1.14 Environment Protection Authority

No	Extract	Response
	Environment Protection Authority	
	1. Environmental management plans	
EPA 49	The Report addresses a number of issues raised by the EPA by indicating that impact mitigation measures are to be adopted through various environmental management plans or the like. The EPA emphasises that for reasons of maintaining regulatory 'arm's length', it neither reviews nor endorses environmental management plans or the like.	Noted
	2. Site contamination	
EPA 50	Report section 5.1 (CP-CG1) proposes that a "... Detailed Site Contamination Investigation (Phase 2) is to be prepared submitted with Stage 2 Development Application, ..." instead of undertaking a detailed investigation of soil and groundwater contamination prior to commencement of any Stage 1 site establishment and demolition works - see also Report Attachment 1 (EPA6, EPA10 and EPA11). Report Attachment 1 (EPA6) indicates the proponent continues to suggest that the Stage 1 demolition work "... does not involve any ground disturbance, ...". However, the EPA remains unclear how such extensive demolition works might be undertaken across the development site without causing significant ground disturbance. The EPA notes Report section 5.2 (S1-CM2, 1st dot point) refers to recyclable demolition materials stockpiling to prevent cross contamination by "... contaminated soil." presumably arising from ground disturbance. Accordingly, the EPA confirms its advice and recommendations concerning site contamination which recommends a detailed investigation of soil and groundwater contamination prior to commencement of any works on the development site.	Noted- refer to responses EPA10-12 in Attachment 1 of the Response to Submissions.
	3. Noise impact (stage 1 concrete crushing)	
EPA 51	The EPA anticipates that the activities associated with on-site recycling of concrete demolition materials are inherently noisy and are likely to include use of noisy plant such as – • articulated front-end loaders for management of raw and processed material stockpiles, • raw material loading hoppers, • raw material loading conveyor systems, • concrete crusher plant (incorporating reinforcing steel separation), and • processed material unloading/stockpiling conveyor systems.	Noted
EPA 52	Section 1.1 to Report Attachment 1 (item EPA 20) estimates concrete crushing and associated operations would occur over a period of about eight months. The Report acknowledges that the University of Technology Sydney (UTS) Sports Sciences faculty is in the adjoining ARDC building and Report Attachment 6 Addendum Noise and vibration Impact Assessment –	The Response to Submission confirms that a shed will be constructed around the concrete crusher, with construction requirements outlined in the Response to Submissions. The requirement for the enclosure over the concrete crusher is primarily for the

No	Extract	Response
	(a) provides additional information concerning Stage 1 demolition phase noise impacts on surrounding noise sensitive receiver locations, including the UTS Sports Sciences faculty located in the adjoining ARDC building, (b) predicts (Section 2) a 9 dB exceedance of internal noise levels and states "Some disturbance to occupants within the affected building during demolition activities. These may include use of the concrete crusher, rock breaking and loading and unloading of debris.", and (c) proposes some additional noise mitigation measures, including location of the proposed on-site concrete crusher in an acoustically treated building. However, Section 1.1 to Report Attachment 1 (item EPA21) appears contradictory to Attachment 6, advising instead that – • use of an acoustic shed around the concrete crushing and stockpiling operations has been considered however has not been pursued, • an enclosure will be constructed around the concrete crusher to assist with dust management as the its primary purpose and this will assist to some degree with acoustic attenuation, • use of an acoustic shed around stockpiles would restrict access thereby slowing down works. The EPA notes that: • major infrastructure projects routinely and successfully deploy acoustic sheds to minimise noise impacts of activities including tunnel spoil stockpiling, load out and removal operations without the shed restricting those operations, • Table 15 to EIS Appendix K identifies the concrete crusher as the noisiest equipment to be used during stage 1, • a predicted significant 9 dB exceedance of internal noise levels in the adjoining educational establishment in the absence of an acoustic shed, • demolition of the Sheridan building, other buildings and the existing stadium would remove any acoustic shielding of nearby residences from concrete crushing and associated loading/unloading and stockpiling operations, and • concrete crushing and associated operations are likely to continue after substantive demolition of existing structures to slab level (and potentially into stage 2). The EPA confirms its advice and recommendations that concrete crusher and associated raw material loading, and processed material unloading/stockpiling activities are undertaken within a suitable acoustic enclosure designed, constructed and operated so as not to emit noise that, by reason of its level, nature, character or quality, or the time at which it is made, or any other circumstances is likely to interfere	control of dust. Notwithstanding, specifications for the enclosure construction to achieve an acceptable acoustic isolation performance are presented in Section 3 of Attachment 6- Addendum Noise and Vibration Impact Assessment to the Response to Submissions. UTS have been consulted in order to identify noise sensitive activities which occur within the building, locations and times of year. Potential management measures have also been discussed, which are outlined in Section 3 of Attachment 6- Addendum Noise and Vibration Impact Assessment to the Response to Submissions and the Section 5 of the Response to Submissions Report.

No	Extract	Response
	unreasonably with the comfort or repose of a person who is outside the development site.	
EPA 53	**Recommendation** The proponent be required to ensure that concrete crushing ceases on the development site prior to commencement of any stage 2 construction works.	There is no justification for requiring concrete crushing to cease prior to Stage 2 construction works commencing. Should concrete crushing be required in conjunction with Stage 2 works, a cumulative construction noise assessment would be included with the Stage 2 SSDA. Further, provision of an enclosure around the crusher is to be provided to address potential noise impacts, as discussed above.
	4. Demolition noise impact (least noisy methods)	
EPA 54	The EPA highlighted its concern that the EIS did not adequately assess feasible and reasonable noise mitigation and management measures. The EPA notes that Report Section 5.2 proposes at item S1- NV2 to prepare a construction noise and vibration management plan and to consider using less noisy concrete shears instead of rock breakers.	Noted
EPA 55	**Recommendation** 1. The proponent be required to ensure that least noisy feasible and reasonable demolition and construction methods are used throughout the project. 2. The proponent be required to ensure that demolition activities (including concrete crushing and related loading, unloading and stockpiling activities) do not result in noise emissions that exceed 45 dB LAeq, 15 minute measured in the centre of the most affected classroom in the UTS sport sciences faculty building adjoining the development site.	The Appendix K of the EIS and Attachment 6 to the Response to Submissions commits to adopting the least noisy equipment where feasible and reasonable. All feasible and reasonable mitigation measures are also to be implemented during demolition works. However, the requirement not to exceed the Noise Management Level (NML) is contrary to the Interim Construction Noise Guide (ICNG). As stated in Section 1.1. of the ICNG, the “Guideline has been developed to focus on applying a range of work practices most suited to minimise construction noise impacts, rather than focusing only on achieving numeric noise levels”. Additionally, Section 1.5 of the ICNG states “in all cases these levels [NMLs] should not simply be included in licence or planning approval conditions, but rather are intended to guide the need for, and the selection of, work practices to minimise noise impacts”. The ICNG NMLs are therefore not to be prescribed as limits, but are levels above which mitigation measures and consultation is required. The recommendations of the NVIA are in accordance with the ICNG and reflected in the Mitigation Measures outlined in the Response to Submissions. Mitigation measures have been adopted and UTS has already been consulted, and will continued to be, during the planning and works phases.
	5. Demolition noise impact (intra-day respite periods)	
EPA 56	The EPA highlighted the need to implement intra-day respite periods in respect of high noise impact activities with particularly annoying characteristics. The EPA recognises the dynamic nature of demolition and construction activities on a major infrastructure project and emphasises the importance of identifying in	Refer to response EPA57.

No	Extract	Response
	advance all high noise impact activities that should be subject to intra-day respite periods.	
EPA 57	Report section 1.1 (item EPA25) suggests "the trigger for consideration of intra-day respite periods is not the presence of annoying or intrusive characteristics per section 4.5 of the Interim Construction Noise Guideline." It goes on to note that "[n]evertheless the recommendation that intra-day respite periods be included during particularly intrusive activities is covered in section 6.1.4 of Appendix K of the exhibited EIS. This is restated as a mitigation measure at section 5.0 of the Response to Submissions Report (S1-NV2)." The EPA notes that: • Section 6.1.3 to EIS Appendix K recommended a curfew to preclude high noise impact activities before 8.00 am and respite periods for certain activities which "... include the use of chainsaws, mulchers, excavators and the concrete crusher, which are identified as the noisiest equipment in Table 15."; • Section 6.1.4 to EIS Appendix K indicates that in respect of activities referred to in section 6.1.3 a curfew on high noise impact activities before 8.00 am and intra-day respite periods for those activities should be undertaken; • Table 15 also identifies jackhammers/rock breakers as high noise impact equipment; • Table 15 omits concrete and demolition saws as high noise impact equipment. The EPA acknowledges that Report section 5.2 proposes at item S1-NV5 to set up unattended noise loggers to monitor construction noise with data from the loggers to "... inform the Contractor on the noise levels being generated so that particularly noisy activities can be identified and practicable options investigated to reduce noise levels further ...". The EPA confirms its advice and recommendation concerning intra-day respite periods for highly intrusive demolition and construction activities, including the use of jackhammers, rock breakers, concrete and demolition saws, chainsaws, excavators, mulchers, vibratory rollers and the concrete crusher.	In accordance with the ICNG (Table 2), respite periods are to be adopted where works have been determined to be potentially highly intrusive, such as exceeding the 'highly affected' targets at residential receivers. This is not simply related to the type of equipment or activity being carried out but is instead dependant on the sound level exposure at the receiver locations. Accordingly, requirements or conditions relating to respite periods should not simply be based on a list of equipment. In relation to the project, the Applicant has committed to undertake respite periods, despite the assessment demonstrating that there are no receivers expected to encounter 'highly intrusive' noise. Consultation has been undertaken with Kira Child Care centre to better understand the nature of rest times at the centre. The Centre currently operates rolling rest times between 12pm and 3pm. Considering the demolition works are not expected to be above the existing ambient noise levels already experienced by the child care centre, the need for and timing of respite will be assessed in consultation with the management of the child care centre. Consultation with the child care centre has confirmed that the most suitable scheduling of respite periods would be in consultation with management on a regular basis when the program of works is known. It is noted that the Responsible Person will be required to liaise regularly with neighbours, including the child care centre in relation to noise issues from the demolition works. As such in accordance with the ICNG the Applicant proposes to modify mitigation measure S1-NV2 to ensure greater clarity around the intent of the respite periods (changes in **bold**): The Demolition and Environmental Management Plan is to include a detailed Construction Noise and Vibration Management Plan to ensure that potential noise and vibration activities are managed in accordance with the Noise and Vibration Impact Assessment (Arup 2018). The DEMP is to implement all mitigation measures and comply with all recommendations of the Noise and Vibration Assessment Report (Arup 2018) that relate to the Stage 1 Demolition works, including: • A noise and vibration management plan shall be prepared. This will specify the actual plant to be used and will include updated estimates of the likely levels of noise and the

No	Extract	Response
		scheduling of activities. • A member of the site staff will act as the Responsible Person with respect to noise and vibration. The Responsible Person is to: ▪ − Regularly train workers and contractors (such as at toolbox talks) to use equipment in ways to minimise noise; ▪ − Ensuring good work practices are adopted to avoid issues such as noise from dropped items, noise from communication radios is kept as low as is practicable; ▪ − Ensure the use of radios or stereos outdoors is avoided; and ▪ − Ensure shouting, talking loudly and slamming vehicle doors is avoided. • Some construction activities **may generate noise that is** identified as being potentially 'annoying' or intrusive to residents **as defined** in Section 4.5 of the ICNG. **Such intrusive noise may result from** the use of chainsaws, mulchers, excavators and the concrete crusher, which are also identified as the noisiest equipment in Table 15 of the Noise and Vibration Impact Assessment (Arup, June 2018). **Stationary equipment that may cause intrusive noise**, such as the mulcher and concrete crusher, should be located to the south of the site as far from receivers as possible. Where possible stationary equipment should be located behind structures such as demountable buildings or stockpiles to maximise shielding to receivers. **Where works have the potential to result in intrusive noise, these works should be**: ▪ undertaken after 8am. ▪ only be undertaken over continuous periods not exceeding 3 hours with at least a 1-hour respite period in between. ▪ not undertaken during rest periods for Kira Child Care Centre at 230 Moore Park Road, Paddington at times to be agreed with centre management. • All vehicles, plant and equipment should be turned off when not in use. • The Responsible Person is to ensure that the condition of the powered equipment used on site is checked daily to ensure plant is properly maintained and that noise is kept as low as

No	Extract	Response
		practicable. • The Responsible Person should keep the local community advised on expected activities and coordinates scheduling and locations of noisy works around any critical user events where practicable. This shall include face to face meetings with nearby receivers if requested and a letter box drop, and shall include close liaison with neighbours during construction, including Fox Studios, NRL and Rugby Australia. • Appropriate records are to be maintained of complaints to include timing, reported issues, actions taken and measures to be included for on-going works. The complaints log will need to be filed with the Responsible Person. • Consultation with stakeholders of surrounding receiver buildings, including the UTS, Rugby Australia, the NRL and Fox Studios, should be sought when developing a construction schedule, with particular focus on noise sensitive periods such as exam periods for UTS • Consider using electric / hydraulic equipment where possible, such as hydraulic pulverisers for demolition • Use 'quacker' style reversing alarms in lieu of tonal beeping alarms • Locate loud, stationary plant as far from noise sensitive receivers as possible. The ideal location is identified as the western most corner of the site compound along Driver Avenue, as shown in the Site Layout Plan by Cox Architecture (September 2018) • Erect hoarding around the stationary plant where feasible. Hoarding shall be erected such that the line of sight between the equipment and the nearest sensitive receivers is broken, cognisant of access requirements.
	6. Waste vehicle monitoring	
EPA 58	Section 1.1 to Report Attachment 1 (item EPA 18) indicates that site establishment and demolition are proposed to occur over a period of approximately nine months (assuming concurrent demolition of stadium and ancillary buildings). The EPA's submission highlighted concerns about ensuring that the large volumes of demolition waste from the project are closely monitored to ensure demolition and construction waste is directed to and received at facilities legally able to accept that waste. The EPA emphasises that inappropriate disposal of demolition and construction waste represents a serious risk to human health and the environment. Traditional measures used to monitor proper disposal of those wastes has proved inadequate as a deterrent to improper disposal on private and public land.	Noted

No	Extract	Response
EPA 59	Section 1.1 to Report Attachment 1 (item EPA 33) indicates that a video monitoring system with number plate recognition is not feasible because "[t]here are multiple exits and entrances to the site (five in total)." However, sections 6 and Section 9.1 to EIS Appendix E indicate respectively that – • "Vehicular access/egress gates are proposed through existing access points off Moore Park Road into Paddington Lane and Driver Avenue.", and • "... Driver Avenue provides a main access point for demolition works, ...".	Noted- refer to responses EPA33 in Attachment 1 of the Response to Submissions.
EPA 60	Similarly, the EPA is concerned the proponent provides no commitment to ensuring each vehicle involved in the transport of waste from the development site is fitted with a real time GPS tracking system and is tracked to ensure waste materials reach their intended destination. Instead, Report section 5.2 (items S1-CM3 and S1-CM4) propose a log book and docket based system.	Noted- refer to responses EPA33 in Attachment 1 of the Response to Submissions.
EPA 61	The EPA anticipates that the proponent would ensure that vehicles entering and leaving the site would only do so via a limited number of points not only to control proper waste handling but also to implement "Blue Book" guidance concerning erosion and sediment control, including truck wash and other measures to prevent tracking of mud and waste from the development site onto public roads. The EPA considers that there appears to be no impediment to ensuring demolition and construction waste vehicles are directed to only use controlled access points and to adopt: (a) measures to prevent mud and waste tracking from the development; (b) electronic monitoring of waste vehicles entering and leaving the development site; and (c) electronic tracking of waste vehicles from the development site to the appropriate recycling or waste disposal facilities.	Noted- refer to Attachment 1 Final Erosion and Sediment Control Plans of the Response to Submissions. The Applicant reaffirms its commitment to managing sediment and erosion in accordance with the Blue Book.
EPA 62	Accordingly, the EPA confirms its advice and recommendations concerning demolition (and construction) waste and recyclables separation, classification, management and disposal, including the electronic monitoring and tracking of all vehicles involved in the transport of those materials.	Noted
	7. Air and water quality (concrete crushing, loading/unloading, stockpiles)	
EPA 63	Section 1.1 Section 1.1 to Report Attachment 1 (item EPA 38) indicates that Report section 5.2 mitigation measure S1-CM2 addresses the EPA's concerns about air and water quality impacts arising from wind action, rainfall and runoff impacts on concrete crushing and related loading/unloading and processed material stockpiles. However, the EPA's view is mitigation measure S1-CM2 appears to relate to waste management and does not address air and water quality impacts.	Noted
EPA 64	The EPA further notes that- (a) its advice and recommendations concerning rainfall and runoff impacts refers to the risk of flooding at that part of the development site proposed for concrete crushing and stockpiling of raw materials for crushing as well as processed materials, (b) section 1.1 to Report Attachment 1 (item EPA16) indicates that an updated stage 1 erosion and	Noted

No	Extract	Response
	sediment control plan has been prepared, (c) Report Attachment 11 comprises an air quality impact assessment that at section 5.2.2 indicates that "... the dust emission magnitude for the proposed demolition works is classified as large.", (d) whilst section 6.1 Report Attachment 11 proposes that the proponent "... consider ... "various dust mitigation and management measures "... where practicable.", it falls short of a commitment to implementing the recommended measures, (e) section 6.1 Report Attachment 11 proposes that there be a "... person accountable for air quality and dust issues ..." but does not propose that all employees and agents on the development site be trained in and have responsibility for minimising and monitoring dust emissions, and (f) whilst section 6.1 Report Attachment 11 proposes 'highly recommended' activity (e.g. demolition, haulage) specific mitigation and management measures, it omits concrete crushing and related activity specific dust mitigation and management measures. Accordingly, the EPA confirms its advice and recommendations about air and water quality impacts arising from wind action, rainfall and runoff impacts on concrete crushing and related loading/unloading activities and processed material stockpiles.	
	8. Operational noise impact (outdoor entertainment activities)	
EPA 65	The EPA's EIS submission cover letter advised: "The Sydney Cricket and Sports Ground Trust is subject to a statutory Notice of Prevention in respect of noise emissions from 'outdoor entertainment activities' held at the Sydney Football Stadium and the Sydney Cricket Ground (SCG). 'Outdoor entertainment activities' (including bump in, bump out, sound tests, and rehearsals) carried out during operation of the new stadium and associated facilities together with those activities at the SCG may not result in increased noise impacts experienced at surrounding noise sensitive receiver locations, especially residences. The EIS (Appendix K 'Noise and Vibration Assessment') proposes noise management levels and an alternative measurement system to manage noise emissions from sporting and concert events (i.e. outdoor entertainment activities) at the proposed stadium. However, the EIS does not provide sufficient information for the EPA to properly consider proposed alternatives to those encompassed by the current Notice of Prevention." Whilst Notice of Preventive Action 1003904 limits the nature and frequency of various types of outdoor entertainment activities held at the Sydney Cricket Ground (SCG), the EPA anticipates that noise impacts from those activities on surrounding residences may – • increase as the existing stadium and associated buildings are progressively demolished (until the new stadium is built), and • change significantly following construction of the new stadium on the proposed new footprint.	This item relates to noise emission from the SCG, which is not the subject of this application. The SFS is not responsible for the management of noise from the SCG, nor is it a requirement for the SFS to provide acoustic shielding from the SCG. Management of noise emissions from SCG operations is directed by the Notice of Preventative Action (NoPA) which would still apply during and post-construction of the SFS. Any amendments required to the NoPA are a matter for the EPA and SCG Trust, and can be readily managed through the regular review process for the NoPA conditions which is administered by the EPA.

No	Extract	Response
	Operational noise (demolition and re-building phases)	
EPA 66	The EPA understands that sporting and concert events would continue to be held at the SCG throughout the demolition and rebuilding phases of the stadium project. The EPA considers that the bowl of the existing stadium and associated buildings (e.g. 'Sheridan') afford local residences a degree of acoustic shielding from noise impacts arising from 'outdoor entertainment activities' held at the SCG. Section 1.1 to Report Attachment 1 (item EPA40) – (a) acknowledges that "Increases in SCG event noise levels due to the demolition of Allianz Stadium may be experienced at receivers along Moore Park Road due to the removal of the shielding provided by the stadium", and (b) suggests that the increase due to removal of shielding "... is unlikely to generate noticeable impacts during events at the SCG due to the dominance of traffic noise at these receivers and the low event noise levels from the SCG". However, the Report and the EIS – (a) did not recognise the significant noise sources (e.g. sound tests, rehearsals, post-event clean up, and bump in/bump out activities) other than 'event' noise, (b) have not recognised that the noise sources referred to in paragraph (a), would be likely to occur at times when traffic noise may not be dominant, and (c) do not include a quantitative assessment of noise impacts arising from 'outdoor entertainment activities' and event-related activities undertaken at the SCG during stage 1 demolition and stage 2 construction stages of the re-development project. Accordingly, the EPA confirms its advice concerning anticipated noise impacts during the demolition and re-building phases particularly given the commitment by the proponent to the Trust that demolition and construction activities would be suspended when major 'outdoor entertainment activities' and event-related activities are to be undertaken at the SCG.	See response to EPA65
EPA 67	**Recommendation** The proponent be required to provide a detailed noise impact assessment to justify its opinion that noise emissions from 'outdoor entertainment activities' (including sound tests, rehearsals and other pre and post event activities) held at the SCG during the demolition and re-building phases of the project will not result in increased noise impacts at noise sensitive receiver locations, especially surrounding residences north of the development site.	See response to EPA65
	Operational noise (new stadium)	
EPA 68	The EPA expects the proponent to ensure that operation of the new stadium and associated facilities together with operation of the SCG would not result in increased noise impacts at surrounding noise sensitive receiver locations (e.g. residences, educational establishments, child care centres, places of public worship) and	Noted

No	Extract	Response
	instead that a reduction in overall impacts would be achieved through amongst other things: (a) contemporary acoustic design of the stadium, and (b) improved noise monitoring and communication technologies that enable 'real-time' active management responses that avoid noise limit exceedances. As previously mentioned, 'outdoor entertainment activities' held at the SCG and the existing Sydney Football Stadium are the subject of a statutory Notice of Preventive Action which sets limits on the nature, number and frequency of various types of 'outdoor entertainment activities' and the noise level limits for those activities. The EPA expects that, in the absence of strong justification otherwise, the noise mitigation and management requirements in respect of 'outdoor entertainment activities' at the new stadium would be consistent with the requirements of the above mentioned Notice of Preventive Action.	
EPA 69	The EPA anticipates that given the fundamental implications of operational noise impacts on surrounding residences and other noise sensitive receiver locations as well as on the design parameters of the proposed stadium, the EIS for the purposes of the Concept Plan would explicitly address the operational noise impact of 'outdoor entertainment activities', including inter alia: (a) predicted noise levels for representative 'worst case' concert and sporting events, sound tests and rehearsals, using the following noise descriptors for the 1-minute, 3-minute, 5-minute and 15-minute monitoring periods - (i) LAeq, (ii) LCeq, (iii) LAmax, (iv) LCmax, (v) L90, (vi) L10, (vii) L5, and (viii) L1, supported by 1/3 octave band data; (b) cumulative noise impact of concurrent activities at both the new stadium and SCG; (c) the impact of pyrotechnic displays in conjunction with outdoor entertainment activities; (d) the impact of event 'bump-in' and 'bump-out' activities, goods delivery, post event clean up activities, and waste collection services (including the noise impact of associated vehicular movements particularly any such movements occurring during the 'night period' or likely to activate reversing alarms); (e) marked up orthophotomaps showing the predicted noise level contours for various proposed activities (including sound checks, rehearsals and pyrotechnic displays); and (f) (where the noise from the venue assessed to the sensitive receiver location exceeds the prevailing background noise level by greater than 5dB) a detailed assessment of all feasible and reasonable	The EPA's expectations relate to a quantitative assessment; however, the SEARs did not require a quantitative assessment of demolition or operational noise from the proposed development. Notwithstanding, the EPAs expectations present an unduly elaborate list of time periods and noise descriptors which would result in **32 different assessments** for a single event/source type. Several of the noise descriptors and time periods are not referred to in the current NoPA, relevant EPA guidelines or management plans for similar venues, and are not consistent with contemporary approaches to measuring noise. It is noted that the Appendix K- Noise and Vibration Impact Assessment of the EIS has already exceeded the requirements of the SEARs and presented a quantitative assessment of the key noise sources that are influenced by the building envelope and location of the new SFS. This assessment concluded that the new design would result in a reduction of noise from the stadium. Accordingly, the existing noise assessment is considered to be appropriate in its existing form. Assessment of other operational activities, such as bump-in/bump-out, delivery and waste services, if required to be assessed, would addressed in the Stage 2 application.

No	Extract	Response
	noise mitigation and management measures to reduce noise impacts.	
	Statutory context	
EPA 70	Section 5.2 to EIS Appendix K outlines an operational noise impact assessment of outdoor entertainment activities at the new stadium that: (a) in referring to "... the main legal framework and basis for managing unacceptable noise ..." at the new stadium omits the requirements of statutory Notice of Preventive Action that applies to 'outdoor entertainment activities' held on Trust lands and in particular at the existing Sydney Football Stadium and the SCG; (b) mistakenly suggests that the EPA's Noise Guidelines for Local Government rather than the statutory Notice of Prevention "... presents guidance on the management of ..." noise from 'outdoor entertainment activities' on Trust lands; (c) suggests a lack of awareness that the integrated noise mitigation and management requirements of the Notice of Preventive Action issued in 2002 have been refined over the intervening period in consultation with the Trust and in response to valid community concerns arising from noise emissions associated with some concert and other 'outdoor entertainment activities' held on Trust lands; and (d) suggests a lack of awareness that amongst other things the objects of the Protection of the Environment Operations Act 1997 are to improve the efficiency of administration of the environment protection legislation.	In preparing the EIS, the application provides an opportunity to have operational noise criteria contained with the project approval conditions, rather than relying on the current NoPA. The NoPA has not, however, been disregarded as discussed in the report. The EIS proposes an alternative noise descriptor for events management to the current NoPA parameters in order to improve the consistency and practicality of measurement and make use of real-time continuous monitoring systems, an opportunity afforded by the proposed redevelopment. While a different noise descriptor is proposed, as presented in the NVIA, it has been established as an equivalent to the existing NoPA criteria. As per point d) raised by the EPA, having all environmental management requirements contained in a single document (i.e. a future stadium development consent), along with the revised criteria and management processes, aim to improve the efficiency of administering the environmental protection requirements. Notwithstanding it is appreciated that the amendment of criteria and regulatory mechanism may require further consideration. As the Stage 2 application is to address operational matters, this matter is not required to be resolved as part of the Concept SSD Application as the operational impacts of the proposed stadium will be assessed as part of Stage 2. As discussed in the NVIA, the proposed regime may be best addressed and formalised in an operational management plan.
	Type, number and frequency of events	
EPA 71	The EPA considers the prescribed limits on the combined number of concerts per financial year (aka 'event year') and the rolling aggregate of concerts averaged over five years to be one of a number of integrated noise mitigation and management measures. Section 5.1 to EIS Appendix K indicated that the new stadium is "... anticipated to host 49-52 events per year, including up to 6 concerts." EIS section 3.2.1 (5th dot point, p.34) under the heading 'Sydney Football Stadium' incorrectly suggested that the stadium typically hosts 6 concerts each year. Report Section 5.1 (item CP-NV3) proposes in regard to the proposed SFS that "[t]he number of concerts is not to exceed six (6) per calendar year". The EPA wishes to clarify that the Notice of Preventive Action prescribes a maximum of six concerts allocated across the adjoining venues (i.e. SFS and SCG) per 'event (i.e. financial) year' with not more than four concerts per 'event year' averaged over five years.	As above, it considered that the operational conditions would be the subject of the Stage 2 application and assessment.

No	Extract	Response
EPA 72	The EPA's view is that the Report – (a) does not justify the additional noise impact of the proposed 50 percent increase in the combined number of concerts (i.e. from a maximum of 20 to 30 concerts averaged over five 'years') permitted to be held on Trust lands, and (b) is unclear whether the Trust proposes additional concerts at the SCG venue over and above the number of concerts proposed at the new Sydney Football Stadium.	The Stage 1 approval is not expected to define these items. As above, it considered that the operational conditions would be the subject of the Stage 2 application and assessment.
EPA 73	**Recommendation** The proponent be required to ensure that the number of concerts held at the proposed SFS does not exceed the combined number of concerts permitted on trust lands, under the statutory Notice of Preventive Action issued to the Sydney Cricket and Sports Ground Trust, being not more than: (a) 6 concerts during any single financial year, and (b) 4 concerts per financial year averaged over any 5 financial years.	No increases to the number of concerts currently permitted on Trust lands as part of the NoPA are being proposed. A maximum of 6 concerts have been assessed as the worst-case scenario, however, it is not proposed to increase the number of events above the average of 20 events per 5-year period.
	Noise sources	
EPA 74	The EPA's SEARs input identified various event-related activities (e.g. pyrotechnics, sound test, rehearsal, 'bump in', 'bump out', and clean up) which may result in the emission of noise that, by reason of its level, nature, character or quality, or the time at which it is made, or any other circumstances is likely to interfere unreasonably with the comfort or repose of a person who is outside the development site.	Refer to EPA 75 below.
EPA 75	Section 5.1 to EIS Appendix K only considers the operational noise impact of sound amplification and crowd noise. Although Report Attachment 6 provides additional assessment of a worst case 'double header' event it only uses the LAeq, 5 minute noise descriptor and omits any assessment of noise impacts of event-related activities such as - • pyrotechnics, • pre-event activities including 'bump in', sound test, rehearsal and stadium precinct grounds maintenance, and • post event activities including 'bump out' and stadium precinct clean up.	Assessment of operational noise will be the subject of the Stage 2 application, and it is not appropriate to impose such conditions on the Concept DA prior to this assessment being undertaken. A quantitative assessment was carried out in support of the Concept DA, notwithstanding that this was not required by the SEARs, focusing on major events, which concluded that the new SFS would result in a reduction of noise emission compared to the existing. It therefore stands that other sources that may emanate from the stadium bowl would also reduce. Assessment of external activities such as arrival and departure of vehicles would be expected to be the subject of the Stage 2 application.
EPA 76	Explosive pyrotechnics may generate significant peak levels at sensitive receivers. This includes aerial pyrotechnics ("fireworks") and other devices such as cannon simulators. Non-explosive pyrotechnics, such as fountains, flamethrowers and waterfalls, are also commonly used at concerts and sporting events, The EPA 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.	Noise emission from pyrotechnics, particularly noise emanating from the sky, would not be anticipated to change under the stadium redevelopment. As noted above, noise emanating from the stadium bowl is expected to reduce.

No	Extract	Response
EPA 77	**Recommendation** The proponent be required to provide a detailed quantitative noise impact assessment of event-related activities proposed to be undertaken at the new stadium, including – • pyrotechnics use, • pre-event activities including 'bump in', sound test, rehearsal and stadium precinct grounds maintenance, and • post event activities including 'bump out' and stadium precinct clean up.	Refer to EPA 75 and 76 above.
	Time restrictions on certain activities	
EPA 78	The EPA confirms that time restrictions on certain activities represent one of a number of integrated noise mitigation and management measures encompassed by the statutory Notice of Preventative Action issued to the Trust. The Notice applies time restrictions to sporting events, concerts, sound tests, and rehearsals. Section 5.2.1 to EIS Appendix K appears to indicate that the proponent does not propose to change event time restrictions "... outlined in the existing NMP", which refers to the Trust's Noise Management Plan rather than the requirements of the Notice of Preventative Action on which required preparation and implementation of the NMP. The EPA considers unlimited periods of sound testing and rehearsal between 10.00 am to 7.00 pm would be likely to cause unreasonable interference with the comfort or repose of persons outside the Trust lands, especially residents and occupants of child care and educational establishments. The EPA notes that Table 23 to EIS Appendix K indicates that sound tests and rehearsals are proposed to be "Kept to absolute minimum" duration between the hours of 10.00 am to 7.00 pm as currently permitted under the statutory Notice of Preventive Action.	See EPA 80 below.
EPA 79	The EPA further considers that the hours of 10.00 am to 7.00pm 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 concert performance or sporting event. The EPA notes that the Notice of Preventive Action allows for the prospect of applications being made by the Trust to request a variation of prescribed time restrictions on a case by case basis.	See EPA 80 below.
EPA 80	**Recommendation** The proponent be required to ensure that sound tests and rehearsals are only undertaken - (a) over a period of not more than 60 minutes each, and (b) between the hours of 10.00 am and 7.00 pm on the day of concert or sporting event.	The current NoPA does not present a time window limit for rehearsals. The EIS NVIA is consistent with the NoPA, noting that the duration would be "kept to an absolute minimum". Additional, more prescriptive conditions are therefore not considered reasonable. It is noted that operational management of the future stadium is to be the subject of the future Stage 2 application.

No	Extract	Response
	Noise impact assessment	
EPA 81	Clause 90 to the Protection of the Environment Operations (General) Regulation 2009 explicitly identifies the EPA as the 'appropriate regulatory authority' for outdoor entertainment activities involving 200 persons or more that are carried on at "... the trust lands within the meaning of Sydney Cricket and Sports Ground Act 1978, ...". The EPA confirms that 'outdoor entertainment activities' include amongst other things concerts and sporting events as well as any associated rehearsal, sound check or other preparation provided that the activity is carried on outdoors (including if it is carried on under or within a tent, marquee or similar structure) and sound amplification equipment is used as part of the activity. The EPA advised in the cover letter to its EIS submission that noise emissions from 'outdoor entertainment activities' held at the new stadium should not exceed the noise level limits imposed by the Notice of Preventive Action issued to the Trust in respect of Trust lands.	See EPA 85 below
EPA 82	The EPA confirms that the statutory Notice of Preventive Action prescribes – • LAmax and LCmax noise level limits for concerts, sound tests, rehearsals and concerts held at the existing SFS and at the SCG, and • an LAmax noise level limit concerning noise from sound amplification equipment used during sporting events held at the existing SFS and at the SCG.	See EPA 85 below
EPA 83	The EPA notes that section 5.2.2 to EIS Appendix K recognises (with reference to Table 24 'Summary of noise limits for similar venues') that "From this summary, the most commonly adopted noise limits descriptors are Lmax and Leq , with levels either set values or based of [sic] measured RBLs.". Nevertheless, section 5.2.3 to EIS Appendix K proposes using an alternative approach (i.e. using the LAeq,5minutes noise descriptor) to the assessment of the noise impacts from 'outdoor entertainment activities' at the new stadium. This approach is inconsistent with the EPA's input to the draft SEARs which recommended assessment using the LAeq,15minutes, LCeq,15minutes, LAmax and LCmax noise descriptors, and the noise descriptors applied to noise level limits in the Notice of Preventive Action. Report Attachment 6 provides an additional noise assessment of a worst case 'double header' scenario of capacity crowds at both the new stadium and SCG but again uses the alternative assessment approach.	See EPA 85 below
EPA 84	The EPA considers that the alternative approach used to assess the noise impact of 'outdoor entertainment activities' proposed to be held at the new stadium: • precludes ready evaluation of the predicted noise impacts against the noise level limits imposed by the statutory Notice of Preventive Action that applies to the existing SFS and the SCG; • precludes ready evaluation of the predicted noise impacts against any of the noise impact measurements undertaken (in accordance with the noise monitoring requirements of the statutory Notice of Preventive	See EPA 85 below

No	Extract	Response
	Action) during actual 'outdoor entertainment activities' held at the existing SFS and the SCG; and • is not adequately justified in section 5.2.3 to EIS Appendix K. Accordingly, the EPA is concerned that, if accepted, the alternative approach could result in the new stadium being subject to two separate and potentially contradictory regulatory instruments. Further information is required to enable the EPA to undertake an assessment of the proposed alternative approach and provide fulsome advice.	
EPA 85	**Recommendation** 1. The proponent be required to undertake a detailed quantitative noise impact assessment of representative 'worst case' 'outdoor entertainment activities' (for example: concerts, sporting events, sound tests, and rehearsals) and other operational activities proposed to be held at the new stadium as a basis for setting the design parameters for any consent to the Concept Plan. The required quantitative assessment must include – (a) tabulated and graphed data using the following noise descriptors for the 1-minute, 3-minute, 5-minute and 15-minute monitoring periods - (i) LAeq, (ii) LCeq, (iii) LAmax, (iv) LCmax, (v) L90, (vi) L10, (vii) L5, and (viii) L1, supported by 1/3 octave band data; (b) cumulative noise impact of concurrent activities at both the new stadium and Sydney Cricket Ground; (c) the impact of pyrotechnic displays in conjunction with outdoor entertainment activities; (d) the impact of event 'bump-in' and 'bump-out' activities, goods delivery, post event clean up activities, and waste collection services (including the noise impact of associated vehicular movements particularly any such movements occurring during the 'night period' or likely to activate reversing alarms); (e) marked up orthophotomaps showing the predicted noise level contours for various proposed activities (including sound checks, rehearsals and pyrotechnic displays); and	The EPAs expectations relate to a quantitative assessment; however, the SEARs did not require a quantitative noise assessment. Notwithstanding, the EPAs expectations present an unduly elaborate list of time periods and noise descriptors which would result in **32 different assessments** for a single event/source type. The requested descriptors and periods are beyond that outlined in the EPAs original EIS response (see EPA 83 above). Several of the noise descriptors and time periods are not referred to in the current NoPA, the relevant EPA guidelines or management plans for similar venues. It is noted that the EIS NVIA went beyond the requirements of the SEARs and presented a quantitative assessment of the key noise sources that are influenced by the building envelope and location of the new SFS, namely crowd and sound system noise. The assessment concluded that the new design would result in a reduction of noise from the stadium. Regarding the proposed $L_{Aeq5min}$ and $L_{Ceq5min}$ noise descriptors, refer to response to Item EPA 87 below.

No	Extract	Response
	(f) (where the noise from the venue assessed to the sensitive receiver location exceeds the prevailing background noise level by greater than 5dB) a detailed assessment of all feasible and reasonable noise mitigation and management measures to reduce noise impacts.	
EPA 86	2. The proponent be required to ensure that the proposed stadium is designed and constructed, and that all feasible and reasonable noise mitigation measures as may be necessary are implemented to consistently reduce noise emissions from 'outdoor entertainment activities' (including sound tests and rehearsals) held at the stadium, such that when measured at surrounding noise sensitive receiver locations, (especially residences) – (a) noise levels are under all circumstances less than the noise level limits prescribed in the statutory Notice of Preventive Action 1003904 (as at the date of the development application), and (b) LCmax minus LAmax noise levels are less than but at no time greater than 20 dB.	Refer above and below.
EPA 87	3. The proponent be required to justify the proposed use of the alternative approach to noise impact assessment described in EIS Appendix K as a basis for establishing compliance criteria and undertaking compliance monitoring not only for the new stadium but for all outdoor entertainment activities held on Sydney Cricket and Sports Ground Trust lands by: (a) undertaking a detailed analysis that clearly demonstrates - (i) the statistical correlation between the Leq criteria proposed by the proponent and the Lmax criteria currently imposed under the Notice of Preventive Action, (ii) how using the proposed Leq criteria instead of the Lmax criteria currently applied by the Notice of Preventative Action would improve the efficiency of administration of the environment protection legislation and reduce noise impacts on noise sensitive receiver locations (especially surrounding residences), and (iii) justification for any other proposed criteria (including any proposed noise metric, assessment time period or other method); (b) including as part of the analysis required by paragraph (a), such representative empirical data as may be necessary to clearly demonstrate the statistical correlation referred to in paragraph (a); and (c) submitting the required analysis for the consideration of the Environment Protection Authority.	The alternative noise criteria and management procedures are proposed for the SFS only, being the subject of this application. Regarding the proposed noise descriptors, DPE was consulted prior to selecting the $L_{eq(5minute)}$ descriptor. The L_{Aeq} descriptor is used by the main noise policy documents in NSW (EPA's Noise Policy for Industry, EPA's Road Noise Policy, EPA's Interim Construction Noise Guideline). Regarding the appropriateness of the L_{Aeq} descriptor as an assessment parameter, "*The L_{Aeq} descriptor… represents the level of average noise energy over the relevant period of measurement and takes account of peak noise levels as well as the degree of noise fluctuation. This descriptor is most widely correlated with the subjective effect of noise"* (Miedema and Vos, 2004)." While the EPA typically utilise a 15-minute period, the shorter 5-minute period was nominated as it initiates more prompt response to potential exceedances. It is noted that in the current regime of attended monitoring at receiver locations affected by other ambient noise, it is impractical to assess using the L_{eq} descriptor, and thus reliance has been on the L_{max}, contrary to the above polices. However, the proposed internal real-time monitoring system, would allow use of the L_{eq} descriptor. The established $L_{eq(5min)}$ criteria was established following review and analysis of event noise data provided by the SCG Trust. The aim was to establish a criterion equivalent to the current limits, but in the form of an L_{eq}, being a more consistent and reliable means to monitor and control of sound levels. Use of the L_{max} can lead to inconsistency, as a more discretionary approach may be taken by those monitoring and controlling events, potentially overlooking 'one-off' or atypical excursions of the criteria.

No	Extract	Response
	9. Operational noise (delivery of goods/ waste collection services)	
EPA 88	In its EIS submission, the EPA raised the issue of community concerns from noise emissions arising from delivery and waste collection services. The EPA wishes to clarify that those community concerns related to incidents at other public authority premises rather than incidents on Trust lands. Section 1.1 to Report Attachment 1 (item EPA44) indicates that– (a) a 360 degree service road is to be provided under the general concourse, (b) that "... a new service access point is proposed from Driver Avenue ...", and (c) the proponent proposes there be no time restrictions on waste collection services "... owing to the main impact (noise) being attenuated through the loading of waste vehicles within the building.". The EPA notes that – • Section 3.9 to EIS Appendix J states that "Service vehicles are not permitted during events", • Figure 47 (section 4.9) to EIS Appendix J confirms the location of a new service vehicle access point from Driver Avenue via car park to a ring road, and • Figure 47 (section 4.9) to EIS Appendix J indicates service vehicle egress is also proposed via 'Paddington Lane' direct to Moore Park Road. The EPA accepts that time restrictions need not apply to service vehicle movements, subject to the proponent being required to ensure that – (a) all goods and equipment delivery (including bump in/ bump out and broadcast vehicle loading and unloading) be undertaken beneath the stadium, (b) all waste collection services be undertaken beneath the stadium, and (c) all delivery (including bump in/ bump out equipment and broadcast equipment transport) vehicles and waste collection vehicles enter and leave the development site via Driver Avenue.	Waste collection activities are to be assessed as part of the Stage 2 application.
	10. Operational noise (grounds maintenance using powered equipment)	
EPA 89	Similar to the issue above, the EPA expressed concern in its EIS submission about noise emissions arising from grounds maintenance using powered equipment in the 'stadium precinct' at times likely to emit noise that, by reason of its level, nature, character or quality, or the time at which it is made, or any other circumstances is likely to interfere unreasonably with the comfort or repose of a person who is outside the development site (i.e. nearby residences). The EPA noted previous community concern about noise emissions from grounds maintenance using powered equipment such as leaf blowers and lawn mowers; this related to incidents at other public authority premises rather than specific incidents on Trust lands.	Grounds maintenance activities are to be assessed as part of the Stage 2 application.

No	Extract	Response
	The EPA notes that grounds maintenance would include post-event clean up which may involve the use of street sweepers, leaf blowers, and other powered plant and equipment in the stadium precinct that is likely to emit noise that interferes unreasonably at certain times with the comfort or repose of a person who is outside the development site. The EPA further notes that the proponent has not undertaken a noise impact assessment of grounds maintenance in either inside the stadium or the surrounding stadium precinct, including the impact of post-event clean up, landscaping, general stadium cleaning, or playing surface maintenance using powered equipment. Accordingly, the EPA confirms its advice and recommendations concerning curfews on grounds maintenance using powered equipment.	
EPA 90	The proponent be required to undertake and report on a detailed noise impact assessment of grounds maintenance activities using powered plant and equipment both – (a) in the stadium, and (b) in the surrounding stadium precinct.	Noted.