

Viridor

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Trident Park Energy Recovery Facility

Noise Monitoring Report March 2015

Ref: Noise Survey 2_201503

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Quality Assurance

This report has been prepared with all reasonable skill, care and diligence. Information reported herein is based on the interpretation of data collected and has been accepted in good faith as being accurate and valid.

Report Details

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Executive Summary

Trident Park Energy Recovery Facility (ERF) is regulated under the Environmental Permitting (England & Wales) Regulations, which requires operators to obtain and operate under an Environmental Permit. Trident Park ERF Permit (EPR/LP3030XA) contains a number of schedules that set certain requirements that must be fulfilled by the operator and holder of the Permit.

One such requirement is the implementation of a noise monitoring scheme that will be carried out at the site at the commissioning stage and also when the plant is fully operational.

This report details the results from the second noise monitoring survey that has been carried out in accordance with the submitted noise monitoring scheme.

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1. Introduction

In line with pre-operational condition 06 contained within the Environmental Permit, Viridor is undertaking a noise monitoring survey at four locations in the vicinity of Trident Park ERF. The survey is designed to enable acquisition of noise emission data, once during the commissioning stage and then on a further four occasions whilst the Plant is in an operational state.

As detailed in the noise monitoring scheme (ref: EPR/LP3030XA_S1.4_PO06), the locations mirror those used in the Environmental Statement that was submitted as part of the Planning application.

Viridor received handover from the EPC Contractor on 31st January 2015, which signalled the start of the operational phase of the Plant. In accordance with section 2.5 in the scheme, monitoring will be carried out at a frequency of once every three months during normal operations for the first year of operations.

This report contains the results of the second noise survey undertaken and provides the following information:

- Noise levels, in terms of the LAeq, and LA90 noise indices
- Details of the instrumentation used including calibration details
- Details of the prevailing weather conditions on the day of the survey
- Details of the audibility of the site and
- Details of any extraneous noise sources that influenced the noise climate

A glossary of terminology to assist in reading this scheme is included in Appendix 1.

2. Site Description

Trident Park ERF is located approximately 1.6 km south-east of Cardiff City Centre and immediately north of Cardiff Docks. The site is within an area of high density industrial and commercial uses. In the immediate area the land uses are characterised by the following:

- South – Port of Cardiff, including Roath Dock and various industrial railway lines
- North - Mixed Use commercial and retail developments associated with Ocean Way and further north by the residential area of Splott
- East - Industrial uses associated with Portmanmoor Industrial Estate and further to the east by Celsa steelworks and Rover Way
- West - Immediately to the west is Celsa Manufacturing, beyond which is the mixed-use area of Cardiff Bay

The Plant is now in its operational phase after the Take Over criteria was met on 31st January 2015, and signalled the start of Viridor operations at the site.

3. Scope

In 2007 a background noise survey was undertaken by SLR Consulting as part of the Environmental Statement submitted with the planning application.

The scope of this report is to replicate the noise survey at the same survey locations, which were considered to be representative of the closest noise sensitive receptors. The survey will facilitate data acquisition and reporting in order to comply with the requirements of pre-operational condition 06; contained within Environmental Permit EPR/LP3030XA, Table S1.4 Pre-operational measures.

Review of the site's environmental setting highlighted four potentially sensitive off-site receptors with regards to noise emissions from the Trident Park ERF, as described in the Environmental Statement. The locations are as follows:

1. **The Water Quarter**- residential apartments located some 600 metres to the south-west of Trident Park.
2. **Lewis Road** - residential development of 100 flats, approximately 600 metres north of Trident Park.
3. **Vanguard Way** - commercial and light industrial units located approximately 250 m north of Trident Park.
4. **Adventurer's Quay** - an apartment development located approximately 650m south of Trident Park.

4. Noise Survey March 2015

The second noise survey was undertaken by Viridor on 11th and 12th March 2015 in order to record noise levels at the four off-site locations now that Trident Park ERF is functioning in operational mode.

4.1. Noise Monitoring Equipment

The equipment used during the survey is set out in Table 1 below. The sound level meter was calibrated before and after the measurement period and no drift in calibration was found to have occurred. All the monitoring equipment was calibrated to a traceable standard by a UKAS-accredited laboratory, or equivalent, within the 12 months preceding the survey.

Table 1
Noise Measurement Equipment

Equipment	Serial Number
Casella C490, M1 Sound level meter	074218
Casella C110-1 Acoustic calibrator	074464

All equipment conforms to Type 1 of British Standard *EN 61672-1:2002 Electroacoustics, Sound Level Meters, Specifications*, or equivalent.

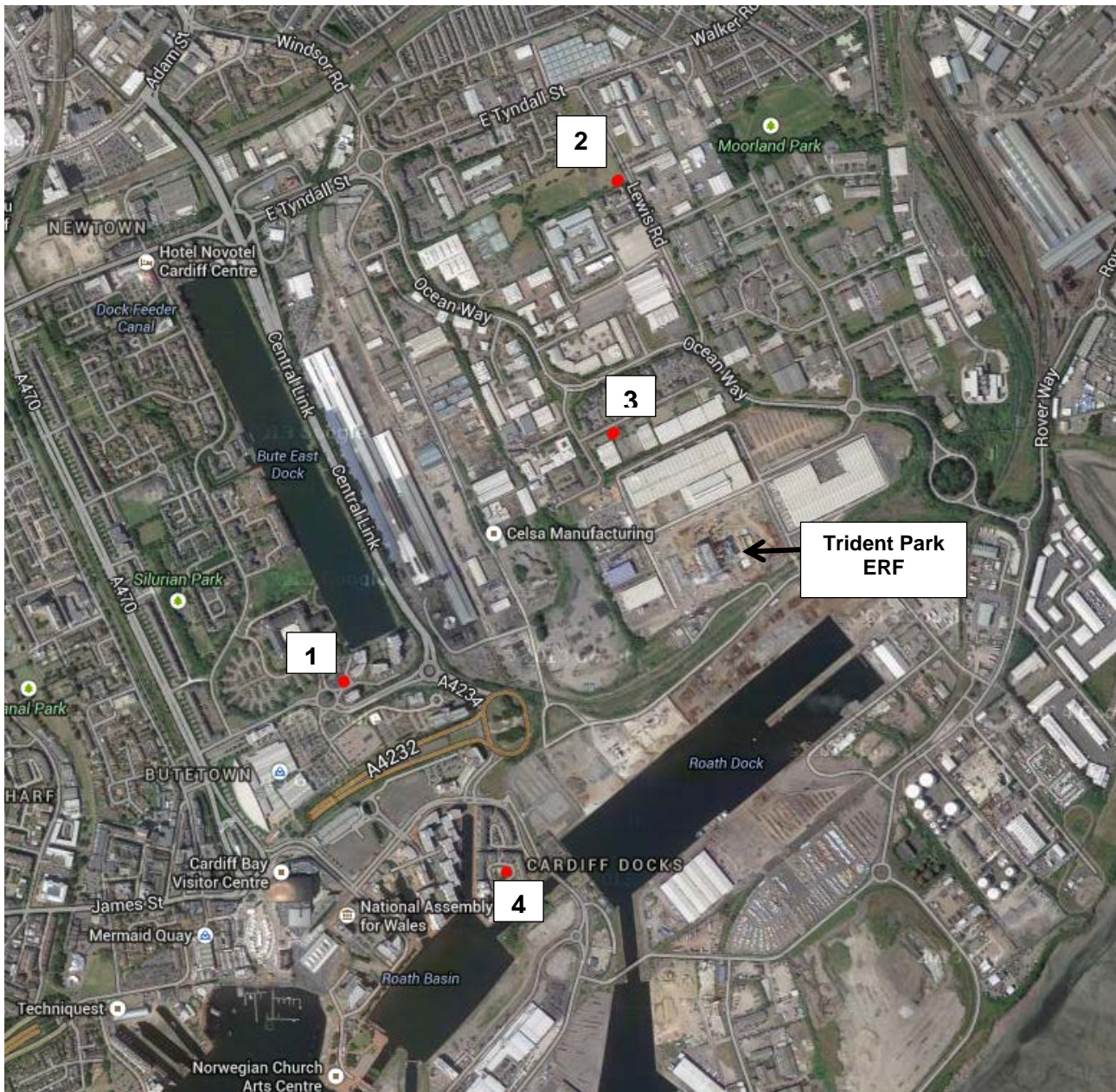
4.2. Noise Survey Locations

The noise environment was surveyed at the four locations listed below.

1. The Water Quarter- on grassed area to the west side of the apartment blocks
2. Lewis Road - playing field on the north side of the flats
3. Vanguard Way - grassed area between two commercial units at western end of Vanguard Way
4. Adventurer's Quay - on grassed area in the centre of the apartment development

The sound level meter was positioned 1.2 to 1.5m above local ground level in free-field conditions, i.e. at least 3.5m from the nearest vertical, reflecting surface, at all survey locations.

Figure 1
Noise Monitoring Locations



4.3. Survey Results

The noise survey comprised of four non-consecutive 15 minute periods to obtain an average noise level over a full one hour period during the daytime and two non-consecutive 15 minute periods during the night-time; replicated at each of the four locations. For the purposes of this scheme it is assumed that daytime is 07:00 to 23:00 hours and night-time is 23:00 to 07:00 hours.

A note of the prevailing weather conditions was made at the time of the survey and the audibility of the Trident Park site noted at each measurement location during each measurement period.

Table 2 summarises the calculated noise levels. The measured survey results can be seen at Appendix 2.

Table 2
Summary of Measured Noise Levels March 2015 - free-field dB

Location	Daytime (07:00 – 23:00)		Night-time (23:00 – 07:00)	
	L _{Aeq} 1hr	L _{A90}	L _{Aeq} ½ hr	L _{A90}
1. The Water Quarter	60.3	58.4	53.5	51.1
2. Lewis Road	59.4	50.4	44.6	37.8
3. Vanguard Way	53.9	49.9	45.4	42.5
4. Adventurer's Quay	50.0	46.3	48.6	37.8

During the survey periods the dominant noise sources at each location was recorded by the surveyor. At all locations, during both day and night-time period, noise from traffic on surrounding roads was reported as a major noise source.

Full details are provided with the survey results at Appendix 2.

5. Conclusion

Viridor has undertaken the second noise monitoring survey as described in the noise monitoring scheme (Ref: EPR/LP3030XA_S1.4_PO06). The survey recorded noise emission data during operational activity at four locations in the vicinity of Trident Park ERF. The results were obtained over four non-consecutive 15 minute periods during the day and two non-consecutive 15 minute periods during the night.

The LAeq (notional steady sound level) readings recorded over the daytime period were below 60 dB(A), with the exception of the Water Quarter at 60.3 dB(A). During the night-time period the LAeq readings were below 50 dB(A), again with the exception of the Water Quarter where the surveyor recorded 53.5 dB(A).

The dominant noise source recorded by the surveyor at each location during the day was traffic on surrounding roads. Dominant sources at night included noise generated from traffic and nearby industrial works.

A third noise survey will be undertaken later in the year.

Appendices

Appendix 1 - Glossary of terminology

In order to assist the understanding of acoustic terminology and the relative change in noise, the following background information is provided.

The human ear can detect a very wide range of pressure fluctuations, which are perceived as sound. In order to express these fluctuations in a manageable way, a logarithmic scale called the decibel, or dB scale is used. The decibel scale typically ranges from 0dB (the threshold of hearing) to over 120dB. An indication of the range of sound levels commonly found in the environment is given in the following table.

Table A.1: Sound levels commonly found in the environment

Sound Level	Location
0dB(A)	Threshold of hearing
20 to 30dB(A)	Quiet bedroom at night
30 to 40dB(A)	Living room during the day
40 to 50dB(A)	Typical office
50 to 60dB(A)	Inside a car
60 to 70dB(A)	Typical high street
70 to 90dB(A)	Inside a factory
100 to 110dB(A)	Burglar alarm at 1 metre away
110 to 130dB(A)	Jet aircraft on take-off
140dB(A)	Threshold of pain

Acoustic terminology

dB (decibel) The scale on which sound pressure level is expressed. It is defined as 20 times the logarithm of the ratio between the root-mean-square pressure of the sound field and a reference pressure (2×10^{-5} Pa).

dB(A) A-weighted decibel. This is a measure of the overall level of sound across the audible spectrum with a frequency weighting (i.e. 'A' weighting) to compensate for the varying sensitivity of the human ear to sound at different frequencies.

L_{Aeq} is defined as the notional steady sound level which, over a stated period of time, would contain the same amount of acoustical energy as the A-weighted fluctuating sound measured over that period.

L₁₀ & L₉₀ If a non-steady noise is to be described it is necessary to know both its level and the degree of fluctuation. The L_n indices are used for this purpose, and the term refers to the level exceeded for n% of the time. Hence L₁₀ is the level exceeded for 10% of the time and as such can be regarded as the 'average maximum level'. Similarly, L₉₀ is the 'average minimum level' and is often used to describe the background noise. It is common practice to use the L₁₀ index to describe traffic noise.

L_{Amax} is the maximum A-weighted sound pressure level recorded over the period stated. L_{Amax} is sometimes used in assessing environmental noise where occasional loud noises

occur, which may have little effect on the overall Leq noise level but will still affect the noise environment. Unless described otherwise, it is measured using the 'fast' sound level meter response.

Appendix 2 – Survey Results

Day time period (07:00 – 23:00 hours)

Location	Start Time	End Time	LAeq (dB)A	L90 (dB)A	LAmx (dB)A	LAmn (dB)A	LcPK (dB)A	Noise Comments	Weather Comment
1	11:40	11:56	60.6	59	71.6	56.4	91.9	Site operations not audible. All noise from traffic on surrounding roads, birds, passing vehicles and 1 second of a car alarm	Overcast, light rain 9.3 degC, 88.7% Humidity 8 Oktas. Wind speed 0.9; SE
1	13:39	13:54	60.9	59	76.4	55.7	99.4	Site operations not audible. All noise from traffic on surrounding roads, birds, passing vehicles and 1 second of a car alarm.	Overcast, light rain 9.3 degC 88.7% Humidity 8 Oktas. Wind speed 0.9; SE
1	15:42	15:57	60.6	59	68.1	56.7	94	Site operations not audible. All noise from traffic on surrounding roads and birds.	Overcast, light rain showers 10.1 degC, 89.4% Humidity 8 Oktas. Wind speed 1.1; SE
1	20:05	20:20	58.6	55.5	71.7	53.4	90.7	Site operations not audible. All noise from traffic on surrounding roads and a distant train.	Overcast, light rain showers 10.1 degC, 89.4% Humidity 8 Oktas. Wind speed 1.1; SE

2	10:48	11:03	58.9	48.5	91.5	46.2	103.9	Site operations not audible. All noise from traffic on surrounding roads, birds, passing vehicles, forklifts working nearby and aircraft.	Overcast, light rain 9.3 degC, 88.7% Humidity 8 Oktas. Wind speed 0.9; SE
2	12:49	13:04	54.9	49	66.6	47.2	91.5	Site operations not audible. All noise from traffic on surrounding roads, birds, passing vehicles, forklifts working nearby and aircraft.	Overcast, light rain 9.3 degC, 88.7% Humidity 8 Oktas. Wind speed 0.9; SE
2	14:44	14:59	63.6	54	77.4	50.9	96.1	Site operations not audible. All noise from traffic on surrounding roads, birds, passing vehicles, forklifts working nearby and aircraft.	Overcast, light rain showers 10.1 degC, 89.4% Humidity 8 Oktas. Wind speed 1.1; SE
2	19:17	19:33	51.7	45.5	68.2	43.5	90.6	Site operations not audible. All noise from traffic on surrounding roads, passing vehicles, distant train and car horn.	Overcast, light rain showers 10.1 degC, 89.4% Humidity 8 Oktas. Wind speed 1.1; SE
3	11:15	11:33	54.3	50.5	72.7	47.7	83.6	Site operations just audible. Other noise from traffic on surrounding roads, birds, nearby building and industrial works and aircraft.	Overcast, light rain 9.3 degC, 88.7% Humidity 8 Oktas. Wind speed 0.9; SE
3	13:16	13:32	55.3	50	72.4	48.9	91.2	Site operations just audible. Other noise from traffic on surrounding roads, birds, nearby building and industrial works and aircraft.	Overcast, light rain 9.3 degC, 88.7% Humidity 8 Oktas. Wind speed 0.9; SE

3	15:03	15:19	54	51	69.7	48.4	88.6	Site operations audible (bleepers, 'bangs' and machinery 'whine'). Other noise from traffic on surrounding roads, birds, nearby industrial units and aircraft.	Overcast, light rain showers 10.1 degC, 89.4% Humidity 8 Oktas. Wind speed 1.1; SE
3	19:37	19:52	51.2	47	63.9	45	81.9	Site operations just audible (low 'humming' sound and occasional vehicle horn). Other noise from traffic on surrounding roads and a very loud flock of seagulls.	Overcast, light rain showers 10.1 degC, 89.4% Humidity 8 Oktas. Wind speed 1.1; SE
4	12:25	12:40	49.4	46	66.1	43.4	89.7	Site operations not audible. All noise from traffic on surrounding roads, birds, nearby industrial/building works and aircraft.	Overcast, light rain 9.3 degC 88.7% Humidity 8 Oktas. Wind speed 0.9; SE
4	13:59	14:14	50.7	48	63.9	45.8	88	Site operations not audible. All noise from traffic on surrounding roads, birds, nearby industrial/building works and aircraft.	Overcast, light rain 9.3 degC 88.7% Humidity 8 Oktas. Wind speed 0.9; SE
4	16:01	16:17	52.2	47.5	73.7	45.3	93.2	Site operations not audible. All noise from recycling collection, traffic on surrounding roads and birds.	Overcast, light rain showers 10.1 degC, 89.4% Humidity, 8 Oktas. Wind speed 1.1; SE
4	20:28	20:43	44.8	40.5	59.1	37.7	82.7	Site operations not audible. All noise from traffic on surrounding roads and railway crossing alarm.	Overcast, light rain showers 10.1 degC, 89.4% Humidity 8 Oktas. Wind speed 1.1; SE

Night-time Period (23:00 – 07:00 hours)

Location	Start Time	End Time	LAeq (dB)A	L90 (dB)A	LAmx (dB)A	LAmn (dB)A	LcPK (dB)A	Noise Comments	Weather Comment
1	00:28	00:43	54.1	52	63.3	50.2	86.1	Site operations not audible. All noise from steam vents and operations at Celsa Manufacturing Plant, distant traffic, rail crossing alarm and a slow moving train.	Overcast, misty 9.4 degC, 89.1% Humidity, 8 Oktas. Wind speed 0.6; S
1	01:53	02:08	52.9	50	65.9	47.5	81.9	Site operations not audible. All noise from steam vents and operations at Celsa Manufacturing Plant, distant traffic, rail crossing alarm and a slow moving train.	Overcast, misty 9.4 degC, 89.1% Humidity 8 Oktas. Wind speed 0.6; S
2	23:49	00:04	44.6	37.5	65.4	35.3	81.4	Site operations not audible. All noise from distant traffic, passing cars and seagulls.	Overcast, misty 9.4 degC, 89.1% Humidity 8 Oktas. Wind speed 0.6; S
2	01:13	01:28	44.5	38	63.6	36.2	84.6	Site operations not audible. All noise from distant traffic, passing cars and seagulls.	Overcast, misty 9.4 degC, 89.1% Humidity 8 Oktas. Wind speed 0.6; S

3	00:08	00:23	46.2	43	62.8	40.2	77.5	Site operations audible (bleepers, squeaky brakes, manitous, etc). Other noise from distant traffic and seagulls.	Overcast, misty 9.4 degC, 89.1% Humidity 8 Oktas. Wind speed 0.6; S
3	01:33	01:48	44.4	42	62.2	40.5	82.5	Site operations just audible (less machinery movement). Other noise from distant traffic, Celsa Manufacturing and birds.	Overcast, misty 9.4 degC, 89.1% Humidity 8 Oktas. Wind speed 0.6; S
4	00:51	01:07	49.7	38.5	79	36.5	99	Site operations not audible. All noise from passing cars, distant traffic, distant industrial "hum" and seagulls.	Overcast, misty 9.4 degC, 89.1% Humidity 8 Oktas. Wind speed 0.6; S
4	02:13	02:28	47.2	37	70.4	34.4	87	Site operations not audible. All noise from a passing car, distant traffic, distant train, crossing beepers and seagulls.	Overcast, misty 9.4 degC, 89.1% Humidity 8 Oktas. Wind speed 0.6; S