Victorian Desalination Project

Utilities D&C Environmental Management Plan

Attachment I8 – Noise and Vibration Sub Plan

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Table of Contents

Definition and Acronyms

The following Definitions and Acronyms are used in this document:

Ambient	The ambient noise level is the noise level measured in the absence of the intrusive noise or the noise requiring control. Ambient noise levels are frequently measured to determine the situation prior to the addition of a new noise source.
CWMS	Construction Work Method Statements
D&C	Design and Construct Phase of the VDP
DC-CIP	D&C Community Involvement Plan
dB	Decibel. The unit of sound level.
dBA	A-weighted decibel. The A-weighting approximates the response of the human ear
DEWHA	Department of the Environment, Water, Heritage and the Arts
DSE	Department of Sustainability and Environment
DPI	Department of Primary Industries
EES	Environment Effects Statement
EIRP	Environmental Incident Response Plan
EMP	Environmental Management Plan
Environmental Incident	Any event that causes, has caused or has the potential to cause an Environmental Hazard or Pollution (from section 4, Appendix S3, PS&PR). [Please see the definition of *Environmental Hazard*. Please see the definitions of *Pollution of Atmosphere*, *Pollution of Land* and *Pollution of Waters* for the legislative definitions of 'Pollution' in Victoria.]
EPA	Victorian Environment Protection Authority
EP Act	*Environment Protection Act 1970*
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999*
JHA	Job Hazard Analysis
JSEA	Job Safety and Environmental Analysis
L90	The noise level exceeded for 90% of the measurement period, usually measured in dBA. This is commonly referred to as the background noise level.
Leq	The equivalent continuous sound level. This is commonly referred to as the average noise level and is usually measured in dBA.
Lmax	The maximum noise level. The highest noise level which occurs during the measurement period, usually measured in dBA.
LCpeak	The C-weighted peak noise level measured or estimated at a worker's ear during any noisy event.
Lw (or SWL)	Sound Power Level. The level of total sound power radiated by a sound source.
Noise	Unwanted sound.

Overpressure	The noise from blasting is called overpressure and is measured differently from other environmental noises. The noise level index used is LLin,Peak. This is the linear peak noise level and is a measure of the absolute maximum acoustic pressure. This is not related directly to the noise level as perceived by the human ear, but does relate directly to the ability of the acoustic pressure wave to do damage, either to human hearing or to building structures.
PEM	Protocol for Environmental Management
Performance Criteria	The Performance Criteria outline the overarching requirements based on the environmental objective for each Subject Area of Schedule A of Appendix S3 of the Project Scope and Project Requirements
PPV	The peak particle velocity is a measure of vibration used when assessing risk of property damage.
PR	Performance Requirements
PS&PR	Project Scope and Project Requirements
Sensitive receptors	Sensitive land uses with the potential to be affected by noise from construction, including but not limited to, residences, boarding-houses, child care centres, educational establishments, hospitals, motels, nursing homes, or places of public worship
The State	The Honourable Timothy James Holding, MP, in his capacity as the Minister for Water of the State of Victoria for and on behalf of the Crown in the Right of the State of Victoria
TDJV	Thiess Degrémont Joint Venture
Utilities corridor	Construction footprint of the Victoria Desalination Project transfer pipeline, power supply and associated utilities
VDP	Victorian Desalination Project
VDP Utilities	Collective term used to refer to the power supply, transfer pipeline and communications components of the VDP including compensations reaction stations, surge vessels and the booster pump station. Refer to Section 1.4 of the Utilities Area EMP for further description of these utilities.
Vibration	The oscillating, reciprocating, or other periodic motion of a rigid or elastic body or medium forced from a position or state of equilibrium. Vibration can be measured in terms of its displacement, velocity or acceleration. The common units for velocity are millimetres per second (mm/s).

1 Purpose and scope

This Noise and Vibration Sub Plan describes the existing noise environment and the management measures required to mitigate the potential noise impacts from the design and construction (D&C) of the Victorian Desalination Project (VDP) transfer pipeline and power supply (collectively referred to as the utilities corridor). This sub plan does not specifically include potential noise impacts on worker health and safety, which are addressed in the project-wide OH&S Management Plan.

This sub plan must be read in conjunction with the Environmental Management System (EMS) Manual, D&C Environmental Management Plan (D&C EMP) and the D&C Utilities EMP. This sub plan forms an attachment to the D&C Utilities EMP and addresses requirements listed in the Environmental Compliance Tracker (TDV-0-EV-RP-0001-01), including licence conditions, Performance Requirements (PRs), Performance Criteria (PC) and other obligations which may influence noise and vibration.

Specific management measures from this and other environmental sub plans have been incorporated in to Work Area Packages (WAP) and Work Packs (WP) which include Construction Work Method Statements (CWMS), Site Environmental Plans (SEP) and Job Safety and Environmental Analysis (JSEA's) where applicable.

2 Objectives and Targets

The objective of this sub plan is to ensure there are no health risks or loss of amenity due to noise and vibration during construction and to ensure project objectives, targets and obligations, including PRs and associated criteria, are met.

2.1 Performance Requirements

Table 1 outlines the relevant noise and vibration objectives and targets nominated to be achieved during the D&C phase of the VDP. Numbered entries are applicable performance requirements taken from Schedule A of Appendix S3 of the Project Deed.

Table 1: Environmental objectives, targets and performance requirements

Issue	Objective/Performance Criteria	Target/Performance Requirement
Airborne Noise	**Protect neighbourhood amenity** Minimise impacts from airborne noise During construction, comply with EPA Publication 1254 as well as relevant aspects of EPA Publication 480 and N3/89 for the Desalination Plant. Comply with EPA N3/89 during day and evening, and with State Environment Protection Policy N1 at night-time for the Leased	Develop and implement communication strategy with key stakeholders and the community to manage the impact of construction noise and limit disturbance to local amenity **(PR#24160).** Model and report predicted airborne noise levels during operation to demonstrate that the design meets the performance criteria. As part of the modelling and reporting exercise, include an assessment of tonality and other character adjustments with consideration to the relevant provisions of State Environment Protection Policy N1. If found present, tonality or character adjustments should be eliminated through the

Vibration	Area **(PR#24158). D,C**	detailed design stage. Alternatively reduced noise limits, with consideration to State Environment Protection Policy N1, may be applicable **(PR#24161), D** Develop and implement a noise mitigation strategy for construction activities **(PR#24162).C** Night time construction works outside the provisions of EPA Publication 1254 should be subject to a specific noise mitigation strategy, through consultation with the EPA prior to commencement of works **(PR#24163).C** Monitor and report on airborne noise levels **(PR#24164)C**
	Protect buildings from vibration impacts Compliance with Section 5.5 of EPA Publication 480: Environmental guidelines for major construction sites **(PR#25165). D,C** Minimise damage from vibration caused by construction activities and Desalination plant activities **(PR#25165). D,C**	Develop and implement methods and management systems to protect buildings from vibration impacts **(PR#25167).D,C** Undertake site investigations, property and land surveys and ground and infrastructure condition surveys of vibration generation works prior to and after carrying out vibration generation works on a case-by-case basis for all potentially impacted dwellings **(PR#25168).C** Short-term vibration levels must not exceed 3 – 10mm/s peak particle velocity (frequency dependent limit) at Heritage buildings, 5 to 20 mm/s Peak Particle Velocity (frequency dependent limit) at rural and residential buildings and 20 to 50mm/s peak particle velocity (frequency dependent limit) at commercial or industrial buildings**(PR#25170).D,C**

D = Design phase requirement; C= Construct phase requirement

All Project Deed PRs from Schedule A of Appendix S3 are contained within the D&C Utilities EMP Attachment G – Environmental Obligations Register. The Environmental Compliance Tracker tracks conformance with these PRs and is updated regularly by the TDJV Environmental Coordinator and Area Environmental Managers.

2.2 Noise criteria – nearby sensitive receptors

EPA requirements are that:

Daytime – all reasonable efforts must be made to minimise noise.

Evening – noise limit to be complied with when practicable. If not practicable, impacts to be managed in accordance with EPA publications 1254 and 480..

Night – noise to be inaudible at nearest sensitive receptors when practicable. If not practicable, impacts to be managed in accordance with EPA publications 1254 and 480.

EPA noise limits and acceptable times of operation that support these requirements are described in Table 2 below.

Table 2: Construction noise management – EPA requirements

Period	Day of week	Start time	End time	Noise limit
Day	Mon-Fri	0700hrs	1800hrs	*
	Sat	0700hrs	1300hrs	*
Evening	Mon-Fri	1800hrs	2200hrs	37dBA
	Sat	1300hrs	2200hrs	37dBA
	Sun, Pub holidays	0700hrs	2200hrs	37dBA
Night	Mon-Sun	2200hrs	0700hrs	Inaudible

* No limits are currently prescribed in N3/89 but activity based assessment applies. Limits will be prescribed in *Noise from Industry in Regional Victoria (NIRV)*, a draft guideline for comment issued by EPA Victoria (Publication 1316) in December 2009. Once finalised this will replace N3/89.

2.3 Noise criteria – occupational health and safety

Occupational noise exposure should not exceed LAeq, 8h 85dBA, or peak levels of LCpeak 140dBC. Further guidance can be found in the Occupational Health and Safety Regulations 2007, Statutory Rule No.54/2007.

These criteria are provided for information only and are formally addressed in the project-wide OH&S Management Plan.

2.4 Vibration criteria – nearby sensitive receptors

Project performance requirements state that short term vibration levels must not exceed:

3-10mm/s peak particle velocity (PPV) at heritage buildings

5-20mm/s PPV at rural and residential buildings

20-50mm/s PPV at commercial or industrial buildings

3 Legal, regulatory, licence, permits and approval requirements

This sub plan has been developed in accordance with the following legislation and standards:

- *Environment Protection Act, (1970)*
- EPA Best Practice Environmental Management – Environmental Guidelines for Major Construction Sites (1996) (Publication 480).
- EPA Information Bulletin Noise Control Guidelines TG 302/92 (superseded)
- EPA Technical Guideline 1254 Noise Control Guideline (EPA 1254)
- EPA Interim guidelines for control of noise from industry in country Victoria N3/89

- Noise from Industry in Regional Victoria (NIRV), EPA draft guideline issued for comment December 2009 (Publication 1316)

The legislative and contractual requirements for the D & C utilities corridor are summarised in:

- D&C Utilities EMP – Attachment E – Environmental Legislation Register
- D&C Utilities EMP – Attachment F – Environmental Licence, Permit and Approval Register
- D&C Utilities EMP – Attachment G – Environmental Obligations Register.

The applicable PRs from Project Deed Schedule A of Appendix S3 are provided in Table 1.

Under the Project Deed the D&C EMP, all sub plans and any changes to these must be endorsed by the State, who may refer aspects to relevant agencies.

EPA and any other relevant agencies and stakeholders will be consulted with regard to any specific approval requirements in relation to this sub plan. The requirements of any permits, licences and approvals obtained will be placed in the Environmental Licence, Permit and Approval Register on receipt and updated in the Environmental Compliance Tracker.

4 Existing conditions and issues

The transfer pipeline and power supply corridor traverses predominantly agricultural land between Wonthaggi and Berwick. The northern limit of the transfer pipeline corridor, between Grices Road and Soldiers Road Berwick, is located in an existing Melbourne Water easement through a residential area. The western limit of the power supply easement also traverses a residential area in Cranbourne Narre Warren Road and the Cranbourne Terminal Station.

4.1 Sensitive receptors

Sensitive receptors are residential premises, schools or other location that are susceptible to disturbance from noise or vibration.

Within the agricultural area of the utilities corridor between Wonthaggi and Berwick there are approximately 25 sensitive receptors within 100m of the alignment. The residential sections of the utilities corridor from Grices Road to Soldiers Road in Berwick and Cranbourne Narre Warren Road and the Cranbourne Terminal Station in Cranbourne are surrounded by sensitive receptors.

5 Environmental Risks

An environmental risk assessment has been carried out for the D & C Utilities site. This assessment is contained in the Environmental Risk Register, Attachment C of the D&C Utilities EMP. Table 3 summarises the potential hazards from project activities, potential impacts of these hazards and the risk of occurrence as rated by the environmental risk assessment.

Table 3: Summary of utilities area risk assessment for Noise and Vibration

Activity posing hazard	Risk/ Potential Impact	Inherent Risk (before controls)	Control Measure Reference (Att I08.1)
Excavation, transfer of material and	Potential for noise and vibration to	Low	All (#1-26)

movement of stockpiles and soils	disturb sensitive receptor		

Attachment C of the D&C Utilities Area EMP should be consulted for a comprehensive assessment of these risks.

The following environmental risks are a more detailed subset of the broader potential impact listed in Table 3:

- disturbance to residential premises in the agricultural areas, particularly out of normal work hours
- disturbance to residential premises in the residential areas of Berwick and Cranbourne, particularly out of normal work hours
- disturbance to schools at Cardinia and Berwick
- disturbance to nearby residential premises as a result of night works such as when completing road crossings
- damage to residential premises or other structures as a result of vibration, particularly in close proximity to pipe jacked crossings.

5.1 Potential sources

The major noise and vibration emissions from D & C activities will be related to the use of vehicles, plant and equipment during construction phase of the works as summarised in Table 4. Operational noise is likely to be limited to pumps associated with the Booster Pump Station which will require assessment during design.

Table 4: Major sources of noise and vibration

Activity	Noise	Vibration
General vehicles, plant and equipment	X	
Excavation works	X	X
Sheet piling	X	X
Pipe jacking	X	X
Loading/ unloading activities	X	
Pumps and generators	X	

6 Control, Management and Mitigation Measures

Attachment I8.1 describes a range of mitigation and control measures to be used to minimise and manage potential noise impacts according to the PRs.

The measures in Attachment I8.1 are designed to address potential impacts from the risks outlined in Section 5 as well as deliver on the objectives, targets and in particular the PRs listed in Section 2, They include requirements and responsibilities for design, construction, evaluating performance and reporting.

Attachment I8.1 also references Design Packages (DPs) in design-related control measures. PRs that relate to design are addressed in accordance with the Design Management Plan (PL-TDV-PM-0-X-000-0011-0-00).

7 Site environmental plans

Site Environmental Plans (SEPs) have been developed for the Utilities corridor that detail practical environmental management measures implemented to minimise potential impacts of construction activity on the environment and community.

The information contained in the SEPs is presented in pictorial and tabular drawing format. This is to make them easy to use by all site personnel, consultants and subcontractors. SEPs are updated to reflect operating practices on a regular basis.

The noise management controls set out in the SEPs are drawn from this sub plan. Additional practical management measures are picked up and covered by the Weekly Environmental Checklist.

SEPs are held by Area Environment Managers.

8 Evaluating performance and reporting

Monitoring of construction noise and vibration will be undertaken:

- Prior to commencement of works to establish baseline conditions
- Of each major work front to characterise the high noise or vibration profile (such as clear and grade, mainline pipelay, sheet piling, pipe jacking etc)
- In response to complaints, where the complaint may have some basis, and when there a substantial changes in the level of noise or vibration generating activity. Additional monitoring is to be recorded using the Utilities Noise Monitoring Record Sheet (FM-TDV-EN-2-X-000-0005).

Condition surveys of nearby buildings (such as Dilapidation Surveys) will be undertaken as outlined in the D&C Community Involvement Plan (DC-CIP).

Environmental audits and site environmental inspections (SEIs) are scheduled to detect where PRs are not being met with appropriate corrective actions developed to address these issues as they arise. Schedules, responsibilities and reporting procedures for noise and vibration monitoring are set out in the Monitoring, inspection, audit and reporting schedule - Attachment L of the D&C Utilities EMP.

Monitoring will be undertaken by appropriately qualified personnel, in accordance with the appropriate standards and guidelines as specified in Attachment L of the D&C Utilities Area EMP. Monitoring equipment will be calibrated in accordance with relevant Australian Standards. Where monitoring identifies levels exceeding the targets specified in this sub plan, contingency measures will be followed (see Section 9).

9 Contingency measures

Contingency measures have been developed and are summarised below. The control measures table (Attachment I8.1) focuses on preventative measures. These include such measures as monitoring the success of revegetation and responding accordingly.

All environmental incidents will be responded to in accordance with the Utiltiies Environmental Incident Response Procedure (EIRP) (PR-PLV-PM-3-X-000-0001-00-00). The EIRP provides project specific details for the identification of and response to potential environmental related incidents along the utilities corridor during the D&C phase of the VDP. It provides guidance on strategies to manage potential and actual incidents, as well as follow-up and reporting requirements.

Various circumstances may occur that may result in excessive noise and vibration impacts to sensitive receptors. This may include:

- Works that occurs in close proximity to sensitive receptors include residential properties
- Works that include very high noise or vibration activities such as sheet piling
- Works that cannot be completed during normal working hours such as road crossing or emergency works.

Sensitive receptors will be notified of the timing of the above works. However, should excessive noise and vibration result in a complaint, or noise/ vibration monitoring results indicate a likely exceedance of the of the construction noise limits, the contingency procedure in Figure 1 will be followed.

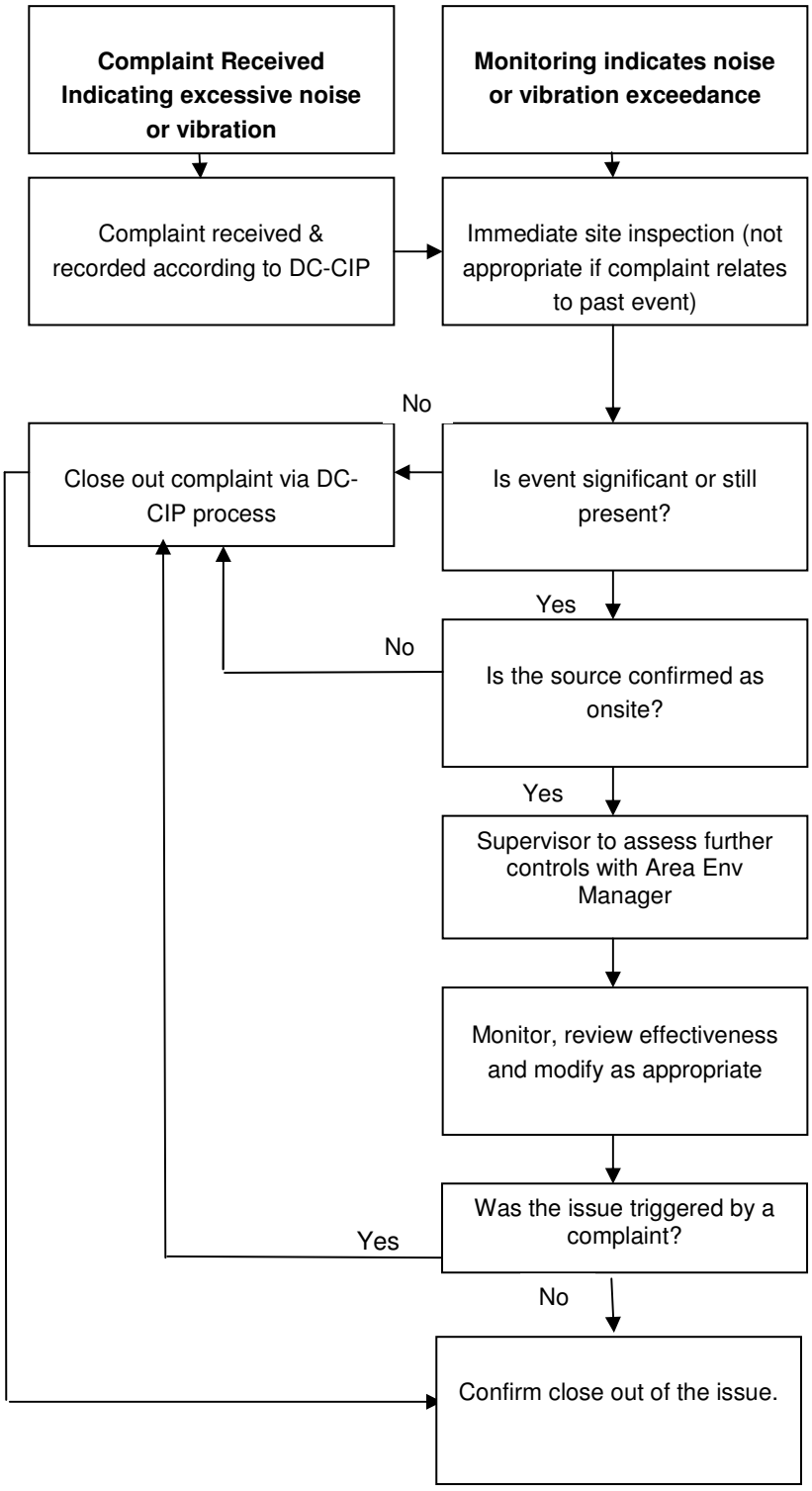

Figure 1: Excessive noise or vibration – contingency procedure

Figure 1: Excessive noise or vibration – contingency procedure

10 References

10.1 VDP Documents

Environment Effects Statement, Volume 3, Chapter 9

Minister of Planning VDP Assessment under the Environment Effects Act 1978, (Jan 2009)

Environment Effects Statement, Technical Appendix 76, GHD 2008

10.2 Technical/ legislative documents

GHD (2008) Impact Assessment Report – Noise and Vibration (Transfer Pipeline), GHD, Melbourne, Victoria (Appendix 66).

10.2.1 Noise

EPA Victoria Environmental Guidelines for Major Construction Sites, publication 480 (1996)

Interim Guidelines for the Control of Noise from Industry in Country Victoria, EPA Victoria, Publication N3/89, April 1989 (Referred to hereafter as N3/89)

Noise from Industry in Regional Victoria (NIRV), draft guideline for comment, EPA Victoria Publication 1316, December 2009 (Scheduled to replace N3/89)

State environment protection policy (Control of Noise from Commerce, Industry and Trade) No. N-1 (SEPP-N1)

EPA Technical Guideline 1254 Noise Control Guideline (EPA 1254)

EPA Victoria – A guide to the measurement and analysis of noise (EPA Publication 280, 1991)

Australian Standard AS 1055.1 – 1997 Acoustics – Description and Measurement of Environmental Noise (AS 1055.1 – 1997)

International Standard ISO 9613-2:1996 Acoustics – Attenuation of sound during propagation outdoors – Part 2: General method of calculation

ISO4872 Acoustics – Measurement of airborne noise emitted by construction equipment intended for outdoor use; Method for checking compliance with noise limits

ISO3744:1994 Acoustics – Determination of sound power levels of noise sources using sound pressure – Engineering method in an essentially free field over a reflecting plane

AS2012.1-1990 Acoustics – Measurement of airborne noise emitted by earth moving machinery and agricultural tractors – Determination of compliance with limit for exterior noise

AS2436-1981 Guide to the noise control of construction maintenance and demolition sites

AS1217 Acoustics – Determination of sound power levels of noise sources. Part 5 – Engineering Method and Part 7 – Survey Method.

10.2.2 Vibration

NSW Department of Environment and Climate Change (DECC) Assessing Vibration: A Technical Guideline (2006)

AS2670.2 Evaluation of human exposure to vibration. Part 2 – Vibration in buildings (1-80Hz)

British Standard BS7385-2:1993 Evaluation and Measurement for Vibration in Buildings, Part 2 – Guide to damage levels from ground-borne vibration

German Standard DIN 4150-3:1999 Structural Vibration – Part 3: Effects of vibration on structures

ATTACHMENT I8.1 NOISE AND VIBRATION – CONTROL MEASURES TABLE

ATTACHMENT I8.1 NOISE AND VIBRATION – CONTROL MEASURES TABLE

#	Issue	PR # addressed	Control Measure	Responsibility *	Project Phase	Evidence	Audit Check
	Noise						
1	Strategic Controls	24164	Undertake baseline noise surveys in the vicinity of the utilities corridor prior to the commencement of construction activities.	Area Environment Manager	Design	Monitoring records	
2	Strategic Controls	24164	Undertake site investigations, property and land surveys and ground and infrastructure condition surveys of all structures within 50m of the utilities corridor prior to and after carrying out vibration generation works on a case-by-case basis for all potentially impacted dwellings.	Area Environment Manager	Construct	Monitoring records, consultant reports	
3	Strategic Controls	24158	Model and report predicted construction noise levels to inform strategies for compliance with the performance criteria.	Noise Consultant, Design Package Manager	Design	Consultants report	
4	Night time noise	24163	Night-time construction works outside the provisions of EPA 1254 are subject to a specific noise mitigation strategy, developed through consultation with the project acoustic consultant and EPA prior to commencement of works. With regard to excessive evening and night-time noise management: • The works to be undertaken should be identified and described, including the duration and times of day of the works. In particular, 'unavoidable works' should be identified in accordance with EPA publication 1254. • Specific noise mitigation strategies should be identified. In particular, 'low-noise or managed-impact works' should be identified in accordance with EPA publication 1254. • Any relevant authorities should be consulted.	Construction Manager	Design	EPA-approved strategy, meeting minutes	

#	Issue	PR # addressed	Control Measure	Responsibility *	Project Phase	Evidence	Audit Check
5	Noise surveys	24164	Complete attended noise surveys of main work activates within two weeks of the commencement of each activity to determine noise and vibration related restrictions for works in close proximity to sensitive receptors. Activities to be measures to include clear and grade, mainline and crossing pipe lay, sheet piling and pipe jack crossing.	Area Environment Manager	Construct	Monitoring records, consultant reports	
6	Equipment Controls	24158	All pneumatic tools operated near a residential area must be fitted with an effective silencer on their air exhaust port.	Construction Manager	Construct	Inspection records	
7	Equipment Controls	24158	All mechanical plant must be silenced by best practical means using current technology. For example, noise suppression devices should be maintained to the manufacturer's specifications and internal combustion engines are to be fitted with a suitable muffler in good repair.	Construction Manager	Construct	Inspection records	
8	Work methods	24158 24162	Review work methods with a preference for quieter and non-vibration-generating methods wherever possible. This is essential for any night-time activities.	Construction Manager	Construct	CWMS	
9	Equipment Controls	24158	Review fixed and mobile equipment fleet with a preference for less noisy equipment wherever possible. Equipment used on site will be in good condition and good working order.	Construction Manager	Construct	Inspection records	
10	Locating noisy equipment	24158	Fixed equipment (i.e. pumps, generators, compressors) should be located as far as possible from the nearest residences or screened by temporary barriers or acoustic enclosures.	Construction Manager	Construct	Site Environmental Plan	
11	Equipment labelling	24158	Noise Labels are required to be affixed to new mobile air compressors and pavement breakers. The unit with the lowest noise rating which meets the requirements of the job should be used	Construction Manager and Site Manager	Construct	Inspection records	

#	Issue	PR # addressed	Control Measure	Responsibility *	Project Phase	Evidence	Audit Check
12	Loading/ unloading areas	24158	Whenever possible, loading and unloading areas should be located as far as possible from the nearest residences or screened by temporary barriers or acoustic enclosures.	Site Manager	Construct	Site Environmental Plan	
13	Management Controls	24158	Equipment which is used intermittently should be shut down when not in use.	Construction Manager	Construct	Inspection records	
14	Management Controls	24158	All engine covers should be kept closed while equipment is operating.	Construction Manager	Construct	Inspection records	
15	Induction	24162	All site workers (including subcontractors and temporary workforce) to be inducted regarding the potential for noise and vibration impacts upon local residents and encouraged to take all practical and reasonable measures to minimise noise during the course of their activities.	Site Manager	Construct	Induction & training records	
16	Limiting working hours	24158, 24163	General work hours shall be: – 7:00am to 6:00pm Monday to Friday – 7:00am to 3.30pm Saturdays – Where noisy of high vibration activities are proposed for after 1.00pm on Saturdays or outside of these hours, contingency measures including communication with nearby sensitive receptors will be initiated.	Site Manager	Construct	Inspection records	
17	Management Controls	24158 24160	Documentation justifying out-of-hours work should be maintained and authorised by site management. Local residents potentially affected by such activities should be notified beforehand.	Site Manager & Stakeholder and Community Relations Manager	Construct	Daily log and correspondence records	
18	Communicati on strategy	24160	Develop and implement a communication strategy with the key stakeholders and the community to manage the impacts of construction noise and limit disturbance to local amenity. Details included in the Community Involvement Plan (CIP).	Stakeholder and Community Relations Manager	Design	CIP and Stakeholder meeting records	

#	Issue	PR # addressed	Control Measure	Responsibility *	Project Phase	Evidence	Audit Check
19	Community Liaison		Inform local residents about the construction program and progress on a regular basis, particularly when noisy or vibration-generating activities are planned, and prior to commencement of each phase with targeted discussion about noise impact minimisation.	Stakeholder and Community Relations Manager	Construct	Stakeholder meeting records	
20	Community Liaison	24160	Set up a community liaison 24-hour phone number and permanent communications officer so that noise and/or vibration related complaints can be received and addressed in a timely manner. Details included in the Community Involvement Plan	Stakeholder and Community Relations Manager	Construct	CIP and complaints register	
	Vibration						
21	Vibration surveys	25166, 25168	Undertake baseline vibration surveys at selected sites prior to the commencement of construction activities	Area Environment Manager	Design	Monitoring records	
22	Vibration surveys	25166, 25167, 25169, 25170	Complete attended vibration surveys of main work activates within two weeks of the commencement of each activity to determine noise and vibration related restrictions for works in close proximity to sensitive receptors. Activities to be measures to include clear and grade, mainline and crossing pipe lay, sheet piling and pipe jack crossing.	Area Environment Manager and Site Manager	Construct	Monitoring records	
23	Blasting	25169	No blasting will be undertaken throughout the project.	Site Manager	Construct	Daily logs	
24	Dilapidation reports	25168	Dilapidation reports will be prepared of all structures within 50m of the transfer pipeline prior to the commencement of works and following completion in that section of the corridor. Details included in the Community Involvement Plan.	Site Manager	Design	Reports	
25	Community Liaison	25165	Develop and implement a communication strategy (Details included in the Community Involvement Plan) with the key stakeholders and the community to manage the impacts of construction vibration and limit disturbance to local amenity	Stakeholder and Community Relations Manager	Design	CIP and Stakeholder meeting records	

#	Issue	PR # addressed	Control Measure	Responsibility *	Project Phase	Evidence	Audit Check
26	Design vibration controls	25167	The following design package incorporate methods and management systems to protect nearby buildings from vibration impacts: DP 0-0200 Project Wide Noise Control	Design Package Manager	Design	Verified designs	

* The *Responsibilities* column refers in many cases to senior positions within the project organisation, due to the changing nature of project teams. In practice some responsibilities may be delegated by the person nominated.