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Western Sydney Stadium (Project No 255417) - Stage 2 DA - Response to EPA & DOP

This letter presents a response to queries raised by the NSW Environmental Protection Authority and Department of Planning in letters dated 7 April 2017 and 13 April 2017 respectively.

This letter is formatted as per the EPA and DOP comments with responses addressing each item.

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1.1 EPA COMMENTS – LETTER EF16/2911, DOC152571-01

1.1.1 EPA Comment – Noise and Vibration

2.5 Noise and vibration

The EPA notes the proximity of noise sensitive receivers including –

- residences,
- Our Lady of Mercy College,
- the Department of Education ‘pop up’ school to operate on the O’Connell Street public school (nee Kings School) site from mid-2017, and
- St Patricks Cathedral and presbytery.

The EPA considers that the project is likely to generate significant demolition, site preparation, bulk earthworks, construction and construction-related noise and vibration impacts on surrounding noise sensitive receivers.

The EPA provides the following guidance material for assessment of noise and vibration impacts -

- Interim Construction Noise Guideline (2009), and
- Assessing Vibration: a technical guideline (2006).

The proponent may download the above mentioned guidance material via the following link

<http://www.epa.nsw.gov.au/noise/>

1.1.2 ALC Response

A Demolition and Construction Noise and Vibration Management Plan has been developed addressing noise and vibration impacts to the receivers noted by the EPA. This DCNVMP has been developed in accordance with the EPA Interim Construction Noise Guideline.

1.1.3 EPA Comment – Recommended Standard Construction Hours

2.5.1 *Recommended standard construction hours*

The EPA notes that EIS section 3.8 (p.42) proposes that construction hours on Saturdays not comply with the standard hours recommended in Table 1 to the Interim Construction Noise Guideline (ICNG) on the basis that the additional hours from 1.00 pm to 3.30 pm are “... are considered reasonable as they are consistent the approved construction hours for the adjoining O’Connell Street Public School. The EPA does not support the proposed departure from the standard construction hours and rejects the proposition that consent for a nearby (not adjoining) smaller scale project is any way adequate justification for such a departure.

The EPA emphasises that it does not consider productivity or efficiency to be adequate grounds to justify works outside standard hours.

Recommendation

The proponent be required to ensure that site preparation, bulk earthworks, construction and construction-related work is undertaken only during standard construction hours, being:

- (a) 7.00 am to 6.00 pm Monday to Friday; and
- (b) 8.00 am to 1.00 pm Saturdays,
with no work on Sundays or public holidays.

2.5.2 Construction hours (respite periods)

The EPA considers it noteworthy that noise may be 'offensive noise' not only by reason of its level but also its nature, character, quality and the time at which it is made as well as any other circumstances, where that noise interferes with (or is likely to interfere with) the comfort or repose of a person who is outside the premises from which the noise is emitted.

The EPA anticipates that those site preparation, bulk earthworks, construction and construction-related activities generating noise with particularly annoying or intrusive characteristics (such as those identified as particularly annoying in section 4.5 of the Interim Construction Noise Guideline) would be subject to a regime of intra-day respite periods.

The EPA's advice concerning intra-day respite periods –

- highlights the types of construction activities that have been identified in the Guideline as being particularly annoying to surrounding noise sensitive receivers, especially residences,
- is based on patterns of community concern referred to the EPA as complaints about 'offensive noise' emitted from construction activities, and
- takes into account proven approaches over many years to the effective mitigation and management of noise and vibration impacts from public infrastructure projects.

The EPA emphasises that intra-day respite periods are not proposed to apply to those site preparation, construction and construction-related activities that do not generate noise with particularly annoying or intrusive characteristics

Recommendation

The proponent be required to schedule intra-day 'respite periods' for site preparation, bulk earthworks, construction and construction-related activities identified in section 4.5 of the Interim Construction Noise Guideline as being particularly intrusive and annoying to noise sensitive receivers such that those intrusive and annoying activities –

- (a) are only undertaken after 8.00 am, and
- (b) are only undertaken over continuous periods not exceeding 3 hours with at least a 1 hour respite every three hours (where 'continuous' means any period during which there is less than an uninterrupted 60 minute respite between temporarily halting and recommencing any of those activities).

1.1.4 ALC Response

The proposed construction hours in the DCNVMP for Saturdays are consistent with all major sites in Parramatta and are in accordance with Parramatta Council typical recommended hours. Restriction of particular equipment (rock breaking/ hydraulic hammering) has been applied within the recommendations of the DCNVMP during the Saturday 1pm - 5pm period to ensure the amenity of receivers.

1.1.5 EPA Comment – Reversing Alarms

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2.5.2 *Reversing and movement alarms*

The EPA has identified the noise from 'beeper' type plant movement alarms to be particularly intrusive and is aware of feasible and reasonable alternatives. Transport for NSW, Barangaroo Delivery Authority/Lend Lease and Leighton Contractors (M2 Upgrade project) have undertaken safety risk assessments of alternatives to the traditional 'beeper' alarms. Each determined that adoption of 'quacker' type movement/reversing alarms instead of traditional beepers on all plant and vehicles would not only maintain a safe workplace but also deliver improved outcomes of reduced noise impacts on surrounding residents.

Interim Construction Noise Guideline Appendix C provides additional background material on this issue.

The proponent should commit to undertaking a safety risk assessment of construction activities to determine whether it is practicable to use audible movement alarms of a type that would minimise the noise impact on surrounding noise sensitive receivers, without compromising safety.

1.1.6 ALC Response

EPA comments regarding reversing beacons are noted and will be adopted (subject to OHS requirements) on site.

1.1.7 EPA Comment – Queuing Vehicles

2.5.3 *Queuing and idling construction vehicles and vessels*

The EPA is aware from previous major infrastructure projects that community concerns are likely to arise from noise impacts associated with the early arrival and idling of construction vehicles (including concrete agitator trucks) at the development site and in the residential precincts surrounding that site.

Recommendation

The proponent be required to ensure construction vehicles (including concrete agitator trucks) involved in demolition and site establishment activities do not arrive at the project site or in surrounding residential precincts outside approved construction hours.

1.1.8 ALC Response

Noted. It is not proposed for any demolition or construction traffic to arrive or queue outside approved hours. Additionally, all loading and unloading of site materials is conducted within the site boundary, with considerable distance between these activities and any surrounding receivers.

1.1.9 EPA Comment – Operational Noise Impact Assessment

Noise impact assessment

The EPA anticipates that nearby residences (including St Patricks Cathedral presbytery/residence and residential development approved on the corner of O'Connell Street and Victoria Road) will be severely affected by noise from major events at the Stadium.

The EPA notes the proximity of noise sensitive educational establishments, being Our Lady of Mercy College, a temporary (so-called 'pop up') school to operate from mid 2017 on the oval adjoining the O'Connell Street school (formerly the Kings school), and the O'Connell Street Public School due to open in 2018.

The EPA does not agree with the suggestion in final paragraph of section 6.2 (p. 21) to EIS Appendix S (Operational Noise and Vibration Impact Assessment) that non-residential sensitive receivers (i.e. local schools, child care centre, place of public worship) "... will not normally be impacted by concert and sporting event noise ..." on the assumption that those events are "... almost exclusively night-time or weekend events." The EPA notes that –

- (a) sound tests and rehearsals are almost exclusively day-time events (i.e. proposed from 10.00 am to 7.00 pm) which may coincide with and adversely impact activities at local schools and the nearby child care centre,
- (b) services are held daily at St Patricks Cathedral (including weekends and public holidays), and
- (c) it is government policy to encourage the community use of school facilities, outside normal school hours, including at night and on weekends.

1.1.10 ALC Response

Operational noise impacts have been assessed in accordance with relevant guidelines and comparable noise levels to those predicted in Stage 1 assessment have been predicted/ presented. The stadium operator will develop a Noise Management Plan which is regularly updated based on monitoring of events (see Section 6.5.1 of the ONVIA. This is consistent with the regularly updated NMPs for all major stadiums (Syd Cricket Ground, Allianz Stadium, ANZ Stadium).

Liaison with the OLMC School and St Patricks Cathedral is proposed for all major events (including sound tests and rehearsals), as is the procedure for all stadiums. It is reiterated that for typical major event times (night-time of weekends), unless there were a special activity at either the School or Church, these receivers would not normally be impacted. Close liaison with the church and school is proposed to ensure that operational noise impacts do not adversely affect special events of the church or school.

1.1.11 EPA Comment – Modelling and Predictions

Modelling and noise predictions

The EPA acknowledges that whilst predicted operational noise contours are presented (developed using proprietary noise modelling software), EIS Appendix S does not include –

- (a) tabulated data using the various recommended A and C weighted noise descriptors required to facilitate proper evaluation of those predicted noise impacts,
- (b) details of predicted day-time noise impacts on non-residential noise sensitive land uses.

Figure 3 of the EIS Appendix S 'Operational Noise and Vibration Impact Assessment' appears to show a simple model of the stadium, with seating tiers represented by vertical barriers and no open space between tiers. However, EIS architectural drawings appear to show a stadium structure that is open behind the tiers, with various gaps between the lower and upper tiers. For example, the EPA notes what appears to be a gap along the whole eastern side of the stadium which side faces the most affected noise sensitive receivers.

The EPA considers it essential for assuring the accuracy of predicted operational noise levels that the proponent clearly demonstrate that the noise model is appropriately detailed, including the taking into account of any gaps between seating tiers.

The EPA considers that EIS predicted concert noise levels of L_{eq} 78 dBA measured at the nearest residences are likely to generate complaints about 'offensive noise'. For example, the Edinburgh Napier University (ENU) report *NANR 292 Research Into Attitudes to Environmental Noise From Concerts* (2011) indicated a marked increase in the occurrence of annoyance when concert noise levels exceeded 70 dBA. The predicted concert noise level would be perceived as almost twice as loud as that identified in the ENU study.

EIS Appendix S assumes that noise criteria for events at the Sydney Football Stadium could be appropriately applied to major events at the proposed Stadium. The EPA expects instead that each proposal must be considered with regard to the particular circumstances of the case, albeit that some noise management measures applied by the EPA to other public entertainment venues may offer suitable guidance for management measures applied to Western Sydney Stadium.

EIS Appendix S does not appear to include –

- (a) tabulated data using the various recommended A and C weighted noise descriptors required to facilitate proper evaluation of those predicted noise impacts, and
- (b) details of predicted day-time noise impacts on non-residential noise sensitive land uses, including local schools, the nearby child care facility and the nearby place of public worship (St Patricks Cathedral).

The EIS is unclear whether all feasible and reasonable noise mitigation measures have been included in modelling for concert noise. For example, would placing the stage at the northern end of the stadium result in lower noise levels at the nearest residences?

The EIS is also unclear how the desired "sound pressure level between 95 and 105dB(A) L_{eq} across the seating area" was determined, and whether that is an appropriate noise level for a concert at the proposed Stadium, given that for instance:

- the Edinburgh Napier University report indicated that the best audience experience is gained with a mixing desk level of about $L_{eq(15min)}$ 95 dBA which is considered likely produce a noise level lower than 95 dBA when averaged over the seating area, and
- although the Edinburgh Napier report was based on a limited data set from concert goers in the UK, it indicates that the levels modelled in EIS Appendix S may be unreasonably high.

1.1.12 ALC Response

All modelling has been conducted in accordance with SEAR 13 and comparable noise levels to those predicted in the Stage 1 assessment have been predicted.

The impacts on all land uses are detailed in the requested "*marked up orthophoto maps showing the predicted noise levels contours for various proposed activities*"

The predicted daytime noise levels for events are the same as the night time events, as ultimate noise levels from concerts, crowds, sporting events, etc are not dictated by the ambient environment.

The developed SoundPLAN model is significantly more detailed than the Stage 1 model and accurately predicts noise emissions from the current stadium planning. The level of detail presented within the REVIT model cannot be replicated within the SoundPLAN model due to the limitations of the modelling software (ie it is not architectural software). That being said, architectural minutia will not have an impact on the predicted noise level given: a) the predominant noise source is the open roof; and b) the relatively significant distance of the receivers from the stadium. The gaps between the roof and rear of the seating tier, etc, at the stadium perimeter have been included in the model. It is noted that the predominant noise source is the hemispherically radiating open roof.

All modelling predicted noise levels are consistent with the Stage 1 acoustic assessment predicted levels (within 2dB).

All noise source levels (concert noise, crowd, etc) are sourced from the approved Stage 1 AECOM acoustic report. As noted within the ONVIA these are conservative estimates in order to present a "worst case scenario".

1.1.13 EPA Comment – Use Restrictions

Operation and use restrictions (other than noise level)

The Protection of the Environment Operations Act defines 'offensive noise' as not only the level of the noise emitted but also its nature, character, quality and the time at which it is emitted.

The EPA is very concerned that EIS section 3.2 '*Stadium Operations and Use*' appears to propose –

- an indicative outline rather than a definitive schedule of events
- an indicative rather than definitive hours of operation, and
- a further postponement of detailed noise impact assessment of that operation and use.

1.1.14 ALC Response

At this early stage, a definitive schedule of events and times has not yet been determined. Notwithstanding this, hours have been proposed for each event to ensure that an accurate assessment can be completed. Additionally, a maximum number of events has been proposed.

Hours have been proposed for each event type. It is not proposed to defer the noise impact assessment. An operational noise impact assessment has been prepared addressing every item of SEAR 13. It is proposed that Noise Management Plans are developed with the stadium operator as is the procedure with all major stadiums. These plans are developed in conjunction with active monitoring of events. A regularly updated noise management plan similar to the SCG and Allianz Stadium is proposed for WSS. As with the SCG and Allianz, it is proposed that the results of active

concert noise monitoring and the Noise Management Plan are located on the publicly accessible website:

<http://www.sydneycricketground.com.au/about-us/trust-policies/noise-management/>

1.1.15 EPA Comment – Hours of Operation

Hours of operation

EIS section 3.2.3 (p.34) that EIS Table 6 outlines the "... indicative hours of operation for the stadium ..." and goes on to note that "... these hours are indicative and will be confirmed and further developed in the noise management plan prepared by the Stadium operator."

The EPA is aware from long experience that noise emissions from outdoor entertainment events and associated sound tests and rehearsals at major venues such as the Sydney Cricket Ground are a source of significant and ongoing community concern.

1.1.16 ALC Response

Noted – Indicative hours have been proposed. It is recognised that outdoor venues such as the Sydney Cricket Ground and Allianz Stadium can be a cause for community concern, which is why regularly Updated Noise Management plans are adopted for these venues. A regularly updated noise management plan similar to the SCG and Allianz Stadium is proposed for WSS. As with the SCG and Allianz, it is proposed that the results of active concert noise monitoring and the Noise Management Plan are located on the publicly accessible website:

<http://www.sydneycricketground.com.au/about-us/trust-policies/noise-management/>

It is noted that WSS is not a new stadium on a greenfield site. Pirtek Stadium has been operating successfully in the same location since the mid-1980s and although the use of WSS is expected to marginally increase with respect to concerts, existing residents, The School and Church are already receivers of noise generated by Pirtek Stadium.

1.1.17 EPA Comment – Amplified Sound Curfew

Amplified sound curfew

The EPA notes that the comparable Sydney Cricket Ground venue is subject to an amplified sound curfew of 10.30 pm for concerts. However, EIS Table 6 indicates an 11.30 pm curfew rather than 10.30pm.

The EPA does not support an amplified sound curfew later than 10.30 pm other than possibly for the purpose of New Year's Eve celebrations.

1.1.18 ALC Response

Whilst the EPA's comment is noted, the time restriction will likely prohibit major performances and some concerts. It is also noted that this time restriction is also more prohibitive than the existing permissible hours of operation of Pirtek stadium, which are detailed below:

1. DAYS AND TIMES OF EVENTS

Days and times for open air concerts and Australian Supercross Championship held at Parramatta Stadium will be limited as in Table 1 below.

Table 1

Activity	Frequency	Time restrictions
Music festivals and concerts	Maximum of three events per year	<u>Festivals</u> : only between 10.00 am to 11.30 pm on weekends. No festivals during the Easter and Christmas public holidays and the day preceding. <u>Concerts</u> : only between 12.00 noon and 11.30 pm, on Fridays and Saturdays, and on Sundays except Easter Sunday. No concerts during the Easter and Christmas public holidays and the day preceding.
Cultural festival	Maximum of twelve events per year	Only on weekends, between 10 am and 12.00 midnight, except Good Friday and Christmas Day.
Children's carnivals	Maximum of three events per year	Only between 10 am and 6 pm.
Motocross	Maximum of three events per year	Only Friday to Saturday (except Good Friday and Christmas public holidays) between 12.00 noon and 10 pm.

1.1.19 EPA Comment – Sound Tests and Rehearsals

Sound tests and rehearsals

EIS Table 6 proposes sound tests being permitted from 10.00 am to 7.00 pm. The EPA does not support unlimited periods of sound testing and rehearsal between 10.00 am to 7.00 pm and instead considers that those hours should only be approved as a 'time window' within which a sound test or rehearsal of limited duration (say 60 minutes) may be conducted on the day of each performance.

The EPA further anticipates that concerts would be limited to a single show per day and should that not be the case then a separate development application (supported by a detailed noise impact assessment) should be required for any additional show.

1.1.20 ALC Response

Again, the EPA's comment is noted. However, this would be more stringent than the current hours of operation of Pirtek Stadium. See existing permissible hours in Section 1.1.18.

1.1.21 EPA Comment – Mechanical Noise

Mechanical plant and equipment

EIS Appendix S omits predicted mechanical plant noise although $L_{eq(Period)}$ noise levels are predicted for other operational noise sources like the loading dock and car park, but it is not clear whether the worst case $L_{eq(15min)}$ operational noise levels would exceed the intrusiveness criteria.

Accordingly, the EPA does not support the open-ended approval of stadium (and surrounding public domain) operation and use currently being sought.

1.1.22 ALC Response

No mechanical plant has been selected at this stage. However, as stated in Section 4.3 of the ONVIA, all mechanical noise has the capacity to comply with EPA INP noise emission criteria. This is clear, given the extensive distance between plant locations and sensitive receivers and the relatively urban ambient / background environment.

Additionally, there is no change to mechanical services proposed in Stage 1.

1.1.23 EPA Comment

The proponent be required to -

- (1) undertake complete measurement of background noise levels in accordance with the EPA's previous advice; and
- (2) prepare and submit for assessment a detailed operational noise impact assessment that -
 - (i) is based on the rating background noise levels determined for each period (day, evening and night) for each of the noise sensitive land uses (including the proposed O'Connell Street public school) surrounding the stadium and in accordance with guidance material in Chapter 3 and Appendix B of the NSW Industrial Noise Policy,
 - (ii) adopts a definitive event schedule and hours of operation for each category of event,
 - (iii) evaluates the noise impacts for each category of event, including events involving pyrotechnic displays, using the noise descriptors (i.e. $L_{Aeq,15minutes}$, $L_{Ceq,15minutes}$, L_{Amax} and $L_{Cmax\ noise}$) referred to in the EPA's previous advice,
 - (iv) evaluates mechanical plant and equipment noise (including the proposed chiller plant at the northern end of the stadium) reported against the relevant criteria in the New South Wales Industrial Noise Policy,
 - (v) is accompanied by tabulated predictions as well as noise contours for each assessment period (day, evening and night), and
 - (vi) is accompanied by details of proposed -
 - (a) feasible and reasonable noise mitigation and management measures for all event categories (including any associated sound tests, rehearsals and pyrotechnic displays), event set up and break down activities, in-house public address systems, in-house mechanical plant and equipment, and emergency evacuation drills/tests,
 - (b) categorisation of events held at the stadium and in the associated public domain on the basis type, frequency, crowd capacity, time of occurrence (including rehearsal and sound tests), and duration,
 - (c) noise monitoring during major events,
 - (d) community information and notification protocols and procedures for upcoming events (including details of letterbox drops as well as web site, social media, and mobile phone apps),
 - (e) noise complaint receipt, handling and response,
 - (f) noise limit compliance monitoring, and
 - (g) event noise impact review processes (for fine tuning event category noise limits, event category noise mitigation and management measures, event noise monitoring requirements, and community notification and complaint processing) based on measured noise impact and community complaint analysis required to be undertaken for initial events of each category held at the stadium precinct;
- (3) ensure that amplified sound, other than for emergency evacuation purposes, is not emitted from the stadium or the associated public domain after 10.30 pm;

- (4) ensure sound tests and rehearsals are limited to a period of not more than 60 minutes duration on the day of the event and that those tests and rehearsals are not carried out before 10.00 am or after 7.00 pm;
- (5) ensure that any pyrotechnic display –
 - (a) ceases not later than 11.00 pm, but
 - (b) (in the case of on New Years Day) commences at midnight and ceases not later than 12.30 am.
- (6) ensure that all mechanical plant and equipment are selected and operated, and the loading dock designed, built and operated so that, in combination, they do not exceed the project specific noise levels;
- (7) ensure that the stadium carparks and public domain surrounding the stadium are designed and built to incorporate all feasible and reasonable mitigation measures (such as noise mounds) to minimise operational noise impacts on nearby residences and other noise sensitive land uses;
- (8) ensure that forklifts and other plant and equipment used for setting up for or breaking down after any event are fitted with reversing/movement alarms use audible movement alarms of a type that would minimise the noise impact on surrounding noise sensitive receivers, without compromising safety; and
- (9) ensure that the function rooms, Cumberland lounge and associated terraces are not used other than in conjunction with scheduled major sporting and concert events.

1.1.24 ALC Response

SEAR 13 has been fully addressed by the Stage 2 ONVIA

(1) All RBLs have been established at the Stage 1 acoustic report. All RBLs established in the Stage 12 report have been adopted for the Stage 2 ONVIA and DCNVMP.

(2) ONVIA has been provided and addressed every item of SEAR 13.

(i) Provided in Stage 2 ONVIA

(ii) Provided in Stage 2 ONVIA, see above regarding "definitive" events schedule.

(iii) Provided in Stage 2 ONVIA

(iv) Provided in Stage 2 ONVIA.

(v) Not required in SEAR 13. All noise levels presented as per the required SEAR 13 "*predicted noise levels using LAeq, 15minutes, LCEq, 15minutes, LMax and LCmax noise descriptors; marked up orthophoto maps showing the predicted noise levels contours for various proposed activities;*

(vi) See above. Proposed as part of the operators NMP which is produced in conjunction with active monitoring. Details of requirements listed in Section 6.5.1 of the ONVIA.

(3) Noted - Time restriction will likely prohibit major performances and some concerts and is more stringent than current Pirtek Stadium hours of operation

(4) Noted - Time restriction will likely prohibit major performances and some concerts and is more stringent than current Pirtek Stadium hours of operation.

(5) - (7) noted - addressed in ONVIA

(8) Noted - subject to OHS requirements

(9) Restriction on lounges and functions rooms is not required for compliance with noise emission goals. These areas are a) enclosed within the building façade; and b) inherently compliant with all noise emission goals given the operational noise levels, facade construction and considerable distance between these spaces and the surrounding receivers.

1.2 DEPARTMENT OF PLANNING COMMENTS – LETTER 13 APRIL 2017

1.2.1 DoP Comment

Noise and Vibration

- The Department considers that the incorrect background noise levels (RBLs) have been applied in the Demolition, Excavation and Construction and Vibration Management Plan (DECNVMP) and Optional Noise and Vibration Impact Assessment (ONVIA). It appears that the RBLs for Event Hours have been applied, rather than the RBLs established for a standard 24-hour period. This has resulted in incorrect project specific noise criteria being adopted for the proposal. Accordingly, the Department requires the RBLs presented in Table 6 of the *Technical Working Paper: Noise and Vibration*, prepared by AECOM and dated 13 July 2016 be adopted for the purposes of the assessment of the potential construction and operational impacts attributed to the proposal.

1.2.2 ALC Response

Department comment regarding RBLs is unclear. The DECNVMP AND ONVIA both adopt the Stage 1 AECOM report RBLs as per the DoP request.

It is noted that ALC have adopted the most current iteration of the AECOM report (September 2016).

1.2.3 DoP Comment

Construction Noise

- The Department requires the proposed mitigation measures to be reviewed having regard to recommendations presented in other supporting technical reports and updated accordingly. In this regard, a mitigation measures presented in the Biodiversity Assessment identifies construction works being tailored to accommodate roosting activities of existing Grey-headed Flying-fox (GHFF), however this is not presented in the proposed DECNVMP.
- The Department does not support the Saturday hours of work presented in the DECNVMP. The hours should be amended to be consistent with the hours proposed in the EIS.

1.2.4 ALC Response

Predicted noise levels for both construction noise and operational noise have been presented for the GHFF camp. Absolute worst case scenario noise levels of 64dB(A) are predicted from a hydraulic hammer mounted on the largest excavator. A noise level of 64dB(A), (which includes a 5dB(A) penalty for the characteristics of excavation noise), is similar to what would be expected from a normal conversation adjacent to the Flying Foxes. These noise levels assume no screening and the excavator operating on the northern boundary. For a large percentage of the excavation timetable, noise levels will be less than this because the excavator will be: a) inherently screened, and b) not constantly working on the northern site boundary.

Fox expert / ecologist to provide comment.

The proposed construction hours in the DCNVMP for Saturdays (8am to 5pm) are consistent with all major sites in Parramatta and are in accordance with Parramatta Council typical recommended hours. Restriction of particular equipment (rock breaking/ hydraulic hammering) have been applied within the recommendations of the DCNVMP during the Saturday 1pm - 5pm period to ensure the amenity of receivers.

1.2.5 DoP Comment

Operational Noise

- The operational noise modelling predictions presented at Appendix 1 of the ONVIA are required to be reproduced detailing the location (and land use) of all sensitive receivers and noise level contours to allow for easier interpretation and assessment. Further, predicted noise emissions for all event types for all sensitive receivers are required to be presented.

1.2.6 ALC Response

SEAR 13 modelling requirements fully addressed by the Stage 2 ONVIA. All event types (worst case events) modelled within the Stage 1 acoustic report have been modelled in Stage 2.

1.2.7 DoP Comment

- The ONVIA fails to assess any potential operational noise emissions from activities/events located outside of the stadium in the surrounding stadium precinct public domain. The consideration of all potential impacts from the whole stadium precinct is considered essential to ensuring no long-term adverse environmental and amenity impacts are generated by the proposal.

1.2.8 ALC Response

Any events located outside of the stadium would be subject to the requirements of the operator's noise management plan (or INP if applicable). All known events and noise sources and likely operational noise sources have been assessed in Stage 2 ONVIA.

1.2.9 DoP Comment

- An explanation is required on why predicted concert and crowd noise levels, particularly the higher noise levels, are concentrated to the north of the stadium footprint, rather than the south and away from the nearest sensitive receivers (i.e. residents and the GHFF camp).

1.2.10 ALC Response

The stadium stage is located on the southern side and land topography account for the increased noise levels to the north (similar propagation to the Stage 1 acoustic modelling and assessment).

Sensitive receivers are also located to the south (330 Church Street Parramatta).

1.2.11 DoP Comment

- The "*study of similar facilities...*" outlined in the ONVIA provides a comparative review with only one other facility. The Department does not consider this to be an extensive enough to characterise the potential operational noise levels of the development and expects additional examples to be reviewed. Further, the Department requires more robust and effective mitigation measures to be proposed that are capable of being implemented to ensure the management and operations of the future Western Sydney Stadium do not result in adverse amenity impacts.

1.2.12 ALC Response

An explanation as to why Allianz Stadium has been adopted as a case study has been presented in the ONVIA. WSS and Allianz stadiums are comparable in that:

- Both have a similar proposed crowd capacity (30, 000 for WSS and 42,000 for Allianz);
- The roof junction with the perimeter of the top seating tier on both stadiums have openings for ventilation and light (which is a source of operational noise emissions);
- WSS and Allianz have central open apertures over the pitch;
- Both stadiums and their respective potentially affected noise receivers are located in similar ambient acoustic environments; and
- The stadiums have almost identical operating principles, in that the stadiums will primarily be a venue for sporting events, with periodic concerts and other events.

1.2.13 DoP Comments

- Clarification is required on why loading dock operations have been identified and assessed as occurring during the 'night period' and subsequently assessed against the Sleep Disturbance Criteria. Whilst compliance with the applicable Sleep Disturbance Criteria may be achievable, the Department would expect as an appropriate measure to mitigate against potential adverse operational noise impacts that all delivery and loading activities would take place during normal day-time operating hours.

1.2.14 ALC Responses

The loading dock has been assessed against the night period as this is when background noise levels are at their lowest. As such, all loading dock emissions will be inherently compliant during daytime hours, when background noise levels are higher. An explanation of this is provided in Section 4 of the ONVIA. An assessment of the loading dock against the EPA Intrusiveness and Amenity criteria is presented in Section 4 and the assessment is not limited to the Sleep Disturbance Assessment.

1.2.15 DoP Comment

- The proposed hours of operation for concerts should be restricted to a finishing time of 10.30 pm, consistent with the management measures applicable to Sydney Cricket Ground and Allianz Stadium.

1.2.16 ALC Response

Whilst the DoP comment is noted, the time restriction will likely prohibit major performances and some concerts. It is also noted that this time restriction is also more prohibitive than the existing permissible hours of operation of Parramatta Stadium, which are detailed below:

1. DAYS AND TIMES OF EVENTS

Days and times for open air concerts and Australian Supercross Championship held at Parramatta Stadium will be limited as in Table 1 below.

Table 1

Activity	Frequency	Time restrictions
Music festivals and concerts	Maximum of three events per year	<u>Festivals</u> : only between 10.00 am to 11.30 pm on weekends. No festivals during the Easter and Christmas public holidays and the day preceding. <u>Concerts</u> : only between 12.00 noon and 11.30 pm, on Fridays and Saturdays, and on Sundays except Easter Sunday. No concerts during the Easter and Christmas public holidays and the day preceding.
Cultural festival	Maximum of twelve events per year	Only on weekends, between 10 am and 12.00 midnight, except Good Friday and Christmas Day.
Children's carnivals	Maximum of three events per year	Only between 10 am and 6 pm.
Motocross	Maximum of three events per year	Only Friday to Saturday (except Good Friday and Christmas public holidays) between 12.00 noon and 10 pm.

1.2.17 DoP Comment

- Clarification is required on why Section 6.4.1.1 of the ONVIA details a non-compliance with the proposed sporting event noise management levels for the nearest residential sensitive receiver.

1.2.18 ALC Response

Sporting events are not predicted as a non-compliance. 60dB(A) is a noise management level for amplification equipment. 64dB(A) is a crowd noise prediction which is: a) the same noise level predicted in the Stage 1 assessment; and b) the same noise level that is currently generated by the existing stadium crowds.

1.2.19 DoP Comment

- The Department notes that no operational noise mitigation measures are proposed, only management measures. While the management of noise emissions is essential, appropriate noise mitigation measures specific to event types should be developed and presented prior to the determination of the proposal. At a minimum, mitigation measures should include generous respite periods be provided between sound amplification system setup/sound checks and scheduled events to ensure the amenity levels of surrounding sensitive receivers is maximised during event periods, as well as the establishment of a complaints hotline that is available at all times, not just limited to 'noisy events'.

Limitations on hours are proposed within the ONVIA. Additionally, mitigation measures, such as respite periods for sound test are proposed by the EPA in their letter dated 7 April 2017: *"The EPA does not support unlimited periods of sound testing and rehearsal between 10.00 am to 7.00 pm and instead considers that those hours should only be approved as a 'time window' within which a sound test or rehearsal of limited duration (say 60 minutes) may be conducted on the day of each performance. The EPA further anticipates that concerts would be limited to a single show per day and should that not be the case then a separate development application (supported by a detailed noise impact assessment) should be required for any additional show."*

We trust this information is satisfactory. Please contact us should you have any further queries.

Yours faithfully,

A handwritten signature in black ink, appearing to read 'Thomas Aubusson', with a long horizontal flourish extending to the right.

Acoustic Logic Consultancy Pty Ltd
Thomas Aubusson MAAS