HERRING STORER ACOUSTICS

CLEANAWAY

DARDANUP WASTE FACILITY
CELL 12A, 9 & 10 WORKS APPROVAL APPLICATION

ENVIRONMENTAL ACOUSTIC ASSESSMENT

MARCH 2022

OUR REFERENCE: 29169-2-22038

[redacted]

DOCUMENT CONTROL PAGE

ENVIRONMENTAL ACOUSTIC ASSESSMENT

CLEANAWAY FACILITY; DARDANUP

Job No: 22038

Document Reference: 29169-2-22038

FOR

CLEANAWAY

DOCUMENT INFORMATION			
Author:	Paul Daly	**Checked By:**	[redacted]
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REVISION HISTORY

Revision	Description	Date	Author	Checked
1	Client Comments	9/3/2022	[redacted]	

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CONTENTS

APPENDICIES

1. INTRODUCTION

Herring Storer Acoustics was commissioned by Cleanaway to undertake a noise assessment relating to noise emissions from the Dardanup Waste Disposal Facility. The emissions to be considered in this assessment were the typical operational noise generation (current business as usual) and the anticipated addition noise impact associated with landfill cell construction activities and excavation of stormwater basins in the western portion of the site.

The purpose of this assessment was to assess noise emissions for the current operational activities and proposed landfill cell construction works and stormwater basin works at the facility for compliance with requirements of the *Environmental Protection (Noise) Regulations 1997*. Therefore, this assessment concentrates on compliance with the requirements of the Regulations at noise sensitive premises (residences) in the vicinity of the Facility.

There are no proposed changes to the operations of the Dardanup Landfill Facility; however, occasional landfill cell construction activities have the potential to impact on the noise levels across the site. This assessment concentrates in the potential increased noise emissions from the proposed new landfill cell construction associated with the development of Cells 12A, 9 & 10 and the Stormwater Basins on the western side of the site.

For information, a locality plan is shown in Appendix A.

2. SUMMARY

Assessment of the current operations and the inclusion of anticipated construction noise emissions for the Cleanaway Waste Transfer Facility shows that compliance with the criteria stipulated in the *Environmental Protection (Noise) Regulations 1997*, is achieved at all times.

3. CRITERIA

The allowable noise level for noise sensitive premises in the vicinity of the proposed Facility site is prescribed by the *Environmental Protection (Noise) Regulations 1997*. Regulations 7 and 8 stipulate maximum allowable external noise levels or assigned noise levels that can be received at a premise from another premises. For “highly sensitive area” of a residential premises, this noise level is determined by the calculation of an influencing factor, which is then added to the base levels shown below. The influencing factor is calculated for the usage of land within two circles, having radii of 100m and 450m from the premises of concern. For noise received at noise sensitive premises, “other than highly sensitive area” the assigned noise levels are fixed at all times. The base noise levels for residential premises are listed in Table 3.1.

TABLE 3.1 - BASELINE ASSIGNED OUTDOOR NOISE LEVEL

Premises Receiving Noise	Time of Day	Assigned Level (dB)		
		L_{A10}	L_{A1}	L_{Amax}
Noise sensitive premises: highly sensitive area	0700 - 1900 hours Monday to Saturday (Day)	45 + IF	55 + IF	65 + IF
	0900 - 1900 hours Sunday and Public Holidays (Sunday / Public Holiday Day)	40 + IF	50 + IF	65 + IF
	1900 - 2200 hours all days (Evening)	40 + IF	50 + IF	55 + IF
	2200 hours on any day to 0700 hours Monday to Saturday and 0900 hours Sunday and Public Holidays (Night)	35 + IF	45 + IF	55 + IF
Noise sensitive premises: other than highly sensitive area	At all times	60	75	80

Note: L_{A10} is the noise level exceeded for 10% of the time.
L_{A1} is the noise level exceeded for 1% of the time.
L_{Amax} is the maximum noise level.
IF is the influencing factor.

The "Highly sensitive area" of a noise sensitive premises means:

that area (if any) of noise sensitive premises comprising —

(a) a building, or a part of a building, on the premises that is used for a noise sensitive purpose; and
(b) any other part of the premises within 15 m of that building or that part of the building;

It is a requirement that received noise be free of annoying characteristics (tonality, modulation and impulsiveness), defined below as per Regulation 9.

"impulsiveness" means a variation in the emission of a noise where the difference between L_{Apeak} and $L_{Amax\ Slow}$ is more than 15 dB when determined for a single representative event;

"modulation" means a variation in the emission of noise that –

(a) is more than 3dB $L_{A\ Fast}$ or is more than 3 dB $L_{A\ Fast}$ in any one-third octave band;
(b) is present for more at least 10% of the representative assessment period; and
(c) is regular, cyclic and audible;

"tonality" means the presence in the noise emission of tonal characteristics where the difference between –

(a) the A-weighted sound pressure level in any one-third octave band; and
(b) the arithmetic average of the A-weighted sound pressure levels in the 2 adjacent one-third octave bands,

is greater than 3dB when the sound pressure levels are determined as $L_{Aeq,T}$ levels where the time period T is greater than 10% of the representative assessment period, or greater than 8 dB at any time when the sound pressure levels are determined as $L_{A\ Slow}$ levels.

Where the noise emission is not music, if the above characteristics exist and cannot be practicably removed, then any measured level is adjusted according to Table 3.2 below.

TABLE 3.2 - ADJUSTMENTS TO MEASURED LEVELS

Where tonality is present	Where modulation is present	Where impulsiveness is present
+5 dB(A)	+5 dB(A)	+10 dB(A)

Note: These adjustments are cumulative to a maximum of 15 dB.

The closest neighboring noise sensitive premises are located at more than 450 metres from any commercial or industrial premises. Thus, the Influencing Factor at these residences would be 0 dB. The assigned noise levels would be as for the base assigned noise levels listed in Table 3.1. For clarity, these are shown on Table 3.3, with Figure 3.1 showing the receiver location plan.

TABLE 3.3 - BASELINE ASSIGNED OUTDOOR NOISE LEVEL

Premises Receiving Noise	Time of Day	Assigned Level (dB)		
		L_{A10}	L_{A1}	L_{Amax}
Noise sensitive premises	0700 - 1900 hours Monday to Saturday (Day)	45	55	65
	0900 - 1900 hours Sunday and Public Holidays (Sunday / Public Holiday Day Period)	40	50	65
	1900 - 2200 hours all days (Evening)	40	50	55
	2200 hours on any day to 0700 hours Monday to Saturday and 0900 hours Sunday and Public Holidays (Night)	35	45	55
Noise sensitive premises: other than highly sensitive area	At all times	60	75	80

Note: L_{A10} is the noise level exceeded for 10% of the time.
L_{A1} is the noise level exceeded for 1% of the time.
L_{Amax} is the maximum noise level.

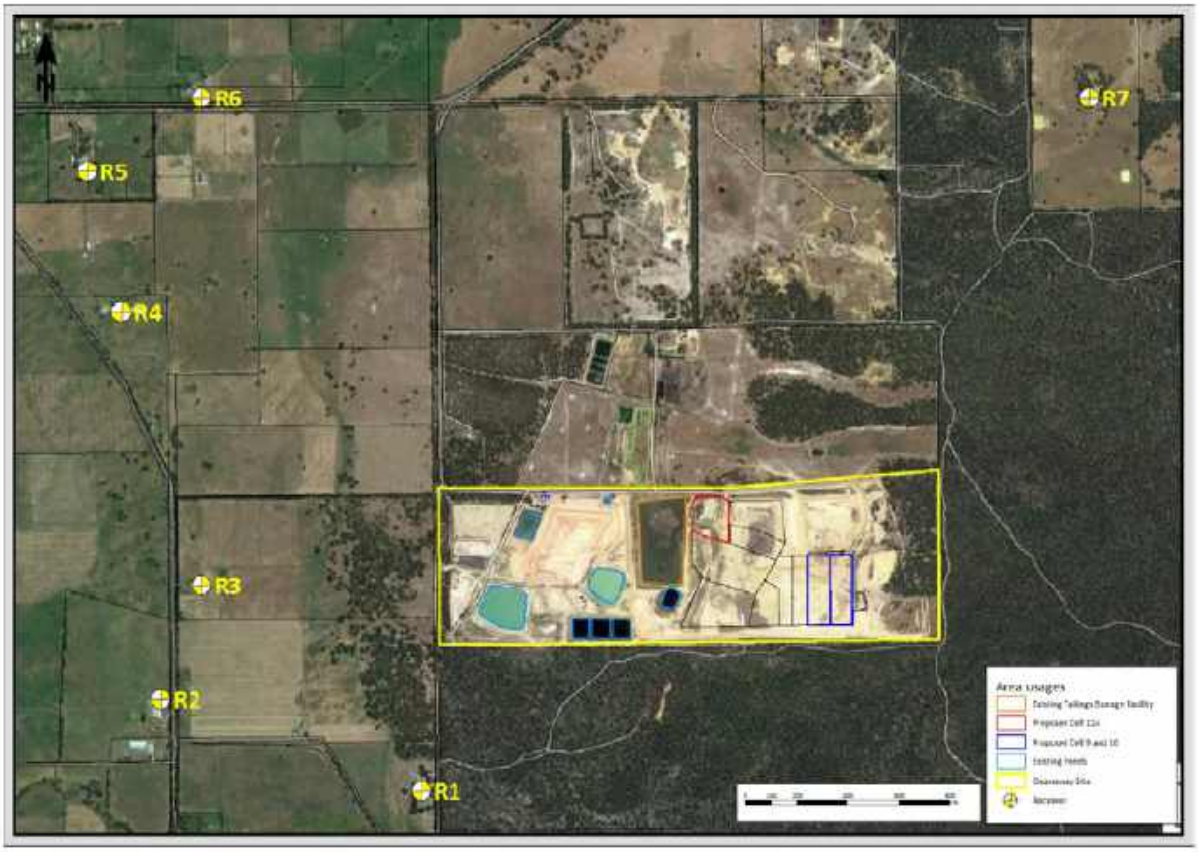


FIGURE 3.1 – RECEIVER LOCATIONS

Additional to the above, it is noted that under the Regulations, where noise received at a premises from a number of different industries, then either the combined noise from all industry needs to comply with the assigned noise levels; or where the combined noise level would lead to an exceedance, then to be deemed compliant with the Regulations, the noise received from those industries contributing to the exceedance need to be considered as NOT "Significantly Contributing" to the noise received at a premises. Under the regulation, to be NOT "Significantly Contributing", the noise received at a premises from that industry needs to be at least 5 dB(A) below the assigned noise.

For information, under the Regulations, "Significantly Contributing" means :

> For the purposes of sub-regulation (1)(a), a noise emission is taken to ***significantly contribute to*** a level of noise if the noise emission as determined under sub-regulation (3) exceeds a value which is 5 dB below the assigned level at the point of reception.

For this development to be considered NOT "Significantly Contributing" to the noise received at the closest neighbouring noise sensitive premises, need to comply with an L_{A10} noise level of 30 dB(A).

Having stated the above, it is noted that at the closest neighbouring premises is located to the south west. At this premises, given the layout of the Industrial Area, the Cleanaway site is the southern most site and given the distances to other potential operations, noise received at this residence would be such that they would not contribute to the noise received. Hence, the "significantly contributing" provisions of the Regulations would not apply at this residence to the south west and the assigned noise levels as stated in Table 3.3 would be the appropriate criteria for compliance.

4. FACILITY

Currently, the hours of operations for the facility are 06:00 to 18:00 hours. Therefore, compliance with the most stringent period (night) i.e. prior to 07:00 on weekdays and Saturdays; and prior to 09:00 on Sundays and Public Holidays, would ensure compliance for all other time periods.

The facility also accepts tailings from mineral sands processing which is delivered to the site up until 20.00 hrs

Construction working hours are limited to 7.00 to 17.00 on Monday to Friday and occasionally between 7.00 to 15.00 on Saturday. There is no construction on Sunday or Public holidays. Consequently, all construction activities occur within the Daytime working period.

Noise monitoring of the current facility (March 2020) resulted in compliance with the regulatory criteria at all neighbouring residential premises, including the most critical at 268 Banksia road.

The proposed change to the site noise emissions, as per this acoustic assessment, is simply the inclusion of construction related noise emissions associated with the construction of landfill Cells 12A, 9 & 10 and the Stormwater Basins.

5. MONITORED NOISE LEVELS

Herring Storer Acoustics was previously commissioned by Cleanaway to undertake a noise assessment relating to noise emissions from the Banksia Road Putrescible Landfill, located on Banksia Road, Crooked Brook. This noise monitoring assessment formed part of the conditions within Licence Approval L8904/2015/1.

To enable the assessment of noise emissions from the current operations, noise level measurements were carried out continuously from the 28th February to the 10th March 2020.

Noise level measurements were conducted using four environmental noise loggers recording continuous noise levels at four different locations. The loggers were set to record continuous noise levels for the assessment period and were time synchronised so that the noise levels at each location were comparable. Weather conditions over the monitoring period were recorded at the Banksia Road facility, with the results used to compare periods of highest noise level propagation. The monitors were also set to record audio files, which were used to confirm noise sources during post analysis.

As this monitoring represents the current operations for the site, it has been used as the basis of this assessment. The report has been included in Appendix D for completeness.

Based on the conditions within the Licence approval, the residential locations are as follows, with Figure 5.1 showing a location plan:

- Res 1 – 268 Banksia Road, Crooked Brook.

FIGURE 5.1 – RESIDENTIAL MONITORING LOCATION STIPULATED IN LICENCE APPROVAL CONDITION 2.5.1(A)

Approval was sought from the owner / residents of the monitoring location by calling at the properties and discussing the details with the resident.

Additional to the residential monitoring location, three monitors were also located at the site and the neighbouring property (industry-based activities). This provided a baseline for noise levels for the landfill facility.

FIGURE 5.2 – REFERENCE LOCATIONS USED FOR THE ASSESSMENT

It is noted that monitor placed in close proximity to the landfill mobile equipment (Location A) failed to capture data for the entire monitoring period. Therefore, noise data results from Location B were used for comparative analysis.

6. MODELLING

6.1 MODELLING SCENARIO

This proposal is subject to the times waste can be received, i.e. 06:00 to 20:00, however, there are various criteria within these times, hence the following time periods and the operations occurring within those periods have been considered:

Night Period (06:00 to 07:00)	Truck arrivals and unloading. During this time the pumps and some of the mobile equipment could at times be operating.
Day Period (07:00 to 19:00)	Truck arrivals and unloading. Full facility operations, including construction of Cells at various stages and the Stormwater Basins.
Sunday Period (09:00 to 20:00)	Limited truck arrivals and unloading. During this time some pumps and a limited number of mobile equipment could be operating.

Notes :

1 The night period stated above is for Monday to Saturday's. The night period also applies from 06:00 to 09:00 on Sundays and Public Holidays.
2 The operations on a Sunday also apply to Public Holidays.

6.2 MODELLING INPUTS

To determine the noise that would be received at the surrounding premises from the facility, modelling of noise emission propagation was carried out using "SoundPlan".

For the operating scenarios, noise modelling was undertaken for each time period listed in Section 6.1 and 6.2.

From site observations and information received from Cleanaway, the items of plant and mobile equipment used on site are listed in Table 6.1 and 6.2. These items form the basis on noise sources within the predictive modelling scenario for the current operations.
Ian Watkins Comment - This table needs to be adjusted to only contain the existing operational activities.

TABLE 6.1 – EXISTING FACILITY PLANT AND EQUIPMENT

Time Period	Plant	Mobile Equipment	Trucks
Weekday Night Period	4x Pumps 2x generators	1 x Compactor 1x D7 Dozer 1x Dump Truck	1x truck 4x Rubbish trucks
Weekday Day Period	4x Pumps 2x generators	2 x Compactor 1x D7 Dozer 1x Dump Truck 1x Track FEL 1x Water Cart	1x Crystal truck 4x Rubbish trucks
Sunday Night Period	4x Pumps 2x generators	1x Water Cart	1x Crystal truck
Sunday Day period	4x Pumps 2x generators	1x Water Cart	1x Crystal truck

Additional to the noise sources noted in Table 6.1, there are activities which operate in order to construct the infrastructure required on site to house the various waste types. For this assessment, consideration has been given to the construction of Cells 12A, 9 and 10 and the Stormwater Basins (western side of site). Figure 6.1 details the areas considered under the construction operations.

Construction activities only occur during the construction hours as per regulatory requirements, i.e. 07:00 to 19:00 weekday and Saturdays. No out of hours, or Sunday / Public Holiday construction work is undertaken at the Cleanaway site.

Information provided for the construction fleet has been included in Table 6.2.

TABLE 6.2 – CONSTRUCTION PLANT AND EQUIPMENT

Time Period	Mobile Equipment
Weekday Days (*07:00 to 17:00) and Saturday (*07:00 to 15:00)	2 x Excavators 45t & 30t (PC450 and PC300 or equivalent) 4 x Moxy Dump Trucks (CAT 740 or equivalent) 1 x Dozer (CAT D8 or equivalent) 1 x Loader (CAT 962 or equivalent) 1 x Grader (CAT 140 or equivalent) 1 x Skid Steer Loader (CAT 287 or equivalent)

*Proposed work times for construction

FIGURE 6.1 – CONSTRUCTION / ACTIVITY AREAS

Based on the information above, the following scenarios have been considered for this assessment:

Scenario 1
Evening / Night Periods (06:00 to 07:00)
Truck arrivals and unloading. During this time the pumps and some of the mobile equipment could at times be operating.

Scenario 2
Day Period (07:00 to 19:00)

A. Truck arrivals and unloading. Full facility operations; and,
B. Noise sources as per scenario A with the inclusion of construction activities for Cell 12A and Stormwater Basins, or
C. Noise sources as per scenario A with the inclusion of construction activities for Cell 9 and Stormwater Basins; or,
D. Noise sources as per scenario A with the inclusion of construction activities for Cell 10 and Stormwater Basins.

Scenario 3
Sunday Period (06:00 to 20:00)
Limited truck arrivals and unloading. During this time some pumps and a limited number of mobile equipment could be operating.

Notes :

1 The night period stated above is for Monday to Saturday's. The night period also applies from 06:00 to 09:00 on Sundays and Public Holidays.
2 The operations on a Sunday also apply to Public Holidays.

The calculations used the following input data:

a) Ground contours (current and future site topography).

b) Sound power levels used in the model were based on either data measured on site, or file data from measurement of the same model of equipment being used. The sound power data is summarised in Table 6.3.

c) DWER worst case day or night weather conditions.

d) Source locations as per Figure 6.1 to Figure 6.5.

TABLE 6.3 – SOUND POWER LEVELS

Item of Plant / Equipment	Sound Power Level (dB(A))
Waste Delivery and Processing	
Compactor	108
Tracked Front End Loader	107
Dump Truck	101
Water Cart	97
Generator Sets	85
Pumps	92
Rubbish Truck	98
Crystal Truck	100
Construction Fleet	
Excavators 45t (PC450 or equivalent)	99
Excavators 30t (PC300 or equivalent)	97
Moxy Dump Trucks (CAT 740 or equivalent)	101
Dozer (CAT D8 or equivalent)	105
Loader (CAT 962 or equivalent)	105
Grader (CAT 140 or equivalent)	100
Skid Steer Loader (CAT 287 or equivalent)	99

Weather conditions for the modelling were undertaken using the "Default Conditions for Noise Modelling" as stipulated within the Environmental Protection Authority's *"Draft Guidance for Environmental Noise for Prescribed Premises"* as listed in Table 6.5.

TABLE 6.5 – WEATHER CONDITIONS

Condition	Night	Day
Temperature	15°C	20°C
Relative humidity	50%	50%
Pasquil Stability Class	F	E
Wind speed	3 m/s*	4 m/s*

* From sources, towards receivers.

FIGURE 6.1 – SCENARIO 1 – NOISE SOURCE LOCATION

FIGURE 6.2 – SCENARIO 2A – NOISE SOURCE LOCATION

FIGURE 6.3 – SCENARIO 2B – NOISE SOURCE LOCATION

FIGURE 6.4 – SCENARIO 2C – NOISE SOURCE LOCATION

FIGURE 6.5 – SCENARIO 3 – NOISE SOURCE LOCATION

7. RESULTS

The results of the noise modelling are attached in Appendix C.

Additionally, for information, the resultant noise level at the worst case receiver for the above scenario is listed in Table 7.1.

TABLE 7.1 – SUMMARY OF RESULTS
WORST CASE RECIEVER

	Scenario	R1	R2	R3	R4	R5	R6
1	Night Operations 06:00 to 07:00	30	26	28	27	22	26
2A	Day Operations 07:00 to 19:00 – No Construction	40	34	36	32	29	31
2B	Day Operations 07:00 to 19:00 – All operations, and construction of Cell 12A and Stormwater Basins	40	34	36	33	30	31
2C	Day Operations 07:00 to 19:00 – All operations, and construction of Cell 9 and 10, 12A and Stormwater Basins	40	34	36	33	29	31
3	Sunday Operations 06:00 to 20:00	32	24	26	21	16	21

8. ANALYSIS / ASSESSMENT

Based on calculated noise levels at the nearest premises, noise levels could be considered as being tonal in characteristics. Therefore, a +5 dB(A) penalty has been included to allow for a tonal component.

Hence, Table 8.1 summarises the applicable Assigned Noise Levels, and assessable noise level emissions, for the scenario considered.

TABLE 8.1 – ASSESSABLE NOISE LEVEL WITH TONAL PENALTY APPLIED

	Scenario	R1	R2	R3	R4	R5	R6
1	Night Operations 06:00 to 07:00	35	31	33	32	27	31
2A	Day Operations 07:00 to 19:00 – No Construction	45	39	41	37	34	36
2B	Day Operations 07:00 to 19:00 – All operations, and construction of Cell 12A	45	39	41	38	35	36
2C	Day Operations 07:00 to 19:00 – All operations, and construction of Cell 9 and 10	45	39	41	38	34	36
3	Sunday Operations 06:00 to 20:00	37	29	31	26	21	26

Based on the assessable noise level above, comparison against the relevant assigned noise level is contained in Table 8.2.

TABLE 8.2 – ASSESSMENT OF NOISE LEVELS

	Scenario	R1	R2	R3	R4	R5	R6	Assigned L_{A10} Level (dB)	Compliance
1	Night Operations 06:00 to 07:00	35	31	33	32	27	31	35	Complies
2A	Day Operations 07:00 to 19:00 – No Construction	45	39	41	37	34	36	45	Complies
2B	Day Operations 07:00 to 19:00 – All operations, and construction of Cell 12A and Stormwater Basins	45	39	41	38	35	36	45	Complies
2C	Day Operations 07:00 to 19:00 – All operations, and construction of Cell 9 and 10 and Stormwater Basins	45	39	41	38	34	36	45	Complies
3	Sunday Operations 06:00 to 20:00	37	29	31	26	21	26	35	Complies

9. CONCLUSION

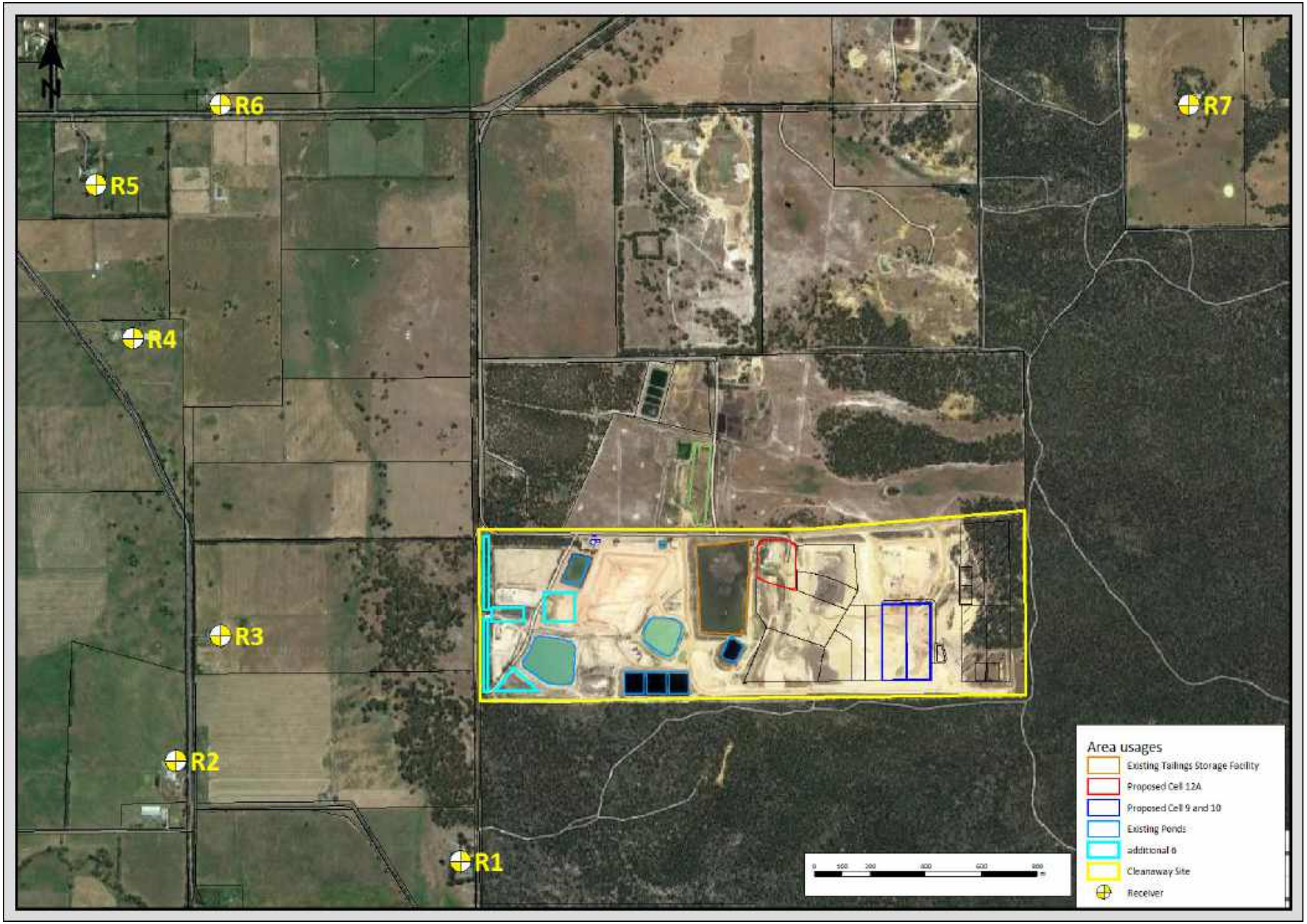
Assessment has been conducted on the noise emissions from the Cleanaway Dardanup Waste Facility for the existing operations.

The facility operates between 6 am and 6pm seven days per week. However, there are various operating scenarios that occur during the day and on Sundays / Public Holidays.

Noise modelling and assessment of the noise emissions from the various operating conditions has been undertaken. The results of that assessment shows that noise emissions from the facility will comply with the requirements of the *Environmental Protection (Noise) Regulations 1997* at all times.

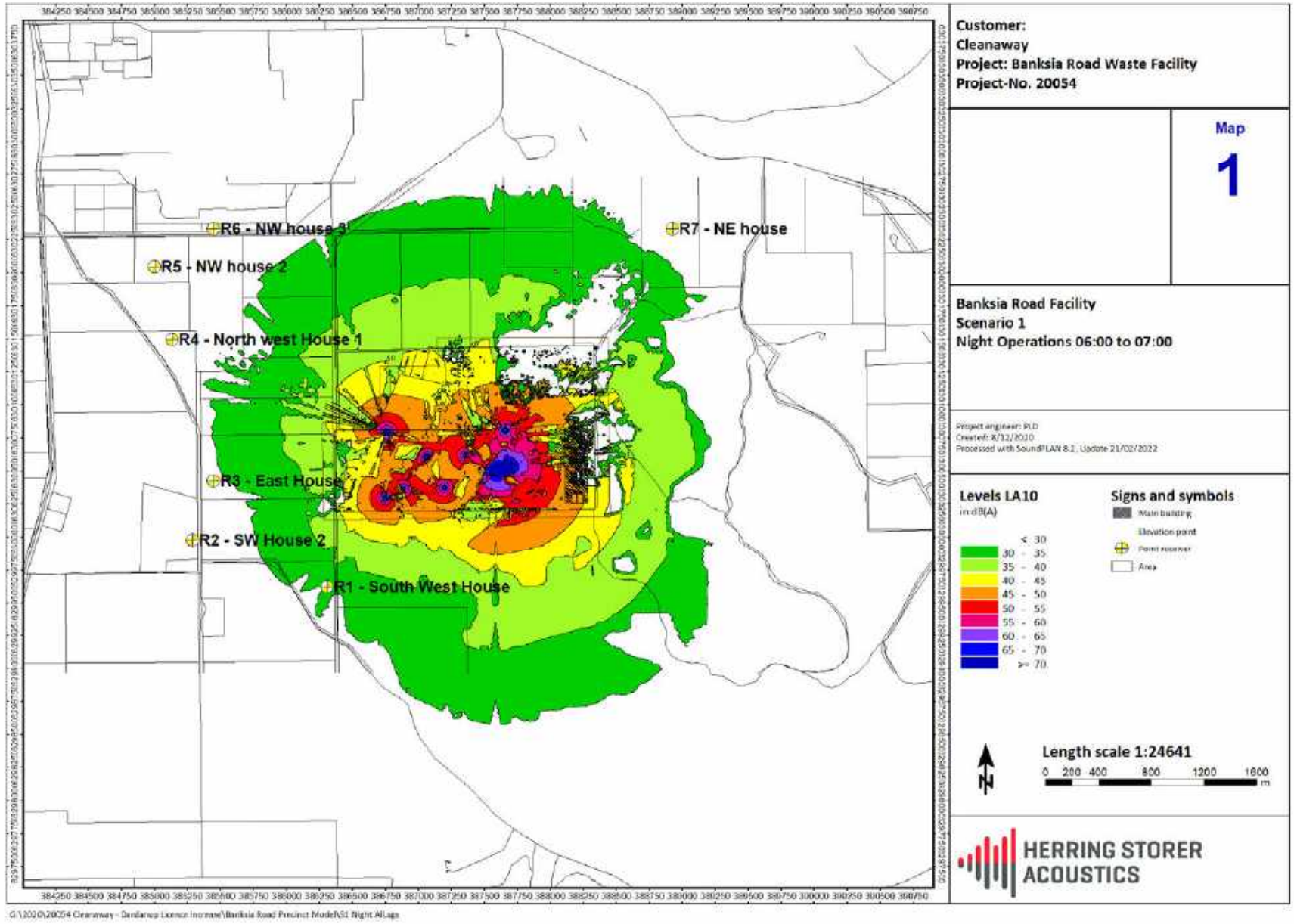
APPENDIX A

LOCATION MAPS / REFERENCE LOCATIONS


N
R6
R7
R5
R4
R3
R2
R1
Area usages
Existing Tailings Storage Facility
Proposed Cell 12A
Proposed Cell 9 and 10
Existing Ponds
additional 6
Cleanaway Site
Receiver

APPENDIX B

NOISE CONTOUR PLOT



Customer:
Cleanaway
Project: Banksia Road Waste Facility
Project-No. 20054

Map
1

Banksia Road Facility
Scenario 1
Night Operations 06:00 to 07:00

Project engineer: PLD
Created: 8/12/2020
Processed with SoundPLAN 8.2, Update 21/02/2022

Levels LA10
in dB(A)

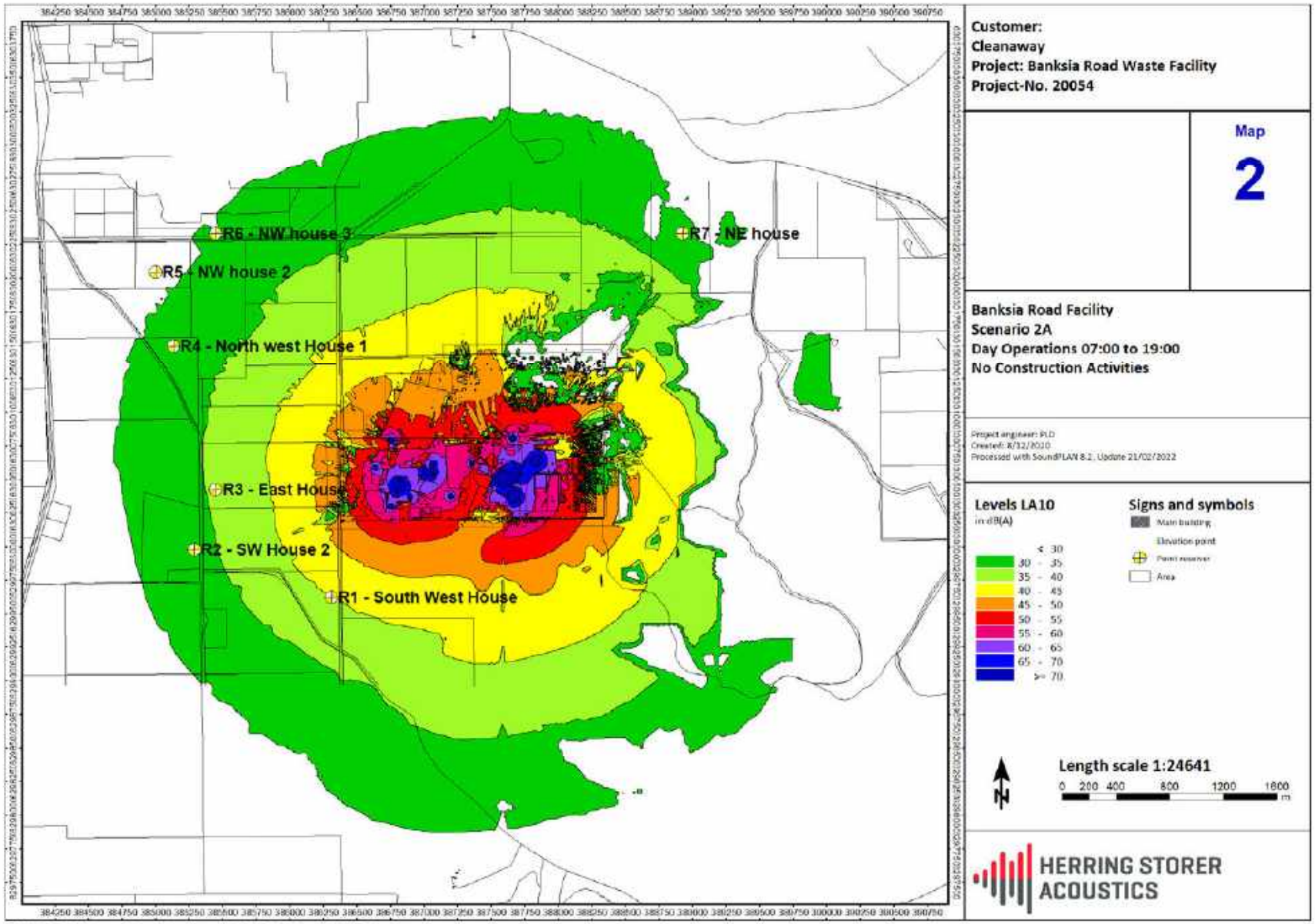
< 30
30 - 35
35 - 40
40 - 45
45 - 50
50 - 55
55 - 60
60 - 65
65 - 70
>= 70

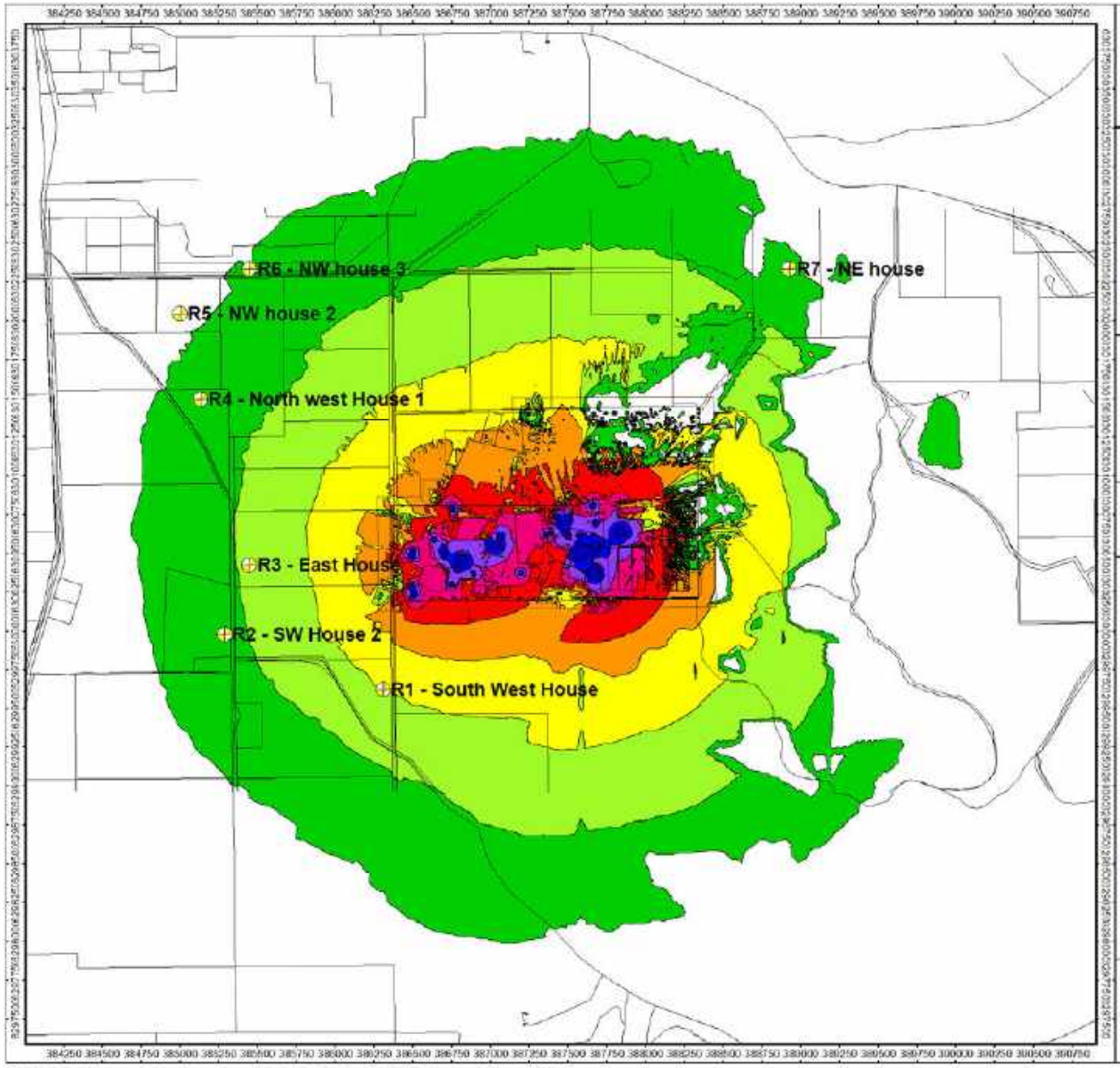
Signs and symbols
Main building
Elevation point
Point receiver
Area

Length scale 1:24641
0 200 400 800 1200 1600 m

HERRING STORER ACOUSTICS

G:\2020\20054 Cleanaway - Banksia Licence Increase\Banksia Road Precinct Model\S1 Night All.sgs


R6 - NW house 3
R7 - NE house
R5 - NW house 2
R4 - North west House 1
R3 - East House
R2 - SW House 2
R1 - South West House
Customer:
Cleanaway
Project: Banksia Road Waste Facility
Project-No. 20054
Map
2
Banksia Road Facility
Scenario 2A
Day Operations 07:00 to 19:00
No Construction Activities
Project engineer: RLD
Created: 8/12/2020
Processed with SoundPLAN 8.2, Update 21/02/2022
Levels LA10
in dB(A)
< 30
30 - 35
35 - 40
40 - 45
45 - 50
50 - 55
55 - 60
60 - 65
65 - 70
>= 70
Signs and symbols
Main building
Elevation point
Point receiver
Area
Length scale 1:24641
0 200 400 800 1200 1600
m
HERRING STORER
ACOUSTICS
G:\2020\20054 Cleanaway - Dandenong Licence Increase\Banksia Road Precinct Model\S2 Day Current.sgs



Customer:
Cleanaway
Project: Banksia Road Waste Facility
Project-No. 20054

Map
2B

Banksia Road Facility
Scenario 2B
Day Operations 07:00 to 19:00
With Construction in Cell 12A

Project engineer: RLD
Created: 4/03/2022
Processed with SoundPLAN 8.2, Update 21/02/2022

Levels LA10
in dB(A)

< 30
30 - 35
35 - 40
40 - 45
45 - 50
50 - 55
55 - 60
60 - 65
65 - 70
>= 70

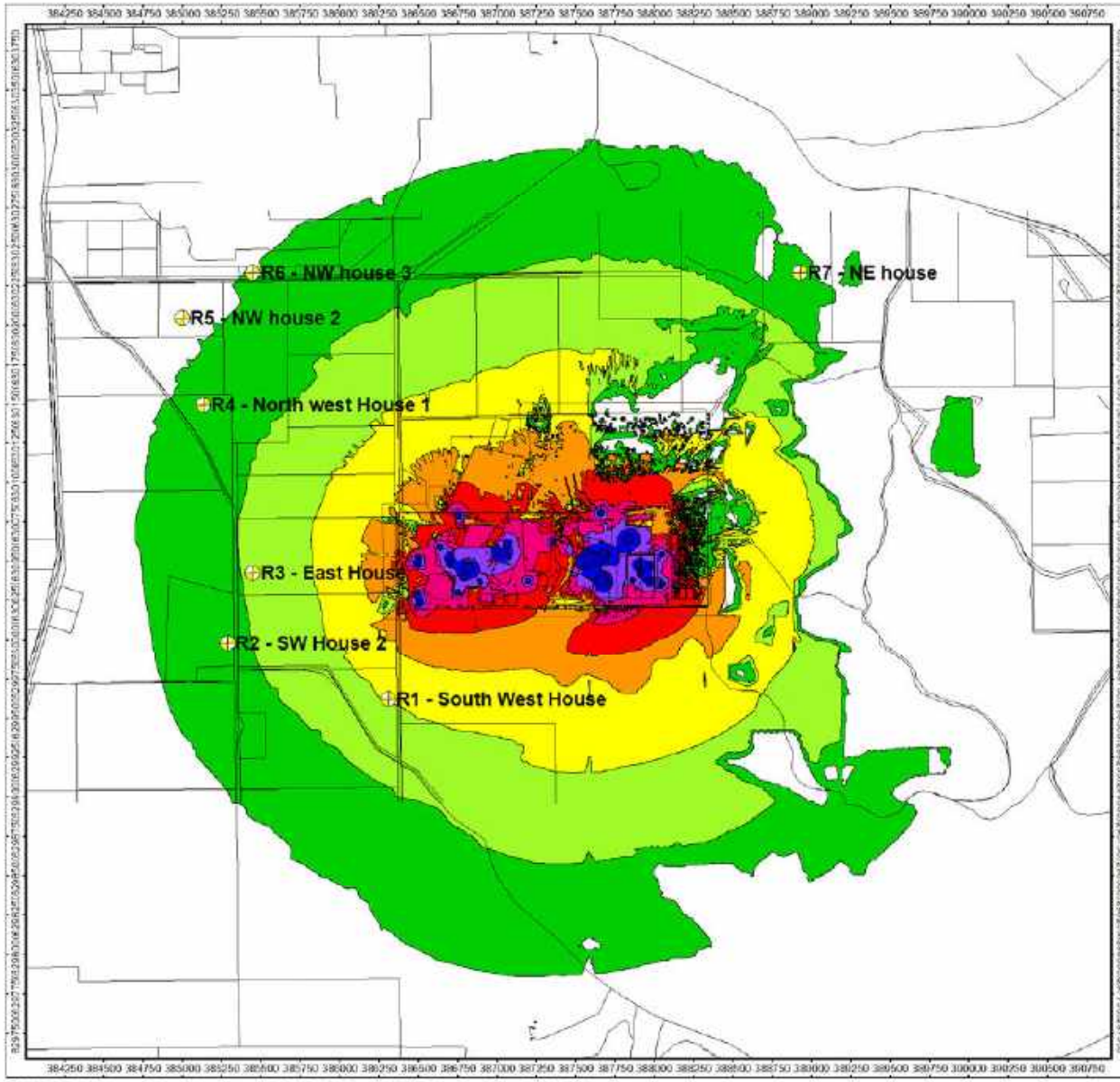
Signs and symbols
Main building
Elevation point
Point receiver
Area

N

Length scale 1:24641
0 200 400 800 1200 1600 m

HERRING STORER ACOUSTICS

G:\2020\20054 Cleanaway - Dandenong Licence Increase\Banksia Road Precinct Model\S2 Day Current with Const Cell 12A.sgs



Customer:
Cleanaway
Project: Banksia Road Waste Facility
Project-No. 20054

Map
2C

Banksia Road Facility
Scenario 2C
Day Operations 07:00 to 19:00
With Construction in Cell 9 and 10

Project engineer: RLD
Created: 4/03/2022
Processed with SoundPLAN 8.2, Update 21/02/2022

Levels LA10
in dB(A)

< 30
30 - 35
35 - 40
40 - 45
45 - 50
50 - 55
55 - 60
60 - 65
65 - 70
>= 70

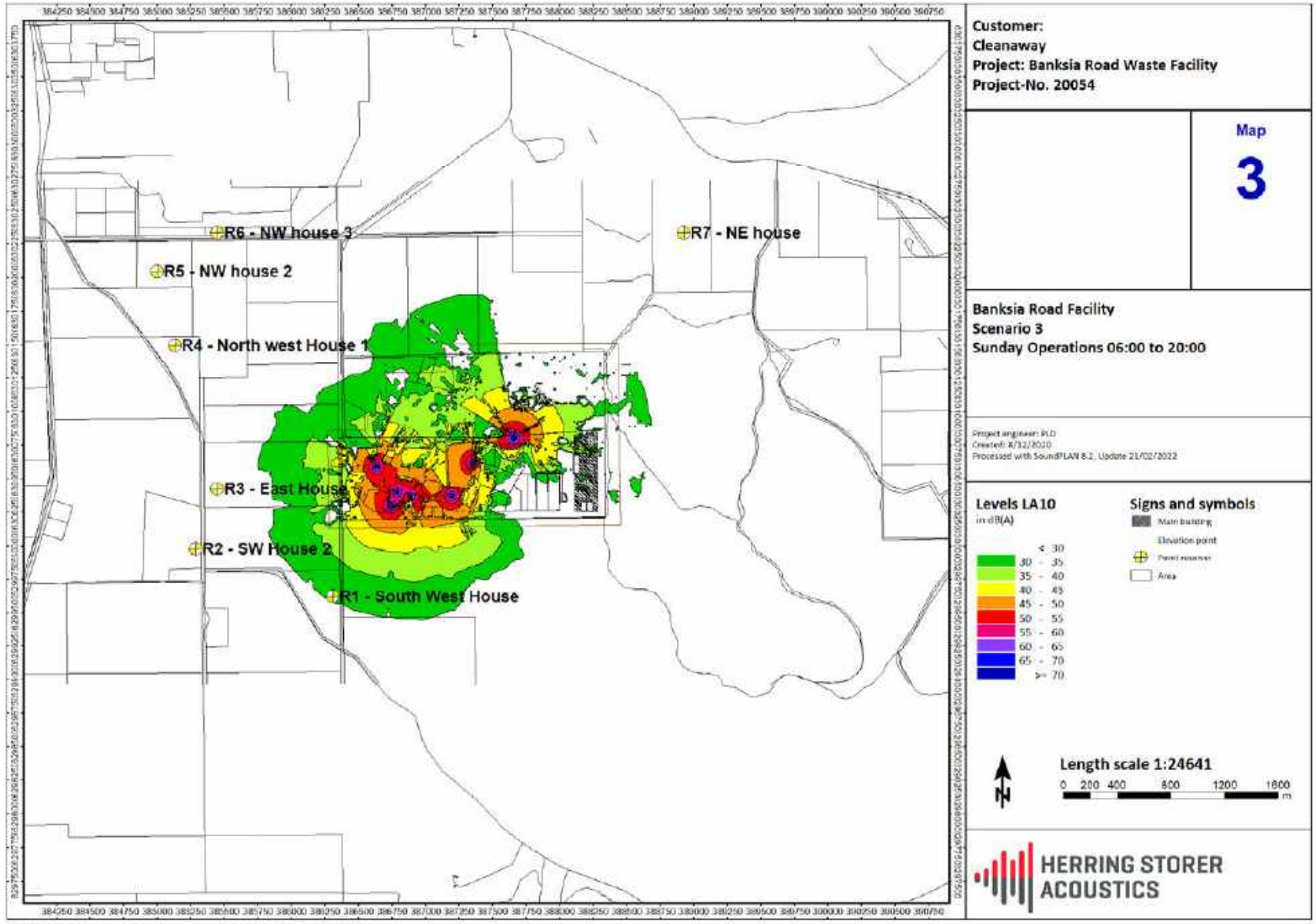
Signs and symbols
Main building
Elevation point
Point receiver
Area

N

Length scale 1:24641
0 200 400 800 1200 1600 m

HERRING STORER ACOUSTICS

G:\2020\20054 Cleanaway - Dandenong Licence Increase\Banksia Road Precinct Model\S2 Day Current with Const Cell 9 and 10.sgs


R6 - NW house 3
R7 - NE house
R5 - NW house 2
R4 - North west House 1
R3 - East House
R2 - SW House 2
R1 - South West House
Customer:
Cleanaway
Project: Banksia Road Waste Facility
Project-No. 20054
Map
3
Banksia Road Facility
Scenario 3
Sunday Operations 06:00 to 20:00
Project engineer: PLD
Created: 8/12/2020
Processed with SoundPLAN 8.2, Update 21/02/2022
Levels LA10
in dB(A)
≤ 30
30 - 35
35 - 40
40 - 45
45 - 50
50 - 55
55 - 60
60 - 65
65 - 70
≥ 70
Signs and symbols
Main building
Elevation point
Point receiver
Area
Length scale 1:24641
0 200 400 800 1200 1600 m
N
HERRING STORER ACOUSTICS
G:\2020\20054 Cleanaway - Banksia Licence Increase\Banksia Road Precinct Model\S3 Sunday.cgs

APPENDIX D

ASSESSMENT BASED ON CONDITIONS WITHIN LICENCE APPROVAL
L8904/2015/1

HERRING STORER ACOUSTICS

CLEANAWAY

BANKSIA ROAD PUTRESCIBLE LANDFILL
BANKSIA ROAD
CROOKED BROOK

LICENCE CONDITION
NOISE MONITORING

ACOUSTIC ASSESSMENT

MARCH 2020

OUR REFERENCE: 25566-2-20055

[redacted]

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ACOUSTIC ASSESSMENT

BANKSIA ROAD FACILITY

Job No: 20055

Document Reference: 25566-2-20055

FOR

CLEANAWAY

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APPENDICIES

- ## INTRODUCTION

Herring Storer Acoustics was commissioned by Cleanaway to undertake a noise assessment relating to noise emissions from the Banksia Road Putrescible Landfill, located on Banksia Road, Crooked Brook.

The focus of this assessment was at residential premises located to the south west of the facility. Continuous noise levels were recorded at the residences over an approximate one-week period. The noise levels were related to continuous monitoring conducted at a location within the Banksia Road Landfill Site.

This noise monitoring assessment forms part of the conditions within Licence Approval L8904/2015/1.

For information, a locality plan is shown in Appendix A.

- ## SUMMARY

Assessment of the current operations for the Banksia Road Landfill Site shows that compliance at the residential locations is achieved with the criteria stipulated in the Environmental Protection (Noise) Regulations 1997, for all hours. This correlates with the predictive noise modelling developed for the Licence Approval (HSA reference 24762-2-19122-02).

- ## CRITERIA

The allowable noise level at the surrounding locales is prescribed by the Environmental Protection (Noise) Regulations 1997. Regulations 7 & 8 stipulate maximum allowable external noise levels determined by the calculation of an influencing factor, which is then added to the base levels shown below. The influencing factor is calculated for the usage of land within two circles, having radii of 100m and 450m from the premises of concern.

TABLE 3.1 - BASELINE ASSIGNED OUTDOOR NOISE LEVEL

Premises Receiving Noise	Time of Day	Assigned Level (dB)		
		L_{A10}	L_{A1}	L_{Amax}
Noise sensitive premises	0700 - 1900 hours Monday to Saturday (Day)	45 + IF	55 + IF	65 + IF
	0900 - 1900 hours Sunday and Public Holidays (Sunday / Public Holiday Day Period)	40 + IF	50 + IF	65 + IF
	1900 - 2200 hours all days (Evening)	40 + IF	50 + IF	55 + IF
	2200 hours on any day to 0700 hours Monday to Saturday and 0900 hours Sunday and Public Holidays (Night)	35 + IF	45 + IF	55 + IF
Industrial and Utility Premises	All Hours	65	80	90

Note: L_{A10} is the noise level exceeded for 10% of the time.
L_{A1} is the noise level exceeded for 1% of the time.
L_{Amax} is the maximum noise level.
IF is the influencing factor.

It is a requirement that received noise be free of annoying characteristics (tonality, modulation and impulsiveness), defined below as per Regulation 9.

"impulsiveness" *means a variation in the emission of a noise where the difference between L_{Apeak} and $L_{Amax\ Slow}$ is more than 15 dB when determined for a single representative event;*

"modulation" *means a variation in the emission of noise that –*

(d) is more than 3dB $L_{A\ Fast}$ or is more than 3 dB $L_{A\ Fast}$ in any one-third octave band;
(e) is present for more at least 10% of the representative assessment period; and
(f) is regular, cyclic and audible;

"tonality" *means the presence in the noise emission of tonal characteristics where the difference between –*

(c) the A-weighted sound pressure level in any one-third octave band; and
(d) the arithmetic average of the A-weighted sound pressure levels in the 2 adjacent one-third octave bands,

is greater than 3dB when the sound pressure levels are determined as $L_{Aeq,T}$ levels where the time period T is greater than 10% of the representative assessment period, or greater than 8 dB at any time when the sound pressure levels are determined as $L_{A\ Slow}$ levels.

Where the noise emission is not music, if the above characteristics exist and cannot be practicably removed, then any measured level is adjusted according to Table 3.2 below.

TABLE 3.2 - ADJUSTMENTS TO MEASURED LEVELS

*Where **tonality** is present*	*Where **modulation** is present*	*Where **impulsiveness** is present*
+5 dB(A)	*+5 dB(A)*	*+10 dB(A)*

Note: These adjustments are cumulative to a maximum of 15 dB.

The closest neighboring noise sensitive premises are located at more than 450 metres from any commercial or industrial premises. Thus, the Influencing Factor at these residences would be 0dB. Thus, the assigned noise levels would be as for the base assigned noise levels listed in Table 3.1. For clarity, these are shown on Table 3.3.

TABLE 3.3 - BASELINE ASSIGNED OUTDOOR NOISE LEVEL

Premises Receiving Noise	***Time of Day***	***Assigned Level (dB)***		
		L_{A10}	L_{A1}	L_{Amax}
Noise sensitive premises	*0700 - 1900 hours Monday to Saturday (Day)*	*45*	*55*	*65*
	0900 - 1900 hours Sunday and Public Holidays (Sunday / Public Holiday Day Period)	*40*	*50*	*65*
	1900 - 2200 hours all days (Evening)	*40*	*50*	*55*
	2200 hours on any day to 0700 hours Monday to Saturday and 0900 hours Sunday and Public Holidays (Night)	*35*	*45*	*55*
Noise sensitive premises: other than highly sensitive area	*At all times*	*60*	*75*	*80*

Note: L_{A10} *is the noise level exceeded for 10% of the time.*
L_{A1} *is the noise level exceeded for 1% of the time.*
L_{Amax} *is the maximum noise level.*

Additional to the above, it is noted that under the Regulations, where noise received at a premises from a number of different industries, then either the combined noise from all industry needs to comply with the assigned noise levels; or where the combined noise level would lead to an exceedance, then to be deemed compliant with the Regulations, the noise received from those industries contributing to the exceedance need to be considered as NOT "Significantly Contributing" to the noise received at a premises. Under the regulation, to be NOT "Significantly Contributing", the noise received at a premises from that industry needs to be at least 5 dB(A) below the assigned noise.

For information, under the Regulations, "Significantly Contributing" means :

> *For the purposes of sub-regulation (1)(a), a noise emission is taken to **significantly contribute to** a level of noise if the noise emission as determined under sub-regulation (3) exceeds a value which is 5 dB below the assigned level at the point of reception.*

For this development to be considered NOT "Significantly Contributing" to the noise received at the closest neighbouring noise sensitive premises, need to comply with an L_{A10} noise level of 30 dB(A).

Having stated the above, it is noted that at the closest neighbouring premises is located to the south west. At this premises, given the layout of the Industrial Area, the Cleanaway site is the southern most site and given the distances to other potential operations, noise received at this residence would be such that they would not contribute to the noise received. Hence, the "significantly contributing" provisions of the Regulations would not apply at this residence to the south west and the assigned noise levels as stated in Table 3.3 would be the appropriate criteria for compliance.

- *<u>MONITORED / MEASURED NOISE LEVELS</u>*

To enable the assessment of noise emissions from the current operations, noise level measurements were carried out continuously from the 28th February to the 10th March 2020.

Noise level measurements were conducted using four environmental noise loggers recording continuous noise levels at four different locations. The loggers were set to record continuous noise levels for the assessment period and were time synchronised so that the noise levels at each location were comparable. Weather conditions over the monitoring period were recorded at the Banksia Road facility, with the results used to compare periods of highest noise level propagation. The monitors were also set to record audio files, which were used to confirm noise sources during post analysis.

The monitoring locations were determined within the Condition 2.5 of the Works Approval, with the extract of the condition shown below:

> ***2.5 Noise validation***
>
> ***2.5.1** Within two months of the date of this licence amendment, the Licence Holder must retain the services of a person qualified and experienced in the area of environmental noise assessment and who by their qualifications and experience is eligible to hold membership of the Australian Acoustical Society or the Australian Association of Acoustical Consultants to:*
>
> ***(a)** validate the noise modelling calculated within Environmental Acoustic Assessment, 24762-2-19122-02, Herring Storer Acoustics, September 2019, by undertaking noise measurements at, or as near as possible, to the nearest noise sensitive premises;*
> ***(b)** assess in accordance with the methodology required in the Environmental Protection (Noise) Regulations 1997, the compliance of the noise emissions from the primary activities, against the relevant assigned levels specified in those Regulations; and*
> ***(c)** compile and submit to the licence holder within three months of the date of this licence amendment, a report in accordance with condition 2.5.2.*

2.5.2 *A report prepared pursuant to condition 2.5.1(c) is to include:*

- ***(a)*** *a description of the methods used for monitoring of noise emissions from the premises;*
- ***(b)*** *details and the results of the validation undertaken pursuant to condition 2.5.1(a); and*
- ***(c)*** *details and results of the assessment of the noise emissions from the premises, against the relevant assigned levels in the Environmental Protection (Noise) Regulations 1997 undertaken pursuant to condition 2.5.1(b); and*

2.5.3 *The Licence Holder must submit to the CEO the report prepared pursuant to condition 2.5.1(c) within 14 days of receiving it.*

2.5.4 *Where an assessment pursuant to condition 2.5.1(b) indicates that noise emissions do not comply with the relevant assigned levels in the Environmental Protection (Noise) Regulations 1997, the license holder must:*

- ***(a)*** *within 60 days of receiving an assessment report pursuant to condition 2.5.1(c) prepare a plan to ensure the undertaking of the licensed activity will no longer lead to any contravention of the Environmental Protection (Noise) Regulations 1997; and*
- ***(b)*** *provide to the CEO a copy of the plan prepared pursuant to condition 2.5.4(a) within 30 days of its preparation.*

Based on the above condition, the residential locations are as follows, with Figure 4.1 showing a location plan:

- *Res 1 – 268 Banksia Road, Crooked Brook*

FIGURE 4.1 – RESIDENTIAL MONITORING LOCATION STIPULATED IN LICENCE APPROVAL CONDITION 2.5.1(A)

Approval was sought from the owner / residents of the monitoring location by calling at the properties and discussing the details with the resident.

Additional to the residential monitoring location, three monitors were also located at the site and the neighbouring property (industry-based activities). This provided a baseline for noise levels for the landfill facility.

FIGURE 4.2 – REFERENCE LOCATIONS USED FOR THE ASSESSMENT

It is noted that monitor placed in close proximity to the landfill mobile equipment (Location A) failed to capture data for the entire monitoring period. Therefore, noise data results from Location B were used for comparative analysis.

- ## *MEASUREMENT RESULTS*

Graphical plots of the monitored noise levels are contained in Appendix B.

- ## *ANALYSIS / ASSESSMENT*

Utilising the weather data collected over the monitoring period, noise levels for the residential receiver have been analysed. The periods of "idea propagation", where weather conditions are of highest propagation from noise source to receiver were investigated. The periods are where the wind is between 0.5 and 5.0 metres per second and from a North-easterly (0 to 90 degrees) direction.

During the monitoring period, the landfill site operated as normal.

Using the above periods of idea noise propagation, the overall noise level from the monitoring location has been plotted. Figure 6.1 details the overall noise comparison with the periods of ideal propagation.

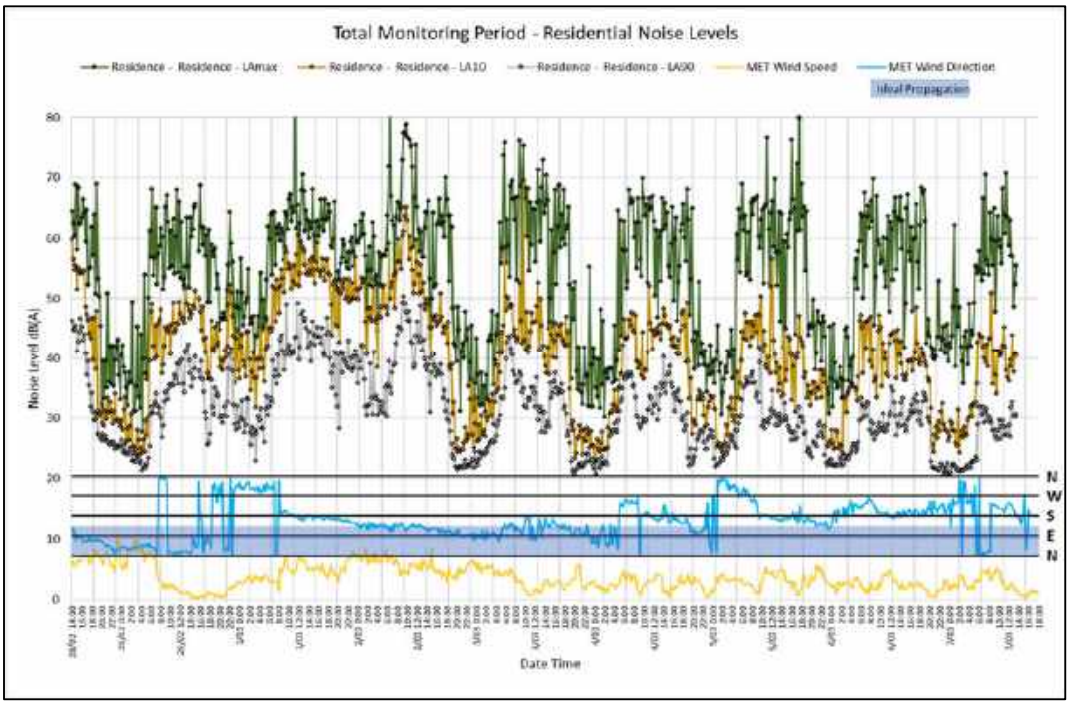


FIGURE 6.1 – OVERALL NOISE LEVEL

For the purpose of the study Tuesday 3rd March 2020 has been chosen as representing a period of ideal noise propagation. During the 3rd March the landfill site would have been in full operation due to the long weekend break.

Figure 6.2 detail the graphical noise levels.

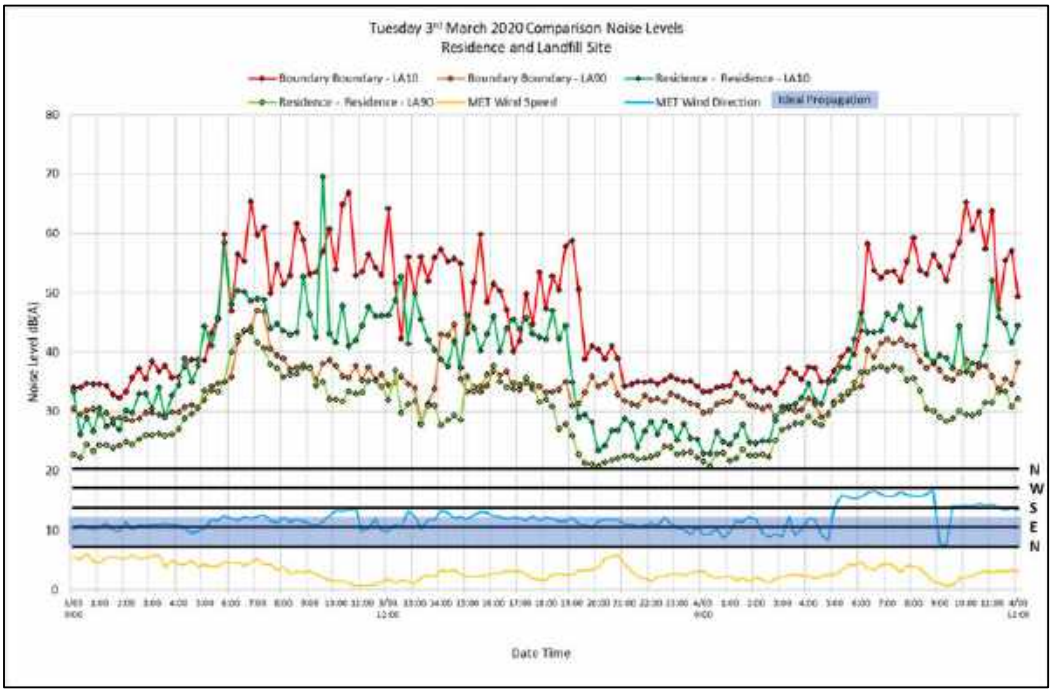


FIGURE 6.2 – NOISE LEVEL COMPARISON 03/03/2020

Based on the noise results, analysis of the correlation between the two locations (landfill site and nearest residence) noise levels can be made. The wind was generally from the north-east throughout the day, which was propagating noise from the landfill site towards the residential noise monitor.

Noise levels at the residence did generally increase over the day period, however this did not correlate to noise measured at the landfill site as the noise sources remained relatively constant. This can be further correlated against the periods where activities ceased at the plant. The operations stopped at around 12:00 with no resultant drop in noise level at the residence.

Similarly, for the operations at the landfill site between 06:00 and 07:00, noise levels at the site increased at 06:00 when operations commence, however, noise levels at the residence for this same time period were confirmed to be influenced by noise sources other than the landfill site noise emissions, such as birds (particularly crows).

Further confirmation of the source of the noise was made for these times by listening to the audio files recorded at each monitoring location. Individual operations of the landfill site were not discernible, with noise influences being from the morning chorus (bird song etc).

- ***CONCLUSION***

Assessment of the current operations for the Banksia Road Landfill Site shows that compliance at the residential locations is achieved with the criteria stipulated in the Environmental Protection (Noise) Regulations 1997, for all hours. This correlates with the predictive noise modelling developed for the Licence Approval (HSA reference 24762-2-19122-02).

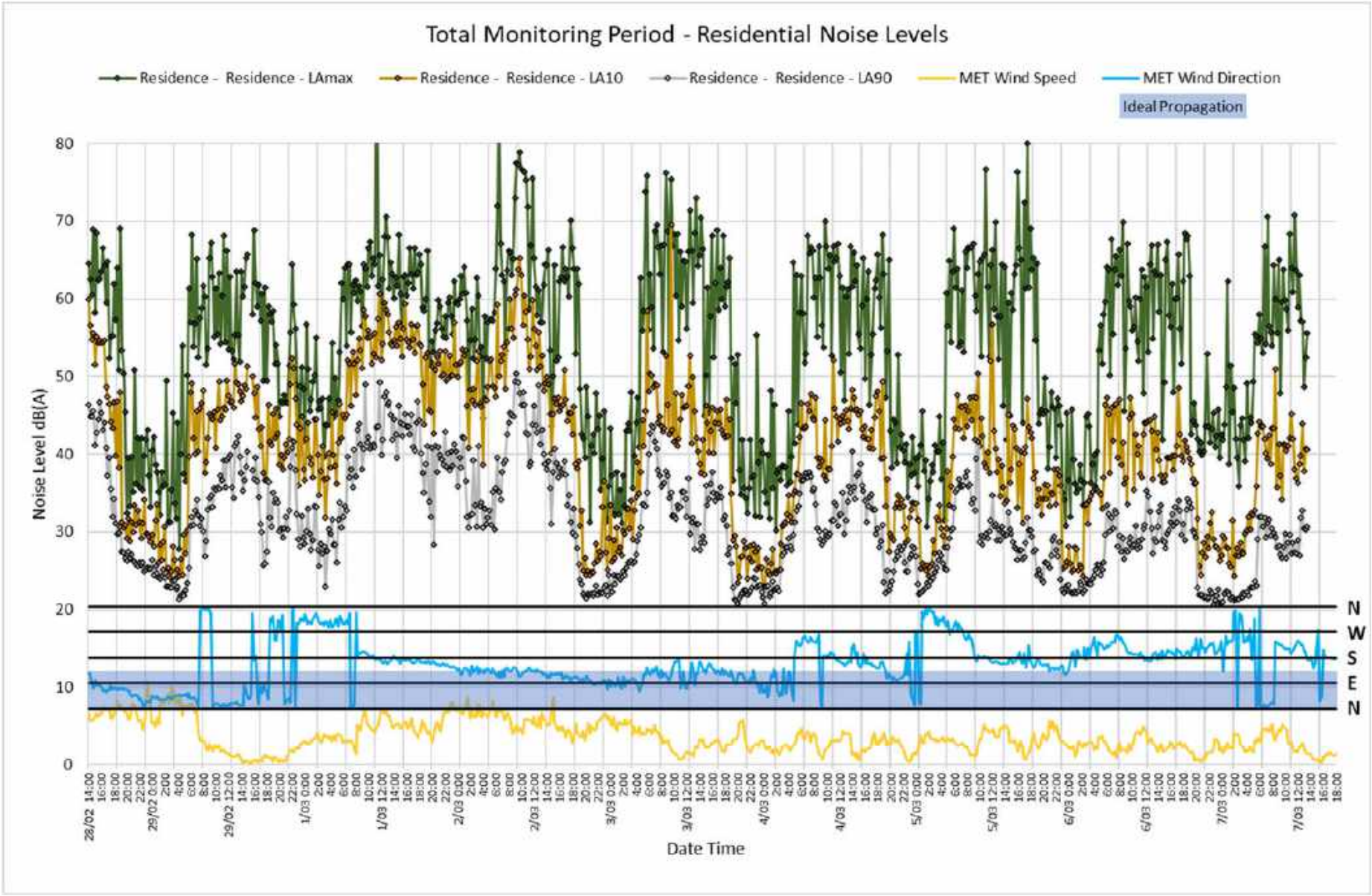
APPENDIX A

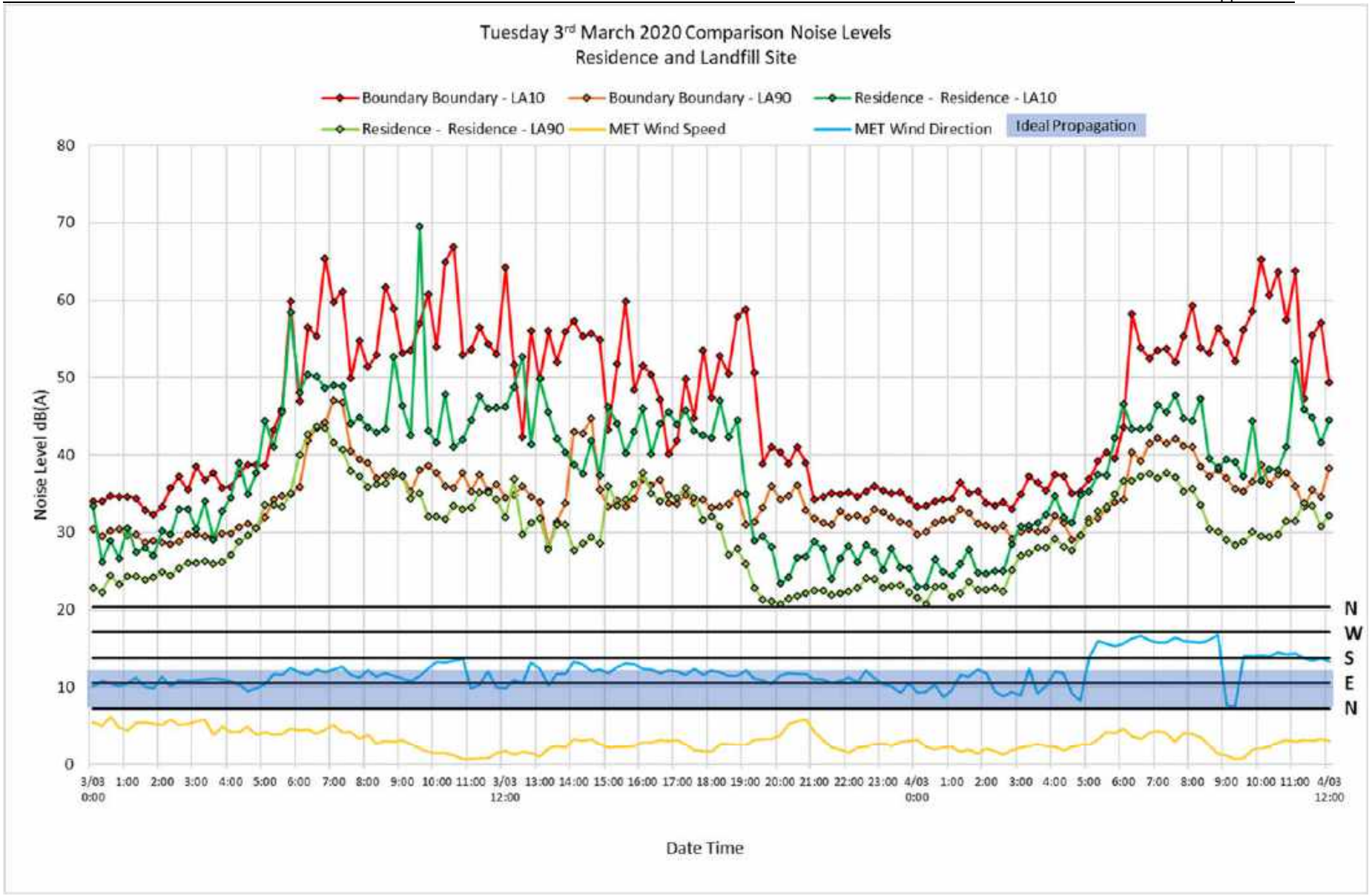
LOCATION MAPS / REFERENCE LOCATION


D - Northern Site
Rubbish Tip
A - Cleanaway close to landfill equipment
B - Boundary site
Crooked Brook Rd
Dillon Rd
Nearest Residence - 268 Banksia Rd
Quarry Rd
Google Earth
900 m
N

APPENDIX B

MONITORING RESULTS


Total Monitoring Period - Residential Noise Levels
Residence - Residence - LAmax
Residence - Residence - LA10
Residence - Residence - LA90
MET Wind Speed
MET Wind Direction
Ideal Propagation
Noise Level dB(A)
Date Time
N
W
S
E
N


Tuesday 3rd March 2020 Comparison Noise Levels
Residence and Landfill Site
Boundary Boundary - LA10
Boundary Boundary - LA90
Residence - Residence - LA10
Residence - Residence - LA90
MET Wind Speed
MET Wind Direction
Ideal Propagation
Noise Level dB(A)
80
70
60
50
40
30
20
10
0
N
W
S
E
N
3/03 0:00
1:00
2:00
3:00
4:00
5:00
6:00
7:00
8:00
9:00
10:00
11:00
3/03 12:00
13:00
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1:00
2:00
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9:00
10:00
11:00
4/03 12:00
Date Time