Rocpower

Yorkshire Generation Scheme Barnsley

Noise Assessment

January 2009

Yorkshire Generation Scheme, Barnsley
Noise Survey

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1 INTRODUCTION

A noise assessment was commissioned by Rocpower with regard to the provision of renewable energy generation plant at a number of sites in Yorkshire. The site this report is associated with is located within an existing YEDL substation compound located on Whaley Road, Barnsley.

No specific noise data relating to noise levels associated with the proposed plant is available at this stage. Therefore, this report is to establish the background noise level at off-site receptors with the data used to provide initial advice with regard to acceptable noise levels associated with the plant at the site.

The findings and conclusions of this assessment are presented below with Report Conditions presented in Appendix A.

2 METHODOLOGY

The guidance provided BS 4142[1] will form the basis for this report. BS 4142 describes a method of determining the level of a noise of an industrial nature, together with procedures for assessing whether the noise in question is likely to give rise to complaints. The potential for complaints is based on the rating of a noise and the margin by which it exceeds the existing background noise level ($L_{A90,T}$[2]). The standard specifies the following criteria for the likelihood of complaint:

- A difference of around +10dB or more indicates that complaints are likely
- A difference of around +5dB is of marginal significance
- If the rating level is more than 10dB below the measured background noise level then this is a positive indication that complaints are unlikely.

BS 4142 states that night-time L_{A90} measurements should be taken over a 5 minute period whilst daytime measurements should be carried out for a 1 hour period. Following the guidance of PPG24[3], the day and night-time periods are taken to be as 07:00 - 23:00 hrs and 23:00 - 07:00 hrs respectively.

If there is a requirement as part of a planning application to submit a noise assessment, reference would be given by the Local Authority (LA) to the guidance provided within BS 4142 with regard to establishing appropriate noise criteria. Due to the sensitivity of the project we are currently unable to consult with the LA to determine the relevant noise criteria. Therefore, the information provided in the conclusions of the report with regard to establishing indicative acceptable noise levels associated with the proposed plant is based on previous experience of similar projects.

[1] BS4142: Method for rating industrial noise affecting mixed residential and industrial areas (1997)
[2] $L_{A90,T}$- Sound level exceeded for 90% of the time period 'T'
[3] Planning Policy Guidance 24: Planning and Noise (1994)

3 BASELINE ENVIRONMENT

3.1 SITE DESCRIPTION

Rocpower have proposed to install renewable energy generating equipment in the south-eastern part of an existing electricity sub-station compound, located to the north of Whaley Road.

The proposed development site is surrounded by industrial and commercial premises to the north, south and west, with a railway line and fields beyond to the north-east and east. The nearest noise sensitive receptors to the site, in this case residential premises, are located approximately 360m to the south-west of the site on Claycliffe Road and approximately 360m to the north-west of the site on the small cul-de-sac located on the south-east side of Dearne Hall Road. It is considered that given the light industrial / commercial nature of the surrounding area there are no non-residential noise sensitive receptors located within proximity to the site.

The daytime noise climate around the site is dominated by constant vehicle movement along Claycliffe Road (A637) and industrial noise from the existing operational premises within the industrial estate. The night-time noise climate at the site is dominated by a drone emanating from operations within the industrial estate.

3.2 NOISE MONITORING

A baseline noise survey was undertaken by Rich Hinton of WYG Environment (WYG) in order to obtain ambient daytime and night-time noise level data at the site and details of the monitoring are as follows.

The daytime noise survey was undertaken on 20th January 2009 between the periods of 12:55 – 15:24 hours whilst the night-time noise survey was undertaken on 21st January between the periods of 01:00 – 02:56 hours. The noise monitoring was undertaken in order to obtain ambient noise level data at the site and capture data during the quietest daytime and night-time periods.

This survey, for the purpose of this report, comprised monitoring at the following locations:

- Location 1 – on the northern edge of Medina Way, approximately 18m from Claycliffe Road.
- Location 2 – on a dirt track running parallel to, and to the north-east of, the railway line, approximately 90m from Dearne Hall Road. Due to access restrictions we were unable to

collect measurements in the field to the rear of the dwellings which face the site on Dearne Hall Road. It was considered, however, that data representative of these premises would be collected at this location;
- Location 3 – off Dearne Hall Road on the grassed area in front of no. 90 Dearne Hall Road, approximately 9m from the main road.

The monitoring positions are illustrated in Appendix B.

During the daytime monitoring exercise the existing noise sources were identified as follows:

- Constant road traffic on Claycliffe Road (A637) was audible at Location 1 only;
- Infrequent road traffic noise from Medina Way was audible at Location 1 only;
- Intermittent road traffic along Dearne Hall Road was audible at Locations 2 only;
- Infrequent dogs barking were audible at Location 1 only;
- Trees and bushes rustling in the wind;
- General industrial noise including vehicle reversing warnings and metallic bangs from operations within the industrial estate audible at Location 2 only;
- Intermittent railway traffic noise audible at Location 2 only;
- Birdsong; and
- Infrequent aircraft overhead audible at Location 2 only.

During the night-time monitoring exercise the existing noise sources were identified as follows:

- Continuous low frequency drone from an unidentified area within the industrial estate was audible at all locations;
- Intermittent mid-high frequency squealing from an unidentified area within the industrial estate was audible at all Location 1 only;
- Intermittent metallic banging and clattering from the industrial estate was audible at all locations;
- Distant vehicle movement within the industrial estate;
- Infrequent distant car alarms were audible at Location 1 only;
- Distant road traffic noise was audible at Locations 2 and 3;
- Infrequent road traffic on Dearne Hall Road was audible at Locations 2 and 3 only; and
- Water running in drains was audible at Location 3 only.

During the daytime assessment weather conditions comprised dry conditions with wind speeds measured at up to 5m/s. During the night-time the wind speed was less than 0.5m/s at all locations with dry conditions.

3.3 INSTRUMENTATION

Measurements were obtained using a Norsonic Class 1 Integrating Sound Level Meter (Type 140 – Serial Number 1402989) and GRAS Type 41AL microphone (Serial Number 16179). The sound level meter was appropriately calibrated using a Norsonic Type 1251 calibrator - Serial Number 31291.

Calibration was undertaken before and after the survey with 0.1 dB sensitivity drift recorded during both the daytime and night-time surveys. The microphone was mounted on a tripod which was extended to approximately 1.5m above ground level and was positioned in freefield conditions. The sound level meter was configured with the time response set to fast. Measurements were obtained with 'A' weighting during the monitoring period for $L_{Aeq,T}$[4], $L_{A1,T}$[5], $L_{A10,T}$[6], $L_{A90,T}$ and L_{Amax}[7]. Calibration certificates are available upon request.

[4] $L_{Aeq,T}$ - Average sound pressure level over the time period 'T'
[5] $L_{A1,T}$ – Sound level exceeded for 1% of the time period 'T'
[6] $L_{A10,T}$ – Sound level exceeded for 10% of the time period 'T'
[7] L_{Amax} – The maximum noise level during the monitoring period

4 RESULTS

A summary of the noise results can be seen in Tables 1 and 2 below. The full monitoring data is shown in Appendix C.

Table 1: Measured noise levels during the daytime

Location	Time (T)	Average Measured Noise Level $L_{Aeq,T}$ (dB)	Average Measured Background Noise Level $L_{A90,1\ hour}$ (dB)
1	12:55 – 13:55	64.4	55.6
2	14:54 – 15:54	54.3	47.1

Table 2: Measured noise levels during the night-time

Location	Time (T)	Average Measured Noise Level $L_{Aeq,T}$ (dB)	Average Measured Noise Level $L_{A90,T}$ (dB)	Lowest measured background noise level $L_{A90,\ 5mins}$ (dB)
1	01:00– 01:36	50.4	43.3	42.1
2	02:36 – 02:56	43.3	36.3	35.9
3	01:51 – 02:26	47.7	38.6	37.8

Noise level data which was recorded during the night-time period at locations 2 and 3 are relatively comparable. It is considered therefore, that this provides a strong indication that the data collected at location 2 is representative of noise levels at the rear of residential premises on Dearne Hall Road which face the site.

5 ASSESSMENT

The experience of WYG in similar projects has shown that different LA's will stipulate different criteria which is required to be adhered to with regard to the rating level as defined in BS 4142. Table 3 illustrates the range of noise level criterion which may be stipulated.

Table 3: Likely LA noise criteria

Period	Likely Worst Case Acceptable Noise Rating Level in comparison to Measured Background Noise Level	Likely Best Case Acceptable Noise Rating Level in comparison to Measured Background Noise Level
Daytime	-10dB	+5dB
Night-time	-10dB	0dB

BS 4142 states that an acoustic feature correction of +5dB should be applied to noise sources which feature a distinguishable tone, impulses or bangs, or is irregular in operation. It is assumed for the purposes of this report that the plant to be installed will produce one or more of these acoustic features and thus a 5 dB correction is included within the resultant Rating Levels specified below.

From our understanding, noise sources associated with the proposed operation of the plant will comprise noise attributable to a fan connected to a noise attenuated exhaust which will discharge externally and noise associated with a generator which will be located within an enclosure which, if necessary, will be specifically designed for sound attenuation. Therefore, the cumulative noise level attributable to the plant will be influenced by noise at the exhaust in addition to the noise breakout through the enclosure. The reduction of noise from within the enclosure will be affected by the building materials and dimensions of the enclosure.

As information relating to the type of plant associated with the proposed process or details regarding the construction of the enclosure are not available, it is difficult to provide a single figure noise level which a specific item of plant can generate. The following information is therefore, based on determining a noise level which does not take into consideration any sound reduction associated with the proposed building enclosure. This will result in the provision of a single figure representing the cumulative level of noise attributable to all noise generating elements of the proposed process based on a single central point (point source). In relation to noise breakout through the enclosure the level of reduction provided by the structure and distance attenuation will be affected by the building materials and dimensions. For reference, the enclosure will reduce noise from the generator at

source although the reduction in noise level at a particular receptor due to distance attenuation will be slightly less than that calculated for a point source.

An indication of acceptable noise levels during the daytime and night-time operation of the units is as follows. As stated previously, the specified noise levels do not make provision for the generator being housed in an enclosure.

Daytime

Table 4 below presents the predicted acceptable noise levels attributable to the proposed plant during the daytime based on the worst case noise criteria which may be required by the LA.

Table 4: Daytime noise level permitted from proposed plant

Location	Distance to Location	Measured Background Noise Level $L_{A90,1Hr}$ (dBA)	Distance Correction Assuming Point Source (dB)	Permissible SPL[8] on Site at 1m from Plant (dB(A))	Equivalent SWL[9] of plant (dB(A))
1	360	55.6	-50	90.6	98.6
2	360	47.1	-50	82.1	90.1

Based on the noise criteria presented in Table 3, a best case scenario will increase the permissible noise level presented in Table 4 by 15 dB(A). If it was determined that noise attributable to the plant does not have a tonal character then the permissible SWL noise level would increase by 20 dB(A) compared to the level presented in Table 4.

Night-time

Table 5 below presents the predicted acceptable noise levels attributable to the proposed plant during the daytime based on the worst case noise criteria which may be required by the LA.

[8] Sound Pressure Level
[9] Sound Power Level

Table 5: Likely Night-time Noise Level Permitted from proposed plant

Location	Distance to Location	Lowest Measured Background Noise Level $L_{A90,5mins}$ (dBA)	Distance Correction Assuming Point Source (dB)	Permissible SPL on Site at 1m from Plant (dB(A))	Equivalent SWL of plant (dB(A))
1	360	42.1	-50	77.1	85.1
2	360	35.9	-50	70.9	78.9

Based on the noise criteria presented in Table 3, a best case scenario will increase the permissible SWL noise level presented in Table 5 by 10 dB(A). If it was determined that noise attributable to the plant does not have a tonal character then the permissible noise level would increase by 15 dB(A) compared to the level presented in Table 5.

6 SUMMARY

Once information relating to the proposed enclosure is available, including details regarding construction materials and dimensions, as well as specific noise levels associated with specific items of plant, detailed advice regarding acceptable noise levels can be established.

Dependent on noise levels associated with items of plant, however, there may be the requirement for acoustic design considerations to be incorporated. This could include establishing measures in relation controlling noise from the plant itself or improving the insulation performance of the enclosure. Examples of such noise control measures include fitting silencers to plant, fixing absorptive materials on the inner walls of the enclosure to reduce noise internally, isolating the generator from the structure of the enclosure to minimise structure borne noise, ensuring that breaks in the structure are appropriately sealed and construct the enclosure out of materials which have a greater level of sound insulation performance. In addition to the above, a further solution could be the restriction of the operation of the unit to periods of the day when noise levels at the adjacent receptors are of a sufficient level for noise from the unit to adhere to the required criteria.

Based on the fact that the generator will be housed in an enclosure it is our consideration that acceptable noise levels at identified receptors should easily achieved over the full 24 hour period.

Appendix A – Report Conditions

WYG Environment Planning Transport Ltd

Report Conditions

Yorkshire Generation Scheme, Barnsley – Noise Survey

This report is produced solely for the benefit of Rocpower and no liability is accepted for any reliance placed on it by any other party unless specifically agreed in writing otherwise.

This report is prepared for the proposed uses stated in the report and should not be used in a different context without reference to WYG. In time improved practices, fresh information or amended legislation may necessitate a re-assessment. Opinions and information provided in this report are on the basis of WYG using due skill and care in the preparation of the report.

This report refers, within the limitations stated, to the environment of the site in the context of the surrounding area at the time of the inspections. Environmental conditions can vary and no warranty is given as to the possibility of changes in the environment of the site and surrounding area at differing times.

This report is limited to those aspects reported on, within the scope and limits agreed with the client under our appointment. It is necessarily restricted and no liability is accepted for any other aspect. It is based on the information sources indicated in the report. Some of the opinions are based on unconfirmed data and information and are presented as the best obtained within the scope for this report.

Reliance has been placed on the documents and information supplied to WYG by others but no independent verification of these has been made and no warranty is given on them. No liability is accepted or warranty given in relation to the performance, reliability, standing etc of any products, services, organisations or companies referred to in this report.

Whilst skill and care have been used, no investigative method can eliminate the possibility of obtaining partially imprecise, incomplete or not fully representative information. Any monitoring or survey work undertaken as part of the commission will have been subject to limitations, including for example timescale, seasonal and weather related conditions.

Although care is taken to select monitoring and survey periods that are typical of the environmental conditions being measured, within the overall reporting programme constraints, measured conditions may not be fully representative of the actual conditions. Any predictive or modelling work, undertaken as part of the commission will be subject to limitations including the representativeness of data used by the model and the assumptions inherent within the approach used. Actual environmental conditions are typically more complex and variable than the investigative, predictive and modelling approaches indicate in practice, and the output of such approaches cannot be relied upon as a comprehensive or accurate indicator of future conditions.

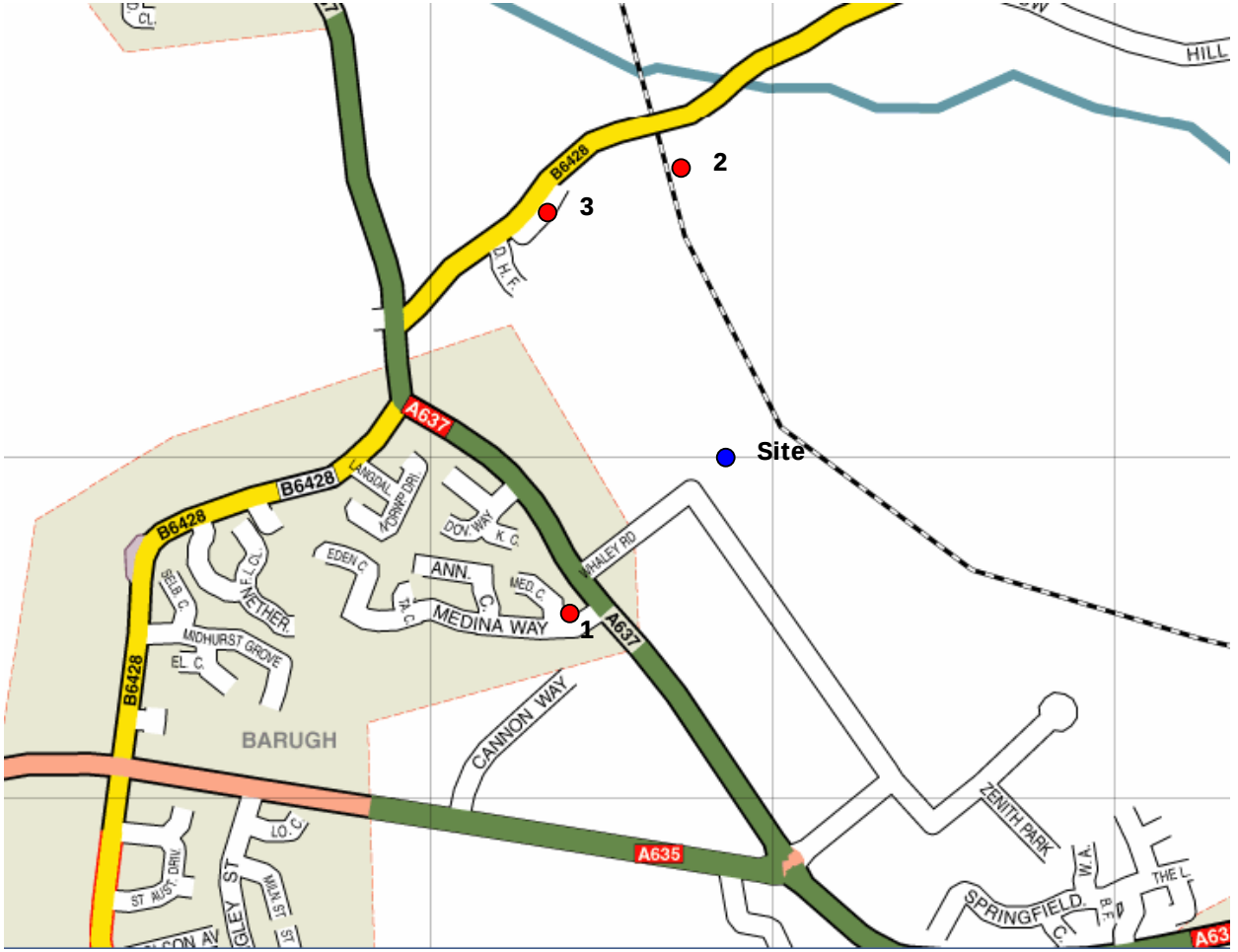
The potential influence of our assessment and report on other aspects of any development or future planning requires evaluation by other involved parties.

The performance of environmental protection measures and of buildings and other structures in relation to acoustics, vibration, noise mitigation and other environmental issues is influenced to a large extent by the degree to which the relevant environmental considerations are incorporated into the final design and specifications and the quality of workmanship and compliance with the specifications on site during construction. WYG accept no liability for issues with performance arising from such factors

November 2008
WYG Environment Planning Transport Ltd

Appendix B – Monitoring Location Plan

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Key

1 Approximate Noise Monitoring Location

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Project
Yorkshire Generation Scheme

Client
Rocpower

Site Address
Whaley Road

Drawing Title
Noise Monitoring Location Plan

Figure No.
001

Project No. A052596

Scale at A4: NTS

Checked By: RH

Approved By: SM

Office 4104 | Type Env | Approval ☐ Information

Appendix C – Noise Monitoring Data

Daytime Noise Monitoring Data, Barnsley, 20/1/09

Location 1

Date / Time	L_{Aeq} (dB)	L_{Amax} (dB)	L_{A1} (dB)	L_{A10} (dB)	L_{A90} (dB)
(2009/01/20 12:55:06.00)	64.0	77.7	71.7	67.4	55.0
(2009/01/20 13:10:10.00)	64.0	75.1	70.6	67.4	55.5
(2009/01/20 13:25:13.00)	64.7	75.9	71.1	67.8	56.0
(2009/01/20 13:40:17.00)	64.7	84.7	71.1	67.6	55.8
Average	**64.4**		**71.1**	**67.6**	**55.6**

Location 2

Date / Time	L_{Aeq} (dB)	L_{Amax} (dB)	L_{A1} (dB)	L_{A10} (dB)	L_{A90} (dB)
(2009/01/20 14:24:18.00)	55.8	81.1	64.3	51.9	46.2
(2009/01/20 14:39:22.00)	50.8	72.3	56.7	51.4	47.1
(2009/01/20 14:54:25.00)	52.8	76.0	59.4	52.7	47.1
(2009/01/20 15:09:29.00)	55.9	80.8	59.6	52.5	47.5
Average	**54.3**		**60.0**	**52.1**	**47.0**

Data from Nor-review v4.4

	$L_{A90,1Hr}$ (dB)
Location 1	55.6
Location 2	47.1

Night-time Noise Monitoring Data, Barnsley, 21/1/09

Location 1

Date / Time	L_{Aeq} (dB)	L_{Amax} (dB)	L_{A1} (dB)	L_{A10} (dB)	L_{A90} (dB)
(2009/01/21 01:00:56.00)	52.6	79.1	64.6	53.2	42.1
(2009/01/21 01:06:00.00)	46.3	61.4	58.0	46.2	43.0
(2009/01/21 01:11:04.00)	52.9	69.3	67.3	50.2	43.2
(2009/01/21 01:16:07.00)	50.6	67.3	63.2	50.8	43.4
(2009/01/21 01:21:11.00)	50.1	70.1	62.9	48.7	45.0
(2009/01/21 01:26:14.00)	49.5	68.9	62.2	47.9	44.5
(2009/01/21 01:31:18.00)	46.6	52.2	49.3	47.8	45.4
Average	**50.4**		**61.1**	**49.3**	**43.8**

Location 2

Date / Time	L_{Aeq} (dB)	L_{Amax} (dB)	L_{A1} (dB)	L_{A10} (dB)	L_{A90} (dB)
(2009/01/21 02:36:34.00)	48.4	77.4	55.3	44.3	35.9
(2009/01/21 02:41:37.00)	37.4	60.6	38.4	37.6	36.1
(2009/01/21 02:46:41.00)	37.5	40.3	39.2	38.5	36.4
(2009/01/21 02:51:45.00)	37.7	41.5	39.3	38.6	36.8
Average	**43.3**		**43.1**	**39.8**	**36.3**

Location 3

Date / Time	L_{Aeq} (dB)	L_{Amax} (dB)	L_{A1} (dB)	L_{A10} (dB)	L_{A90} (dB)
(2009/01/21 01:51:10.00)	41.8	57.6	46.1	43.2	39.7
(2009/01/21 01:56:13.00)	46.2	64.7	59.8	43.5	39.8
(2009/01/21 02:01:17.00)	40.0	44.7	43.0	41.5	38.3
(2009/01/21 02:06:21.00)	50.3	67.0	65.2	46.0	39.4
(2009/01/21 02:11:24.00)	47.6	67.1	62.5	43.2	38.2
(2009/01/21 02:16:28.00)	50.9	67.1	64.2	52.4	38.1
(2009/01/21 02:21:32.00)	47.6	68.2	61.6	43.9	37.8
Average	**47.7**		**57.5**	**44.8**	**38.8**