



Your Ref: SSI 7400

Ms Karen Jones
Director Transport Assessments
Department of Planning and Environment
GPO Box 39
SYDNEY NSW 2001

Attention: Mick Fallon

Dear Ms Jones

Sydney Metro City and Southwest (Chatswood to Sydenham) - SSI 7400 EIS Response

I refer to the request from the Department of Planning and Environment (DP&E) to the Environment Protection Authority (EPA) dated 9 May 2016 to undertake a review of the Environmental Impact Statement (EIS) for Sydney Metro and Southwest (Chatswood to Sydenham) rail project.

The EPA has reviewed the EIS and has provided comments in Attachment 1. The comments outline the EPA's concerns regarding certain aspects of the EIS and recommend that additional information is included in the EIS in relation to groundwater management, noise and vibration.

Draft recommended conditions of approval for noise have been included in attachment 2. EPA will provide further recommended conditions during the response to submissions stage of the process. The EPA also requests the opportunity to comment on the draft conditions of approval proposed by DP&E prior to determination.

If you have any questions regarding this letter please call Mark Jansons on 9995 6829.

Yours sincerely

A handwritten signature in black ink, appearing to read 'P Morrall', followed by the date '1.7.16'.

PETER MORRALL
A/Unit Head Infrastructure
Environment Protection Authority

Contact officer: MARK JANSONS
9995 6829

Attachment 1

Construction Groundwater

The EIS states that groundwater at the site has elevated iron and manganese and low pH in the Hawkesbury Sandstone and that in seepage into the dive structures and shaft excavations is likely of volumes up to 11.8 litres per second across the whole project.

The current proposed treatment during construction is only for total suspended solids, oil and grease, and pH. The EIS does not include treatment of other pollutants in the construction phase. While EPA agrees that the tanked nature of the project does minimise groundwater inflow, the standard process on most construction projects is to collect inflows until sufficient volumes have been reached and then treat and discharge in bulk. This increases the impact of pollutants to the environment.

The EIS should include further information on the treatment of groundwater indicating how the project will comply with s120 of the *Protection of the Environment Operations Act 1997* for these activities.

Noise

Construction

The Sydney Metro Chatswood to Sydenham project includes significant components of demolition of office and other buildings and structures within the Sydney CBD, North Sydney and other built up areas, and excavation of access shafts to the Metro line tunnel in close proximity to residences, office buildings, hotels, pedestrian areas, cafés, restaurants and other such commercial activities. The proposed methods of demolition and excavation include extensive use, over relatively long periods, and including during the night-time, of large, hydraulic excavator rock hammers, which have the potential to generate high levels of airborne noise, ground borne noise and vibration. Predicted daytime noise and vibration levels are such that there is potential for a large number of offices to experience significant disruption to their activities over an extended duration.

EPA does not usually specify noise limits for construction and other limited duration activities (such as demolition), other than for the night-time, but instead usually requires that all feasible and reasonable noise mitigation measures be implemented to minimise impacts. EPA is aware of demolition and excavation techniques that can be feasibly be used instead of, or together with, rock hammers to reduce noise and vibration impacts. Such techniques include, but are not necessarily limited to, section sawing, slab sawing, wall sawing; diamond impregnated wire sawing; bursting, splitting, fracturing using bursting heads or other consistent means; portable or excavator assisted crushing. The Noise and Vibration Paper has indicated that such techniques will not be used on this project because they may be more expensive and slower than rock hammering. EPA believes that this is not adequate justification and that such techniques are reasonable to implement on this project. In addition the Noise and Vibration Paper appears to be indicating that works are proposed that would routinely result in noise levels more than 5dB above background at night, which has not been allowed on other similar infrastructure projects. Therefore EPA's is proposing recommended conditions for this project that include airborne noise, ground borne noise and vibration limits, which EPA believes are achievable by the alternative methods other than rock hammering. Rock hammering can still be used because the EPA's limits are amenity based and therefore only apply when noise sensitive receiver locations are occupied or in use: they would not apply where alternative accommodation or respite offers have been applied. Because EPA does not usually specify noise limits for construction – type activities other than for the night-time, the attached indicative recommended Conditions of Approval identify the limits as nominal at this stage, requiring consideration by Planning and the proponent

Blasting

The project includes a blasting component as a lesser – impact alternative to rock hammering once excavations are some distance from the surface. EPA has proposed its usual ground vibration limits for blasting. However, EPA has specified its overpressure limits in terms of Accumulated Peak Level, to allow for the potential of more than one blast per day of smaller blasts without unacceptable impacts.

Operation

The project can be built such that noise and vibration as a result of operation does not exceed relevant criteria in the Rail Noise Policy and the Industrial Noise Policy. This is reflected in EPA's recommended operational limits.

Attachment 2

Sydney Metro Chatswood to Sydenham - Recommended Indicative Conditions of Approval for Noise, Vibration and Blasting for consideration by DPE and proponent.

Construction Hours

Construction activities associated with the project, other than tunnel boring by a TBM, shall be undertaken during the following standard construction hours:

- (a) 7:00am to 6:00pm Mondays to Fridays, inclusive; and
- (b) 8:00am to 1:00pm Saturdays;
- (c) at no time on Sundays or public holidays.

Except as permitted by an EPL, construction activities during the above hours that result in 75dBLAeq, 15minute levels external to premises that are occupied or in use (residences, school buildings, offices, commercial premises), including any corrections for annoying characteristics such as impulsiveness or tonality shall only be undertaken in continuous blocks not exceeding three hours each with a minimum respite from those activities and works of not less than one hour between each block, and only between the hours of:

- (a) 8:00 am to 5:00 pm Monday to Friday;
- (b) 8:00 am to 1:00 pm Saturday; and,
- (c) for a total duration not exceeding 6 months (180 days).

For the purposes of this condition 'continuous' includes any period during which there is less than a one hour respite between ceasing and recommencing any of the work the subject of this condition.

Construction activities outside of the prescribed construction hours may be undertaken in any of the following circumstances:

- (a) construction works that generate air-borne noise that is:
 - (i) no more than 5 dB(A) above rating background level external to a residence that is occupied in accordance with the Interim Construction Noise Guideline (DECC, 2009);
 - (ii) no more than the noise management levels specified in Table 3 of the Interim Construction Noise Guideline (DECC, 2009) at other sensitive receivers;
- (b) construction works that generate continuous or impulsive vibration values, measured at the most affected, occupied residence, that are no more than those for human exposure to vibration, specified for residences in Table 2.2 of Assessing Vibration: a technical guideline (DEC, 2006);
- (c) works that generate intermittent vibration values, measured at the most affected, occupied residence, that are no more than those for human exposure to vibration, specified for residences in Table 2.4 of Assessing Vibration: a technical guideline (DEC, 2006);
- (d) where a negotiated agreement, including respite or alternative accommodation offers, has been reached with affected receivers, where the prescribed noise and vibration levels cannot be achieved;

(e) for the delivery of materials required outside these hours by the NSW Police Force or other authorities for safety reasons;

(f) where it is required in an emergency to avoid the loss of lives, property and/or to prevent environmental harm; and

(g) works approved through an EPL, including for works identified in an out of hour's procedure. Any such works would require strong justification, such as necessary due to road or rail possession restrictions.

Construction Noise and Vibration

The project shall be constructed with the aim of not exceeding the construction noise management levels detailed in the Interim Construction Noise Guideline (DECC, 2009).

All feasible and reasonable noise mitigation measures shall be implemented and any activities that could exceed the construction noise management levels shall be identified and managed in accordance with the Construction Noise and Vibration Management Plan developed for the project.

Rock hammering shall not be permitted during the night-time, unless the noise is not more than the Rating Background Level plus 5dBA at any residence or other noise sensitive receiver when occupied or in use.

Note: The Construction Noise Guideline identifies 'particularly annoying' activities that require the addition of 5dB(A) to the predicted level before comparing to the construction Noise Management Levels.

Air borne noise from construction

Within the Sydney CBD noise from construction must not exceed:

- 70dBLAeq, 15minutes during Standard Construction hours, at the external façade of a noise sensitive receiver when in use;
- the Rating Background Level plus 5dBLAeq, 15minutes during the night-time, at the external façade of a noise sensitive receiver when in use,
- 60dBLAeq, 15minutes at any other time, at the external façade of a noise sensitive receiver when in use.

Ground borne noise from construction.

Airborne noise, and ground borne noise from construction other than tunnel boring shall not exceed, whilst a premises is occupied and in use:

- 50dBLAeq, 15minutes, inside commercial premises during Standard Construction hours;
- 45dBLAeq, 15minutes, inside residential premises during the Standard Construction hours;
- 35dBLAeq, 15minutes, inside commercial and residential premises during the night-time.
- 40dBLAeq, 15minutes, inside commercial and residential premises at any other time;

Wherever feasible and reasonable, piling activities shall be undertaken using quieter alternative methods than impact or percussion piling, such as bored piles or vibrated piles.

The Proponent shall consult with potentially-affected community, religious, educational institutions and vibration-sensitive businesses and critical working areas (such as theatres, laboratories and operating theatres) to ensure that noise generating construction works in the vicinity of the receivers are not timetabled during sensitive periods, unless appropriate other arrangements are made.

During construction, proponents of other construction works in the vicinity of the project shall be consulted and reasonable steps taken to coordinate works to minimise impacts on, and maximise respite for, affected sensitive receivers.

Vibration, other than from blasting

The project shall be constructed without exceeding the construction vibration goals for human exposure, the acceptable vibration values set out in the Environmental Noise Management Assessing Vibration: A Technical Guideline (Department of Environment and Conservation, 2006).

Blasting

The airblast overpressure level from blasting operations at the premises must not exceed 120dB (Lin Peak) at any time at any occupied or in use noise sensitive locations. Error margins associated with any monitoring equipment used to measure this are not to be taken into account in determining whether or not the limit has been exceeded.

The Accumulated Peak Level (APL) airblast overpressure from blasting operations at the premises must not exceed 115dB (Lin Peak) at any occupied or in use noise sensitive locations for more than five per cent of the total number of days of blasting. Error margins associated with any monitoring equipment used to measure this are not to be taken into account in determining whether or not the limit has been exceeded.

The Accumulated Peak Level (APL) is to be calculated according to the method in Audible bird scaring devices Environmental Noise Guidelines (October 2007) South Australian Environment Protection Authority. ISBN 978-1-921125-60-7.

Ground vibration peak particle velocity from the blasting operations at the premises must not exceed 10mm/sec at any time at any occupied or in use noise sensitive locations. Error margins associated with any monitoring equipment used to measure this are not to be taken into account in determining whether or not the limit has been exceeded.

Ground vibration peak particle velocity from the blasting operations at the premises must not exceed 5mm/sec at any occupied or in use noise sensitive locations for more than five per cent of the total number of days of blasting. Error margins associated with any monitoring equipment used to measure this are not to be taken into account in determining whether or not the limit has been exceeded.

Blasting is not permitted other than between 9am and 5pm, Monday to Saturday.

Recommended inclusions in the Planning Approval

Demolition and excavation

EPA recommends DPE include in an approval, if issued, appropriate deferred commencement conditions that must be satisfied prior to the consent becoming operative, such as:

The proponent must appoint a suitably qualified and experienced professional engineer (Demolition Professional) and a suitably qualified and experienced acoustic engineer (Acoustic Consultant) who must work together and prepare a Demolition and Excavation Methodology Report, to the satisfaction of the Secretary, DPE. The report must:

- (a) Review the construction methodology of each building or structure to be demolished;*
- (b) Identify and provide alternative demolition and excavation work methodologies that must be used in removing the existing structure in a manner that will comply with the EPA's construction noise and vibration Noise Management Levels. Methodologies that are to be considered include:*
 - Section sawing, slab sawing and wall sawing;*
 - Diamond wire sawing;*
 - Bursting, splitting, fracturing using bursting heads or other consistent means;*
 - Portable or excavator assisted crushing methodologies; and,*
 - Other means aside from excavator mounted or otherwise non-handheld, power actuated percussion hammers or rock breakers.*

The report may not dismiss the use of any of the above in favour of non-handheld percussion hammer equipment for demolition without:

- Identifying the specific floor and section of the building (not generalised) for which non-hand held percussion equipment is proposed to be used.*
- Providing specific written justification as to why each of the methodologies cannot be employed with reference to the specific section of the building in which non-hand held percussion hammers are proposed to be used. If Workplace Health and Safety is to be used as a basis for exclusion of the methodologies, the Demolition Professional must be able to present risk assessment documentation detailing as to why this is the case; and*
- Providing advice from the Acoustic Consultant as to specific (not generalised) acoustic treatment / mitigation in any circumstances where percussion hammers are proposed to be used and demonstrate that it will not exceed the construction noise and vibration management levels at surrounding noise and vibration sensitive receivers when occupied / in use.*

The Report must provide the name, qualifications and experience of the Demolition Professional and Acoustic Consultant and a statement that the methodology reported on encapsulates all feasible and reasonable measures to minimise the environmental noise and vibration impacts of the proposal. The statement must be supported with adequate demonstration that alternative methodologies have been investigated.

Note: Suitably qualified Acoustic Consultant means a person with acoustic expertise to render them eligible for membership of the Australian Acoustical Society at the grade of Member, the Institution of Engineers Australia or the Association of Australian Acoustical Consultants.

The consent will not operate until such time that the Department notifies the applicant that deferred commencement consent conditions, as indicated above, have been satisfied.

Site specific Demolition, Excavation, Construction Noise and Vibration Management Plans must be prepared to the satisfaction of DPE prior to works commencing on site.

Works must be carried out on each site in accordance with the Demolition, Excavation, Construction Noise and Vibration Management Plan.

The proponent must implement the Project Construction Noise Management Strategy.

Operational Noise and Vibration

The proponent shall design and operate the rail line components of the project so that noise from trains travelling along the lines does not generate noise in excess of the airborne and ground-borne noise trigger levels at existing developments, at each stage of the project, as presented in the Rail Infrastructure Noise Guideline (EPA, 2013).

For the purpose of this condition, existing development includes all existing development (built and approved) adjacent to the rail corridor, and development (including subdivisions) approved prior to the determination of this project.

The proponent shall design and operate ancillary infrastructure, such as substations and the like, so that they do not generate noise in excess of the Rating Background Level (RBL) plus 5dBA, free of tones and other potentially annoying characteristics.

The proponent shall prepare an Operational Noise and Vibration Review (ONVR) to confirm noise (air and ground-borne) and vibration control measures that would be implemented for the project. The ONVR shall (but not limited to):

- (a) identify the appropriate operational noise and vibration objectives and levels for adjoining development, including existing sensitive receivers;
- (b) predict the operational noise and vibration impacts at adjoining development based on the final design of the project;
- (c) examine all feasible and reasonable noise and vibration mitigation measures;
- (d) identify specific physical and other mitigation measures for controlling noise and vibration at the source and at the receiver (if relevant) including location, type and timing for the erection of permanent noise barriers and/or other noise mitigation measures;
- (e) include a consultation strategy to seek feedback from directly affected property owners (including educational institutions) on the noise and vibration mitigation measures; and
- (f) procedures for operational noise and vibration complaints management, including investigation and monitoring (subject to complainant agreement).

The proponent shall, prior to the lodgement of the ONVR, derive operational noise targets for fixed facilities (including substations and the train stabling facility) and associated activities and identify these noise targets in the ONVR.

Operational noise targets shall be reviewed within 5 years of the date of any approval of the ONVR and at any subsequent time as required. The review shall have regard to the status of land use planning, any land use changes and the background noise environment within areas adjacent to the fixed facilities at the time of the relevant review. Any proposed changes to the noise targets as a result of the review shall be included in a revised ONVR.

The proponent shall design and operate fixed facilities, including the substations and the train stabling facility with the objective of not exceeding the noise targets. The proponent shall apply mitigation at existing receivers where the noise targets cannot be achieved.

The proponent shall design and operate the project with the objective, where feasible and reasonable, of not exceeding the vibration goals for human exposure for existing receivers, as presented in Assessing Vibration: A Technical Guideline (DECC 2006).

The ONVR is to be independently verified by a noise and vibration expert. The verification will be undertaken at the proponent's expense. The ONVR and independent review is to be submitted for approval prior to commencement of the construction of physical noise mitigation structures, unless otherwise agreed.

The proponent shall implement the identified noise and vibration control measures and make the ONVR publicly available.

The proponent shall undertake a noise and vibration compliance assessment to confirm the predictions of the noise assessment referred to in the ONVR. This shall be undertaken within three months of the commencement of operation of the project, or as otherwise agreed. If the assessment indicates an exceedance of the noise and vibration targets identified in the ONVR, the proponent shall implement further reasonable and feasible measures (where required) to mitigate these exceedances in consultation with the affected property owners.