Appendix AA

Pipeline development noise and vibration assessment

REGIS RESOURCES LTD

Noise and Vibration Assessment

McPhillamys Gold Project - Pipeline Development
Lithgow to Blayney, NSW.

Prepared for: Blakely's Environmental
July 2019
MAC180742RP1

Muller Acoustic Consulting

Document Information

Noise and Vibration Assessment

McPhillamys Gold Project – Pipeline Development

Lithgow to Blayney, NSW.

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1 Introduction

Muller Acoustic Consulting Pty Ltd (MAC) has been commissioned by Blakely's Environmental on behalf of LFB Resources NL (Regis) to prepare a Noise and Vibration Assessment (NVA) for the Construction and Operation of a proposed Pipeline Development. The project consists of a 90km pipeline and ancillary infrastructure to transfer raw water from Lithgow to the proposed McPhillamys Mine Site near Blayney, NSW. The pipeline corridor is illustrated at a regional scale in **Figure 1**.

The scope of the Construction NVA is to identify potential noise and vibration impacts from activities such as vegetation clearing, trenching, pipeline laying, backfill, under boring and blasting emissions where required and road traffic relating to construction activities.

The scope of the Operational NVA is to identify potential noise and vibration impacts from the operation of the pump stations situated at various locations along the pipeline corridor.

1.1 Purpose and Objectives

The McPhillamys Gold Project includes the development of an open cut mine and associated infrastructure (site access, water and power supply, tailings management, water management, ore stockpiles and processing) and the development of a water supply pipeline between the mine site and the Western Coalfields near Lithgow. The NVA has been completed as part of the Environmental Impact Statement (EIS) for the Pipeline Development which has been prepared to address Secretary's Environmental Assessment Requirements (EARs) from the Department of Planning and Environment NSW (DPE) (ref: SSD18_9505) for the McPhillamys Gold Project.

The EARs applicable to the construction and operational NVA for the pipeline development are:

- an assessment of the likely operational noise impacts of the development (including construction noise) in accordance with the Noise Policy for Industry NSW[1];
- if a claim is made for specific construction noise criteria for certain activities, then this claim must be justified and accompanied by an assessment of the likely construction noise impacts of these activities in accordance with the Interim Construction Noise Guideline;
- an assessment of the likely road noise impacts of the development in accordance with the NSW Road Noise Policy; and

[1] Construction noise is not in the scope of the NPI and is addressed in the Interim Construction Noise Guideline (ICNG).

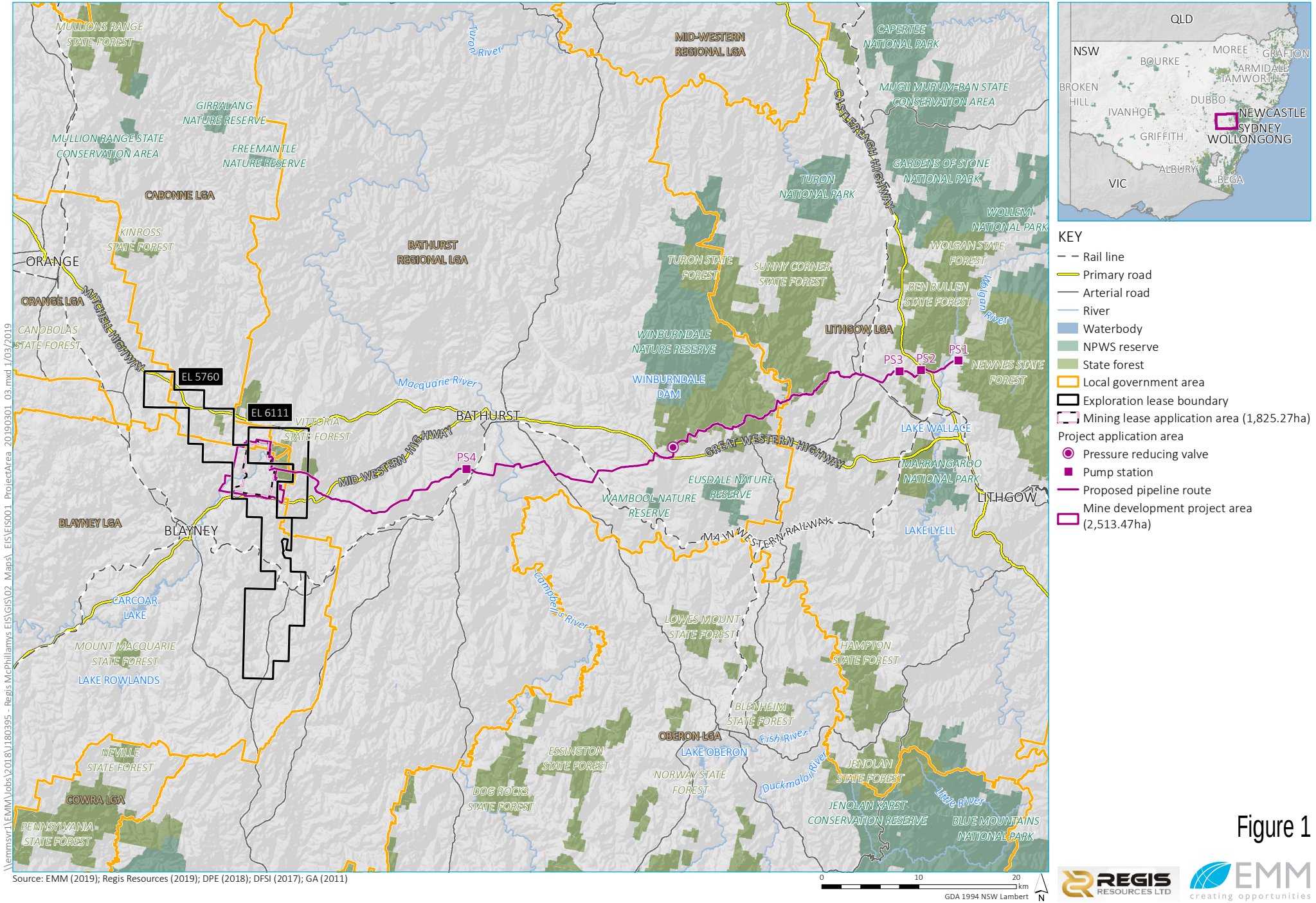
- an assessment of the likely blasting impacts of the development on people, animals, buildings and infrastructure, and significant natural features, having regard to the relevant ANZECC guidelines.

This NVA summarises the construction and operational noise and vibration related findings of the Pipeline Development and the noise mitigation and management measures that may be implemented to effectively manage construction noise emissions at off-site receivers.

The objectives of the NVA are as follows:

- identify the closest and/or potentially most affected receivers situated within the area of influence to the Pipeline Development;
- review construction activities to identify noise generating plant, equipment, machinery or activities proposed to be undertaken that have the potential to exceed construction Noise Management Levels (NMLs) during standard construction hours and out of hours periods;
- assess the potential noise impacts associated with construction of the Pipeline Development and provide a comparison of predicted noise levels against the construction NMLs and relevant vibration criteria;
- review operating activities to identify noise generating plant, equipment, machinery or activities proposed to be undertaken that have the potential to exceed Project Noise Trigger Levels (PNTL) for all operating periods;
- utilise 3D noise modelling to predict noise levels that may occur as a result of the construction and operation of the Pipeline Development at the closest and/or potentially most affected receptors;
- provide feasible and reasonable noise mitigation and management measures, and monitoring options, where construction Noise Management Levels (NML) may be exceeded;
- assess the potential noise impacts associated with operation of the Pipeline Development and provide a comparison of predicted noise levels against the PNTLs; and
- assess the potential for blasting impacts from the construction of the Pipeline Development and provide a comparison with the relevant blasting emissions criteria.

A glossary of terms, definitions and abbreviations used in this report is provided in **Appendix A**.



KEY

- Rail line
- Primary road
- Arterial road
- River
- Waterbody
- NPWS reserve
- State forest
- Local government area
- Exploration lease boundary
- Mining lease application area (1,825.27ha)

Project application area

- Pressure reducing valve
- Pump station
- Proposed pipeline route
- Mine development project area (2,513.47ha)

Source: EMM (2019); Regis Resources (2019); DPE (2018); DFSI (2017); GA (2011)

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Figure 1

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EMM creating opportunities

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2 Project Description

The project is located approximately 8km north east of Blayney in the Central Tablelands of NSW. The McPhillamys Gold Project (McPhillamys or Mine Site) is a large tonnage, low grade gold deposit that would produce an average of approximately 200,000 ounces per annum.

Approximately 13 megalitres per day ("ML/day") would be transferred from Angus Place Colliery (Angus Place), Centennial Coal's Springvale Coal Services Operation (SCSO) and the Mount Piper Power Station (MPPS) operations near Lithgow to the mine site water supply dam for the mining and processing requirements during the operational phase of the indicative 15 year lifespan of the Mine Development.

Regis proposes to construct a pipeline along an approximate 90km easement to transfer water from three sources; Angus Place, SCSO and MPPS to the Mine Site near Blayney (**Figure 1**). The pipeline corridor will accommodate all components of the pipeline development including pumping station facilities and associated pipeline infrastructure. The corridor width varies from 6m to 20m in width, excluding the four pumping stations facilities. At these facilities, the corridor width extends to an area of up to 75m by 75m to accommodate the construction and operation of these facilities. The key components of the pipeline development include:

- a pipeline approximately 90km in length, starting at Angus Place and finishing in the mine development project area;
- four pumping station facilities including water storage tanks;
- a pressure reducing system; and
- a control system.

The pipeline will be designed to accommodate a nominal flow of approximately 13ML/day up to a maximum of 15.6ML/day. The mode of operation of the system will provide continuous pumping 24 hours per day.

2.1 Construction Duration and Hours

Construction is estimated to take approximately 12 months, subject to arrangements made between Regis and the contractor. It is anticipated that construction will commence upon the required approvals being obtained.

Standard construction hours will be from 7:00 am to 6:00 pm Monday to Friday and 8:00 am to 1:00 pm on Saturdays, although some out of hours works (ie trenched road crossings) may be required at the request of Roads and Maritime Services, the NSW Police or property owners to minimise specific impacts. Neighbouring land owners will be advised of any variations to the nominated construction hours. Any requirement for extended working hours would be assessed in accordance with the *Interim Construction Noise Guideline* (DECC, 2009).

2.2 Receiver Review

From review of aerial photos and other project information, 297 receivers that may be affected by noise from pipeline construction activities, have been identified. **Table 1** presents a summary of the nine project areas/catchments and receivers in each area and are reproduced visually in **Figure 2**.

Table 1 Representative Noise Sensitive Receivers

Catchment	Receiver ID
Angus Place	R1 – R40
Portland	R41 – R99; R100 – R135; R293
Sunny Corner	R136 – R148
Yetholme	R149 – R187; R192 – R194; Kirkconnell Correction Centre
Brewongle	R188 – R191; R195 – R204
Bike Park	R205 – R256, R259, R260
Perthville	R257, R258, R261 – R285; R294; R297, AR33[1]
Bathampton	Nil
McPhillamys	R286 – R292; R295, R296

Note 1: Representative of Bathurst Cycling Club, Bathurst BMX track and Bathurst Mountain Bike Park.

2.2.1 Heritage Items

The pipeline corridor does not extend over any historic heritage listed item, however, it will traverse land adjacent to two heritage items:

- Leeholme Homestead and outbuildings at 3664 O'Connell Road and 47 Tarana Road; and
- Portland General Cemetery at Sunny Corner Road.

All other heritage items are located more than 135m away from the pipeline corridor.

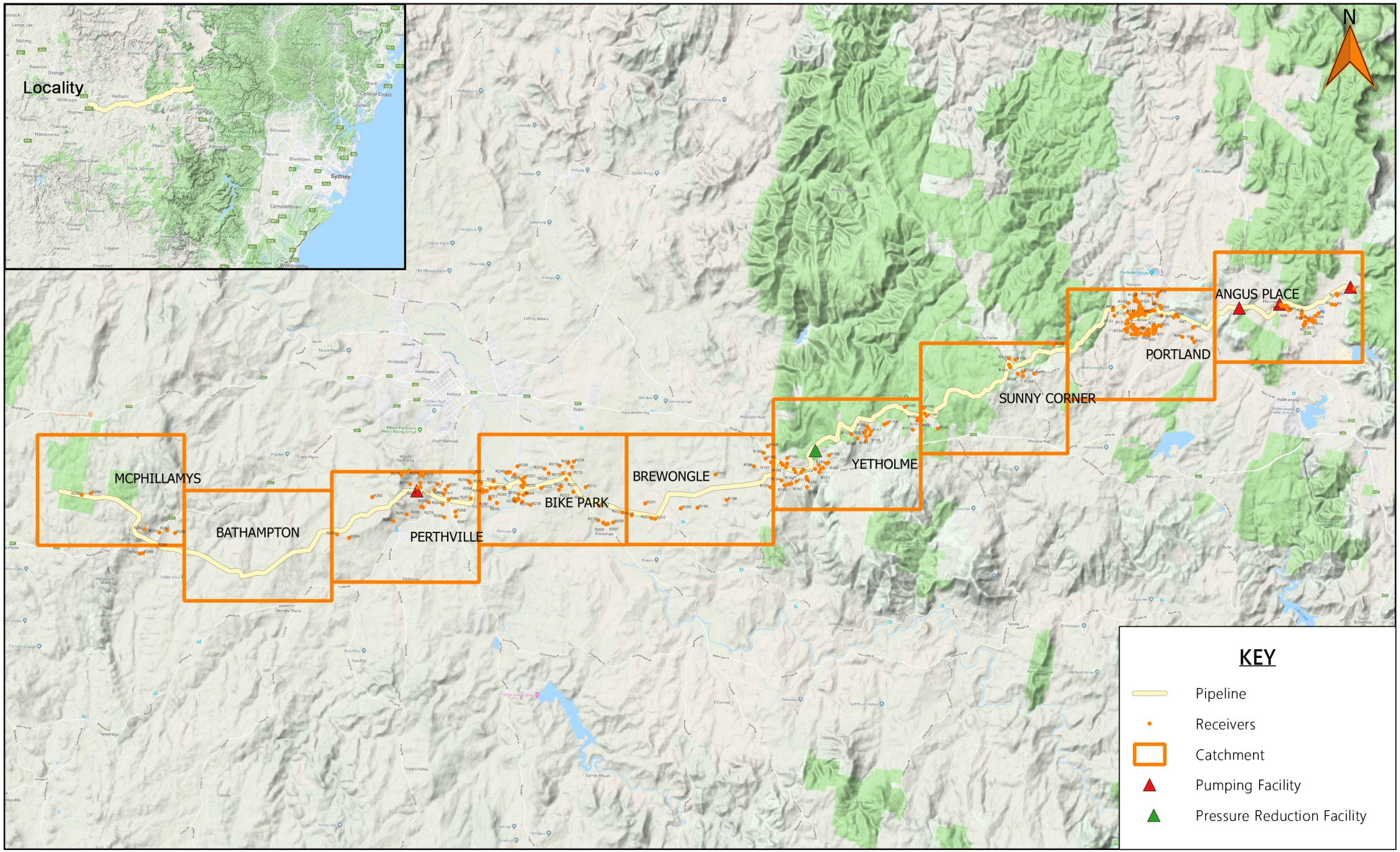

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FIGURE 2
Receivers, Catchments, Pump Stations and Pipeline Alignment
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3 Noise Policy and Guidelines

This NVA has been prepared in consideration of the following relevant policies and standards, providing a framework for assessment, monitoring, communication, management, reporting and auditing.

- Environment Protection Authority (EPA) 2017, NSW Noise Policy for *Industry* (NPI);
- Department of Environment and Climate Change (DECC) 2009, *Interim Construction Noise Guideline* (ICNG);
- Transport for NSW 2018 (TfNSW), *Construction Noise and Vibration Strategy*; and
- Department of Environment and Conservation (DEC) 2006, *Assessing Vibration: A Technical Guideline*.

The NVA has also considered and applied the following additional policy, guidelines and standards where relevant:

- Australian Standard AS 1055:2018 - Acoustics - Description and measurement of environmental noise - General Procedures;
- Australian Standard AS2187.2-2006 (AS2187.2) – Explosives—Storage and Use Part 2: Use of Explosives;
- Australian Standard AS 2436–2010 (R2016) (AS 2436) – Guide to Noise and Vibration Control on Construction, Demolition and Maintenance sites;
- Australian Standard AS NZS IEC 61672.1–2019 (AS61672) – Electro Acoustics - Sound Level Meters Part 1: Specifications;
- Australian Standard AS/IEC 60942:2019/IEC 60942:2003 (IEC60942) – Australian Standard – Electroacoustics – Sound Calibrators;
- Australia and New Zealand Environment Conservation Council (ANZECC) Guideline – Technical Basis for Guidelines To Minimise Annoyance Due To Blasting Overpressure And Ground Vibration (ANZECC Guideline), September 1990;
- German Institute for Standardisation – DIN 4150 (2015) Part 3 (DIN4150-3) –Vibration in Buildings – Part 3: Effects of Vibration on Structures; and

3.1 Assessment Requirements

This assessment has been prepared in accordance with requirements of the NSW DPE's EARs for the Project, issued on 24 July 2018 and revised on 19 December 2018. The EARs identify matters which must be addressed in the EIS and essentially form the project's terms of reference. **Table 2** lists individual requirements relevant to this NVA and where they are addressed in this report.

Table 2 Technical Assessment – Noise Related EARs

EAR	Section
An assessment of the likely operational noise impacts of the development (including construction noise) in accordance with the Noise Policy for Industry NSW	7.1, 7.2, 7.3, 7.4
If a claim is made for specific construction noise criteria for certain activities, then this claim must be justified and accompanied by an assessment of the likely construction noise impacts of these activities in accordance with the Interim Construction Noise Guideline	7.1, 7.2, 7.3, 7.4
An assessment of the likely road noise impacts of the development in accordance with the NSW Road Noise Policy	7.7
An assessment of the likely blasting impacts of the development on people, animals, buildings and infrastructure, and significant natural features, having regard to the relevant ANZECC guidelines	7.8, 7.9

3.2 Construction Noise

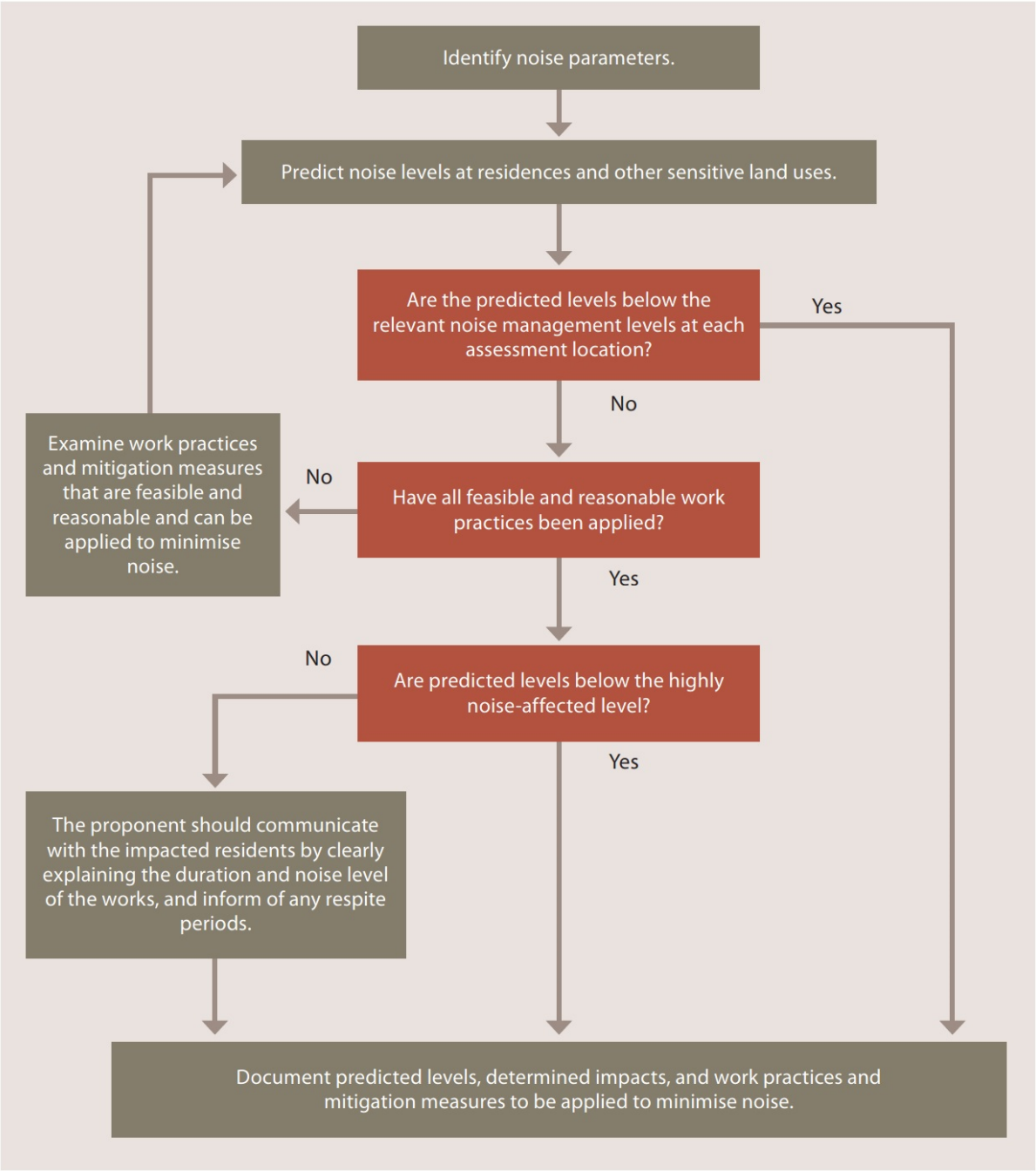
The ICNG sets out procedures to identify and address the impacts of construction noise on residences and other sensitive land uses. This section provides a summary of noise objectives that are applicable to the assessment. The ICNG provides two methodologies for the assessment of construction noise emissions:

- Quantitative, which is suited to major construction projects with typical durations of more than three weeks; and
- Qualitative, which is suited to short term infrastructure maintenance (< three weeks).

The methodology for a quantitative assessment requires a more complex approach, involving noise predictions from construction activities to the nearest relevant assessment locations. The qualitative assessment methodology is a more simplified approach that relies on noise management strategies. This study has adopted a quantitative assessment approach. Steps of the quantitative approach are summarised in **Figure 3**.

The quantitative approach includes identification of potentially affected receivers, description of activities involved in the proposal, derivation of the construction noise management levels, quantification of potential noise impact at receivers and, provides management and mitigation recommendations.

Figure 3 Quantitative Assessment Processes for Assessing and Managing Construction Noise



3.2.1 Construction Noise Management Levels

Section 4 of the ICNG details the quantitative assessment method involving predicting noise levels and comparing them with the NMLs and are important indicators of the potential level of construction noise impact. **Table 3** provides the ICNG recommended $LA_{eq(15min)}$ NMLs and how they are to be applied.

Table 3 Noise Management Levels

Time of Day	Management Level $LA_{eq(15min)}$[1]	How to Apply
Recommended standard hours: Monday to Friday - 7am to 6pm; Saturday - 8am to 1pm; No work on Sundays or public holidays.	Noise affected RBL + 10 dB	The noise affected level represents the point above which there may be some community reaction to noise. Where the predicted or measured $LA_{eq(15min)}$ is greater than the noise affected level, the proponent should apply all feasible and reasonable work practices to meet the noise affected level. The proponent should also inform all potentially impacted residents of the nature of work to be carried out, the expected noise levels and duration, as well as contact details.
	Highly noise affected 75 dBA	The highly noise affected level represents the point above which there may be strong community reaction to noise. Where noise is above this level, the relevant authority (consent, determining or regulatory) may require respite periods by restricting the hours that the very noisy activities can occur, taking into account times identified by the community when they are less sensitive to noise (such as before and after school for work near schools, or mid-morning or mid-afternoon for work near residences; and if the community is prepared to accept a longer period of construction in exchange for restrictions on construction times.
Outside recommended standard hours.	Noise affected RBL + 5 dB	A strong justification would typically be required for work outside the recommended standard hours. The proponent should apply all feasible and reasonable work practices to meet the noise affected level. Where all feasible and reasonable practices have been applied and noise is more than 5dBA above the noise affected level, the proponent should negotiate with the community. For guidance on negotiating agreements see section 7.2.2.

Note 1: The Rating Background Level (RBL) is an overall single figure background level representing each assessment period over the whole monitoring period. The RBL is used to determine the construction noise management levels for noise assessment purposes and is the median of the ABL's.

3.2.2 Construction Sleep Disturbance

Section 4.3 of the ICNG (DECC, 2009) states that a sleep disturbance assessment is required where construction activities are planned to occur for more than two consecutive nights.

Notwithstanding, most construction works will be undertaken during the day period (ie 7am to 6pm) and construction activities are not expected to occur for more than two consecutive nights at any particular location.

Table 4 summarises the recommended standard and out of hours periods for construction. Note, although are not mandatory, strong justification is required to work outside of normal construction hours.

Table 4 Recommended Hours for Construction

Period	Preferred Construction Hours
Standard Construction Hours	Monday to Friday - 7am to 6pm Saturdays - 8am to 1pm Sundays or Public Holidays - No construction
Out of Hours Period 1	Monday to Friday - 6pm to 10pm Saturdays - 7am to 8am and 1pm to 10pm Sundays or Public Holidays - 8am to 6pm
Out of Hours Period 2	Monday to Friday - 10pm to 7am Saturdays - 10pm to 8am Sundays or Public Holidays - 6pm to 7am

These recommended hours do not apply in the event of direction from police, or other relevant authorities, for safety reasons or where required in an emergency to avoid the loss of lives, property and/or to prevent environmental harm.

3.3 Construction Vibration

Department of Environment and Conservation (DEC) 2009, *Assessing Vibration: A Technical Guideline* (the 'Guideline') provides guidance on determining effects of vibration on buildings occupants. The guideline does not address vibration induced damage to structures, blast induced vibration effects or structure borne noise effects.

Determining the effects of vibration relating to vibration induced damage to structures is guided by DIN4150-3 where relevant or applicable. Vibration criteria relevant to this assessment are presented in detail in **Section 5.2** and the assessment is presented in **Section 7.5**.

3.4 Road Noise Policy

The road traffic noise criteria are provided in the Department of Environment, Climate Change and Water NSW (DECCW*), Road Noise Policy* (RNP), 2011. The policy sets out noise criteria applicable to different road classifications for the purpose of quantifying traffic noise impacts. Road noise criteria relevant to this assessment are presented in detail in **Section 5.4** and the assessment is presented in **Section 7.7**.

3.5 Blasting Guideline

The limits adopted by EPA for blasting are provided in the Australian and New Zealand Environment Conservation Council (ANZECC) - Technical basis for guidelines to minimise annoyance due to blasting overpressure and ground vibration. Blasting criteria relevant to this assessment are presented in detail in **Section 5.3** and the assessment is presented in **Section 7.8.**

3.6 Noise Policy for Industry

During operation the pumping station facilities are assessed against the EPA's *Noise Policy for Industry* (NPI) which provides a process for establishing operational noise criteria for consents and licenses enabling the EPA to regulate noise emissions from scheduled premises under the *Protection of the Environment Operations Act 1997*. The objectives of the NPI are to:

- provide noise criteria that is used to assess the change in both short term and long term noise levels;
- provide a clear and consistent framework for assessing environmental noise impacts from industrial premises and industrial development proposals;
- promote the use of best-practice noise mitigation measures that are feasible and reasonable where potential impacts have been identified; and
- support a process to guide the determination of achievable noise limits for planning approvals and/or licences, taking into account the matters that must be considered under the relevant legislation (such as the economic and social benefits and impacts of industrial development).

The policy sets out a process for industrial noise management involving the following key steps:

1. Determine the PNTLs (ie criteria) for a development. These are the levels (criteria), above which noise management measures are required to be considered. They are derived by considering two factors: shorter-term intrusiveness due to changes in the noise environment; and maintaining the noise amenity of an area.

2. Predict or measure the noise levels produced by the development with regard to the presence of annoying noise characteristics and meteorological effects such as temperature inversions and wind.

3. Compare the predicted or measured noise level with the PNTL, assessing impacts and the need for noise mitigation and management measures.

4. Consider residual noise impacts - that is, where noise levels exceed the PNTLs after the application of feasible and reasonable noise mitigation measures. This may involve balancing economic, social and environmental costs and benefits from the proposed development against the noise impacts, including consultation with the affected community where impacts are expected to be significant.

5. Set statutory compliance levels that reflect the best achievable and agreed noise limits for the development.

6. Monitor and report environmental noise levels from the development.

3.6.1 Project Noise Trigger Levels (PNTL)

The policy sets out the procedure to determine the PNTLs relevant to an industrial development. The PNTL is the lower (ie, the more stringent) value of the **Project Intrusiveness Noise Level** (PINL) and **Project Amenity Noise Level** (PANL) determined in accordance with Section 2.3 and Section 2.4 of the NPI.

3.6.2 Rating Background Level (RBL)

The **Rating Background Level** (RBL) is a determined parameter from noise monitoring and is used for assessment purposes. As per the NPI, the RBL is an overall single figure background level representing each assessment period (day, evening and night) over the noise monitoring period.

The measured RBLs relevant to the project are contained in **Section 4.2**.

3.6.3 Project Intrusiveness Noise Level (PINL)

The PINL ($LA_{eq(15min)}$) is the RBL + 5dB and seeks to limit the degree of change a new noise source introduces to an existing environment. Hence, when assessing intrusiveness, background noise levels need to be measured.

3.6.4 Project Amenity Noise Level (PANL)

The PANL is relevant to a specific land use or locality. To limit continuing increases in intrusiveness levels, the ambient noise level within an area from all combined industrial sources should remain below the recommended amenity noise levels specified in Table 2.2 (of the NPI). The NPI defines two categories of amenity noise levels:

- **Amenity Noise Levels (ANL)** – are determined considering all current and future industrial noise within a receiver area.
- **Project Amenity Noise Levels (PANL)** – is the recommended levels for a receiver area, specifically focusing the project being assessed.

Additionally, Section 2.4 of the NPI states: "*to ensure that industrial noise levels (existing plus new) remain within the recommended amenity noise levels for an area, a project amenity noise level applies for each new source of industrial noise as follows*":

PANL for new industrial developments = recommended **ANL** minus 5dBA.

The recommended amenity noise levels as per Table 2.2 of the NPI reproduced in **Table 5**.

Table 5 Amenity Criteria			
Receiver Type	Noise Amenity Area	Time of day	Recommended amenity noise level L_{Aeq} dB
Residential	Rural	Day	50
		Evening	45
		Night	40
School Classroom	All	Noisiest 1 Hour when in use	35 (internal) 45 (external)
Passive Recreation	All	When in use	50
Active Recreation	All	When in use	55
Commercial premises	All	When in use	65
Industrial	All	When in use	70

Notes: The recommended amenity noise levels refer only to noise from industrial noise sources. However, they refer to noise from all such sources at the receiver location, and not only noise due to a specific project under consideration. The levels represent outdoor levels except where otherwise stated.

Types of receivers are defined as rural residential; suburban residential; urban residential; industrial interface; commercial; industrial – see Table 2.3 and Section 2.7 of the NPI.

Time of day is defined as follows: (These periods may be varied where appropriate, for example, see A3 in Fact Sheet A.)

- day – the period from 7am to 6pm Monday to Saturday or 8am to 6pm on Sundays and public holidays
- evening – the period from 6pm to 10pm
- night – the remaining periods.

3.6.5 Maximum Noise Level Assessment

The pumping station facilities and pressure reducing system are the only operational noise sources with the potential for sleep disturbance from maximum noise level events during the night-time period which needs to be considered. The NPI considers sleep disturbance to be both awakenings and disturbance to sleep stages.

Where night-time noise levels from a development/premises at a residential location exceed the following criteria, a detailed maximum noise level event assessment should be undertaken:

- $L_{Aeq(15min)}$ 40dB or the prevailing RBL plus 5dBA, whichever is the greater, and/or
- L_{Amax} 52dB or the prevailing RBL plus 15dBA, whichever is the greater,

A detailed assessment should cover the maximum noise level, the extent to which the maximum noise level exceeds the rating background noise level, and the number of times this happens during the night-time period.

Other factors that may be important in assessing the impacts on sleep disturbance include:

- how often the events would occur;
- the distribution of likely events across the night-time period and the existing ambient maximum events in the absence of the development;
- whether there are times of day when there is a clear change in the noise environment (such as during early morning shoulder periods); and
- current understanding of effects of maximum noise level events at night.

4 Existing Environment

4.1 Noise Monitoring Methodology

To quantify the existing background noise environment of the area, a review of historical unattended monitoring data was conducted by MAC for the pipeline corridor. The review of previous monitoring data showed that RBLs were generally less than 35dB $L_{A90(daytime)}$ and 30dB $L_{A90(evening)}$ and 30dB $L_{A90(night)}$ in several catchments. Therefore, unattended noise monitoring was conducted in the three catchments where there was no historical data available.

Unattended noise surveys were conducted in general accordance with the procedures described in Australian Standard AS 1055:2018, "Acoustics - *Description and Measurement of Environmental Noise*". The measurements were carried out using Svantek 977 noise analysers from Friday 19 October 2018 to Tuesday 30 October 2018 at Portland Cemetery (NM8); Noon Street (NM0); and Yetholme Drive (NM5) and are presented in **Table 6** and presented graphically in **Figure 4.**

Calibration of all instrumentation was checked prior to and following measurements. Drift in calibration did not exceed ±0.5dBA. All equipment carried appropriate and current NATA (or manufacturer) calibration certificates. Data affected by adverse meteorological conditions have been excluded from the results in accordance with methodologies provided in Fact Sheet A4 of the NPI.

Table 6 Noise Monitoring Locations

Measurement ID	Catchment	Unattended Noise Monitoring Location	Co-ordinates MGA55	
NM0	Yetholme	Great Western Highway, Walang	757867m E	6295181m S
NM5	Angus Place	Noon Street, Blackmans Flat	784878m E	6304409m S
NM8	Portland	Sunny Corner Road, Portland	776676m E	6303446m S
N/A	Remaining Catchments	Minimum NPI RBL	N/A	N/A

4.2 Noise Monitoring Results

From observations whilst on site, the noise environment at existing residential receivers is best described as 'rural' in accordance with the NPI. A rural area, as described in the NPI, is one that has an acoustical environment that is dominated by natural sounds, having little or no road traffic noise and generally characterised by low background noise levels. The results of the unattended noise measurements for the background monitoring locations, including derived RBLs are summarised in **Table 7**. Minimum NPI RBLs have been applied to the remaining receivers. It is noted for assessment purposes, the resulting data from each unattended monitoring location has been allocated to the respective noise catchments for this assessment. Noise monitoring charts are presented graphically in **Appendix B**.

Table 7 Unattended Noise Monitoring Results			
Unattended Noise Monitoring Location	Period	Measured Background Level RBL dB LA_{90}	Measured Ambient Noise Level dB $LA_{eq(period)}$
NM0 (Yetholme) Great Western Highway	Day	47	67
	Evening	37	65
	Night	23	63
NM5 (Angus Place) Noon Street	Day	37	63
	Evening	34	59
	Night	27	57
NM8 (Portland) Sunny Corner Road	Day	30	46
	Evening	31	45
	Night	26	42
Remaining Catchments (Minimum NPI RBL)	Day	35	N/A
	Evening	30	N/A
	Night	30	N/A

Note 1: Day - the period from 7am to 6pm Monday to Saturday or 8am to 6pm on Sundays and public holidays; Evening - the period from 6pm to 10pm; Night - the remaining periods.

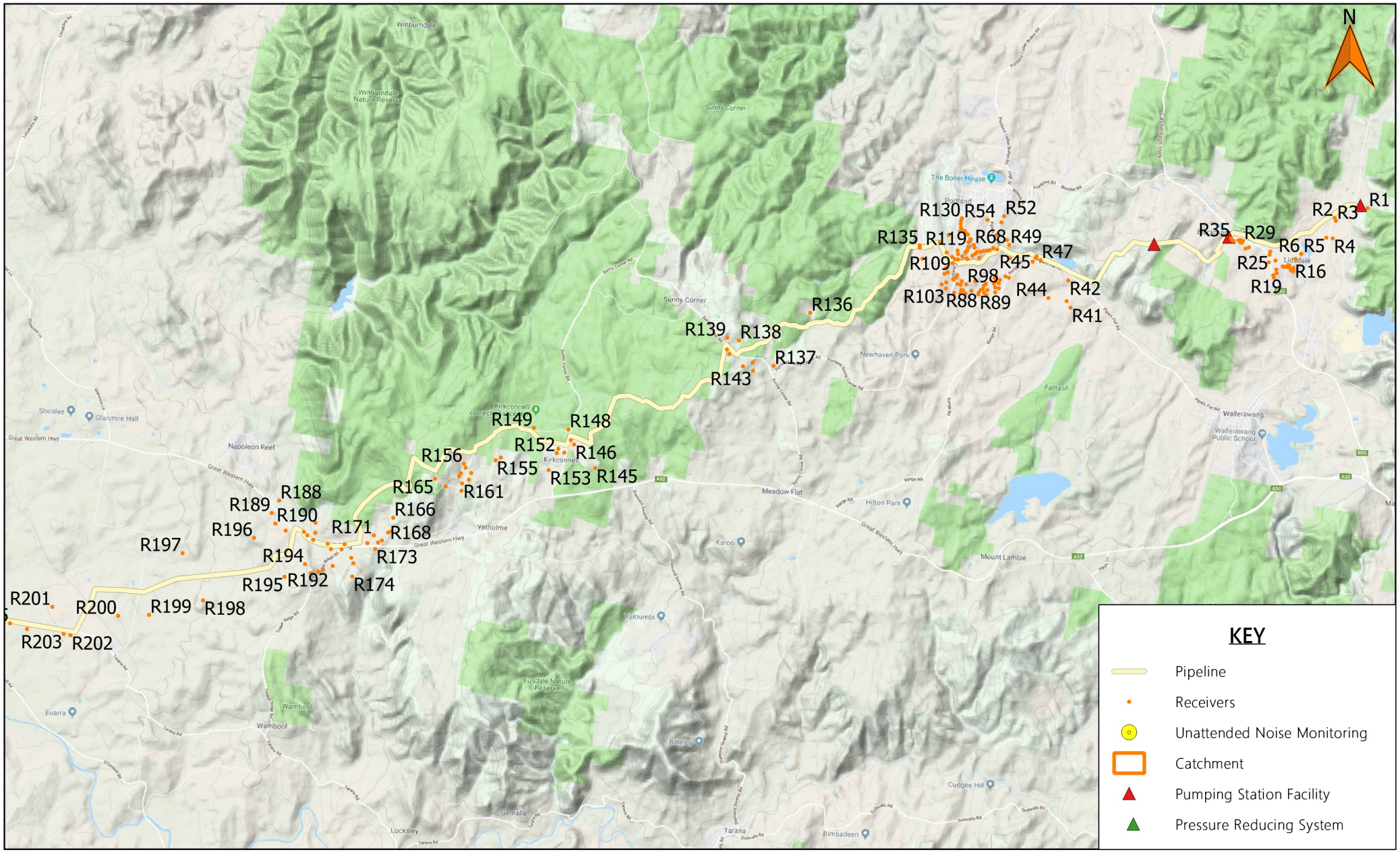


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FIGURE 4
Background Noise Monitoring Locatons

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5 Assessment Criteria

5.1 Construction Noise Management Levels

Although the majority of construction activities are planned for Standard Construction Hours, the relevant Noise Management Levels (NMLs) for Standard Construction Hours and Out Of Hours periods are presented in **Table 8**.

Table 8 Construction Noise Management Levels

Catchment	Reference RBL	Assessment Period[1]	RBL, dBA[2]	NML dB $LA_{eq(15min)}$
NM5 (Angus Place)	NM5 (Angus Place) Noon Street	Day (Standard Hours)	37	47 (RBL+10dBA)
		OOH Period 1	34	39 (RBL+5dBA)
		OOH Period 2	30 (27)	35 (RBL+5dBA)
NM8 (Portland)	NM8 (Portland) Sunny Corner Road	Day (Standard Hours)	35 (30)	45 (RBL+10dBA)
		OOH Period 1	30 (31)	35 (RBL+5dBA)
		OOH Period 2	30 (26)	35 (RBL+5dBA)
NM0 (Yetholme)	NM0 (Yetholme) Great Western Highway	Day (Standard Hours)	47	57 (RBL+10dBA)
		OOH Period 1	37	42 (RBL+5dBA)
		OOH Period 2	30 (23)	35 (RBL+5dBA)
Sunny Corner Brewongle Bike Park Perthville Bathampton McPhillamys	Minimum NPI RBLs	Day (Standard Hours)	35	45 (RBL+10dBA)
		OOH Period 1	30	35 (RBL+5dBA)
		OOH Period 2	30	35 (RBL+5dBA)
AR33	N/A	When in use	N/A	65 (external)
Kirkconnell Correction Centre[3]	N/A	Day (Standard Hours)	N/A	50
		OOH Period 1		45
		OOH Period 2		40

Note 1: Recommended Hours for Construction are shown in Table 4.

Note 2: NPI minimum RBL adopted for the assessment, measured level shown in brackets.

Note 3: The applicable Amenity Noise Level (NPI Table 2.2) for the receiver area has been applied as it is a mixed use receiver.

5.2 Construction Vibration Criteria

5.2.1 Cosmetic Damage Criteria

The DIN 4150-3 safe limit values (maximum levels measured in any direction at the foundation, or maximum levels measured in (x) or (y) horizontal directions, in the plane of the uppermost floor) are summarised in **Table 9**.

Table 9 Structural Damage Safe Limit Values (DIN 4150-3)

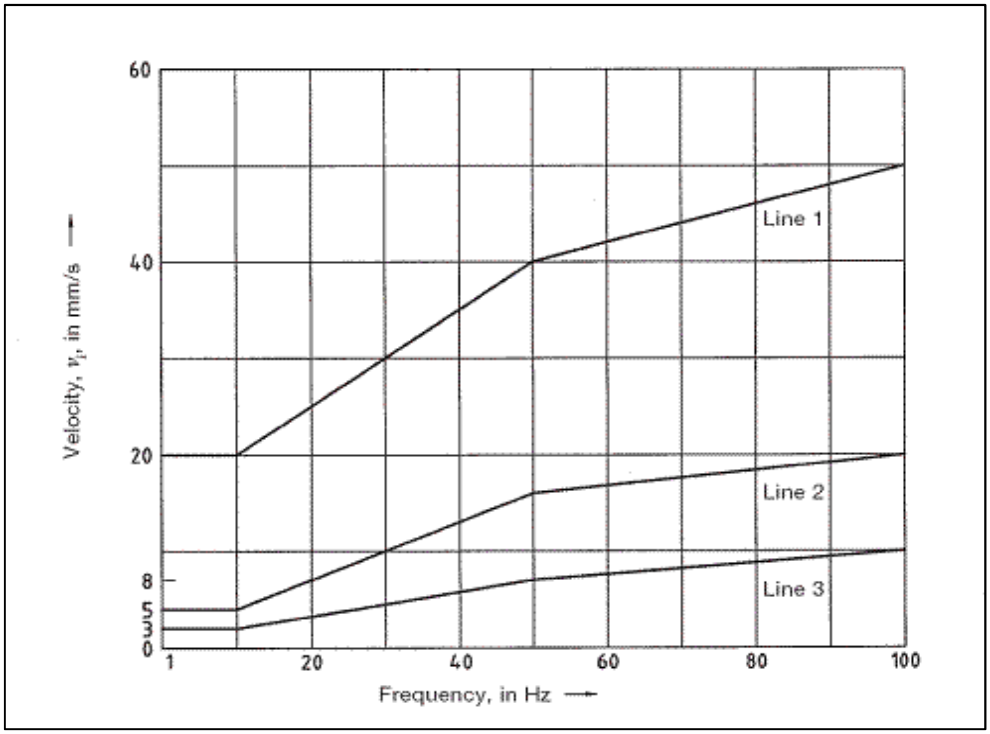
		Vibration Velocity in mm/s Vibration at foundation at a Frequency of:			
Line	Type of Structure	Less than 10Hz	10Hz to 50Hz	50Hz to 100Hz1	Plane of Floor of Uppermost Storey at all Frequencies
1	Buildings used for commercial purposes, industrial buildings, and buildings of similar design	20	20 to 40	40 to 50	40
2	Dwellings and buildings of similar design and/or occupancy	5	5 to 15	15 to 20	15
3	Sensitive Buildings: Structures that because of their particular sensitivity to vibration do not correspond to those listed in Lines 1 or 2 and have intrinsic value (e.g. buildings that are under a preservation order)	3	3 to 8	8 to 10	8
At frequencies above 100Hz, the values given in this column may be used as a minimum.					

Guidance Note

These levels are safe limits, for which damage due to vibration is unlikely to occur. Damage is defined in DIN 4150 to include minor non-structural effects such as superficial cracking in cement render, the enlargement of cracks already present, and the separation of partitions or intermediate walls from load bearing walls. Should such damage be observed without vibration levels exceeding the safe limits then it is likely to be attributable to other causes. DIN 4150 also states that when vibration levels higher than the safe limits are present, it does not necessarily follow that damage will occur.

As indicated by the criteria from DIN 4150, high frequency vibration has less potential to cause damage than that from lower frequencies - this is visually presented in **Figure 5** below where the vibration level increases with the frequency.

Figure 5 – DIN-4150-3 Structural Damage Safe Limits for a variety of building types



5.3 Blasting Criteria

The Pipeline Development would be expected to operate within the overpressure and ground vibration limits stipulated in ANZECC guidelines which are reproduced in **Table 10**.

Table 10 Blasting Emissions Criteria

Receiver	Airblast Overpressure (dBZ Peak)	Ground Vibration (mm/s)	Allowable Exceedance
Any Residences on privately owned land	120	10	0%
	15	5	5% of the total number of blast over a period of 12 months

5.4 Road Traffic Noise Criteria

The RNP road traffic noise criteria relevant to construction generated traffic for this assessment are presented in **Table 11** for residential receivers.

Table 11 Road Traffic Noise Assessment Criteria for Residential Land Uses

Road Category	Road Name	Type of Project/Development	Assessment Criteria - dBA	
			Day (7am to 10pm)	Night (10pm to 7am)
Freeway/arterial /sub-arterial road	Castlereagh Highway Great Western Highway Mid Western Highway	Existing residences affected by additional traffic on existing freeways/arterial/sub-arterial roads generated by land use developments	60dBA LAeq(15hr) external	55dBA LAeq(9hr) external
Local Roads	Numerous	Existing residences affected by additional traffic on existing local roads generated by land use developments	55dBA LAeq(1hr) external	50dBA LAeq(1hr) external

Note: For road noise assessments, the day period is from 7am to 10pm (ie there is no evening assessment period as there is with operational noise). Night is from 10pm to 7am.

For the purposes of assessment, the 'sub arterial road' category is applied to those roads that connect directly to the main highways throughout the region. It is acknowledged that the functional classification of some of these roads are a 'Collector Road' in accordance with the Roads and Maritime Noise Criteria Guideline (April 2015). However, the Road Noise Policy does not provide separate noise criteria for Collector Roads but applies the sub-arterial category to all roads that are not classified as local roads. All other roads would be in the 'local road' category.

Additionally, the RNP states where existing road traffic noise criteria are already exceeded, any additional increase in total traffic noise level should be limited to 2dB, which is generally accepted as the threshold of perceptibility to a change in noise level.

5.5 Operational Project Noise Trigger Levels (Criteria)

The Project Noise Trigger Levels (criteria) for the Pipeline Development are presented in **Table 12** and as there is the potential for the pumps and the pressure reducing system to operate at night, the PNTLs have been determined based on the default night RBL +5dBA which is the worst case scenario. The PNTL for AR33 has also been included as there is a pump station situated to the west of this receiver location.

Table 12 Project Noise Trigger Level

Receiver	Period[1]	Default RBL dB LA_{90}	PNTL dB $LA_{eq(15min)}$
All Residential	Night	30	35
Active Recreation (AR33)	When in use	N/A	53[2]
Kirkconnell Correction Centre[3]	Night	N/A	40

Note: As per Section 2.1 of the NPI, Intrusiveness Noise Levels only apply to residences.

Note 1: Day - the period from 7am to 6pm Monday to Saturday or 8am to 6pm on Sundays and public holidays; Evening - the period from 6pm to 10pm; Night - the remaining periods.

Note 2: Includes a +3dBA adjustment to the amenity period level to convert to a fifteen-minute assessment period as per Section 2.2 of the NPI.

Note 3: The applicable Amenity Noise Level (NPI Table 2.2) for the receiver area has been applied as it is a mixed use receiver.

5.5.1 Maximum Noise Level Screening Criterion

The maximum noise level screening criterion shown in **Table 13** is based on night time RBLs and trigger values as per Section 2.5 of the NPI.

Table 13 Maximum Noise Assessment Trigger Levels

Residential Receivers			
$LA_{eq(15min)}$		LA_{max}	
40dB $LA_{eq(15min)}$ or RBL + 5dB		52dB LA_{max} or RBL + 15dB	
Trigger	40	Trigger	52
RBL +5dB	35	RBL +15dB	45
Highest	**40**	**Highest**	**52**

Note 1: As per Section 2.5 of the NPI, the highest of the two criteria are adopted as the screening criteria.

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6 Noise Modelling Methodology

A computer model was developed to determine the impact of noise emissions from the Pipeline Development to neighbouring receivers for typical construction and operational activities. DGMR iNoise (Version 2019) noise modelling software was used to assess potential noise impacts associated with the pipeline construction and operation. A three-dimensional digital terrain map giving all relevant topographic information was used in the modelling process. Additionally, the model uses relevant noise source data representative of each construction activity, ground type, shielding such as barriers and/or adjacent buildings and atmospheric information to predict noise levels at the nearest potentially affected receivers. Plant and equipment were modelled at various locations and heights, representative of realistic construction and operational conditions for assessed scenarios.

The model calculation method used to predict noise levels was in accordance with ISO 9613-1 *'Acoustics - Attenuation of sound during propagation outdoors. Part 1: Calculation of the absorption of sound by the atmosphere*' and ISO 9613-2 '*Acoustics - Attenuation of sound during propagation outdoors. Part 2: General method of calculation*'.

6.1 Construction Assessment Methodology

To prepare the pipeline construction corridor, the area will be cleared of trees and vegetation. Topsoil and other obstacles such as rocks will be removed with a grader or excavator. The trench will then be excavated using a tracked excavator, backhoe, tracked chain trencher or other similar mechanical equipment. Where rock is encountered, hydraulic breaking and/or blasting may be required. It is anticipated that most of the pipeline will be constructed using open trenching techniques. However, some crossings or works in sensitive areas may be undertaken using alternative methods such as underboring for some road, river and rail crossings. The pipeline will consist of 112 water crossings, 33 road crossings, three rail crossings and five gas pipeline crossings.

Pipe sections will be stockpiled approximately 5 to 10km apart adjacent to an existing road or access which will be suitable for a semi-trailer or truck. Where possible the pipes will be transported to the cleared construction corridor and will be strung out along the edge of the proposed pipeline alignment. Pipeline construction will be a progressive operation with several workfronts being constructed at any one time. The trenching rate will be variable depending upon ground conditions and machinery used. In rocky conditions, for example on forestry tracks through Sunny Corner State Forest, the trenching rate will be around 40m-80m per day, compared to open farmland where the rate may be 600m-650m per day. Once the pipe has been laid and joined, backfill will be placed around the pipe with an excavator (or similar plant) and compacted, typically with a hand-held vibrating plate compactor.

Tipping trucks (for spoil and backfill movement) and flatbed trucks (for movement of pipes and other equipment) will shuttle between the stockpiles and pipeline construction sites. Bulk supplies of material will be delivered to the stockpile sites via semi-trailer. Site rehabilitation will be undertaken progressively following construction. Typical rehabilitation activities will include spreading topsoil and revegetation in accordance with the restoration plan and easement requirements.

6.1.1 Construction Assessment Scenarios

Two assessment methods were chosen to quantify noise emissions from construction activities as some occur along the entire alignment (transient) and potentially affect all receivers, while other activities are static and only occur in certain areas and have the potential to impact a select few receivers. For static activities, offset calculations have been completed to provide indication of where these activities achieve the relevant NMLs.

In consideration of the construction activities and methods, the following transient noise scenarios were modelled:

- Transient Scenarios
  - Clearing and grading;
  - Pipeline construction (trenching); and
  - Backfilling and restoration.
- Static Scenarios
  - Vegetation clearing;
  - Rock breaking;
  - Underboring (river crossings, road/rail crossing or gas pipeline crossings);
  - Civil, mechanical and electrical installations; and
  - Excavation and establishment (for fixed infrastructure such as pumping station facilities and pressure reducing system).
- Blasting to break up rock formations where required.

Noise emission data and assumptions used in this assessment are summarised in **Table 14**.

Table 14 Construction Equipment Sound Power Levels, Lw dBA re 10^{-12} W				
Noise Source/Item	Utilisation %	Quantity	Lw/Item	Total Lw
Pipeline Construction (open trenching entire alignment)				
20t Excavator	100	1	102	102
Track trencher	100	1	102	102
Shaft drive petrol pump	100	1	91	91
Concrete mixer	100	1	103	103
Concrete vibrator	100	1	108	108
Diesel generator	100	1	93	93
Power tools	100	1	102	102
Heavy Vehicles	100	2	108	111
Total – Trenching				**114**
Clearing and Grading				
30t Excavator/Piling Rig	100	1	104	104
Loader	100	1	101	101
Grader	100	1	108	108
Shaft drive petrol pump	100	1	91	91
Power tools	100	2	102	105
Heavy Vehicles	100	2	108	111
Light Vehicles	100	2	76	79
Total – Clearing and Grading				**114**
Backfilling & Restoration				
20t Excavator	100	1	102	102
Vibrating plate compactor	100	2	102	105
Shaft drive petrol pump	100	1	91	91
Power tools	100	1	102	102
Light Vehicles	100	2	76	79
Total – Backfilling & Restoration				**108**
Under boring (river crossings, road/rail crossing or gas pipeline crossings)				
30t Excavator/Backhoe	100	1	104	104
Diesel pump	100	1	88	88
Shaft drive petrol pump	100	1	91	91
Petrol generator	100	1	93	93
Horizontal drill rig	100	1	114	114
Drilling mud plant	100	1	114	114
Hydraulic power pack	100	1	102	102
Water tank	100	1	116	116
Heavy Vehicles	100	2	108	111
Light Vehicles	100	2	76	79
Total – Under boring				**120**

Table 14 Construction Equipment Sound Power Levels, Lw dBA re 10^{-12} W				
Noise Source/Item	Utilisation %	Quantity	Lw/Item	Total Lw
Vegetation Clearing (only areas where vegetation removal is required)				
Mulcher	100	1	102	102
Cherry picker/EWP	100	1	102	102
30t Excavator/Backhoe	100	1	104	104
Chainsaw	100	1	107	107
Heavy Vehicles	100	2	108	111
Light Vehicles	100	2	76	79
Total – Vegetation Clearing				**113**
Excavation and Establishment				
20t Excavator	100	1	102	102
15t Mobile crane	100	1	106	106
Diesel generator	100	2	93	96
Shaft drive petrol pump	100	1	91	91
Power tools	100	1	102	102
Concrete mixer	100	1	103	103
Concrete agitator	100	1	103	103
Concrete vibrator	100	1	108	108
Heavy Vehicles	100	2	108	111
Light Vehicles	100	2	76	79
Total - Excavation and Establishment				**114**
Rock Breaking				
30t Excavator with impact hammer	100	1	120	120
Jack hammer	100	1	102	102
Loader	100	1	101	101
Heavy Vehicles	100	2	108	111
Light Vehicles	100	2	76	79
Total – Rock Breaking				**120**
Civil mechanical and electrical installation				
15t Mobile crane	100	1	106	106
Diesel generator	100	2	93	96
Shaft drive petrol pump	100	1	91	91
Welding equipment	100	1	102	102
Air compressor	100	1	102	102
Power tools	100	1	102	102
Light Vehicles	100	2	76	79
Total - Excavation and Establishment				**110**

6.2 Blasting Assessment Methodology

A calculation of air-blast overpressure and ground-borne vibration levels has been conducted in accordance with methods in AS2187.2.

6.2.1 Air-Blast Overpressure

Calculation of overpressures have been completed using the following AS2187.2 equation:

Where:

$$\mathrm{P} = K_a \left(\frac{R}{(Q^{1/3})} \right)^a$$

P = Pressure, in kilopascals;

Q = Effective explosives charge mass, in kilograms (MIC);

R = Distance from charge, in metres;

Ka = Site constant, a conservative value of 25 was adopted; and

a = Site exponent, a value of -1.45 was adopted.

The conversion of 'P' to unweighted decibels (dBZ) is completed using the following formula:

$$\mathrm{SPL} = 10\, x \log \left(\frac{P}{P_0} \right)^2$$

6.2.2 Ground-Borne Vibration

Preliminary estimations of vibration from blasting have been completed using the following AS2187.2 equation:

$$V = K_g \left(\frac{R}{(Q^{1/2})} \right)^{-B}$$

Where:

V = ground vibration as vector peak particle velocity, in mm/s;

R = distance between charge and point of measurement, in m;

Q = maximum instantaneous charge (effective charge mass per delay), in kg;

Kg = a constant related to site and rock properties for estimation purposes, a value of 1140 was adopted; and

B = a constant related to site and rock properties for estimation purposes, a value of 1.6 was adopted.

6.3 Road Traffic Noise

The United States (US) Environmental Protection Agency's road traffic calculation method was used to predict the L_{Aeq} noise levels from construction vehicles travelling past receivers along public roads. This method is an internationally accepted theoretical traffic noise prediction model and is ideal for calculating road traffic noise where relatively small traffic flows are encountered.

6.4 Operational Assessment Methodology

Key operational activities of the pipeline development include:

- Operation and maintenance of the pumping station facilities;
- Maintenance of the pipeline, the pressure reducing system and valves; and
- Other infrequent maintenance of the pipeline (e.g. pigging to remove scaling or repairing of leaks).

A pressure reducing system will comprise of pressure reduction valves (PRV), a water storage tank, vents and electrical controls as required in accordance with the detailed design. It will be installed at Sunny Corner (CH38.5) to protect the pipeline from excessive pressure. The pressure reducing system is typically enclosed in a concrete building with noise mitigation measures depending on the distance to nearest sensitive noise receiver. An additional pressure reducing system may be required along the pipeline corridor depending on refinements made to the design and choice of materials, which will be determined during detailed design.

Four pumping station facilities (refer **Figure 2**) will be required to ensure efficient transfer of water through the pipeline and will be located at:

- Pumping Station 1 (Angus Place Coal Mine);
- Pumping Station 2 (Springvale Coal Services);
- Pumping Station 3 (Mt Piper Power Station); and
- Pumping Station 4 (Bathurst Bike Park).

Each pumping station facility will occupy an area of approximately 5,600m^2 (75m x 75m) for pumping stations 1, 2 and 3) and 1,700m^2 (35m x 50m) for pumping station 4. They will be fenced for public safety. Within each pumping station facility there will be the following:

- a 750kL water storage tank, pipework and valving;
- monitoring and control equipment, including flow meters, tank level detection and automated valves;
- a pump and motor building, typically comprising electric motor and pump sets;
- a pad mounted power transformer, incoming high voltage supply and switchroom; and
- an access road and small parking area.

6.4.1 Operation Assessment Scenarios

For this assessment, operational noise predictions were modelled for a typical worst-case operational scenario for each of the four pumping station locations and assumes two of the four pumps are operational continuously for a 15-minute assessment period at each location. Currently there are several types of pumps proposed to be used at each site, hence the worst-case sound power level of the proposed pumps was adopted for this assessment, as shown in **Table 15**. It is noted that the pumps are proposed to be enclosed within a building and a moderate attenuation level of 15dBA has been adopted. Therefore, predictions should be considered a worst case.

Table 15 Operational Equipment Sound Power Levels dBA re 10^{-12} W

Noise Source/Item	Quantity	Lw/Item	Total Lw
Pump Station Motor (per site)	2	82	85

7 Results

7.1 Construction Noise Results

Noise levels were predicted to each assessed receptor assuming receiver heights of 1.5m above ground level for typical construction activities.

Two assessment methods were chosen to quantify noise emissions from each construction activity as some are along the entire alignment (transient) and potentially affect all receivers, while other activities are static areas and only have the potential to impact a select few receivers.

7.2 Pipeline Construction Results – Transient Activities

Noise emissions from transient Pipeline Construction activities are presented for each catchment and offset distance from the pipeline alignment. Noise emissions for Standard Construction Hours and OOH periods without additional noise mitigation or management measures at assessed receiver locations are presented in:

- **Table 16** for Clearing and Grading activities;
- **Table 17** for Trenching; and
- **Table 18** for Backfill and Restoration.

Detailed results for the transient construction activities along the pipeline alignment are presented in:

- **Appendix C** for Clearing and Grading activities**;**
- **Appendix D** for Trenching;
- **Appendix E** for Backfill and Restoration; and
- **Appendix F** which provides detailed tabulated results for the all transient construction activities including alternative mitigation measures using the TfNSW Construction Noise Strategy, reproduced in **Table 19**.

Table 16 Predicted Construction Noise Levels – Clearing & Grading								
	Offset from	Noise Level	NML dB $LA_{eq(15min)}$			Level above NML		
Catchment	Pipeline	dB $LA_{eq(15min)}$	Std	Period 1	Period 2	Std	Period 1	Period 2
Angus Place	50-100m	64	47	39	35	17	25	29
	100-200m	62	47	39	35	15	23	27
	200-400m	59	47	39	35	12	20	24
	400-800m	53	47	39	35	6	14	18
	>800m	47	47	39	35	0	8	12
Bathurst Bike Park	<50m	68	45	35	35	23	33	33
	50-100m	64	45	35	35	19	29	29
	100-200m	63	45	35	35	18	28	28
	200-400m	58	45	35	35	13	23	23
	400-800m	52	45	35	35	7	17	17
	>800m	46	45	35	35	1	11	11
Brewongle	100-200m	62	45	35	35	17	27	27
	200-400m	53	45	35	35	8	18	18
	400-800m	51	45	35	35	6	16	16
	>800m	46	45	35	35	1	11	11
McPhillamys	<50m	66	45	35	35	21	31	31
	50-100m	62	45	35	35	17	27	27
	200-400m	54	45	35	35	9	19	19
	400-800m	53	45	35	35	8	18	18
	>800m	66	45	35	35	21	31	31
Perthville	<50m	69	45	35	35	24	34	34
	50-100m	62	45	35	35	17	27	27
	100-200m	55	45	35	35	10	20	20
	200-400m	57	45	35	35	12	22	22
	400-800m	52	45	35	35	7	17	17
	>800m	47	45	35	35	2	12	12
Portland	<50m	***80***	45	35	35	35	45	45
	50-100m	65	45	35	35	20	30	30
	100-200m	62	45	35	35	17	27	27
	200-400m	58	45	35	35	13	23	23
	400-800m	52	45	35	35	7	17	17
	>800m	48	45	35	35	3	13	13
Sunny Corner	50-100m	65	45	35	35	20	30	30
	100-200m	60	45	35	35	15	25	25
	200-400m	56	45	35	35	11	21	21
	400-800m	52	45	35	35	7	17	17

Table 16 Predicted Construction Noise Levels – Clearing & Grading								
	Offset from	Noise Level	NML dB $LA_{eq(15min)}$			Level above NML		
Catchment	Pipeline	dB $LA_{eq(15min)}$	Std	Period 1	Period 2	Std	Period 1	Period 2
Yetholme	<50m	69	57	42	35	12	27	34
	50-100m	62	57	42	35	5	20	27
	100-200m	61	57	42	35	4	19	26
	200-400m	57	57	42	35	0	15	22
	400-800m	53	57	42	35	0	11	18
	>800m	47	57	42	35	0	5	12

Note: Bold italics indicates exceedance of the highly affected Noise Management Level (NML).

Table 17 Predicted Construction Noise Levels – Trenching								
Catchment	Offset from Pipeline	Noise Level dB $L_{Aeq(15min)}$	NML dB $L_{Aeq(15min)}$			Difference to NML		
			Std	Period 1	Period 2	Std	Period 1	Period 2
Angus Place	50-100m	64	47	39	35	17	25	29
	100-200m	63	47	39	35	16	24	28
	200-400m	60	47	39	35	13	21	25
	400-800m	54	47	39	35	7	15	19
	>800m	47	47	39	35	0	8	12
Bathurst Bike Park	<50m	69	45	35	35	24	34	34
	50-100m	65	45	35	35	20	30	30
	100-200m	63	45	35	35	18	28	28
	200-400m	58	45	35	35	13	23	23
	400-800m	52	45	35	35	7	17	17
	>800m	47	45	35	35	2	12	12
Brewongle	100-200m	62	45	35	35	17	27	27
	200-400m	54	45	35	35	9	19	19
	400-800m	51	45	35	35	6	16	16
	>800m	46	45	35	35	1	11	11
McPhillamys	<50m	67	45	35	35	22	32	32
	50-100m	63	45	35	35	18	28	28
	200-400m	54	45	35	35	9	19	19
	400-800m	53	45	35	35	8	18	18
	>800m	47	45	35	35	2	12	12
Perthville	<50m	70	45	35	35	25	35	35
	50-100m	63	45	35	35	18	28	28
	100-200m	56	48	40	38	10	20	20
	200-400m	57	45	35	35	12	22	22
	400-800m	53	45	35	35	8	18	18
	>800m	47	45	35	35	2	12	12
Portland	<50m	***81***	45	35	35	36	46	46
	50-100m	66	45	35	35	21	31	31
	100-200m	62	45	35	35	17	27	27
	200-400m	59	45	35	35	14	24	24
	400-800m	52	45	35	35	7	17	17
	>800m	48	45	35	35	3	13	13
Sunny Corner	50-100m	66	45	35	35	21	31	31
	100-200m	61	45	35	35	16	26	26
	200-400m	56	45	35	35	11	21	21
	400-800m	53	45	35	35	8	18	18

Table 17 Predicted Construction Noise Levels – Trenching								
Catchment	Offset from Pipeline	Noise Level dB $LA_{eq(15min)}$	NML dB $LA_{eq(15min)}$			Difference to NML		
			Std	Period 1	Period 2	Std	Period 1	Period 2
Yetholme	<50m	69	57	42	35	12	27	34
	50-100m	63	57	42	35	6	21	28
	100-200m	62	57	42	35	5	20	27
	200-400m	58	57	42	35	1	16	23
	400-800m	53	57	42	35	0	11	18
	>800m	47	57	42	35	0	5	12

Note: Bold italics indicates exceedance of the highly affected Noise Management Level (NML).

Table 18 Predicted Construction Noise Levels – Backfill & Restoration								
Catchment	Offset from Pipeline	Noise Level dB $LA_{eq(15min)}$	NML dB $LA_{eq(15min)}$			Difference to NML		
			Std	Period 1	Period 2	Std	Period 1	Period 2
Angus Place	50-100m	58	47	39	35	11	19	23
	100-200m	57	47	39	35	10	18	22
	200-400m	54	47	39	35	7	15	19
	400-800m	48	47	39	35	1	9	13
	>800m	42	47	39	35	0	3	7
Bathurst Bike Park	<50m	63	45	35	35	18	28	28
	50-100m	59	45	35	35	14	24	24
	100-200m	57	45	35	35	12	22	22
	200-400m	52	45	35	35	7	17	17
	400-800m	46	45	35	35	1	11	11
	>800m	41	45	35	35	0	6	6
Brewongle	100-200m	56	45	35	35	11	21	21
	200-400m	48	45	35	35	3	13	13
	400-800m	46	45	35	35	1	11	11
	>800m	41	45	35	35	0	6	6
McPhillamys	<50m	61	45	35	35	16	26	26
	50-100m	57	45	35	35	12	22	22
	200-400m	48	45	35	35	3	13	13
	400-800m	47	45	35	35	2	12	12
	>800m	41	45	35	35	0	6	6
Perthville	<50m	64	45	35	35	19	29	29
	50-100m	57	45	35	35	12	22	22
	100-200m	50	48	40	38	4	14	14
	200-400m	51	45	35	35	6	16	16
	400-800m	47	45	35	35	2	12	12
	>800m	42	45	35	35	0	7	7
Portland	<50m	*75*	45	35	35	30	40	40
	50-100m	60	45	35	35	15	25	25
	100-200m	57	45	35	35	12	22	22
	200-400m	53	45	35	35	8	18	18
	400-800m	47	45	35	35	2	12	12
	>800m	43	45	35	35	0	8	8
Sunny Corner	50-100m	60	45	35	35	15	25	25
	100-200m	55	45	35	35	10	20	20
	200-400m	51	45	35	35	6	16	16
	400-800m	47	45	35	35	2	12	12

Table 18 Predicted Construction Noise Levels – Backfill & Restoration								
Catchment	Offset from Pipeline	Noise Level dB $LA_{eq(15min)}$	NML dB $LA_{eq(15min)}$			Difference to NML		
			Std	Period 1	Period 2	Std	Period 1	Period 2
Yetholme	<50m	64	57	42	35	7	22	29
	50-100m	57	57	42	35	0	15	22
	100-200m	56	57	42	35	0	14	21
	200-400m	52	57	42	35	0	10	17
	400-800m	47	57	42	35	0	5	12
	>800m	42	57	42	35	0	0	7

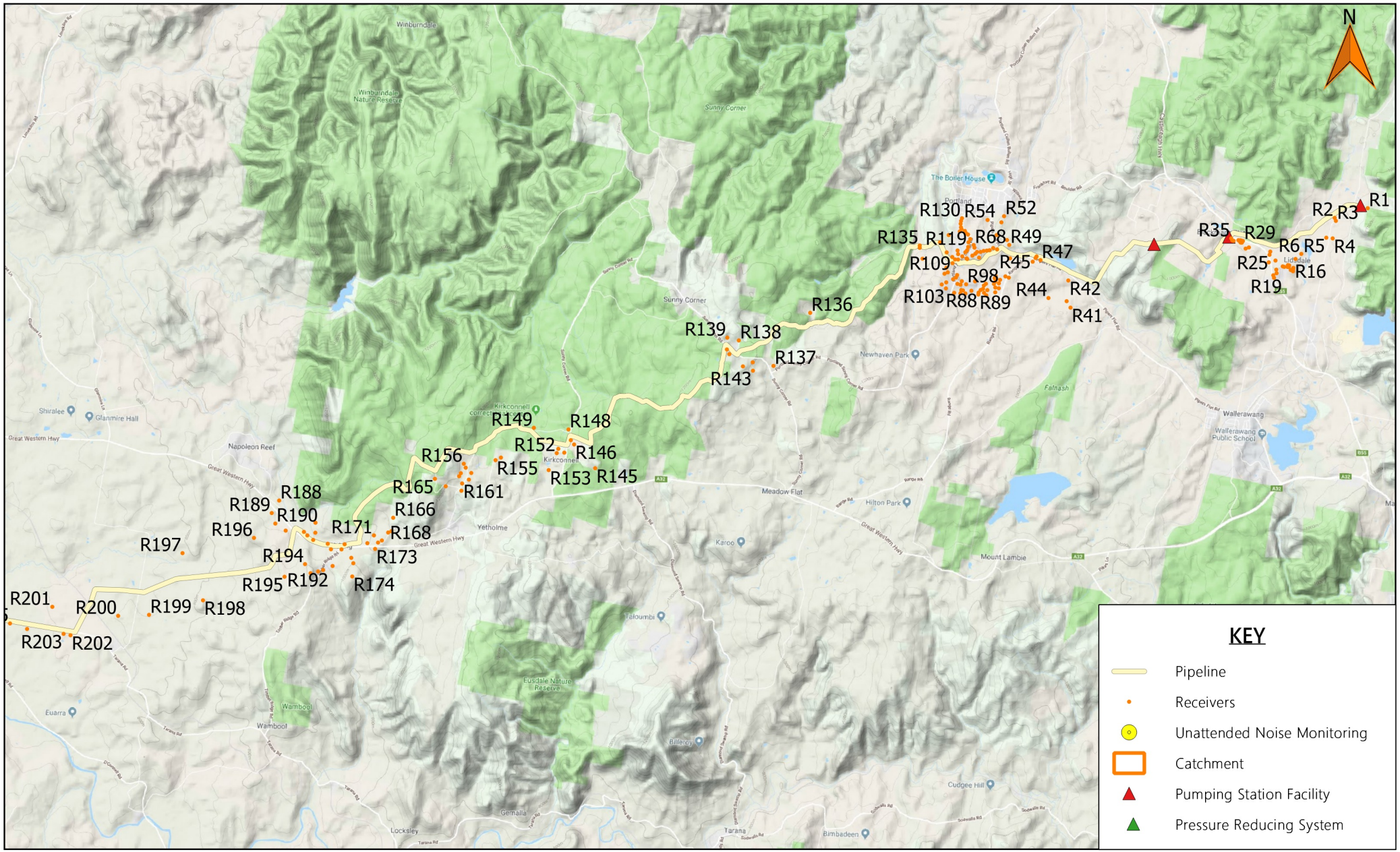
Note: Bold font identifies exceedances at receivers.

Note: Bold italics indicates exceedance of the highly affected Noise Management Level (NML).

A review of the results show that construction noise levels for transient activities have the potential to be above the relevant NMLs at most receivers in proximity to the work, although for the most part are expected to be only for a short duration (ie either one to two shifts or up to a few days). Notwithstanding, construction noise mitigation measures as outlined in **Section 8** should be considered.

Furthermore, the highly affected $LA_{eq(15min)}$ noise management level of 75dBA is expected to be satisfied at all receivers except at one receiver (R48) during all pipeline transient construction activities (clearing and grading, trenching and backfill). **Figure 6** shows the location of Receiver R48 and its proximity to the pipeline alignment.

Table 19 Additional Mitigation Measures	
Mitigation Measure	Abbreviation
Alternative accommodation	AA
Monitoring	M
Individual briefings	IB
Letter box drops10	LB
Project specific respite offer	RO
Phone calls	PC
Specific notifications	SN



MAC Muller Acoustic Consulting

FIGURE 4
Background Noise Monitoring Locatons

REF: MAC180742

7.3 Pipeline Construction Results – Static Activities

Predicted noise emissions from Static Construction activities for Standard Construction Hours and OOH periods, without additional noise mitigation or management measures, have been calculated at several offset distances to determine the buffer distance required to meet the relevant NMLs for each catchment (refer **Figure 7**, **Figure 8** and **Figure 9**). Predicted noise levels have allowed for propagation due to spherical spreading and attenuation, associated with air absorption and ground absorption.

Results identify that it may not be possible to conduct rock breaking in some areas of the alignment based on the buffer distances required and achieve relevant NMLs. Therefore, where possible or feasible alternative methods should be considered, such as non-explosive rock breaking techniques, including Cardox, Nonex and/or Penetrating Cone Fracture (PCF) (Caldwell, 2005).

Figure 7 Offset Distances for Static Construction Activities – Minimum NML

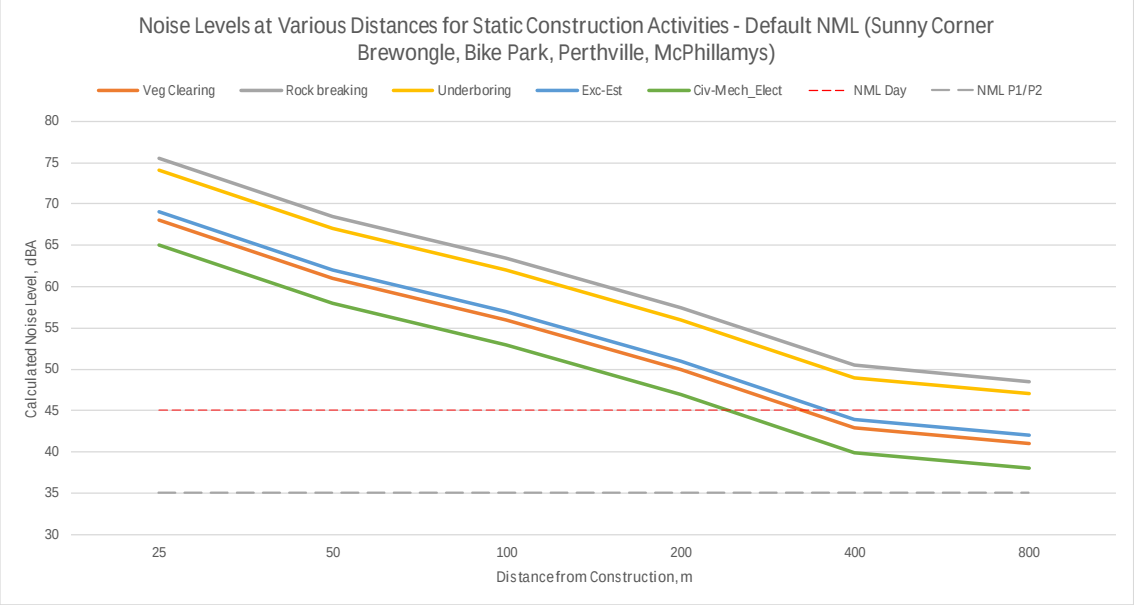


Figure 8 Offset Distances for Static Construction Activities – Yetholme Catchment

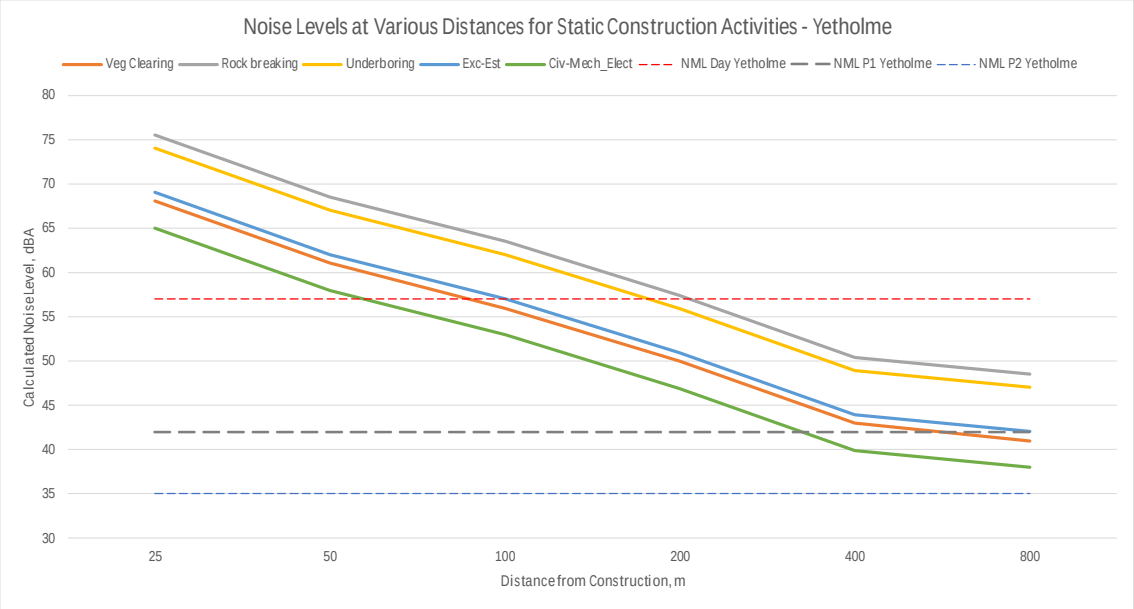
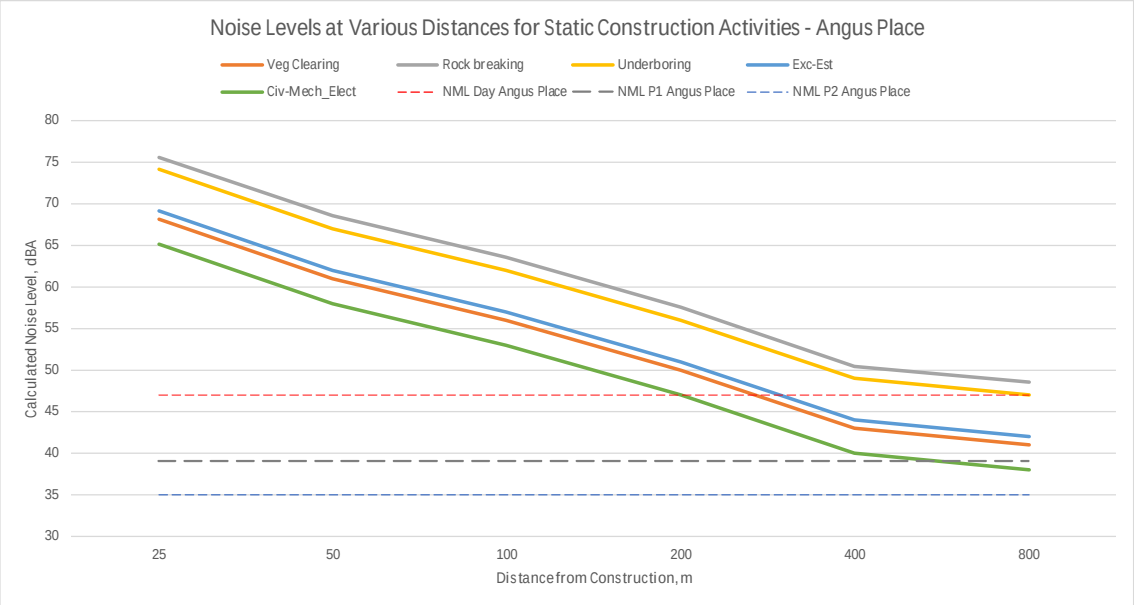


Figure 9 Offset Distances for Static Construction Activities – Angus Place Catchment



7.4 Maximum Noise Level Assessment - Construction

Although OOH works are not specifically considered, there is potential for construction activities during OOH Period 2 (night time) that has potential to generate noise emissions that may cause sleep disturbance at receivers directly adjacent to the construction work.

Therefore, for situations where works may occur during OOH Period 2, calculations have quantified the potential for maximum night time events at various offset distances from the pipeline. Calculations adopted a sound power level of 115dB L_{Amax} to represent emissions from transient sources such as truck tail gate bangs and metallic impacts from equipment. Moderate levels of attenuation, associated with molecular absorption (-3dBA), directivity and ground absorption (-5dBA) were considered in the calculations. Results identified that maximum emissions have the potential to be above the sleep disturbance screening criterion at receivers within 200m of the works.

Furthermore, it is envisaged that the pipeline development would avoid night time works where possible and when required, proactively manage night time noise emissions and implement reasonable and feasible noise control strategies to minimise and where possible, eliminate the occurrence of sleep disturbance within the surrounding locality.

7.5 Construction Vibration Impacts

A qualitative assessment of potential vibration impacts has been completed. Due to the nature of the works proposed and distances to receivers, vibration impacts from the Pipeline Development would be negligible.

The *Construction Noise Strategy* (Transport for NSW, 2012) sets out safe working distances to achieve the human response criteria for vibration. The key vibration generating source proposed to be used for the Pipeline Development is a vibratory pile driver. For a small hydraulic hammer, the Construction Noise Strategy sets a safe working distance of 7m to achieve the residential human response criteria for continuous vibration. Therefore, as the nearest receivers to the Pipeline Development site are greater than 10m, human exposure to vibration is anticipated to be minimal. Furthermore, where the human response criteria are satisfied, the structural and cosmetic criteria for sensitive receivers will also be achieved. Therefore, vibration impacts are not considered to be a significant issue to the Pipeline Development and has not been considered further in this assessment.

7.6 Heritage

The pipeline corridor does not intersect the curtilages of the heritage listed items of Leeholme Homestead and outbuildings and Portland General Cemetery and no direct impacts are expected. For Leeholme Homestead and outbuildings the pipeline corridor is on the western side of O'Connell Road, while the homestead is on the eastern side, approximately 400m from the pipeline.

Portland Cemetery is adjacent to the pipeline corridor and within 25m. If vibration generating equipment is to be used whilst the pipeline construction is adjacent to the cemetery, the safe working distance for

the relevant plant item should be sought as outlined in The Construction Noise Strategy (Transport for NSW, 2012). If there is no data pertaining to the type of equipment in use, then vibration monitoring should be undertaken whilst vibration generating works are within 50m (twice the safe working distance for large vibratory roller) of the cemetery.

7.7 Construction Road Traffic Noise Impacts

It is anticipated that each activity would consist of construction crews who would travel to and from each specific work area for each shift. The traffic and access impact assessment for the pipeline development (Ason, 2019) estimates that at transient worksites (i.e. pipeline construction) an average of 30 truck movements per day or a peak of 14 truck movements per hour would be required. For static worksites (i.e. pumping station facilities) an average of six truck movements per day or a peak of four truck movements per hour would be required. Peak light vehicle movements are estimated to be 16 vehicles per day for transient worksites and nine vehicles per day for static worksites. A worst-case night-time assessment of road noise emissions using the United States (US) Environmental Protection Agency's road traffic calculation for construction generated road traffic would be approximately 44dB $LA_{eq(9hr)}$ at a nominal offset distance of 10m and satisfy relevant night time road noise criteria and not increase existing levels by more than 2dBA and has not been considered further in this assessment.

7.8 Construction Blasting Results

Predicted noise emissions from blasting has been calculated at varying offset distances to determine the offset distance required to meet the blasting criteria at the nearest receiver to the blast location.

Figure 10 and **Figure 11** shows the relationship between distance and the charge weight (MIC) for airblast overpressure and vibration such that blast emissions can be estimated for receivers for when blasting is required, enabling the MIC to be adjusted such that emissions can be managed within ANZECC limits.

Figure 10 Offset Distances for Airblast Overpressure

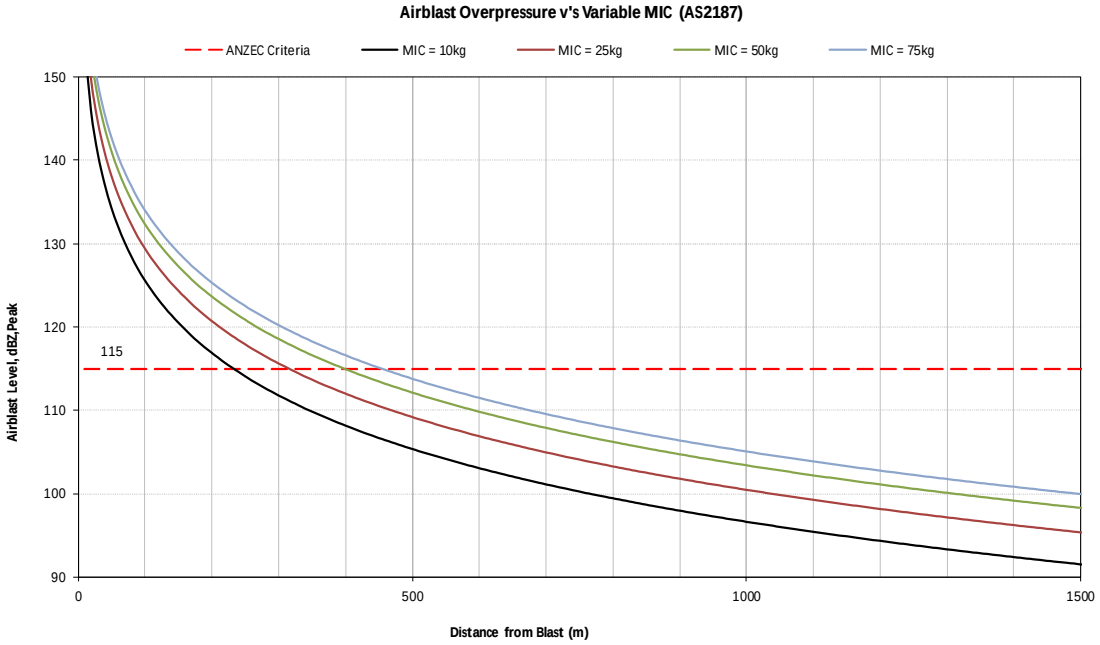
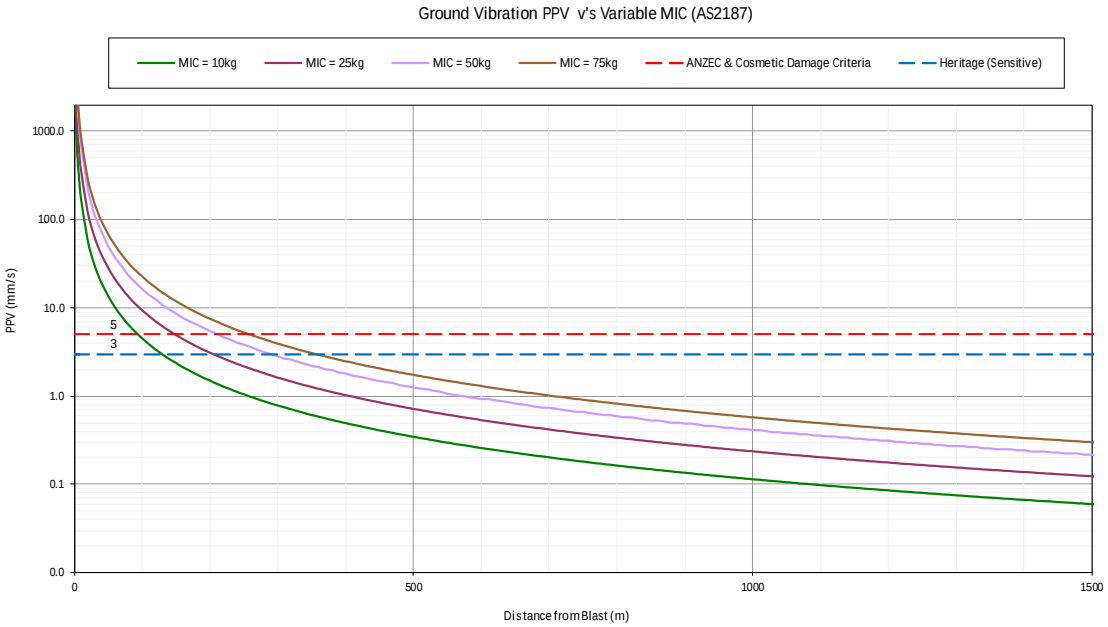


Figure 11 Offset Distances Vibration



7.9 Operational Noise Results

Noise levels of the operational pump stations were predicted to each assessed receptor within 1,000m of the four pump stations and the pressure reducing system. Predicted noise emissions are presented in **Table 20** and **Figure 12, Figure 13, Figure 14** and **Figure 15.** It is noted that there are no receivers within 1,000m of pump station Facility No.3 (Mt Piper Power Station) and hence, no figure is provided. Noise modelling identifies that the operation of the pump stations would satisfy the most conservative night criteria.

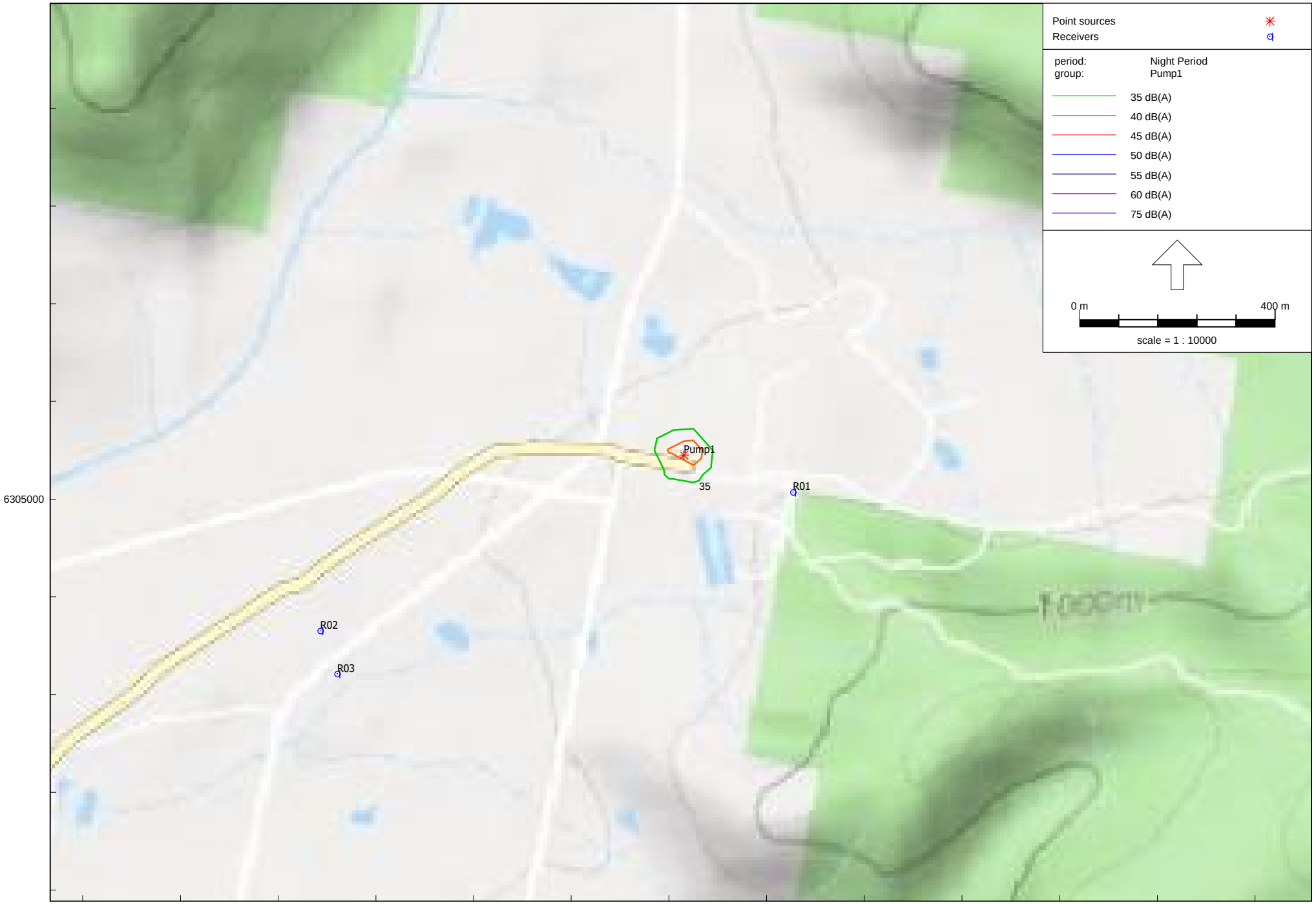
Table 20 Predicted Operations Noise Levels – Night time

Catchment	Offset from Pipeline	Noise Level dB $L_{Aeq(15min)}$	PNTL dB $L_{Aeq(15min)}$	Compliance
Angus Place	50-100m	<30	35	Yes
	100-200m	<30	35	Yes
	200-400m	<30	35	Yes
	400-800m	<30	35	Yes
	>800m	<30	35	Yes
Bathurst Bike Park	<50m	<30	35	Yes
	50-100m	<30	35	Yes
	100-200m	<30	35	Yes
	200-400m	<30	35	Yes
	400-800m	<30	35	Yes
	>800m	<30	35	Yes
Brewongle	100-200m	<30	35	Yes
	200-400m	<30	35	Yes
	400-800m	<30	35	Yes
	>800m	<30	35	Yes
McPhillamys	<50m	<30	35	Yes
	50-100m	<30	35	Yes
	200-400m	<30	35	Yes
	400-800m	<30	35	Yes
	>800m	<30	35	Yes
Perthville	<50m	<30	35	Yes
	50-100m	<30	35	Yes
	100-200m	<30	35	Yes
	200-400m	<30	35	Yes
	400-800m	<30	35	Yes
	>800m	<30	35	Yes

Table 20 Predicted Operations Noise Levels – Night time				
Catchment	Offset from Pipeline	Noise Level dB $LA_{eq(15min)}$	PNTL dB $LA_{eq(15min)}$	Compliance
Portland	<50m	<30	35	Yes
	50-100m	<30	35	Yes
	100-200m	<30	35	Yes
	200-400m	<30	35	Yes
	400-800m	<30	35	Yes
	>800m	<30	35	Yes
Sunny Corner	50-100m	<30	35	Yes
	100-200m	<30	35	Yes
	200-400m	<30	35	Yes
	400-800m	<30	35	Yes
Yetholme	<50m	<30	35	Yes
	50-100m	<30	35	Yes
	100-200m	<30	35	Yes
	200-400m	<30	35	Yes
	400-800m	<30	35	Yes
	>800m	<30	35	Yes

Note 1: Modelled against the most conservative night criteria.

Figure 12
Operational Pump Station 1 (Angus Place)



Industrial noise - ISO 9613.1/2, [Operation - Operational Pump Stations] , iNoise V2019 Enterprise. Licensed to Muller Acoustic Consulting - Australia

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Figure 13
Operational Pump Station 2 (Springvale Coal Services)

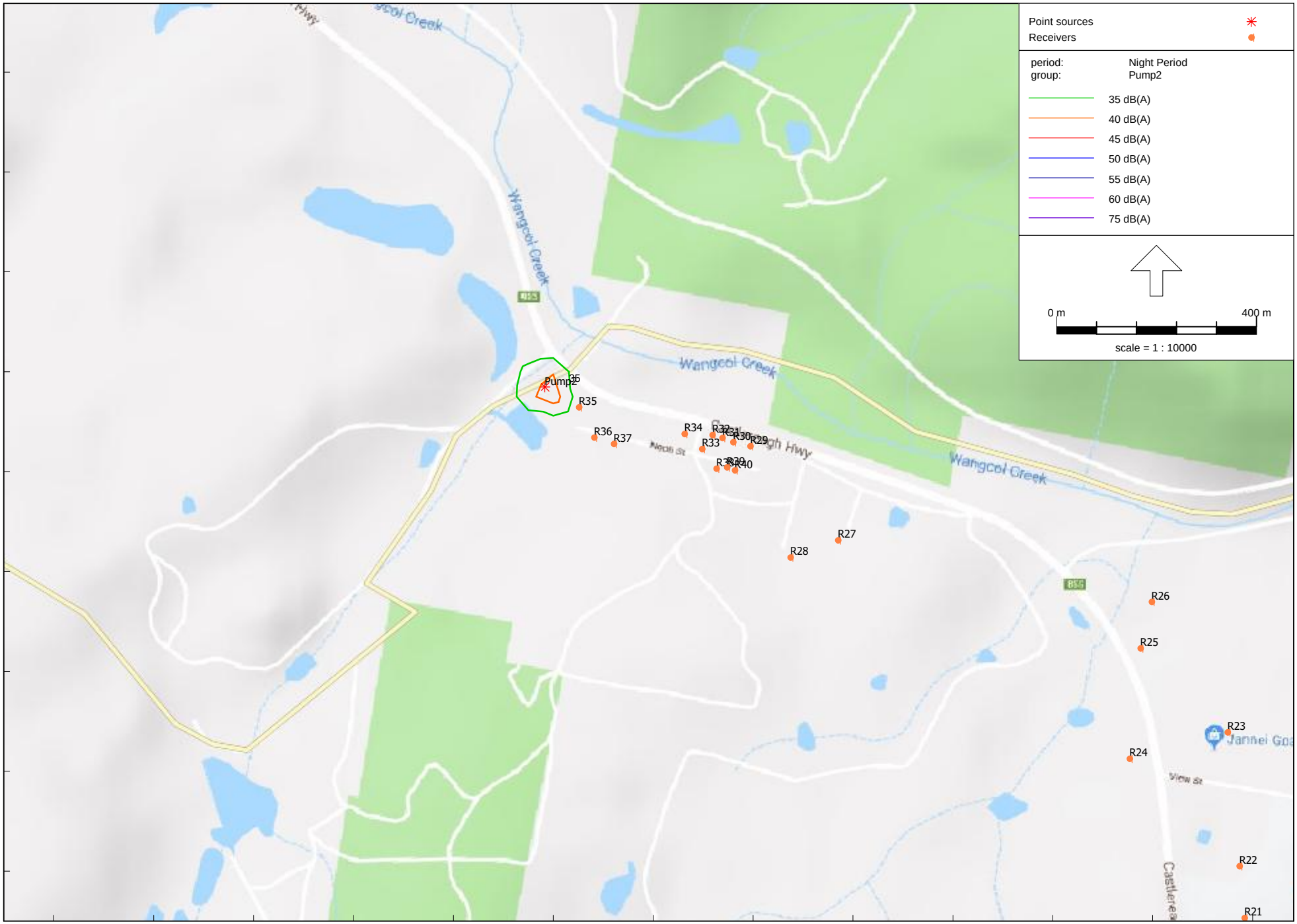

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Figure 14
Operational Pump Station 4 (Bathurst Bike Park)

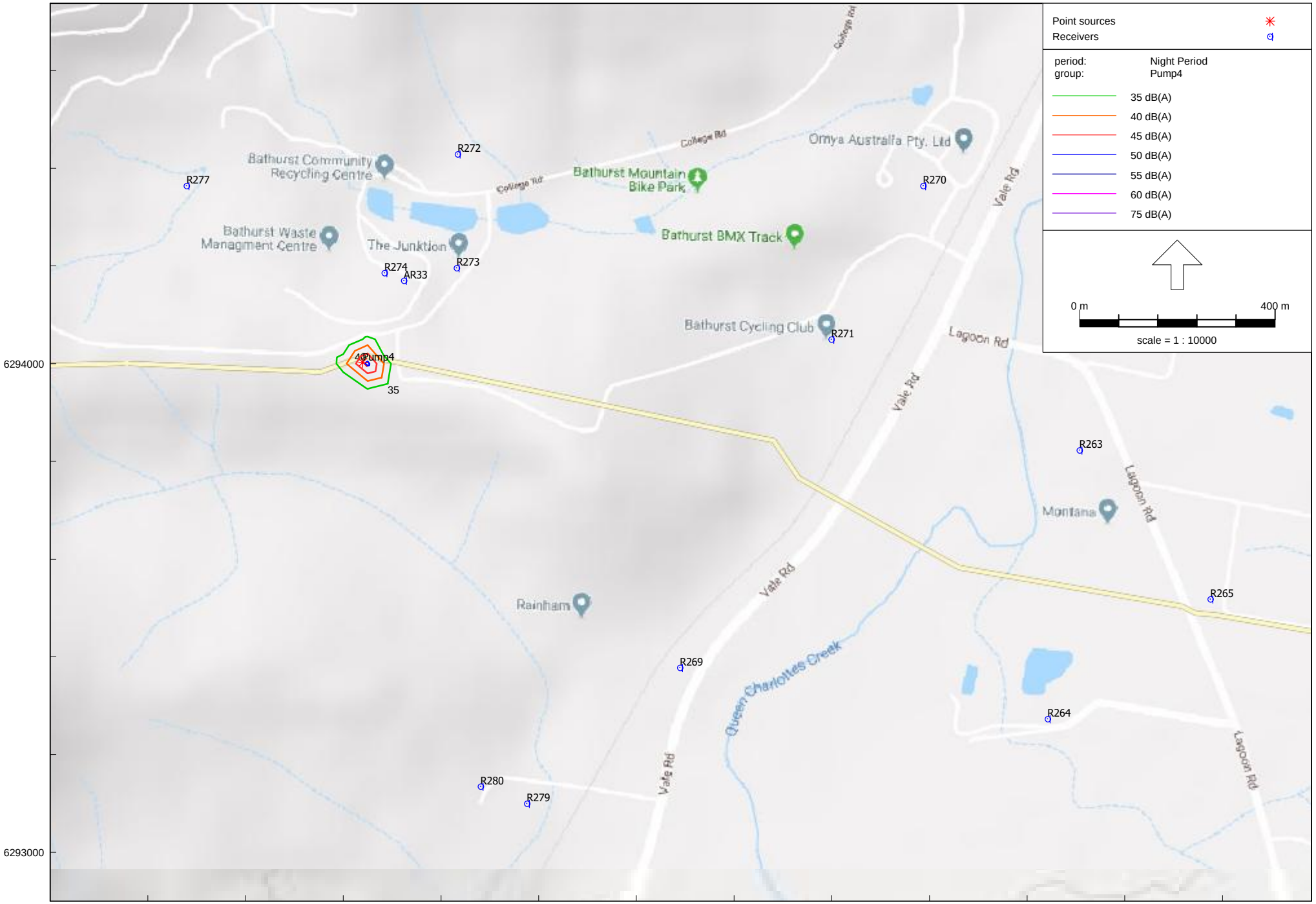

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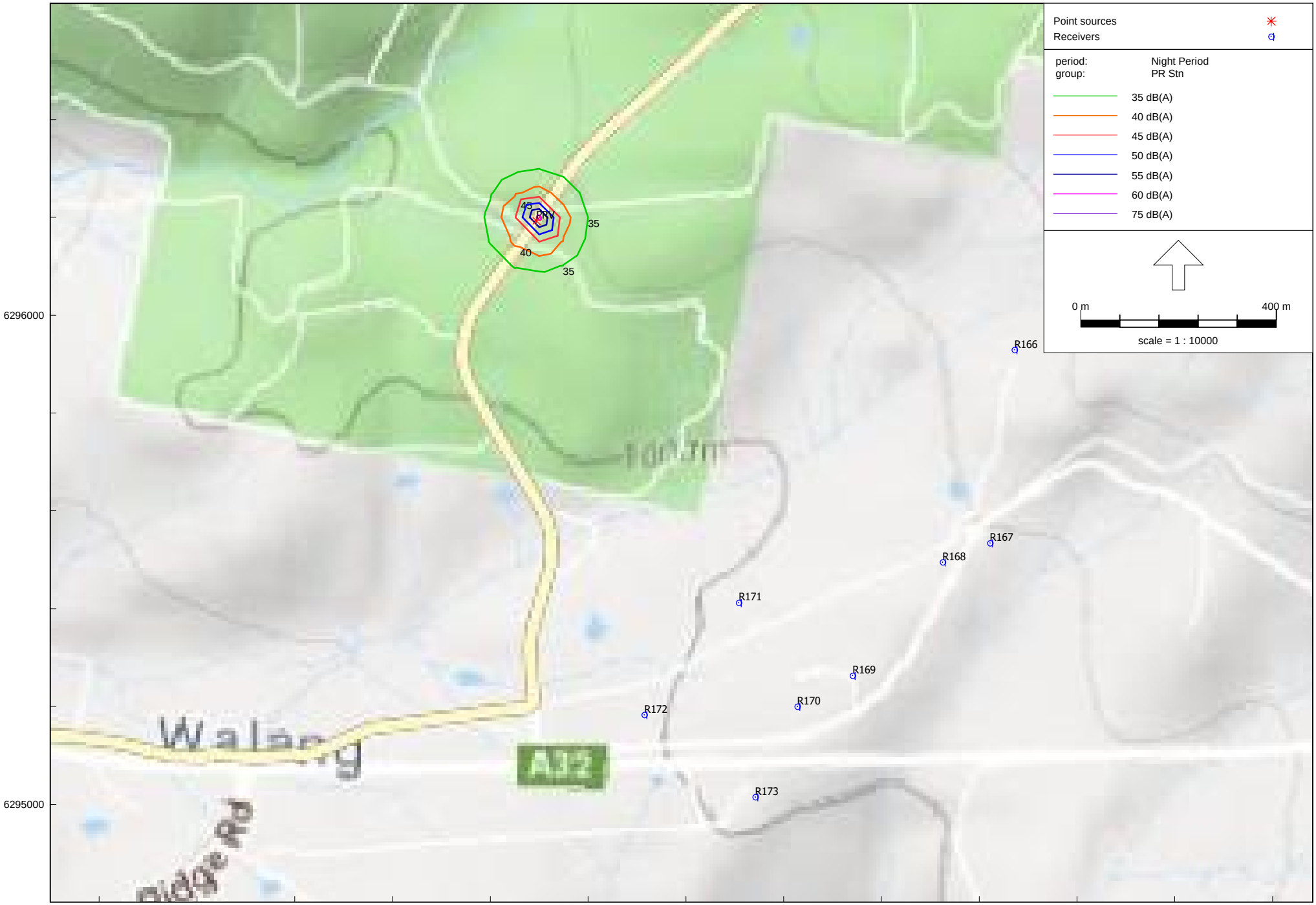
Figure 15
Pressure Reduction Facility



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8 Noise Mitigation and Management for Construction Activities

The results of the assessment indicate that noise levels during construction have the potential to exceed the NMLs at most surrounding noise sensitive receivers, although it is understood that during trenching, the exceedances are likely to only occur for one to two shifts. For the static construction activities, such as underboring, exceedances are anticipated to occur for a few shifts during peak construction activities. Notwithstanding, construction noise levels are predicted to satisfy the highly noise affected criteria of 75dB $L_{Aeq(15min)}$ for all activities except at receiver R48 (Portland catchment) during all pipeline transient construction activities (clearing and grading, trenching and backfill) as it is located within 50m of the pipeline alignment.

The primary objective of the Noise Assessment is to provide recommendations regarding noise mitigation and management measures that will minimise noise impacts on surrounding receivers. The pipeline construction manager may adopt the following hierarchical strategy to minimise noise impacts:

- ensure that construction activities meet construction noise management levels within standard construction hours as far as practicable;
- where feasible, avoid completing construction activities adjacent to residential receivers between 6pm to 7am (especially Vegetation Clearing and Rock Breaking);
- where noise levels are above relevant noise management levels, implement reasonable and feasible best practice noise controls to minimise noise emissions and/or exposure duration at affected receivers; and
- where the use of best practice noise controls does not adequately address exceedance of noise management levels, adopt alternative measures to minimise impacts on the community.

Australian Standard AS 2436-2010 (R2016) "*Guide to Noise Control on Construction, Maintenance and Demolition Sites"* sets out numerous practical recommendations to assist in mitigating construction noise emissions. These recommendations include operational strategies, source noise control strategies, noise barrier control strategies, and community consultation.

Standard, Level 1 and Level 2 mitigation measures are described in **Table 21**.

Table 21 Construction Noise Mitigation and Management Measures	
Mitigation Level	Mitigation Measures
Standard Mitigation and Management Measures	▪ Toolbox and induction of personnel prior to shift to discuss noise control measures that may be implemented to reduce noise emissions to surrounding receivers; ▪ Training (of employees to conduct quieter work practices); ▪ Equipment which is used intermittently is to be shut down when not in use; ▪ Where possible, machinery will be located/orientated to direct noise away from the closest sensitive receivers; ▪ Undertake regular maintenance of machinery to minimise noise emissions. Maintenance will be confined to standard daytime construction hours and where possible, away from noise sensitive receivers; ▪ The quietest suitable machinery reasonably available will be selected for each work activity; ▪ Where feasible substitute noisy plant items with a quieter alternative, such as non-explosive rock breaking techniques, including Cardox, Nonex and/or Penetrating Cone Fracture (PCF) (Caldwell, 2005) in lieu of Rock Hammering; ▪ Avoid queuing of vehicles adjacent to any receivers; ▪ Where practicable, ensure noisy plant/machinery are not working simultaneously in close proximity to receivers; ▪ Where possible, all plant are to utilise a broad band reverse alarm in lieu of the traditional hi-frequency type reverse alarm; ▪ Minimising the need for reversing or movement alarms.
Level 1 Mitigation and Management Measures (Including Standard Level)	▪ Scheduling of construction activities to minimise the number of work fronts and simultaneous activities occurring to minimise noise levels; ▪ Wherever possible, subject to feasibility and reasonability, the quietest plant and equipment should be utilised in combination with management measures to minimise noise impacts; ▪ Where vehicle queuing is required, for example due to safety reasons, engines are to be switched off to reduce their overall noise impacts on receivers; ▪ Notification of OOH works; ▪ Conduct noise monitoring to validate noise emissions are within NMLs.
Level 2 Mitigation and Management Measures (Including Level 1)	▪ Use mobile noise screens (which can achieve noise reductions of up to 8dBA), optimise the positioning of plant and equipment to minimise line of site to receivers or substitute noisy equipment to reduce the noise level at nearby receivers for these activities; ▪ Conduct noise monitoring to validate noise emissions are within NMLs; ▪ Respite periods; ▪ Potential temporary alternative accommodation.

Employing these strategies could potentially result in noise level reductions ranging:

- Standard – up to 10dB in instances where space requirements place limitations on the attenuation options available;
- Level 1 – potentially up to 20dB depending on mixture of measures and noise sources in operation, location and proximity to receivers;
- Level 2 – potentially over 20dB where the use of enclosures, silencers, etc can be combined with noise barriers and management techniques (eg avoidance of clustering).

Should compliance noise monitoring (see **Section 8.2**) indicate exceedances of the noise criteria, a combination of comprehensive noise mitigation treatments (i.e. noise barriers, equipment enclosures, silencers, regular equipment maintenance, etc) and consultation with the local community will be considered on a case by case basis to manage exceedances. Further descriptions of management measures and mitigation options are provided for specific construction activities and work areas in the following sections.

8.1.1 Complaints Handling

- Provide a readily accessible contact point, for example, through a toll-free information and complaints line and give complaints a fair hearing.
- Have a documented complaints process, including an escalation procedure so that if a complainant is not satisfied there is a clear path to follow.
- Records of all community complaints will be maintained on an up-to-date complaints register. The records will include:
    - date and time of the complaint;
    - the means by which the complaint was made (telephone, mail or email);
    - any personal details of the complainant that were provided, or if no details are provided, a note to that effect;
    - the nature of the complaint;
    - any actions taken by the site supervisor/construction contractor in relation to the complaint, including any follow up contact with the complainant and the timing for implementing action; and
    - if no action was taken by site supervisor/construction contractor in relation to the complaint, the reason why no action was taken.

- Community complaints will be allocated to a responsible contractors representative immediately to facilitate the implementation of corrective actions. The details of the complaint will also be circulated to the applicable construction personnel for action, where required.

8.2 Noise Monitoring

A noise monitoring program may be considered by the proponent to guide, manage, quantify and control noise emissions from construction activities in the event of community concerns regarding noise emissions or receipt of a formal noise complaint. Where monitoring indicates exceedances, additional mitigation measures and controls may be considered to minimise impacts to nearby sensitive receivers.

The objectives of the noise monitoring program are as follows:

- assess construction noise levels against derived NMLs presented in this report, with consideration given to non-site related ambient and background noise at the time of measurements;
- identify potential noise sources and their relative contribution to noise impacts from construction;
- specify appropriate intervals for noise monitoring to evaluate, assess and report the noise contribution due to construction;
- outline the methodologies to be adopted for monitoring construction noise, including justification for monitoring intervals or triggers, weather conditions, monitoring location selection and timing; and
- incorporate noise management and mitigation strategies outlined in this plan.

The noise measurement procedures employed throughout the monitoring programme shall be guided by the requirements of AS 1055:2018 "*Acoustics - Description and Measurement of Environmental Noise" and the EPA's Noise Policy for Industry* (NPI), 2017. Noise monitoring will be undertaken by a suitably qualified acoustic specialist or suitably qualified and trained environment officer.

Operator attended noise measurements and recordings shall be conducted to quantify the intrusive noise emissions from construction as well as the overall level of ambient noise.

The operator shall quantify and characterise the maximum (L_{Amax}) and the energy equivalent (L_{Aeq}) intrusive noise level from construction over a 15-minute measurement period. In addition, the operator shall quantify and characterise the overall levels of ambient noise over the 15-minute measurement

interval. It is recommended that instrumentation used during the monitoring is to be equivalent to a Type 1 meter with 1/3 octave band analysis and have audio recording functionality for post processing source identification. It is noted that 1/3 octave band analysis is required to establish whether modification factors in accordance with the NPI are to be applied.

All acoustic instrumentation used as part of the attended monitoring program must be designed to comply with the requirements of AS/NZS IEC 61672.1-2019, "*Electroacoustics - Sound level meters - Specifications*" and shall have current NATA or manufacturer calibration certificates. All instrumentation shall be programmed to record continuously statistical noise level indices in 15-minute intervals which may include the L_{Amax}, L_{A1}, L_{A5}, L_{A10}, L_{A90}, L_{A99}, L_{Amin} and the L_{Aeq}.

Instrument calibration shall be checked before and after each measurement survey, with the variation in calibrated levels not exceeding ±0.5 dBA. The measurement position(s) should be selected taking into account:

- weather conditions such as rain and wind, insect noise;
- the location and direction of any noise source/s;
- the most sensitive position at the affected receiver; and
- the need to avoid reflecting surfaces (where possible).

8.2.1 Data Presentation and Reporting

The measured $LA_{eq(15min)}$ noise level contributions from construction operations as well as the overall ambient noise levels together with the weather and construction activities at the time of the measurement shall be reported on a regular basis.

In the event of an exceedance of the relevant NMLs, the Construction Manager shall be promptly informed of the location, the margin of exceedance and the source of emission. The noise level, meteorological conditions at the time of the survey and plant operating data shall be documented and forwarded to the Construction Manager so that an appropriate response can be made with respect to conformance.

Reporting of monitoring will include the following:

- monitoring location(s);
- list of operating plant and equipment;
- measured noise and/or vibration levels from construction;
- overall ambient noise levels;
- comparison of results with relevant NMLs;
- monitoring equipment details;
- weather conditions; and
- comments specific to each site.

Compliance reports, discussing compliance against the NMLs, will be prepared and submitted to the Construction Manager as required. Compliance reports will include a summary of the information listed in the preceding sections, specifically issues or non-compliances and the response or management of the issues and non-compliances.

9 Conclusion

Muller Acoustic Consulting Pty Ltd (MAC) has been engaged by Blakely's Environmental on behalf of LFB Resources NL (Regis) to prepare a Noise and Vibration Assessment (NVA) for the proposed Pipeline Development consisting of a 90km pipeline and ancillary infrastructure to transfer raw water from Lithgow to the proposed McPhillamys Mine Site near Blayney, NSW. The NVA has quantified potential noise emissions associated with the construction phase of the project and potential mitigation management measures. An assessment of operational noise from pump stations for the project has also been completed.

The results of the NVA demonstrate that construction noise levels for most activities have the potential to be above the relevant NMLs at most receivers in close proximity to the work, although for the most part are expected to be only for a short duration (ie either one to two shifts or up to a few days). Notwithstanding, construction noise mitigation measures as outlined in **Section 8** should be considered to minimise noise impacts.

Furthermore, the highly affected $LA_{eq(15min)}$ noise management level of 75dBA is expected to be satisfied at all receivers except at one receiver (R48) during all pipeline construction activities (clearing and grading, trenching and backfill) as it is situated within 50m of the pipeline alignment.

Operational noise emissions from the pump stations are anticipated to be negligible at adjacent receivers to each site, although assumes some form of container or enclosure is adopted for each pump station.

In summary, it is recommended that during construction, noise control and management measures provided in this report are adopted to minimise impacts to surrounding receivers, specifically during noise intensive works when they occur in close proximity to receivers (ie <200m).

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Appendix A – Glossary of Terms

A number of technical terms have been used in this report and are explained in **Table A1**.

Table A1 Glossary of Terms

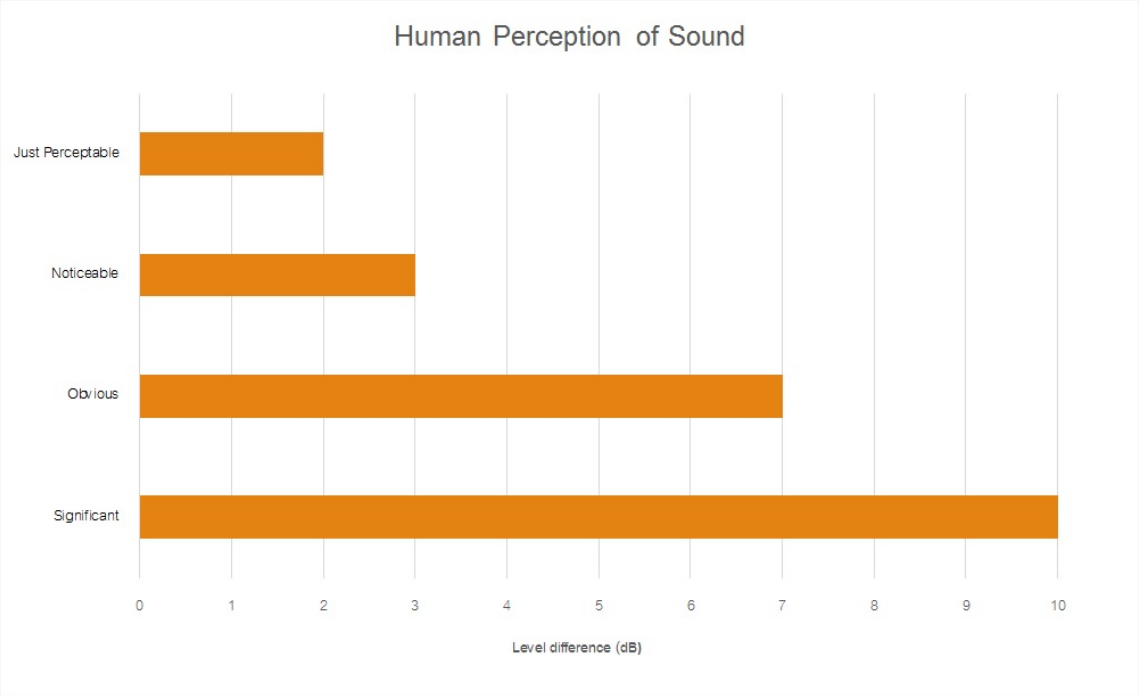
Term	Description
1/3 Octave	Single octave bands divided into three parts
Octave	A division of the frequency range into bands, the upper frequency limit of each band being twice the lower frequency limit.
ABL	Assessment Background Level (ABL) is defined in the NPI as a single figure background level for each assessment period (day, evening and night). It is the tenth percentile of the measured L90 statistical noise levels.
Ambient Noise	The noise associated with a given environment. Typically a composite of sounds from many sources located both near and far where no particular sound is dominant.
A Weighting	A standard weighting of the audible frequencies designed to reflect the response of the human ear to noise.
dBA	Noise is measured in units called decibels (dB). There are several scales for describing noise, the most common being the 'A-weighted' scale. This attempts to closely approximate the frequency response of the human ear.
dB(Z), dB(L)	Decibels Z-weighted (Z) or Linear (L).
Hertz (Hz)	The measure of frequency of sound wave oscillations per second - 1 oscillation per second equals 1 hertz.
LA10	A noise level which is exceeded 10 % of the time. It is approximately equivalent to the average of maximum noise levels.
LA90	Commonly referred to as the background noise, this is the level exceeded 90 % of the time.
LAeq	The summation of noise over a selected period of time. It is the energy average noise from a source, and is the equivalent continuous sound pressure level over a given period.
LAmax	The maximum root mean squared (rms) sound pressure level received at the microphone during a measuring interval.
RBL	The Rating Background Level (RBL) is an overall single figure background level representing each assessment period over the whole monitoring period. The RBL is used to determine the intrusiveness criteria for noise assessment purposes and is the median of the ABL's.
Sound power level (LW)	This is a measure of the total power radiated by a source. The sound power of a source is a fundamental location of the source and is independent of the surrounding environment. Or a measure of the energy emitted from a source as sound and is given by : = 10.log10 (W/Wo) Where : W is the sound power in watts and Wo is the sound reference power at 10-12 watts.

Table A2 provides a list of common noise sources and their typical sound level.

Table A2 Common Noise Sources and Their Typical Sound Pressure Levels (SPL), dBA

Source	Typical Sound Level
Threshold of pain	140
Jet engine	130
Hydraulic hammer	120
Chainsaw	110
Industrial workshop	100
Lawn-mower (operator position)	90
Heavy traffic (footpath)	80
Elevated speech	70
Typical conversation	60
Ambient suburban environment	40
Ambient rural environment	30
Bedroom (night with windows closed)	20
Threshold of hearing	0

Figure A1 – Human Perception of Sound



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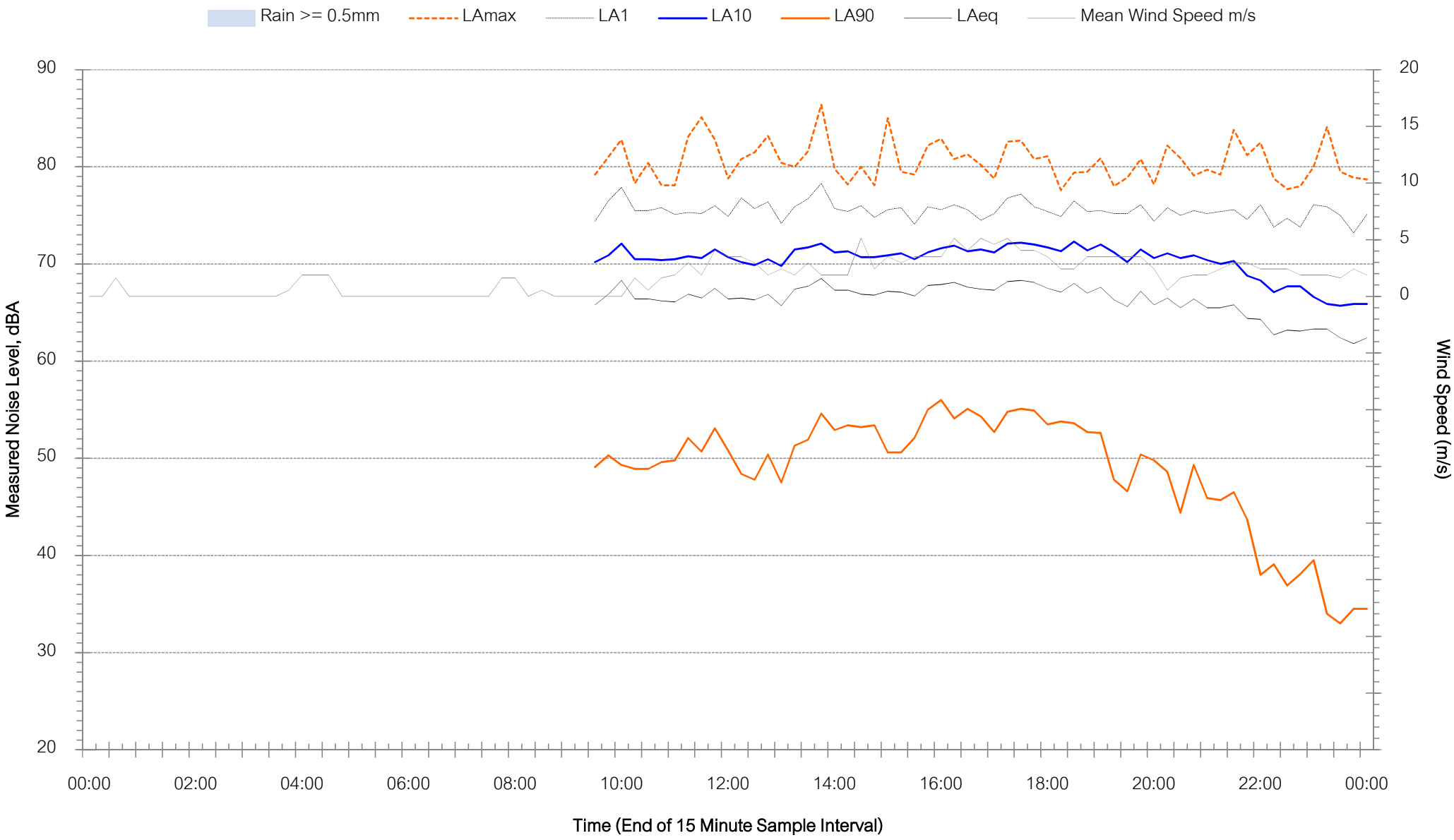
Appendix B – Noise Monitoring Charts

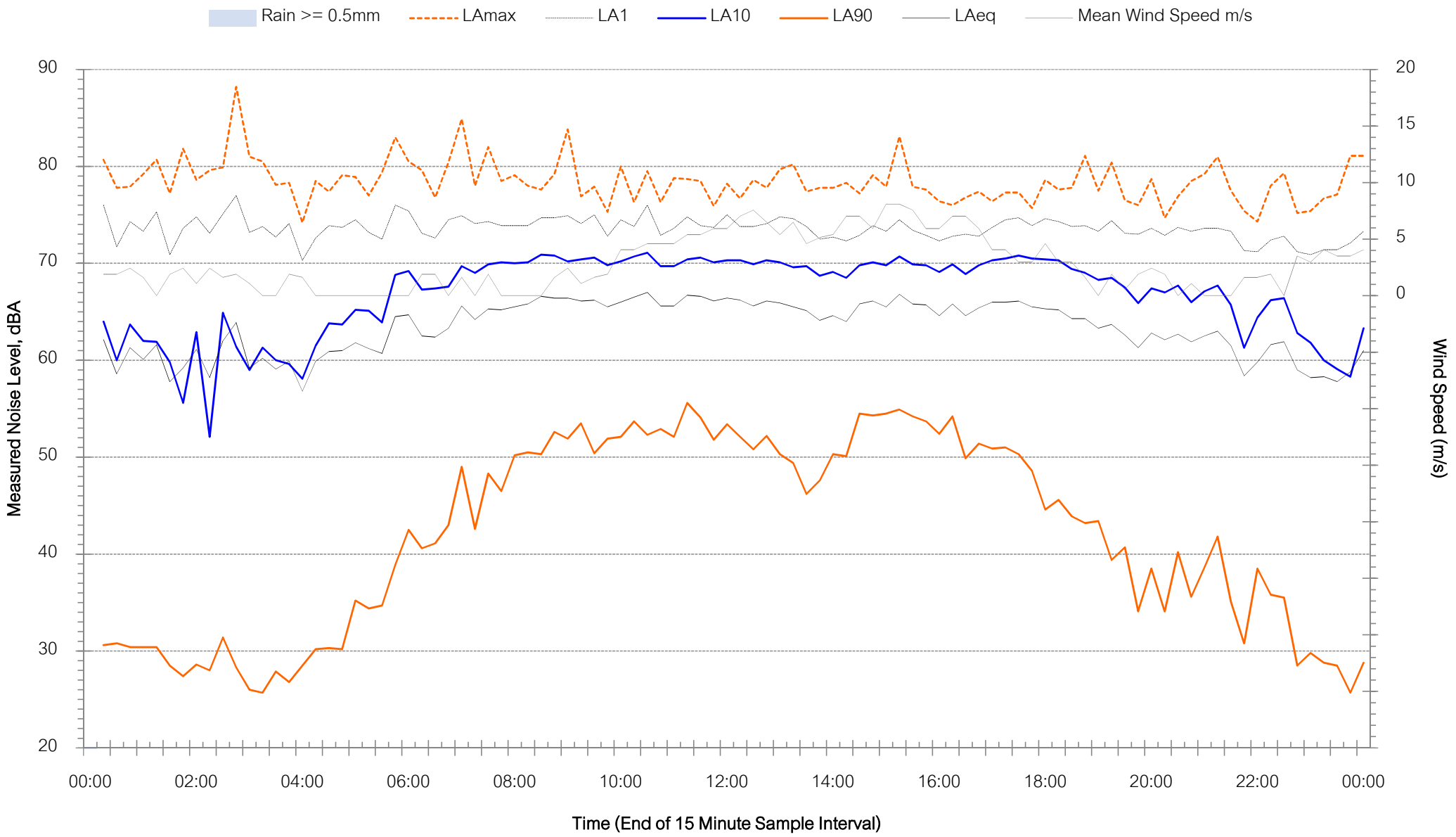
Background Noise Levels

Location - NM0 - Friday 19 October 2018



Background Noise Levels

Location - NM0 - Saturday 20 October 2018

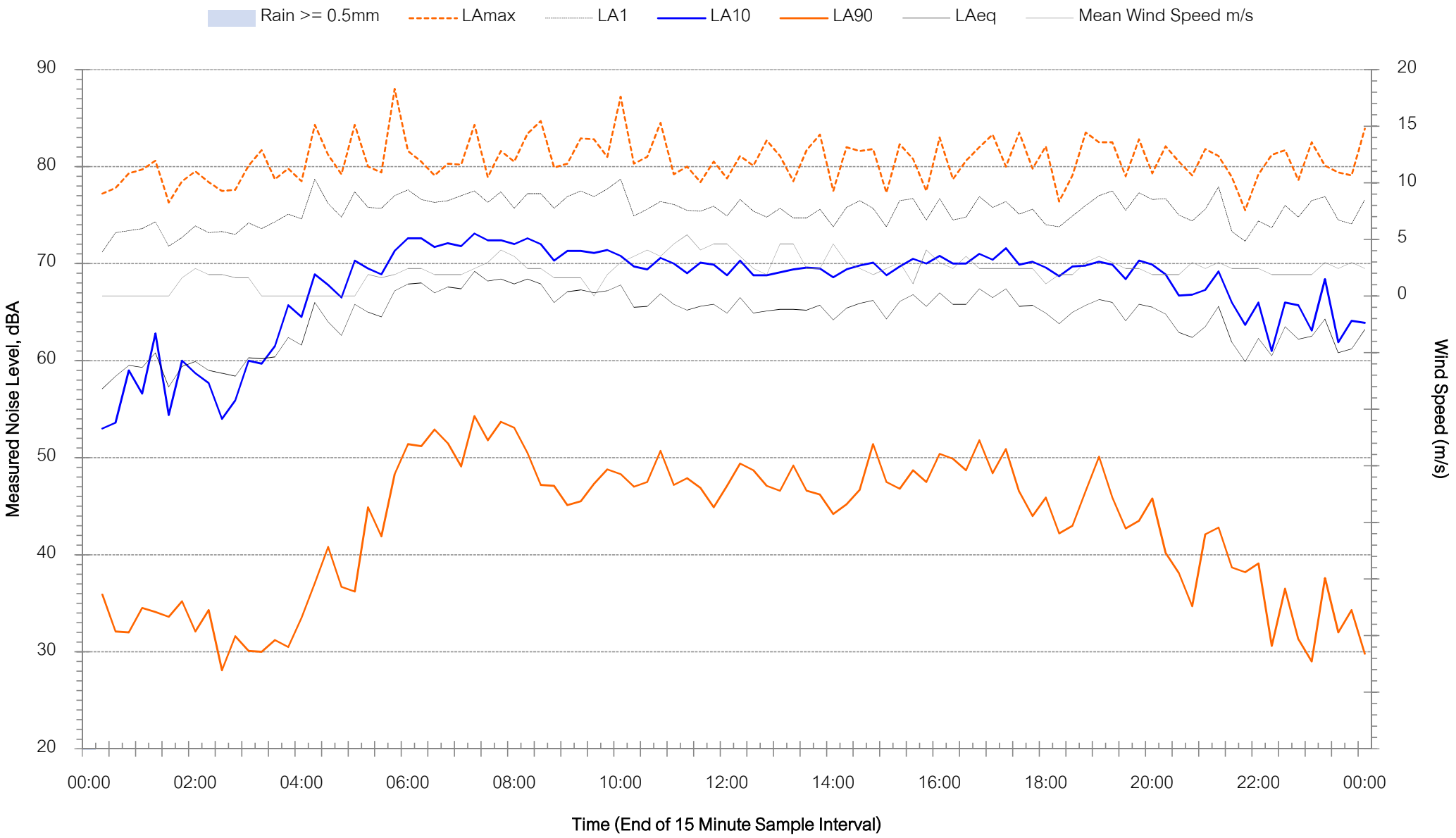


Background Noise Levels

Location - NM0 - Sunday 21 October 2018

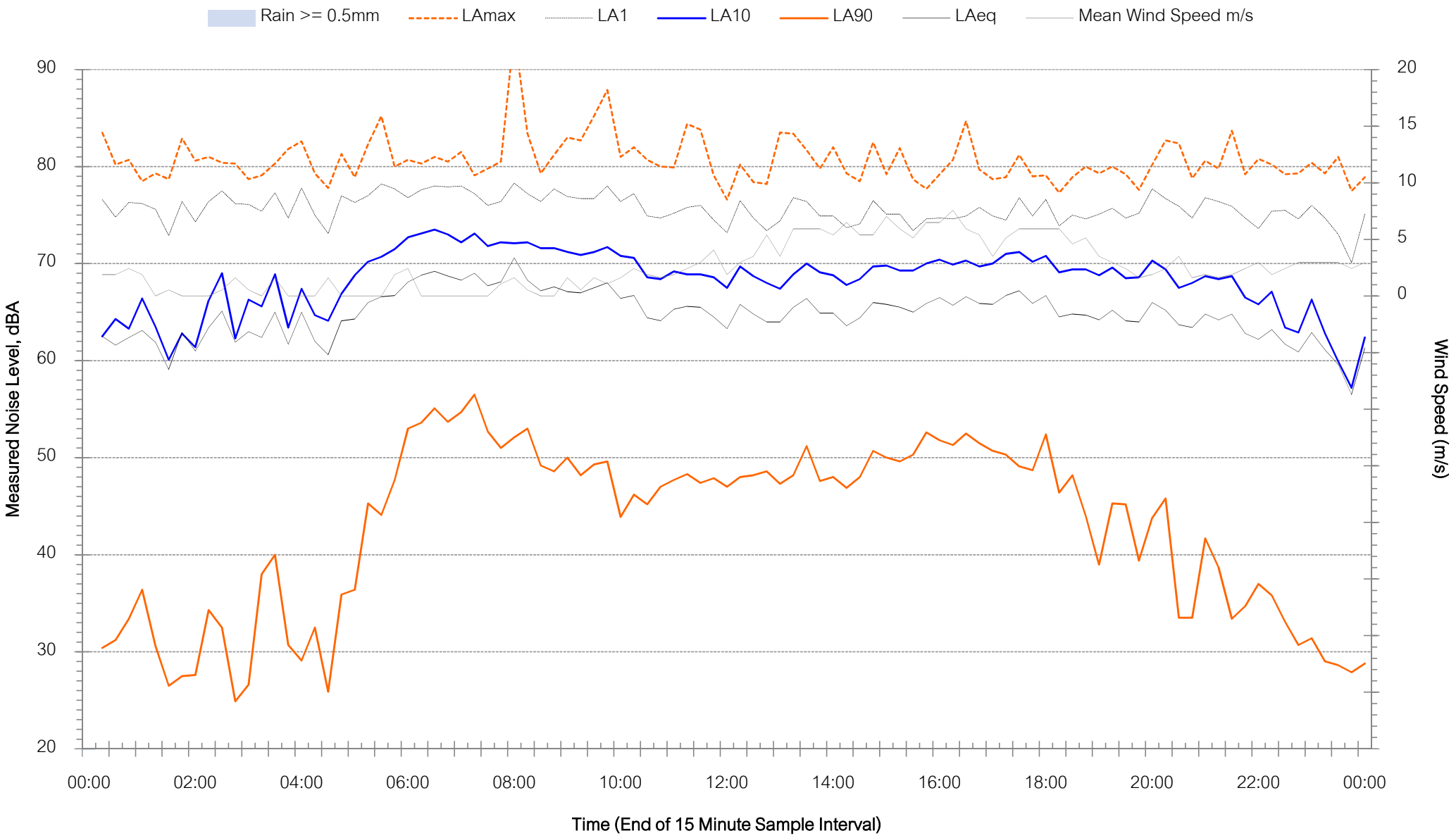
Background Noise Levels

Location - NM0 - Monday 22 October 2018



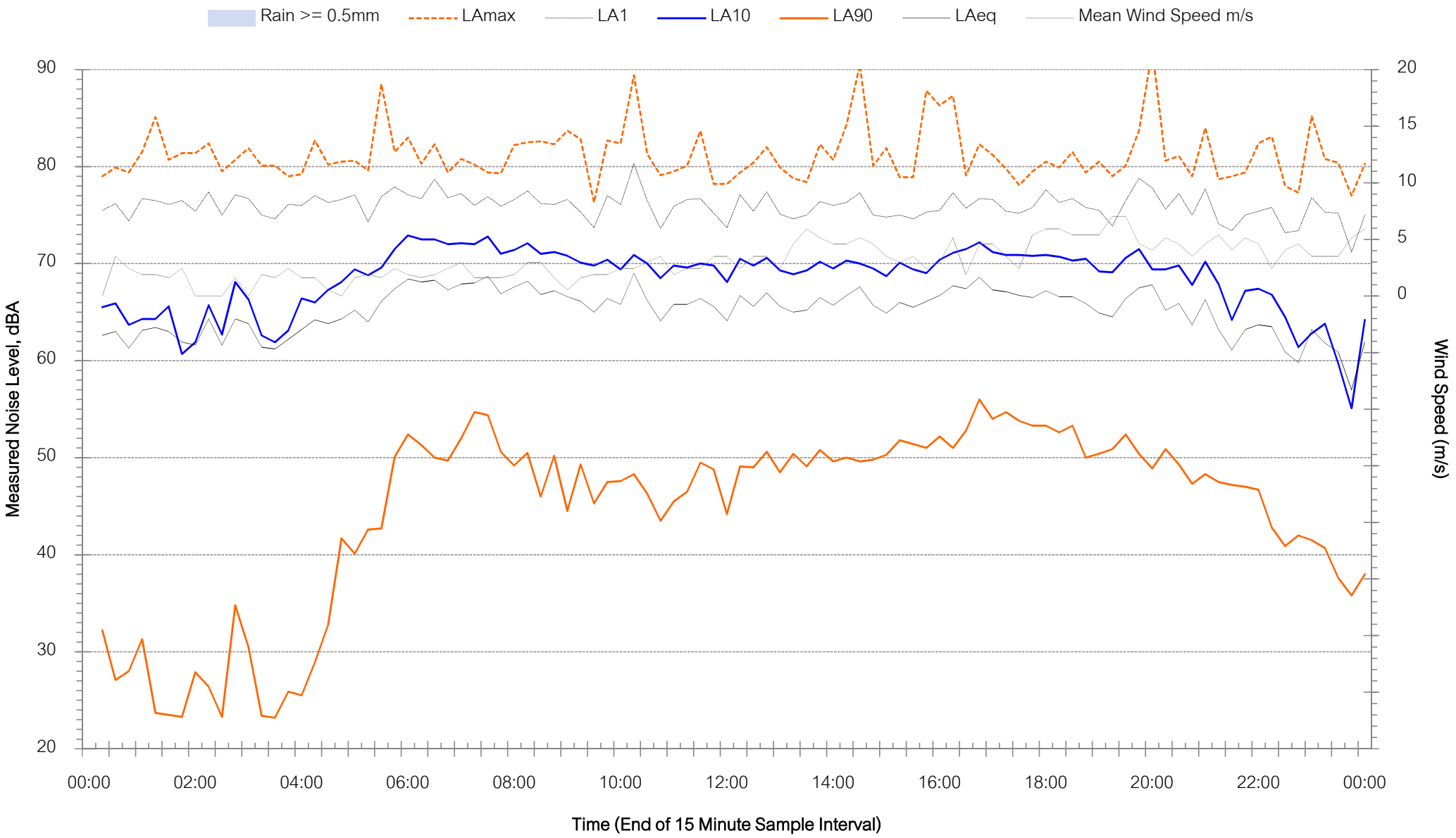
Background Noise Levels

Location - NM0 - Tuesday 23 October 2018



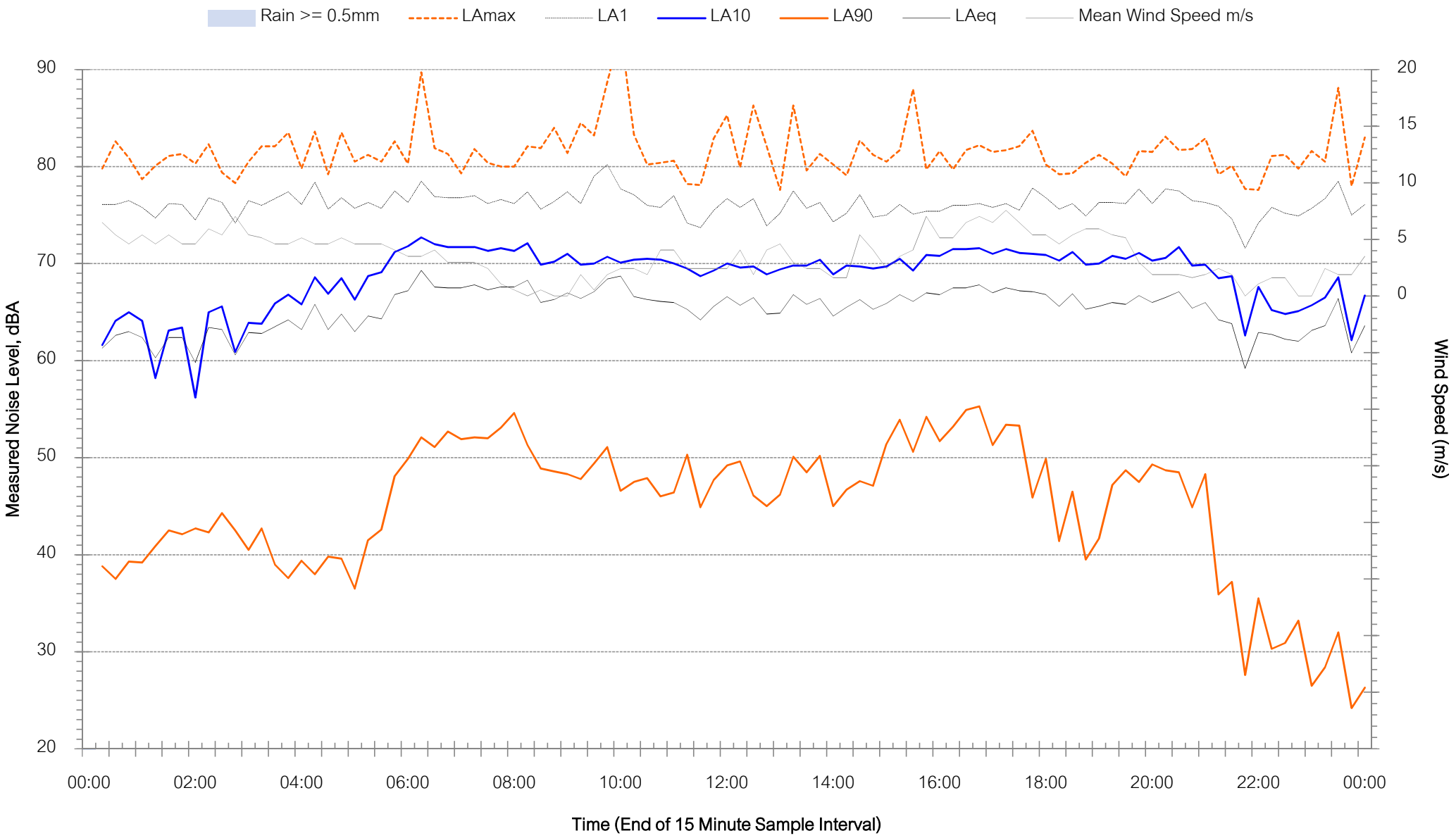
Background Noise Levels

Location - NM0 - Wednesday 24 October 2018



Background Noise Levels

Location - NM0 - Thursday 25 October 2018

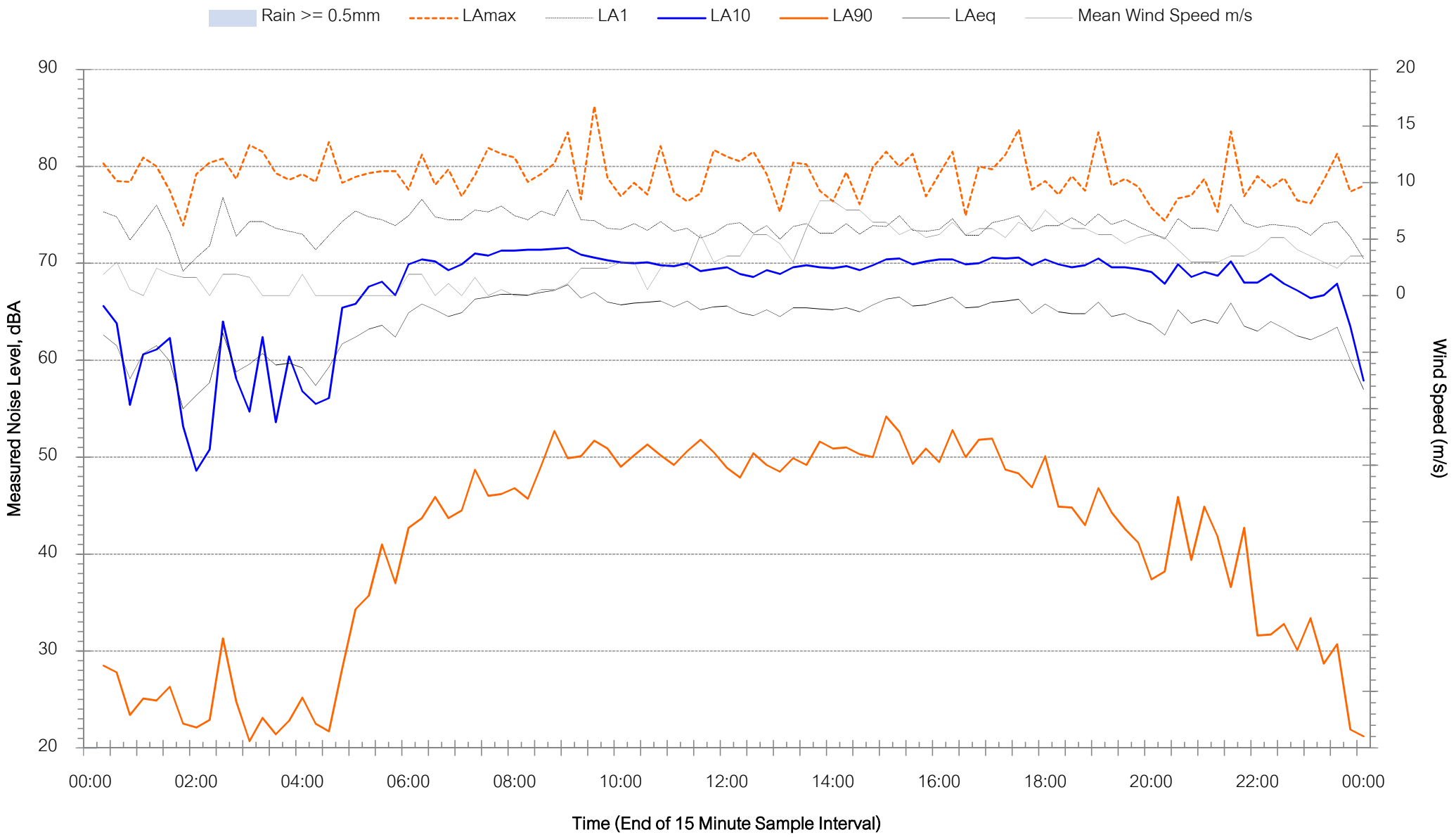


Background Noise Levels

Location - NM0 - Friday 26 October 2018

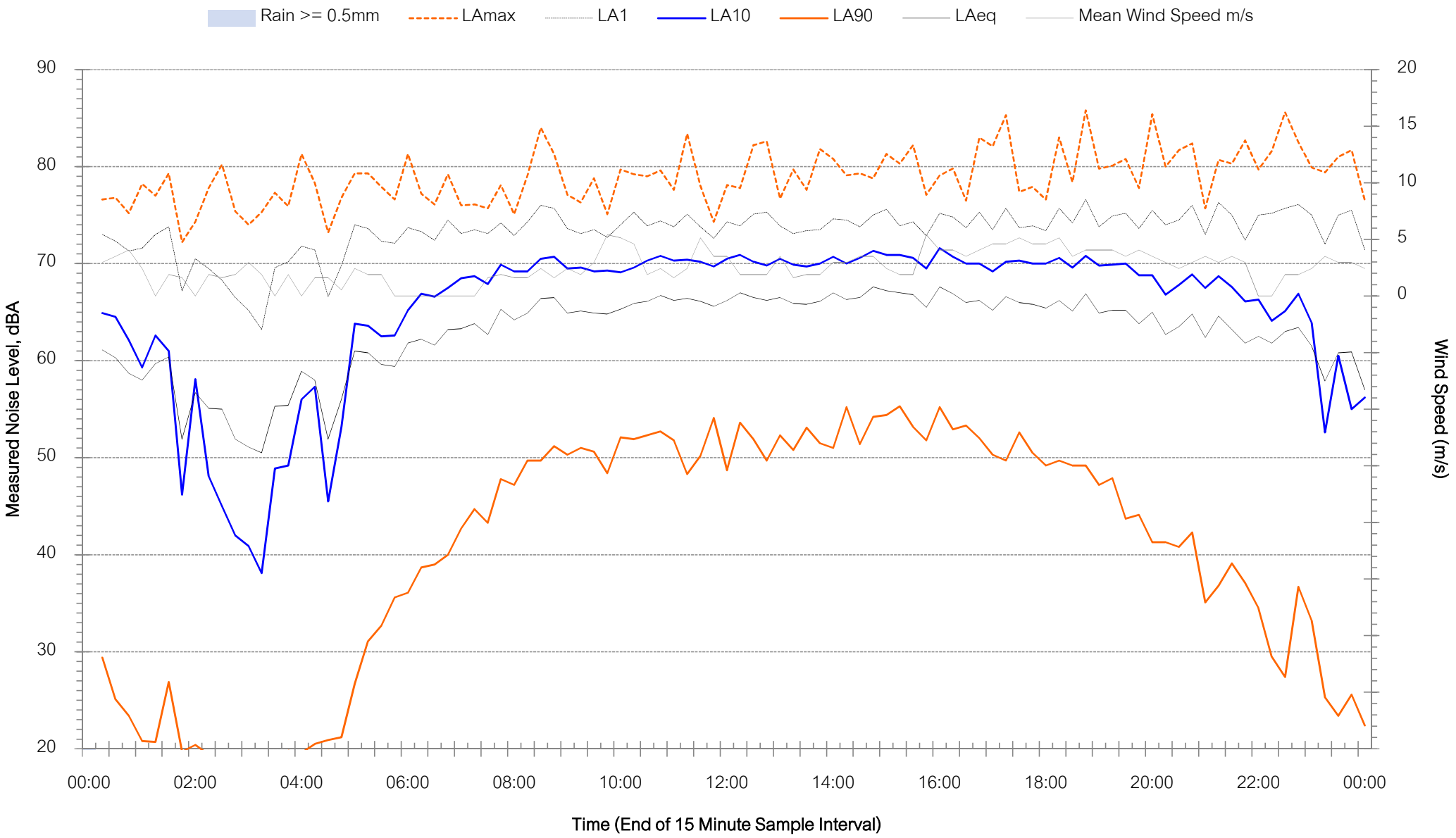
Background Noise Levels

Location - NM0 - Saturday 27 October 2018



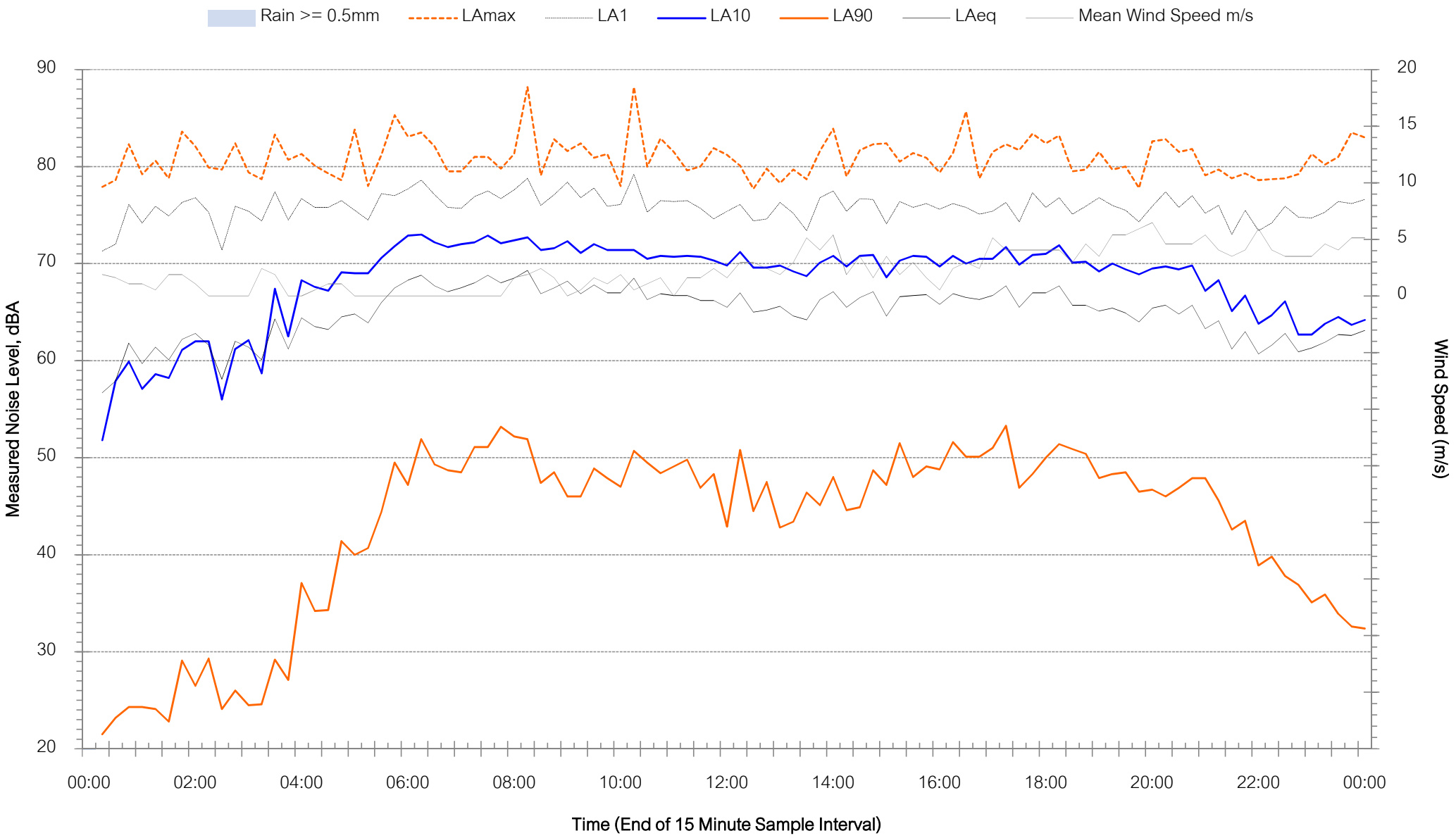
Background Noise Levels

Location - NM0 - Sunday 28 October 2018



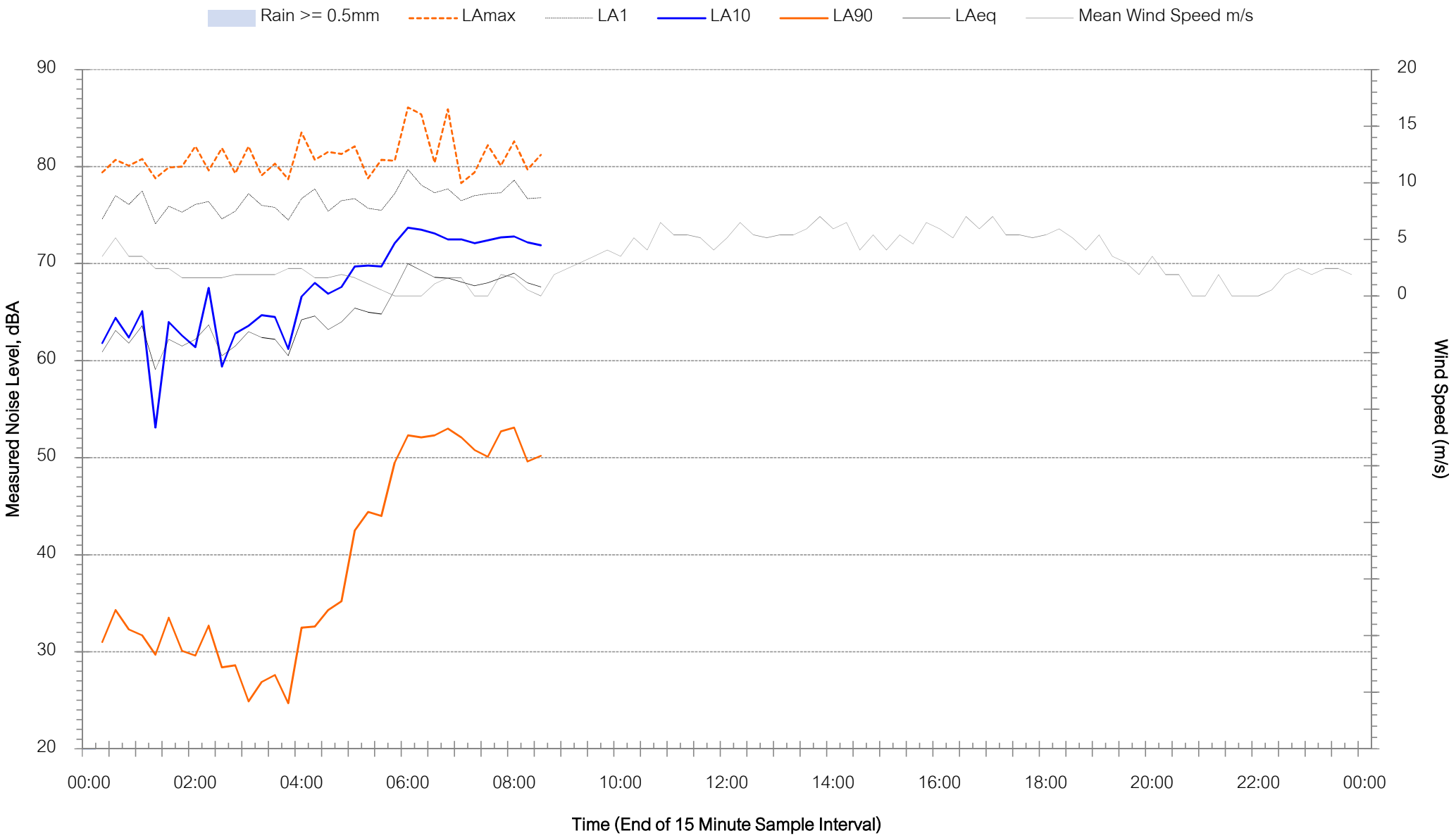
Background Noise Levels

Location - NM0 - Monday 29 October 2018



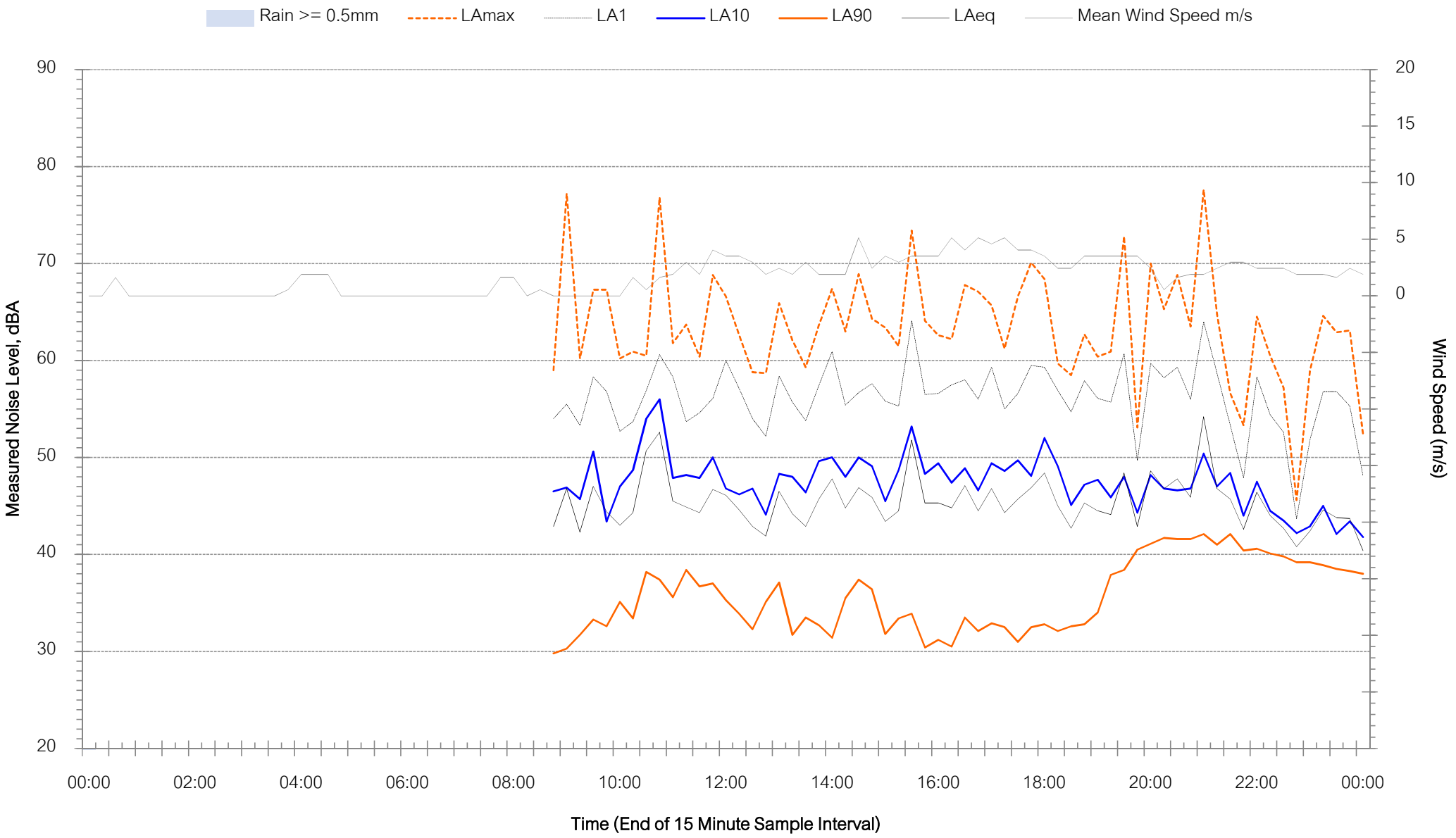
Background Noise Levels

Location - NM0 - Tuesday 30 October 2018



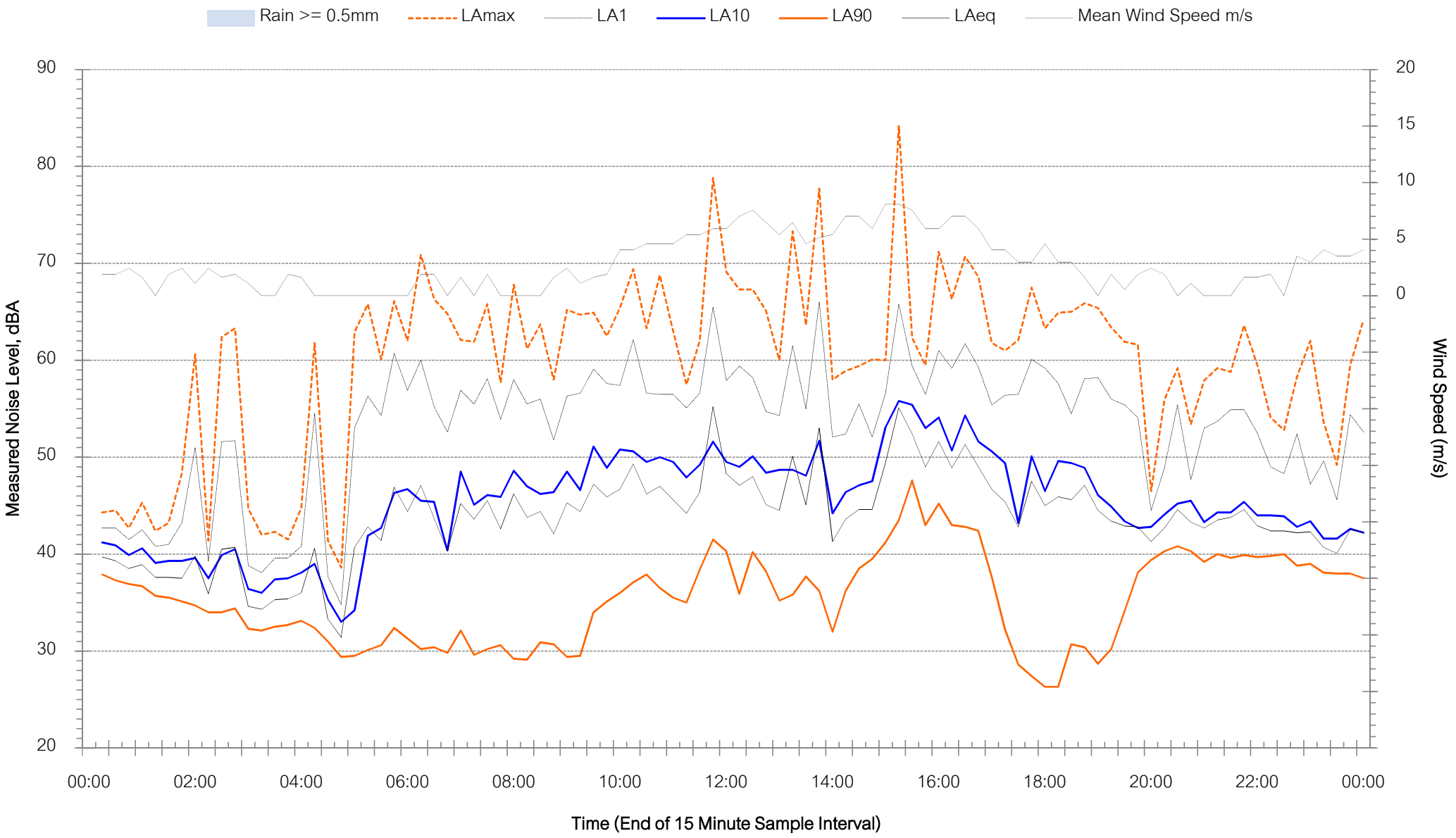
Background Noise Levels

Location - NM8 - Friday 19 October 2018



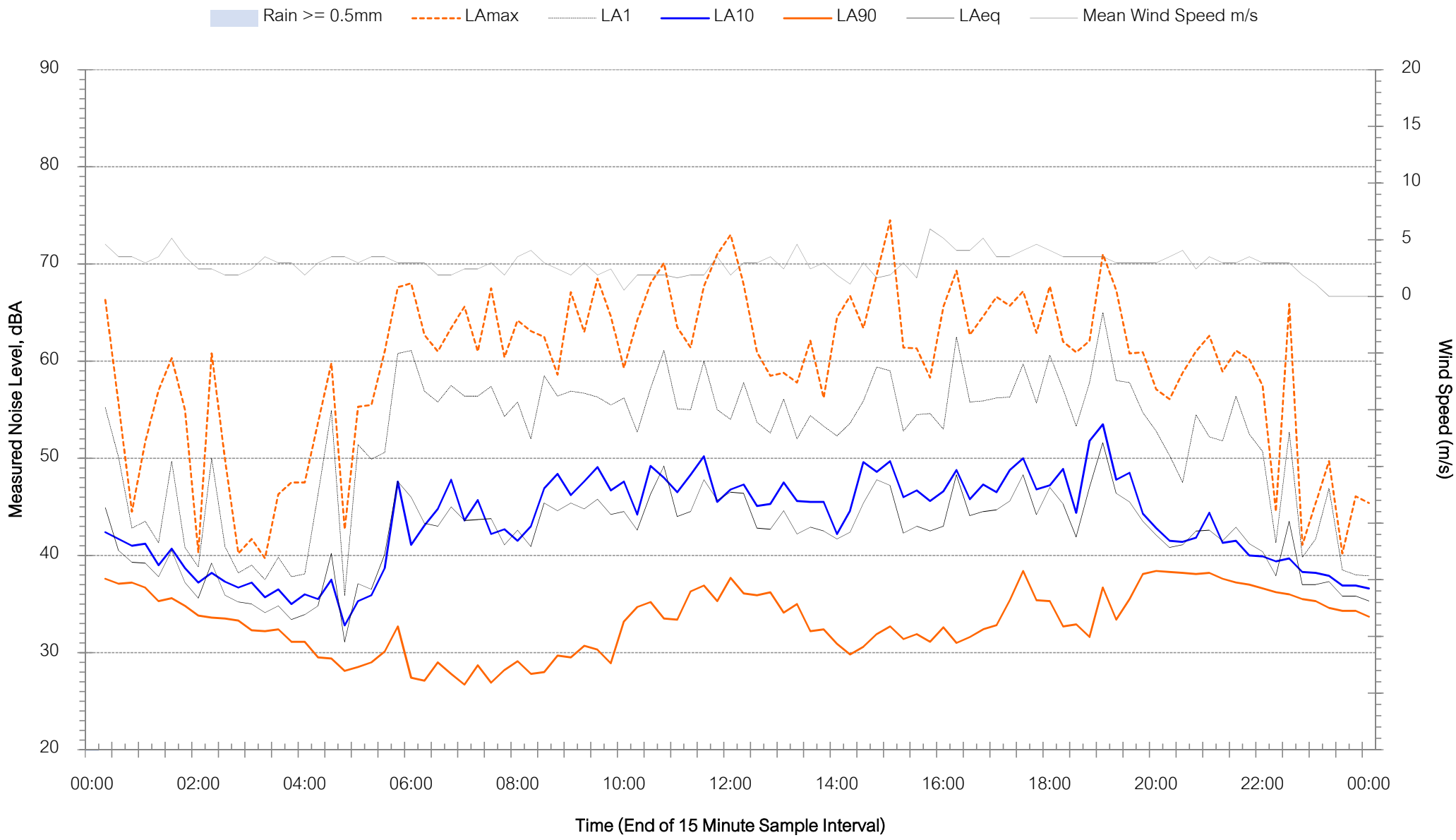
Background Noise Levels

Location - NM8 - Saturday 20 October 2018



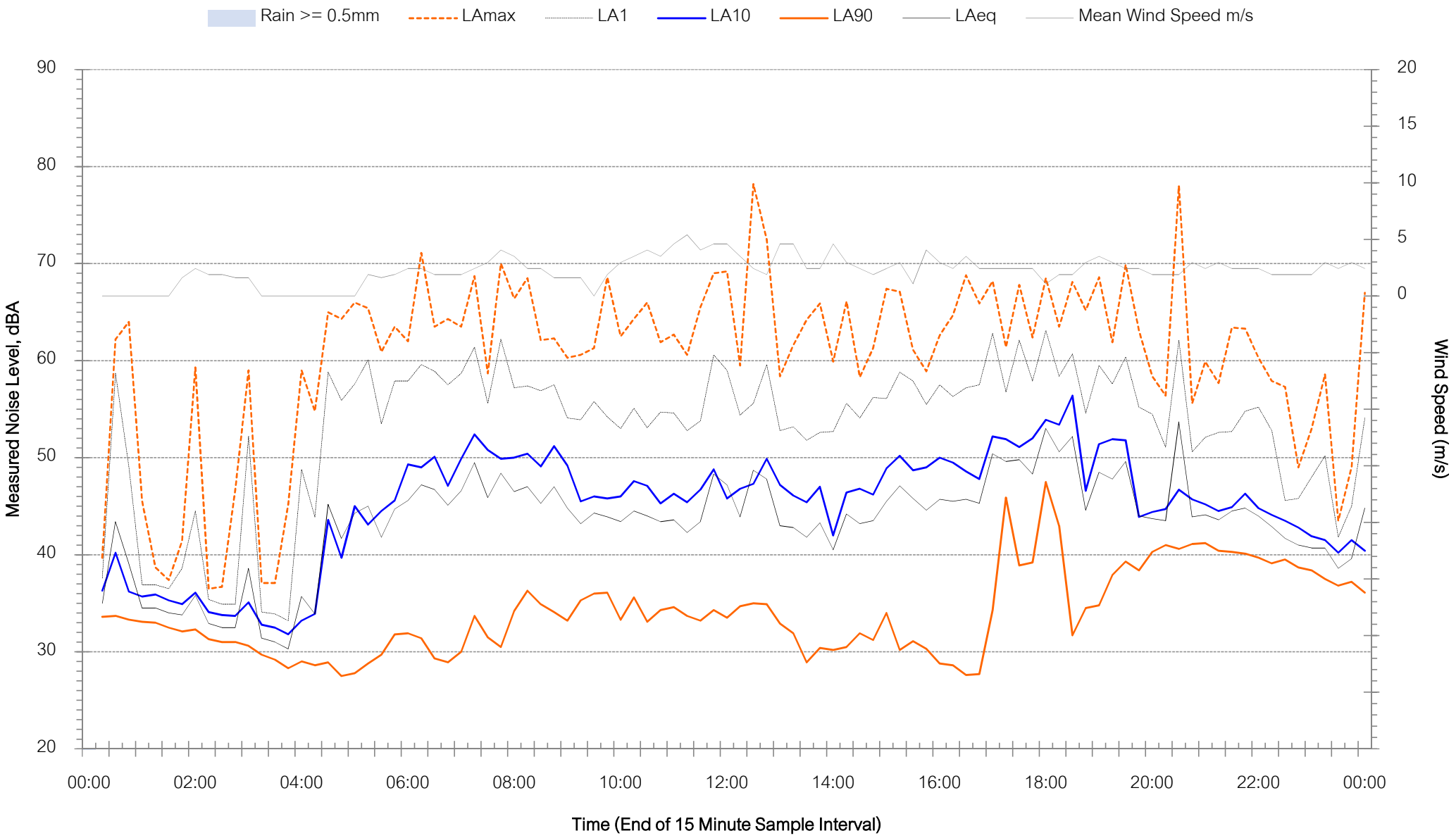
Background Noise Levels

Location - NM8 - Sunday 21 October 2018



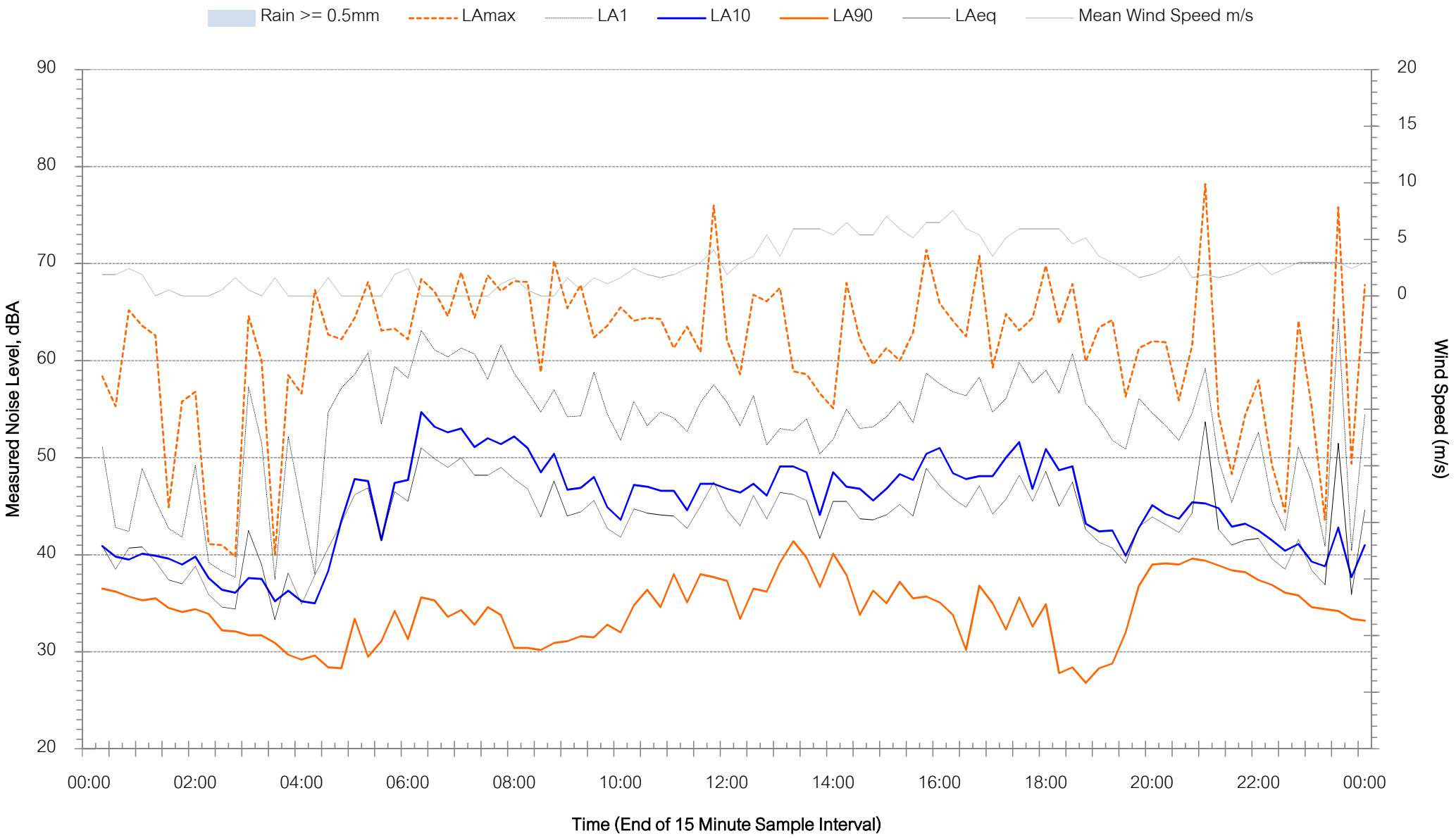
Background Noise Levels

Location - NM8 - Monday 22 October 2018



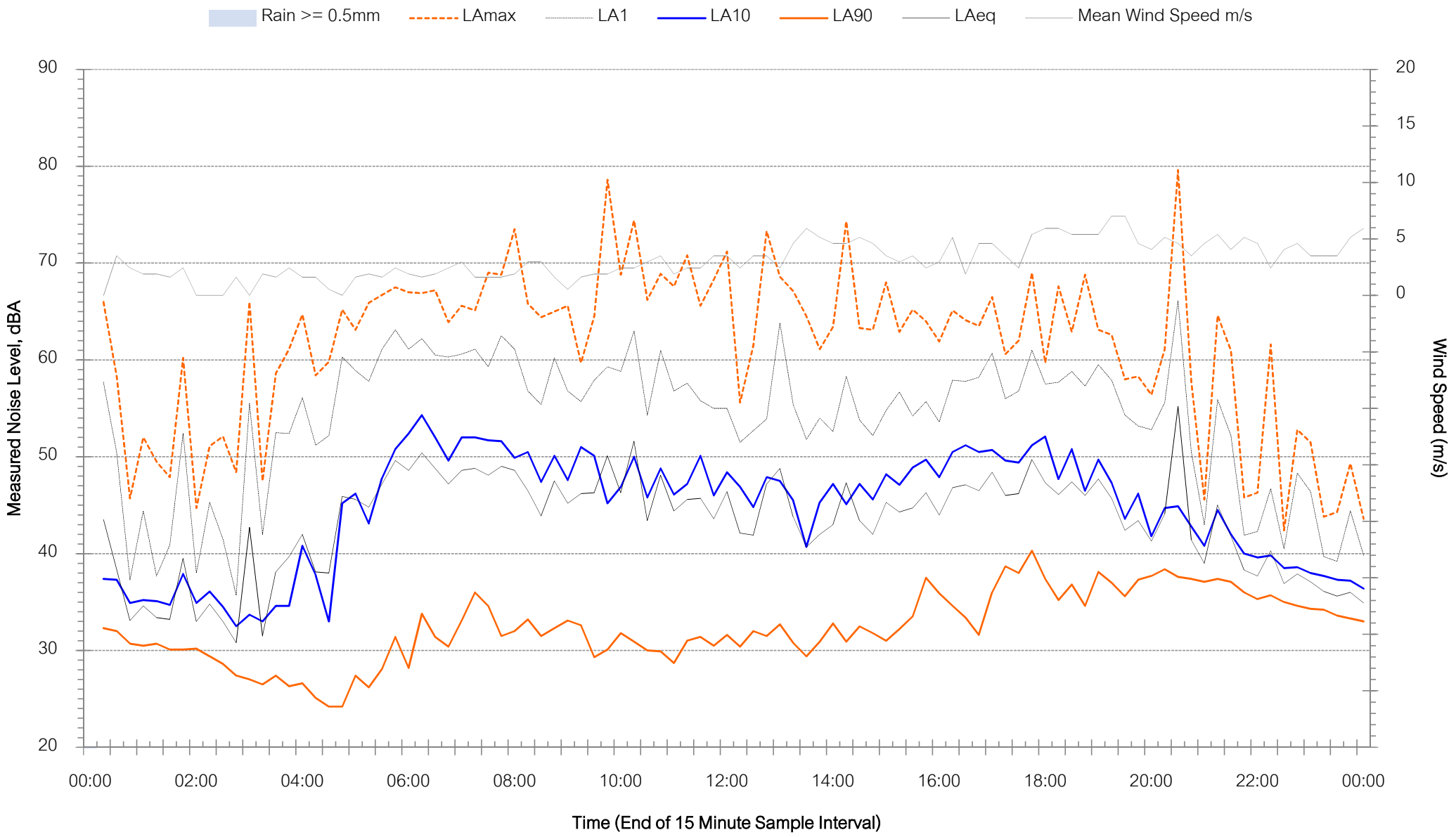
Background Noise Levels

Location - NM8 - Tuesday 23 October 2018



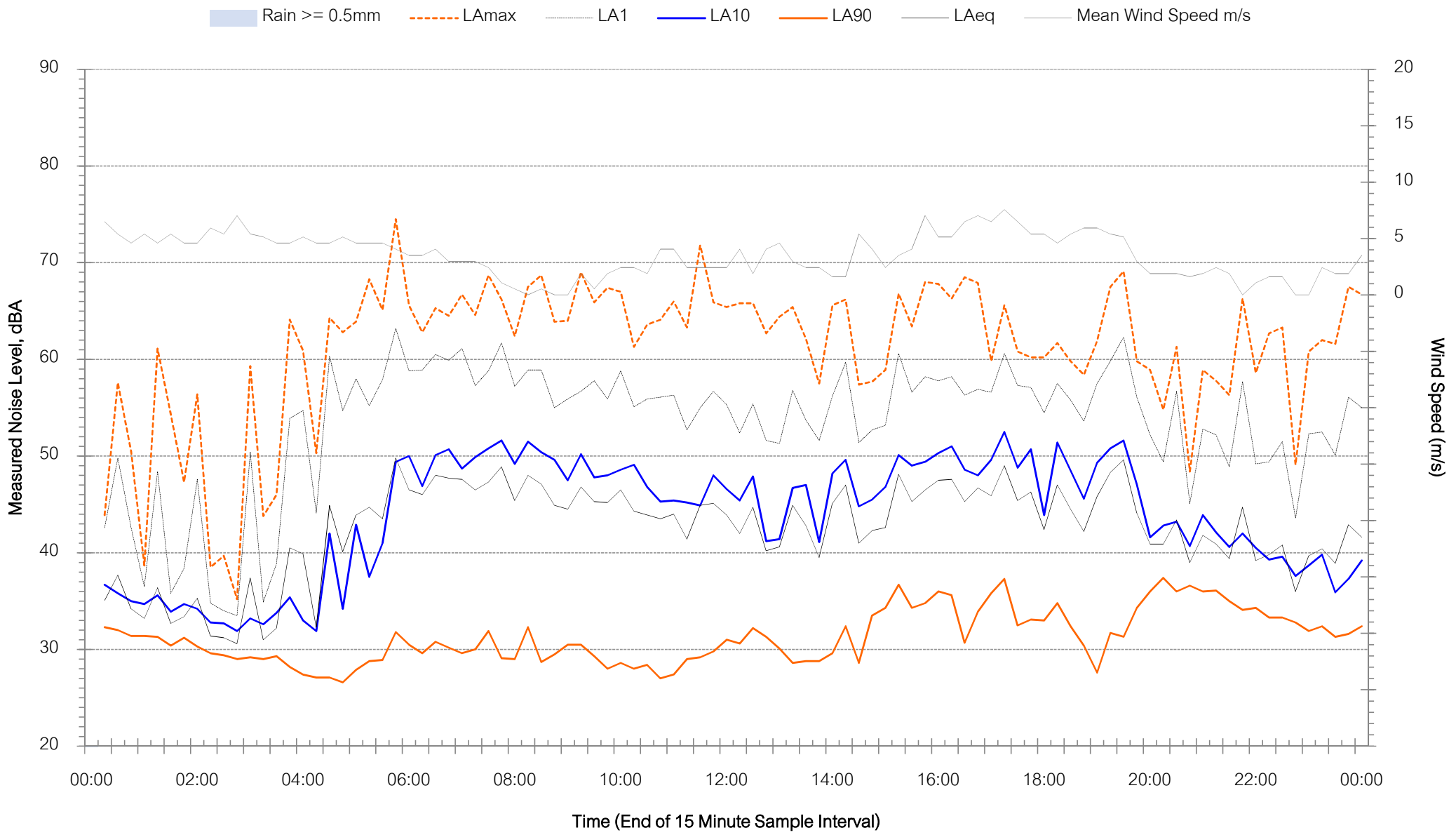
Background Noise Levels

Location - NM8 - Wednesday 24 October 2018



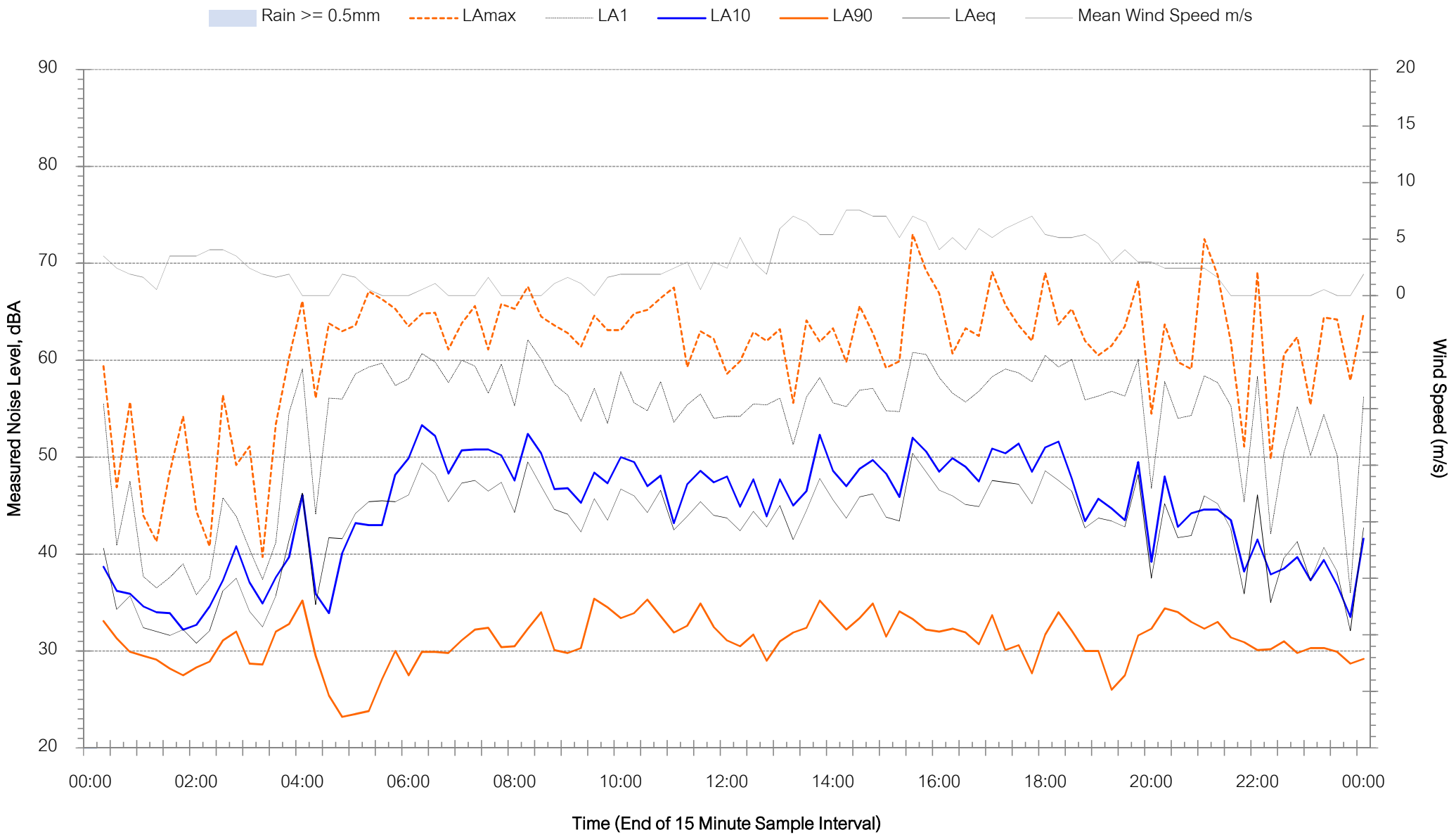
Background Noise Levels

Location - NM8 - Thursday 25 October 2018



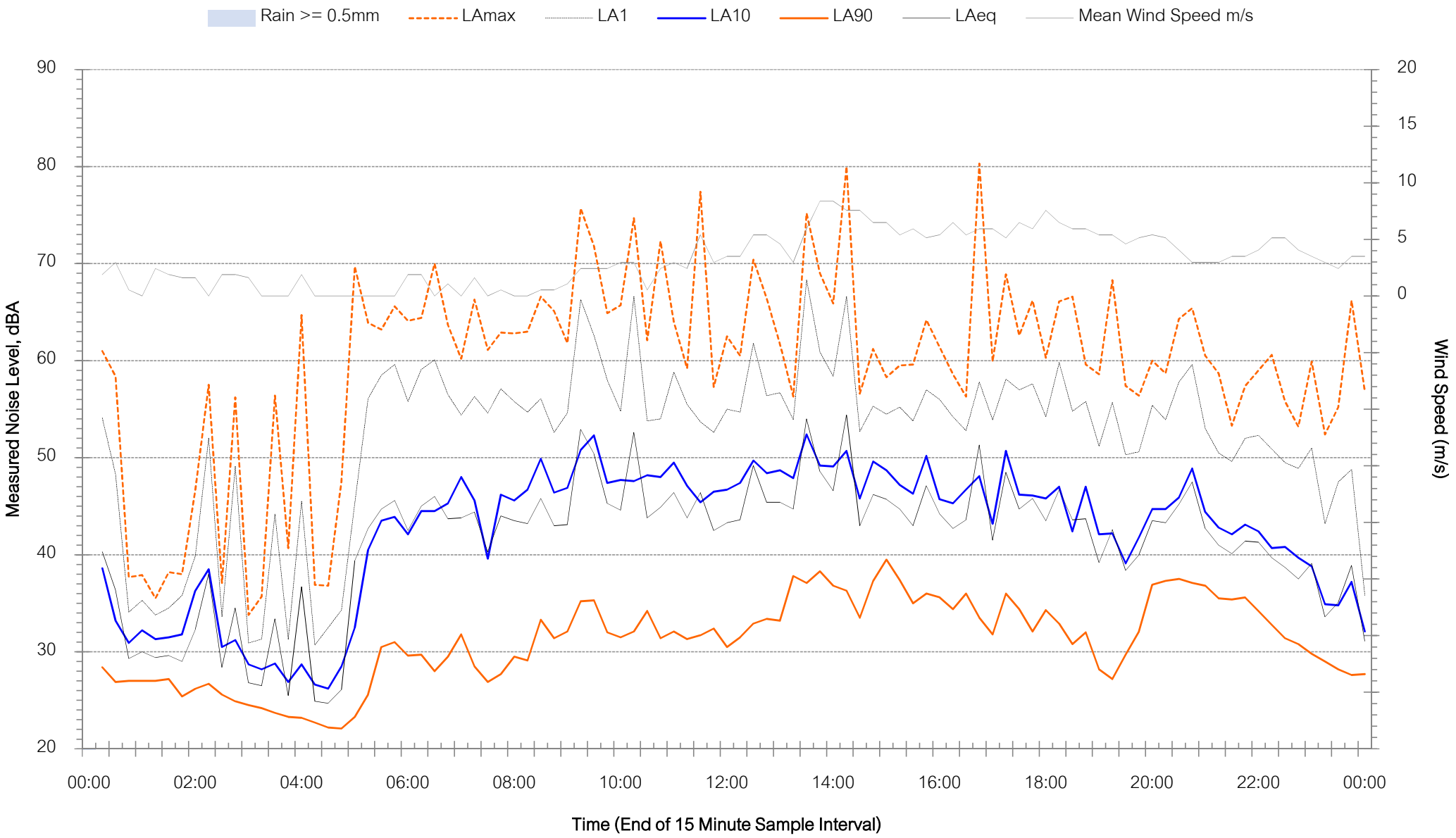
Background Noise Levels

Location - NM8 - Friday 26 October 2018



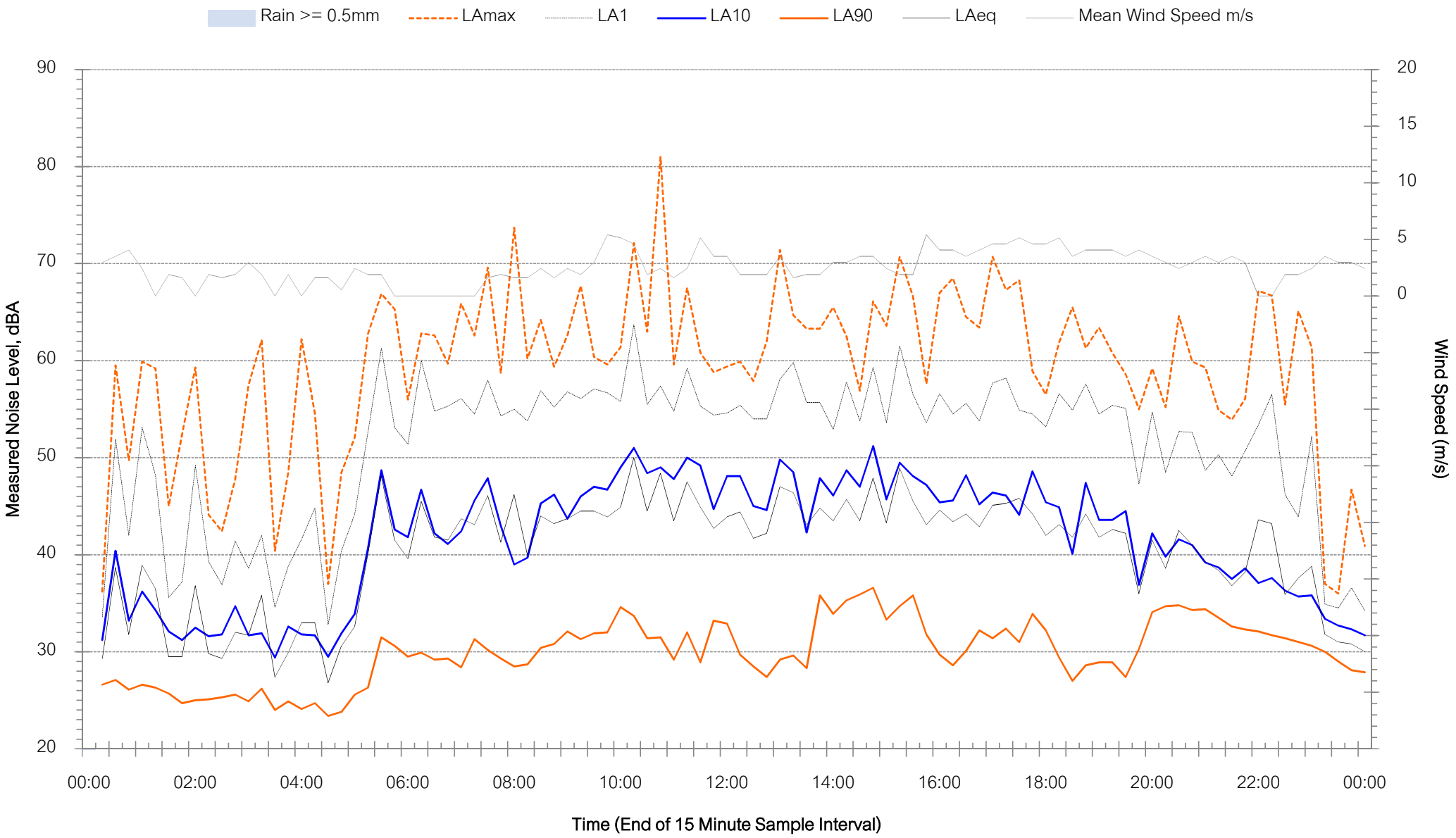
Background Noise Levels

Location - NM8 - Saturday 27 October 2018



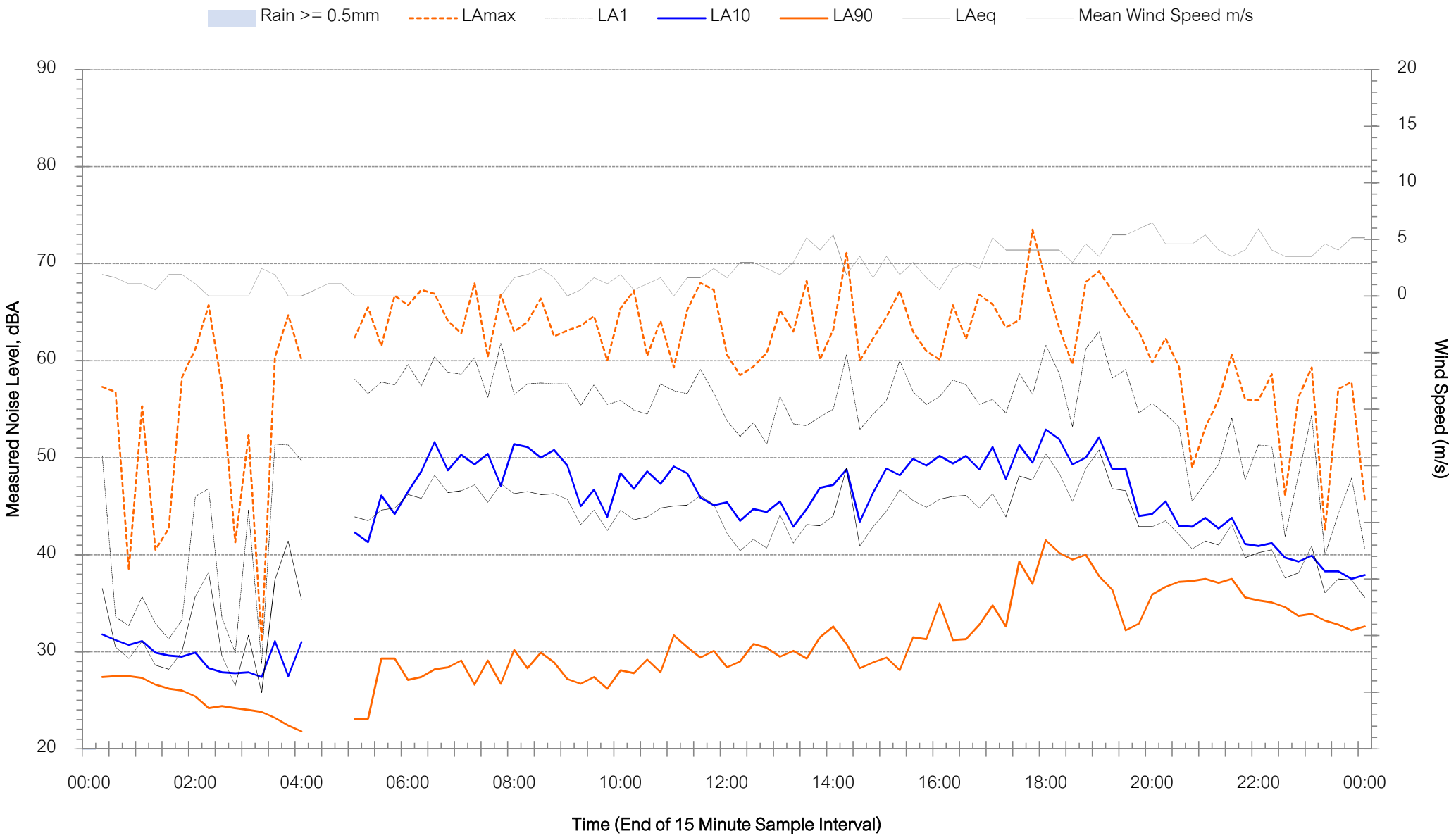
Background Noise Levels

Location - NM8 - Sunday 28 October 2018



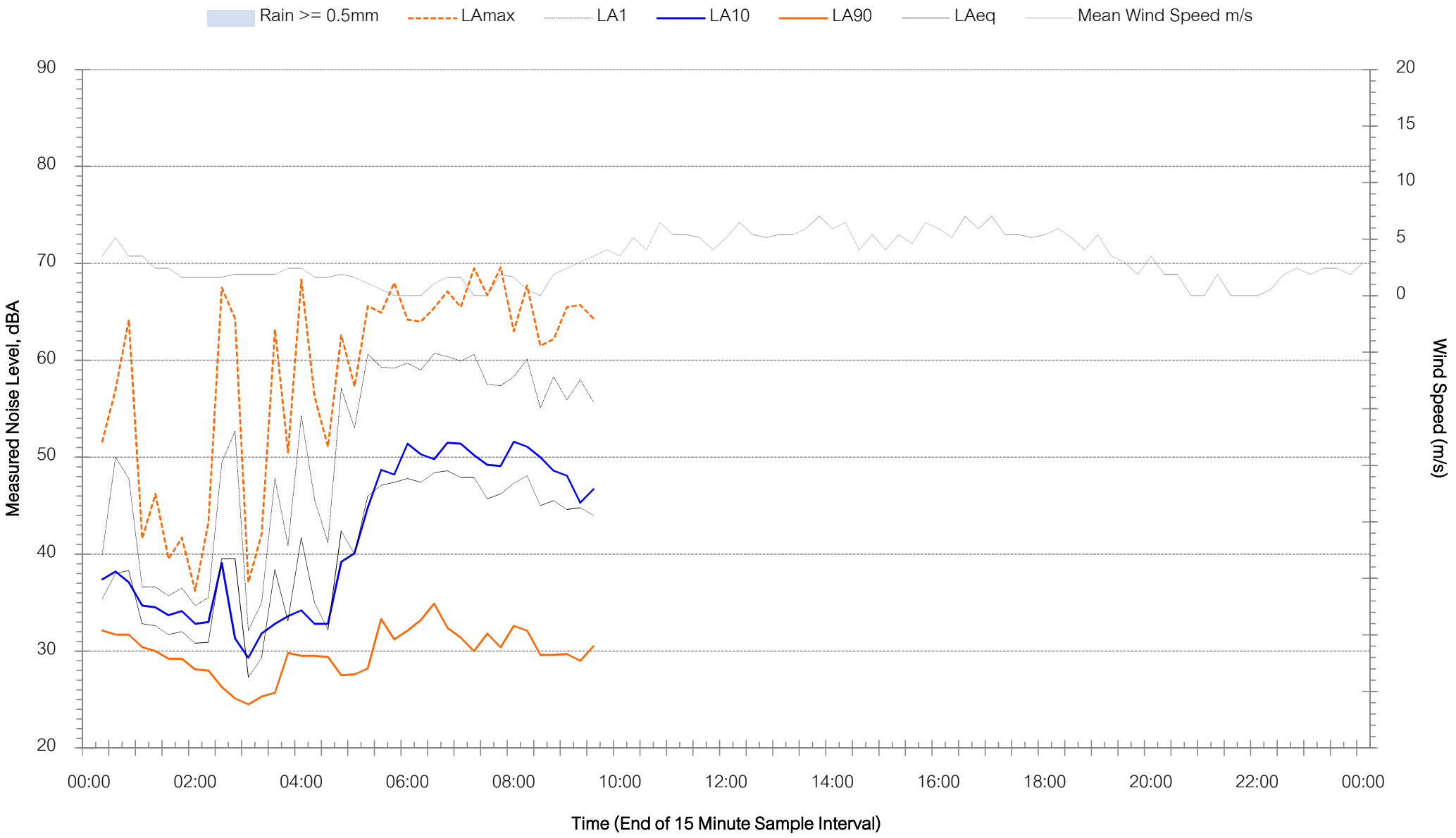
Background Noise Levels

Location - NM8 - Monday 29 October 2018



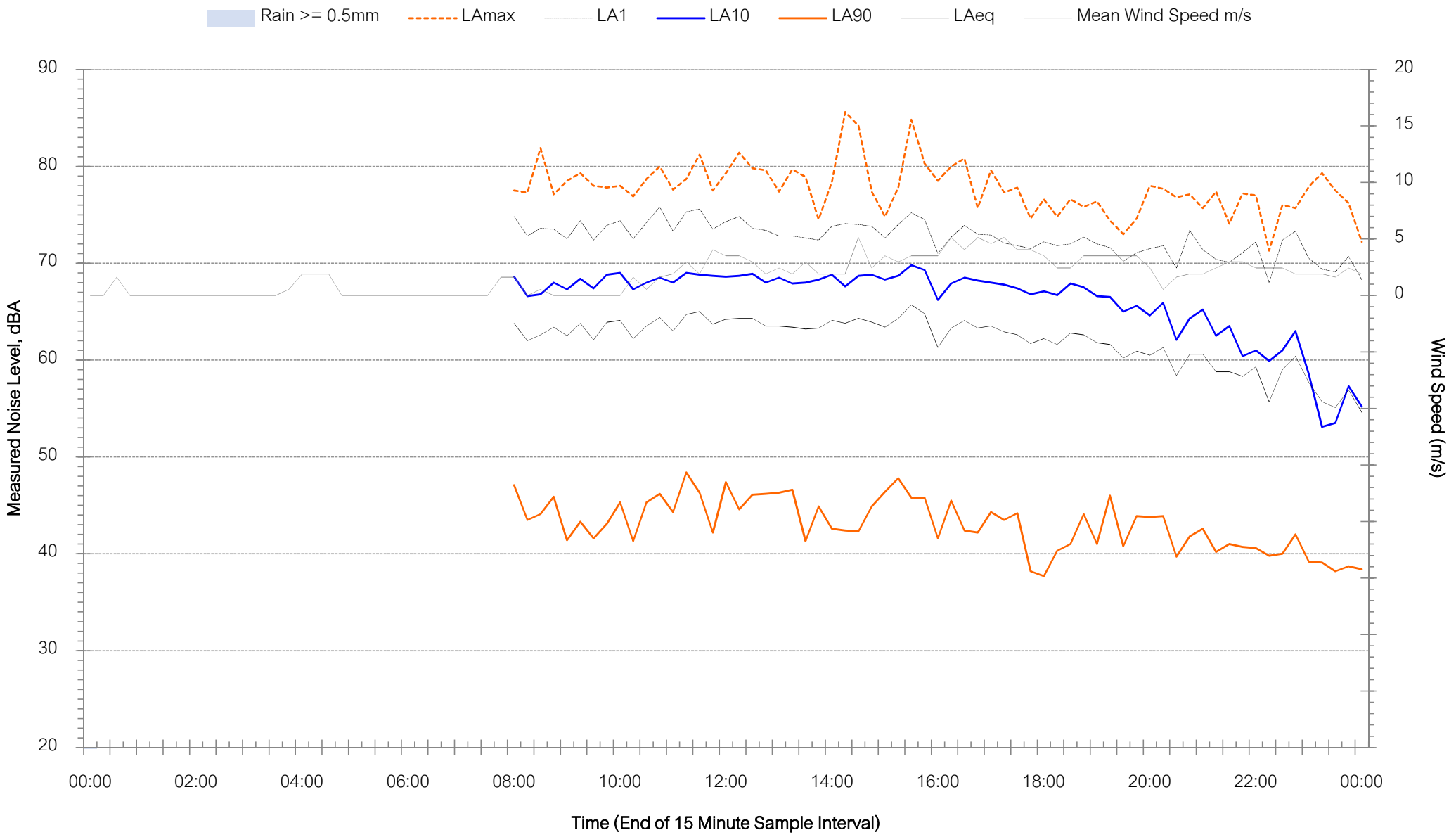
Background Noise Levels

Location - NM8 - Tuesday 30 October 2018



Background Noise Levels

Location - NM5 - Friday 19 October 2018

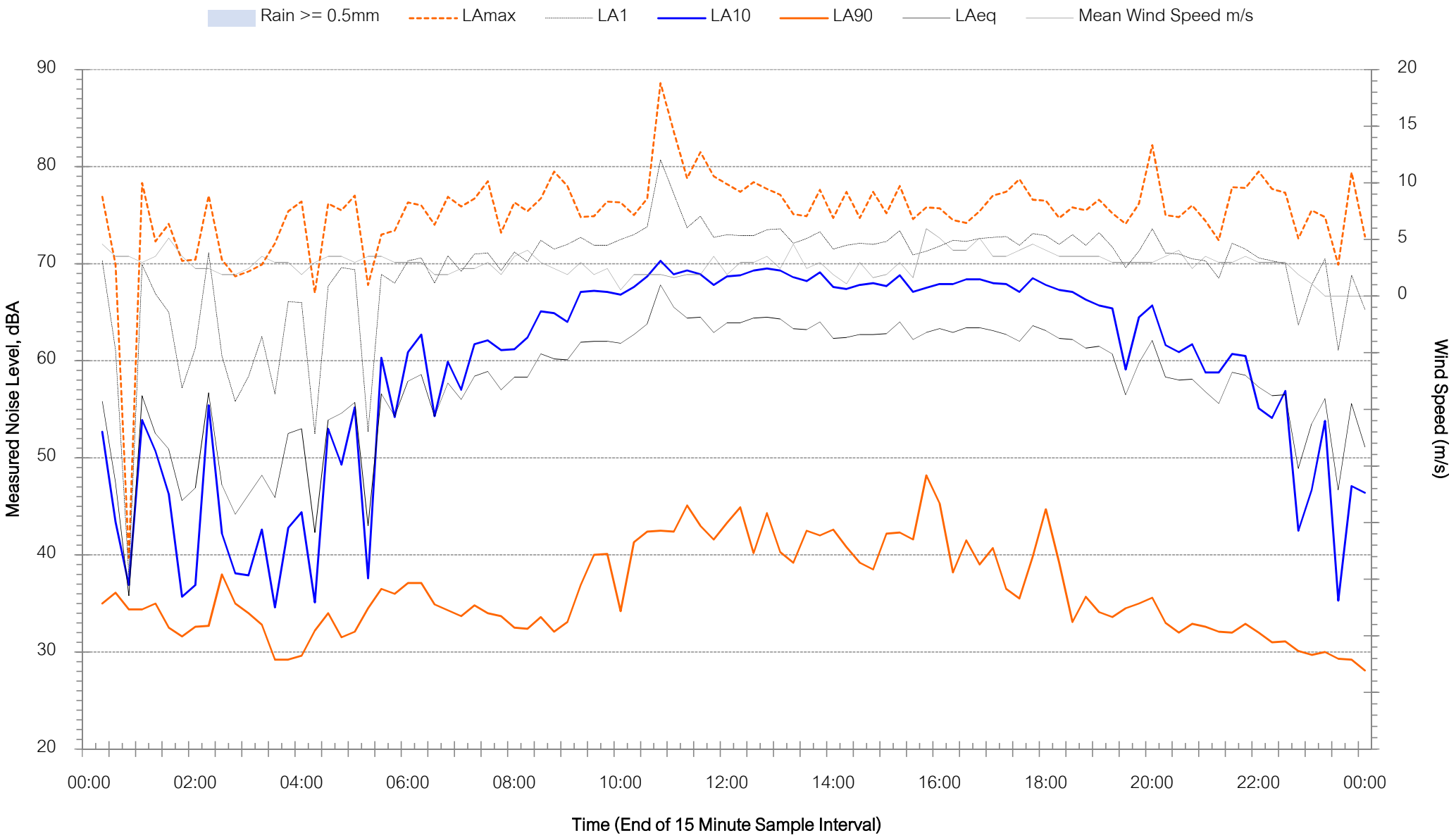


Background Noise Levels

Location - NM5 - Saturday 20 October 2018

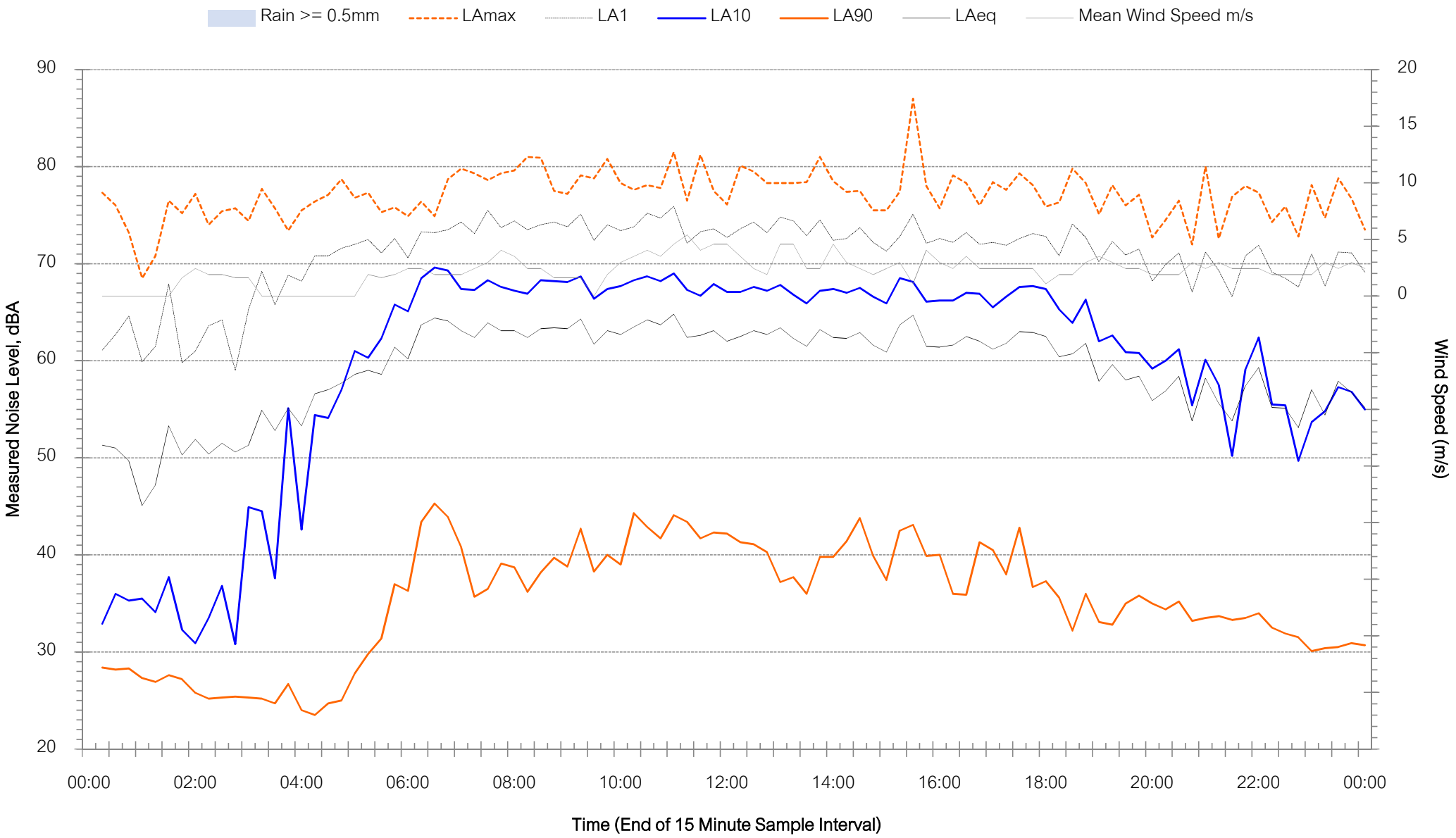
Background Noise Levels

Location - NM5 - Sunday 21 October 2018



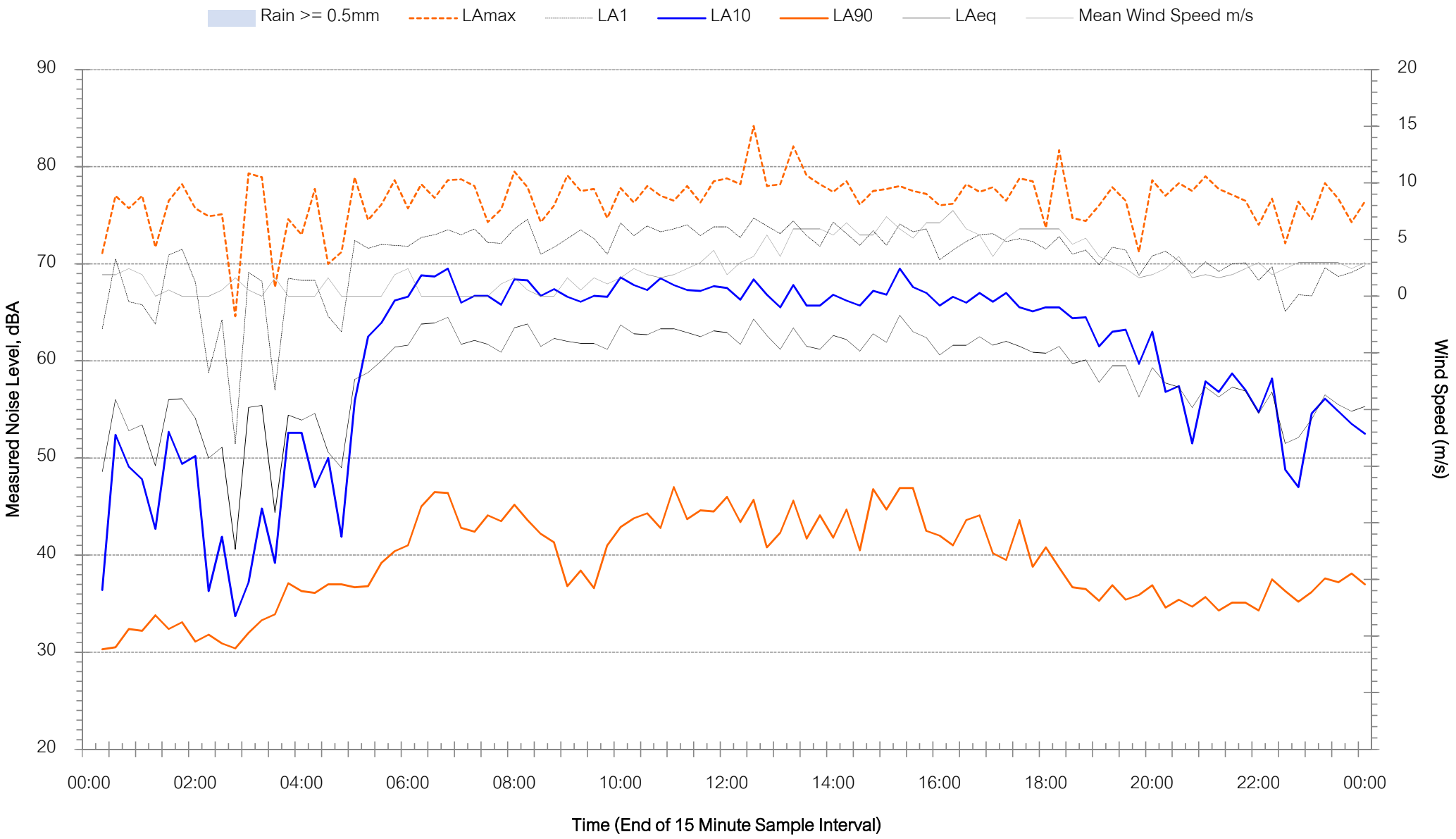
Background Noise Levels

Location - NM5 - Monday 22 October 2018



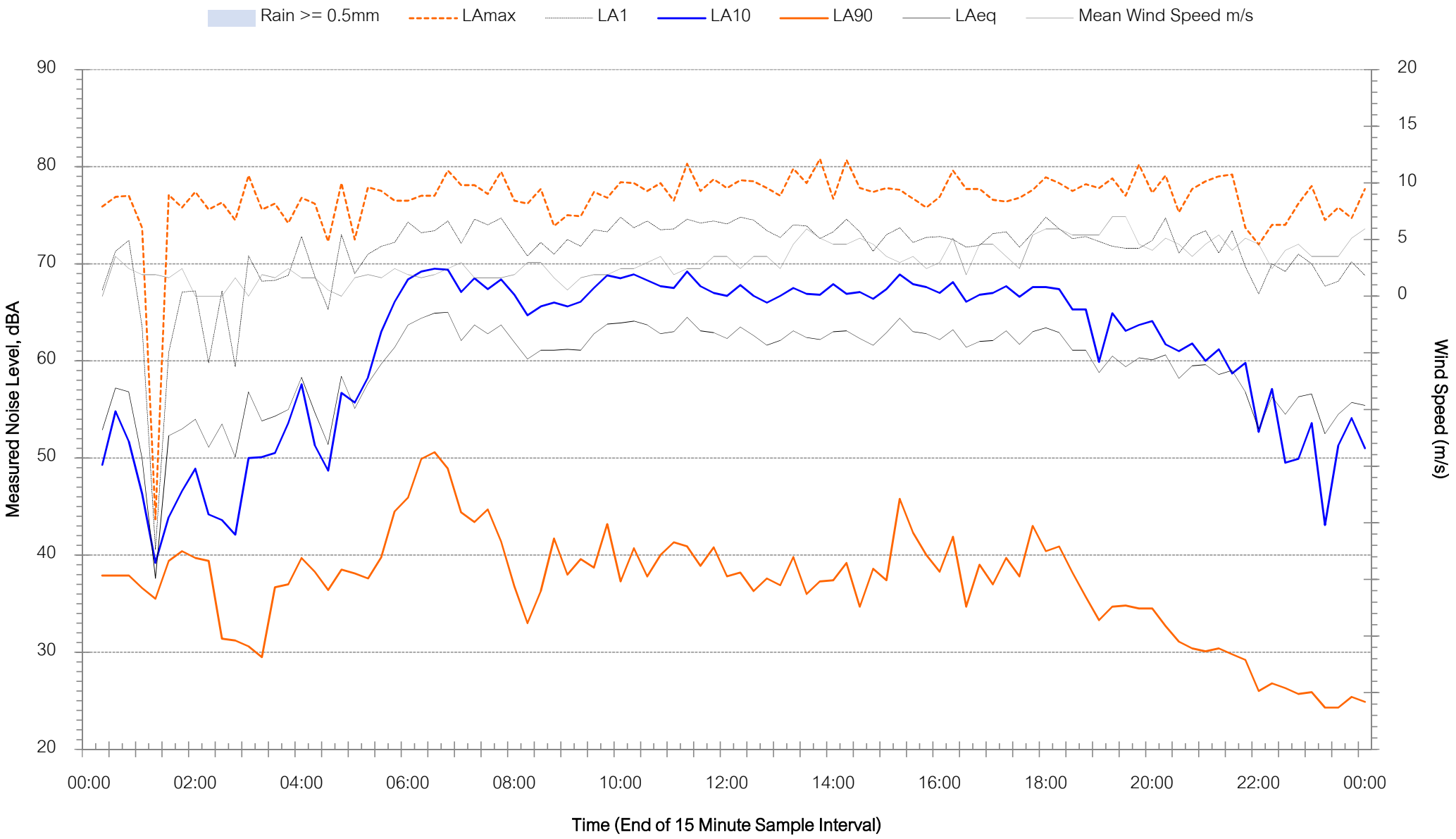
Background Noise Levels

Location - NM5 - Tuesday 23 October 2018



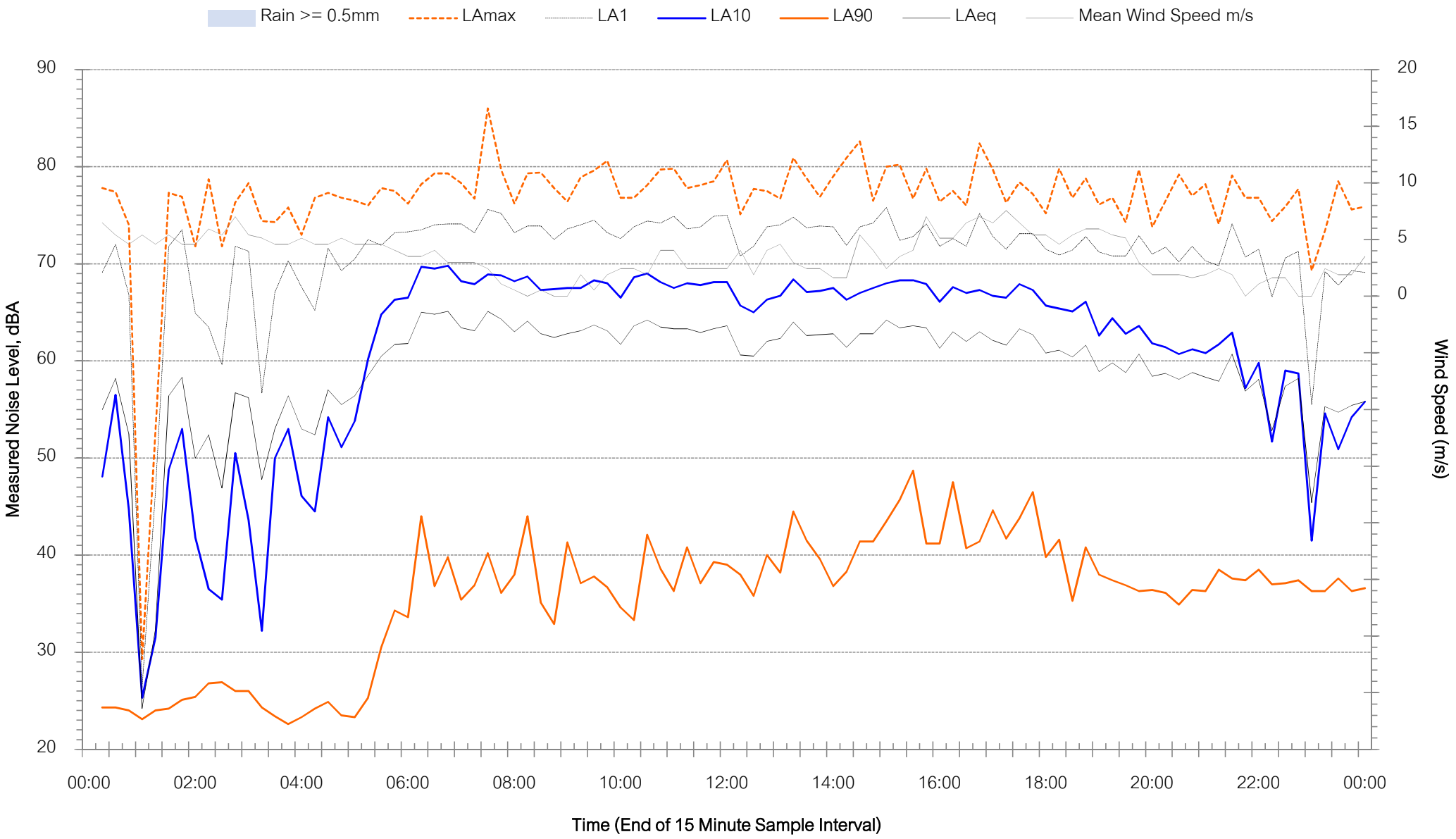
Background Noise Levels

Location - NM5 - Wednesday 24 October 2018



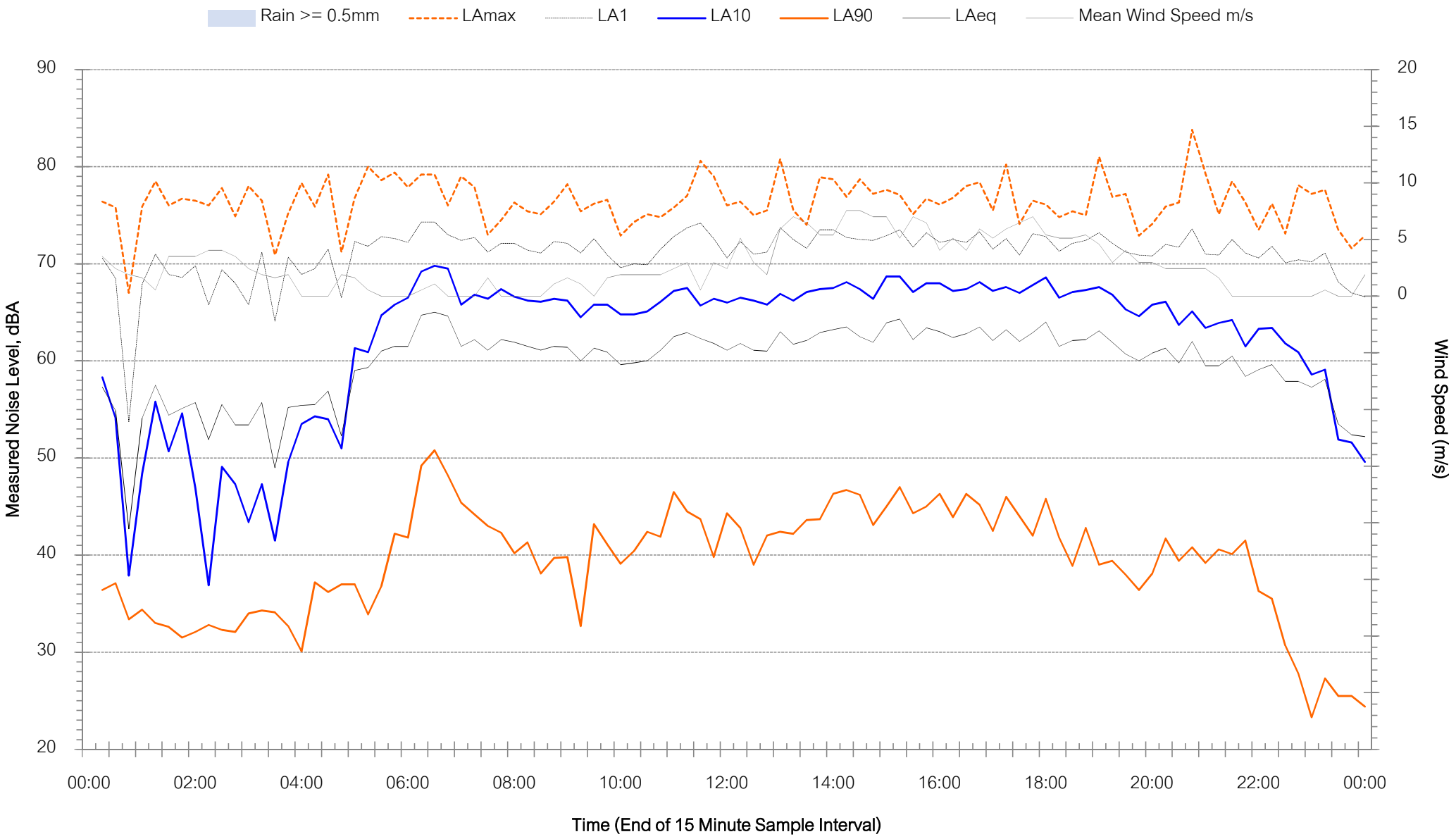
Background Noise Levels

Location - NM5 - Thursday 25 October 2018



Background Noise Levels

Location - NM5 - Friday 26 October 2018



Background Noise Levels

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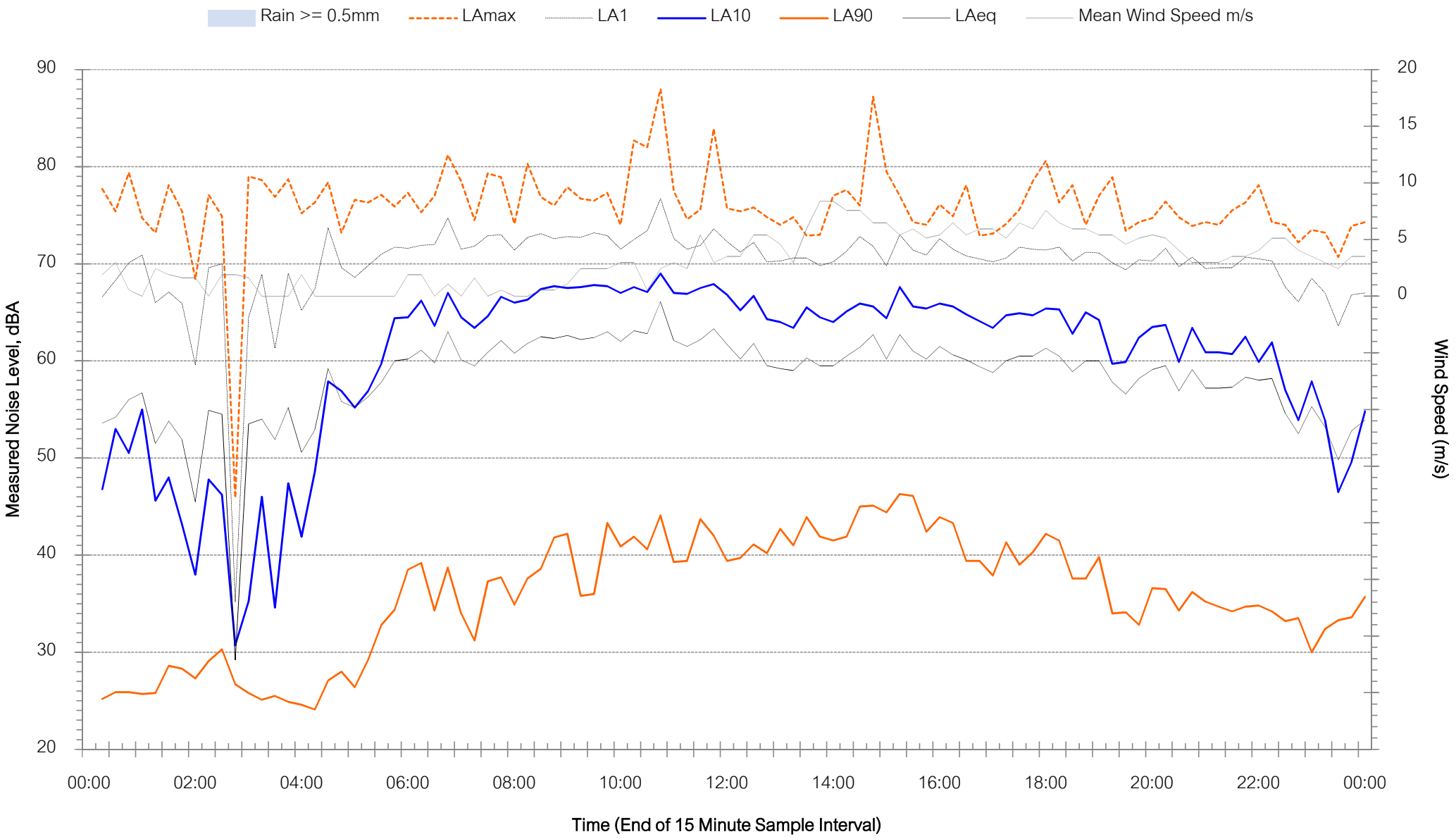
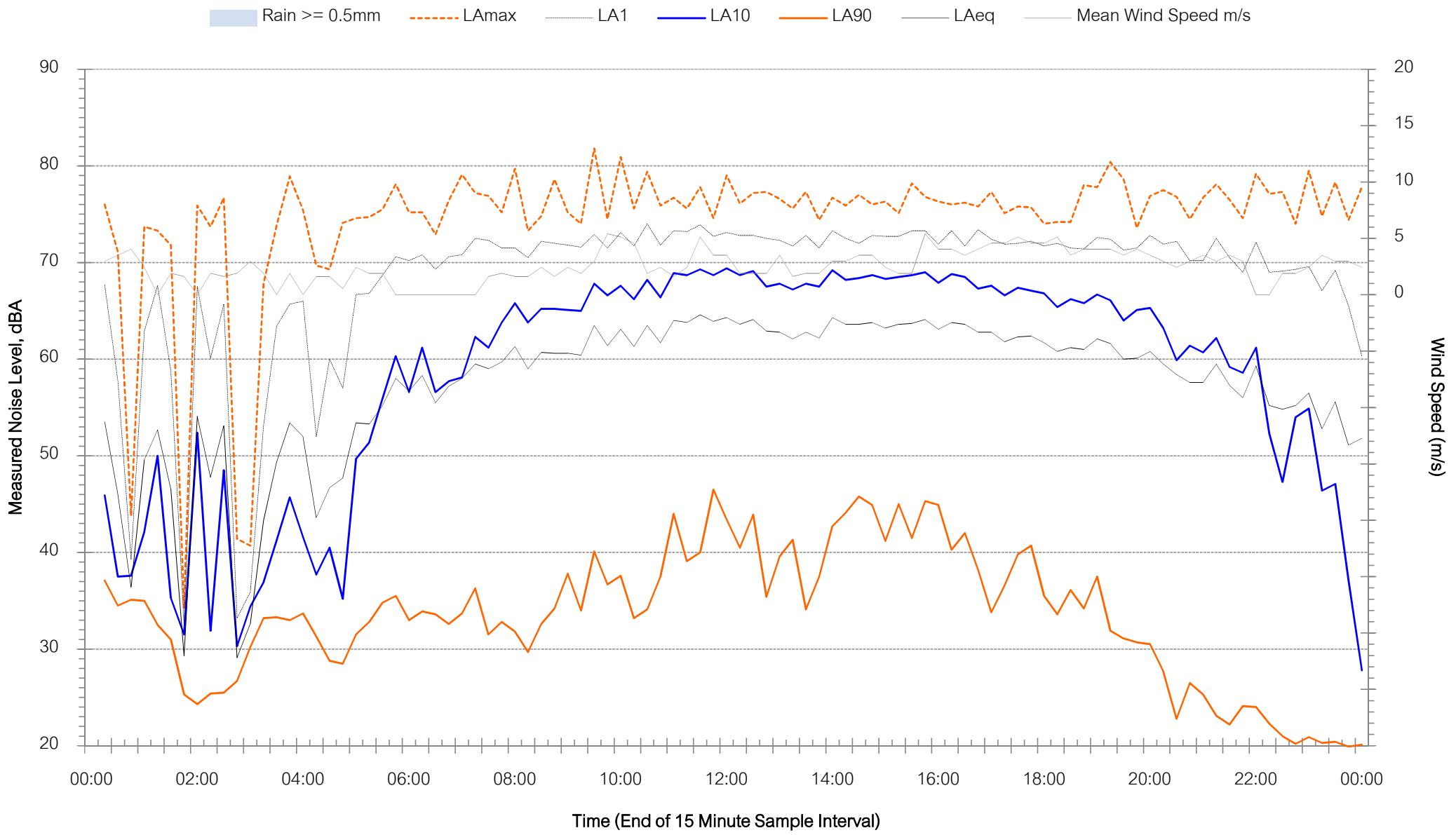


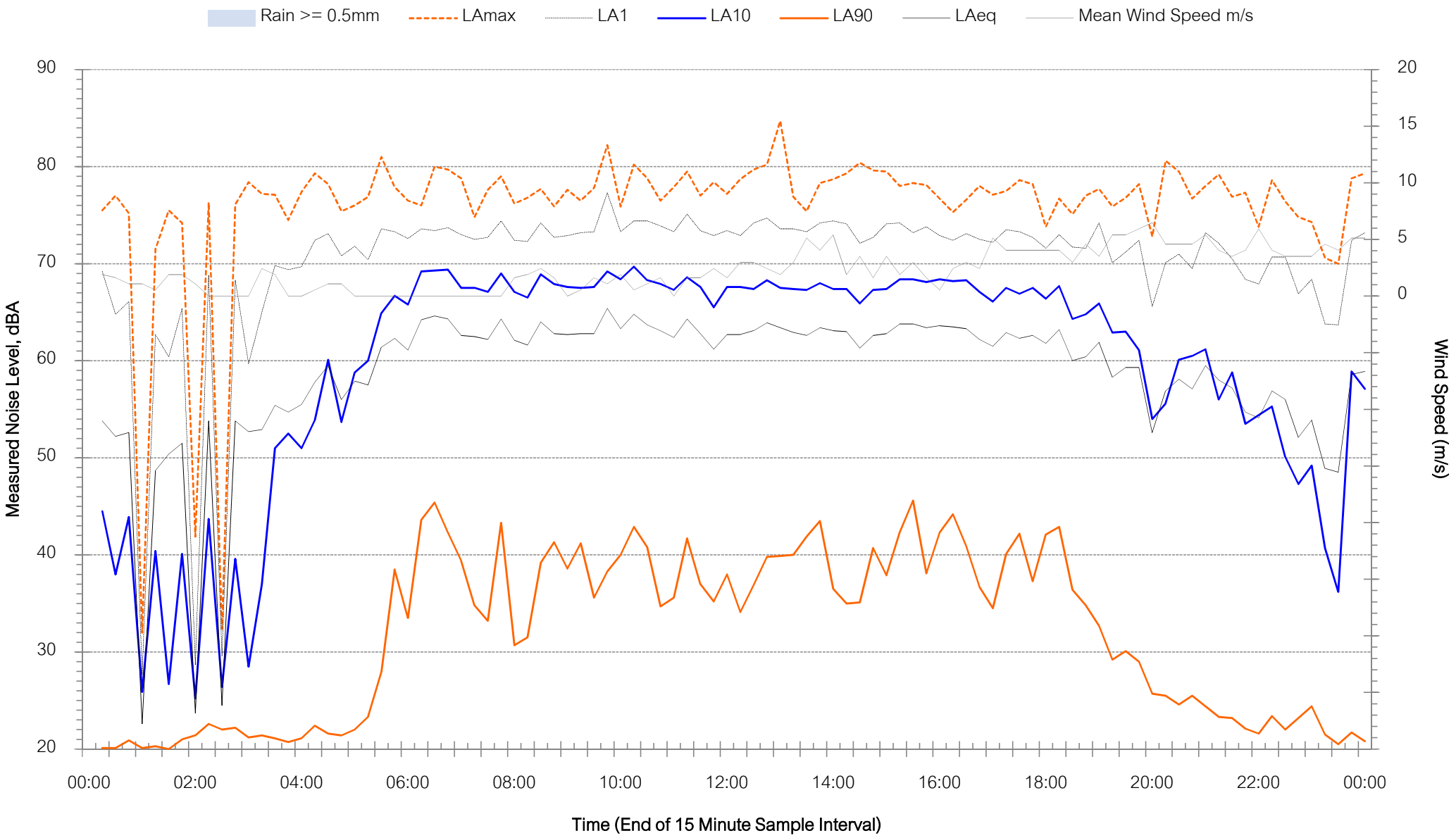
Background Noise Levels

Location - NM5 - Sunday 28 October 2018



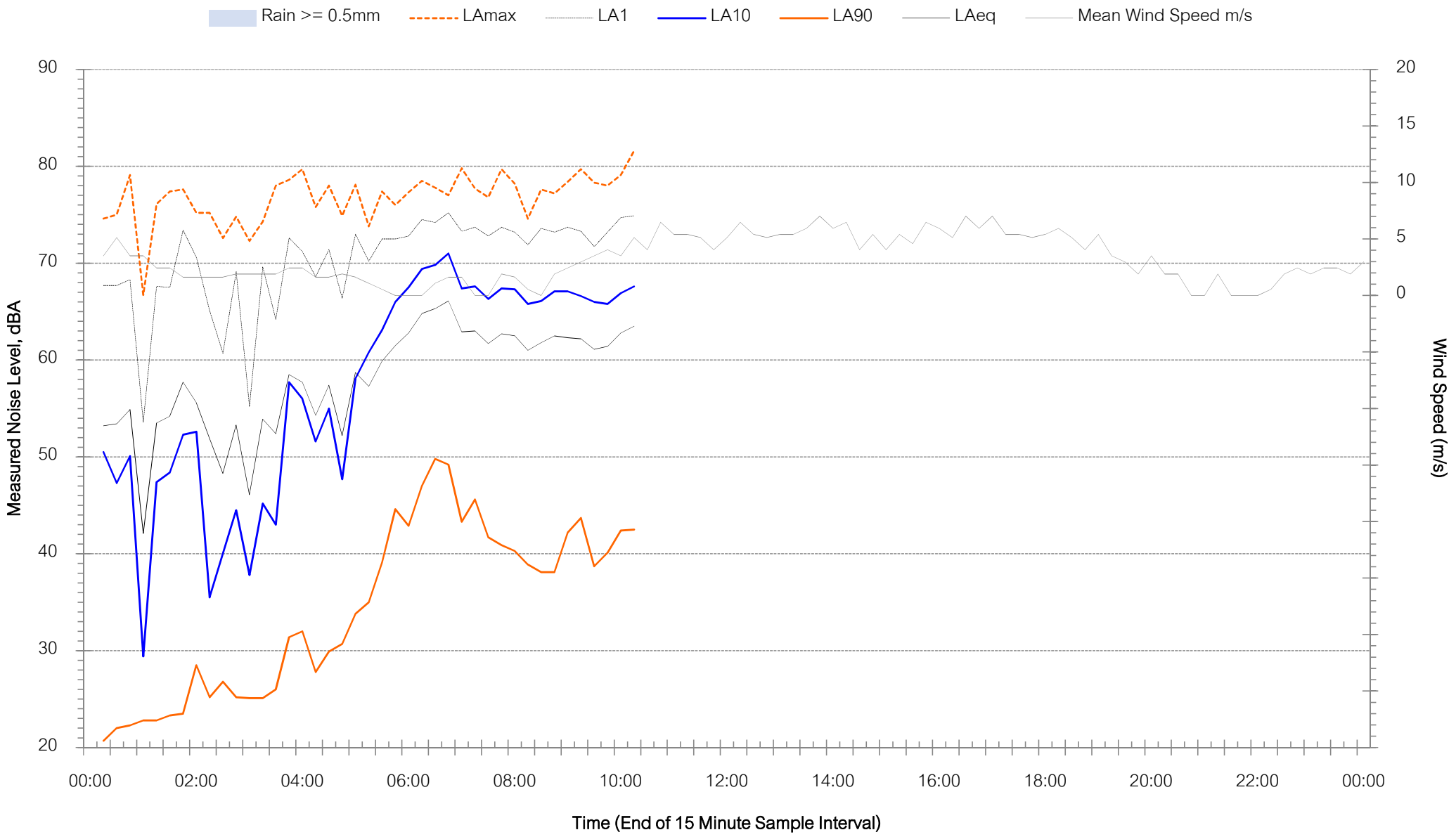
Background Noise Levels

Location - NM5 - Monday 29 October 2018



Background Noise Levels

Location - NM5 - Tuesday 30 October 2018



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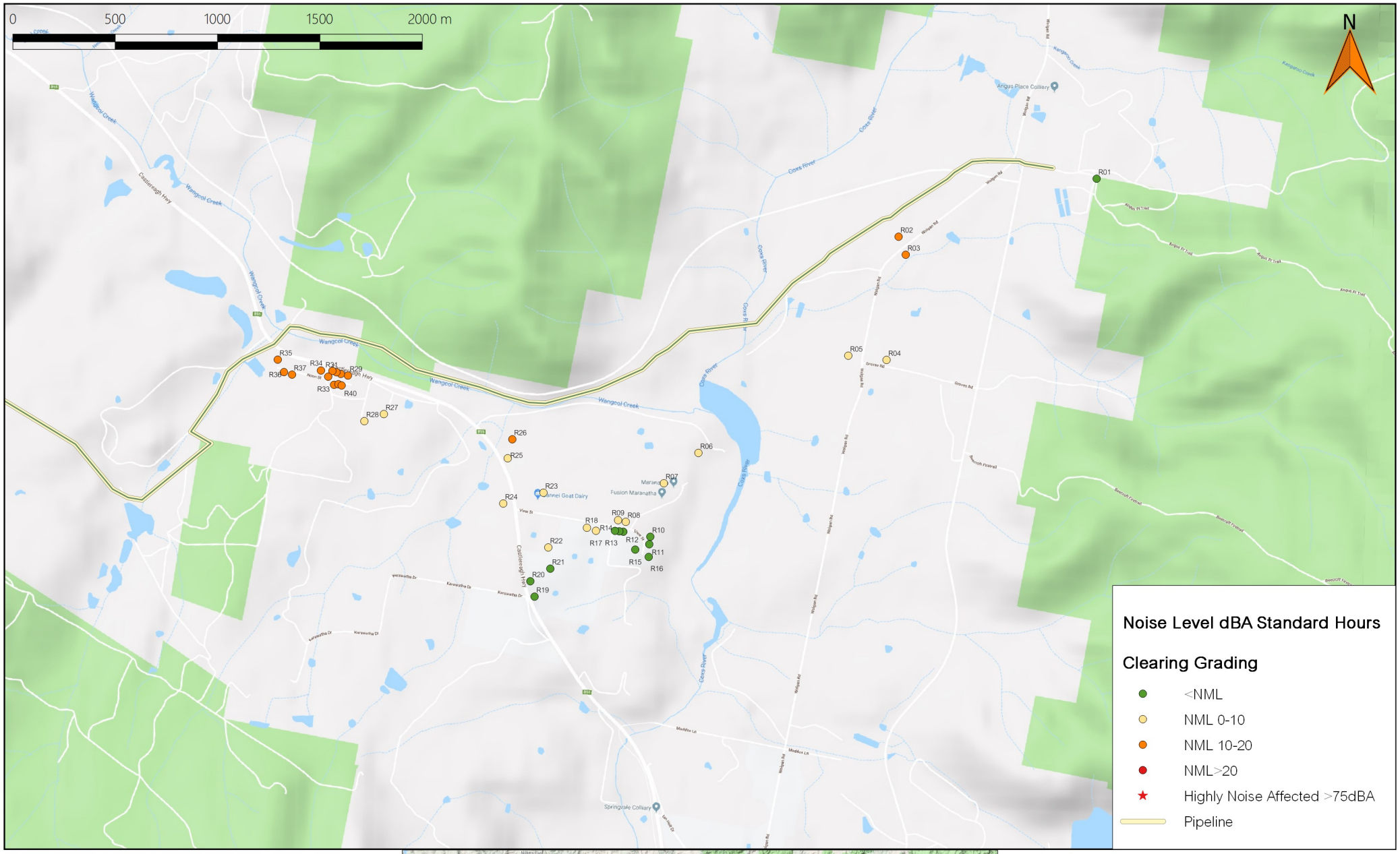
Appendix C – Clearing & Grading



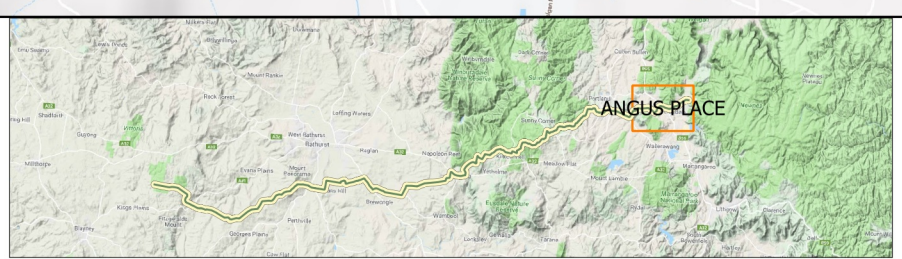


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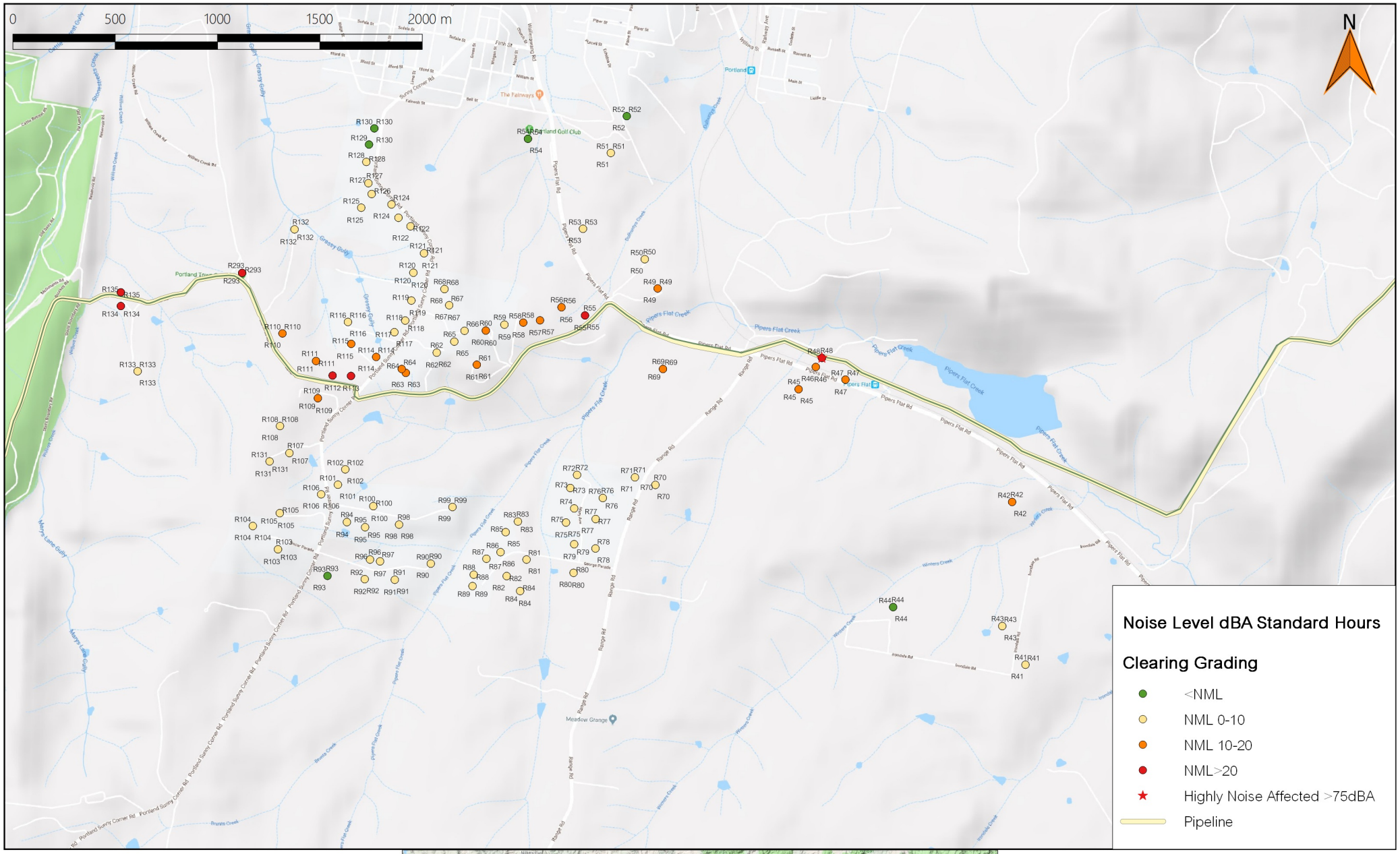
FIGURE C1

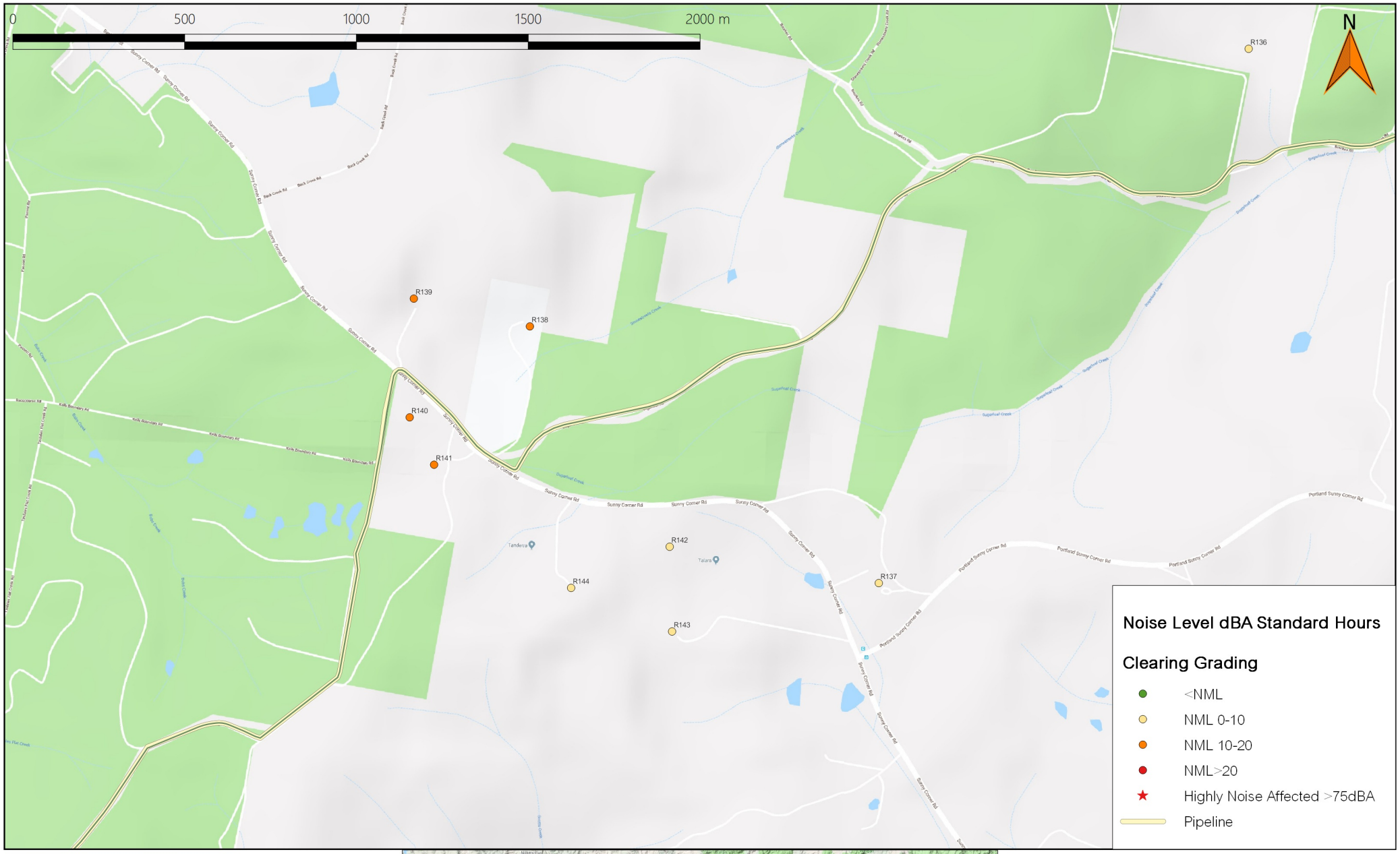
Pipeline Construction
Clearing & Grading - Angus Place
REF: MAC180742



MAC
Muller Acoustic Consulting

FIGURE C2

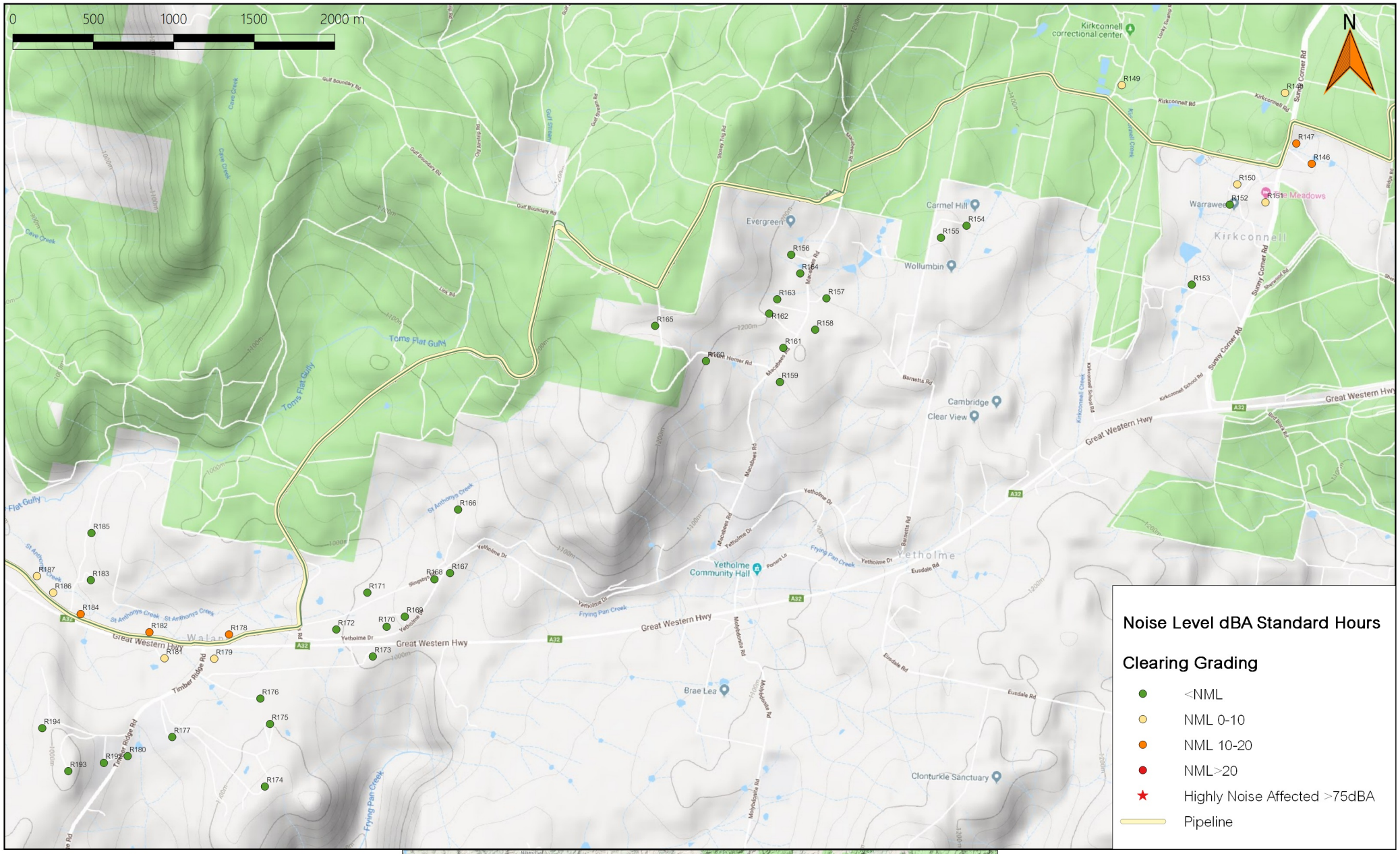
Pipeline Construction
Clearing & Grading - Portland
REF: MAC180742



MAC
Muller Acoustic Consulting

FIGURE C3

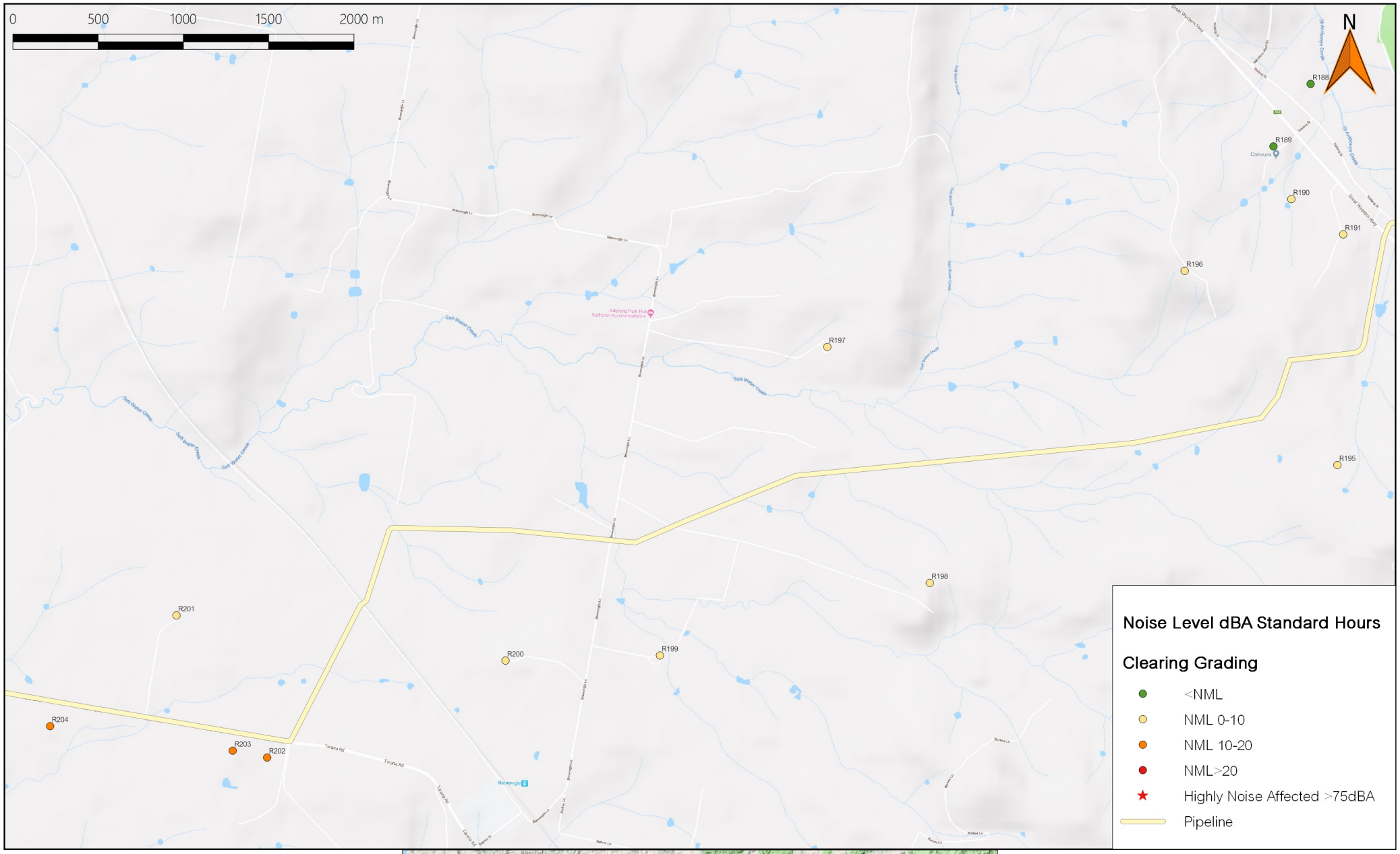
Pipeline Construction
Clearing & Grading - Sunny Corner
REF: MAC180742



MAC
Muller Acoustic Consulting

FIGURE C4

Pipeline Construction
Clearing & Grading - Yetholme
REF: MAC180742



MAC
Muller Acoustic Consulting

FIGURE C5

Pipeline Construction
Clearing & Grading - Brewongle
REF: MAC180742

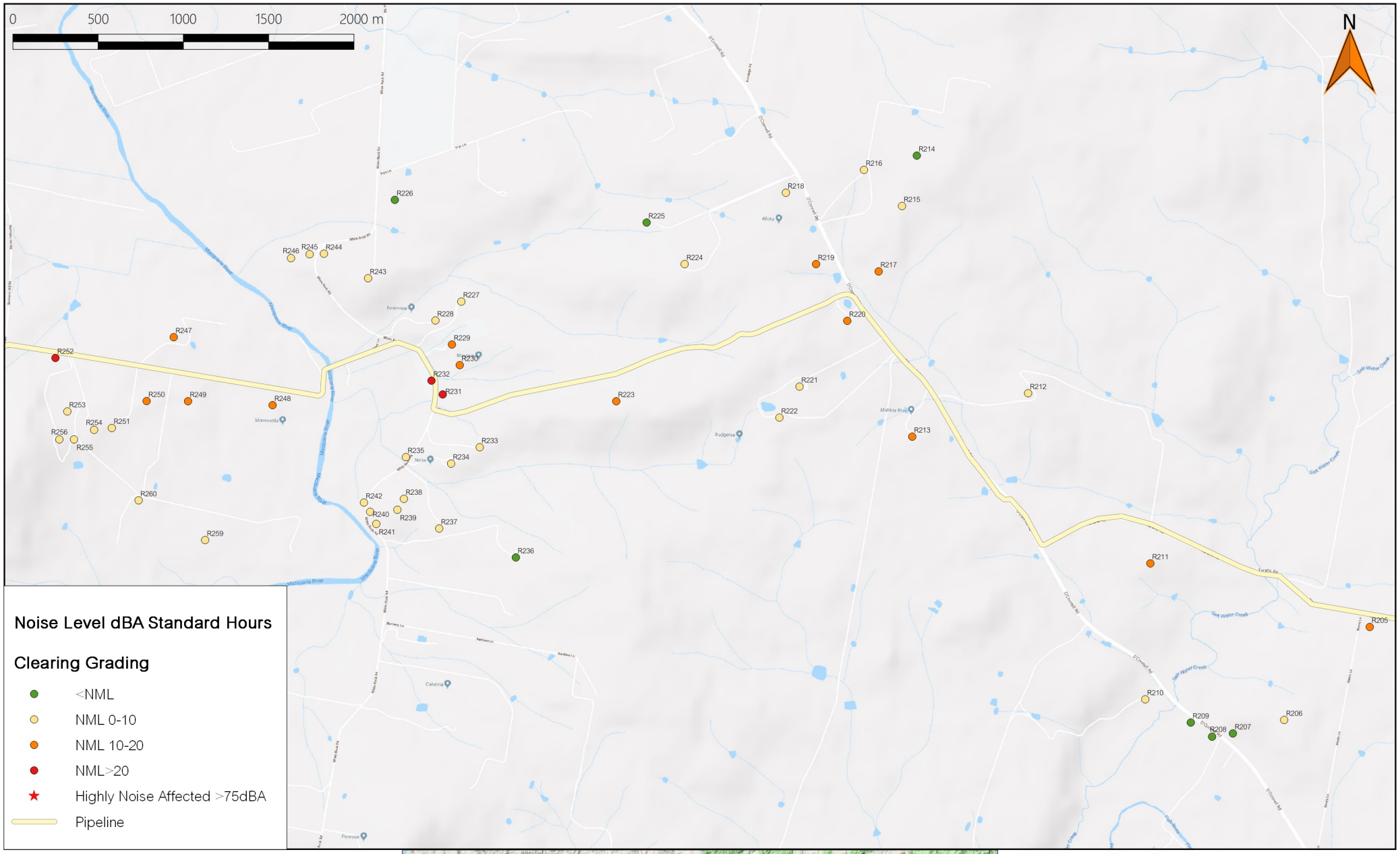


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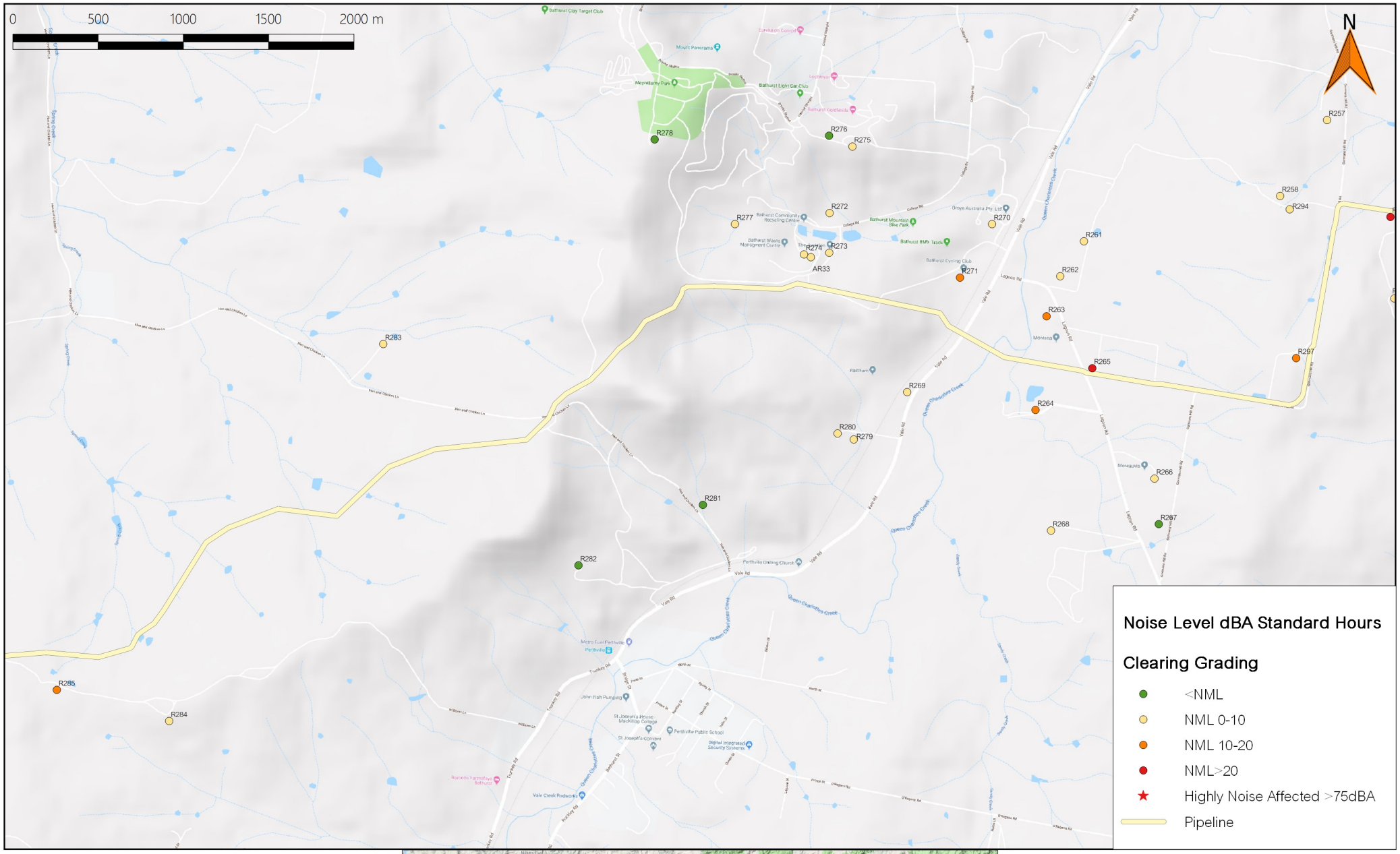
FIGURE C6

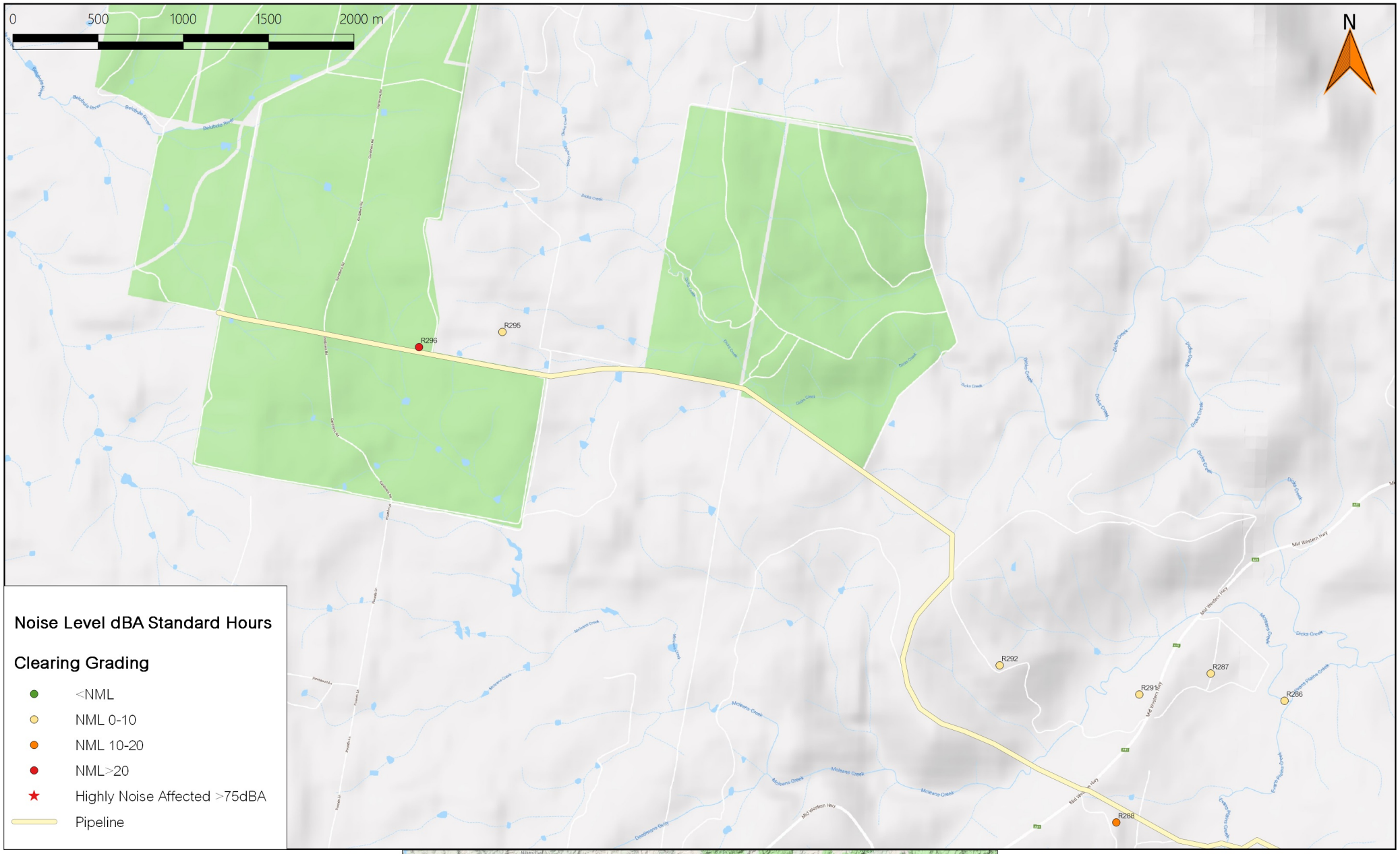
Pipeline Construction
Clearing & Grading - Bike Park
REF: MAC180742



MAC
Muller Acoustic Consulting

FIGURE C7

Pipeline Construction
Clearing & Grading - Perthville
REF: MAC180742



MAC
Muller Acoustic Consulting

FIGURE C8

Pipeline Construction
Clearing & Grading - McPhillamys
REF: MAC180742

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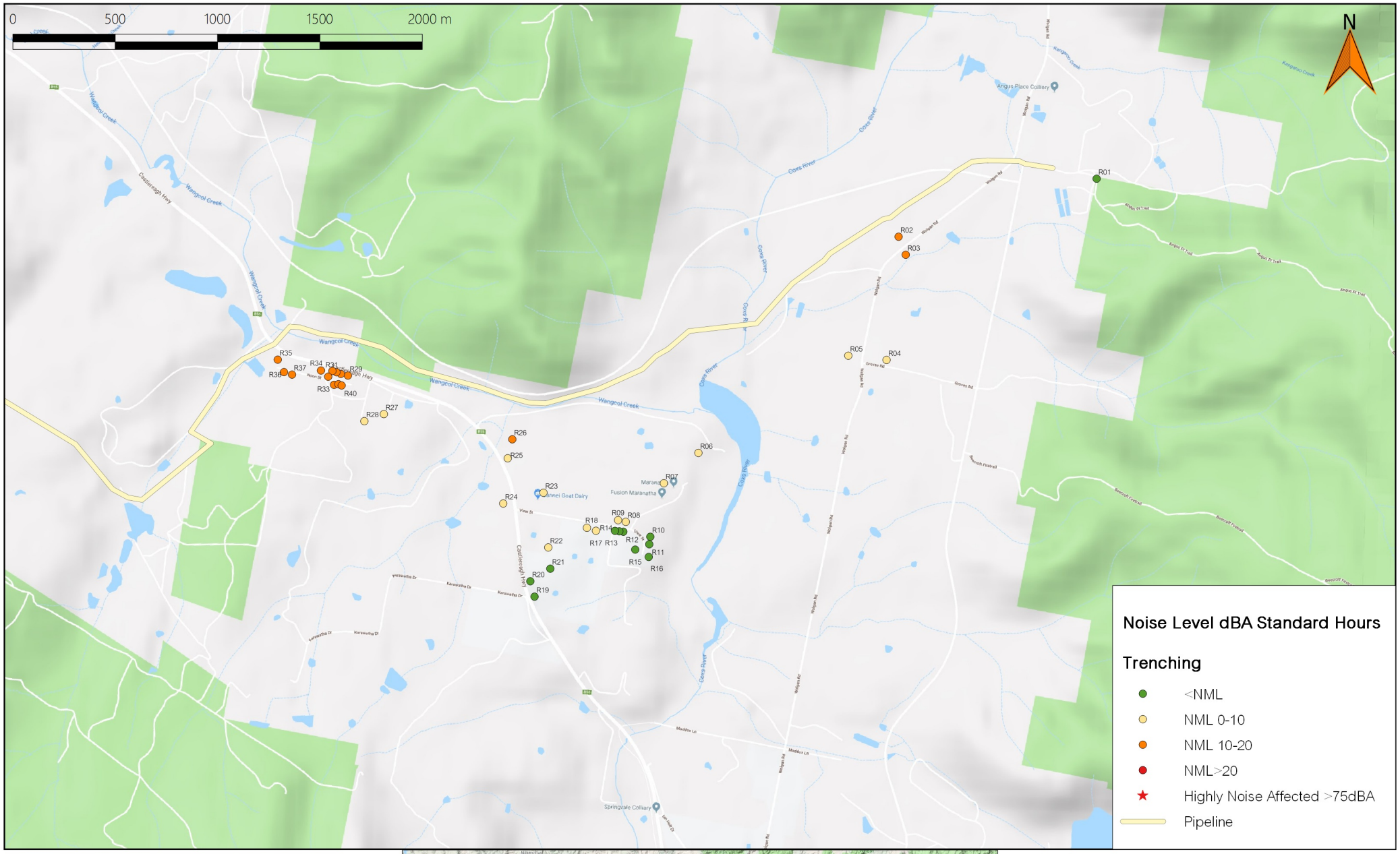
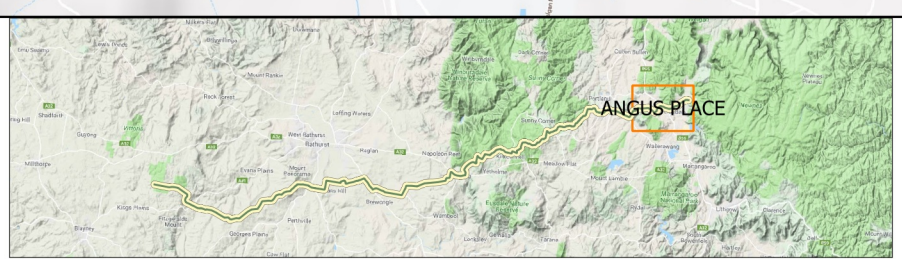
Appendix D – Trenching

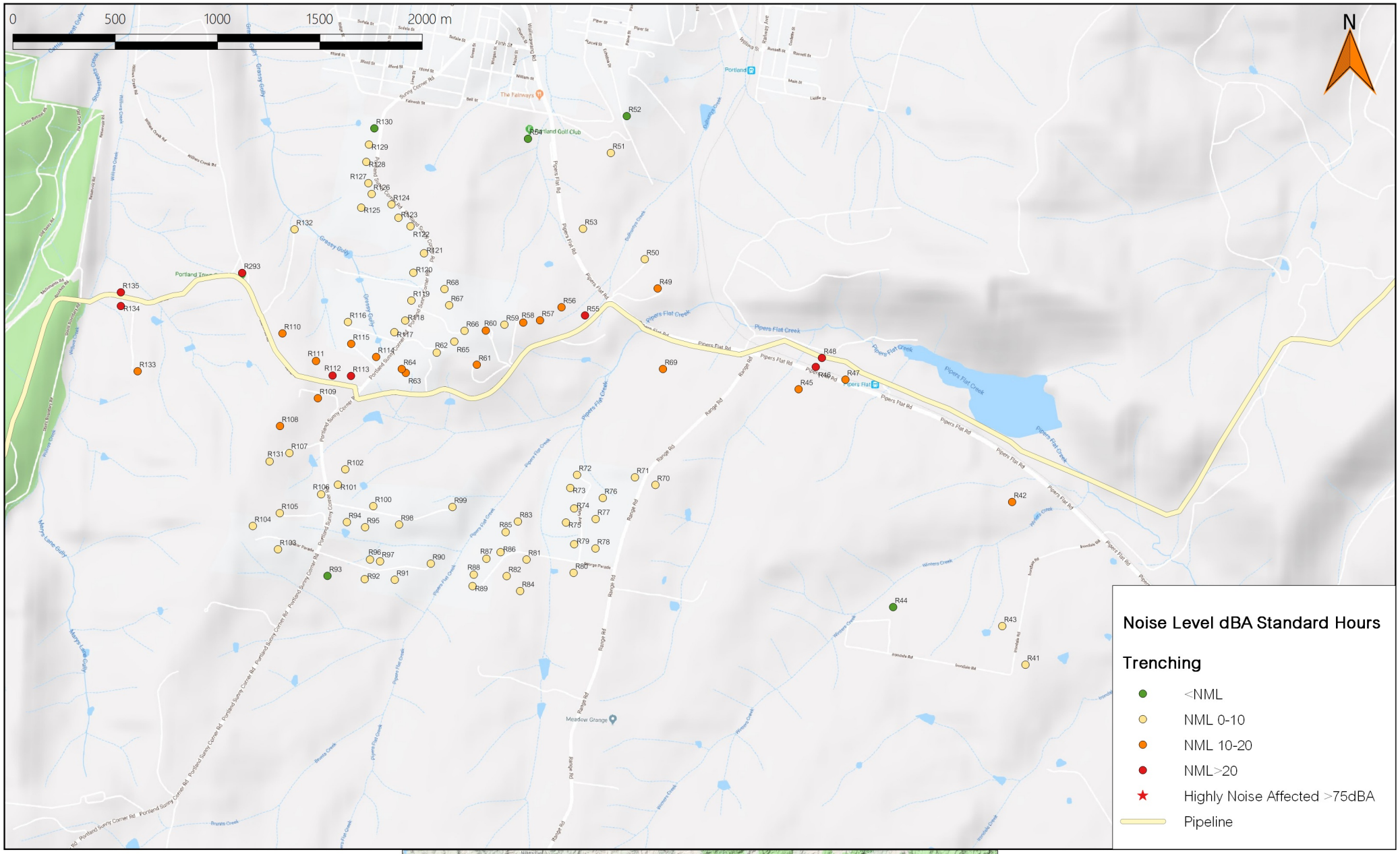




MAC
Muller Acoustic Consulting

FIGURE D1

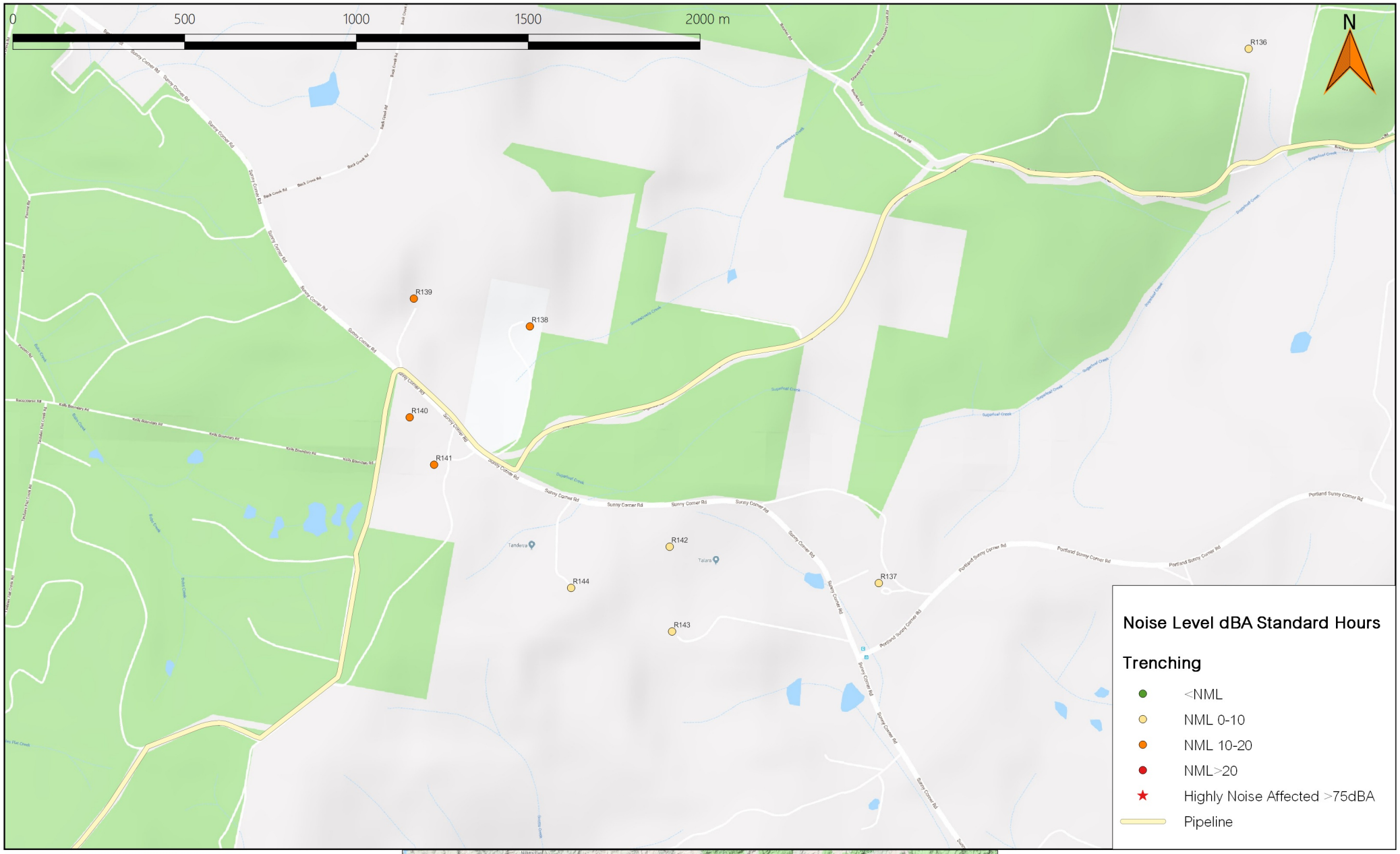
Pipeline Construction
Trenching - Angus Place
REF: MAC180742



MAC
Muller Acoustic Consulting

FIGURE D2

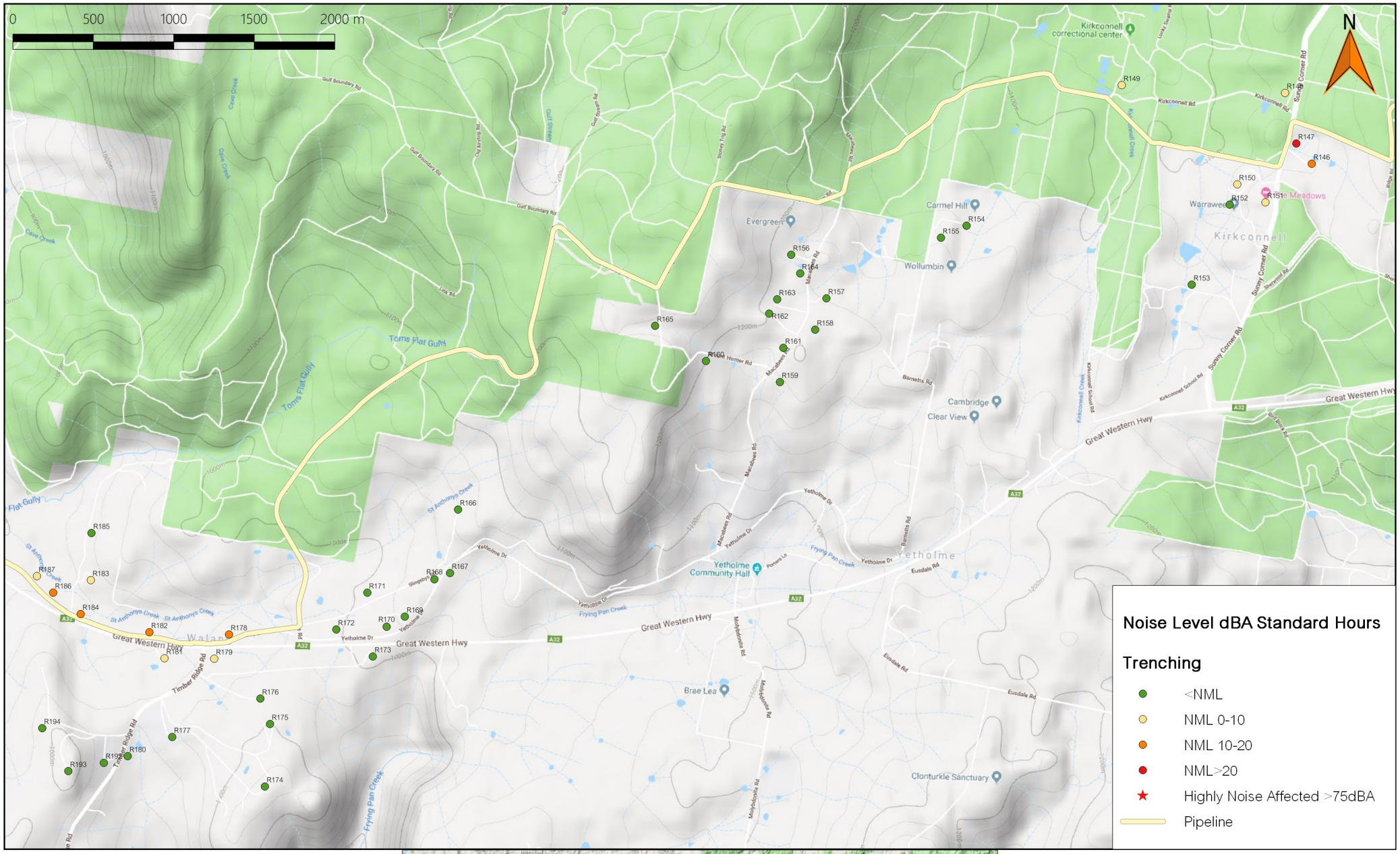
Pipeline Construction
Trenching - Portland
REF: MAC180742



MAC
Muller Acoustic Consulting

FIGURE D3

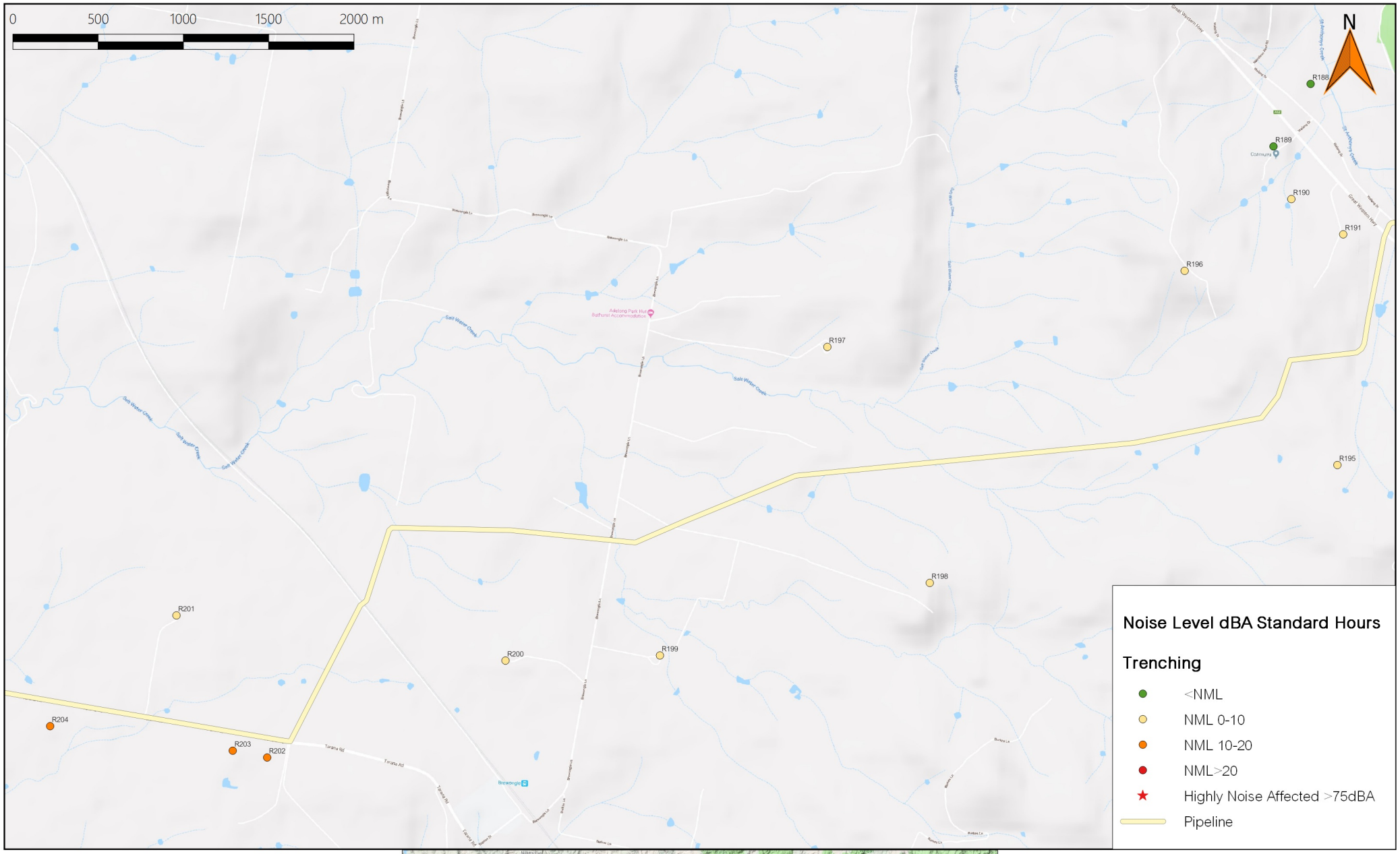
Pipeline Construction
Trenching - Sunny Corner
REF: MAC180742



MAC
Muller Acoustic Consulting

FIGURE D4

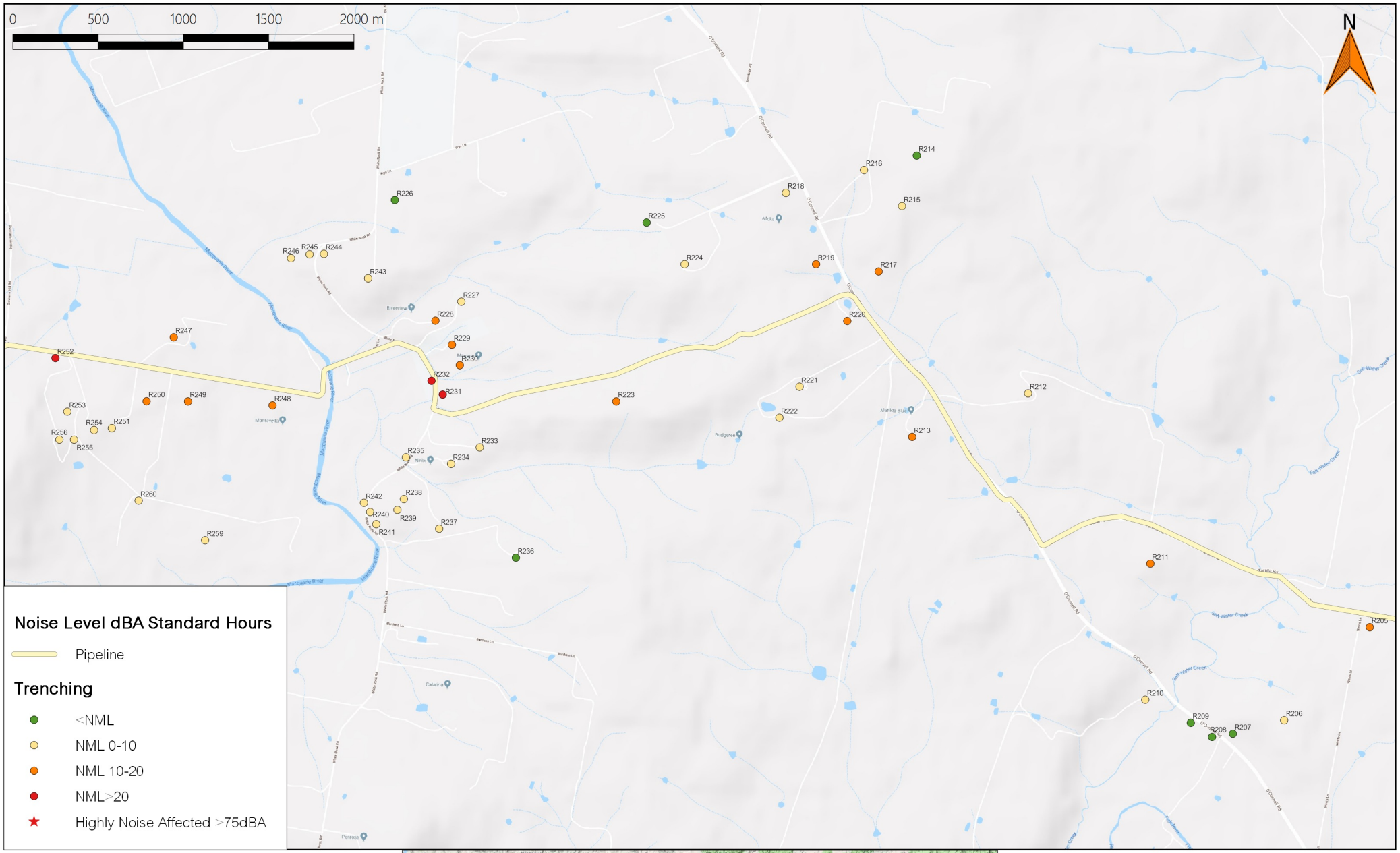
Pipeline Construction
Trenching - Yetholme
REF: MAC180742



MAC
Muller Acoustic Consulting

FIGURE D5

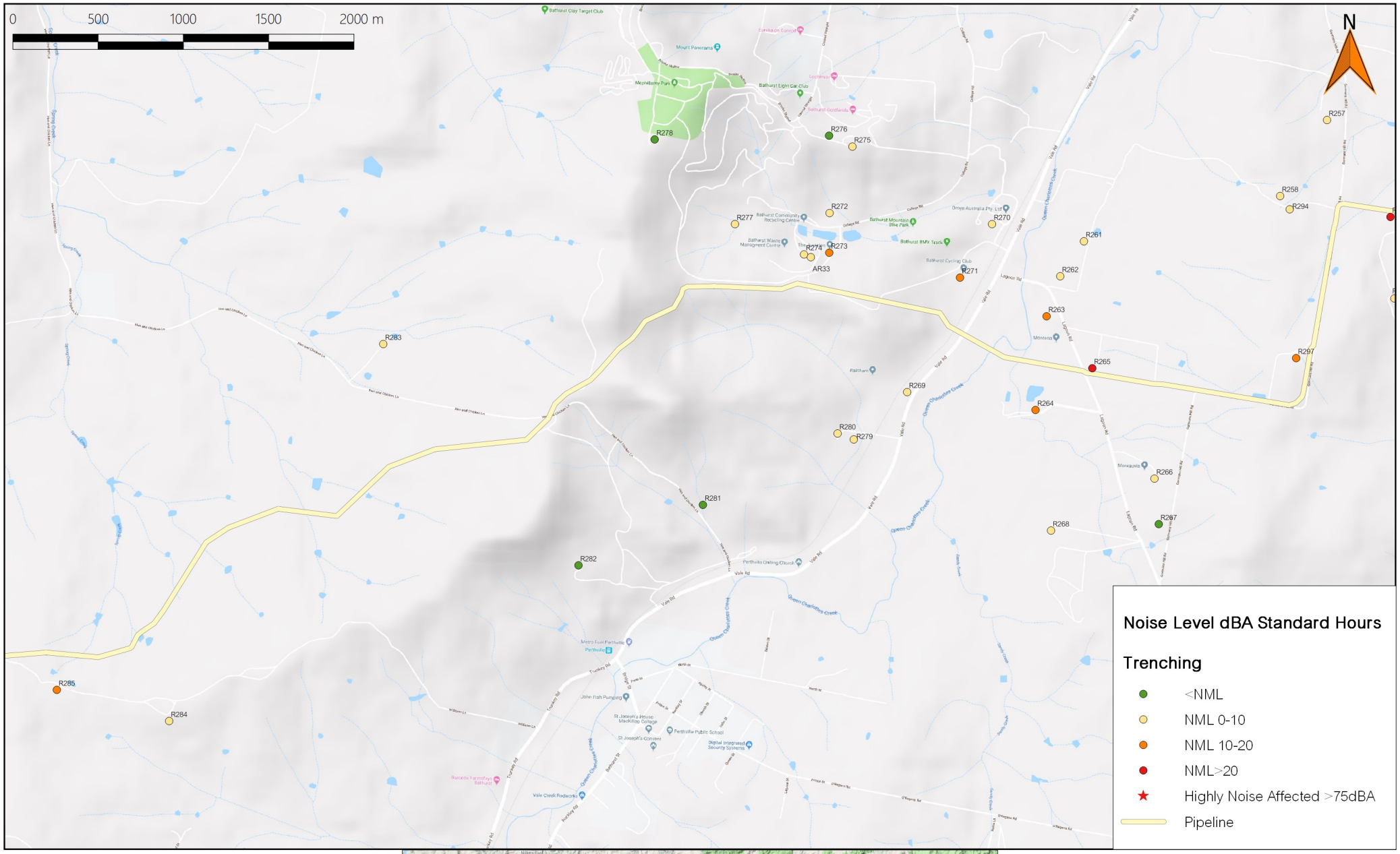
Pipeline Construction
Trenching - Brewongle
REF: MAC180742



MAC
Muller Acoustic Consulting

FIGURE D6

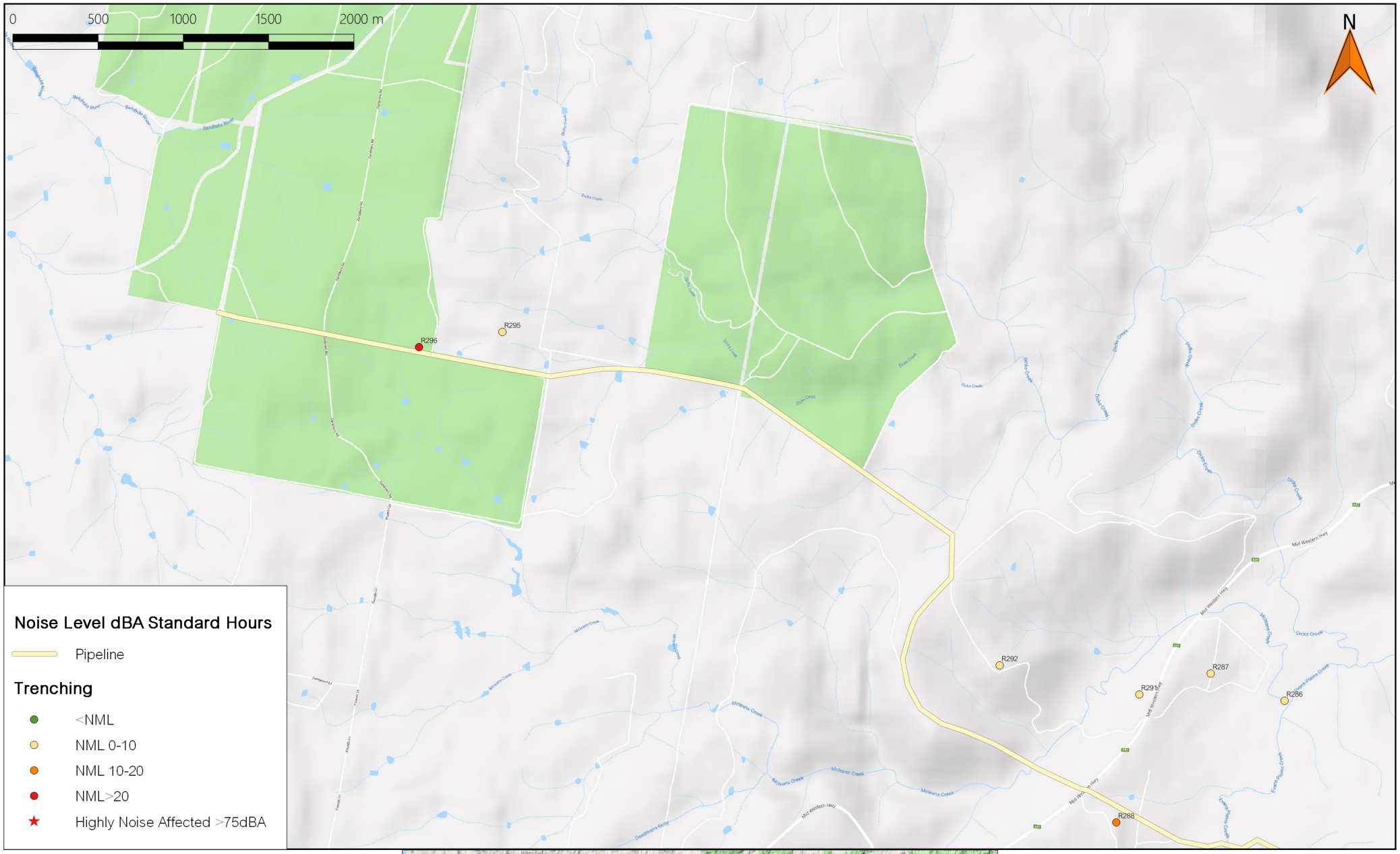
Pipeline Construction Trenching - Bike Park
REF: MAC180742



MAC
Muller Acoustic Consulting

FIGURE D7

Pipeline Construction
Trenching - Perthville
REF: MAC180742

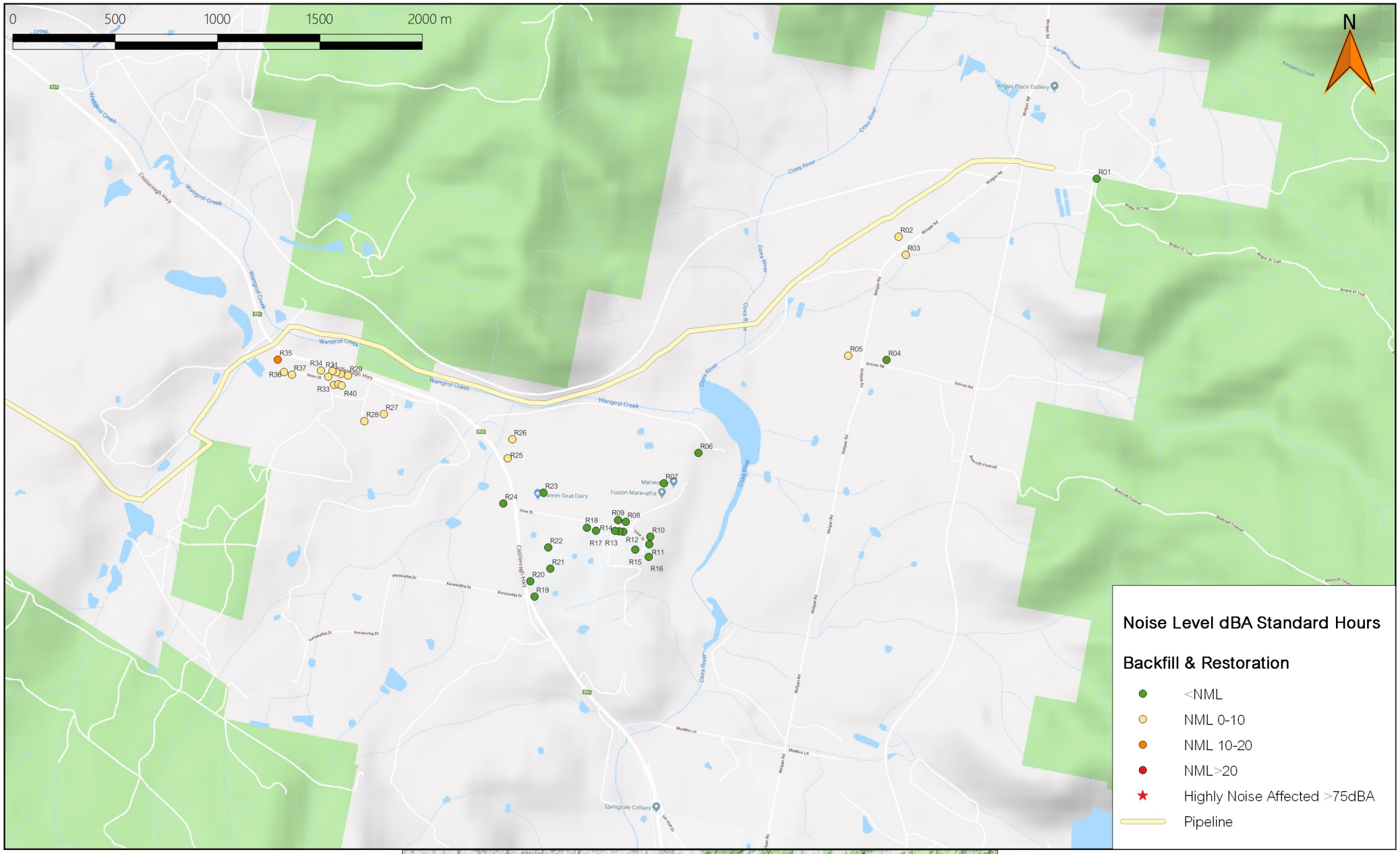


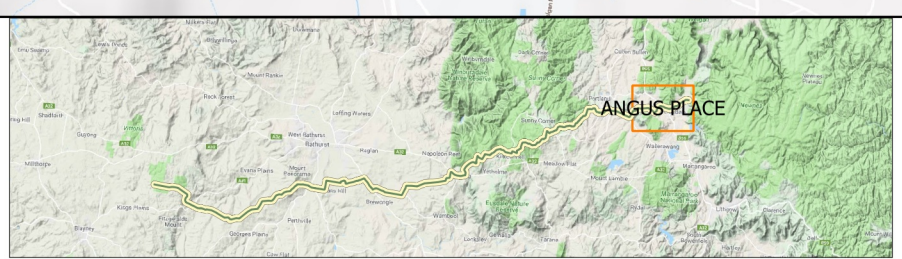
MAC
Muller Acoustic Consulting

FIGURE D8

Pipeline Construction
Trenching - McPhillamys
REF: MAC180742

Appendix E – Backfill & Restoration

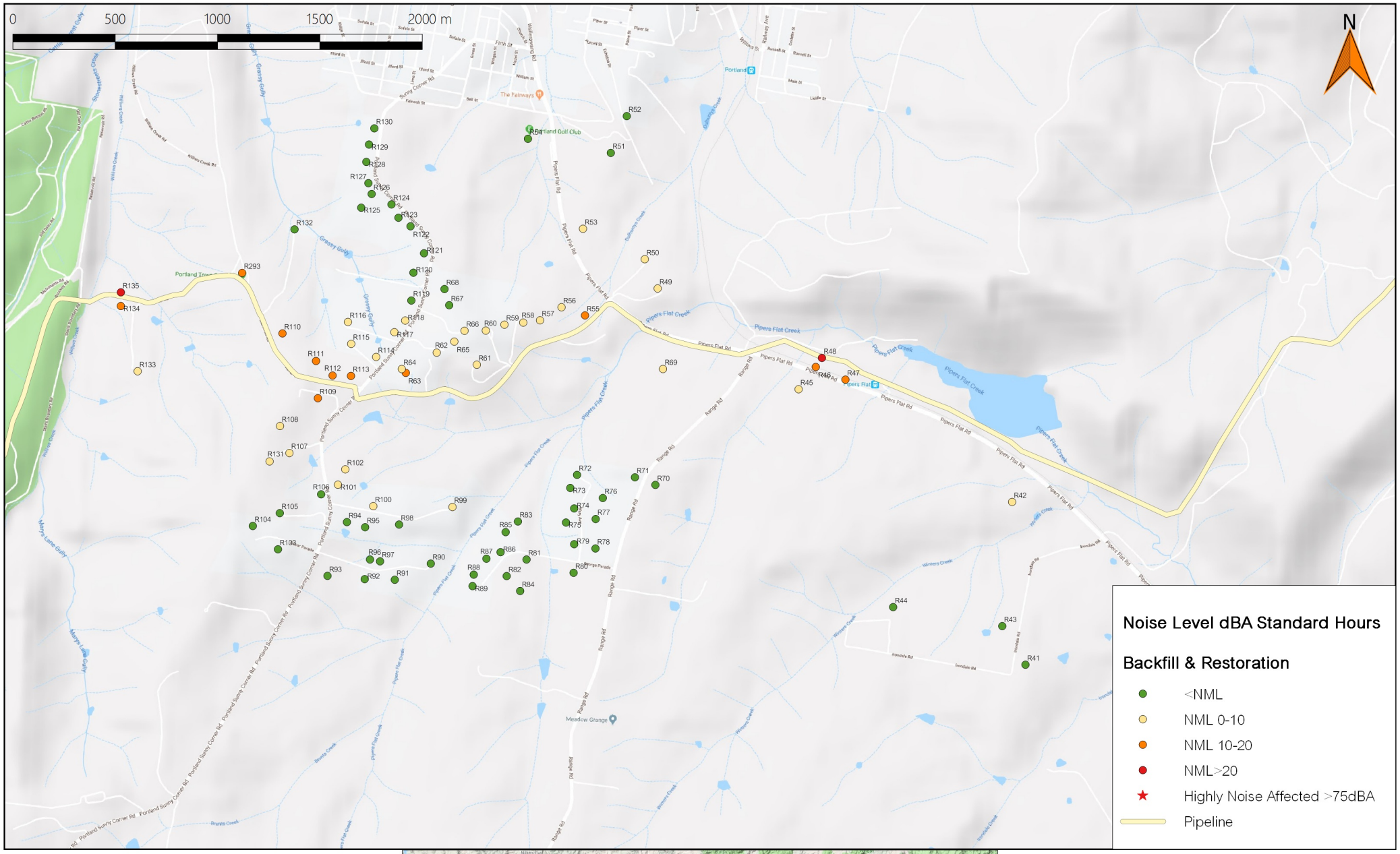




MAC
Muller Acoustic Consulting

FIGURE E1

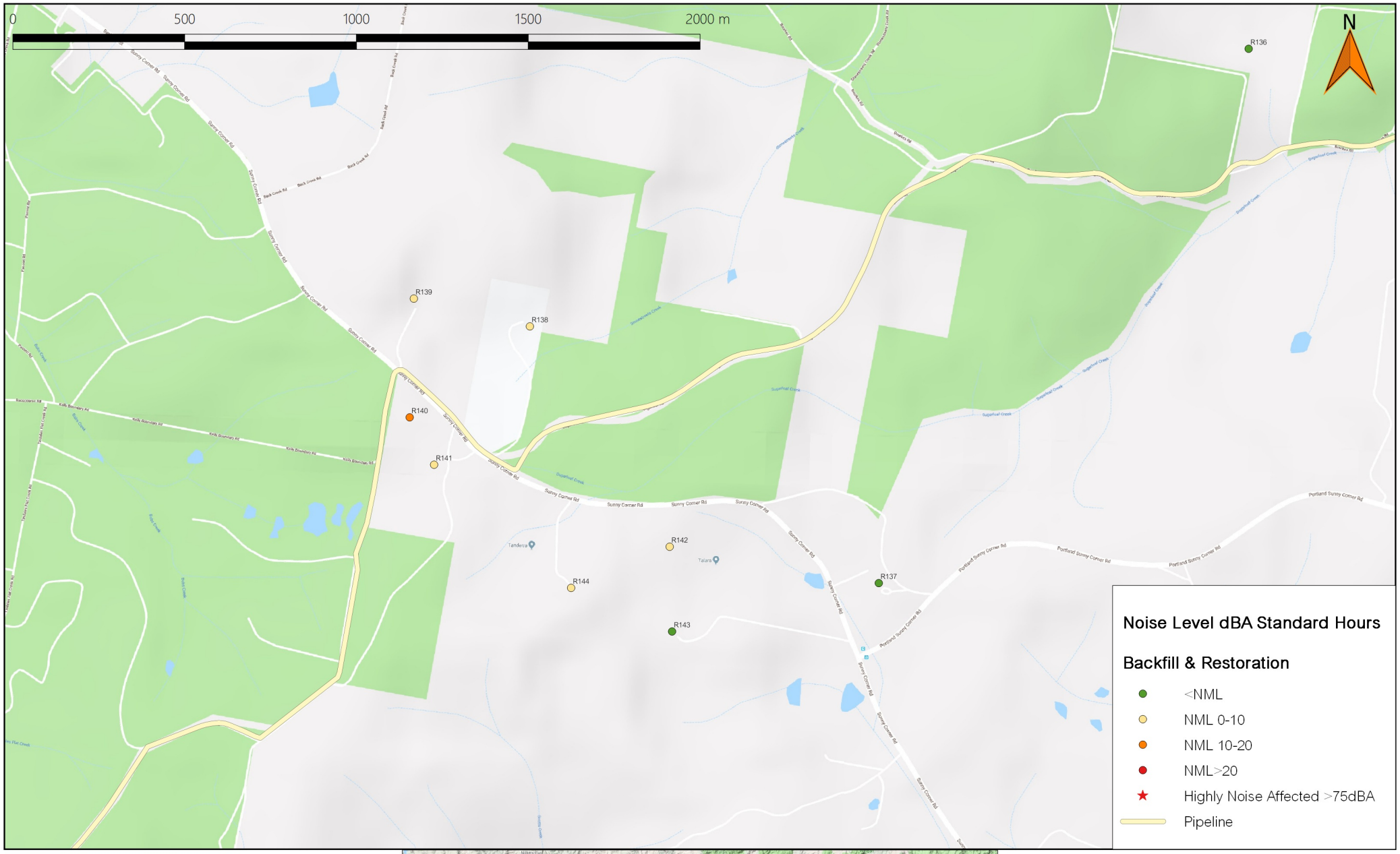
Pipeline Construction
Backfill & Restoration - Angus Place
REF: MAC180742



MAC
Muller Acoustic Consulting

FIGURE E2

Pipeline Construction
Backfill & Restoration - Portland
REF: MAC180742



MAC
Muller Acoustic Consulting

FIGURE E3

Pipeline Construction
Backfill & Restoration - Sunny Corner
REF: MAC180742

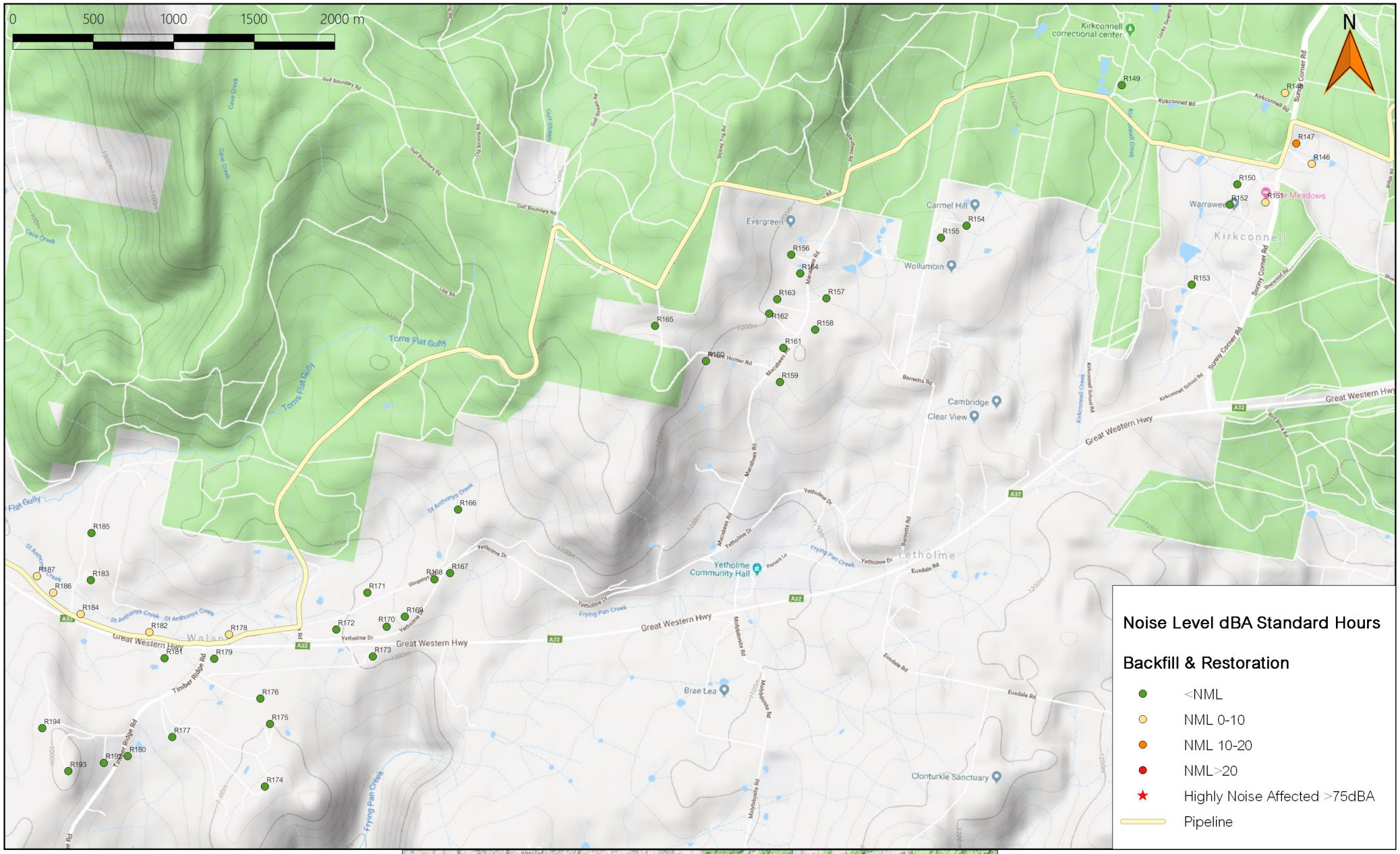


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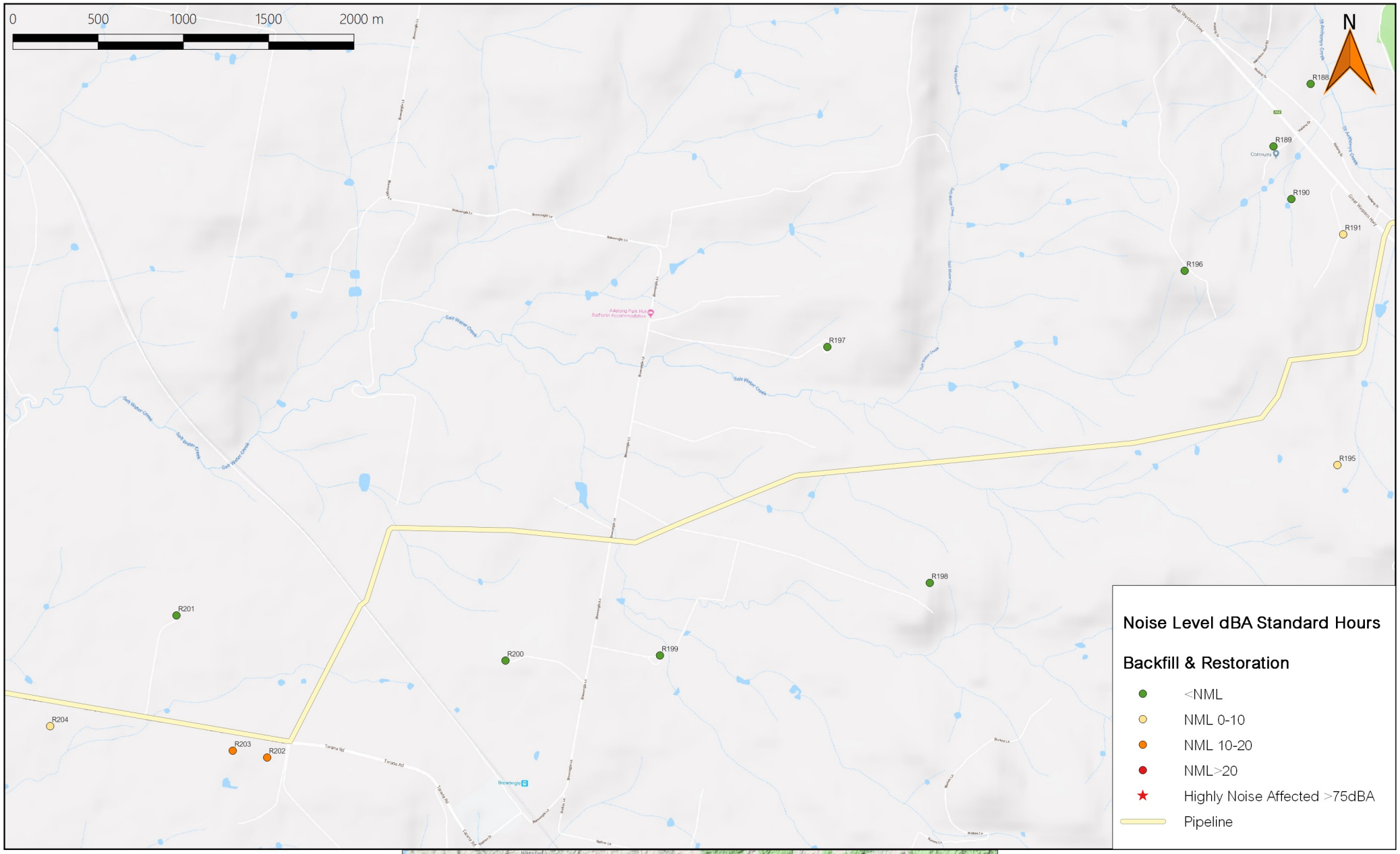
FIGURE E4

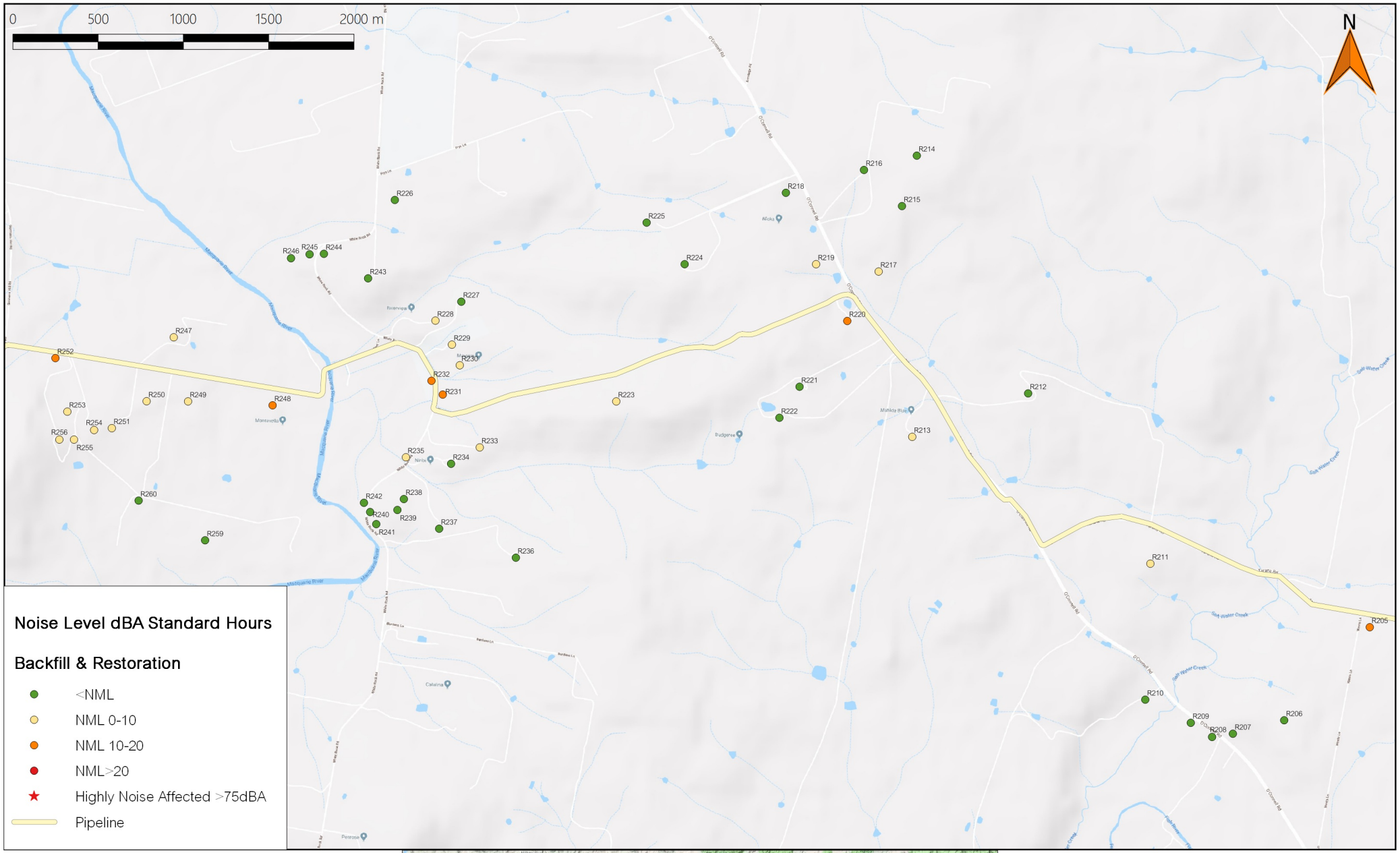
Pipeline Construction
Backfill & Restoration - Yetholme
REF: MAC180742



MAC
Muller Acoustic Consulting

FIGURE E5

Pipeline Construction
Backfill & Restoration - Brewongle
REF: MAC180742



MAC
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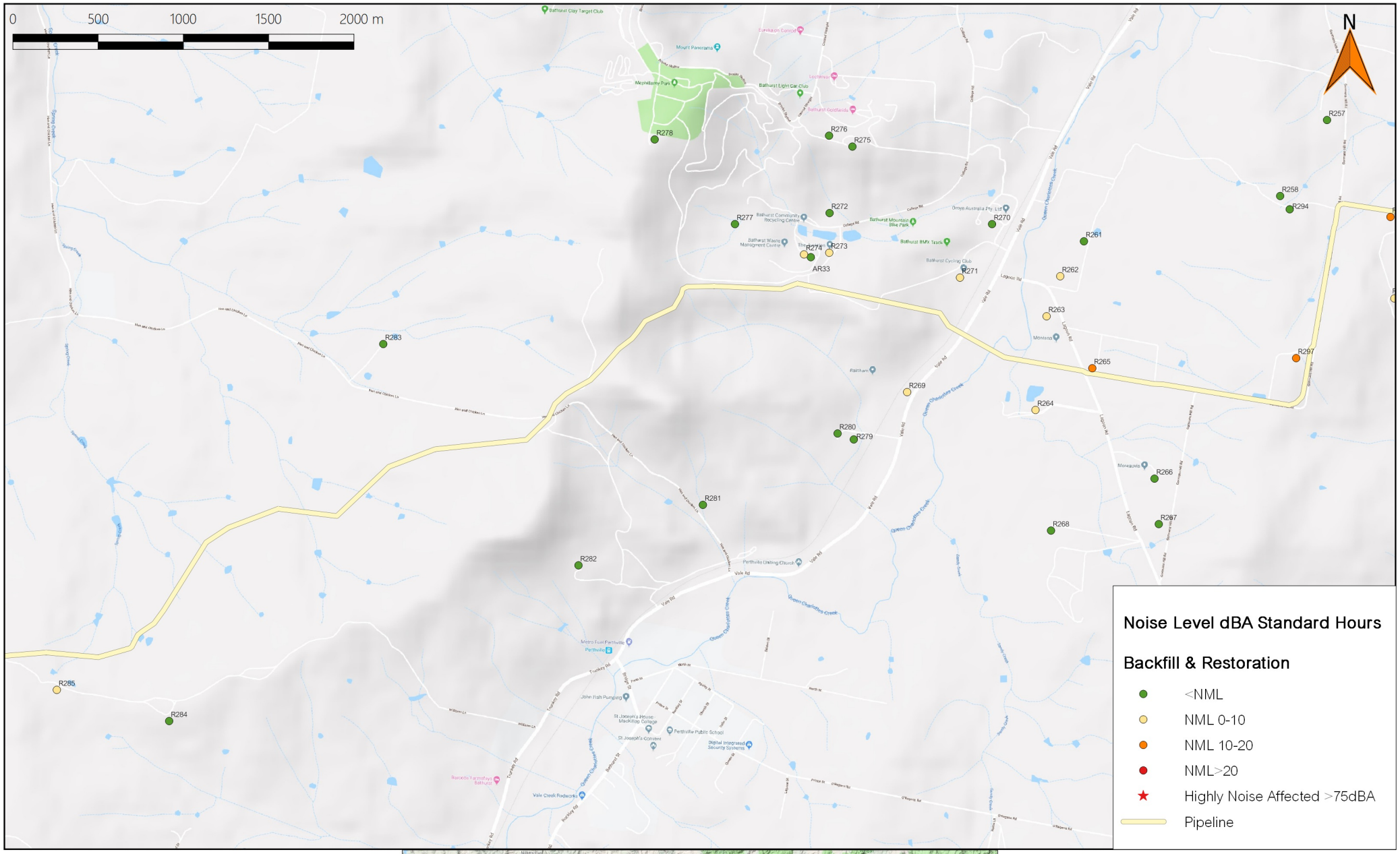
FIGURE E6

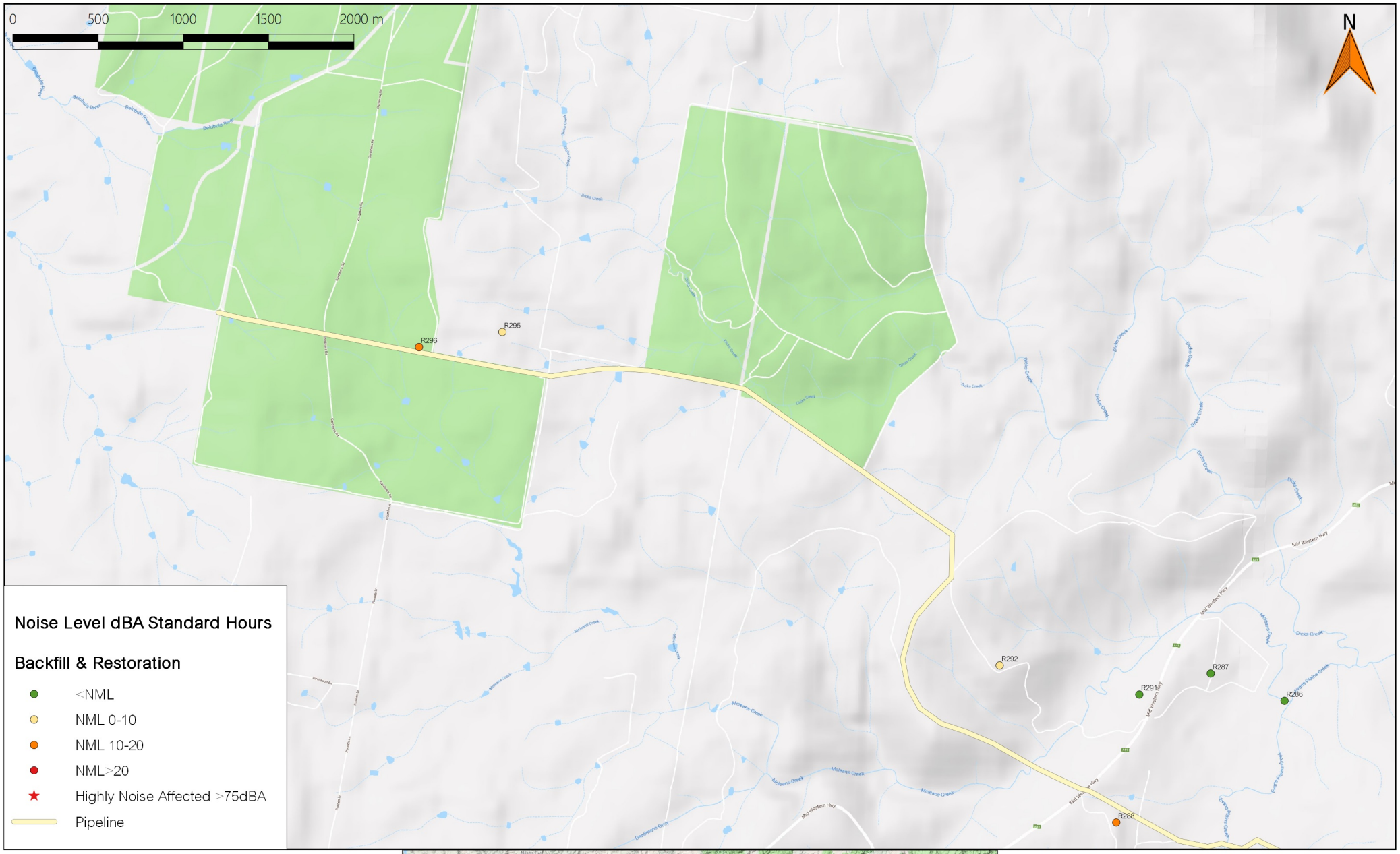
Pipeline Construction
Backfill & Restoration - Bike Park
REF: MAC180742



MAC
Muller Acoustic Consulting

FIGURE E7

Pipeline Construction
Backfill & Restoration - Perthville
REF: MAC180742



MAC
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FIGURE E8

Pipeline Construction
Backfill & Restoration - McPhillamys
REF: MAC180742

Appendix F – Detailed Tabulated Results

Rec ID	Catchment	Offset	RBL Day	RBL Eve	RBL Night	PNL C-G	NML Std	NML P1	NML P2	PNL-NML Day	PNL-NML P1	PNL-NML P2	PNL - RBL Std	PNL-RBL P1	PNL-RBL P2	AMMM Std	AMMM P1	AMMM P2
R35	Angus Place	Rec2 50-100m	37	34	30	64	47	39	35	17	25	29	27	30	34	LB, M	M, LB	AA, M, IB, LB, PC, SN, RO
R02	Angus Place	Rec3 100-200m	37	34	30	62	47	39	35	15	23	27	25	28	32	LB, M	M, LB	AA, M, IB, LB, PC, SN, RO
R26	Angus Place	Rec3 100-200m	37	34	30	58	47	39	35	11	19	23	21	24	28	LB, M	M, LB	M, IB, LB, PC, SN, RO2
R29	Angus Place	Rec3 100-200m	37	34	30	59	47	39	35	12	20	24	22	25	29	LB, M	M, LB	M, IB, LB, PC, SN, RO2
R30	Angus Place	Rec3 100-200m	37	34	30	59	47	39	35	12	20	24	22	25	29	LB, M	M, LB	M, IB, LB, PC, SN, RO2
R31	Angus Place	Rec3 100-200m	37	34	30	59	47	39	35	12	20	24	22	25	29	LB, M	M, LB	M, IB, LB, PC, SN, RO2
R32	Angus Place	Rec3 100-200m	37	34	30	59	47	39	35	12	20	24	22	25	29	LB, M	M, LB	M, IB, LB, PC, SN, RO2
R34	Angus Place	Rec3 100-200m	37	34	30	59	47	39	35	12	20	24	22	25	29	LB, M	M, LB	M, IB, LB, PC, SN, RO2
R36	Angus Place	Rec3 100-200m	37	34	30	61	47	39	35	14	22	26	24	27	31	LB, M	M, LB	AA, M, IB, LB, PC, SN, RO
R37	Angus Place	Rec3 100-200m	37	34	30	60	47	39	35	13	21	25	23	26	30	LB, M	M, LB	M, IB, LB, PC, SN, RO2
R01	Angus Place	Rec4 200-400m	37	34	30	44	47	39	35	-3	5	9	7	10	14	-		M, LB, RO2
R03	Angus Place	Rec4 200-400m	37	34	30	58	47	39	35	11	19	23	21	24	28	LB, M	M, LB	M, IB, LB, PC, SN, RO2
R25	Angus Place	Rec4 200-400m	37	34	30	55	47	39	35	8	16	20	18	21	25	-	M, LB	M, IB, LB, PC, SN, RO2
R27	Angus Place	Rec4 200-400m	37	34	30	56	47	39	35	9	17	21	19	22	26	-	M, LB	M, IB, LB, PC, SN, RO2
R28	Angus Place	Rec4 200-400m	37	34	30	55	47	39	35	8	16	20	18	21	25	-	M, LB	M, IB, LB, PC, SN, RO2
R33	Angus Place	Rec4 200-400m	37	34	30	59	47	39	35	12	20	24	22	25	29	LB, M	M, LB	M, IB, LB, PC, SN, RO2
R38	Angus Place	Rec4 200-400m	37	34	30	58	47	39	35	11	19	23	21	24	28	LB, M	M, LB	M, IB, LB, PC, SN, RO2
R39	Angus Place	Rec4 200-400m	37	34	30	58	47	39	35	11	19	23	21	24	28	LB, M	M, LB	M, IB, LB, PC, SN, RO2
R40	Angus Place	Rec4 200-400m	37	34	30	58	47	39	35	11	19	23	21	24	28	LB, M	M, LB	M, IB, LB, PC, SN, RO2
R04	Angus Place	Rec5 400-800m	37	34	30	51	47	39	35	4	12	16	14	17	21	-	LB	M, IB, LB, PC, SN, RO2
R05	Angus Place	Rec5 400-800m	37	34	30	53	47	39	35	6	14	18	16	19	23	-	LB	M, IB, LB, PC, SN, RO2
R06	Angus Place	Rec5 400-800m	37	34	30	52	47	39	35	5	13	17	15	18	22	-	LB	M, IB, LB, PC, SN, RO2
R07	Angus Place	Rec5 400-800m	37	34	30	50	47	39	35	3	11	15	13	16	20	-	LB	M, LB, RO2
R08	Angus Place	Rec5 400-800m	37	34	30	48	47	39	35	1	9	13	11	14	18	-	LB	M, LB, RO2
R09	Angus Place	Rec5 400-800m	37	34	30	48	47	39	35	1	9	13	11	14	18	-	LB	M, LB, RO2
R10	Angus Place	Rec5 400-800m	37	34	30	46	47	39	35	-1	7	11	9	12	16	-	LB	M, LB, RO2
R12	Angus Place	Rec5 400-800m	37	34	30	47	47	39	35	0	8	12	10	13	17	-	LB	M, LB, RO2
R13	Angus Place	Rec5 400-800m	37	34	30	47	47	39	35	0	8	12	10	13	17	-	LB	M, LB, RO2
R14	Angus Place	Rec5 400-800m	37	34	30	47	47	39	35	0	8	12	10	13	17	-	LB	M, LB, RO2
R17	Angus Place	Rec5 400-800m	37	34	30	48	47	39	35	1	9	13	11	14	18	-	LB	M, LB, RO2
R18	Angus Place	Rec5 400-800m	37	34	30	50	47	39	35	3	11	15	13	16	20	-	LB	M, LB, RO2
R22	Angus Place	Rec5 400-800m	37	34	30	49	47	39	35	2	10	14	12	15	19	-	LB	M, LB, RO2
R23	Angus Place	Rec5 400-800m	37	34	30	52	47	39	35	5	13	17	15	18	22	-	LB	M, IB, LB, PC, SN, RO2
R24	Angus Place	Rec5 400-800m	37	34	30	51	47	39	35	4	12	16	14	17	21	-	LB	M, IB, LB, PC, SN, RO2
R11	Angus Place	Rec6 >800m	37	34	30	46	47	39	35	-1	7	11	9	12	16	-	LB	M, LB, RO2
R15	Angus Place	Rec6 >800m	37	34	30	46	47	39	35	-1	7	11	9	12	16	-	LB	M, LB, RO2
R16	Angus Place	Rec6 >800m	37	34	30	45	47	39	35	-2	6	10	8	11	15	-	LB	M, LB, RO2
R19	Angus Place	Rec6 >800m	37	34	30	43	47	39	35	-4	4	8	6	9	13	-		M, LB, RO2
R20	Angus Place	Rec6 >800m	37	34	30	45	47	39	35	-2	6	10	8	11	15	-	LB	M, LB, RO2
R21	Angus Place	Rec6 >800m	37	34	30	47	47	39	35	0	8	12	10	13	17	-	LB	M, LB, RO2
R231	Bike Park	Rec1 <50m	35	30	30	67	45	35	35	22	32	32	32	37	37	LB, M	M, IB, LB, RO, PC, SN, RO2	AA, M, IB, LB, PC, SN, RO
R232	Bike Park	Rec1 <50m	35	30	30	68	45	35	35	23	33	33	33	38	38	LB, M	M, IB, LB, RO, PC, SN, RO2	AA, M, IB, LB, PC, SN, RO
R252	Bike Park	Rec1 <50m	35	30	30	67	45	35	35	22	32	32	32	37	37	LB, M	M, IB, LB, RO, PC, SN, RO2	AA, M, IB, LB, PC, SN, RO
R205	Bike Park	Rec2 50-100m	35	30	30	64	45	35	35	19	29	29	29	34	34	LB, M	M, IB, LB, RO, PC, SN, RO2	AA, M, IB, LB, PC, SN, RO
R248	Bike Park	Rec2 50-100m	35	30	30	63	45	35	35	18	28	28	28	33	33	LB, M	M, IB, LB, RO, PC, SN, RO2	AA, M, IB, LB, PC, SN, RO
R220	Bike Park	Rec3 100-200m	35	30	30	63	45	35	35	18	28	28	28	33	33	LB, M	M, IB, LB, RO, PC, SN, RO2	AA, M, IB, LB, PC, SN, RO
R223	Bike Park	Rec3 100-200m	35	30	30	58	45	35	35	13	23	23	23	28	28	LB, M	M, LB	M, IB, LB, PC, SN, RO2
R229	Bike Park	Rec3 100-200m	35	30	30	59	45	35	35	14	24	24	24	29	29	LB, M	M, LB	M, IB, LB, PC, SN, RO2
R230	Bike Park	Rec3 100-200m	35	30	30	60	45	35	35	15	25	25	25	30	30	LB, M	M, LB	M, IB, LB, PC, SN, RO2
R247	Bike Park	Rec3 100-200m	35	30	30	58	45	35	35	13	23	23	23	28	28	LB, M	M, LB	M, IB, LB, PC, SN, RO2
R249	Bike Park	Rec3 100-200m	35	30	30	60	45	35	35	15	25	25	25	30	30	LB, M	M, LB	M, IB, LB, PC, SN, RO2
R250	Bike Park	Rec3 100-200m	35	30	30	58	45	35	35	13	23	23	23	28	28	LB, M	M, LB	M, IB, LB, PC, SN, RO2
R211	Bike Park	Rec4 200-400m	35	30	30	57	45	35	35	12	22	22	22	27	27	LB, M	M, LB	M, IB, LB, PC, SN, RO2
R213	Bike Park	Rec4 200-400m	35	30	30	58	45	35	35	13	23	23	23	28	28	LB, M	M, LB	M, IB, LB, PC, SN, RO2
R217	Bike Park	Rec4 200-400m	35	30	30	57	45	35	35	12	22	22	22	27	27	LB, M	M, LB	M, IB, LB, PC, SN, RO2
R219	Bike Park	Rec4 200-400m	35	30	30	56	45	35	35	11	21	21	21	26	26	LB, M	M, LB	M, IB, LB, PC, SN, RO2
R221	Bike Park	Rec4 200-400m	35	30	30	50	45	35	35	5	15	15	15	20	20	-	LB	M, LB, RO2
R227	Bike Park	Rec4 200-400m	35	30	30	50	45	35	35	5	15	15	15	20	20	-	LB	M, LB, RO2
R228	Bike Park	Rec4 200-400m	35	30	30	55	45	35	35	10	20	20	20	25	25	-	M, LB	M, IB, LB, PC, SN, RO2
R233	Bike Park	Rec4 200-400m	35	30	30	52	45	35	35	7	17	17	17	22	22	-	M, LB	M, IB, LB, PC, SN, RO2
R234	Bike Park	Rec4 200-400m	35	30	30	50	45	35	35	5	15	15	15	20	20	-	LB	M, LB, RO2
R235	Bike Park	Rec4 200-400m	35	30	30	54	45	35	35	9	19	19	19	24	24	-	M, LB	M, IB, LB, PC, SN, RO2
R251	Bike Park	Rec4 200-400m	35	30	30	53	45	35	35	8	18	18	18	23	23	-	M, LB	M, IB, LB, PC, SN, RO2
R253	Bike Park	Rec4 200-400m	35	30	30	54	45	35	35	9	19	19	19	24	24	-	M, LB	M, IB, LB, PC, SN, RO2
R206	Bike Park	Rec5 400-800m	35	30	30	47	45	35	35	2	12	12	12	17	17	-	LB	M, LB, RO2
R212	Bike Park	Rec5 400-800m	35	30	30	50	45	35	35	5	15	15	15	20	20	-	LB	M, LB, RO2
R215	Bike Park	Rec5 400-800m	35	30	30	46	45	35	35	1	11	11	11	16	16	-	LB	M, LB, RO2
R216	Bike Park	Rec5 400-800m	35	30	30	46	45	35	35	1	11	11	11	16	16	-	LB	M, LB, RO2
R218	Bike Park	Rec5 400-800m	35	30	30	47	45	35	35	2	12	12	12	17	17	-	LB	M, LB, RO2
R222	Bike Park	Rec5 400-800m	35	30	30	48	45	35	35	3	13	13	13	18	18	-	LB	M, LB, RO2
R224	Bike Park	Rec5 400-800m	35	30	30	49	45	35	35	4	14	14	14	19	19	-	LB	M, LB, RO2
R225	Bike Park	Rec5 400-800m	35	30	30	44	45	35	35	-1	9	9	9	14	14	-	LB	M, LB, RO2
R237	Bike Park	Rec5 400-800m	35	30	30	47	45	35	35	2	12	12	12	17	17	-	LB	M, LB, RO2
R238	Bike Park	Rec5 400-800m	35	30	30	50	45	35	35	5	15	15	15	20	20	-	LB	M, LB, RO2
R239	Bike Park	Rec5 400-800m	35	30	30	48	45	35	35	3	13	13	13	18	18	-	LB	M, LB, RO2
R240	Bike Park	Rec5 400-800m	35	30	30	48	45	35	35	3	13	13	13	18	18	-	LB	M, LB, RO2
R241	Bike Park	Rec5 400-800m	35	30	30	46	45	35	35	1	11	11	11	16	16	-	LB	M, LB, RO2

Rec ID	Catchment	Offset	RBL Day	RBL Eve	RBL Night	PNL C-G	NML Std	NML P1	NML P2	PNL-NML Day	PNL-NML P1	PNL-NML P2	PNL - RBL Std	PNL-RBL P1	PNL-RBL P2	AMMM Std	AMMM P1	AMMM P2
R242	Bike Park	Rec5 400-800m	35	30	30	49	45	35	35	4	14	14	14	19	19		LB	M, LB, RO2
R243	Bike Park	Rec5 400-800m	35	30	30	50	45	35	35	5	15	15	15	20	20		LB	M, LB, RO2
R244	Bike Park	Rec5 400-800m	35	30	30	48	45	35	35	3	13	13	13	18	18		LB	M, LB, RO2
R245	Bike Park	Rec5 400-800m	35	30	30	48	45	35	35	3	13	13	13	18	18		LB	M, LB, RO2
R246	Bike Park	Rec5 400-800m	35	30	30	49	45	35	35	4	14	14	14	19	19		LB	M, LB, RO2
R254	Bike Park	Rec5 400-800m	35	30	30	51	45	35	35	6	16	16	16	21	21		M, LB	M, IB, LB, PC, SN, RO2
R255	Bike Park	Rec5 400-800m	35	30	30	51	45	35	35	6	16	16	16	21	21		M, LB	M, IB, LB, PC, SN, RO2
R256	Bike Park	Rec5 400-800m	35	30	30	52	45	35	35	7	17	17	17	22	22		M, LB	M, IB, LB, PC, SN, RO2
R260	Bike Park	Rec5 400-800m	35	30	30	48	45	35	35	3	13	13	13	18	18		LB	M, LB, RO2
R207	Bike Park	Rec6 >800m	35	30	30	42	45	35	35	-3	7	7	7	12	12		LB	M, LB, RO2
R208	Bike Park	Rec6 >800m	35	30	30	44	45	35	35	-1	9	9	9	14	14		LB	M, LB, RO2
R209	Bike Park	Rec6 >800m	35	30	30	45	45	35	35	0	10	10	10	15	15		LB	M, LB, RO2
R210	Bike Park	Rec6 >800m	35	30	30	46	45	35	35	1	11	11	11	16	16		LB	M, LB, RO2
R214	Bike Park	Rec6 >800m	35	30	30	43	45	35	35	-2	8	8	8	13	13		LB	M, LB, RO2
R226	Bike Park	Rec6 >800m	35	30	30	44	45	35	35	-1	9	9	9	14	14		LB	M, LB, RO2
R236	Bike Park	Rec6 >800m	35	30	30	45	45	35	35	0	10	10	10	15	15		LB	M, LB, RO2
R259	Bike Park	Rec6 >800m	35	30	30	46	45	35	35	1	11	11	11	16	16		LB	M, LB, RO2
R202	Brewongle	Rec3 100-200m	35	30	30	61	45	35	35	16	26	26	26	31	31	LB, M	M, IB, LB, RO, PC, SN, RO2	AA, M, IB, LB, PC, SN, RO
R203	Brewongle	Rec3 100-200m	35	30	30	62	45	35	35	17	27	27	27	32	32	LB, M	M, IB, LB, RO, PC, SN, RO2	AA, M, IB, LB, PC, SN, RO
R204	Brewongle	Rec3 100-200m	35	30	30	60	45	35	35	15	25	25	25	30	30	LB, M	M, LB	M, IB, LB, PC, SN, RO2
R191	Brewongle	Rec4 200-400m	35	30	30	53	45	35	35	8	18	18	18	23	23		M, LB	M, IB, LB, PC, SN, RO2
R190	Brewongle	Rec5 400-800m	35	30	30	46	45	35	35	1	11	11	11	16	16		LB	M, LB, RO2
R195	Brewongle	Rec5 400-800m	35	30	30	51	45	35	35	6	16	16	16	21	21		M, LB	M, IB, LB, PC, SN, RO2
R197	Brewongle	Rec5 400-800m	35	30	30	48	45	35	35	3	13	13	13	18	18		LB	M, LB, RO2
R198	Brewongle	Rec5 400-800m	35	30	30	47	45	35	35	2	12	12	12	17	17		LB	M, LB, RO2
R199	Brewongle	Rec5 400-800m	35	30	30	48	45	35	35	3	13	13	13	18	18		LB	M, LB, RO2
R200	Brewongle	Rec5 400-800m	35	30	30	47	45	35	35	2	12	12	12	17	17		LB	M, LB, RO2
R201	Brewongle	Rec5 400-800m	35	30	30	49	45	35	35	4	14	14	14	19	19		LB	M, LB, RO2
R188	Brewongle	Rec6 >800m	35	30	30	43	45	35	35	-2	8	8	8	13	13		LB	M, LB, RO2
R189	Brewongle	Rec6 >800m	35	30	30	44	45	35	35	-1	9	9	9	14	14		LB	M, LB, RO2
R196	Brewongle	Rec6 >800m	35	30	30	46	45	35	35	1	11	11	11	16	16		LB	M, LB, RO2
R296	McPhillamys	Rec1 <50m	35	30	30	66	45	35	35	21	31	31	31	36	36	LB, M	M, IB, LB, RO, PC, SN, RO2	AA, M, IB, LB, PC, SN, RO
R288	McPhillamys	Rec2 50-100m	35	30	30	62	45	35	35	17	27	27	27	32	32	LB, M	M, IB, LB, RO, PC, SN, RO2	AA, M, IB, LB, PC, SN, RO
R295	McPhillamys	Rec4 200-400m	35	30	30	54	45	35	35	9	19	19	19	24	24		M, LB	M, IB, LB, PC, SN, RO2
R289	McPhillamys	Rec5 400-800m	35	30	30	46	45	35	35	1	11	11	11	16	16		LB	M, LB, RO2
R291	McPhillamys	Rec5 400-800m	35	30	30	49	45	35	35	4	14	14	14	19	19		LB	M, LB, RO2
R292	McPhillamys	Rec5 400-800m	35	30	30	53	45	35	35	8	18	18	18	23	23		M, LB	M, IB, LB, PC, SN, RO2
R286	McPhillamys	Rec6 >800m	35	30	30	46	45	35	35	1	11	11	11	16	16		LB	M, LB, RO2
R287	McPhillamys	Rec6 >800m	35	30	30	46	45	35	35	1	11	11	11	16	16		LB	M, LB, RO2
R290	McPhillamys	Rec6 >800m	35	30	30	45	45	35	35	0	10	10	10	15	15		LB	M, LB, RO2
R265	Perthville	Rec1 <50m	35	30	30	69	45	35	35	24	34	34	34	39	39	LB, M	M, IB, LB, RO, PC, SN, RO2	AA, M, IB, LB, PC, SN, RO
R297	Perthville	Rec2 50-100m	35	30	30	62	45	35	35	17	27	27	27	32	32	LB, M	M, IB, LB, RO, PC, SN, RO2	AA, M, IB, LB, PC, SN, RO
AR33	Perthville	Rec3 100-200m	40	40	35	55	50	45	40	5	10	10	15	15	20		LB	M, LB, RO2
R274	Perthville	Rec3 100-200m	35	30	30	54	45	35	35	9	19	19	19	24	24		M, LB	M, IB, LB, PC, SN, RO2
R258	Perthville	Rec4 200-400m	35	30	30	49	45	35	35	4	14	14	14	19	19		LB	M, LB, RO2
R263	Perthville	Rec4 200-400m	35	30	30	56	45	35	35	11	21	21	21	26	26	LB, M	M, LB	M, IB, LB, PC, SN, RO2
R264	Perthville	Rec4 200-400m	35	30	30	57	45	35	35	12	22	22	22	27	27	LB, M	M, LB	M, IB, LB, PC, SN, RO2
R271	Perthville	Rec4 200-400m	35	30	30	56	45	35	35	11	21	21	21	26	26	LB, M	M, LB	M, IB, LB, PC, SN, RO2
R273	Perthville	Rec4 200-400m	35	30	30	55	45	35	35	10	20	20	20	25	25		M, LB	M, IB, LB, PC, SN, RO2
R277	Perthville	Rec4 200-400m	35	30	30	46	45	35	35	1	11	11	11	16	16		LB	M, LB, RO2
R285	Perthville	Rec4 200-400m	35	30	30	56	45	35	35	11	21	21	21	26	26	LB, M	M, LB	M, IB, LB, PC, SN, RO2
R294	Perthville	Rec4 200-400m	35	30	30	48	45	35	35	3	13	13	13	18	18		LB	M, LB, RO2
R257	Perthville	Rec5 400-800m	35	30	30	49	45	35	35	4	14	14	14	19	19		LB	M, LB, RO2
R261	Perthville	Rec5 400-800m	35	30	30	49	45	35	35	4	14	14	14	19	19		LB	M, LB, RO2
R262	Perthville	Rec5 400-800m	35	30	30	52	45	35	35	7	17	17	17	22	22		M, LB	M, IB, LB, PC, SN, RO2
R266	Perthville	Rec5 400-800m	35	30	30	50	45	35	35	5	15	15	15	20	20		LB	M, LB, RO2
R269	Perthville	Rec5 400-800m	35	30	30	51	45	35	35	6	16	16	16	21	21		M, LB	M, IB, LB, PC, SN, RO2
R270	Perthville	Rec5 400-800m	35	30	30	50	45	35	35	5	15	15	15	20	20		LB	M, LB, RO2
R272	Perthville	Rec5 400-800m	35	30	30	50	45	35	35	5	15	15	15	20	20		LB	M, LB, RO2
R283	Perthville	Rec5 400-800m	35	30	30	47	45	35	35	2	12	12	12	17	17		LB	M, LB, RO2
R284	Perthville	Rec5 400-800m	35	30	30	46	45	35	35	1	11	11	11	16	16		LB	M, LB, RO2
R267	Perthville	Rec6 >800m	35	30	30	44	45	35	35	-1	9	9	9	14	14		LB	M, LB, RO2
R268	Perthville	Rec6 >800m	35	30	30	46	45	35	35	1	11	11	11	16	16		LB	M, LB, RO2
R275	Perthville	Rec6 >800m	35	30	30	47	45	35	35	2	12	12	12	17	17		LB	M, LB, RO2
R276	Perthville	Rec6 >800m	35	30	30	45	45	35	35	0	10	10	10	15	15		LB	M, LB, RO2
R278	Perthville	Rec6 >800m	35	30	30	42	45	35	35	-3	7	7	7	12	12		LB	M, LB, RO2
R279	Perthville	Rec6 >800m	35	30	30	46	45	35	35	1	11	11	11	16	16		LB	M, LB, RO2
R280	Perthville	Rec6 >800m	35	30	30	46	45	35	35	1	11	11	11	16	16		LB	M, LB, RO2
R281	Perthville	Rec6 >800m	35	30	30	41	45	35	35	-4	6	6	6	11	11		LB	M, LB, RO2
R282	Perthville	Rec6 >800m	35	30	30	39	45	35	35	-6	4	4	4	9	9			LB
R112	Portland	Rec1 <50m	35	30	30	67	45	35	35	22	32	32	32	37	37	LB, M	M, IB, LB, RO, PC, SN, RO2	AA, M, IB, LB, PC, SN, RO
R113	Portland	Rec1 <50m	35	30	30	66	45	35	35	21	31	31	31	36	36	LB, M	M, IB, LB, RO, PC, SN, RO2	AA, M, IB, LB, PC, SN, RO
R134	Portland	Rec1 <50m	35	30	30	67	45	35	35	22	32	32	32	37	37	LB, M	M, IB, LB, RO, PC, SN, RO2	AA, M, IB, LB, PC, SN, RO
R135	Portland	Rec1 <50m	35	30	30	73	45	35	35	28	38	38	38	43	43	LB, M	M, IB, LB, RO, PC, SN, RO2	AA, M, IB, LB, PC, SN, RO
R293	Portland	Rec1 <50m	35	30	30	68	45	35	35	23	33	33	33	38	38	LB, M	M, IB, LB, RO, PC, SN, RO2	AA, M, IB, LB, PC, SN, RO
R48	Portland	Rec1 <50m	35	30	30	80	45	35	35	35	45	45	45	50	50	LB, M	M, IB, LB, RO, PC, SN, RO2	AA, M, IB, LB, PC, SN, RO
R55	Portland	Rec1 <50m	35	30	30	66	45	35	35	21	31	31	31	36	36	LB, M	M, IB, LB, RO, PC, SN, RO2	AA, M, IB, LB, PC, SN, RO

Rec ID	Catchment	Offset	RBL Day	RBL Eve	RBL Night	PNL C-G	NML Std	NML P1	NML P2	PNL-NML Day	PNL-NML P1	PNL-NML P2	PNL - RBL Std	PNL-RBL P1	PNL-RBL P2	AMMM Std	AMMM P1	AMMM P2
R109	Portland	Rec2 50-100m	35	30	30	62	45	35	35	17	27	27	27	32	32	LB, M	M, IB, LB, RO, PC, SN, RO2	AA, M, IB, LB, PC, SN, RO
R110	Portland	Rec2 50-100m	35	30	30	64	45	35	35	19	29	29	29	34	34	LB, M	M, IB, LB, RO, PC, SN, RO2	AA, M, IB, LB, PC, SN, RO
R111	Portland	Rec2 50-100m	35	30	30	63	45	35	35	18	28	28	28	33	33	LB, M	M, IB, LB, RO, PC, SN, RO2	AA, M, IB, LB, PC, SN, RO
R46	Portland	Rec2 50-100m	35	30	30	65	45	35	35	20	30	30	30	35	35	LB, M	M, IB, LB, RO, PC, SN, RO2	AA, M, IB, LB, PC, SN, RO
R47	Portland	Rec2 50-100m	35	30	30	64	45	35	35	19	29	29	29	34	34	LB, M	M, IB, LB, RO, PC, SN, RO2	AA, M, IB, LB, PC, SN, RO
R114	Portland	Rec3 100-200m	35	30	30	59	45	35	35	14	24	24	24	29	29	LB, M	M, LB	M, IB, LB, PC, SN, RO2
R45	Portland	Rec3 100-200m	35	30	30	59	45	35	35	14	24	24	24	29	29	LB, M	M, LB	M, IB, LB, PC, SN, RO2
R49	Portland	Rec3 100-200m	35	30	30	58	45	35	35	13	23	23	23	28	28	LB, M	M, LB	M, IB, LB, PC, SN, RO2
R56	Portland	Rec3 100-200m	35	30	30	60	45	35	35	15	25	25	25	30	30	LB, M	M, LB	M, IB, LB, PC, SN, RO2
R57	Portland	Rec3 100-200m	35	30	30	61	45	35	35	16	26	26	26	31	31	LB, M	M, IB, LB, RO, PC, SN, RO2	AA, M, IB, LB, PC, SN, RO
R58	Portland	Rec3 100-200m	35	30	30	57	45	35	35	12	22	22	22	27	27	LB, M	M, LB	M, IB, LB, PC, SN, RO2
R59	Portland	Rec3 100-200m	35	30	30	53	45	35	35	8	18	18	18	23	23	-	M, LB	M, IB, LB, PC, SN, RO2
R61	Portland	Rec3 100-200m	35	30	30	58	45	35	35	13	23	23	23	28	28	LB, M	M, LB	M, IB, LB, PC, SN, RO2
R62	Portland	Rec3 100-200m	35	30	30	54	45	35	35	9	19	19	19	24	24	-	M, LB	M, IB, LB, PC, SN, RO2
R63	Portland	Rec3 100-200m	35	30	30	62	45	35	35	17	27	27	27	32	32	LB, M	M, IB, LB, RO, PC, SN, RO2	AA, M, IB, LB, PC, SN, RO
R64	Portland	Rec3 100-200m	35	30	30	59	45	35	35	14	24	24	24	29	29	LB, M	M, LB	M, IB, LB, PC, SN, RO2
R69	Portland	Rec3 100-200m	35	30	30	59	45	35	35	14	24	24	24	29	29	LB, M	M, LB	M, IB, LB, PC, SN, RO2
R102	Portland	Rec4 200-400m	35	30	30	53	45	35	35	8	18	18	18	23	23	-	M, LB	M, IB, LB, PC, SN, RO2
R107	Portland	Rec4 200-400m	35	30	30	53	45	35	35	8	18	18	18	23	23	-	M, LB	M, IB, LB, PC, SN, RO2
R108	Portland	Rec4 200-400m	35	30	30	55	45	35	35	10	20	20	20	25	25	-	M, LB	M, IB, LB, PC, SN, RO2
R115	Portland	Rec4 200-400m	35	30	30	58	45	35	35	13	23	23	23	28	28	LB, M	M, LB	M, IB, LB, PC, SN, RO2
R116	Portland	Rec4 200-400m	35	30	30	54	45	35	35	9	19	19	19	24	24	-	M, LB	M, IB, LB, PC, SN, RO2
R117	Portland	Rec4 200-400m	35	30	30	54	45	35	35	9	19	19	19	24	24	-	M, LB	M, IB, LB, PC, SN, RO2
R118	Portland	Rec4 200-400m	35	30	30	52	45	35	35	7	17	17	17	22	22	-	M, LB	M, IB, LB, PC, SN, RO2
R132	Portland	Rec4 200-400m	35	30	30	46	45	35	35	1	11	11	11	16	16	-	LB	M, LB, RO2
R133	Portland	Rec4 200-400m	35	30	30	55	45	35	35	10	20	20	20	25	25	-	M, LB	M, IB, LB, PC, SN, RO2
R42	Portland	Rec4 200-400m	35	30	30	57	45	35	35	12	22	22	22	27	27	LB, M	M, LB	M, IB, LB, PC, SN, RO2
R50	Portland	Rec4 200-400m	35	30	30	53	45	35	35	8	18	18	18	23	23	-	M, LB	M, IB, LB, PC, SN, RO2
R53	Portland	Rec4 200-400m	35	30	30	51	45	35	35	6	16	16	16	21	21	-	M, LB	M, IB, LB, PC, SN, RO2
R60	Portland	Rec4 200-400m	35	30	30	56	45	35	35	11	21	21	21	26	26	LB, M	M, LB	M, IB, LB, PC, SN, RO2
R65	Portland	Rec4 200-400m	35	30	30	52	45	35	35	7	17	17	17	22	22	-	M, LB	M, IB, LB, PC, SN, RO2
R66	Portland	Rec4 200-400m	35	30	30	52	45	35	35	7	17	17	17	22	22	-	M, LB	M, IB, LB, PC, SN, RO2
R100	Portland	Rec5 400-800m	35	30	30	51	45	35	35	6	16	16	16	21	21	-	M, LB	M, IB, LB, PC, SN, RO2
R101	Portland	Rec5 400-800m	35	30	30	52	45	35	35	7	17	17	17	22	22	-	M, LB	M, IB, LB, PC, SN, RO2
R104	Portland	Rec5 400-800m	35	30	30	47	45	35	35	2	12	12	12	17	17	-	LB	M, LB, RO2
R105	Portland	Rec5 400-800m	35	30	30	49	45	35	35	4	14	14	14	19	19	-	LB	M, LB, RO2
R106	Portland	Rec5 400-800m	35	30	30	51	45	35	35	6	16	16	16	21	21	-	M, LB	M, IB, LB, PC, SN, RO2
R119	Portland	Rec5 400-800m	35	30	30	51	45	35	35	6	16	16	16	21	21	-	M, LB	M, IB, LB, PC, SN, RO2
R120	Portland	Rec5 400-800m	35	30	30	49	45	35	35	4	14	14	14	19	19	-	LB	M, LB, RO2
R121	Portland	Rec5 400-800m	35	30	30	48	45	35	35	3	13	13	13	18	18	-	LB	M, LB, RO2
R125	Portland	Rec5 400-800m	35	30	30	47	45	35	35	2	12	12	12	17	17	-	LB	M, LB, RO2
R126	Portland	Rec5 400-800m	35	30	30	47	45	35	35	2	12	12	12	17	17	-	LB	M, LB, RO2
R127	Portland	Rec5 400-800m	35	30	30	47	45	35	35	2	12	12	12	17	17	-	LB	M, LB, RO2
R131	Portland	Rec5 400-800m	35	30	30	52	45	35	35	7	17	17	17	22	22	-	M, LB	M, IB, LB, PC, SN, RO2
R51	Portland	Rec5 400-800m	35	30	30	46	45	35	35	1	11	11	11	16	16	-	LB	M, LB, RO2
R67	Portland	Rec5 400-800m	35	30	30	49	45	35	35	4	14	14	14	19	19	-	LB	M, LB, RO2
R68	Portland	Rec5 400-800m	35	30	30	49	45	35	35	4	14	14	14	19	19	-	LB	M, LB, RO2
R70	Portland	Rec5 400-800m	35	30	30	49	45	35	35	4	14	14	14	19	19	-	LB	M, LB, RO2
R71	Portland	Rec5 400-800m	35	30	30	49	45	35	35	4	14	14	14	19	19	-	LB	M, LB, RO2
R72	Portland	Rec5 400-800m	35	30	30	51	45	35	35	6	16	16	16	21	21	-	M, LB	M, IB, LB, PC, SN, RO2
R73	Portland	Rec5 400-800m	35	30	30	50	45	35	35	5	15	15	15	20	20	-	LB	M, LB, RO2
R74	Portland	Rec5 400-800m	35	30	30	49	45	35	35	4	14	14	14	19	19	-	LB	M, LB, RO2
R75	Portland	Rec5 400-800m	35	30	30	49	45	35	35	4	14	14	14	19	19	-	LB	M, LB, RO2
R76	Portland	Rec5 400-800m	35	30	30	49	45	35	35	4	14	14	14	19	19	-	LB	M, LB, RO2
R83	Portland	Rec5 400-800m	35	30	30	49	45	35	35	4	14	14	14	19	19	-	LB	M, LB, RO2
R85	Portland	Rec5 400-800m	35	30	30	49	45	35	35	4	14	14	14	19	19	-	LB	M, LB, RO2
R86	Portland	Rec5 400-800m	35	30	30	48	45	35	35	3	13	13	13	18	18	-	LB	M, LB, RO2
R87	Portland	Rec5 400-800m	35	30	30	47	45	35	35	2	12	12	12	17	17	-	LB	M, LB, RO2
R94	Portland	Rec5 400-800m	35	30	30	49	45	35	35	4	14	14	14	19	19	-	LB	M, LB, RO2
R95	Portland	Rec5 400-800m	35	30	30	49	45	35	35	4	14	14	14	19	19	-	LB	M, LB, RO2
R96	Portland	Rec5 400-800m	35	30	30	46	45	35	35	1	11	11	11	16	16	-	LB	M, LB, RO2
R98	Portland	Rec5 400-800m	35	30	30	50	45	35	35	5	15	15	15	20	20	-	LB	M, LB, RO2
R99	Portland	Rec5 400-800m	35	30	30	51	45	35	35	6	16	16	16	21	21	-	M, LB	M, IB, LB, PC, SN, RO2
R103	Portland	Rec6 >800m	35	30	30	47	45	35	35	2	12	12	12	17	17	-	LB	M, LB, RO2
R122	Portland	Rec6 >800m	35	30	30	47	45	35	35	2	12	12	12	17	17	-	LB	M, LB, RO2
R123	Portland	Rec6 >800m	35	30	30	48	45	35	35	3	13	13	13	18	18	-	LB	M, LB, RO2
R124	Portland	Rec6 >800m	35	30	30	47	45	35	35	2	12	12	12	17	17	-	LB	M, LB, RO2
R128	Portland	Rec6 >800m	35	30	30	46	45	35	35	1	11	11	11	16	16	-	LB	M, LB, RO2
R129	Portland	Rec6 >800m	35	30	30	45	45	35	35	0	10	10	10	15	15	-	LB	M, LB, RO2
R130	Portland	Rec6 >800m	35	30	30	45	45	35	35	0	10	10	10	15	15	-	LB	M, LB, RO2
R41	Portland	Rec6 >800m	35	30	30	46	45	35	35	1	11	11	11	16	16	-	LB	M, LB, RO2
R43	Portland	Rec6 >800m	35	30	30	47	45	35	35	2	12	12	12	17	17	-	LB	M, LB, RO2
R44	Portland	Rec6 >800m	35	30	30	44	45	35	35	-1	9	9	9	14	14	-	LB	M, LB, RO2
R52	Portland	Rec6 >800m	35	30	30	42	45	35	35	-3	7	7	7	12	12	-	LB	M, LB, RO2
R54	Portland	Rec6 >800m	35	30	30	43	45	35	35	-2	8	8	8	13	13	-	LB	M, LB, RO2
R77	Portland	Rec6 >800m	35	30	30	48	45	35	35	3	13	13	13	18	18	-	LB	M, LB, RO2
R78	Portland	Rec6 >800m	35	30	30	47	45	35	35	2	12	12	12	17	17	-	LB	M, LB, RO2

Rec ID	Catchment	Offset	RBL Day	RBL Eve	RBL Night	PNL C-G	NML Std	NML P1	NML P2	PNL-NML Day	PNL-NML P1	PNL-NML P2	PNL - RBL Std	PNL-RBL P1	PNL-RBL P2	AMMM Std	AMMM P1	AMMM P2
R79	Portland	Rec6 >800m	35	30	30	47	45	35	35	2	12	12	12	17	17		LB	M, LB, RO2
R80	Portland	Rec6 >800m	35	30	30	46	45	35	35	1	11	11	11	16	16		LB	M, LB, RO2
R81	Portland	Rec6 >800m	35	30	30	47	45	35	35	2	12	12	12	17	17		LB	M, LB, RO2
R82	Portland	Rec6 >800m	35	30	30	46	45	35	35	1	11	11	11	16	16		LB	M, LB, RO2
R84	Portland	Rec6 >800m	35	30	30	46	45	35	35	1	11	11	11	16	16		LB	M, LB, RO2
R88	Portland	Rec6 >800m	35	30	30	46	45	35	35	1	11	11	11	16	16		LB	M, LB, RO2
R89	Portland	Rec6 >800m	35	30	30	46	45	35	35	1	11	11	11	16	16		LB	M, LB, RO2
R90	Portland	Rec6 >800m	35	30	30	46	45	35	35	1	11	11	11	16	16		LB	M, LB, RO2
R91	Portland	Rec6 >800m	35	30	30	46	45	35	35	1	11	11	11	16	16		LB	M, LB, RO2
R92	Portland	Rec6 >800m	35	30	30	46	45	35	35	1	11	11	11	16	16		LB	M, LB, RO2
R93	Portland	Rec6 >800m	35	30	30	43	45	35	35	-2	8	8	8	13	13		LB	M, LB, RO2
R97	Portland	Rec6 >800m	35	30	30	46	45	35	35	1	11	11	11	16	16		LB	M, LB, RO2
R140	Sunny Corner	Rec2 50-100m	35	30	30	61	45	35	35	16	26	26	26	31	31	LB, M	M, IB, LB, RO, PC, SN, RO2	AA, M, IB, LB, PC, SN, RO
R147	Sunny Corner	Rec2 50-100m	35	30	30	65	45	35	35	20	30	30	30	35	35	LB, M	M, IB, LB, RO, PC, SN, RO2	AA, M, IB, LB, PC, SN, RO
R141	Sunny Corner	Rec3 100-200m	35	30	30	60	45	35	35	15	25	25	25	30	30	LB, M	M, LB	M, IB, LB, PC, SN, RO2
R146	Sunny Corner	Rec3 100-200m	35	30	30	59	45	35	35	14	24	24	24	29	29	LB, M	M, LB	M, IB, LB, PC, SN, RO2
R148	Sunny Corner	Rec3 100-200m	35	30	30	54	45	35	35	9	19	19	19	24	24		M, LB	M, IB, LB, PC, SN, RO2
R136	Sunny Corner	Rec4 200-400m	35	30	30	46	45	35	35	1	11	11	11	16	16		LB	M, LB, RO2
R138	Sunny Corner	Rec4 200-400m	35	30	30	56	45	35	35	11	21	21	21	26	26	LB, M	M, LB	M, IB, LB, PC, SN, RO2
R139	Sunny Corner	Rec4 200-400m	35	30	30	56	45	35	35	11	21	21	21	26	26	LB, M	M, LB	M, IB, LB, PC, SN, RO2
R144	Sunny Corner	Rec4 200-400m	35	30	30	53	45	35	35	8	18	18	18	23	23		M, LB	M, IB, LB, PC, SN, RO2
R151	Sunny Corner	Rec4 200-400m	35	30	30	54	45	35	35	9	19	19	19	24	24		M, LB	M, IB, LB, PC, SN, RO2
R137	Sunny Corner	Rec5 400-800m	35	30	30	46	45	35	35	1	11	11	11	16	16		LB	M, LB, RO2
R142	Sunny Corner	Rec5 400-800m	35	30	30	52	45	35	35	7	17	17	17	22	22		M, LB	M, IB, LB, PC, SN, RO2
R143	Sunny Corner	Rec5 400-800m	35	30	30	47	45	35	35	2	12	12	12	17	17		LB	M, LB, RO2
R145	Sunny Corner	Rec5 400-800m	35	30	30	43	45	35	35	-2	8	8	8	13	13		LB	M, LB, RO2
R178	Yetholme	Rec1 <50m	47	37	30	68	57	42	35	11	26	33	21	31	38	LB, M	M, IB, LB, RO, PC, SN, RO2	AA, M, IB, LB, PC, SN, RO
R182	Yetholme	Rec1 <50m	47	37	30	68	57	42	35	11	26	33	21	31	38	LB, M	M, IB, LB, RO, PC, SN, RO2	AA, M, IB, LB, PC, SN, RO
R184	Yetholme	Rec1 <50m	47	37	30	69	57	42	35	12	27	34	22	32	39	LB, M	M, IB, LB, RO, PC, SN, RO2	AA, M, IB, LB, PC, SN, RO
R186	Yetholme	Rec1 <50m	47	37	30	67	57	42	35	10	25	32	20	30	37		M, LB	AA, M, IB, LB, PC, SN, RO
R187	Yetholme	Rec1 <50m	47	37	30	65	57	42	35	8	23	30	18	28	35		M, LB	AA, M, IB, LB, PC, SN, RO
R179	Yetholme	Rec2 50-100m	47	37	30	62	57	42	35	5	20	27	15	25	32		M, LB	AA, M, IB, LB, PC, SN, RO
R149	Yetholme	Rec3 100-200m	47	37	30	60	57	42	35	3	18	25	13	23	30		M, LB	M, IB, LB, PC, SN, RO2
R150	Yetholme	Rec3 100-200m	47	37	30	58	57	42	35	1	16	23	11	21	28		M, LB	M, IB, LB, PC, SN, RO2
R181	Yetholme	Rec3 100-200m	47	37	30	61	57	42	35	4	19	26	14	24	31		M, LB	AA, M, IB, LB, PC, SN, RO
R152	Yetholme	Rec4 200-400m	47	37	30	53	57	42	35	-4	11	18	6	16	23		LB	M, IB, LB, PC, SN, RO2
R156	Yetholme	Rec4 200-400m	47	37	30	51	57	42	35	-6	9	16	4	14	21		LB	M, IB, LB, PC, SN, RO2
R165	Yetholme	Rec4 200-400m	47	37	30	51	57	42	35	-6	9	16	4	14	21		LB	M, IB, LB, PC, SN, RO2
R171	Yetholme	Rec4 200-400m	47	37	30	51	57	42	35	-6	9	16	4	14	21		LB	M, IB, LB, PC, SN, RO2
R172	Yetholme	Rec4 200-400m	47	37	30	56	57	42	35	-1	14	21	9	19	26		LB	M, IB, LB, PC, SN, RO2
R183	Yetholme	Rec4 200-400m	47	37	30	57	57	42	35	0	15	22	10	20	27		LB	M, IB, LB, PC, SN, RO2
R154	Yetholme	Rec5 400-800m	47	37	30	47	57	42	35	-10	5	12	0	10	17			M, LB, RO2
R155	Yetholme	Rec5 400-800m	47	37	30	50	57	42	35	-7	8	15	3	13	20		LB	M, LB, RO2
R157	Yetholme	Rec5 400-800m	47	37	30	48	57	42	35	-9	6	13	1	11	18		LB	M, LB, RO2
R158	Yetholme	Rec5 400-800m	47	37	30	46	57	42	35	-11	4	11	-1	9	16			M, LB, RO2
R160	Yetholme	Rec5 400-800m	47	37	30	44	57	42	35	-13	2	9	-3	7	14			M, LB, RO2
R162	Yetholme	Rec5 400-800m	47	37	30	48	57	42	35	-9	6	13	1	11	18		LB	M, LB, RO2
R163	Yetholme	Rec5 400-800m	47	37	30	49	57	42	35	-8	7	14	2	12	19		LB	M, LB, RO2
R164	Yetholme	Rec5 400-800m	47	37	30	51	57	42	35	-6	9	16	4	14	21		LB	M, IB, LB, PC, SN, RO2
R169	Yetholme	Rec5 400-800m	47	37	30	49	57	42	35	-8	7	14	2	12	19		LB	M, LB, RO2
R170	Yetholme	Rec5 400-800m	47	37	30	50	57	42	35	-7	8	15	3	13	20		LB	M, LB, RO2
R173	Yetholme	Rec5 400-800m	47	37	30	47	57	42	35	-10	5	12	0	10	17			M, LB, RO2
R175	Yetholme	Rec5 400-800m	47	37	30	49	57	42	35	-8	7	14	2	12	19		LB	M, LB, RO2
R176	Yetholme	Rec5 400-800m	47	37	30	53	57	42	35	-4	11	18	6	16	23		LB	M, IB, LB, PC, SN, RO2
R177	Yetholme	Rec5 400-800m	47	37	30	46	57	42	35	-11	4	11	-1	9	16			M, LB, RO2
R180	Yetholme	Rec5 400-800m	47	37	30	43	57	42	35	-14	1	8	-4	6	13			M, LB, RO2
R185	Yetholme	Rec5 400-800m	47	37	30	52	57	42	35	-5	10	17	5	15	22		LB	M, IB, LB, PC, SN, RO2
R194	Yetholme	Rec5 400-800m	47	37	30	49	57	42	35	-8	7	14	2	12	19		LB	M, LB, RO2
R153	Yetholme	Rec6 >800m	47	37	30	45	57	42	35	-12	3	10	-2	8	15			M, LB, RO2
R159	Yetholme	Rec6 >800m	47	37	30	43	57	42	35	-14	1	8	-4	6	13			M, LB, RO2
R161	Yetholme	Rec6 >800m	47	37	30	45	57	42	35	-12	3	10	-2	8	15			M, LB, RO2
R166	Yetholme	Rec6 >800m	47	37	30	47	57	42	35	-10	5	12	0	10	17			M, LB, RO2
R167	Yetholme	Rec6 >800m	47	37	30	44	57	42	35	-13	2	9	-3	7	14			M, LB, RO2
R168	Yetholme	Rec6 >800m	47	37	30	46	57	42	35	-11	4	11	-1	9	16			M, LB, RO2
R174	Yetholme	Rec6 >800m	47	37	30	44	57	42	35	-13	2	9	-3	7	14			M, LB, RO2
R192	Yetholme	Rec6 >800m	47	37	30	44	57	42	35	-13	2	9	-3	7	14			M, LB, RO2
R193	Yetholme	Rec6 >800m	47	37	30	45	57	42	35	-12	3	10	-2	8	15			M, LB, RO2

Rec ID	Catchment	Offset	RBL Day	RBL Eve	RBL Night	PNL Trench	NML Day	NML P1	NML P2	PNL-NML Day	PNL-NML P1	PNL-NML P2	PNL - RBL Std	PNL-RBL P1	PNL-RBL P2	AMMM Std	AMMM P1	AMMM P2
R35	Angus Place	Rec2 50-100m	37	34	30	64	47	39	35	17	25	29	27	30	34	LB, M	M, LB	AA, M, IB, LB, PC, SN, RO
R02	Angus Place	Rec3 100-200m	37	34	30	63	47	39	35	16	24	28	26	29	33	LB, M	M, LB	AA, M, IB, LB, PC, SN, RO
R26	Angus Place	Rec3 100-200m	37	34	30	59	47	39	35	12	20	24	22	25	29	LB, M	M, LB	M, IB, LB, PC, SN, RO2
R29	Angus Place	Rec3 100-200m	37	34	30	60	47	39	35	13	21	25	23	26	30	LB, M	M, LB	M, IB, LB, PC, SN, RO2
R30	Angus Place	Rec3 100-200m	37	34	30	60	47	39	35	13	21	25	23	26	30	LB, M	M, LB	M, IB, LB, PC, SN, RO2
R31	Angus Place	Rec3 100-200m	37	34	30	60	47	39	35	13	21	25	23	26	30	LB, M	M, LB	M, IB, LB, PC, SN, RO2
R32	Angus Place	Rec3 100-200m	37	34	30	60	47	39	35	13	21	25	23	26	30	LB, M	M, LB	M, IB, LB, PC, SN, RO2
R34	Angus Place	Rec3 100-200m	37	34	30	60	47	39	35	13	21	25	23	26	30	LB, M	M, LB	M, IB, LB, PC, SN, RO2
R36	Angus Place	Rec3 100-200m	37	34	30	62	47	39	35	15	23	27	25	28	32	LB, M	M, LB	AA, M, IB, LB, PC, SN, RO
R37	Angus Place	Rec3 100-200m	37	34	30	60	47	39	35	13	21	25	23	26	30	LB, M	M, LB	M, IB, LB, PC, SN, RO2
R01	Angus Place	Rec4 200-400m	37	34	30	44	47	39	35	-3	5	9	7	10	14	-		M, LB, RO2
R03	Angus Place	Rec4 200-400m	37	34	30	59	47	39	35	12	20	24	22	25	29	LB, M	M, LB	M, IB, LB, PC, SN, RO2
R25	Angus Place	Rec4 200-400m	37	34	30	56	47	39	35	9	17	21	19	22	26	-	M, LB	M, IB, LB, PC, SN, RO2
R27	Angus Place	Rec4 200-400m	37	34	30	57	47	39	35	10	18	22	20	23	27	-	M, LB	M, IB, LB, PC, SN, RO2
R28	Angus Place	Rec4 200-400m	37	34	30	55	47	39	35	8	16	20	18	21	25	-	M, LB	M, IB, LB, PC, SN, RO2
R33	Angus Place	Rec4 200-400m	37	34	30	60	47	39	35	13	21	25	23	26	30	LB, M	M, LB	M, IB, LB, PC, SN, RO2
R38	Angus Place	Rec4 200-400m	37	34	30	59	47	39	35	12	20	24	22	25	29	LB, M	M, LB	M, IB, LB, PC, SN, RO2
R39	Angus Place	Rec4 200-400m	37	34	30	59	47	39	35	12	20	24	22	25	29	LB, M	M, LB	M, IB, LB, PC, SN, RO2
R40	Angus Place	Rec4 200-400m	37	34	30	59	47	39	35	12	20	24	22	25	29	LB, M	M, LB	M, IB, LB, PC, SN, RO2
R04	Angus Place	Rec5 400-800m	37	34	30	52	47	39	35	5	13	17	15	18	22	-	LB	M, IB, LB, PC, SN, RO2
R05	Angus Place	Rec5 400-800m	37	34	30	54	47	39	35	7	15	19	17	20	24	-	LB	M, IB, LB, PC, SN, RO2
R06	Angus Place	Rec5 400-800m	37	34	30	53	47	39	35	6	14	18	16	19	23	-	LB	M, IB, LB, PC, SN, RO2
R07	Angus Place	Rec5 400-800m	37	34	30	51	47	39	35	4	12	16	14	17	21	-	LB	M, IB, LB, PC, SN, RO2
R08	Angus Place	Rec5 400-800m	37	34	30	48	47	39	35	1	9	13	11	14	18	-	LB	M, LB, RO2
R09	Angus Place	Rec5 400-800m	37	34	30	48	47	39	35	1	9	13	11	14	18	-	LB	M, LB, RO2
R10	Angus Place	Rec5 400-800m	37	34	30	47	47	39	35	0	8	12	10	13	17	-	LB	M, LB, RO2
R12	Angus Place	Rec5 400-800m	37	34	30	47	47	39	35	0	8	12	10	13	17	-	LB	M, LB, RO2
R13	Angus Place	Rec5 400-800m	37	34	30	47	47	39	35	0	8	12	10	13	17	-	LB	M, LB, RO2
R14	Angus Place	Rec5 400-800m	37	34	30	47	47	39	35	0	8	12	10	13	17	-	LB	M, LB, RO2
R17	Angus Place	Rec5 400-800m	37	34	30	48	47	39	35	1	9	13	11	14	18	-	LB	M, LB, RO2
R18	Angus Place	Rec5 400-800m	37	34	30	50	47	39	35	3	11	15	13	16	20	-	LB	M, LB, RO2
R22	Angus Place	Rec5 400-800m	37	34	30	49	47	39	35	2	10	14	12	15	19	-	LB	M, LB, RO2
R23	Angus Place	Rec5 400-800m	37	34	30	53	47	39	35	6	14	18	16	19	23	-	LB	M, IB, LB, PC, SN, RO2
R24	Angus Place	Rec5 400-800m	37	34	30	52	47	39	35	5	13	17	15	18	22	-	LB	M, IB, LB, PC, SN, RO2
R11	Angus Place	Rec6 >800m	37	34	30	46	47	39	35	-1	7	11	9	12	16	-	LB	M, LB, RO2
R15	Angus Place	Rec6 >800m	37	34	30	46	47	39	35	-1	7	11	9	12	16	-	LB	M, LB, RO2
R16	Angus Place	Rec6 >800m	37	34	30	45	47	39	35	-2	6	10	8	11	15	-	LB	M, LB, RO2
R19	Angus Place	Rec6 >800m	37	34	30	43	47	39	35	-4	4	8	6	9	13	-		M, LB, RO2
R20	Angus Place	Rec6 >800m	37	34	30	46	47	39	35	-1	7	11	9	12	16	-	LB	M, LB, RO2
R21	Angus Place	Rec6 >800m	37	34	30	47	47	39	35	0	8	12	10	13	17	-	LB	M, LB, RO2
R231	Bike Park	Rec1 <50m	35	30	30	67	45	35	35	22	32	32	32	37	37	LB, M	M, IB, LB, RO, PC, SN, RO2	AA, M, IB, LB, PC, SN, RO
R232	Bike Park	Rec1 <50m	35	30	30	69	45	35	35	24	34	34	34	39	39	LB, M	M, IB, LB, RO, PC, SN, RO2	AA, M, IB, LB, PC, SN, RO
R252	Bike Park	Rec1 <50m	35	30	30	68	45	35	35	23	33	33	33	38	38	LB, M	M, IB, LB, RO, PC, SN, RO2	AA, M, IB, LB, PC, SN, RO
R205	Bike Park	Rec2 50-100m	35	30	30	65	45	35	35	20	30	30	30	35	35	LB, M	M, IB, LB, RO, PC, SN, RO2	AA, M, IB, LB, PC, SN, RO
R248	Bike Park	Rec2 50-100m	35	30	30	63	45	35	35	18	28	28	28	33	33	LB, M	M, IB, LB, RO, PC, SN, RO2	AA, M, IB, LB, PC, SN, RO
R220	Bike Park	Rec3 100-200m	35	30	30	63	45	35	35	18	28	28	28	33	33	LB, M	M, IB, LB, RO, PC, SN, RO2	AA, M, IB, LB, PC, SN, RO
R223	Bike Park	Rec3 100-200m	35	30	30	59	45	35	35	14	24	24	24	29	29	LB, M	M, LB	M, IB, LB, PC, SN, RO2
R229	Bike Park	Rec3 100-200m	35	30	30	60	45	35	35	15	25	25	25	30	30	LB, M	M, LB	M, IB, LB, PC, SN, RO2
R230	Bike Park	Rec3 100-200m	35	30	30	60	45	35	35	15	25	25	25	30	30	LB, M	M, LB	M, IB, LB, PC, SN, RO2
R247	Bike Park	Rec3 100-200m	35	30	30	58	45	35	35	13	23	23	23	28	28	LB, M	M, LB	M, IB, LB, PC, SN, RO2
R249	Bike Park	Rec3 100-200m	35	30	30	61	45	35	35	16	26	26	26	31	31	LB, M	M, IB, LB, RO, PC, SN, RO2	AA, M, IB, LB, PC, SN, RO
R250	Bike Park	Rec3 100-200m	35	30	30	59	45	35	35	14	24	24	24	29	29	LB, M	M, LB	M, IB, LB, PC, SN, RO2
R211	Bike Park	Rec4 200-400m	35	30	30	57	45	35	35	12	22	22	22	27	27	LB, M	M, LB	M, IB, LB, PC, SN, RO2
R213	Bike Park	Rec4 200-400m	35	30	30	58	45	35	35	13	23	23	23	28	28	LB, M	M, LB	M, IB, LB, PC, SN, RO2
R217	Bike Park	Rec4 200-400m	35	30	30	57	45	35	35	12	22	22	22	27	27	LB, M	M, LB	M, IB, LB, PC, SN, RO2
R219	Bike Park	Rec4 200-400m	35	30	30	57	45	35	35	12	22	22	22	27	27	LB, M	M, LB	M, IB, LB, PC, SN, RO2
R221	Bike Park	Rec4 200-400m	35	30	30	50	45	35	35	5	15	15	15	20	20	-	LB	M, LB, RO2
R227	Bike Park	Rec4 200-400m	35	30	30	50	45	35	35	5	15	15	15	20	20	-	LB	M, LB, RO2
R228	Bike Park	Rec4 200-400m	35	30	30	56	45	35	35	11	21	21	21	26	26	LB, M	M, LB	M, IB, LB, PC, SN, RO2
R233	Bike Park	Rec4 200-400m	35	30	30	52	45	35	35	7	17	17	17	22	22	-	M, LB	M, IB, LB, PC, SN, RO2
R234	Bike Park	Rec4 200-400m	35	30	30	51	45	35	35	6	16	16	16	21	21	-	M, LB	M, IB, LB, PC, SN, RO2
R235	Bike Park	Rec4 200-400m	35	30	30	54	45	35	35	9	19	19	19	24	24	-	M, LB	M, IB, LB, PC, SN, RO2
R251	Bike Park	Rec4 200-400m	35	30	30	53	45	35	35	8	18	18	18	23	23	-	M, LB	M, IB, LB, PC, SN, RO2
R253	Bike Park	Rec4 200-400m	35	30	30	55	45	35	35	10	20	20	20	25	25	-	M, LB	M, IB, LB, PC, SN, RO2
R206	Bike Park	Rec5 400-800m	35	30	30	48	45	35	35	3	13	13	13	18	18	-	LB	M, LB, RO2
R212	Bike Park	Rec5 400-800m	35	30	30	50	45	35	35	5	15	15	15	20	20	-	LB	M, LB, RO2
R215	Bike Park	Rec5 400-800m	35	30	30	46	45	35	35	1	11	11	11	16	16	-	LB	M, LB, RO2
R216	Bike Park	Rec5 400-800m	35	30	30	46	45	35	35	1	11	11	11	16	16	-	LB	M, LB, RO2
R218	Bike Park	Rec5 400-800m	35	30	30	48	45	35	35	3	13	13	13	18	18	-	LB	M, LB, RO2
R222	Bike Park	Rec5 400-800m	35	30	30	48	45	35	35	3	13	13	13	18	18	-	LB	M, LB, RO2
R224	Bike Park	Rec5 400-800m	35	30	30	49	45	35	35	4	14	14	14	19	19	-	LB	M, LB, RO2
R225	Bike Park	Rec5 400-800m	35	30	30	44	45	35	35	-1	9	9	9	14	14	-	LB	M, LB, RO2
R237	Bike Park	Rec5 400-800m	35	30	30	48	45	35	35	3	13	13	13	18	18	-	LB	M, LB, RO2
R238	Bike Park	Rec5 400-800m	35	30	30	51	45	35	35	6	16	16	16	21	21	-	M, LB	M, IB, LB, PC, SN, RO2
R239	Bike Park	Rec5 400-800m	35	30	30	48	45	35	35	3	13	13	13	18	18	-	LB	M, LB, RO2
R240	Bike Park	Rec5 400-800m	35	30	30	48	45	35	35	3	13	13	13	18	18	-	LB	M, LB, RO2
R241	Bike Park	Rec5 400-800m	35	30	30	46	45	35	35	1	11	11	11	16	16	-	LB	M, LB, RO2

Rec ID	Catchment	Offset	RBL Day	RBL Eve	RBL Night	PNL Trench	NML Day	NML P1	NML P2	PNL-NML Day	PNL-NML P1	PNL-NML P2	PNL - RBL Std	PNL-RBL P1	PNL-RBL P2	AMMM Std	AMMM P1	AMMM P2
R242	Bike Park	Rec5 400-800m	35	30	30	49	45	35	35	4	14	14	14	19	19	-	LB	M, LB, RO2
R243	Bike Park	Rec5 400-800m	35	30	30	50	45	35	35	5	15	15	15	20	20	-	LB	M, LB, RO2
R244	Bike Park	Rec5 400-800m	35	30	30	48	45	35	35	3	13	13	13	18	18	-	LB	M, LB, RO2
R245	Bike Park	Rec5 400-800m	35	30	30	49	45	35	35	4	14	14	14	19	19	-	LB	M, LB, RO2
R246	Bike Park	Rec5 400-800m	35	30	30	49	45	35	35	4	14	14	14	19	19	-	LB	M, LB, RO2
R254	Bike Park	Rec5 400-800m	35	30	30	51	45	35	35	6	16	16	16	21	21	-	M, LB	M, IB, LB, PC, SN, RO2
R255	Bike Park	Rec5 400-800m	35	30	30	52	45	35	35	7	17	17	17	22	22	-	M, LB	M, IB, LB, PC, SN, RO2
R256	Bike Park	Rec5 400-800m	35	30	30	52	45	35	35	7	17	17	17	22	22	-	M, LB	M, IB, LB, PC, SN, RO2
R260	Bike Park	Rec5 400-800m	35	30	30	48	45	35	35	3	13	13	13	18	18	-	LB	M, LB, RO2
R207	Bike Park	Rec6 >800m	35	30	30	42	45	35	35	-3	7	7	7	12	12	-	LB	M, LB, RO2
R208	Bike Park	Rec6 >800m	35	30	30	44	45	35	35	-1	9	9	9	14	14	-	LB	M, LB, RO2
R209	Bike Park	Rec6 >800m	35	30	30	45	45	35	35	0	10	10	10	15	15	-	LB	M, LB, RO2
R210	Bike Park	Rec6 >800m	35	30	30	46	45	35	35	1	11	11	11	16	16	-	LB	M, LB, RO2
R214	Bike Park	Rec6 >800m	35	30	30	43	45	35	35	-2	8	8	8	13	13	-	LB	M, LB, RO2
R226	Bike Park	Rec6 >800m	35	30	30	44	45	35	35	-1	9	9	9	14	14	-	LB	M, LB, RO2
R236	Bike Park	Rec6 >800m	35	30	30	45	45	35	35	0	10	10	10	15	15	-	LB	M, LB, RO2
R259	Bike Park	Rec6 >800m	35	30	30	47	45	35	35	2	12	12	12	17	17	-	LB	M, LB, RO2
R202	Brewongle	Rec3 100-200m	35	30	30	62	45	35	35	17	27	27	27	32	32	LB, M	M, IB, LB, RO, PC, SN, RO2	AA, M, IB, LB, PC, SN, RO
R203	Brewongle	Rec3 100-200m	35	30	30	62	45	35	35	17	27	27	27	32	32	LB, M	M, IB, LB, RO, PC, SN, RO2	AA, M, IB, LB, PC, SN, RO
R204	Brewongle	Rec3 100-200m	35	30	30	61	45	35	35	16	26	26	26	31	31	LB, M	M, IB, LB, RO, PC, SN, RO2	AA, M, IB, LB, PC, SN, RO
R191	Brewongle	Rec4 200-400m	35	30	30	54	45	35	35	9	19	19	19	24	24	-	M, LB	M, IB, LB, PC, SN, RO2
R190	Brewongle	Rec5 400-800m	35	30	30	46	45	35	35	1	11	11	11	16	16	-	LB	M, LB, RO2
R195	Brewongle	Rec5 400-800m	35	30	30	51	45	35	35	6	16	16	16	21	21	-	M, LB	M, IB, LB, PC, SN, RO2
R197	Brewongle	Rec5 400-800m	35	30	30	48	45	35	35	3	13	13	13	18	18	-	LB	M, LB, RO2
R198	Brewongle	Rec5 400-800m	35	30	30	48	45	35	35	3	13	13	13	18	18	-	LB	M, LB, RO2
R199	Brewongle	Rec5 400-800m	35	30	30	49	45	35	35	4	14	14	14	19	19	-	LB	M, LB, RO2
R200	Brewongle	Rec5 400-800m	35	30	30	48	45	35	35	3	13	13	13	18	18	-	LB	M, LB, RO2
R201	Brewongle	Rec5 400-800m	35	30	30	50	45	35	35	5	15	15	15	20	20	-	LB	M, LB, RO2
R188	Brewongle	Rec6 >800m	35	30	30	44	45	35	35	-1	9	9	9	14	14	-	LB	M, LB, RO2
R189	Brewongle	Rec6 >800m	35	30	30	44	45	35	35	-1	9	9	9	14	14	-	LB	M, LB, RO2
R196	Brewongle	Rec6 >800m	35	30	30	46	45	35	35	1	11	11	11	16	16	-	LB	M, LB, RO2
R296	McPhillamys	Rec1 <50m	35	30	30	67	45	35	35	22	32	32	32	37	37	LB, M	M, IB, LB, RO, PC, SN, RO2	AA, M, IB, LB, PC, SN, RO
R288	McPhillamys	Rec2 50-100m	35	30	30	63	45	35	35	18	28	28	28	33	33	LB, M	M, IB, LB, RO, PC, SN, RO2	AA, M, IB, LB, PC, SN, RO
R295	McPhillamys	Rec4 200-400m	35	30	30	54	45	35	35	9	19	19	19	24	24	-	M, LB	M, IB, LB, PC, SN, RO2
R289	McPhillamys	Rec5 400-800m	35	30	30	46	45	35	35	1	11	11	11	16	16	-	LB	M, LB, RO2
R291	McPhillamys	Rec5 400-800m	35	30	30	49	45	35	35	4	14	14	14	19	19	-	LB	M, LB, RO2
R292	McPhillamys	Rec5 400-800m	35	30	30	53	45	35	35	8	18	18	18	23	23	-	M, LB	M, IB, LB, PC, SN, RO2
R286	McPhillamys	Rec6 >800m	35	30	30	47	45	35	35	2	12	12	12	17	17	-	LB	M, LB, RO2
R287	McPhillamys	Rec6 >800m	35	30	30	47	45	35	35	2	12	12	12	17	17	-	LB	M, LB, RO2
R290	McPhillamys	Rec6 >800m	35	30	30	45	45	35	35	0	10	10	10	15	15	-	LB	M, LB, RO2
R265	Perthville	Rec1 <50m	35	30	30	70	45	35	35	25	35	35	35	40	40	LB, M	M, IB, LB, RO, PC, SN, RO2	AA, M, IB, LB, PC, SN, RO
R297	Perthville	Rec2 50-100m	35	30	30	63	45	35	35	18	28	28	28	33	33	LB, M	M, IB, LB, RO, PC, SN, RO2	AA, M, IB, LB, PC, SN, RO
AR33	Perthville	Rec3 100-200m	40	40	35	56	50	45	40	6	11	16	16	16	21	-	LB	M, IB, LB, PC, SN, RO2
R274	Perthville	Rec3 100-200m	35	30	30	55	45	35	35	10	20	20	20	25	25	-	M, LB	M, IB, LB, PC, SN, RO2
R258	Perthville	Rec4 200-400m	35	30	30	49	45	35	35	4	14	14	14	19	19	-	LB	M, LB, RO2
R263	Perthville	Rec4 200-400m	35	30	30	57	45	35	35	12	22	22	22	27	27	LB, M	M, LB	M, IB, LB, PC, SN, RO2
R264	Perthville	Rec4 200-400m	35	30	30	57	45	35	35	12	22	22	22	27	27	LB, M	M, LB	M, IB, LB, PC, SN, RO2
R271	Perthville	Rec4 200-400m	35	30	30	56	45	35	35	11	21	21	21	26	26	LB, M	M, LB	M, IB, LB, PC, SN, RO2
R273	Perthville	Rec4 200-400m	35	30	30	56	45	35	35	11	21	21	21	26	26	LB, M	M, LB	M, IB, LB, PC, SN, RO2
R277	Perthville	Rec4 200-400m	35	30	30	46	45	35	35	1	11	11	11	16	16	-	LB	M, LB, RO2
R285	Perthville	Rec4 200-400m	35	30	30	57	45	35	35	12	22	22	22	27	27	LB, M	M, LB	M, IB, LB, PC, SN, RO2
R294	Perthville	Rec4 200-400m	35	30	30	48	45	35	35	3	13	13	13	18	18	-	LB	M, LB, RO2
R257	Perthville	Rec5 400-800m	35	30	30	49	45	35	35	4	14	14	14	19	19	-	LB	M, LB, RO2
R261	Perthville	Rec5 400-800m	35	30	30	50	45	35	35	5	15	15	15	20	20	-	LB	M, LB, RO2
R262	Perthville	Rec5 400-800m	35	30	30	53	45	35	35	8	18	18	18	23	23	-	M, LB	M, IB, LB, PC, SN, RO2
R266	Perthville	Rec5 400-800m	35	30	30	50	45	35	35	5	15	15	15	20	20	-	LB	M, LB, RO2
R269	Perthville	Rec5 400-800m	35	30	30	52	45	35	35	7	17	17	17	22	22	-	M, LB	M, IB, LB, PC, SN, RO2
R270	Perthville	Rec5 400-800m	35	30	30	50	45	35	35	5	15	15	15	20	20	-	LB	M, LB, RO2
R272	Perthville	Rec5 400-800m	35	30	30	50	45	35	35	5	15	15	15	20	20	-	LB	M, LB, RO2
R283	Perthville	Rec5 400-800m	35	30	30	48	45	35	35	3	13	13	13	18	18	-	LB	M, LB, RO2
R284	Perthville	Rec5 400-800m	35	30	30	46	45	35	35	1	11	11	11	16	16	-	LB	M, LB, RO2
R267	Perthville	Rec6 >800m	35	30	30	44	45	35	35	-1	9	9	9	14	14	-	LB	M, LB, RO2
R268	Perthville	Rec6 >800m	35	30	30	47	45	35	35	2	12	12	12	17	17	-	LB	M, LB, RO2
R275	Perthville	Rec6 >800m	35	30	30	47	45	35	35	2	12	12	12	17	17	-	LB	M, LB, RO2
R276	Perthville	Rec6 >800m	35	30	30	45	45	35	35	0	10	10	10	15	15	-	LB	M, LB, RO2
R278	Perthville	Rec6 >800m	35	30	30	42	45	35	35	-3	7	7	7	12	12	-	LB	M, LB, RO2
R279	Perthville	Rec6 >800m	35	30	30	46	45	35	35	1	11	11	11	16	16	-	LB	M, LB, RO2
R280	Perthville	Rec6 >800m	35	30	30	46	45	35	35	1	11	11	11	16	16	-	LB	M, LB, RO2
R281	Perthville	Rec6 >800m	35	30	30	41	45	35	35	-4	6	6	6	11	11	-	LB	M, LB, RO2
R282	Perthville	Rec6 >800m	35	30	30	39	45	35	35	-6	4	4	4	9	9	-	-	LB
R112	Portland	Rec1 <50m	35	30	30	68	45	35	35	23	33	33	33	38	38	LB, M	M, IB, LB, RO, PC, SN, RO2	AA, M, IB, LB, PC, SN, RO
R113	Portland	Rec1 <50m	35	30	30	66	45	35	35	21	31	31	31	36	36	LB, M	M, IB, LB, RO, PC, SN, RO2	AA, M, IB, LB, PC, SN, RO
R134	Portland	Rec1 <50m	35	30	30	67	45	35	35	22	32	32	32	37	37	LB, M	M, IB, LB, RO, PC, SN, RO2	AA, M, IB, LB, PC, SN, RO
R135	Portland	Rec1 <50m	35	30	30	73	45	35	35	28	38	38	38	43	43	LB, M	M, IB, LB, RO, PC, SN, RO2	AA, M, IB, LB, PC, SN, RO
R293	Portland	Rec1 <50m	35	30	30	69	45	35	35	24	34	34	34	39	39	LB, M	M, IB, LB, RO, PC, SN, RO2	AA, M, IB, LB, PC, SN, RO
R48	Portland	Rec1 <50m	35	30	30	81	45	35	35	36	46	46	46	51	51	LB, M	M, IB, LB, RO, PC, SN, RO2	AA, M, IB, LB, PC, SN, RO
R55	Portland	Rec1 <50m	35	30	30	67	45	35	35	22	32	32	32	37	37	LB, M	M, IB, LB, RO, PC, SN, RO2	AA, M, IB, LB, PC, SN, RO

Rec ID	Catchment	Offset	RBL Day	RBL Eve	RBL Night	PNL Trench	NML Day	NML P1	NML P2	PNL-NML Day	PNL-NML P1	PNL-NML P2	PNL - RBL Std	PNL-RBL P1	PNL-RBL P2	AMMM Std	AMMM P1	AMMM P2
R109	Portland	Rec2 50-100m	35	30	30	63	45	35	35	18	28	28	28	33	33	LB, M	M, IB, LB, RO, PC, SN, RO2	AA, M, IB, LB, PC, SN, RO
R110	Portland	Rec2 50-100m	35	30	30	65	45	35	35	20	30	30	30	35	35	LB, M	M, IB, LB, RO, PC, SN, RO2	AA, M, IB, LB, PC, SN, RO
R111	Portland	Rec2 50-100m	35	30	30	64	45	35	35	19	29	29	29	34	34	LB, M	M, IB, LB, RO, PC, SN, RO2	AA, M, IB, LB, PC, SN, RO
R46	Portland	Rec2 50-100m	35	30	30	66	45	35	35	21	31	31	31	36	36	LB, M	M, IB, LB, RO, PC, SN, RO2	AA, M, IB, LB, PC, SN, RO
R47	Portland	Rec2 50-100m	35	30	30	65	45	35	35	20	30	30	30	35	35	LB, M	M, IB, LB, RO, PC, SN, RO2	AA, M, IB, LB, PC, SN, RO
R114	Portland	Rec3 100-200m	35	30	30	60	45	35	35	15	25	25	25	30	30	LB, M	M, LB	M, IB, LB, PC, SN, RO2
R45	Portland	Rec3 100-200m	35	30	30	60	45	35	35	15	25	25	25	30	30	LB, M	M, LB	M, IB, LB, PC, SN, RO2
R49	Portland	Rec3 100-200m	35	30	30	58	45	35	35	13	23	23	23	28	28	LB, M	M, LB	M, IB, LB, PC, SN, RO2
R56	Portland	Rec3 100-200m	35	30	30	61	45	35	35	16	26	26	26	31	31	LB, M	M, IB, LB, RO, PC, SN, RO2	AA, M, IB, LB, PC, SN, RO
R57	Portland	Rec3 100-200m	35	30	30	61	45	35	35	16	26	26	26	31	31	LB, M	M, IB, LB, RO, PC, SN, RO2	AA, M, IB, LB, PC, SN, RO
R58	Portland	Rec3 100-200m	35	30	30	58	45	35	35	13	23	23	23	28	28	LB, M	M, LB	M, IB, LB, PC, SN, RO2
R59	Portland	Rec3 100-200m	35	30	30	53	45	35	35	8	18	18	18	23	23	-	M, LB	M, IB, LB, PC, SN, RO2
R61	Portland	Rec3 100-200m	35	30	30	59	45	35	35	14	24	24	24	29	29	LB, M	M, LB	M, IB, LB, PC, SN, RO2
R62	Portland	Rec3 100-200m	35	30	30	55	45	35	35	10	20	20	20	25	25	-	M, LB	M, IB, LB, PC, SN, RO2
R63	Portland	Rec3 100-200m	35	30	30	62	45	35	35	17	27	27	27	32	32	LB, M	M, IB, LB, RO, PC, SN, RO2	AA, M, IB, LB, PC, SN, RO
R64	Portland	Rec3 100-200m	35	30	30	60	45	35	35	15	25	25	25	30	30	LB, M	M, LB	M, IB, LB, PC, SN, RO2
R69	Portland	Rec3 100-200m	35	30	30	60	45	35	35	15	25	25	25	30	30	LB, M	M, LB	M, IB, LB, PC, SN, RO2
R102	Portland	Rec4 200-400m	35	30	30	54	45	35	35	9	19	19	19	24	24	-	M, LB	M, IB, LB, PC, SN, RO2
R107	Portland	Rec4 200-400m	35	30	30	53	45	35	35	8	18	18	18	23	23	-	M, LB	M, IB, LB, PC, SN, RO2
R108	Portland	Rec4 200-400m	35	30	30	56	45	35	35	11	21	21	21	26	26	LB, M	M, LB	M, IB, LB, PC, SN, RO2
R115	Portland	Rec4 200-400m	35	30	30	59	45	35	35	14	24	24	24	29	29	LB, M	M, LB	M, IB, LB, PC, SN, RO2
R116	Portland	Rec4 200-400m	35	30	30	54	45	35	35	9	19	19	19	24	24	-	M, LB	M, IB, LB, PC, SN, RO2
R117	Portland	Rec4 200-400m	35	30	30	54	45	35	35	9	19	19	19	24	24	-	M, LB	M, IB, LB, PC, SN, RO2
R118	Portland	Rec4 200-400m	35	30	30	53	45	35	35	8	18	18	18	23	23	-	M, LB	M, IB, LB, PC, SN, RO2
R132	Portland	Rec4 200-400m	35	30	30	46	45	35	35	1	11	11	11	16	16	-	LB	M, LB, RO2
R133	Portland	Rec4 200-400m	35	30	30	56	45	35	35	11	21	21	21	26	26	LB, M	M, LB	M, IB, LB, PC, SN, RO2
R42	Portland	Rec4 200-400m	35	30	30	57	45	35	35	12	22	22	22	27	27	LB, M	M, LB	M, IB, LB, PC, SN, RO2
R50	Portland	Rec4 200-400m	35	30	30	54	45	35	35	9	19	19	19	24	24	-	M, LB	M, IB, LB, PC, SN, RO2
R53	Portland	Rec4 200-400m	35	30	30	52	45	35	35	7	17	17	17	22	22	-	M, LB	M, IB, LB, PC, SN, RO2
R60	Portland	Rec4 200-400m	35	30	30	57	45	35	35	12	22	22	22	27	27	LB, M	M, LB	M, IB, LB, PC, SN, RO2
R65	Portland	Rec4 200-400m	35	30	30	52	45	35	35	7	17	17	17	22	22	-	M, LB	M, IB, LB, PC, SN, RO2
R66	Portland	Rec4 200-400m	35	30	30	53	45	35	35	8	18	18	18	23	23	-	M, LB	M, IB, LB, PC, SN, RO2
R100	Portland	Rec5 400-800m	35	30	30	51	45	35	35	6	16	16	16	21	21	-	M, LB	M, IB, LB, PC, SN, RO2
R101	Portland	Rec5 400-800m	35	30	30	52	45	35	35	7	17	17	17	22	22	-	M, LB	M, IB, LB, PC, SN, RO2
R104	Portland	Rec5 400-800m	35	30	30	48	45	35	35	3	13	13	13	18	18	-	LB	M, LB, RO2
R105	Portland	Rec5 400-800m	35	30	30	49	45	35	35	4	14	14	14	19	19	-	LB	M, LB, RO2
R106	Portland	Rec5 400-800m	35	30	30	51	45	35	35	6	16	16	16	21	21	-	M, LB	M, IB, LB, PC, SN, RO2
R119	Portland	Rec5 400-800m	35	30	30	51	45	35	35	6	16	16	16	21	21	-	M, LB	M, IB, LB, PC, SN, RO2
R120	Portland	Rec5 400-800m	35	30	30	49	45	35	35	4	14	14	14	19	19	-	LB	M, LB, RO2
R121	Portland	Rec5 400-800m	35	30	30	48	45	35	35	3	13	13	13	18	18	-	LB	M, LB, RO2
R125	Portland	Rec5 400-800m	35	30	30	48	45	35	35	3	13	13	13	18	18	-	LB	M, LB, RO2
R126	Portland	Rec5 400-800m	35	30	30	48	45	35	35	3	13	13	13	18	18	-	LB	M, LB, RO2
R127	Portland	Rec5 400-800m	35	30	30	47	45	35	35	2	12	12	12	17	17	-	LB	M, LB, RO2
R131	Portland	Rec5 400-800m	35	30	30	52	45	35	35	7	17	17	17	22	22	-	M, LB	M, IB, LB, PC, SN, RO2
R51	Portland	Rec5 400-800m	35	30	30	46	45	35	35	1	11	11	11	16	16	-	LB	M, LB, RO2
R67	Portland	Rec5 400-800m	35	30	30	49	45	35	35	4	14	14	14	19	19	-	LB	M, LB, RO2
R68	Portland	Rec5 400-800m	35	30	30	49	45	35	35	4	14	14	14	19	19	-	LB	M, LB, RO2
R70	Portland	Rec5 400-800m	35	30	30	49	45	35	35	4	14	14	14	19	19	-	LB	M, LB, RO2
R71	Portland	Rec5 400-800m	35	30	30	50	45	35	35	5	15	15	15	20	20	-	LB	M, LB, RO2
R72	Portland	Rec5 400-800m	35	30	30	51	45	35	35	6	16	16	16	21	21	-	M, LB	M, IB, LB, PC, SN, RO2
R73	Portland	Rec5 400-800m	35	30	30	50	45	35	35	5	15	15	15	20	20	-	LB	M, LB, RO2
R74	Portland	Rec5 400-800m	35	30	30	49	45	35	35	4	14	14	14	19	19	-	LB	M, LB, RO2
R75	Portland	Rec5 400-800m	35	30	30	49	45	35	35	4	14	14	14	19	19	-	LB	M, LB, RO2
R76	Portland	Rec5 400-800m	35	30	30	49	45	35	35	4	14	14	14	19	19	-	LB	M, LB, RO2
R83	Portland	Rec5 400-800m	35	30	30	49	45	35	35	4	14	14	14	19	19	-	LB	M, LB, RO2
R85	Portland	Rec5 400-800m	35	30	30	49	45	35	35	4	14	14	14	19	19	-	LB	M, LB, RO2
R86	Portland	Rec5 400-800m	35	30	30	48	45	35	35	3	13	13	13	18	18	-	LB	M, LB, RO2
R87	Portland	Rec5 400-800m	35	30	30	47	45	35	35	2	12	12	12	17	17	-	LB	M, LB, RO2
R94	Portland	Rec5 400-800m	35	30	30	49	45	35	35	4	14	14	14	19	19	-	LB	M, LB, RO2
R95	Portland	Rec5 400-800m	35	30	30	50	45	35	35	5	15	15	15	20	20	-	LB	M, LB, RO2
R96	Portland	Rec5 400-800m	35	30	30	46	45	35	35	1	11	11	11	16	16	-	LB	M, LB, RO2
R98	Portland	Rec5 400-800m	35	30	30	50	45	35	35	5	15	15	15	20	20	-	LB	M, LB, RO2
R99	Portland	Rec5 400-800m	35	30	30	51	45	35	35	6	16	16	16	21	21	-	M, LB	M, IB, LB, PC, SN, RO2
R103	Portland	Rec6 >800m	35	30	30	47	45	35	35	2	12	12	12	17	17	-	LB	M, LB, RO2
R122	Portland	Rec6 >800m	35	30	30	48	45	35	35	3	13	13	13	18	18	-	LB	M, LB, RO2
R123	Portland	Rec6 >800m	35	30	30	48	45	35	35	3	13	13	13	18	18	-	LB	M, LB, RO2
R124	Portland	Rec6 >800m	35	30	30	47	45	35	35	2	12	12	12	17	17	-	LB	M, LB, RO2
R128	Portland	Rec6 >800m	35	30	30	46	45	35	35	1	11	11	11	16	16	-	LB	M, LB, RO2
R129	Portland	Rec6 >800m	35	30	30	46	45	35	35	1	11	11	11	16	16	-	LB	M, LB, RO2
R130	Portland	Rec6 >800m	35	30	30	45	45	35	35	0	10	10	10	15	15	-	LB	M, LB, RO2
R41	Portland	Rec6 >800m	35	30	30	46	45	35	35	1	11	11	11	16	16	-	LB	M, LB, RO2
R43	Portland	Rec6 >800m	35	30	30	48	45	35	35	3	13	13	13	18	18	-	LB	M, LB, RO2
R44	Portland	Rec6 >800m	35	30	30	44	45	35	35	-1	9	9	9	14	14	-	LB	M, LB, RO2
R52	Portland	Rec6 >800m	35	30	30	42	45	35	35	-3	7	7	7	12	12	-	LB	M, LB, RO2
R54	Portland	Rec6 >800m	35	30	30	43	45	35	35	-2	8	8	8	13	13	-	LB	M, LB, RO2
R77	Portland	Rec6 >800m	35	30	30	48	45	35	35	3	13	13	13	18	18	-	LB	M, LB, RO2
R78	Portland	Rec6 >800m	35	30	30	47	45	35	35	2	12	12	12	17	17	-	LB	M, LB, RO2

Rec ID	Catchment	Offset	RBL Day	RBL Eve	RBL Night	PNL Trench	NML Day	NML P1	NML P2	PNL-NML Day	PNL-NML P1	PNL-NML P2	PNL - RBL Std	PNL-RBL P1	PNL-RBL P2	AMMM Std	AMMM P1	AMMM P2
R79	Portland	Rec6 >800m	35	30	30	47	45	35	35	2	12	12	12	17	17	-	LB	M, LB, RO2
R80	Portland	Rec6 >800m	35	30	30	46	45	35	35	1	11	11	11	16	16	-	LB	M, LB, RO2
R81	Portland	Rec6 >800m	35	30	30	47	45	35	35	2	12	12	12	17	17	-	LB	M, LB, RO2
R82	Portland	Rec6 >800m	35	30	30	47	45	35	35	2	12	12	12	17	17	-	LB	M, LB, RO2
R84	Portland	Rec6 >800m	35	30	30	46	45	35	35	1	11	11	11	16	16	-	LB	M, LB, RO2
R88	Portland	Rec6 >800m	35	30	30	46	45	35	35	1	11	11	11	16	16	-	LB	M, LB, RO2
R89	Portland	Rec6 >800m	35	30	30	46	45	35	35	1	11	11	11	16	16	-	LB	M, LB, RO2
R90	Portland	Rec6 >800m	35	30	30	47	45	35	35	2	12	12	12	17	17	-	LB	M, LB, RO2
R91	Portland	Rec6 >800m	35	30	30	46	45	35	35	1	11	11	11	16	16	-	LB	M, LB, RO2
R92	Portland	Rec6 >800m	35	30	30	46	45	35	35	1	11	11	11	16	16	-	LB	M, LB, RO2
R93	Portland	Rec6 >800m	35	30	30	43	45	35	35	-2	8	8	8	13	13	-	LB	M, LB, RO2
R97	Portland	Rec6 >800m	35	30	30	46	45	35	35	1	11	11	11	16	16	-	LB	M, LB, RO2
R140	Sunny Corner	Rec2 50-100m	35	30	30	61	45	35	35	16	26	26	26	31	31	LB, M	M, IB, LB, RO, PC, SN, RO2	AA, M, IB, LB, PC, SN, RO
R147	Sunny Corner	Rec2 50-100m	35	30	30	66	45	35	35	21	31	31	31	36	36	LB, M	M, IB, LB, RO, PC, SN, RO2	AA, M, IB, LB, PC, SN, RO
R141	Sunny Corner	Rec3 100-200m	35	30	30	61	45	35	35	16	26	26	26	31	31	LB, M	M, IB, LB, RO, PC, SN, RO2	AA, M, IB, LB, PC, SN, RO
R146	Sunny Corner	Rec3 100-200m	35	30	30	60	45	35	35	15	25	25	25	30	30	LB, M	M, LB	M, IB, LB, PC, SN, RO2
R148	Sunny Corner	Rec3 100-200m	35	30	30	55	45	35	35	10	20	20	20	25	25	-	M, LB	M, IB, LB, PC, SN, RO2
R136	Sunny Corner	Rec4 200-400m	35	30	30	46	45	35	35	1	11	11	11	16	16	-	LB	M, LB, RO2
R138	Sunny Corner	Rec4 200-400m	35	30	30	56	45	35	35	11	21	21	21	26	26	LB, M	M, LB	M, IB, LB, PC, SN, RO2
R139	Sunny Corner	Rec4 200-400m	35	30	30	56	45	35	35	11	21	21	21	26	26	LB, M	M, LB	M, IB, LB, PC, SN, RO2
R144	Sunny Corner	Rec4 200-400m	35	30	30	54	45	35	35	9	19	19	19	24	24	-	M, LB	M, IB, LB, PC, SN, RO2
R151	Sunny Corner	Rec4 200-400m	35	30	30	54	45	35	35	9	19	19	19	24	24	-	M, LB	M, IB, LB, PC, SN, RO2
R137	Sunny Corner	Rec5 400-800m	35	30	30	46	45	35	35	1	11	11	11	16	16	-	LB	M, LB, RO2
R142	Sunny Corner	Rec5 400-800m	35	30	30	53	45	35	35	8	18	18	18	23	23	-	M, LB	M, IB, LB, PC, SN, RO2
R143	Sunny Corner	Rec5 400-800m	35	30	30	47	45	35	35	2	12	12	12	17	17	-	LB	M, LB, RO2
R145	Sunny Corner	Rec5 400-800m	35	30	30	42	45	35	35	-3	7	7	7	12	12	-	LB	M, LB, RO2
R178	Yetholme	Rec1 <50m	47	37	30	69	57	42	35	12	27	34	22	32	39	LB, M	M, IB, LB, RO, PC, SN, RO2	AA, M, IB, LB, PC, SN, RO
R182	Yetholme	Rec1 <50m	47	37	30	69	57	42	35	12	27	34	22	32	39	LB, M	M, IB, LB, RO, PC, SN, RO2	AA, M, IB, LB, PC, SN, RO
R184	Yetholme	Rec1 <50m	47	37	30	69	57	42	35	12	27	34	22	32	39	LB, M	M, IB, LB, RO, PC, SN, RO2	AA, M, IB, LB, PC, SN, RO
R186	Yetholme	Rec1 <50m	47	37	30	68	57	42	35	11	26	33	21	31	38	LB, M	M, IB, LB, RO, PC, SN, RO2	AA, M, IB, LB, PC, SN, RO
R187	Yetholme	Rec1 <50m	47	37	30	66	57	42	35	9	24	31	19	29	36	-	M, LB	AA, M, IB, LB, PC, SN, RO
R179	Yetholme	Rec2 50-100m	47	37	30	63	57	42	35	6	21	28	16	26	33	-	M, LB	AA, M, IB, LB, PC, SN, RO
R149	Yetholme	Rec3 100-200m	47	37	30	61	57	42	35	4	19	26	14	24	31	-	M, LB	AA, M, IB, LB, PC, SN, RO
R150	Yetholme	Rec3 100-200m	47	37	30	58	57	42	35	1	16	23	11	21	28	-	M, LB	M, IB, LB, PC, SN, RO2
R181	Yetholme	Rec3 100-200m	47	37	30	62	57	42	35	5	20	27	15	25	32	-	M, LB	AA, M, IB, LB, PC, SN, RO
R152	Yetholme	Rec4 200-400m	47	37	30	54	57	42	35	-3	12	19	7	17	24	-	LB	M, IB, LB, PC, SN, RO2
R156	Yetholme	Rec4 200-400m	47	37	30	52	57	42	35	-5	10	17	5	15	22	-	LB	M, IB, LB, PC, SN, RO2
R165	Yetholme	Rec4 200-400m	47	37	30	51	57	42	35	-6	9	16	4	14	21	-	LB	M, IB, LB, PC, SN, RO2
R171	Yetholme	Rec4 200-400m	47	37	30	52	57	42	35	-5	10	17	5	15	22	-	LB	M, IB, LB, PC, SN, RO2
R172	Yetholme	Rec4 200-400m	47	37	30	56	57	42	35	-1	14	21	9	19	26	-	LB	M, IB, LB, PC, SN, RO2
R183	Yetholme	Rec4 200-400m	47	37	30	58	57	42	35	1	16	23	11	21	28	-	M, LB	M, IB, LB, PC, SN, RO2
R154	Yetholme	Rec5 400-800m	47	37	30	47	57	42	35	-10	5	12	0	10	17	-	-	M, LB, RO2
R155	Yetholme	Rec5 400-800m	47	37	30	50	57	42	35	-7	8	15	3	13	20	-	LB	M, LB, RO2
R157	Yetholme	Rec5 400-800m	47	37	30	48	57	42	35	-9	6	13	1	11	18	-	LB	M, LB, RO2
R158	Yetholme	Rec5 400-800m	47	37	30	47	57	42	35	-10	5	12	0	10	17	-	-	M, LB, RO2
R160	Yetholme	Rec5 400-800m	47	37	30	44	57	42	35	-13	2	9	-3	7	14	-	-	M, LB, RO2
R162	Yetholme	Rec5 400-800m	47	37	30	48	57	42	35	-9	6	13	1	11	18	-	LB	M, LB, RO2
R163	Yetholme	Rec5 400-800m	47	37	30	49	57	42	35	-8	7	14	2	12	19	-	LB	M, LB, RO2
R164	Yetholme	Rec5 400-800m	47	37	30	51	57	42	35	-6	9	16	4	14	21	-	LB	M, IB, LB, PC, SN, RO2
R169	Yetholme	Rec5 400-800m	47	37	30	49	57	42	35	-8	7	14	2	12	19	-	LB	M, LB, RO2
R170	Yetholme	Rec5 400-800m	47	37	30	50	57	42	35	-7	8	15	3	13	20	-	LB	M, LB, RO2
R173	Yetholme	Rec5 400-800m	47	37	30	47	57	42	35	-10	5	12	0	10	17	-	-	M, LB, RO2
R175	Yetholme	Rec5 400-800m	47	37	30	49	57	42	35	-8	7	14	2	12	19	-	LB	M, LB, RO2
R176	Yetholme	Rec5 400-800m	47	37	30	53	57	42	35	-4	11	18	6	16	23	-	LB	M, IB, LB, PC, SN, RO2
R177	Yetholme	Rec5 400-800m	47	37	30	46	57	42	35	-11	4	11	-1	9	16	-	-	M, LB, RO2
R180	Yetholme	Rec5 400-800m	47	37	30	43	57	42	35	-14	1	8	-4	6	13	-	-	M, LB, RO2
R185	Yetholme	Rec5 400-800m	47	37	30	52	57	42	35	-5	10	17	5	15	22	-	LB	M, IB, LB, PC, SN, RO2
R194	Yetholme	Rec5 400-800m	47	37	30	50	57	42	35	-7	8	15	3	13	20	-	LB	M, LB, RO2
R153	Yetholme	Rec6 >800m	47	37	30	45	57	42	35	-12	3	10	-2	8	15	-	-	M, LB, RO2
R159	Yetholme	Rec6 >800m	47	37	30	43	57	42	35	-14	1	8	-4	6	13	-	-	M, LB, RO2
R161	Yetholme	Rec6 >800m	47	37	30	45	57	42	35	-12	3	10	-2	8	15	-	-	M, LB, RO2
R166	Yetholme	Rec6 >800m	47	37	30	47	57	42	35	-10	5	12	0	10	17	-	-	M, LB, RO2
R167	Yetholme	Rec6 >800m	47	37	30	44	57	42	35	-13	2	9	-3	7	14	-	-	M, LB, RO2
R168	Yetholme	Rec6 >800m	47	37	30	46	57	42	35	-11	4	11	-1	9	16	-	-	M, LB, RO2
R174	Yetholme	Rec6 >800m	47	37	30	44	57	42	35	-13	2	9	-3	7	14	-	-	M, LB, RO2
R192	Yetholme	Rec6 >800m	47	37	30	44	57	42	35	-13	2	9	-3	7	14	-	-	M, LB, RO2
R193	Yetholme	Rec6 >800m	47	37	30	45	57	42	35	-12	3	10	-2	8	15	-	-	M, LB, RO2

Rec ID	Catchment	Offset	RBL Day	RBL Eve	RBL Night	PNL BR	NML Day	NML P1	NML P2	NL-NML D	NL-NML P	NL-NML P	PNL - RBL Std	PNL-RBL P1	PNL-RBL P2	AMMM Std	AMMM P1	AMMM P2
R35	Angus Place	Rec2 50-100m	37	34	30	58	47	39	35	11	19	23	21	24	28	LB, M	M, LB	M, IB, LB, PC, SN, RO2
R02	Angus Place	Rec3 100-200m	37	34	30	57	47	39	35	10	18	22	20	23	27	-	M, LB	M, IB, LB, PC, SN, RO2
R26	Angus Place	Rec3 100-200m	37	34	30	53	47	39	35	6	14	18	16	19	23	-	LB	M, IB, LB, PC, SN, RO2
R29	Angus Place	Rec3 100-200m	37	34	30	54	47	39	35	7	15	19	17	20	24	-	LB	M, IB, LB, PC, SN, RO2
R30	Angus Place	Rec3 100-200m	37	34	30	54	47	39	35	7	15	19	17	20	24	-	LB	M, IB, LB, PC, SN, RO2
R31	Angus Place	Rec3 100-200m	37	34	30	54	47	39	35	7	15	19	17	20	24	-	LB	M, IB, LB, PC, SN, RO2
R32	Angus Place	Rec3 100-200m	37	34	30	54	47	39	35	7	15	19	17	20	24	-	LB	M, IB, LB, PC, SN, RO2
R34	Angus Place	Rec3 100-200m	37	34	30	54	47	39	35	7	15	19	17	20	24	-	LB	M, IB, LB, PC, SN, RO2
R36	Angus Place	Rec3 100-200m	37	34	30	56	47	39	35	9	17	21	19	22	26	-	M, LB	M, IB, LB, PC, SN, RO2
R37	Angus Place	Rec3 100-200m	37	34	30	54	47	39	35	7	15	19	17	20	24	-	LB	M, IB, LB, PC, SN, RO2
R01	Angus Place	Rec4 200-400m	37	34	30	40	47	39	35	7	1	5	3	6	10	-	-	LB
R03	Angus Place	Rec4 200-400m	37	34	30	53	47	39	35	6	14	18	16	19	23	-	LB	M, IB, LB, PC, SN, RO2
R25	Angus Place	Rec4 200-400m	37	34	30	50	47	39	35	3	11	15	13	16	20	-	LB	M, LB, RO2
R27	Angus Place	Rec4 200-400m	37	34	30	51	47	39	35	4	12	16	14	17	21	-	LB	M, IB, LB, PC, SN, RO2
R28	Angus Place	Rec4 200-400m	37	34	30	49	47	39	35	2	10	14	12	15	19	-	LB	M, LB, RO2
R33	Angus Place	Rec4 200-400m	37	34	30	54	47	39	35	7	15	19	17	20	24	-	LB	M, IB, LB, PC, SN, RO2
R38	Angus Place	Rec4 200-400m	37	34	30	53	47	39	35	6	14	18	16	19	23	-	LB	M, IB, LB, PC, SN, RO2
R39	Angus Place	Rec4 200-400m	37	34	30	53	47	39	35	6	14	18	16	19	23	-	LB	M, IB, LB, PC, SN, RO2
R40	Angus Place	Rec4 200-400m	37	34	30	53	47	39	35	6	14	18	16	19	23	-	LB	M, IB, LB, PC, SN, RO2
R04	Angus Place	Rec5 400-800m	37	34	30	46	47	39	35	-1	7	11	9	12	16	-	LB	M, LB, RO2
R05	Angus Place	Rec5 400-800m	37	34	30	48	47	39	35	1	9	13	11	14	18	-	LB	M, LB, RO2
R06	Angus Place	Rec5 400-800m	37	34	30	47	47	39	35	0	8	12	10	13	17	-	LB	M, LB, RO2
R07	Angus Place	Rec5 400-800m	37	34	30	45	47	39	35	-2	6	10	8	11	15	-	LB	M, LB, RO2
R08	Angus Place	Rec5 400-800m	37	34	30	42	47	39	35	-5	3	7	5	8	12	-	-	M, LB, RO2
R09	Angus Place	Rec5 400-800m	37	34	30	43	47	39	35	-4	4	8	6	9	13	-	-	M, LB, RO2
R10	Angus Place	Rec5 400-800m	37	34	30	41	47	39	35	-6	2	6	4	7	11	-	-	M, LB, RO2
R12	Angus Place	Rec5 400-800m	37	34	30	42	47	39	35	-5	3	7	5	8	12	-	-	M, LB, RO2
R13	Angus Place	Rec5 400-800m	37	34	30	42	47	39	35	-5	3	7	5	8	12	-	-	M, LB, RO2
R14	Angus Place	Rec5 400-800m	37	34	30	42	47	39	35	-5	3	7	5	8	12	-	-	M, LB, RO2
R17	Angus Place	Rec5 400-800m	37	34	30	43	47	39	35	-4	4	8	6	9	13	-	-	M, LB, RO2
R18	Angus Place	Rec5 400-800m	37	34	30	44	47	39	35	-3	5	9	7	10	14	-	-	M, LB, RO2
R22	Angus Place	Rec5 400-800m	37	34	30	43	47	39	35	-4	4	8	6	9	13	-	-	M, LB, RO2
R23	Angus Place	Rec5 400-800m	37	34	30	47	47	39	35	0	8	12	10	13	17	-	LB	M, LB, RO2
R24	Angus Place	Rec5 400-800m	37	34	30	46	47	39	35	-1	7	11	9	12	16	-	LB	M, LB, RO2
R11	Angus Place	Rec6 >800m	37	34	30	41	47	39	35	-6	2	6	4	7	11	-	-	M, LB, RO2
R15	Angus Place	Rec6 >800m	37	34	30	41	47	39	35	-6	2	6	4	7	11	-	-	M, LB, RO2
R16	Angus Place	Rec6 >800m	37	34	30	40	47	39	35	-7	1	5	3	6	10	-	-	LB
R19	Angus Place	Rec6 >800m	37	34	30	38	47	39	35	-9	-1	3	1	4	8	-	-	LB
R20	Angus Place	Rec6 >800m	37	34	30	40	47	39	35	-7	1	5	3	6	10	-	-	LB
R21	Angus Place	Rec6 >800m	37	34	30	42	47	39	35	-5	3	7	5	8	12	-	-	M, LB, RO2
R231	Bike Park	Rec1 <50m	35	30	30	61	45	35	35	16	26	26	26	31	31	LB, M	M, IB, LB, RO, PC, SN, R	AA, M, IB, LB, PC, SN, RO
R232	Bike Park	Rec1 <50m	35	30	30	63	45	35	35	18	28	28	28	33	33	LB, M	M, IB, LB, RO, PC, SN, R	AA, M, IB, LB, PC, SN, RO
R252	Bike Park	Rec1 <50m	35	30	30	62	45	35	35	17	27	27	27	32	32	LB, M	M, IB, LB, RO, PC, SN, R	AA, M, IB, LB, PC, SN, RO
R205	Bike Park	Rec2 50-100m	35	30	30	59	45	35	35	14	24	24	24	29	29	LB, M	M, LB	M, IB, LB, PC, SN, RO2
R248	Bike Park	Rec2 50-100m	35	30	30	57	45	35	35	12	22	22	22	27	27	LB, M	M, LB	M, IB, LB, PC, SN, RO2
R220	Bike Park	Rec3 100-200m	35	30	30	57	45	35	35	12	22	22	22	27	27	LB, M	M, LB	M, IB, LB, PC, SN, RO2
R223	Bike Park	Rec3 100-200m	35	30	30	53	45	35	35	8	18	18	18	23	23	-	M, LB	M, IB, LB, PC, SN, RO2
R229	Bike Park	Rec3 100-200m	35	30	30	54	45	35	35	9	19	19	19	24	24	-	M, LB	M, IB, LB, PC, SN, RO2
R230	Bike Park	Rec3 100-200m	35	30	30	54	45	35	35	9	19	19	19	24	24	-	M, LB	M, IB, LB, PC, SN, RO2
R247	Bike Park	Rec3 100-200m	35	30	30	53	45	35	35	8	18	18	18	23	23	-	M, LB	M, IB, LB, PC, SN, RO2
R249	Bike Park	Rec3 100-200m	35	30	30	55	45	35	35	10	20	20	20	25	25	-	M, LB	M, IB, LB, PC, SN, RO2
R250	Bike Park	Rec3 100-200m	35	30	30	53	45	35	35	8	18	18	18	23	23	-	M, LB	M, IB, LB, PC, SN, RO2
R211	Bike Park	Rec4 200-400m	35	30	30	51	45	35	35	6	16	16	16	21	21	-	M, LB	M, IB, LB, PC, SN, RO2
R213	Bike Park	Rec4 200-400m	35	30	30	52	45	35	35	7	17	17	17	22	22	-	M, LB	M, IB, LB, PC, SN, RO2
R217	Bike Park	Rec4 200-400m	35	30	30	52	45	35	35	7	17	17	17	22	22	-	M, LB	M, IB, LB, PC, SN, RO2
R219	Bike Park	Rec4 200-400m	35	30	30	51	45	35	35	6	16	16	16	21	21	-	M, LB	M, IB, LB, PC, SN, RO2
R221	Bike Park	Rec4 200-400m	35	30	30	45	45	35	35	0	10	10	10	15	15	-	LB	M, LB, RO2
R227	Bike Park	Rec4 200-400m	35	30	30	44	45	35	35	-1	9	9	9	14	14	-	LB	M, LB, RO2
R228	Bike Park	Rec4 200-400m	35	30	30	50	45	35	35	5	15	15	15	20	20	-	LB	M, LB, RO2
R233	Bike Park	Rec4 200-400m	35	30	30	47	45	35	35	2	12	12	12	17	17	-	LB	M, LB, RO2
R234	Bike Park	Rec4 200-400m	35	30	30	45	45	35	35	0	10	10	10	15	15	-	LB	M, LB, RO2
R235	Bike Park	Rec4 200-400m	35	30	30	48	45	35	35	3	13	13	13	18	18	-	LB	M, LB, RO2
R251	Bike Park	Rec4 200-400m	35	30	30	48	45	35	35	3	13	13	13	18	18	-	LB	M, LB, RO2
R253	Bike Park	Rec4 200-400m	35	30	30	49	45	35	35	4	14	14	14	19	19	-	LB	M, LB, RO2
R206	Bike Park	Rec5 400-800m	35	30	30	42	45	35	35	-3	7	7	7	12	12	-	LB	M, LB, RO2
R212	Bike Park	Rec5 400-800m	35	30	30	44	45	35	35	-1	9	9	9	14	14	-	LB	M, LB, RO2
R215	Bike Park	Rec5 400-800m	35	30	30	41	45	35	35	-4	6	6	6	11	11	-	LB	M, LB, RO2
R216	Bike Park	Rec5 400-800m	35	30	30	41	45	35	35	-4	6	6	6	11	11	-	LB	M, LB, RO2
R218	Bike Park	Rec5 400-800m	35	30	30	42	45	35	35	-3	7	7	7	12	12	-	LB	M, LB, RO2
R222	Bike Park	Rec5 400-800m	35	30	30	43	45	35	35	-2	8	8	8	13	13	-	LB	M, LB, RO2
R224	Bike Park	Rec5 400-800m	35	30	30	44	45	35	35	-1	9	9	9	14	14	-	LB	M, LB, RO2
R225	Bike Park	Rec5 400-800m	35	30	30	40	45	35	35	-5	5	5	5	10	10	-	-	LB
R237	Bike Park	Rec5 400-800m	35	30	30	42	45	35	35	-3	7	7	7	12	12	-	LB	M, LB, RO2
R238	Bike Park	Rec5 400-800m	35	30	30	45	45	35	35	0	10	10	10	15	15	-	LB	M, LB, RO2
R239	Bike Park	Rec5 400-800m	35	30	30	43	45	35	35	-2	8	8	8	13	13	-	LB	M, LB, RO2
R240	Bike Park	Rec5 400-800m	35	30	30	42	45	35	35	-3	7	7	7	12	12	-	LB	M, LB, RO2
R241	Bike Park	Rec5 400-800m	35	30	30	41	45	35	35	-4	6	6	6	11	11	-	LB	M, LB, RO2

Rec ID	Catchment	Offset	RBL Day	RBL Eve	RBL Night	PNL BR	NML Day	NML P1	NML P2	NL-NML D	NL-NML P	NL-NML P	PNL - RBL Std	PNL-RBL P1	PNL-RBL P2	AMMM Std	AMMM P1	AMMM P2
R242	Bike Park	Rec5 400-800m	35	30	30	43	45	35	35	-2	8	8	8	13	13	-	LB	M, LB, RO2
R243	Bike Park	Rec5 400-800m	35	30	30	45	45	35	35	0	10	10	10	15	15	-	LB	M, LB, RO2
R244	Bike Park	Rec5 400-800m	35	30	30	43	45	35	35	-2	8	8	8	13	13	-	LB	M, LB, RO2
R245	Bike Park	Rec5 400-800m	35	30	30	43	45	35	35	-2	8	8	8	13	13	-	LB	M, LB, RO2
R246	Bike Park	Rec5 400-800m	35	30	30	44	45	35	35	-1	9	9	9	14	14	-	LB	M, LB, RO2
R254	Bike Park	Rec5 400-800m	35	30	30	46	45	35	35	1	11	11	11	16	16	-	LB	M, LB, RO2
R255	Bike Park	Rec5 400-800m	35	30	30	46	45	35	35	1	11	11	11	16	16	-	LB	M, LB, RO2
R256	Bike Park	Rec5 400-800m	35	30	30	46	45	35	35	1	11	11	11	16	16	-	LB	M, LB, RO2
R260	Bike Park	Rec5 400-800m	35	30	30	43	45	35	35	-2	8	8	8	13	13	-	LB	M, LB, RO2
R207	Bike Park	Rec6 >800m	35	30	30	38	45	35	35	-7	3	3	3	8	8	-	-	LB
R208	Bike Park	Rec6 >800m	35	30	30	39	45	35	35	-6	4	4	4	9	9	-	-	LB
R209	Bike Park	Rec6 >800m	35	30	30	40	45	35	35	-5	5	5	5	10	10	-	-	LB
R210	Bike Park	Rec6 >800m	35	30	30	41	45	35	35	-4	6	6	6	11	11	-	LB	M, LB, RO2
R214	Bike Park	Rec6 >800m	35	30	30	38	45	35	35	-7	3	3	3	8	8	-	-	LB
R226	Bike Park	Rec6 >800m	35	30	30	39	45	35	35	-6	4	4	4	9	9	-	-	LB
R236	Bike Park	Rec6 >800m	35	30	30	40	45	35	35	-5	5	5	5	10	10	-	-	LB
R259	Bike Park	Rec6 >800m	35	30	30	41	45	35	35	-4	6	6	6	11	11	-	LB	M, LB, RO2
R202	Brewongle	Rec3 100-200m	35	30	30	56	45	35	35	11	21	21	21	26	26	LB, M	M, LB	M, IB, LB, PC, SN, RO2
R203	Brewongle	Rec3 100-200m	35	30	30	56	45	35	35	11	21	21	21	26	26	LB, M	M, LB	M, IB, LB, PC, SN, RO2
R204	Brewongle	Rec3 100-200m	35	30	30	55	45	35	35	10	20	20	20	25	25	-	M, LB	M, IB, LB, PC, SN, RO2
R191	Brewongle	Rec4 200-400m	35	30	30	48	45	35	35	3	13	13	13	18	18	-	LB	M, LB, RO2
R190	Brewongle	Rec5 400-800m	35	30	30	41	45	35	35	-4	6	6	6	11	11	-	LB	M, LB, RO2
R195	Brewongle	Rec5 400-800m	35	30	30	46	45	35	35	1	11	11	11	16	16	-	LB	M, LB, RO2
R197	Brewongle	Rec5 400-800m	35	30	30	42	45	35	35	-3	7	7	7	12	12	-	LB	M, LB, RO2
R198	Brewongle	Rec5 400-800m	35	30	30	42	45	35	35	-3	7	7	7	12	12	-	LB	M, LB, RO2
R199	Brewongle	Rec5 400-800m	35	30	30	43	45	35	35	-2	8	8	8	13	13	-	LB	M, LB, RO2
R200	Brewongle	Rec5 400-800m	35	30	30	42	45	35	35	-3	7	7	7	12	12	-	LB	M, LB, RO2
R201	Brewongle	Rec5 400-800m	35	30	30	44	45	35	35	-1	9	9	9	14	14	-	LB	M, LB, RO2
R188	Brewongle	Rec6 >800m	35	30	30	39	45	35	35	-6	4	4	4	9	9	-	-	LB
R189	Brewongle	Rec6 >800m	35	30	30	39	45	35	35	-6	4	4	4	9	9	-	-	LB
R196	Brewongle	Rec6 >800m	35	30	30	41	45	35	35	-4	6	6	6	11	11	-	LB	M, LB, RO2
R296	McPhillamys	Rec1 <50m	35	30	30	61	45	35	35	16	26	26	26	31	31	LB, M	M, IB, LB, RO, PC, SN, R	AA, M, IB, LB, PC, SN, RO
R288	McPhillamys	Rec2 50-100m	35	30	30	57	45	35	35	12	22	22	22	27	27	LB, M	M, LB	M, IB, LB, PC, SN, RO2
R295	McPhillamys	Rec4 200-400m	35	30	30	48	45	35	35	3	13	13	13	18	18	-	LB	M, LB, RO2
R289	McPhillamys	Rec5 400-800m	35	30	30	41	45	35	35	-4	6	6	6	11	11	-	LB	M, LB, RO2
R291	McPhillamys	Rec5 400-800m	35	30	30	43	45	35	35	-2	8	8	8	13	13	-	LB	M, LB, RO2
R292	McPhillamys	Rec5 400-800m	35	30	30	47	45	35	35	2	12	12	12	17	17	-	LB	M, LB, RO2
R286	McPhillamys	Rec6 >800m	35	30	30	41	45	35	35	-4	6	6	6	11	11	-	LB	M, LB, RO2
R287	McPhillamys	Rec6 >800m	35	30	30	41	45	35	35	-4	6	6	6	11	11	-	LB	M, LB, RO2
R290	McPhillamys	Rec6 >800m	35	30	30	40	45	35	35	-5	5	5	5	10	10	-	-	LB
R265	Perthville	Rec1 <50m	35	30	30	64	45	35	35	19	29	29	29	34	34	LB, M	M, IB, LB, RO, PC, SN, R	AA, M, IB, LB, PC, SN, RO
R297	Perthville	Rec2 50-100m	35	30	30	57	45	35	35	12	22	22	22	27	27	LB, M	M, LB	M, IB, LB, PC, SN, RO2
AR33	Perthville	Rec3 100-200m	40	40	35	50	50	45	40	0	5	10	10	10	15	-	-	M, LB, RO2
R274	Perthville	Rec3 100-200m	35	30	30	49	45	35	35	4	14	14	14	19	19	-	LB	M, LB, RO2
R258	Perthville	Rec4 200-400m	35	30	30	44	45	35	35	-1	9	9	9	14	14	-	LB	M, LB, RO2
R263	Perthville	Rec4 200-400m	35	30	30	51	45	35	35	6	16	16	16	21	21	-	M, LB	M, IB, LB, PC, SN, RO2
R264	Perthville	Rec4 200-400m	35	30	30	51	45	35	35	6	16	16	16	21	21	-	M, LB	M, IB, LB, PC, SN, RO2
R271	Perthville	Rec4 200-400m	35	30	30	51	45	35	35	6	16	16	16	21	21	-	M, LB	M, IB, LB, PC, SN, RO2
R273	Perthville	Rec4 200-400m	35	30	30	50	45	35	35	5	15	15	15	20	20	-	LB	M, LB, RO2
R277	Perthville	Rec4 200-400m	35	30	30	42	45	35	35	-3	7	7	7	12	12	-	LB	M, LB, RO2
R285	Perthville	Rec4 200-400m	35	30	30	51	45	35	35	6	16	16	16	21	21	-	M, LB	M, IB, LB, PC, SN, RO2
R294	Perthville	Rec4 200-400m	35	30	30	43	45	35	35	-2	8	8	8	13	13	-	LB	M, LB, RO2
R257	Perthville	Rec5 400-800m	35	30	30	44	45	35	35	-1	9	9	9	14	14	-	LB	M, LB, RO2
R261	Perthville	Rec5 400-800m	35	30	30	44	45	35	35	-1	9	9	9	14	14	-	LB	M, LB, RO2
R262	Perthville	Rec5 400-800m	35	30	30	47	45	35	35	2	12	12	12	17	17	-	LB	M, LB, RO2
R266	Perthville	Rec5 400-800m	35	30	30	44	45	35	35	-1	9	9	9	14	14	-	LB	M, LB, RO2
R269	Perthville	Rec5 400-800m	35	30	30	46	45	35	35	1	11	11	11	16	16	-	LB	M, LB, RO2
R270	Perthville	Rec5 400-800m	35	30	30	45	45	35	35	0	10	10	10	15	15	-	LB	M, LB, RO2
R272	Perthville	Rec5 400-800m	35	30	30	45	45	35	35	0	10	10	10	15	15	-	LB	M, LB, RO2
R283	Perthville	Rec5 400-800m	35	30	30	42	45	35	35	-3	7	7	7	12	12	-	LB	M, LB, RO2
R284	Perthville	Rec5 400-800m	35	30	30	42	45	35	35	-3	7	7	7	12	12	-	LB	M, LB, RO2
R267	Perthville	Rec6 >800m	35	30	30	40	45	35	35	-5	5	5	5	10	10	-	-	LB
R268	Perthville	Rec6 >800m	35	30	30	41	45	35	35	-4	6	6	6	11	11	-	LB	M, LB, RO2
R275	Perthville	Rec6 >800m	35	30	30	42	45	35	35	-3	7	7	7	12	12	-	LB	M, LB, RO2
R276	Perthville	Rec6 >800m	35	30	30	40	45	35	35	-5	5	5	5	10	10	-	-	LB
R278	Perthville	Rec6 >800m	35	30	30	37	45	35	35	-8	2	2	2	7	7	-	-	LB
R279	Perthville	Rec6 >800m	35	30	30	41	45	35	35	-4	6	6	6	11	11	-	LB	M, LB, RO2
R280	Perthville	Rec6 >800m	35	30	30	41	45	35	35	-4	6	6	6	11	11	-	LB	M, LB, RO2
R281	Perthville	Rec6 >800m	35	30	30	37	45	35	35	-8	2	2	2	7	7	-	-	LB
R282	Perthville	Rec6 >800m	35	30	30	35	45	35	35	-10	0	0	0	5	5	-	-	LB
R112	Portland	Rec1 <50m	35	30	30	62	45	35	35	17	27	27	27	32	32	LB, M	M, IB, LB, RO, PC, SN, R	AA, M, IB, LB, PC, SN, RO
R113	Portland	Rec1 <50m	35	30	30	60	45	35	35	15	25	25	25	30	30	LB, M	M, LB	M, IB, LB, PC, SN, RO2
R134	Portland	Rec1 <50m	35	30	30	62	45	35	35	17	27	27	27	32	32	LB, M	M, IB, LB, RO, PC, SN, R	AA, M, IB, LB, PC, SN, RO
R135	Portland	Rec1 <50m	35	30	30	68	45	35	35	23	33	33	33	38	38	LB, M	M, IB, LB, RO, PC, SN, R	AA, M, IB, LB, PC, SN, RO
R293	Portland	Rec1 <50m	35	30	30	63	45	35	35	18	28	28	28	33	33	LB, M	M, IB, LB, RO, PC, SN, R	AA, M, IB, LB, PC, SN, RO
R48	Portland	Rec1 <50m	35	30	30	75	45	35	35	30	40	40	40	45	45	LB, M	M, IB, LB, RO, PC, SN, R	AA, M, IB, LB, PC, SN, RO
R55	Portland	Rec1 <50m	35	30	30	61	45	35	35	16	26	26	26	31	31	LB, M	M, IB, LB, RO, PC, SN, R	AA, M, IB, LB, PC, SN, RO

Rec ID	Catchment	Offset	RBL Day	RBL Eve	RBL Night	PNL BR	NML Day	NML P1	NML P2	NL-NML D	NL-NML P	NL-NML P	PNL - RBL Std	PNL-RBL P1	PNL-RBL P2	AMMM Std	AMMM P1	AMMM P2
R109	Portland	Rec2 50-100m	35	30	30	57	45	35	35	12	22	22	22	27	27	LB, M	M, LB	M, IB, LB, PC, SN, RO2
R110	Portland	Rec2 50-100m	35	30	30	59	45	35	35	14	24	24	24	29	29	LB, M	M, LB	M, IB, LB, PC, SN, RO2
R111	Portland	Rec2 50-100m	35	30	30	58	45	35	35	13	23	23	23	28	28	LB, M	M, LB	M, IB, LB, PC, SN, RO2
R46	Portland	Rec2 50-100m	35	30	30	60	45	35	35	15	25	25	25	30	30	LB, M	M, LB	M, IB, LB, PC, SN, RO2
R47	Portland	Rec2 50-100m	35	30	30	59	45	35	35	14	24	24	24	29	29	LB, M	M, LB	M, IB, LB, PC, SN, RO2
R114	Portland	Rec3 100-200m	35	30	30	54	45	35	35	9	19	19	19	24	24	-	M, LB	M, IB, LB, PC, SN, RO2
R45	Portland	Rec3 100-200m	35	30	30	54	45	35	35	9	19	19	19	24	24	-	M, LB	M, IB, LB, PC, SN, RO2
R49	Portland	Rec3 100-200m	35	30	30	53	45	35	35	8	18	18	18	23	23	-	M, LB	M, IB, LB, PC, SN, RO2
R56	Portland	Rec3 100-200m	35	30	30	55	45	35	35	10	20	20	20	25	25	-	M, LB	M, IB, LB, PC, SN, RO2
R57	Portland	Rec3 100-200m	35	30	30	55	45	35	35	10	20	20	20	25	25	-	M, LB	M, IB, LB, PC, SN, RO2
R58	Portland	Rec3 100-200m	35	30	30	52	45	35	35	7	17	17	17	22	22	-	M, LB	M, IB, LB, PC, SN, RO2
R59	Portland	Rec3 100-200m	35	30	30	48	45	35	35	3	13	13	13	18	18	-	LB	M, LB, RO2
R61	Portland	Rec3 100-200m	35	30	30	53	45	35	35	8	18	18	18	23	23	-	M, LB	M, IB, LB, PC, SN, RO2
R62	Portland	Rec3 100-200m	35	30	30	49	45	35	35	4	14	14	14	19	19	-	LB	M, LB, RO2
R63	Portland	Rec3 100-200m	35	30	30	57	45	35	35	12	22	22	22	27	27	LB, M	M, LB	M, IB, LB, PC, SN, RO2
R64	Portland	Rec3 100-200m	35	30	30	54	45	35	35	9	19	19	19	24	24	-	M, LB	M, IB, LB, PC, SN, RO2
R69	Portland	Rec3 100-200m	35	30	30	54	45	35	35	9	19	19	19	24	24	-	M, LB	M, IB, LB, PC, SN, RO2
R102	Portland	Rec4 200-400m	35	30	30	48	45	35	35	3	13	13	13	18	18	-	LB	M, LB, RO2
R107	Portland	Rec4 200-400m	35	30	30	47	45	35	35	2	12	12	12	17	17	-	LB	M, LB, RO2
R108	Portland	Rec4 200-400m	35	30	30	50	45	35	35	5	15	15	15	20	20	-	LB	M, LB, RO2
R115	Portland	Rec4 200-400m	35	30	30	53	45	35	35	8	18	18	18	23	23	-	M, LB	M, IB, LB, PC, SN, RO2
R116	Portland	Rec4 200-400m	35	30	30	48	45	35	35	3	13	13	13	18	18	-	LB	M, LB, RO2
R117	Portland	Rec4 200-400m	35	30	30	48	45	35	35	3	13	13	13	18	18	-	LB	M, LB, RO2
R118	Portland	Rec4 200-400m	35	30	30	47	45	35	35	2	12	12	12	17	17	-	LB	M, LB, RO2
R132	Portland	Rec4 200-400m	35	30	30	42	45	35	35	-3	7	7	7	12	12	-	LB	M, LB, RO2
R133	Portland	Rec4 200-400m	35	30	30	50	45	35	35	5	15	15	15	20	20	-	LB	M, LB, RO2
R42	Portland	Rec4 200-400m	35	30	30	52	45	35	35	7	17	17	17	22	22	-	M, LB	M, IB, LB, PC, SN, RO2
R50	Portland	Rec4 200-400m	35	30	30	48	45	35	35	3	13	13	13	18	18	-	LB	M, LB, RO2
R53	Portland	Rec4 200-400m	35	30	30	46	45	35	35	1	11	11	11	16	16	-	LB	M, LB, RO2
R60	Portland	Rec4 200-400m	35	30	30	51	45	35	35	6	16	16	16	21	21	-	M, LB	M, IB, LB, PC, SN, RO2
R65	Portland	Rec4 200-400m	35	30	30	47	45	35	35	2	12	12	12	17	17	-	LB	M, LB, RO2
R66	Portland	Rec4 200-400m	35	30	30	47	45	35	35	2	12	12	12	17	17	-	LB	M, LB, RO2
R100	Portland	Rec5 400-800m	35	30	30	46	45	35	35	1	11	11	11	16	16	-	LB	M, LB, RO2
R101	Portland	Rec5 400-800m	35	30	30	47	45	35	35	2	12	12	12	17	17	-	LB	M, LB, RO2
R104	Portland	Rec5 400-800m	35	30	30	42	45	35	35	-3	7	7	7	12	12	-	LB	M, LB, RO2
R105	Portland	Rec5 400-800m	35	30	30	43	45	35	35	-2	8	8	8	13	13	-	LB	M, LB, RO2
R106	Portland	Rec5 400-800m	35	30	30	45	45	35	35	0	10	10	10	15	15	-	LB	M, LB, RO2
R119	Portland	Rec5 400-800m	35	30	30	45	45	35	35	0	10	10	10	15	15	-	LB	M, LB, RO2
R120	Portland	Rec5 400-800m	35	30	30	44	45	35	35	-1	9	9	9	14	14	-	LB	M, LB, RO2
R121	Portland	Rec5 400-800m	35	30	30	43	45	35	35	-2	8	8	8	13	13	-	LB	M, LB, RO2
R125	Portland	Rec5 400-800m	35	30	30	42	45	35	35	-3	7	7	7	12	12	-	LB	M, LB, RO2
R126	Portland	Rec5 400-800m	35	30	30	42	45	35	35	-3	7	7	7	12	12	-	LB	M, LB, RO2
R127	Portland	Rec5 400-800m	35	30	30	42	45	35	35	-3	7	7	7	12	12	-	LB	M, LB, RO2
R131	Portland	Rec5 400-800m	35	30	30	47	45	35	35	2	12	12	12	17	17	-	LB	M, LB, RO2
R51	Portland	Rec5 400-800m	35	30	30	41	45	35	35	-4	6	6	6	11	11	-	LB	M, LB, RO2
R67	Portland	Rec5 400-800m	35	30	30	44	45	35	35	-1	9	9	9	14	14	-	LB	M, LB, RO2
R68	Portland	Rec5 400-800m	35	30	30	44	45	35	35	-1	9	9	9	14	14	-	LB	M, LB, RO2
R70	Portland	Rec5 400-800m	35	30	30	43	45	35	35	-2	8	8	8	13	13	-	LB	M, LB, RO2
R71	Portland	Rec5 400-800m	35	30	30	44	45	35	35	-1	9	9	9	14	14	-	LB	M, LB, RO2
R72	Portland	Rec5 400-800m	35	30	30	45	45	35	35	0	10	10	10	15	15	-	LB	M, LB, RO2
R73	Portland	Rec5 400-800m	35	30	30	45	45	35	35	0	10	10	10	15	15	-	LB	M, LB, RO2
R74	Portland	Rec5 400-800m	35	30	30	44	45	35	35	-1	9	9	9	14	14	-	LB	M, LB, RO2
R75	Portland	Rec5 400-800m	35	30	30	43	45	35	35	-2	8	8	8	13	13	-	LB	M, LB, RO2
R76	Portland	Rec5 400-800m	35	30	30	44	45	35	35	-1	9	9	9	14	14	-	LB	M, LB, RO2
R83	Portland	Rec5 400-800m	35	30	30	44	45	35	35	-1	9	9	9	14	14	-	LB	M, LB, RO2
R85	Portland	Rec5 400-800m	35	30	30	43	45	35	35	-2	8	8	8	13	13	-	LB	M, LB, RO2
R86	Portland	Rec5 400-800m	35	30	30	42	45	35	35	-3	7	7	7	12	12	-	LB	M, LB, RO2
R87	Portland	Rec5 400-800m	35	30	30	42	45	35	35	-3	7	7	7	12	12	-	LB	M, LB, RO2
R94	Portland	Rec5 400-800m	35	30	30	44	45	35	35	-1	9	9	9	14	14	-	LB	M, LB, RO2
R95	Portland	Rec5 400-800m	35	30	30	44	45	35	35	-1	9	9	9	14	14	-	LB	M, LB, RO2
R96	Portland	Rec5 400-800m	35	30	30	41	45	35	35	-4	6	6	6	11	11	-	LB	M, LB, RO2
R98	Portland	Rec5 400-800m	35	30	30	44	45	35	35	-1	9	9	9	14	14	-	LB	M, LB, RO2
R99	Portland	Rec5 400-800m	35	30	30	46	45	35	35	1	11	11	11	16	16	-	LB	M, LB, RO2
R103	Portland	Rec6 >800m	35	30	30	42	45	35	35	-3	7	7	7	12	12	-	LB	M, LB, RO2
R122	Portland	Rec6 >800m	35	30	30	42	45	35	35	-3	7	7	7	12	12	-	LB	M, LB, RO2
R123	Portland	Rec6 >800m	35	30	30	42	45	35	35	-3	7	7	7	12	12	-	LB	M, LB, RO2
R124	Portland	Rec6 >800m	35	30	30	42	45	35	35	-3	7	7	7	12	12	-	LB	M, LB, RO2
R128	Portland	Rec6 >800m	35	30	30	41	45	35	35	-4	6	6	6	11	11	-	LB	M, LB, RO2
R129	Portland	Rec6 >800m	35	30	30	40	45	35	35	-5	5	5	5	10	10	-	-	LB
R130	Portland	Rec6 >800m	35	30	30	40	45	35	35	-5	5	5	5	10	10	-	-	LB
R41	Portland	Rec6 >800m	35	30	30	40	45	35	35	-5	5	5	5	10	10	-	-	LB
R43	Portland	Rec6 >800m	35	30	30	42	45	35	35	-3	7	7	7	12	12	-	LB	M, LB, RO2
R44	Portland	Rec6 >800m	35	30	30	39	45	35	35	-6	4	4	4	9	9	-	-	LB
R52	Portland	Rec6 >800m	35	30	30	38	45	35	35	-7	3	3	3	8	8	-	-	LB
R54	Portland	Rec6 >800m	35	30	30	38	45	35	35	-7	3	3	3	8	8	-	-	LB
R77	Portland	Rec6 >800m	35	30	30	43	45	35	35	-2	8	8	8	13	13	-	LB	M, LB, RO2
R78	Portland	Rec6 >800m	35	30	30	41	45	35	35	-4	6	6	6	11	11	-	LB	M, LB, RO2

Rec ID	Catchment	Offset	RBL Day	RBL Eve	RBL Night	PNL BR	NML Day	NML P1	NML P2	NL-NML D	NL-NML P	NL-NML P	PNL - RBL Std	PNL-RBL P1	PNL-RBL P2	AMMM Std	AMMM P1	AMMM P2
R79	Portland	Rec6 >800m	35	30	30	42	45	35	35	-3	7	7	7	12	12	-	LB	M, LB, RO2
R80	Portland	Rec6 >800m	35	30	30	40	45	35	35	-5	5	5	5	10	10	-	-	LB
R81	Portland	Rec6 >800m	35	30	30	42	45	35	35	-3	7	7	7	12	12	-	LB	M, LB, RO2
R82	Portland	Rec6 >800m	35	30	30	41	45	35	35	-4	6	6	6	11	11	-	LB	M, LB, RO2
R84	Portland	Rec6 >800m	35	30	30	40	45	35	35	-5	5	5	5	10	10	-	-	LB
R88	Portland	Rec6 >800m	35	30	30	41	45	35	35	-4	6	6	6	11	11	-	LB	M, LB, RO2
R89	Portland	Rec6 >800m	35	30	30	41	45	35	35	-4	6	6	6	11	11	-	LB	M, LB, RO2
R90	Portland	Rec6 >800m	35	30	30	41	45	35	35	-4	6	6	6	11	11	-	LB	M, LB, RO2
R91	Portland	Rec6 >800m	35	30	30	41	45	35	35	-4	6	6	6	11	11	-	LB	M, LB, RO2
R92	Portland	Rec6 >800m	35	30	30	41	45	35	35	-4	6	6	6	11	11	-	LB	M, LB, RO2
R93	Portland	Rec6 >800m	35	30	30	39	45	35	35	-6	4	4	4	9	9	-	-	LB
R97	Portland	Rec6 >800m	35	30	30	41	45	35	35	-4	6	6	6	11	11	-	LB	M, LB, RO2
R140	Sunny Corner	Rec2 50-100m	35	30	30	56	45	35	35	11	21	21	21	26	26	LB, M	M, LB	M, IB, LB, PC, SN, RO2
R147	Sunny Corner	Rec2 50-100m	35	30	30	60	45	35	35	15	25	25	25	30	30	LB, M	M, LB	M, IB, LB, PC, SN, RO2
R141	Sunny Corner	Rec3 100-200m	35	30	30	55	45	35	35	10	20	20	20	25	25	-	M, LB	M, IB, LB, PC, SN, RO2
R146	Sunny Corner	Rec3 100-200m	35	30	30	54	45	35	35	9	19	19	19	24	24	-	M, LB	M, IB, LB, PC, SN, RO2
R148	Sunny Corner	Rec3 100-200m	35	30	30	49	45	35	35	4	14	14	14	19	19	-	LB	M, LB, RO2
R136	Sunny Corner	Rec4 200-400m	35	30	30	41	45	35	35	-4	6	6	6	11	11	-	LB	M, LB, RO2
R138	Sunny Corner	Rec4 200-400m	35	30	30	50	45	35	35	5	15	15	15	20	20	-	LB	M, LB, RO2
R139	Sunny Corner	Rec4 200-400m	35	30	30	51	45	35	35	6	16	16	16	21	21	-	M, LB	M, IB, LB, PC, SN, RO2
R144	Sunny Corner	Rec4 200-400m	35	30	30	48	45	35	35	3	13	13	13	18	18	-	LB	M, LB, RO2
R151	Sunny Corner	Rec4 200-400m	35	30	30	49	45	35	35	4	14	14	14	19	19	-	LB	M, LB, RO2
R137	Sunny Corner	Rec5 400-800m	35	30	30	41	45	35	35	-4	6	6	6	11	11	-	LB	M, LB, RO2
R142	Sunny Corner	Rec5 400-800m	35	30	30	47	45	35	35	2	12	12	12	17	17	-	LB	M, LB, RO2
R143	Sunny Corner	Rec5 400-800m	35	30	30	42	45	35	35	-3	7	7	7	12	12	-	LB	M, LB, RO2
R145	Sunny Corner	Rec5 400-800m	35	30	30	38	45	35	35	-7	3	3	3	8	8	-	-	LB
R178	Yetholme	Rec1 <50m	47	37	30	63	57	42	35	6	21	28	16	26	33	-	M, LB	AA, M, IB, LB, PC, SN, RO
R182	Yetholme	Rec1 <50m	47	37	30	63	57	42	35	6	21	28	16	26	33	-	M, LB	AA, M, IB, LB, PC, SN, RO
R184	Yetholme	Rec1 <50m	47	37	30	64	57	42	35	7	22	29	17	27	34	-	M, LB	AA, M, IB, LB, PC, SN, RO
R186	Yetholme	Rec1 <50m	47	37	30	62	57	42	35	5	20	27	15	25	32	-	M, LB	AA, M, IB, LB, PC, SN, RO
R187	Yetholme	Rec1 <50m	47	37	30	60	57	42	35	3	18	25	13	23	30	-	M, LB	M, IB, LB, PC, SN, RO2
R179	Yetholme	Rec2 50-100m	47	37	30	57	57	42	35	0	15	22	10	20	27	-	LB	M, IB, LB, PC, SN, RO2
R149	Yetholme	Rec3 100-200m	47	37	30	55	57	42	35	-2	13	20	8	18	25	-	LB	M, IB, LB, PC, SN, RO2
R150	Yetholme	Rec3 100-200m	47	37	30	52	57	42	35	-5	10	17	5	15	22	-	LB	M, IB, LB, PC, SN, RO2
R181	Yetholme	Rec3 100-200m	47	37	30	56	57	42	35	-1	14	21	9	19	26	-	LB	M, IB, LB, PC, SN, RO2
R152	Yetholme	Rec4 200-400m	47	37	30	48	57	42	35	-9	6	13	1	11	18	-	LB	M, LB, RO2
R156	Yetholme	Rec4 200-400m	47	37	30	46	57	42	35	-11	4	11	-1	9	16	-	-	M, LB, RO2
R165	Yetholme	Rec4 200-400m	47	37	30	46	57	42	35	-11	4	11	-1	9	16	-	-	M, LB, RO2
R171	Yetholme	Rec4 200-400m	47	37	30	46	57	42	35	-11	4	11	-1	9	16	-	-	M, LB, RO2
R172	Yetholme	Rec4 200-400m	47	37	30	50	57	42	35	-7	8	15	3	13	20	-	LB	M, LB, RO2
R183	Yetholme	Rec4 200-400m	47	37	30	52	57	42	35	-5	10	17	5	15	22	-	LB	M, IB, LB, PC, SN, RO2
R154	Yetholme	Rec5 400-800m	47	37	30	42	57	42	35	-15	0	7	-5	5	12	-	-	M, LB, RO2
R155	Yetholme	Rec5 400-800m	47	37	30	45	57	42	35	-12	3	10	-2	8	15	-	-	M, LB, RO2
R157	Yetholme	Rec5 400-800m	47	37	30	43	57	42	35	-14	1	8	-4	6	13	-	-	M, LB, RO2
R158	Yetholme	Rec5 400-800m	47	37	30	41	57	42	35	-16	-1	6	-6	4	11	-	-	M, LB, RO2
R160	Yetholme	Rec5 400-800m	47	37	30	39	57	42	35	-18	-3	4	-8	2	9	-	-	LB
R162	Yetholme	Rec5 400-800m	47	37	30	43	57	42	35	-14	1	8	-4	6	13	-	-	M, LB, RO2
R163	Yetholme	Rec5 400-800m	47	37	30	44	57	42	35	-13	2	9	-3	7	14	-	-	M, LB, RO2
R164	Yetholme	Rec5 400-800m	47	37	30	45	57	42	35	-12	3	10	-2	8	15	-	-	M, LB, RO2
R169	Yetholme	Rec5 400-800m	47	37	30	43	57	42	35	-14	1	8	-4	6	13	-	-	M, LB, RO2
R170	Yetholme	Rec5 400-800m	47	37	30	44	57	42	35	-13	2	9	-3	7	14	-	-	M, LB, RO2
R173	Yetholme	Rec5 400-800m	47	37	30	42	57	42	35	-15	0	7	-5	5	12	-	-	M, LB, RO2
R175	Yetholme	Rec5 400-800m	47	37	30	44	57	42	35	-13	2	9	-3	7	14	-	-	M, LB, RO2
R176	Yetholme	Rec5 400-800m	47	37	30	47	57	42	35	-10	5	12	0	10	17	-	-	M, LB, RO2
R177	Yetholme	Rec5 400-800m	47	37	30	41	57	42	35	-16	-1	6	-6	4	11	-	-	M, LB, RO2
R180	Yetholme	Rec5 400-800m	47	37	30	39	57	42	35	-18	-3	4	-8	2	9	-	-	LB
R185	Yetholme	Rec5 400-800m	47	37	30	46	57	42	35	-11	4	11	-1	9	16	-	-	M, LB, RO2
R194	Yetholme	Rec5 400-800m	47	37	30	44	57	42	35	-13	2	9	-3	7	14	-	-	M, LB, RO2
R153	Yetholme	Rec6 >800m	47	37	30	40	57	42	35	-17	-2	5	-7	3	10	-	-	LB
R159	Yetholme	Rec6 >800m	47	37	30	38	57	42	35	-19	-4	3	-9	1	8	-	-	LB
R161	Yetholme	Rec6 >800m	47	37	30	40	57	42	35	-17	-2	5	-7	3	10	-	-	LB
R166	Yetholme	Rec6 >800m	47	37	30	42	57	42	35	-15	0	7	-5	5	12	-	-	M, LB, RO2
R167	Yetholme	Rec6 >800m	47	37	30	40	57	42	35	-17	-2	5	-7	3	10	-	-	LB
R168	Yetholme	Rec6 >800m	47	37	30	41	57	42	35	-16	-1	6	-6	4	11	-	-	M, LB, RO2
R174	Yetholme	Rec6 >800m	47	37	30	39	57	42	35	-18	-3	4	-8	2	9	-	-	LB
R192	Yetholme	Rec6 >800m	47	37	30	39	57	42	35	-18	-3	4	-8	2	9	-	-	LB
R193	Yetholme	Rec6 >800m	47	37	30	41	57	42	35	-16	-1	6	-6	4	11	-	-	M, LB, RO2

Table 4: Additional Mitigation Measures

Measure	Abbreviation
Alternative accommodation	AA
Monitoring	M
Individual briefings	IB
Letter box drops[10]	LB
Project specific respite offer	RO
Phone calls	PC
Specific notifications	SN

Table 5: AMMM – Airborne construction noise

Time period		Mitigation measures			
		$L_{Aeq(15minute)}$ noise level above background (RBL) Qualitative assessment of noise levels[1]			
		0 to 10 dBA Noticeable	10 to 20 dBA Clearly audible	20 to 30 dBA Moderately intrusive	> 30 dBA Highly intrusive
Standard	Mon-Fri (7am - 6pm)	-	-	LB, M	LB, M
	Sat (8am - 1pm)				
	Sun/Pub Hol (Nil)				
OOHW Period 1	Mon-Fri (6pm - 10pm)	-	LB	M, LB	M, IB, LB, RO, PC, SN, RO[2]
	Sat (7am-8am) & (1pm- 10pm)				
	Sun/Pub Hol (8am - 6pm)				
OOHW Period 2	Mon-Fri (10pm - 7am)	LB	M, LB, RO[2]	M, IB, LB, PC, SN, RO[2]	AA, M, IB, LB, PC, SN, RO
	Sat (10pm - 8am)				
	Sun/Pub Hol (6pm - 7am)				

Notes:

1. For some types of construction activities (refer Appendix B), a qualitative assessment of the potential noise impacts can be undertaken in lieu of detailed noise modelling. For these activities, noise mitigation measures should be evaluated on the basis of the noise levels being noticeable, clearly audible, moderately intrusive or highly intrusive. The qualitative assessment should consider the type of equipment being used, the character of the noise emissions, time of day, the location of the nearest receivers and the noise sensitivity of the nearest receivers. Where a qualitative assessment is being undertaken, this will need to be approved by the Environmental Management Representative.
2. Respite Offers identified in Period 2 for clearly audible (10 to 20dBA) and moderately intrusive (20 to 30dBA) work shall only apply if works are expected to continue for more than 3 consecutive evenings for Period 1 or more than 2 consecutive nights for Period 2.

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