Cardiff Parkway Developments Ltd

Hendre Lakes

Environmental Statement

Draft 1 | 16 July 2019





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1 Baseline Noise Report

1.1 Introduction

1.1.1 An environmental noise survey has been undertaken to determine the existing noise climate around the site. This appendix details the baseline noise survey and results.

1.2 Site description

1.2.1 The noise survey locations are detailed in Table 1 below. This baseline noise data will be used to inform the construction and operation noise impact assessments for the proposed development. A diagram of the locations and the receptors they represent may be found in Figure 1 below.

Survey Location (Figure 1)	Receptor Name	Receptor Type	Noise Survey Measurement Type	Sampling Durations (Section A2 for details)
1	Maes-Y-Crochan	Residential	Unattended – logger secured in a resident's garden	Continuous logging over 7 days during week and over a weekend.
2	St Mellons Road	Residential	Attended	Day: 3x 15-minute measurements
				Evening: 3x 15-minute measurements
				Night: 2x 10-minute measurements
3	Heol Las	Residential	Attended	Day: 3x 15-minute measurements
				Evening: 3x 15-minute measurements
				Night: 2x 10-minute measurements
4	Water Avens Cl	Residential	Unattended – logger secured in a resident's garden	Continuous logging over 6 days and 5 days, respectively, during the week and over a weekend.
5	Rhosog Fawr Reen	Residential	Attended	Day: 3x 15-minute measurements
				Evening: 3x 15-minute measurements
				Night: 2x 10-minute measurements

Table 1: Survey Locations Summary

1.2.2 All baseline noise survey locations represented residential receptors. Locations 2, 3 and 5 were attended measurements, conducted on public land to be representative of closest residential receptors. Locations 1 and 4 were unattended measurements, set to log data continuously. Contact was made with the owners of locations 1 and 4 to facilitate this as no other secure areas could be located for loggers other than private gardens.



Figure 1: Noise Survey Locations

1.3 Instrumentation

1.3.1 The sound level meters and microphones are Class 1 conforming to BS EN 61672-1:2013. All equipment is calibrated annually according to international standards, together with traceable records. Calibration certificates can be provided upon request. Onsite calibration checks were conducted and no significant drift recorded. The monitoring equipment used is described in Table 2.

Description	Serial number	Item type					
Attended measurements:							
B&K 2250 Investigator SLM G4 (Kit F)	2818079	SLM					
B&K 4189 Microphone (Kit F)	2799527	Microphones					
B&K 4231 Calibrator (Kit F)	3015465	Calibrator					
Unattended measurements:							
Rion NL-52 (Kit B)	00264534	SLM					
UC-59 Microphone	09682	Microphone					
SLM Rion NH25 Preamp	64659	Microphone pre-amp					
Rion NC-74 Calibrator	34667800	Calibrator					
Rion NL-52 (Kit A)	00120480	SLM					
UC-59 Microphone	03152	Microphone					
SLM Rion NH25 Preamp	10479	Microphone pre-amp					
Rion NC-74 Calibrator	35015346	Calibrator					

Table 2: Measurement instrumentation

1.4 Measurement Methodology

- 1.4.1 At each location LAeq, LA10, LA90, LAmax metric values were measured. All broadband measurements were A-weighted and used a fast time constant (0.125s).
- 1.4.2 For attended measurements, the sound level meter was mounted on a tripod with the microphone set approximately at 1.2m-1.5m above local ground level. All measurements were taken under acoustically free-field conditions. A windshield was fitted to the microphone.
- 1.4.3 For unattended measurements, an environmental windshield was fitted to the microphone and this was mounted on a tripod with the microphone set approximately at 1.5m 2m above local ground level. Gathered data on precipitation and wind speed in the local area has been used to omit results that were potentially adversely affected by weather conditions.

1.5 Measurement results

Attended measurements

Location 2

Location Description: St Mellons Road

Measurement Period – Samples Taken Between: Day: Mon 15/07/2019 14:44 to Mon 15/07/2019 17:41

Evening: Thu 25/07/2019 19:01 to Thu 25/07/2019 21:18

Night: Thu 25/07/2019 23:07 to Fri 26/07/2019 00:18

Weather Conditions:

Wind Speed: 0 m/s (day, evening); 1-1.5 m/s, South-westerly (night)

Summary: Clear conditions; no adverse weather for all attended measurements.

Personnel:

Rob Eadon Kate Jones

Additional Comments:

The dominant sound source at this location was passing traffic from all directions and, during day and evening measurements, traffic was always the source of L_{Amax,F} events.

Crickets were consistent throughout measurements, especially during the day and contributed to background noise levels alongside distant traffic to the north-west.

Occasional noise sources included overflights and distant residential / industrial noise to the west – the latter featuring loading noise and a reversing mobile plant siren at 1.25kHz.

During night measurements, factory plant noise from directly north of the location impacted background levels.



Figure 2: Location 2 - Area local to measurement



Figure 3: Location 2 – Daytime survey

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Period	Sound Pressure Level, dB(A) (re 20 µPa)				
	L90	Leq	L10	Lmax (range)	
Day (07:00-19:00)	35	60	64	74 - 86	
Evening (19:00-23:00)	37	57	58	72 - 80	
Night (23:00-07:00)	35	44	40	43 - 69	

Table 3 Broadband summary of averaged sound pressure levels - Location 2

Table 4 Measured octave band sound pressure levels - Location 2

Descriptor	Sound Pressure Level, dB(A) (re		Oc	tave ban	d sound	pressure	e levels (dB)	
	20 µPa)	63	125	250	500	1k	2k	4k	8k
Daytime: 15/07/2019, 14	4:44 - 17:41								
L90,45mins*	35	43.3	34.6	31.8	29.7	30.8	25.9	20.4	17.8
L _{eq,45mins} *	60	66.3	59.9	54.3	54.3	56.3	53.3	49.1	41.9
L _{10,45mins*}	52	56.2	51.2	48.8	47.7	48.5	44.1	38.1	28.3
Evening time: 25/07/20	19, 19:01 - 2	1:18							
L _{90,45mins}	37	46.4	39.6	33.1	32.6	32.3	25.2	18.6	16.1
L _{eq,45mins}	57	65.6	58.2	53.4	52.1	53.6	49.6	42.9	36.0
L _{10,45mins*}	48	52.8	48.0	46.7	45.4	43.9	38.7	32.2	24.6
Night: 25/07/2019, 23:0	7 - 00:18								
L90,20mins**	35	43.6	35.9	31.0	31.6	29.8	22.6	16.1	14.1
Leq,20mins**	44	52.1	48.8	43.5	40.1	39.7	34.0	28.6	26.7
L _{10,20mins**}	39	45.6	37.4	34.5	36.6	34.4	27.9	21.5	16.5

*45mins across three sample measurements

**20mins across two sample measurements

Data	Time (hl	h:mm:ss)	Sound F	Pressure Lev	vel, dB(A) (re	20 µPa)	Comments
Date	Start	Duration	L90	Leq	L ₁₀	L _{max}	
	14:44:30	00:15:00	34.9	59.6	63.8	77.5	Overflights; L _{Amax,F} = Truck
15/07/2010	16:16:29	00:15:00	34.6	60.6	63.2	86.0	Mild increase in traffic; overflights.
15/07/2019	17:26:42	00:15:00	37.0	60.0	64.4	79.1	$L_{Amax,F}$ = Truck acceleration. Increased, but steadier traffic.
	19:01:12	00:15:00	37.7	57.4	59.7	74.4	Industrial 1.6kHz noise / unloading. Residential electric gate. Helicopter in distance at time of train passing.
25/07/2019	20:02:56	00:15:00	35.4	57.1	58.7	76.8	Traffic to west more distinguished. Overflights.
	21:03:13	00:15:00	38.0	56.5	56.4	79.5	L _{Amax,F} -= Lorry passing. Lorry idles 30m down road.
	23:07:14	00:10:00	35.6	46.5	43.8	68.8	1 train passby; 1 car passby.
26/07/2019	00:08:37	00:10:00	33.5	34.5	35.5	45.9	Acceleration from north-west. No passing traffic. Factory plant to north audible.

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Table 5 Measured sound pressure levels and observations - Location 2

Location 3

Location Description: Heol Las

Measurement Period – Samples Taken Between: Day: Mon 15/07/2019 15:09 to Mon 15/07/2019 18:01

Evening: Thu 25/07/2019 19:21 to Thu 25/07/2019 22:06

Night: Thus 25/07/2019 23:23 to Fri 26/07/2019 00:35

Weather Conditions: Wind Speed: 0 - >2.5 m/s (day, evening); >1 m/s (night) Wind Direction: N (day); SW (evening, night)

Summary: Clear conditions; no adverse weather for all attended measurements.

Personnel: Rob Eadon Kate Jones

Additional Comments:

The dominant sound source at this location was passing traffic predominantly traveling southbound and, during day and evening measurements, traffic was always the source of $L_{Amax,F}$ events.

Train passbys occurred throughout at this location – roughly, once every 5-minutes at day, evening and night. At night, the reduced amount of road traffic resulted in train passbys being the cause of L_{Amax,F} events.

Wind through long grass and crickets contributed to background noise levels alongside distant traffic to the South.

Occasional noise sources included overflights and the bleating of sheep in fields to the south-west.



Figure 4: Location 3 - Area local to measurement



Figure 5: Location 3 - Daytime survey

Table 6 Summary of averaged sound pressure levels at Location 3

Period	Sound Pressure Level, dB(A) (re 20 µPa)						
	L_{90}	\mathbf{L}_{eq}	\mathbf{L}_{10}	L _{max (range)}			
Day (07:00-19:00)	32	59	58	75 - 81			
Evening (19:00-23:00)	32	55	49	70 - 79			
Night (23:00-07:00)	30	52	45	38 - 72			

Table 7 Measured octave band sound pressure levels - Location 3

Descriptor	Sound Pressure Level, dB(A)	Octave band sound pressure levels (dB)					iB)		
	(re 20 µPa)	63	125	250	500	1k	2k	4k	8k
Daytime: 15/07/2019, 15:09 - 18:01									
L90,45mins*	32	38.2	29.7	27.6	27.3	27.6	20.0	15.2	13.8
L _{eq,45mins} *	59	65.8	56.4	53.9	54.1	56.0	51.4	43.7	37.1
L _{10,45mins*}	57	60.0	54.4	52.0	51.3	54.1	49.4	43.0	33.5
Evening time: 25/0	7/2019, 19:21 - 2	22:06							
L _{90,45mins}	32	42.4	37.8	33.2	27.8	26.2	17.6	13.7	13.2
L _{eq,45mins}	55	57.8	51.7	49.8	49.4	52.1	47.2	38.3	32.6
L _{10,45mins} *	50	54.0	48.3	45.6	44.6	46.0	41.5	34.1	27.6
Night: 25/07/2019,	23:23 - 00:35								
L _{90,20mins} **	30	41.0	35.6	31.0	26.0	23.4	14.9	12.1	12.3
Leq,20mins**	52	53.5	50.5	45.7	44.7	49.2	45.4	36.5	26.0
L _{10,20mins**}	49	53.1	46.7	43.9	43.3	46.0	38.7	30.0	22.7

*45mins across three sample measurements

**20mins across two sample measurements

Data	Time (h	h:mm:ss)	Sound I	Pressure Lev	vel, dB(A) (re	20 µPa)	Comments
Date	Start	Duration	L90	Leq	L10	Lmax	
	15:09:08	00:15:00	30.3	57.8	55.2	78.9	Very still when cars not present. Two train passbys.
15/07/2019	16:38:05	00:15:00	32.7	59.3	58.7	80.2	Overflight. Two train passbys.
	17:46:00	00:15:00	32.5	59.4	60.0	80.6	Overflight. Two train passbys.
	19:21:26	00:15:00	32.4	55.6	50.9	77.9	Industrial 1.6kHz noise / unloading. Overflight. Two train passbys.
25/07/2019	20:22:51	00:15:00	32.4	52.9	49.9	75.2	Less car passbys. Two overflights; Two train passbys.
	21:51:15	00:15:00	32.1	55.2	45.7	78.9	Helicopter in distant north. Overflights. Four car passbys; three trains.
	23:23:42	00:10:00	32.0	54.2	51.9	72.0	Five Train passbys. Distant dog barks.
26/07/2019	00:25:49	00:10:00	28.0	46.4	38.5	67.8	One train passby; no road vehicles. Traffic to the north dominates background.

Table 8 Mea	asured sound	pressure	levels and	observations	- Location 3

Location 5

Location Description: Rhosog Fawr Reen

Measurement Period – Samples Taken Between: Day: Mon 15/07/2019 15:29 to Mon 15/07/2019 18:36

Evening: Thu 25/07/2019 19:39 to Thu 25/07/2019 22:27

Night: Thu 25/07/2019 23:37 to Fri 26/07/2019 00:52

Weather Conditions:

Wind Speed: 0 m/s (day); 1-2 m/s (evening),0 m/s (night) Wind Direction: SW (evening)

Summary: Clear conditions; no adverse weather for all attended measurements

Personnel: Rob Eadon Kate Jones

Additional Comments:

The dominant sound source at this location was birds in nearby trees and passing traffic, predominantly traveling southbound. During day and evening measurements, traffic was always the cause of L_{Amax,F} events.

Being half a kilometre south of location 3, train passbys occurred throughout the surveys at location 5 but at a comparably much lower level than location 3 and were only occasionally distinguishable.

Traffic to the south-west and crickets contributed to background noise levels at this location. During evening and night measurements, the Reen (just north of the location – Figure 8) was flowing and dominated the background alongside distant flows of traffic to the south.

At night a low-level hum at 80Hz was audible, however the source or direction could not be identified.

Occasional noise sources included overflights, livestock in fields to the south-west and distant dog barks to the south-west.



Figure 6: Location 5 – Area local to measurement



Figure 7: Location 5 - Daytime survey



Figure 8: Location 5 - Reen Noise Source

Period	Sound Pressure Level, dB(A) (re 20 µPa)					
	\mathbf{L}_{90}	\mathbf{L}_{eq}	\mathbf{L}_{10}	L _{max (range)}		
Day (07:00-19:00)	33	53	50	68 - 74		
Evening (19:00-23:00)	30	50	43	51 - 77		
Night (23:00-07:00)	27	44	38	43 - 63		

Table 9 Summary of averaged sound pressure levels - Location

Table 10 Measured octave band sound pressure levels - Location 5

Descriptor	Sound Pressure Level, dB(A) (re 20 μPa)	Octave band sound pressure levels (dB)								
	• /	63	125	250	500	1k	2k	4k	8k	
Daytime: 15/07/2019, 15:29 - 18:36										
L _{90,45mins*}	33	37.8	31.7	26.8	27.8	29.3	21.5	16.0	13.7	
Leq,45mins*	53	60.5	58.1	50.0	48.1	49.2	44.9	39.9	32.8	
L _{10,45mins*}	58	60.4	55.2	52.9	52.8	53.9	49.6	43.3	36.5	
Evening time:	25/07/2019, 19:39 - 2	2:27								
L _{90,45mins}	30	39.6	32.6	27.8	25.2	23.3	18.7	16.9	13.9	
Leq,45mins	50	54.2	49.3	48.2	46.7	45.5	42.0	36.8	31.7	
L _{10,45mins*}	48	53.8	50.4	46.0	43.5	44.6	39.1	31.1	23.3	
Night: 25/07/2	019, 23:37 - 00:52									
L _{90,20mins**}	27	38.2	29.8	26.5	21.7	19.1	16.2	15.3	12.3	
Leq,20mins**	44	42.6	34.3	32.6	42.8	40.8	30.5	19.6	15.7	
L _{10,20mins**}	43	50.1	43.8	40.5	38.8	39.6	32.6	25.4	19.2	

*45mins across three sample measurements

**20mins across two sample measurements

Data	Time (hh:mm:ss)		Sound l	Pressure Le	Comments		
Date	Start	Duration	L90	Leq	L ₁₀	L _{max}	
15/07/2019	15:29:15	00:15:00	32.4	53.5	52.3	73.8	Overflights. Pigeon in nearby tree.
	18:05:14	00:15:00	33.7	52.5	47.9	74.4	Large pickup = $L_{Amax,F}$
	18:21:04	00:15:00	32.7	52.8	49.0	72.5	Overflights. Decrease in traffic; increase in birds.
25/07/2019	19:39:47	00:15:00	32.5	50.4	47.0	71.7	Resident's boiler flue noise audible from here onwards. Residential gate opening.
	20:41:45	00:15:00	30.7	48.9	42.9	75.5	Reen noise dominates background from here onwards.
	22:11:50	00:15:00	27.6	50.0	39.8	76.7	Overflight. Quieter on road – 1 car, 1 moped and 2 train passbys.
	23:37:42	00:10:00	27.0	46.3	40.9	63.1	Distant traffic to south in ebbs and flows. 2 train passbys recorded – L _{Amax,F.}
26/07/2019	00:41:38	00:10:00	26.1	36.3	35.7	53.8	Overflight. Low-level yet distinguishable 80Hz tone – source undefinable. 2 train passbys recorded – L _{Amax,F} .

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Table 1	1	Measured	sound	pressure	levels	and	observati	ons – 1	Location 5	
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Unattended measurements

Location 1

Location Description:

32 Maes-Y-Crochan back garden - 1m from garden fencing and approx. 2m above the ground.

Measurement Duration: Fri 26/7/2019 10:25 to Thu 01/08/2019 18:25

Logging Interval: 00:05:00

Weather Conditions:

Adverse weather events has been illustrated as part of the time history of the location. This has been deemed as any level of precipitation and wind speeds of 5m/s and above.

Additional Comments:

The garden featured a tall, thick (5m high; 2m thick) hedge along its eastern side – parallel to cypress drive.

Cypress drive was the dominant noise source at this location, with birds in nearby trees / nesting in the guttering of the property also prevalent.

Distant traffic to the west contributed to the background noise levels as well as ebb and flows of traffic to the north and south.

Occasional noise sources at this location are overflights; residential noise; use of power tools and industrial noise to the distant west, featuring a distinguishable recurring 1.6kHz distant tone from reversing mobile plant.



Figure 9: Location 1-32 Maes-Y-Crochan



Figure 10: Location 1 - Logger Setup in Private Garden



Figure 11: Time history for the unattended measurement at Location 1

Table 12 Averaged broadband sound pressure levels - Location 1

Dowind	Sound Pressure Level, dB(A) (re 20 µPa)					
renou	L90	Leq	L10	Lmax (range)		
Day (07:00-19:00)	34	44	48	31 - 79		
Evening (19:00-23:00)	39	50	48	52 - 85		
Night (23:00-07:00)	34	41	47	32 - 82		

Location 4

Location Description:

6 Water Avens Close back garden – 3.5m from fencing; 2m above ground.

Measurement Duration:

Tue 16/07/2019 to Sun 21/07/2019 & Thu 25/07/2019 to Mon 29/07/2019

Logging Interval: 00:05:00

Weather Conditions:

Adverse weather events has been illustrated as part of the time history of the location. This has been deemed as any level of precipitation and wind speeds of 5m/s and above.

Additional Comments:

Train passbys and accelerations on Cypress Drive dominate at this location.

 $L_{Amax,F}$ events were typically car / train passbys, if present, or birds in nearby trees.

Distant traffic to the north contribute to background noise levels here.

Occasional noise sources at this location are overflights and industrial noise to the northwest, featuring a distinguishable recurring 1.6kHz distant tone from reversing mobile plant.



Figure 12: Location 4 – 6 Water Avens Close



Figure 13: Location 4 - Logger Setup in Private Garden



Figure 14: Time history for the unattended measurement at Location 4

Table 13 Averaged broadband sound pressure levels - Location 4

Dowind	Sound Pressure Level, dB(A) (re 20 µPa)					
reriou	L90	Leq	L10	Lmax (range)		
Day (07:00-19:00)	35	49	48	45 - 88		
Evening (19:00-23:00)	34	46	45	38 - 94		
Night (23:00-07:00)	29	42	33	32 - 79		