Upper South Creek

Advanced Water Recycling Centre and Pipelines

Noise and Vibration Construction Monitoring Report

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Revisions and Distribution

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Revisions

Draft issues of this document shall be identified as Revision 01, 02, 03 etc. Upon initial issue (generally Contract Award) this shall be changed to a sequential number commencing at Revision A. Revision numbers shall commence at Rev. A, B etc.

Date	Rev	Remarks	Section	Prepared By	Reviewed By & Approved By
25/11/2024	0	Initial version for review	All	Ryan Maxwell	Alyce Harrington
06/01/2025	1	Updated to include AA, SW and ER comments	Various	Ryan Maxwell	Alyce Harrington

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1 Background

The Upper South Creek Advanced Water Recycling Centre and Pipelines project (the project) has been proposed to support the population growth and economic development of the Western Sydney Aerotropolis Growth Area (WSAGA or Aerotropolis), South West Growth Area (SWGA) and the new Western Sydney International Airport. The project will provide wastewater services to Western Sydney to produce high-quality treated water for non-drinking reuse and for release to local waterways.

The project comprises of the following components:

- A new Advanced Water Recycling Centre (AWRC) to collect wastewater from businesses and homes and treat it, producing high-quality treated water, renewable energy and biosolids for beneficial reuse
- A new green space area around the AWRC, adjacent to South Creek and Kemps Creek, to support the ongoing development of a green spine through Western Sydney
- New infrastructure from the AWRC to South Creek, to release excess treated water during significant wet weather events, estimated to occur about 3 – 14 days each year
- A new treated water pipeline from the AWRC to Nepean River at Wallacia Weir, to release high-quality treated water to the river during normal weather conditions
- A new brine pipeline from the AWRC connecting into Sydney Water's existing wastewater system to transport brine to the Malabar Wastewater Treatment Plant
- A range of ancillary infrastructure.

2 Purpose

This Noise and Vibration Construction Monitoring Report (NVMR) has been prepared to:

- validate the impacts of noise and vibration predicted for the project
- measure the effectiveness of environmental controls and implementation of the CEMP (specifically the Noise and Vibration CEMP Sub Plan (NVCSP) and the Noise and Vibration Monitoring Program (NVMoP))
- address approval requirements in accordance with CoA C18.

In accordance with the NVMoP (Appendix E of the NVCSP), monitoring reports are to be prepared on a bi-annual basis (every 6 months) in response to noise and vibration monitoring undertaken during the reporting period and will capture the following details.

- The location and description on monitoring undertaken.
- A tabulation of results (e.g., for noise including Lmax, L10, L90 LAeq noise levels) together with notes identifying the principal sources and operations.
- Summary of any measurements exceeding the nominated criteria and descriptions of the plant or operations causing the exceedances.
- Details of any corrective actions and confirmation of their successful implementation.

Construction Monitoring Reports will be provided to the Department of Planning, Housing and Infrastructure (DPHI), the Environmental Protection Authority (EPA) and relevant councils for information, in accordance with CoA C18. The report will also be provided to the Environmental Representative (ER) and Acoustic Advisor (AA) (Appendix 2). In line with CoA C18, the following report details the noise and vibration records from March 2024 to August 2024 (inclusive).

3 Construction Activities During Reporting Period

Activities undertaken at AWRC throughout the reporting period are as follows.

- Clearing and Grubbing
- Bulk Earthworks
- Structure Construction Works including:
  - Piling Works
  - Steel fixing
  - Installation of structural elements
  - Form, reo, pour (FRP) works
  - Concrete pours.

Activities undertaken on pipelines throughout the reporting period are as follows.

- Clearing and grubbing
- Potholing
- Open-trench excavation
- Horizontal directional drilling (HDD)
- Pipe installation
- Trench backfilling and surface reinstatement
- Instream works particularly at Oaky Creek, Cosgroves Creek and South Creek
- Construction of the Nepean River discharge structure
- Rehabilitation.

4 Noise & Vibration Monitoring

4.1 Noise Monitoring

4.1.1 Noise Monitoring Methodology

Noise monitoring and assessment has been undertaken and recorded in accordance with the NVMoP and relevant noise measurement requirements in the reference standards listed below:

The main guidelines, specifications and policy documents relevant to this NVMR include:

- NSW EPA 2022. Approved methods for the measurement and analysis of environmental noise in NSW
- NSW Interim Construction Noise Guideline (ICNG), Department of Environment and Climate Change 2009;
- NSW Road Noise Policy, Department of Environment, Climate Change and Water 2011;
- Noise Policy for Industry, Environment Protection Authority 2017;
- NSW Assessing Vibration – a technical guideline, Department of Environment and Conservation 2006;
- Australian Standard 2659.1 – 1998 Guide to the use of sound measuring equipment – portable sound level meters;
- Australian Standard IEC 61672.1 Electroacoustic – Sound Level Meters – Specifications;
- Australian Standard 2775 Mechanical Mounting of Accelerometers;
- Australian Standard 1055 Acoustics – Description and Measurement of Environmental Noise;
- Australian Standard AS/NZS 2107:2016 Acoustics - Recommended design sound levels and reverberation times for building interiors;
- Australian Standard 2834-1995 Computer Accommodation, Chapter 2.9 Vibration;
- Australian Standard AS 2187.2 Explosives - Storage and use - Part 2 Use of explosives;
- Australian Standard AS2436-1981 Guide to Noise Control on Construction, Maintenance and Demolition Sites;
- British Standard BS 6472-2008, 'Evaluation of human exposure to vibration in buildings (1-80Hz);
- British Standard 7385: Part 2-1993 'Evaluation and measurement of vibration in buildings;
- German Standard DIN4150-2016 Structural vibration Part 3: Effects of vibration on Structures.

Attended monitoring of construction noise levels has been undertaken during the reporting period as follows:

- At locations identified as part of noise prediction assessments;
- Monitoring has been carried out at the commencement of activities for which a location and activity specific noise and vibration impact assessment has been prepared to confirm predicted values;
- In response to noise related complaints;
- As required by the CNVIS and/or EPL;
- Ongoing spot checks for noise intensive plant and equipment;

Each noise monitoring period has covered a representative period of the construction activity for which verification has been carried-out.

Where possible, monitoring has been undertaken at the most affected noise sensitive receiver's location in proximity to the Project's construction activities. Noise monitoring locations have considered factors including:

- The location of previous monitoring sites;
- The proximity of the receiver to a Project worksite;
- The sensitivity of the receiver to noise;
- Background noise levels; and
- The expected duration of the impact.

Monitored noise levels have been analysed against the predictions made in the relevant CNVIS or using the Project's predictive tools, this analysis is provided in Section 4.3 below.

4.1.2 Monitored Parameters and Record Keeping for Noise Monitoring

All environmental noise monitoring was taken with the following noise meter settings:

- Time Constant: Fast (i.e. 125 milliseconds);
- Frequency Weightings: A-weighting; and
- Sample period: 15 minutes.

Environmental noise monitoring (excluding spot checks of plant and equipment) was recorded over 15-minute sample intervals. The range of noise metrics stored in the memory of the noise meter on each occasion includes the following A-weighted noise levels: L_{A90}, L_{Aeq}, L_{A10}, $L_{A\,(min)}$ and $L_{A(max)}$.

Duration of monitoring periods for spot checks of noise intensive plant and equipment depended on the source of noise being monitored.

Measurements have been recorded on a field data collection form.

4.1.3 Calibration, QA and Competency for Noise Monitoring

Noise monitoring has been carried out in accordance with the EPA's *Approved Methods for the Measurement and Analysis of Environmental Noise in NSW* (Approved Methods).

All monitoring has been undertaken by competent personnel, suitability certified, trained and experienced in undertaking noise measurements.

Noise monitoring equipment used throughout the reporting period was a Type 1 instrument as per the Approved Methods. The noise meters and calibrators which were used are detailed below:

- NL-53EX Sound Level Meter x2
- NC-75 Acoustic Calibrator x2.

The noise monitor and calibrator used have been calibrated in a NATA accredited laboratory prior to use. Calibration certificates can be found in Appendix 1. The calibration of the monitoring equipment is also checked in the field before each noise measurement period.

All outdoor noise measurements have been undertaken with a windscreen over the microphone and measurements of noise have been disregarded when rain adversely affects the measurement and/or the wind speed has been greater than 5 m/s at the microphone (18 km/h).

4.2 Vibration Monitoring

4.2.1 Vibration Monitoring Methodology

Vibration monitoring and assessment has been undertaken in accordance with the NVMoP and relevant vibration measurement requirements in the reference standards listed below:

Attended vibration monitoring has been undertaken during the reporting period as follows:

- At the commencement of operation for each activity on site, which had the potential to generate significant vibration levels as determined by a vibration assessment;
- At the commencement of vibration generating activities that have the potential to impact on heritage items to confirm the minimum working distances to prevent cosmetic damage;
- Where vibration sensitive locations have been determined to fall within the 'minimum working distances' established for each item of plant;
- In response to a vibration related complaints.

Vibration monitoring has been undertaken in accordance with the relevant vibration measurement requirements in the reference standards and documents in Section 4.1.1.

On each occasion of vibration monitoring during the reporting period:

- Vibration monitoring equipment has been placed outside at the footings or foundations of the building of interest, closest to the vibrating plant;
- Where possible, the surface has been solid and rigid to best represent the vibration entering the structure under investigation;
- The vibration sensor has not been mounted on loose tiles, loose gravel or other non-resilient surfaces;
- The vibration sensor has been directly mounted to the vibrating surface using bees wax; and
- Where a suitable mounting surface has been unavailable at the Upper Canal, a metal stake of 300mm in length was driven into solid ground adjacent to the structure and the vibration sensor has been mounted on that. It's also noted that the Upper Canal is a heritage listed structure.

Monitored vibration levels have been analysed against the predictions made in the relevant CNVIS.

4.2.2 Monitored Parameters and Record keeping for Vibration Monitoring

Vibration data has been processed statistically and stored in memory before being transferred to records. The vibration metrics stored in memory include the following:

- Root-Mean-Square acceleration (RMS);
- Vector-sum peak-particle velocity (PPV).

All short term attended vibration monitoring has been recorded over a representative sampling interval where the worst-case vibration levels have been captured. Where unattended vibration monitoring has been required, monitoring has been undertaken continuously whilst the vibrating plant has been operational to capture the worst-case vibration levels.

4.2.3 Calibration, QA and Competency for Vibration Monitoring

All monitoring has been undertaken by competent personnel, suitability trained and experienced in undertaking vibration measurements.

All vibration instruments have been calibrated in accordance with manufacturers specifications or relevant Australian Standards. Monitoring equipment used during the reporting period are listed below and records of monitoring equipment calibration are found in Appendix 1:

- Meter - Svan-958A
- Transducer – SV 84.

4.3 Noise Monitoring Results

4.3.1 AWRC

Table 1 below sets out the results of construction noise monitoring events at the AWRC site between March 2024 and August 2024 (inclusive). An assessment of the results is given in Section 4.3.2 below. Due to difficulty gaining access to the nearest residential properties surrounding the AWRC site,146B Clifton Avenue (South of site) and 203-229 Clifton Avenue (East of site), monitoring has been carried out at Sitehives established at the southernmost and easternmost points of the site. The distance from these monitoring points to the nearest residential receivers has been ascertained to develop a corresponding NML when monitoring at these locations i.e. 60dB recorded at the Sitehive located at the AWRC Car Park (approximately 100m to the east of the AWRC active construction site) will result in 45dB at the nearest sensitive receiver 203-229 Clifton Avenue due to the distance of 460m from the Car Park Sitehive to the resident. Similarly, 60dB measured at the SiteHive located near the Inlet (approximately 10m to the south of the AWRC active construction site) will result in 45dB at the nearest sensitive receiver 146B Clifton Avenue. The locations of these Sitehives in relation to their nearest sensitive receiver is shown below in Figure 1.

Figure 1: Location of nearest sensitive receivers to AWRC and Monitoring Points

Table 1: Results of noise verification undertaken between March 2024 and August 2024 (inclusive) for the AWRC Site

NCA	Location of Monitoring	Date	Distance to Works	Construction Activities on Site	Predicted Noise Level (Leq, 15min)		Measured Noise Level				Compliant Y/N	Comments
					At Receiver	At Site Hive	Leq, 15min	Lmax	L90	L10		
T1	Site Hive Carpark	7/03/2024*	200m	Bioreactor concrete pour	41	53	43	62	41	45	Y	Monitoring undertaken at the SiteHive
T1	Site Hive Carpark	7/03/2024*	200m	Spoil Delivery	43	58	45	63	42	45	Y	Monitoring undertaken at the SiteHive
T1	Site Hive Carpark	23/04/2024*	200m	Concrete Pour	41	53	50	65	48	52	Y	Monitoring undertaken at the SiteHive. Concrete trucks arriving to site. Dominant noise source was insects
T1	Site Hive Inlet	24/04/2024*	15m	Structural Works	36	66	65	85	54	68	Y	Monitoring undertaken at the SiteHive. LV's driving around site passing the monitoring point.
T1	Site Hive Carpark	9/05/2024	150m	Structural Works	42	53	48	64	45	50	Y	Monitoring undertaken at the SiteHive. General works being undertaken, LV's driving past intermittently.
T1	Site Hive Inlet	14/05/2024*	10m	Concrete Pour	41	67	62	85	53	65	Y	Monitoring undertaken at the SiteHive. General works being undertaken, LV's driving past intermittently.
T1	Site Hive Carpark	14/05/2024*	150m	Concrete Pour	41	53	52	81	45	51	Y	Monitoring undertaken at the SiteHive. Concrete works being undertaken, LV's driving past intermittently. Background noise (insects, birds, frogs)dominant noise source.
T1	Site Hive Carpark	16/05/2024*	100m	Concrete Pour	43	58	49	81	44	49	Y	Monitoring undertaken at the SiteHive. Concrete works being undertaken.
T1	Site Hive Carpark	18/05/2024*	100m	General Construction	43	58	47	63	43	50	Y	Monitoring undertaken at the SiteHive. General works being undertaken.
T1	230-234 Clifton Ave	19/05/2024*	550m	Earthworks	40	n/a	51	71	37	50	Y^	Non-construction traffic dominant noise source and the cause of the exceedance.

NCA	Location of Monitoring	Date	Distance to Works	Construction Activities on Site	Predicted Noise Level (Leq, 15min)		Measured Noise Level				Compliant Y/N	Comments
					At Receiver	At Site Hive	Leq, 15min	Lmax	L90	L10		
T1	Site Hive Carpark	23/05/2024*	200m	Concrete Pour	43	58	51	67	47	53	Y	Monitoring undertaken at the SiteHive. Concrete works being undertaken. Concrete trucks arriving to site.
T1	Site Hive Carpark	24/05/2024*	200m	Concrete Pour	36	52	51	69	47	52	Y	Monitoring undertaken at the SiteHive. Concrete works being undertaken. Concrete trucks arriving to site.
T1	Site Hive Carpark	24/05/2024*	200	Concrete Pour	36	52	51	72	47	52	Y	Monitoring undertaken at the SiteHive. Concrete works being undertaken. Concrete trucks arriving/leaving site.
T1	Site Hive Carpark	31/05/2024*	150m	General Construction	40	51	50	77	43	48	Y	Monitoring undertaken at the SiteHive. Concrete works being undertaken. Concrete trucks arriving/leaving site.
T1	Site Hive Carpark	7/07/2024*	100m	Clean up - Vac Truck	41	51	48	66	42	51	Y	Monitoring undertaken at the SiteHive. Vac truck in use.
T1	230-234 Clifton Ave	13/07/2024*	550m	General Construction / Solar	40	n/a	56	77	38	54	Y^	Construction works not audible. Background noise generated from non-construction traffic.
T1	Site Hive Carpark	18/07/2024*	150m	OSOM	36	53	52	72	46	53	Y	Monitoring undertaken at the SiteHive. Arrival of OSOM vehicles.

* Monitoring which occurred outside standard construction hours
^ Exceedance of predicted value however not caused by Project construction, refer to 'Comments'

4.3.2 Assessment of noise monitoring results at AWRC

Noise verification monitoring was carried out at the AWRC on 17 occasions during the reporting period which were predominantly undertaken for concrete pours, structural steel works and oversized/overmass (OSOM) deliveries outside standard construction hours in accordance with an OOHW Permit. Monitoring events were predominantly within the predicted levels of the associated noise and vibration impact assessment. Where an exceedance of predicted levels was identified, these have been determined to be related to external factors not relating to construction noise. No non-compliances were identified.

Monitoring was predominantly conducted at the closest SiteHive due to access restrictions at the nearest resident. The following equation was used to determine the noise limit at the Site Hive and resident in consultation with the Project Acoustic Advisor.

$$L_p = L_W - 20\log_{10}(r) - 8\ \text{dB}$$

4.3.3 Brine and Treated Water Pipeline

Table 2 below sets out the results of construction noise monitoring events at both the Brine and Treated Water Pipelines between March 2024 and August 2024 (inclusive). An assessment of the results is given in Section 4.3.4 below.

Table 2: Results of noise verification undertaken between March 2024 and August 2024 (inclusive) for the Pipelines

NCA	Location of Monitoring	Date	Construction Activities on Site	NML	Predicted Noise Level (Leq, 15min)	Measured Noise Level				Compliant	Comments
						Leq, 15min	Lmax	L90	L10		
B09	1 Katinka St	5/03/2024*	Trenching	45	89	86	94	63	91	Y	Non-construction vehicles passing by. Noise blankets in use.
B06	339 N Liverpool Rd	6/03/2024*	Trenching	5	86	88	95	77	92	Y^	Non-construction vehicles passing by. Noise blankets in use, frequent pedestrians. Due to access issues, had to noise monitor closer to noise source (<7m) rather than at the receiver which was the cause of the exceedance.
B06	339 N Liverpool Rd	6/03/2024*	Trenching	45	86	75	81	70	78	Y	Non-construction vehicles passing by. Noise blankets in use for roadsaw.
B06	339 N Liverpool Rd	6/03/2024*	Trenching	45	86	89	98	62	93	Y^	Noise blankets in use, frequent pedestrians. Due to access issues, had to noise monitor closer to noise source (<7m) rather than at the receiver which was the cause of the exceedance.
B2	120 Cross St	14/03/2024*	Pipe Install / backfill	45	75	57	72	54	59	Y	General works being undertaken, monitoring approx. 25m from works.
B16	47 Willowbank Crescent	27/03/2024	Trenching and loading material into truck and dog	60	73	60	78	52	62	Y	Dominant noise source non-construction related i.e. traffic, pedestrians, motorbikes etc.
B10	6 Meadows Rd	27/03/2024	Trenching and loading material into truck and dog	65	72	75	89	66	78	Y^	Dominant noise source non-construction related i.e. traffic, pedestrians, motorbikes etc. Exceedance not caused by construction.
B5	C10 - 25m from 77 Edinburgh Circuit	2/04/2024*	Worker mobilisation and plant leaving site	50	76	56	68	55	57	Y	Truck in use, non-construction traffic from Cowpasture Road dominant noise source.
B5	C10 - 25m from 77 Edinburgh Circuit	2/04/2024*	Truck and dog returning to site to dump material then leave site	45	76	52	72	46	52	Y	Truck in use, non-construction traffic from Cowpasture Road dominant noise source.
B12	203 John St (east)	21/04/2024*	HDD works	55	95	74	92	70	76	Y	HDD works occurring however frequent pedestrian and non-construction traffic.
T5	C6 Entry gate	17/04/2024*	Background compound monitoring	50	N/A	58	79	50	60	N/A	Background only – Frequent vehicle passing on Park Road, constant insect and frog noises (moderate impact, vehicle noise greater impact).

NCA	Location of Monitoring	Date	Construction Activities on Site	NML	Predicted Noise Level (Leq, 15min)	Measured Noise Level				Compliant	Comments
						Leq, 15min	Lmax	L90	L10		
B5	Park opposite 111 Feodore St	16/04/2024*	Grinding and FRP works	54	88	66	73	65	66	Y	Works in preparation for concrete pour. Non-construction traffic noise the dominant noise source.
B5	Park opposite 109 Feodore St	15/04/2024*	Trenching and pipe installation	54	85	69	90	59	72	Y	Truck unloading ashpalt, with movement around site to allow for busses to pass.
B5	Between 109 and 111 Feodore St	15/04/2024*	Trenching and pipe installation	54	85	65	82	63	65	Y	Noise blankets between monitor and works on ATF fencing spanning length of work area, infrequent buses passing.
B7	107 Montgomery St	13/04/2024*	HDD works	60	78	78	97	72	83	Y	Frequent non-construction vehicles passing on opposing side of works causing spikes, excavator working close to noise monitoring location.
B7	107 Montgomery St	13/04/2024*	HDD works	60	78	69	92	63	72	Y	Frequent non-construction vehicles passing on opposing side of works causing spikes, excavator working close to noise monitoring location.
B10	607 Cabramatta Rd	1/05/2024*	Pumping water and excavation	50	87	70	87	62	71	Y	Frequent non-construction traffic passing (minor to moderate impact) which was the dominant noise source.
B16	11 Willowbank Cres	2/05/2024*	clearing	45	80	61	72	53	64	Y	Non-construction traffic levels high and the dominant noise source.
B16	11 Willowbank Cres	2/05/2024*	clearing	45	75	55	67	49	58	Y	Non-construction traffic levels high and the dominant noise source.
B14	Cabravale Leisure Centre	6/05/2024*	ATF setup	70	44	54	73	49	55	Y^	Non-construction vehicles driving through carpark constantly, frogs present in area, rain started close to end of monitoring increasing the dB reading. Exceedance caused by non-construction noise sources.
B17	Lansdowne Reserve access track	31/05/2024*	Kemmfix installation	55	45	68	86	55	70	Y^	Non-construction vehicles and heavy traffic along Henry Lawson Dr constant, works barely audible over general traffic. Exceedance caused by non-construction noise sources.
B16	Behind 9 Willowbank Cres	29/06/2024*	HDD works	55	47	60	68	56	62	Y^	Construction works inaudible over traffic from Hume Highway. Exceedance caused by non-construction noise sources.
B6	1 Marriott Rd	5/07/2024*	Pipe towing	50	84	63	75	53	66	Y	Moving noise source from 8-50m. Rubber duckie pulling the pipe along North Liverpool Road.
B6	1 Marriott Rd	5/07/2024*	Pipe tugging	50	79	57	74	52	60	Y	Noise source approx 30m. Excavator guiding pipe into HDD hole.
B6	1 Marriott Rd	6/07/2024*	Pipe tugging	50	81	67	77	61	70	Y	Moving noise source from 15-35m. Excavator guiding pipe into HDD hole.

NCA	Location of Monitoring	Date	Construction Activities on Site	NML	Predicted Noise Level (Leq, 15min)	Measured Noise Level				Compliant	Comments
						Leq, 15min	Lmax	L90	L10		
B8	1 Tarlington Parade	23/07/2024*	Tree clearing	50	91	72	85	63	76	Y	Chainsaw in use intermittently, hum from EWP constant. Significant non-construction road traffic
B8	1 Tarlington Parade	23/07/2024*	Tree clearing	45	91	69	84	61	71	Y	Chainsaw in use intermittently, hum from EWP constant. Significant non-construction road traffic
B17	N Liverpool/ Montgomery roundabout	24/07/2024*	Pipe pull - tracking pipe down the road	50	97	68	87	56	67	Y	Excavator pulling pipe down the road was the main noise generating works, other works barely audible. Non-construction traffic also contributed.
B17	217A North Liverpool Road	24/07/2024*	Pipe pull - welding	45	97	73	79	71	74	Y	Pipe being welded with the engine being the main noise source however not obtrusive. Good noise reduction practices observed. Non-construction traffic also contributed.
B17	217A North Liverpool Road	24/07/2024*	Pipe pull - welding and cutting with chainsaw	45	97	73	95	70	74	Y	Pipe being welded with the engine being the main noise source which was constant. Chainsaw (electric) used intermittently to cut the end of each pipe before the weld. Good noise reduction practices observed.
B3	M7 HDD Entry Pit, western side M7	6/08/2024	Trenching Pipeline Installation	42	76.42	58	84	49	60	Y	Excavator reversing back away from noise monitor. Constant noise from M7 Motorway and birds chirping within the parklands. No noise receivers in the vicinity of works.
B17	Lansdowne Reserve NGRS	8/08/2024	HDD Pipe pulling and welding	45	77.74	65	80	60	67	Y	HDD works being undertaken, no noise receivers in the vicinity of works.
B3	M7 HDD Entry Pit, western side M7	13/08/2024	Topsoil spreading, stockpile management	42	73.38	73	89	63	77	Y	Excavator working. Constant noise from M7 Motorway and birds chirping within the parklands. No noise receivers in the vicinity of works.
B6	Opposite 331 North Liverpool Road and Wilson Road	29/08/2024	Background roadway monitoring	55	n/a	76	98	57	70	N/A	Background only, no construction works occurring. Frequent and constant non-construction vehicles passing, intersection of 2 main roads.
B6	Opposite 218 North Liverpool Road	29/08/2024*	Excavating roadway	55	94	75	93	71	76	Y	Excavator working in the roadway. Occasional non-construction vehicles passing.
B6	Opposite 325 North Liverpool Road	29/08/2024*	Concrete pouring	55	94	75	86	67	77	Y	Concrete trucks working. Occasional non-construction vehicles passing.
B6	Opposite 331 North Liverpool Road	29/08/2024*	Background noise monitoring	55	75.9	76	98	56	70	N/A	Background only – Several cars, motorcycles and helicopters generating noise.

NCA	Location of Monitoring	Date	Construction Activities on Site	NML	Predicted Noise Level (Leq, 15min)	Measured Noise Level				Compliant	Comments
						Leq, 15min	Lmax	L90	L10		
B6	Opposite 329 North Liverpool Road	29/08/2024*	Excavating roadway	55	91	73	100	64	74	Y	Excavator working in the roadway, metal barrier poles being placed. Number of non-construction noisy vehicles and horns.
B6	Opposite 329 North Liverpool Road	29/08/2024*	Excavating roadway	55	91	82	94	94	84	Y	Generator on vac truck predominant source of noise. Rubber duckie placed buckets down on road service gently
B6	Opposite 222 North Liverpool Road	29/08/2024*	Excavating roadway	55	97	78	94	77	79	Y	Generator on vac truck predominant source of noise.
B6	Opposite 222 North Liverpool Road	29/08/2024*	Excavating roadway	55	97	78	100	77	79	Y	Generator on vac truck predominant source of noise with intermittent noise from rubber duckie with hammer
T6	1 Shelley Road	2/03/2024	Drilling/HDD	55	54	52	60	48	55	Y	Consistent noise from the drill rig and sucker truck throughout the monitoring period.
T3	889 Luddenham Road	7/03/2024*	Potholing	44	61	61	86	50	57	Y	Works only slightly audible during gaps in non-construction traffic noise.
T3	889 Luddenham Road	7/03/2024*	Potholing	38	61	59	80	45	55	Y	Works only slightly audible during gaps in non-construction traffic noise.
T8	Opposite 2720 Silverdale Rd	6/05/2024*	Site Establishment, Delivery Truck with Tanks	35	47	52	69	33	54	Y^	Exceedance caused due to close proximity to Silverdale Road and non-construction vehicles.
T8	Opposite 2720 Silverdale Rd	7/05/2024*	Site Establishment, Excavator Unloading Tank	35	47	55	73	54	56	Y^	Exceedance caused due to close proximity to Silverdale Road and non-construction vehicles.
T4	120 Willmington Rd	7/05/2024*	Saw Cutting / Road Excavation	45	71	59	79	50	63	Y	Works only slightly audible during gaps in non-construction traffic noise.
T3	2289-2309 Elizabeth Dr	7/05/2024*	Spoil Movement / Site shed use	44	55	55	75	44	56	Y	Non-construction trucks and vehicles driving past. Construction noise minimal. Spoil truck movements passing by. No issues noted.
T5	406 Park Road	7/05/2024*	Road Excavation	45	55	62	85	39	60	Y^	Exceedances caused by non-construction trucks and vehicles driving past / braking on park road. Construction noise minimal
T6	24 Park Road	23/05/2024*	Trenching, spoil removal, pipe installation	45	87	68	81	64	71	Y	Works consisted of an excavator loading material into truck/dog, excavator tracking, truck movements, and use of lighting towers. Construction noise dominant but not intrusive.
T6	24 Park Road	23/05/2024*	Trenching, spoil removal, pipe installation	40	87	70	85	66	72	Y	Works consisted of an excavator loading material into truck/dog, excavator tracking, truck movements, and use of lighting towers. Construction noise dominant but not intrusive.

NCA	Location of Monitoring	Date	Construction Activities on Site	NML	Predicted Noise Level (Leq, 15min)	Measured Noise Level				Compliant	Comments
						Leq, 15min	Lmax	L90	L10		
T5	C6 compound	23/05/2024*	Spoil delivery, stockpile shaping	40	55	54	67	44	58	Y	Works consisted of an excavator loading material into truck/dog, excavator tracking, truck movements, and use of lighting towers. Construction noise dominant but not intrusive.
T6	72 Park Road	27/05/2024*	Traffic and work area set up	45	44	39	60	35	41	Y	Traffic control and work areas being setup, no significant noise generation observed from construction
T5	1 William Street / 148 Park Rd	27/05/2024*	Traffic set up / Road Excavation	45	71	44	65	43	45	Y	Traffic control and work areas being setup, no significant noise generation observed from construction
T5	1 William Street / 148 Park Rd	28/05/2024*	Pipe Installation, Spoil haulage, material delivery	40	70	44	64	42	44	Y	Works consisted of an excavator loading material into truck/dog, general pipe installation, excavator tracking, truck movements, and use of lighting towers. Construction noise dominant but not intrusive.
T6	72 Park Road	28/05/2024*	Pipe Installation, Spoil haulage, material delivery	40	43	37	51	34	39	Y	Works consisted of an excavator loading material into truck/dog, general pipe installation, excavator tracking, truck movements, and use of lighting towers. Construction noise barely audible in the distance.
T8	25 Matingara Way	28/05/2024*	Road Excavation	40	32	34	39	33	35	Y^	No construction noise audible, non-construction vehicles driving past, dogs barking
T6	72 Park Road	28/05/2024*	Pipe Installation, Spoil haulage, material delivery	45	44	42	57	39	44	Y	Works consisted of an excavator loading material into truck/dog, general pipe installation, excavator tracking, truck movements, and use of lighting towers. Construction noise dominant but not intrusive.
T5	1 William Street / 148 Park Rd	29/05/2024*	Pipe Installation, Spoil haulage, material delivery	40	70	46	65	43	47	Y	Works consisted of an excavator loading material into truck/dog, general pipe installation, excavator tracking, truck movements, and use of lighting towers. Construction noise dominant but not intrusive.
T6	72 Park Road	29/05/2024*	Compaction (landscaping road), pipe install	40	43	40	53	38	41	Y	Works consisted of an excavator for pipeline construction and compaction of road base material. Significant distant away from monitoring location.
T4	2650 Elizabeth Drive	27/06/2024*	Road sawing	45	58	55	65	48	57	Y	Road sawing the road which was the first activity undertaken and the noisiest of the night. Only took approximately 10 minutes to complete.

* Monitoring which occurred outside standard construction hours
^ Exceedance of predicted value however not caused by Project construction, refer to 'Comments'

4.3.4 Assessment of noise monitoring results at the Brine and Treated Water Pipelines

Noise verification monitoring was carried out on the treated water and brine pipeline on 61 occasions during the reporting period which were predominantly undertaken for trenching, HDD and spoil movements outside standard construction hours in accordance with an OOHW Permit. Monitoring events were predominantly within the predicted levels of the associated noise and vibration impact assessment. Where an exceedance of predicted levels was identified, these have been determined to be related to external factors not relating to construction noise. In many cases, this was caused by non-construction related road traffic. No non-compliances were identified.

4.4 Vibration Monitoring Results

Vibration verification was undertaken on 13 occasions on the brine and treated water pipeline during the reporting period. Vibration monitoring has not been required at the AWRC site during the period. The specific details of principle sources of vibration (plant) and activities being monitored are detailed in Table 3 below. An assessment of the results is given in Section 4.4.1 below.

Table 3: Results of vibration verification undertaken between March 2024 to August 2024 (inclusive).

Date	Purpose	Receiver Type	Work Location	Work Description	Plant & Equipment in use	Monitoring Location	Safe Work Distance (m)	Distance from activity to receiver (m)	Type	Vibration Limit (mm/s)	Highest Recorded Level (mm/s)	Compliant (Y/N)
5/03/2024	OOHW/Precautionary	Place of Worship	Cabramatta Rd at Humphries	Trenching	Roadsaw, jackhammer, excavator	654-658 Cabramatta Rd	5m	9m-25m (moving source)	Cosmetic/structural Damage	7.5 mm/s	3.35	Y
6/03/2024	OOHW/Precautionary	House	North Liverpool Rd	Trenching	Roadsaw, excavator	339 North Liverpool Rd	5m	7m-40m (moving source)	Cosmetic/structural Damage	7.5 mm/s	1.30	Y
9/03/2024	Other/precautionary	House	6 Byron Avenue	Concrete cutting, jackhammer out pavement	Excavator with hammer attachment and concrete saw	6 Byron Avenue	5m	13m	Cosmetic/structural Damage	7.5 mm/s	2.70	Y
14/03/2024	Complaint	House	Opposite 4 Cumberland St	Trenching - recreating previous days works	Excavator	4 Cumberland St	5m	25m at closest point	Cosmetic/structural Damage	7.5 mm/s	0.41	Y
21/03/2024	Complaint	House	Opposite 18 Beckenham St	Trenching	Hook bin and truck, excavator, workers with brooms, roller, truck and dog	18 Beckenham St	5m	10m at closest	Cosmetic/structural Damage	7.5 mm/s	1.40	Y
13/04/2024	OOHW/Precautionary	House	Opposite 107 Montgomery St	HDD	HDD drill, excavator, vac truck, worker movement	107 Montgomery St	5m	15m	Cosmetic/structural Damage	7.5 mm/s	2.70	Y
15/04/2024	OOHW/Precautionary	House	Feodore Dr near Frederick roundabout	Trenching and pipe installation	Excavator, daymakers, hand tools	Between 109 and 111 Feodore Dr	5m	15m	Cosmetic/structural Damage	7.5 mm/s	1.10	Y
23/05/2024	Background/baseline	House	N/A background only	N/A background only	N/A background only	24 Park Road	5m	N/A background only	N/A background only	N/A background only	0.35	Y
24/05/2024	Other/precautionary	House	Outside 24 Park Road on road	Rolling asphalt for road restoration	Roller (static rolling, not vibratory)	24 Park Road	5m	15m	Cosmetic/structural Damage	7.5 mm/s	1.71	Y
29/05/2024	Other/precautionary	Place of Worship	Cabra Vale Leisure Centre	HDD	Drill rig, vac truck	69 Curtin St	5m	15m	Cosmetic/structural Damage	7.5 mm/s	0.10	Y
28/06/2024	Other/precautionary	Service	Lansdowne NGRS	backfilling water diversion pipe and general earthworks	Excavator 13T	NGRS on top of SW pipe service	5m	2m-30m (moving source)	Cosmetic/structural Damage	7.5 mm/s	0.69	Y
5/07/2024	OOHW/Precautionary	House	North Liverpool Road	HDD Pipe pulling	Excavator 13T	283 North Liverpool Road	5m	30-15m	Cosmetic/structural Damage	7.5 mm/s	1.27	Y
8/08/2024	Other/precautionary	Service	Lansdowne NGRS	HDD Pipe pulling and welding	Excavator 13T x3, generator, pipe welder, HV, LV	Lansdowne NGRS entrance pit	5m	20m	Cosmetic/structural Damage	7.5 mm/s	0.08	Y

4.4.1 Assessment of Vibration Monitoring Results

Vibration verification monitoring was undertaken on 13 occasions on the brine and treated water pipeline during the reporting period. Vibration monitoring has not been required at the AWRC site during the period.

It's noted that no vibration intensive works occurred within the safe working distance however monitoring was still undertaken as a precaution, or in response to the two complaints received on 14/03/2024 and 21/03/2024. No vibration intensive works within safe working distances of heritage structures occurred and therefore vibration monitoring was not required. Two monitoring events were also undertaken at Lansdowne Reserve at the NGRS structure to confirm works would not have any impacts to pre-existing Sydney Water assets (buried pipelines).

As shown in Table 3, there were no exceedances of vibration limits for any vibration monitoring events.

4.5 Conclusion

Noise and vibration monitoring has been carried out during the reporting period (March 2024 to August 2024 (inclusive)) at the AWRC, the brine pipeline and the treated water pipeline in accordance with the project CNVMoP. No exceedances of applicable noise or vibration criteria as a result of construction works have been identified during this period and no non-compliances have been identified with the CoAs.

Appendix 1 – Calibration Certificates of Noise and Vibration Monitoring Equipment

Acoustic Research Labs Pty Ltd
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Sound Calibrator

IEC 60942:2017

Calibration Certificate

Calibration Number C23672

Client Details John Holland Group
Level 3, 65 Pirrama Road
Pyrmont NSW 2009

Equipment Tested/ Model Number : NC-75
Instrument Serial Number : 34835114

Atmospheric Conditions

Ambient Temperature : 24.4 °C
Relative Humidity : 35 %
Barometric Pressure : 100.38 kPa

Calibration Technician : Max Moore
Calibration Date : 19 Sep 2023
Secondary Check: Dhanush Bonu
Report Issue Date : 20 Sep 2023

Approved Signatory :  Ken Williams

Characteristic Tested	Result
Generated Sound Pressure Level	*Pass*
Frequency Generated	*Pass*
Total Distortion	*Pass*

Nominal Level	Nominal Frequency	Measured Level	Measured Frequency
94	1000	94.03	1000.00

The sound calibrator has been shown to conform to the class 1 requirements for periodic testing, described in Annex B of IEC 60942:2017 for the sound pressure level(s) and frequency(ies) stated, for the environmental conditions under which the tests were performed..

Uncertainties of Measurement -

Specific Tests		Environmental Conditions	
Generated SPL	*±0.10 dB*	*Temperature*	*±0.1 °C*
Frequency	*±0.07 %*	*Relative Humidity*	*±1.9 %*
Distortion	*±0.20 %*	*Barometric Pressure*	*±0.014 kPa*

All uncertainties are derived at the 95% confidence level with a coverage factor of 2.

NATA WORLD RECOGNISED ACCREDITATION

This calibration certificate is to be read in conjunction with the calibration test report.

Acoustic Research Labs Pty Ltd is NATA Accredited Laboratory Number 14172.
Accredited for compliance with ISO/IEC 17025 - Calibration.

The results of the tests, calibrations and/or measurements included in this document are traceable to SI units.

NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration and inspection reports.

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Sound Calibrator
IEC 60942:2017
Calibration Test Report

Calibration Number C23672

Client Details John Holland Group
Level 3, 65 Pirrama Road
Pyrmont NSW 2009

Equipment Tested/ Model Number : NC-75
Instrument Serial Number : 34835114

Atmospheric Conditions
Ambient Temperature : 24.4 °C
Relative Humidity : 35 %
Barometric Pressure : 100.38 kPa

Calibration Technician : Max Moore
Calibration Date : 19 Sep 2023
Secondary Check: Dhanush Bonu
Report Issue Date : 20 Sep 2023

Approved Signatory : Ken Williams

Characteristic Tested	Result
Generated Sound Pressure Level	*Pass*
Frequency Generated	*Pass*
Total Distortion	*Pass*

The sound calibrator has been shown to conform to the class 1 requirements for periodic testing, described in Annex B of IEC 60942:2017 for the sound pressure level(s) and frequency(ies) stated, for the environmental conditions under which the tests were performed..

Uncertainties of Measurement -

Specific Tests		Environmental Conditions	
Generated SPL	*±0.10 dB*	*Temperature*	*±0.1 °C*
Frequency	*±0.07 %*	*Relative Humidity*	*±1.9 %*
Distortion	*±0.20 %*	*Barometric Pressure*	*±0.014 kPa*

All uncertainties are derived at the 95% confidence level with a coverage factor of 2.

This report applies only to the item tested and shall only be reproduced in full, unless approved in writing by Acoustic Research Labs.

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Sound Calibrator

IEC 60942:2017

Calibration Certificate

Calibration Number C23673

Client Details John Holland Group
Level 3, 65 Pirrama Road
Pyrmont NSW 2009

Equipment Tested/ Model Number : NC-75
Instrument Serial Number : 34735010

Atmospheric Conditions
Ambient Temperature : 24.6 °C
Relative Humidity : 34.3 %
Barometric Pressure : 100.36 kPa

Calibration Technician : Max Moore
Calibration Date : 19 Sep 2023
Secondary Check: Dhanush Bonu
Report Issue Date : 20 Sep 2023
Approved Signatory : Ken Williams

Characteristic Tested	Result
Generated Sound Pressure Level	*Pass*
Frequency Generated	*Pass*
Total Distortion	*Pass*

Nominal Level	Nominal Frequency	Measured Level	Measured Frequency
94	1000	94.04	1000.00

The sound calibrator has been shown to conform to the class 1 requirements for periodic testing, described in Annex B of IEC 60942:2017 for the sound pressure level(s) and frequency(ies) stated, for the environmental conditions under which the tests were performed..

Uncertainties of Measurement -

Specific Tests		Environmental Conditions	
Generated SPL	*±0.10 dB*	*Temperature*	*±0.1 °C*
Frequency	*±0.07 %*	*Relative Humidity*	*±1.9 %*
Distortion	*±0.20 %*	*Barometric Pressure*	*±0.014 kPa*

All uncertainties are derived at the 95% confidence level with a coverage factor of 2.

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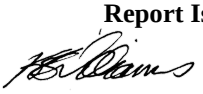
Sound Level Meter
IEC 61672-3:2013
Calibration Certificate

Calibration Number C23693

Client Details	John Holland Group Level 3, 65 Pirrama Road Pyrmont NSW 2009
Equipment Tested/ Model Number :	NL-53EX
Instrument Serial Number :	00730321
Microphone Serial Number :	23781
Pre-amplifier Serial Number :	33173
Firmware Version :	V1.0

Pre-Test Atmospheric Conditions		Post-Test Atmospheric Conditions	
Ambient Temperature :	23.6 °C	**Ambient Temperature :**	23.6 °C
Relative Humidity :	37.8 %	**Relative Humidity :**	38.3 %
Barometric Pressure :	100.55 kPa	**Barometric Pressure :**	100.5 kPa

Calibration Technician :	Max Moore	**Secondary Check:**	Dhanush Bonu
Calibration Date :	19 Sep 2023	**Report Issue Date :**	20 Sep 2023

Approved Signatory :  Ken Williams

Clause and Characteristic Tested	Result	Clause and Characteristic Tested	Result
12: Acoustical Sig. tests of a frequency weighting	*Pass*	17: Level linearity incl. the level range control	*N/A*
13: Electrical Sig. tests of frequency weightings	*Pass*	18: Toneburst response	*Pass*
14: Frequency and time weightings at 1 kHz	*Pass*	19: C Weighted Peak Sound Level	*Pass*
15: Long Term Stability	*Pass*	20: Overload Indication	*Pass*
16: Level linearity on the reference level range	*Pass*	21: High Level Stability	*Pass*

The sound level meter submitted for testing has successfully completed the class 1 periodic tests of IEC 61672-3:2013, for the environmental conditions under which the tests were performed.

However, no general statement or conclusion can be made about conformance of the sound level meter to the full requirements of IEC 61672-1:2013 because evidence was not publicly available, from an independent testing organisation responsible for pattern approvals, to demonstrate that the model of sound level meter fully conformed to the requirements in IEC 61672-1:2013 and because the periodic tests of IEC 61672-3:2013 cover only a limited subset of the specifications in IEC 61672-1:2013.

Uncertainties of Measurement -

Acoustic Tests		Environmental Conditions	
125Hz	*±0.13 dB*	*Temperature*	*±0.1 °C*
1kHz	*±0.13 dB*	*Relative Humidity*	*±1.9 %*
8kHz	*±0.14 dB*	*Barometric Pressure*	*±0.014 kPa*
Electrical Tests	*±0.13 dB*		

All uncertainties are derived at the 95% confidence level with a coverage factor of 2.

This calibration certificate is to be read in conjunction with the calibration test report.

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Sound Level Meter
IEC 61672-3:2013
Calibration Certificate

Calibration Number C23694

Client Details	John Holland Group Level 3, 65 Pirrama Road Pyrmont NSW 2009
Equipment Tested/ Model Number :	NL-53EX
Instrument Serial Number :	00730322
Microphone Serial Number :	23782
Pre-amplifier Serial Number :	33174
Firmware Version :	V1.0

Pre-Test Atmospheric Conditions		Post-Test Atmospheric Conditions	
Ambient Temperature :	23.9 °C	**Ambient Temperature :**	24.5 °C
Relative Humidity :	37.8 %	**Relative Humidity :**	34.6 %
Barometric Pressure :	100.43 kPa	**Barometric Pressure :**	100.39 kPa

Calibration Technician :	Max Moore	**Secondary Check:**	Dhanush Bonu
Calibration Date :	19 Sep 2023	**Report Issue Date :**	20 Sep 2023

Approved Signatory :  Ken Williams

Clause and Characteristic Tested	Result	Clause and Characteristic Tested	Result
12: Acoustical Sig. tests of a frequency weighting	*Pass*	17: Level linearity incl. the level range control	*N/A*
13: Electrical Sig. tests of frequency weightings	*Pass*	18: Toneburst response	*Pass*
14: Frequency and time weightings at 1 kHz	*Pass*	19: C Weighted Peak Sound Level	*Pass*
15: Long Term Stability	*Pass*	20: Overload Indication	*Pass*
16: Level linearity on the reference level range	*Pass*	21: High Level Stability	*Pass*

The sound level meter submitted for testing has successfully completed the class 1 periodic tests of IEC 61672-3:2013, for the environmental conditions under which the tests were performed.

However, no general statement or conclusion can be made about conformance of the sound level meter to the full requirements of IEC 61672-1:2013 because evidence was not publicly available, from an independent testing organisation responsible for pattern approvals, to demonstrate that the model of sound level meter fully conformed to the requirements in IEC 61672-1:2013 and because the periodic tests of IEC 61672-3:2013 cover only a limited subset of the specifications in IEC 61672-1:2013.

Uncertainties of Measurement -

Acoustic Tests		Environmental Conditions	
125Hz	*±0.13 dB*	*Temperature*	*±0.1 °C*
1kHz	*±0.13 dB*	*Relative Humidity*	*±1.9 %*
8kHz	*±0.14 dB*	*Barometric Pressure*	*±0.014 kPa*
Electrical Tests	*±0.13 dB*		

All uncertainties are derived at the 95% confidence level with a coverage factor of 2.

This calibration certificate is to be read in conjunction with the calibration test report.

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CERTIFICATE OF CALIBRATION

CERTIFICATE NO: G37191

EQUIPMENT TESTED : Ground Vibration Monitor

Manufacturer: Svantek
Meter Type: SVAN-958A **Serial No:** 99115
Transducers A: SV-84 **Serial No:** R6092

Owner: John Holland Rail Pty Ltd
Level 3, 65 Pirrama Road
Pyrmont NSW 2009

Tests Performed: Measured Frequency response, Correct level display, Linearity display and Nominal Sensitivity
Comments: Detailed overleaf.

CONDITION OF TEST:
Temperature 22 °C ±1° C
Relative Humidity 42 % ±5%

Date of Receipt : 28/08/2020
Date of Calibration : 28/08/2023
Date of Issue : 28/08/2023

Acu-Vib Test Procedure: AVP15 (Ground vibration Monitor & Low Frequency Transducer) based on AS2187.2 & DIN45669-1

CHECKED BY: .....

AUTHORISED SIGNATURE: .....
Helu Soe

Accredited for compliance with ISO/IEC 17025 - Calibration
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The uncertainties quoted are calculated in accordance with the methods of the ISO Guide to the Uncertainty of Measurement and quoted at a coverage factor of 2 with a confidence interval of approximately 95%.

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Acoustic and Vibration Measurements

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CALIBRATIONS SALES RENTALS REPAIRS
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www.acu-vib.com.au

CERTIFICATE OF CALIBRATION

CERTIFICATE NO: G37190

EQUIPMENT TESTED : Ground Vibration Monitor

Manufacturer:	Svantek		
Meter Type:	SVAN-958A	**Serial No:**	99116
Transducers A:	SV-84	**Serial No:**	R6094

Owner: John Holland Rail Pty Ltd
Level 3, 65 Pirrama Road
Pyrmont NSW 2009

Tests Performed: Measured Frequency response, Correct level display, Linearity display and Nominal Sensitivity

Comments: Detailed overleaf.

CONDITION OF TEST:

Temperature	23	°C ±1° C
Relative Humidity	42	% ±5%

Date of Receipt :	28/08/2023
Date of Calibration :	28/08/2023
Date of Issue :	28/08/2023

Acu-Vib Test Procedure: AVP15 (Ground vibration Monitor & Low Frequency Transducer) based on AS2187.2 & DIN45669-1

CHECKED BY: ..... **AUTHORISED SIGNATURE:** .....

Hein Soe

Accredited for compliance with ISO/IEC 17025 - Calibration
Results of the tests, calibration and/or measurements included in this document are traceable to SI units through reference equipment that has been calibrated by the Australian National Measurement Institute or other NATA accredited laboratories demonstrating traceability.

This report applies only to the item identified in the report and may not be reproduced in part.

The uncertainties quoted are calculated in accordance with the methods of the ISO Guide to the Uncertainty of Measurement and quoted at a coverage factor of 2 with a confidence interval of approximately 95%.

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Appendix 2 – AA Endorsement

ACOUSTICS ADVISOR ENDORSEMENT
SYDNEY WATER UPPER SOUTH CREEK PROJECT

Project:	**SSI 8609189**	**Stage:**	**Concept and Stage 1**
Review of	Noise and Vibration Construction Monitoring Report March to August 2024.	**Reviewed document reference:**	Upper South Creek Advanced Water Recycling Centre and Pipelines Noise and Vibration Construction Monitoring Report Document Number: USCP-JHG-RPT-ENV-0016 Revision: 1 Dated: 6 January 2025
Prepared by:	Larry Clark, Acoustics Advisor		
Date of issue:	5 March 2025		

As approved Acoustics Advisor (AA) for the Sydney Water Upper South Creek Project I reviewed and provided comments on a previous version of the Noise and Vibration Construction Monitoring Report (NVMoR) for March to August 2024, for Sydney Water's Advanced Water Recycling Centre and Pipelines.

I am satisfied that my comments, and those of Sydney Water and the ER, have been adequately addressed and I endorse the NVMoR as required by Condition of Approval A34 (e).

Larry Clark

Larry Clark, Acoustics Advisor