Based on Sydney Metro's careful consideration of the environmental impact assessment contained in the Review of Environmental Factors, and this addendum REF, it is recommended that the Proposal proceed subject to the mitigation measures contained in Section 5 of this Report.

7. Determination

Addendum Review of Environmental Factors: Buchanan Precast Facility

I, Hugh Chapman, Director Project Environment, Sustainability and Planning (Sydney Metro – Western Sydney Airport), state as follows:

- I have examined and taken into account to the fullest extent possible all matters affecting or likely to affect the environment by reason of the Proposal assessed in the Buchanan Precast Facility Review of Environmental Factors (14 September 2022), the approved addendum Review of Environmental Factors (27 October 2022), and this Addendum Review of Environmental Factors in accordance with Section 5.5 of the *Environmental Planning and Assessment Act 1979* (NSW).
- I have formed a view that the Proposal is not likely to have a significant impact on the environment, having regard to the environmental factors specified in the environmental factors guidelines that apply to the activity, as required by clause 171 (1) of the *Environmental Planning and Assessment Regulation 2021* (NSW). Therefore, an Environmental Impact Statement is not required.
- I have formed a view that the Proposal will not be carried out in a declared area of outstanding biodiversity value and is not likely to significantly affect threatened species, populations or ecological communities, or their habitats or impact biodiversity values. Therefore, a Biodiversity Development Assessment Report is not required.
- I have formed a view that the Proposal does not trigger the need for referral or approval under the *Environment Protection and Biodiversity Conservation Act 1999* (Cth).
- I determine, on behalf of Sydney Metro, that the Proposal may proceed in accordance with the Conditions of Approval and environmental management measures, as described in this Addendum Review of Environmental Factors, consistent with the Proposal described in the Buchanan Precast Facility Review of Environmental Factors (September 2022), the Buchanan Precast Facility Determination Report (September 2022), the approved addendum Review of Environmental Factors (October 2022), and this Addendum Review of Environmental Factors.

Signature: 

Name: Hugh Chapman

Title: Director Project Environment Sustainability and Planning (SM-WSA)

Date: July 10th, 2023

8. References

Department of Agriculture, Water and the Environment, Protected Matters search tool, Accessed on 22 February 2022 from <https://www.environment.gov.au/epbc/protected-matters-search-tool>

Department of Environment and Climate Change (DECC) 2009, Interim Construction Noise Guideline, July 2009.

Department of Urban Affairs and Planning 1995/1996. Is an EIS Required? Best Practice Guidelines for Part 5 of the *Environmental Planning and Assessment Act 1979*.

Environmental Protection Authority (2017) *NSW Noise Policy for Industry*

Lower Hunter Central Coast Regional Environmental Strategy 2009

Sydney Metro, 2020, Sydney Metro – Western Sydney Airport – Environmental Impact Statement

Sydney Metro, 2021, Sydney Metro – Western Sydney Airport – Submissions Report

Appendix A

Addendum Noise and Vibration Impact Assessment

23 June 2023

TM625-02_1F01 SMWSA HV Precast NV_Addendum (r4)

Aurecon Australasia Pty Ltd
Level 11/73 Miller Street
North Sydney NSW 2060

SYDNEY METRO WESTERN SYDNEY AIRPORT PROJECT - Buchanan Precast Facility - Noise and Vibration Addendum

1 Introduction

A noise and vibration impact assessment (NVIA) was been prepared on behalf of Aurecon Australasia Pty Ltd (Aurecon) for the re-establishment and operation of a precast facility (the Proposal) located on George Booth Drive, Buchanan, in the Cessnock local government area (LGA) (the Proposal site) to support the construction of the Sydney Metro – Western Sydney Airport [1]. The NVIA was used to support a Review of Environmental Factors (REF) permitting CPB to operate the pre-cast yard. The REF was subsequently determined by Sydney Metro.

This Addendum noise and vibration assessment has been prepared to assess the noise and vibration impacts from extending certain activities at the facility into the evening period and night period and on weekends.

2 Addendum works, hours and objectives

2.1 Location of works

The works assessed in this addendum NVIA are undertaken within the existing works footprint. The figure in APPENDIX B shows the works location and nearest sensitive receivers assessed in this Addendum NVIA.

2.2 Nearest sensitive receivers

The NVIA Section 4 describes the nearest noise sensitive receivers for the purpose of assessment and management of impact. All relevant residential sensitive receivers in the vicinity of the worksite are identified on aerial photographs located in APPENDIX B.

2.3 Operational Hours

Hours of operation are as reported in the NVIA Section 2.2. The proposed hours of operation described in the NVIA are:

- 7 am to 6 pm Monday to Friday
- 8 am to 1 pm Saturdays
- No work on Sundays or Public Holidays.

The works assessed in this addendum report will be undertaken outside the NVIA proposed hours and will include evenings, nights and weekends. The additional assessment periods are defined under the EPA's Noise Policy for Industry (NPfI) [2] as

- Weekend day, from 1pm to 6pm on Saturday and from 8am to 6pm on Sundays and public holidays
- Evening, from 6pm to 10pm Monday to Sunday
- Night, from 10pm to 7am Sunday/Monday to Friday/ Saturday, and from 10pm to 8am Saturday/Sunday.

2.4 Operational works in this addendum NVIA

The works assessed in this addendum NVIA will be undertaken during the evening and night periods. The extent of the works has been limited as much as practicable. The works are summarised in Table 2.1. A detailed summary of the operations assessed in this report is presented in Table C1 of APPENDIX C.

Table 2.1: Summary of operational works under this Addendum

Activity	Aspect	Operational hours	Indicative timing
Precast Yard operation	Oversize load deliveries	Evening/ Night	May-23 to May-25
	Survey works and Mould stripping works	Night	May-23 to May-25
	Concreting works, clean up and curing tasks	Evening/ Night	May-23 to May-25

Notes: 'Evening' period, 6pm to 10pm Monday to Sunday

'Night' period, 10pm to 7am Sunday/Monday to Thursday/ Friday; 10pm to 8am Friday/Saturday and Saturday/Sunday

2.5 Noise objectives

2.5.1 Operational noise objectives

Operational noise objectives are detailed in the NVIA Section 5.2. The NPfI project trigger levels for the proposed operating hours are presented in Table 2.2.

Table 2.2: NPfl site requirement and project noise trigger level (PNTL)

Receiver location	Time of Day ^{1,2}	L _{Aeq, 15min} NPfl site requirement, dB(A)	
		Intrusive	Amenity
Nearest residential receivers	Day (including weekend days)	44	48
	Evening	44	43
	Night	41	38
Industrial premises	When in use	-	68

Notes: The controlling noise trigger level is **bolded**.

Grey text indicates assessment period not applicable to this assessment.

2.5.2 Sleep disturbance objectives

Sleep disturbance was not assessed in the NVIA as the site was not operating during the night period. The potential for sleep disturbance from maximum noise level events from premises during the night-time period needs to be considered. In accordance with NPfl, a detailed maximum noise level event assessment should be undertaken where the subject development night-time noise levels at a residential location exceed:

- L_{Aeq,15min} 40dB(A) or the prevailing RBL plus 5dB, whichever is the greater, and/or
- L_{AFmax} 52dB(A) or the prevailing RBL plus 15dB, whichever is the greater.

Where there are noise events found to exceed the initial screening level, further analysis is undertaken to identify:

- The likely number of events that might occur during the night assessment period,
- The extent to which the maximum noise level exceeds the rating background noise level.

The sleep disturbance noise levels for the project are presented in Table 2.3.

Table 2.3: NPfl sleep disturbance assessment levels

Receiver type	Assessment Level L _{Aeq,15min}	Assessment Level L _{AFmax}
Residential	36 + 5 = 41	52

2.5.3 Operation related road traffic noise objectives

Operation related traffic noise objectives are set using the NSW Road Noise Policy (RNP) [3], as detailed in the NVIA Section 5.3. This assessment is of the noise impact on existing residences caused by additional traffic generated by a new land use development at night. George Booth Drive is considered a sub-arterial road. Therefore, this assessment uses the category 3:

- Night criterion: 55 dB(A) L_{Aeq,(9hour)}.

2.6 Vibration assessment

As noted in the NVIA, the nearest residential or other sensitive receiver is located more than 400 metres from the Proposal. At this distance the risk of vibration impact from the extension and operation of the proposed facility is assessed as negligible. No further assessment of vibration impacts is required.

3 Noise assessment

3.1 Operational noise assessment

Key details regarding the site layout, the likely plant and equipment (including truck movements), and hours of operation were informed by Aurecon. This information is presented in APPENDIX C and formed the basis for all modelling assumptions used in this assessment.

The modelling of the operation of the precast facility includes combinations of items of plant considered to be representative of typical worst-case operation. Predicted L_{Aeq} noise levels from the sites are presented in Table 3.1 below for all receivers. The predictions are representative of noise levels during the works.

Table 3.1: Predicted operational noise levels (weekend day, evening and night period)

Receiver ID	Address	Predicted noise level - dB(A), $L_{Aeq,(15min)}$			NPfl project noise trigger level - dB(A), $L_{Aeq,(15min)}$		
		Weekend Day	Evening	Night	Weekend Day	Evening	Night
R_01	████████████████████	41	39	35	44	43	38
R_02	████████████████████	32	30	-	44	43	38
R_03	████████████████████	40	40	35	44	43	38
R_04	████████████████████	30	-	-	44	43	38
R_05	████████████████████	45	44	39	44	43	38
R_06	████████████████████	47	46	42	44	43	38
R_07	████████████████████	46	46	42	44	43	38

Note: Bold text indicates an exceedance of the project noise trigger level

'-' indicates predicted noise level is less than 30 dB(A)

Modelling indicates that at some times there may be minor exceedances of up to 3 dB(A) of the day noise trigger level, which is based on the intrusiveness level but are below the amenity noise levels. There may be minor exceedances of up to 3 dB(A) of the evening noise trigger level, which is based on the amenity level, depending on what plant/ equipment are operating at the time. Predicted noise levels at night are within 4 dB(A) of the night noise trigger level, which is based on the amenity level, and within 1 dB(A) of the intrusiveness level. The significance of the residual noise level is considered marginal.

In accordance with the NPfI, the noise assessment is required to consider the effects of adverse meteorological conditions such as wind and temperature inversions. The increase in noise that results from atmospheric temperature inversions and winds needs to be compared with the criteria, to establish whether the meteorological effects will cause a significant impact. Noise prediction modelling has been undertaken using the International Standard ISO 9613-2 (1996), which incorporates moderately adverse meteorological conditions (i.e. wind and temperature inversions) implemented in accordance with ISO/TR 17534-3 (2015).

A comparison with predictions using the CONCAWE noise propagation algorithm with an F-class temperature inversion and 2 m/s source to receiver winds was undertaken. The comparison found up to 2 dB increase at worst affected receivers (R05, R06 and R07). At receivers further away the increase from adverse meteorology was more than 2 dB but did not cause an exceedance of the noise trigger levels.

Aurecon advises that the residences where the exceedances are occurring are owned by the owner of the land leased by the precast facility. Targeted consultation with the affected landowner found that they do not experience any impacts from the project currently nor previously when it was operated out of hours. It is understood that the level of use of the facility during the evening and night periods and on weekends will not be substantially different to the previous operations experienced by the landowner.

Mitigation measures such as staggered operation of equipment or the erection of noise barriers can be considered, subject to noise verification monitoring.

Noise management measures are presented in Section 3.4.

3.2 Sleep disturbance

Predicted L_{max} noise levels from the sites are presented in Table 3.2 for most affected receivers. The predictions are representative of noise levels during the night operations.

Table 3.2: Predicted operational noise levels (sleep disturbance)

Receiver ID	Address	Predicted noise level - dB(A)		Sleep Disturbance Assessment Level - dB(A)	
		$L_{Aeq,15min}$	L_{Amax}	$L_{Aeq,15min}$	L_{Amax}
R_01	[REDACTED]	35	42	41	52
R_03	[REDACTED]	35	35	41	52
R_05	[REDACTED]	39	40	41	52
R_06	[REDACTED]	42	43	41	52
R_07	[REDACTED]	42	43	41	52

Note: Bold text indicates an exceedance of the project noise trigger level
 '-' indicates predicted noise level is less than 40 dB(A)

Modelling indicates that at some times there may be minor exceedances of the sleep disturbance $L_{Aeq(15min)}$ assessment level, depending on what plant/ equipment are operating at the time. Instantaneous noise sources (L_{Amax}) are below the screening level. The significance of the residual noise level is considered negligible. Aurecon advises that the residences where the exceedances are occurring are owned by the owner of the land leased by the precast facility, as discussed in Section 3.1.

In the event of complaints, mitigation measures such as staggered operation of equipment or the erection of noise barriers can be considered after verification noise monitoring has been conducted.

Noise management measures are presented in Section 3.4.

3.3 Operation related road traffic noise

3.3.1 Traffic sources

Details of projected vehicle movements associated with the works were provided by Aurecon (see Table C1), as described in the NVIA. Light vehicle movements were not considered to be significant. Traffic noise is assessed for the night period (10pm to 7am).

As noted in the NVIA, existing traffic volumes were informed by the previous noise assessment prepared by Renzo Tonin and Associates in 2018 [5] and the Sydney Metro – Western Sydney Airport – Technical Paper 2: Noise and Vibration [4]. The traffic data assumptions are summarised in Table 3.3.

Table 3.3: Traffic noise modelling data – existing road network

Road	Road category (RNP)	9-hour night period (10pm-7am)			
		Existing		With project	
		TOTAL	HV	TOTAL	HV
George Booth Drive (north of access road)	Sub-arterial	125	7.2%	193	8.8%

3.3.2 Predicted traffic noise

As discussed in Section 7.2 of the NVIA, for assessment purposes, residential receivers are assumed to be a typical worst-case distance of 15m from the road. The posted speed limit on George Booth Drive is 80 km/h. Table 3.4 below summarises the predicted traffic noise levels during the day period.

Table 3.4: Predicted traffic noise levels (with/ without proposal)

Road	Predicted noise level Night period (10pm to 7am), dB(A)			
	Noise descriptor	No precast facility	With precast facility	RNP Noise Criteria
George Booth Drive	$L_{Aeq(9h)}$	49.3	51.7	55 (2.4 dB increase)

Note: Bold text indicates more than 2dB(A) increase in traffic noise levels resulting from traffic.

The predicted road traffic noise levels in Table 3.4 indicate there may be a 2.4 dB increase in road traffic noise levels. An increase of up to 2 dB represents a minor impact that is considered barely perceptible

to the average person. Furthermore, the overall road traffic noise level including additional traffic from the precast facility is below the RNP noise criteria $L_{Aeq(9hr)}$ 55dB(A). Therefore, the precast facility will have minimal impact on traffic noise generated to residences on George Booth Drive and are found to satisfy the traffic noise criteria identified in Section 2.5.3.

3.4 Noise and vibration mitigation and management

The mitigation and management measures outlined in Section 6.4 and Section 7.3 of the NVIA will be implemented as applicable to the precast facility operation.

3.4.1 Other noise control measures

In addition to the mitigation outlined in the NVIA, noise mitigation and management measures are recommended Table 3.5 to reduce noise impacts during the evening and night period.

Table 3.5: Noise mitigation and management measures

Action required	Applies to	Details	Estimated noise benefit
Maximum noise levels	Airborne noise	The noise levels of plant and equipment (including rental plant) must have operating Sound Power Levels consistent with or below the noise levels in Table C1 of Appendix C.	Variable. Minimise noise impact and reduce risk of annoyance.
Use and siting of plant	Airborne noise	Plant and equipment operating during the night period will be located inside the precast shed. Concrete trucks will be located wholly within the precast shed during evening (or night, if required) pours. Where practicable, stationary plant such as compressors will be shielded by fixtures within the facility	5-10 dB reduction
Upgrade the existing precast shed to reduce noise emission to the west and north-west	Airborne noise	Retrofit the western facing sides of the sheds with a full height wall, to mitigate operations during the evening and night period.	5-15 dB reduction, depending on the location of plant within the precast shed relative to the full height wall sections. Review of this option found that it was not feasible as it would inhibit access to the shed and the operation of the facility.
Install noise wall on west site boundary		Install container wall 1 container (2.7 m) high, or similar on the western site boundary to mitigate operations during the evening and night period.	Up to approx. 5 dB reduction, depending on the location of plant/equipment relative to the noise barrier. Review of this option found that it was not feasible due to space constraints on site which would inhibit the operation of the facility.

Action required	Applies to	Details	Estimated noise benefit
Manage night heavy vehicle movement within the site, <i>subject to verification monitoring</i>	Airborne noise	During the night period (10pm to 7am Monday to Friday and to 8am on Saturday), heavy vehicle movement on site (excluding concrete agitators) will remain on the southern side of the existing precast shed. This will provide additional distance between night vehicle movements and the nearest receivers and allow the precast facility to shield truck movements during this period.	Approx. 5 dB reduction
Consultation / agreement	Airborne noise	Consultation would be undertaken with the affected landowner and written agreement sought to allow out of hours operation of the precast facility with minor noise exceedances, subject to verification monitoring as described in Section 3.4.2.	-

3.4.2 Attended noise monitoring

As part of the consultation with the affected landowner described in Table 3.5, attended noise monitoring is to be undertaken to verify that operations comply with the project noise trigger levels, subject to obtaining the property owner/occupier's consent to access the property (where required).

It is recommended that noise monitoring is conducted at the following location:

- [REDACTED] - within 30m of the building, on the side closest to the precast facility.

Noise monitoring should follow the procedures outlined in Sydney Metro – Western Sydney Airport project Construction Noise and Vibration Management Plan. Note that monitoring at all properties may be undertaken from the property boundary to limit any inconvenience to property owners.

3.4.3 Traffic noise mitigation and management

As discussed in the NVIA, no traffic mitigation measures are required for operation related traffic. Measures described in the NVIA will be implemented to manage overall impacts on public roads.

4 Conclusion

In conclusion, the activities associated with the Buchanan Precast Facility have been described in the NVIA to identify potential environmental risks associated with operational noise and vibration. This addendum report has assessed the extension of operational activities into the evening and night period.

Operational noise

Operational noise during the evening and night period has been assessed in Section 3.1. Predicted noise levels at night are within 3 to 4 dB(A) of the noise trigger level, which is based on the amenity level, during the evening and night period. It was further noted that noise levels are within 1 to 2 dB(A) of the

intrusiveness level. The significance of the residual noise level is considered marginal. Aurecon advises that the residences where the exceedances are occurring are owned by the owner of the land leased by the precast facility.

Noise mitigation and management measures have been presented in Section 3.4 to aid in providing additional noise reduction benefits where exceedance of the objective occurs, including consultation with the affected landowner and written agreement sought to allow out of hours operation of the precast facility with minor noise exceedances, subject to verification monitoring.

Sleep disturbance

Potential sleep disturbance during the night period has been assessed in Section 3.2. There may be minor exceedances of the sleep disturbance $L_{Aeq(15min)}$ assessment level, within 1 dB(A), depending on what plant/ equipment are operating at the time. Instantaneous noise sources (L_{Amax}) are below the screening level.

Operation related traffic noise

Traffic noise generated by the precast facility on the local road network during the night period has been assessed in Section 3.3. Traffic noise levels are predicted to comply with the noise objectives.

Document control

Date	Revision history	Non-issued revision	Issued revision	Prepared	Instructed	Reviewed / Authorised
04.05.2023	Initial issue	0	1	T.Gowen	-	M.Tabacchi
02.06.2023	Respond to comments	-	2	T.Gowen	-	A.Leslie
08.06.2023	Minor edits	-	3	T.Gowen	-	T.Gowen
23.06.2023	Minor edits	-	4	T.Gowen	-	T.Gowen
File Path: R:\AssocSydProjects\TM601-TM650\TM625 TG Buchanan Precast Facility REF\1 Docs\TM625-02_1F01 SMWSA HV Precast NV_Addendum (r4).docx						

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We have derived data in this report from information sourced from the Client (if any) and/or available in the public domain at the time or times outlined in this report. The passage of time, manifestation of latent conditions or impacts of future events may require further examination and re-evaluation of the data, findings, observations and conclusions expressed in this report.

We have prepared this report in accordance with the usual care and thoroughness of the consulting profession, for the sole purpose described above and by reference to applicable standards, guidelines, procedures and practices at the date of issue of this report. For the reasons outlined above, however, no other warranty or guarantee, whether expressed or implied, is made as to the data, observations and findings expressed in this report, to the extent permitted by law.

The information contained herein is for the purpose of acoustics only. No claims are made and no liability is accepted in respect of design and construction issues falling outside of the specialist field of acoustics engineering including and not limited to structural integrity, fire rating, architectural buildability and fit-for-purpose, waterproofing and the like. Supplementary professional advice should be sought in respect of these issues.

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References

- [1] Renzo Tonin & Associates 2022 Sydney Metro Western Sydney Airport Project - Buchanan Precast Facility - Noise and Vibration Assessment (Report: TM625-01_1F01 SMWSA HV Precast NVA (r2) 9 May 2022)
- [2] NSW Noise Policy for Industry, Environmental Protection Authority, 2017
- [3] NSW Road Noise Policy, Department of Environment, Climate Change and Water NSW, 2011
- [4] M2A Joint Venture 2020 Sydney Metro - Western Sydney Airport - Technical Paper 2: Noise and Vibration October 2020
- [5] Renzo Tonin and Associates 2018 WestConnex New M5 - Noise Impact Statement: Hunter Valley Precast Facility January 2018

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 L _{eq} 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.

APPENDIX B Buchanan Precast Facility locality map and sensitive receivers

APPENDIX C Operational activities/ site layout

Table C1: Operational timetable/ activities/ equipment

PRECAST FACILITY - BUCHANAN

Activity/ Work Area	Aspect	Plant/ Equipment (as provided by client)	Day	Evening	Night	Timing of Activity		Sound Power Level (Lw re: 1pW) in Noise Model, dB(A)			High noise plant	Vibration intensive plant	Notes
			7am - 6pm	6pm - 10pm*	10pm - 7am**	Start Date	End Date	L _{Aeq}	Penalty	L _{Amax}			
Operation Stage													
Precast Yard	General/ minor equipment	Light vehicle	120 per day (120 in/ 120 out)			Nov-22		89	-	100	-	-	
		Compressor (125 CFU)	3	3	3	Dec-22		109	-	111	-	-	Not used with water blasters. Where practicable, screen compressor to west.
		Water Blaster (3000 PSI)	3	3	-			104	-	115	-	-	Not used with compressors
		External Form Vibrators	54	54	-			97	-	100	-	-	Half an hour only, by themselves
		Poker Vibrator (Medium)	6	6	-			99	-	102	-	-	
		Weld set	6	-	-			96	-	107	-	-	
		Truck pump (concrete)	2	2	-			106	-	110	-	-	Hire, for afternoon pours
	Small hand tools	Grinder (7")	6	6	6			108	-	118	-	-	
		Hilti Drill	6	6	6			106	-	118	-	0	
		Skill Saw	6	6	6			115	5	120	HN	-	
	Cranage	Crane 35t (or Telehandler)	2	-	-			104	-	108	-	-	Start up and demobilisation only
		Forklift 10t	1	1	1			99	-	103	-	-	Always in use
	Transport	Light Vehicle	50 per day	16 p.h.	16 p.h.			89	-	100	-	-	Staff/Labour - arrive at start and leave at end of day
		Site Pickup	6 per day	-	-			89	-	100	-	-	
		Truck wash unit	1	1	1			99	-	101	-	-	
		Workshop Vehicle	2	-	-			89	-	100	-	-	
	Access equipment	Scissor Lift	5	5	5			95	-	98	-	-	Always in use
	Gensets	Generator (25kva)	4	4	4			92	-	94	-	-	Always in use
		Generator (100kva) - Offices	2	2	2			94	-	96	-	-	Always in use
		Generator (450kva) - Factory	1	1	1			95	-	97	-	-	Always in use
		Hydraulic Pump	6	6	6			-	-	-	-	-	No mechanical noise
	Reinforcement equipment	Equip For Tables	5	5	-			-	-	-	-	-	No mechanical noise
	Straddle carrier	Straddle Carrier 110t	2	-	-			108	-	112	-	-	Always in use
	Gantry cranes	Gantry 15t	3	-	-			106	-	110	-	-	Always in use
		Gantry 10t	3	-	-			106	-	110	-	-	Always in use
	Deliveries - regular	Concrete Delivery Truck	16 per day	4 per hour	-^			108	-	111	-	-	^Limited at night, subject to verification monitoring and consultation outcomes
		Rebar Delivery Truck	2 per day	-	-			106	-	111	-	-	Sit on site (engine off) 2-3 hours
Deliveries - miscellaneous	Delivery Trucks	6 per day	-	-			106	-	111	-	-	Misc. and variable	
Deliveries - Precast segments for storage	Oversize Delivery Truck	16 per day	4 per hour	4 per hour#			106	-	111	-	-	# 8 per night based on delivery program.	
Precase concrete segment delivery	Oversize Delivery Truck	-	-	-			106	-	111	-	-		
	Crane 100t	-	-	-			104	-	108	-	-		

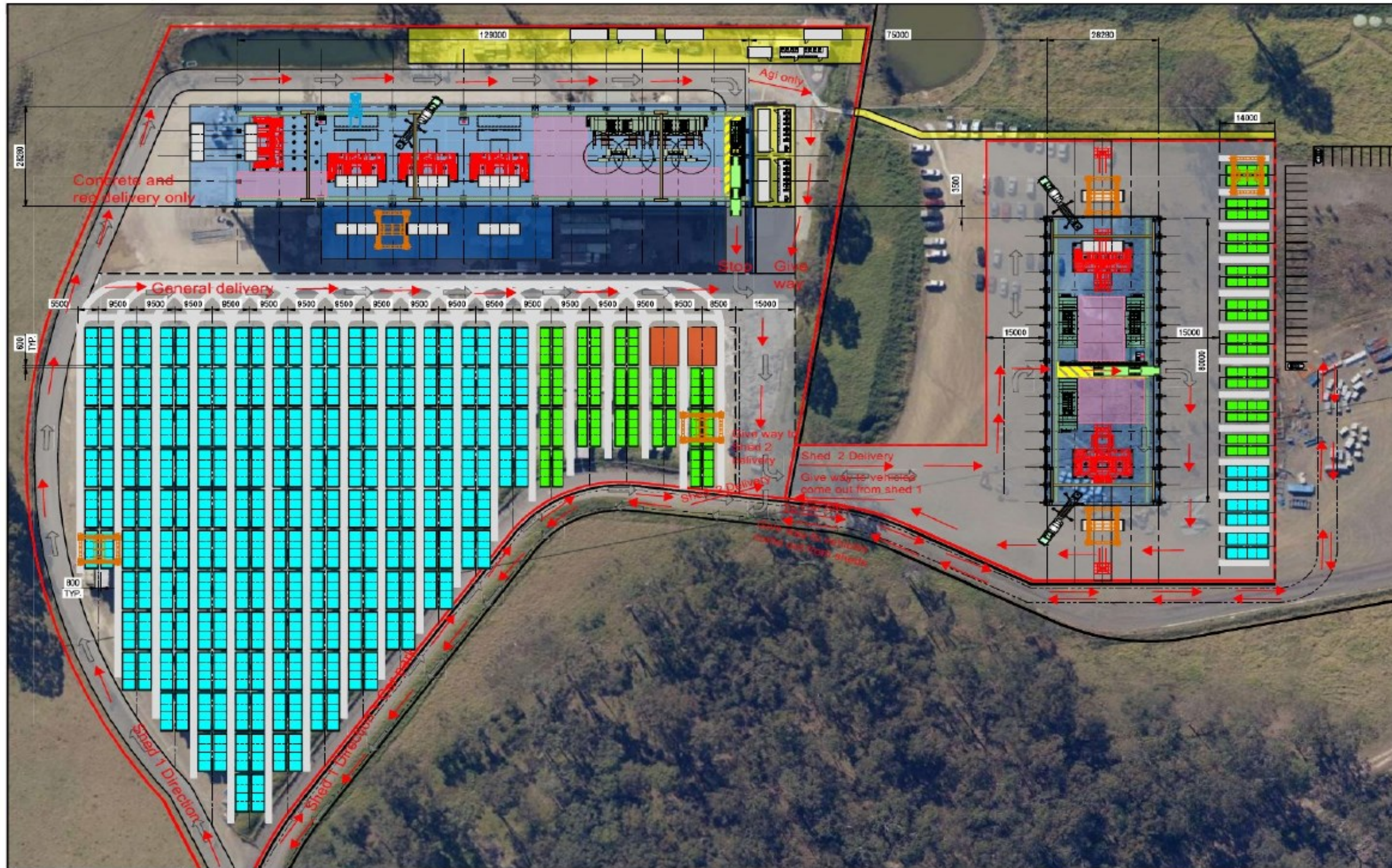
Notes: Grey boxes with blue text indicate OOH activities assessed in this Addendum NVIA report

* Cleanup tasks may extend to 11pm (contingency only)

** 10pm to 8am on Saturdays

Figure C1: Site Layout and proposed noise mitigation

PRECAST FACILITY - BUCHANAN



NOTES:
 REFER TO DRAWINGS NO. ??????????
 FOR SEGMENT STORAGE
 ARRANGEMENT.

TOTAL SEGMENT STORAGE
 (SINGLE STACKED) 250

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