

Chapter Ten

NOISE AND VIBRATION

INTRODUCTION

10.1 This chapter of the ES addendum describes the noise and vibration impacts of the proposed development. More specifically, this chapter assesses noise and vibration sources associated with the following elements of the revised development proposals:

- The Gasification Hall;
- The Fuel Store;
- The Turbine Hall; and,
- External plant and HGV movements.

10.2 This assessment has been prepared by Ion Acoustics Limited for Enviroparks (Wales) Limited and is intended to be read in conjunction with chapter ten of the ES submitted in 2008 as part of the first planning applications. The structure adopted within this document broadly follows that of the original noise chapter for ease of reference.

10.3 This addendum assessment has involved the following elements:

- consultation with Natural Resources Wales (NRW) relating to the scope and methodology of the study;
- identification of appropriate standards and guidance for use in the assessment of noise and vibration impacts;
- collection of daytime and night-time background and ambient noise level data in order to quantify the existing, typical noise climate at the nearest noise sensitive receptor locations in the vicinity of the site;
- qualitative assessment of construction noise levels at the nearest noise sensitive receptor locations;
- quantitative prediction of operational noise levels at the nearest noise sensitive receptor locations;
- qualitative assessment of road traffic noise on the wider road network as a result of the proposed development;
- determination of the significance of the impacts associated with the operation of the development;
- consideration of cumulative noise impacts arising from other developments within the area;

- determination of the magnitude of any residual effects that may remain following the implementation of any recommended mitigation measures.

10.4 Elements of the proposed facility will operate on a continuous basis. However, HGV movements will only occur during the daytime period (08:00 to 18:00hrs).

LEGISLATION AND PLANNING CONTEXT

10.5 A general review of relevant law and policy in relation to the development proposals is provided in chapter five of this ES addendum. This section addresses those policies which directly relate to noise and vibration issues. Within the context of this assessment, these are:

The Control of Pollution Act 1974 (CoPA) [1]

10.6 The CoPA provides legislation that Local Authorities can implement in order to control the noise from construction sites and prevent the occurrence of disturbance to surrounding residents. Sections 60 and 61 are relevant. These are summarised in the original ES chapter and have not changed since that review.

Environmental Protection Act 1990 (EPA) [2]

10.7 The Environmental Protection Act (Section 79, Part III of Chapter 43, *Statutory Nuisances and Inspections*) contains a definition of what constitutes a 'statutory nuisance' with regard to noise and places a duty on Local Authorities to detect any such nuisances within their area. Where such nuisances arise, section 80 of the 1990 Act requires the local authority to issue a noise abatement notice requiring the nuisance to be abated.

Planning Guidance (Wales): Technical Advice Note (TAN) 11 – 1997 [3]

10.8 Again, the TAN 11 is summarised within the original ES chapter and has not changed since that review. That said, paragraph B17 of TAN 11 refers to BS4142:1990 and BS8233:1987 which have been superseded by BS4142:2014 and BS8233:2014 respectively.

10.9 Similarly, paragraph B20 refers to BS5228 parts 1-4 which have been superseded by BS5228-1:2009 + A1: 2014 and BS5228-2: 2009.

10.10 Details of these changes and revised texts referring to the underpinning British Standards is detailed in the letter from the Chief Planning Officer for the Welsh Government in the letter dated 25th November 2015.

10.11 The assessments undertaken within this ES addendum have been based on the following guidance and standards:

- BS5228-1: 2009+A1:2014 – *Code of practice for noise and vibration control on construction and open sites – Part 1: Noise*; [4]
- BS5228 -2: 2009+A1:2014 – *Code of practice for noise and vibration control on construction and open sites – Part 2: Vibration*; [5]
- BS6471-1: 2008 – *Guide to evaluation of human exposure to vibration in buildings*; [6]
- BS7385-1: 1990 – *Evaluation and measurement for vibration in buildings*; [7]
- BS4142:2014 – *Methods for rating and assessing industrial and commercial sound*; [8]
- *Calculation of Road Traffic Noise (CRTN)*, Department of Transport (Welsh Office) 1988; [9]
- BS7445-1: 2003: *Description and Measurement of Environmental Noise*, 2003;
- BS7445-2:1991: *Description and Measurement of Environmental Noise*. 1991.

10.12 These guidance documents are discussed in further detail in Appendix 10.1 of this chapter.

Assessment criteria

Noise from construction activities

10.13 A significant construction noise impact will be deemed to occur if the levels generated during the construction period exceed the relevant limits as derived in accordance with Annex E of BS5228-1. These limits vary depending on the existing ambient noise level and the assessment period however, for typical daytime operations, the lower limit would be 65dB $L_{Aeq, T}$ at the receptor location.

10.14 Where best practical means are deemed to be insufficient to control noise impacts during the construction period, it is recommended that a section 61 agreement under CoPA legislation be put in place. This would permit specific noise generating tasks to be permitted under strict controls. Detailed calculations would be required in order to inform the S61 agreement.

Vibration from construction activities

10.15 The original ES chapter presents a summary of the vibration criteria for occupants of a building and thresholds of potential cosmetic damage to buildings. These criteria are still relevant to the assessment of construction vibration.

10.16 A significant impact will be deemed to occur if these vibration levels are exceeded as a result of the construction activities at the site.

Noise from operation

10.17 A significant noise effect will be deemed to occur during the operational period if the rating level (as determined according to BS4142: 2014) should exceed the background sound level by more than 3dB at any sensitive receptor location. The rating level will include any appropriate acoustic character corrections.

Ground-borne vibration from operation

10.18 No ground-borne vibration impacts are expected to occur outside the site boundary as a result of typical operations at the proposed development.

Operational traffic

10.19 The Enviroparks site is located on the existing industrial estate at Hirwaun and as such, noise associated with vehicle movements would not be out of keeping with the general noise climate of the area.

10.20 A significant noise impact will be deemed to occur if off-site traffic noise levels at any receptor location, increase by more than 3dB $L_{A10(18\text{hours})}$ as a result of the proposed development.

Cumulative consideration

10.21 A number of sites in the vicinity of the proposed development could give rise to cumulative impacts in terms of both noise and vibration. Developments that might generate cumulative impacts include the following:

- The High Energy Use (HEU) building within the site area;
- The existing Enviroparks Fuel Preparation Hall;
- The Hirwaun Power Station; and,
- The Abergorki Wind Farm in respect of construction traffic.

The impact of these sites have been considered in further detail below in Paragraph 10.82 onwards.

Limitations to the assessment

10.22 Given the nature of the development and the iterative design process for the facility, it was necessary to make a number of assumptions which could be considered limitations to the assessment methodology. These include:

- limited information relating to the type of activities, duration, phasing and specific plant used in the construction of the facility;
- the traffic data provided by the transport consultants is in Annual Average Daily Traffic (AADT) format as opposed to Annual Average Weekday Traffic (AAWT) format as required by CRTN; and,
- no octave band noise data for any of the items of fixed plant at the facility.

10.23 The procurement process for new plant will include consideration of noise levels and attenuation to ensure that any noise limits are met both for internal noise levels and for break out through the building envelope.

CONSULTATION

10.24 The noise assessment presented in Chapter 10 of the original ES indicates that discussions relating to noise and vibration were held with both Brecon Beacons National Park Authority and Rhondda Cynon Taf County Borough Council in July 2008.

10.25 Ion Acoustics contacted Toby Griffiths at Natural Resources Wales (NRW) in June 2016 to discuss the proposed development and to agree an assessment methodology in relation to the Environmental Permit. During these discussions the following points were raised:

- The assessment of operational noise impacts should be undertaken in line with BS4142 and aim to achieve a rating level of 0dB with +3dB relative to the typical background sound being the maximum permissible to avoid adverse noise impacts;
- Mr Griffiths indicated that a rating noise level closer to 0dB relative to the background would be favourable;
- Mr Griffiths indicated that NRW would want to avoid any acoustic features e.g. tonal or impulsive noise;
- NRW would expect a follow up monitoring survey when the site is operational to confirm the findings of the noise assessment.

10.26 Mr Griffiths provided the Environment Agency's guidance note on the information requirements for permit applications that include computer modelling or spreadsheet calculations (version 4, April 2016) for reference.

BASELINE CONDITIONS

10.27 As part of the original noise assessment, a baseline monitoring survey was undertaken by RPS Planning and Development in August 2008 at a number of locations in the vicinity of the Hirwaun site. These locations were:

- Location 1 - Ty Newydd (Hotel);
- Location 2 – Reservoir House;
- Location 3 – Tai-cwplau Farm; and,

- Location 4 – Trebanog-uchaf Farm.

10.28 Noise measurements were made for two hours during the daytime period and one hour during the night.

10.29 The details of the methodology used within the survey are presented in chapter 10 of the original ES. For reference, the noise levels established during this survey are summarised below:

Table 10.1: Daytime Noise Monitoring Data – 2008

Location	Time	Measured Statistical Parameters in dB		
		L_{Aeq}	L_{A90}	L_{Amax}
Location 1	09:00 – 10:00	46.1	40.2	82.1
	10:00 – 11:00	44.6	40.4	65.3
Location 2	11:10 – 12:10	46.1	41.7	71.2
	12:10 – 13:10	46.6	42.9	79.6
Location 3	15:50 – 16:50	50.1	40.9	75.6
	16:50 – 17:50	48.3	43.0	70.5
Location 4	13:25 – 14:25	49.0	45.9	66.0
	14:25 – 15:25	48.7	44.5	79.2

Table 10.2: Night-time Noise Monitoring Data – 2008

Location	Time	Measured Statistical Parameters in dB		
		L_{Aeq}	L_{A90}	L_{Amax}
Location 1	00:00 – 01:00	40.8	24.5	67.1
Location 2	01:14 – 02:14	39.0	37.7	61.7
Location 3	03:39 – 04:39	54.6	31.6	81.1
Location 4	02:20 – 03:20	37.7	35.7	60.7

10.30 To supplement and update the RPS survey, a new noise survey was carried out on 23-24 June 2016 by Ion Acoustics. The specifics of the new survey including the monitoring locations, durations and measured data are presented in Ion Acoustics' report reference A1000 R01 Dated 30th June 2016. This report is appended to this ES addendum as Appendix 10.2.

10.31 The Ion Acoustics survey was undertaken at locations approximating those used in the RPS survey but included an additional daytime survey at Fifth Avenue House, a guest house located approximately 430m to the west of the Enviroparks site. The monitoring locations are presented on Figure 10.1 below for reference.



Figure 10.1: Site Location Plan and Monitoring Locations (Map Ref Google Earth)

10.32 The monitoring locations are summarised in Table 10.3 below:

Table 10.3: Noise Monitoring Location – 2016

<i>Location Reference</i>	<i>Address</i>	<i>Grid Reference</i>	<i>Distance to Site Boundary, m</i>
M01	Ty Newydd Hotel	294630, 206875	620
M02	Underwood Lodge (Reservoir House)	294173, 207265	365
M03	Tai-cwpla Farm	293510, 207018	260
M04	Trebanog Uchaf Farm	294071, 207396	450
M05	Fifth Avenue Guest House	293275, 206864	430

10.33 The locations identified as Locations 1-4 in the RPS survey broadly correlate to location M01 – M04 of the Ion Acoustics Survey.

10.34 The noise climate of the area was dominated by traffic movements on the A465 Heads of the Valley Road, which was audible, to some degree, at all monitoring locations. Other noise sources included wind noise in the undergrowth / trees and bird song. Noise from the open cast mining operation at Tower Colliery in the vicinity of the A4061 was audible at location M01 at a very low level. The noise climate during the night was markedly quieter with only sporadic vehicle movements on the A465 audible.

10.35 The baseline data from the Ion Acoustics survey is summarised in Table 10.4 below.

Table 10.4: Noise Monitoring Data – 2016

<i>Location</i>	<i>Period</i>	<i>Duration hh:mm:ss</i>	<i>L_{Aeq}, dB</i>	<i>Average L_{A90}, dB</i>
M01	Daytime	15:15:00	46.8	39
	Night-time	05:00:00	35.1	29
M02	Daytime	01:15:00	48.7	41
	Night-time	00:45:00	36.8	33
M03	Daytime	16:45:00	53.8	42
	Night-time	05:00:00	46.4	32
M04	Daytime	16:00:00	45.3	41
	Night-time	05:00:00	37.7	34
M05	Daytime	00:45:00	56.1	41
	Night-time	/	/	/

Identification of noise sensitive receptors

10.36 The noise sensitive receptors identified within the scope of this study are detailed in Table 10.5 below.

Table 10.5: Noise sensitive receptor locations

<i>Receptor Location</i>	<i>Noise Receptor Reference</i>	<i>Sensitivity</i>	<i>Approximate Ordnance Survey Co-ordinates (E,N)</i>	<i>Distance to Site, m</i>
Ty Newydd Hotel	AL01	High	294622, 206930	615
Underwood Lodge (Reservoir House)	AL02	High	294135, 207270	360
Tai-Cwpla Farm	AL03	High	293518, 207033	260
Trebanog Uchaf Farm	AL04	High	294059, 207402	450
Fifth Avenue Guest House	AL05	High	293324, 206836	390

INCORPORATED ENHANCEMENTS AND MITIGATION

Construction Activities

10.37 In the absence of any detailed information relating to exact programming of the construction phase, including the type of activity, proposed fixed / mobile plant and construction durations, it is

not possible to detail specific mitigation measures. This would be addressed by the principal contractor on site in a construction method statement prior to the commencement of any works.

10.38 The 2008 ES indicates that the principal contractor will be required to adhere to the following:

- reduce noise to a minimum, as defined in section 72 of the CoPA 1974 using the best practical means (BPM) at all times and in agreement with the Local Planning Authorities;
- maintain / replace exhaust silencers to ensure they are effective;
- use well silenced compressors in noise-sensitive areas;
- maintain plant and ensure that noise abatement measures (e.g. covers) are fully operational and used correctly;
- confine construction activity to within a time period agreed with the Local Authority;
- keep local residents and the Local Authorities informed of the proposed working schedule, where appropriate, including the times and duration of any abnormally noisy activity that may cause concern;
- provide a helpline/ contact number for any complaints or concerns from members of the public;
- employ a manager to ensure that all works are being carried out in accordance with BPM.

10.39 The 2008 ES noise chapter indicates that all issues relating to construction noise mitigation measures will be contained within the scope of a Section 61 agreement. This remains the case.

Operational activities

10.40 The following mitigation measures have been included within the design of the Enviroparks site and have been incorporated into the subsequent noise assessment:

Waste recycling and energy recovery facility

10.41 The proposed buildings will be clad in an appropriate wall cladding product that affords a minimum sound reduction index of R_w 25dB. Buildings in the revised planning proposals will be clad in a manner similar to the existing Fuel Preparation Hall. This building is clad in a combination of the following elements:

- Timber cladding on a profiled steel panel;
- Kingspan XL forte Symphony; and,
- Kingspan Microrib XL Forte Crescendo.

10.42 All of the above elements would provide at least R_w 25dB, as required.

10.43 In addition, it is proposed that:

- roofs will be constructed with a Euroclad Euroseam EX400 cladding system, which affords R_w 44dB.

- all vehicle access doors will be rapid closing and will be required to be closed when not in use;
- the roof fans on the Gasification Hall will be located within the building envelope and ducted to the roof through appropriate attenuators. The roof fans will generate no more than 75dB(A) at a distance of 1m from the fan termination;
- the Air Cooled Condenser (ACC) fan units located to the west of the Gasification Hall will generate no more than 70dB(A) at a distance of 1m from the unit. The associated steam ducting will be clad to ensure noise break out is reduced to 70dB(A) at 1m;
- the Dry Air Cooler (DAC) fans will be enclosed to the north and west by a 3.5m acoustic barrier. The barrier should provide a minimum surface density of 10kg/m² and be lined on the internal facing with acoustically absorbent material;
- the process water and gas booster stations should be constructed to be acoustically robust and afford a minimum noise reduction of 25dB. This could be achieved by providing a 0.8m steel enclosure or a typical brick/ block enclosure though care should be taken when locating ventilation points and access panels; and,
- the standby diesel generator should generate a sound pressure level of no greater than 75dB(A) at a distance of 1m from the unit. This would include noise from the exhaust system and any supply/ extract fans.

High Energy Use Building

10.44 As explained in the original ES noise chapter, no information relating to the High Energy Use building is available at this time therefore, it is recommended that further calculations be carried out once the intended use has been identified. This building lies outside of the red line boundary for the current planning applications.

IDENTIFICATION AND EVALUATION OF KEY IMPACTS

Construction phase

10.45 The construction phase of the development has the potential to cause short-term disturbance to the amenity of nearby receptors in terms of both noise and vibration. Activities most likely to generate disturbance include:

- *site establishment including ground works* – the most recent site visit indicates that the site is already levelled and access roads have been constructed though there may be further recourse for foundations/ footings which could require piling and/ or ground stabilisation;
- *building construction* – typically undertaken with less large-scale equipment though could include cranes etc. for the construction of steel frame buildings; and,
- *construction traffic* – increases in road traffic movements on the surrounding road network due to construction traffic have the potential to generate short-term noise impacts at receptor locations. Construction phase traffic data has been provided and has been assessed in further detail below.

10.46 A qualitative assessment of construction noise in line with BS5228 has been undertaken, discussing potential noise levels from typical construction processes, noise limits and control measures that could be implemented at the closest residential properties should it be necessary.

10.47 Effects on specific identified receptors during the construction phase are expected to be short-term in duration, although the exact duration over which the construction phase will occur is not yet known. As such construction noise should be covered within the scope of an Environmental Management Plan (EMP) once the specifics of the programme are known and understood.

Construction noise thresholds

10.48 The information contained in Table 10.6 below details the threshold levels at which significant effects would be expected to occur due to construction noise. These thresholds are based the data established during the Ion Acoustics monitoring survey and the two methodologies described in BS5228-1 Annex E.

10.49 Construction operations would generally only occur during daytime working hours - typically 07:00 to 19:00hrs Monday to Friday and 07:00 to 13:00 on Saturday. Movement of construction vehicles would be restricted to 08:00 to 18:00 Monday to Friday and 08:00 to 13:00 on Saturday.

Table 10.6: Proposed construction noise limits

Location Reference	Average Measured L_{Aeq} dB	Column 2 rounded to the nearest 5dB 'ABC Method', dB	BS5228 Methodology	
			'ABC Method'	'+5dB Change Method'
AL01	46.8	50	65	65
AL02	48.7	50	65	65
AL03	53.8	55	65	65
AL04	45.3	45	65	65
AL05	56.1	55	65	65

Construction noise predictions

10.50 As previously stated, details of construction techniques and types of plant likely to be used in the construction of the site are not currently available. However, it is considered useful to present potential worst-case noise levels from a selection of typical construction plant sources that might be used within a development of this type, and to calculate noise levels from these, back to different distances which may reflect noise levels at sensitive receptors. These are shown in Table 10.7 below.

10.51 It is noted that the noise levels presented within Table 10.7 below do not take into account any attenuation due to screening and have been based upon hard reflective ground between source and receiver (water, concrete, bituminous surfaces). Given the nature of the existing ground cover around the site being predominately grass and / or crop plants, actual noise levels should in most

cases be slightly lower than those that predicted. The figures are based upon a 100% on-time, which is unlikely to occur in practice.

10.52 All predicted noise levels have been based on typical plant source noise levels taken from the appendices of BS5228.

Table 10.7: Indicative construction plant noise levels

Plant	Sound Pressure Level in dB(A) at 10m	Sound Pressure Level (dB L _{Aeq})						
		20m	50m	100m	200m	300m	600m	1km
44tn Tracked 360° Excavator	85	79	71	65	59	55	49	45
Crane	78	72	64	58	52	48	42	38
Pneumatic Chipper	89	83	75	69	63	60	53	49
Crawler Mounted Rig	80	74	66	60	54	51	44	40
Concrete Pump	78	72	64	58	52	49	42	38
Road Lorry (Drive By)	80*	74*	66*	60*	54*	50*	44*	40*

* Note: Drive by maximum sound pressure level, L_{pA} as shown in BS5228

10.53 It is considered that the properties potentially most affected by construction noise would be the farm house at Tai-cwplau (260m from site) and Reservoir House (360m from site). However, from Table 10.7 it can be seen that noise levels from on-site construction activity will be well below the 65 dB L_{Aeq} significance threshold.

Piling activity

10.54 Information provided by the construction contractor indicates that the site will require piling as part of the ground works. This piling is to be undertaken by means of continuous flight auguring (CFA) piling. This involves drilling of deep holes which are backfilled with concrete as the auger is removed and then reinforced with steel.

10.55 CFA piling is a relatively quiet form of piling though noise is generated by the drilling rig and the concrete pump and any other ancillary plant.

10.56 The information presented in Table 10.7 above indicates that noise from plant associated with the piling process would fall below the construction noise limits as detailed in Table 10.6.

10.57 Further calculations relating to other construction activities are recommended once the detailed construction programme is known. These should be taken into account when preparing the EMP.

Construction phase traffic

10.58 Information provided by the project's transport consultant indicates vehicle visits during the construction period will average 178 vehicle visits per day and are predicted to reach a maximum of 248 for a brief period. It is anticipated that less than one quarter of the vehicles visiting the site will be HGVs, the majority being made up of cars or light goods vehicles.

10.59 HGV movements during both the construction and operational phases will be restricted to routes from the east, via the A465 and A4061. This route serves the Hirwaun Industrial Estate and, being an industrial estate road, accommodates a large percentage of HGV movements during a typical 24hr period. As such, the increase in HGV movements during the construction phase is not considered to result in significant noise effects.

10.60 Traffic data for the A465, provided by the project's transport consultant, indicates a total of 31,404 motor vehicles use the A465 per day, comprising 10,852 west of the estate and 20,552 east of the estate. Given this, and the maximum number of 248 vehicle visits (495 vehicle movements), it is possible to calculate that the construction traffic would result in an increase in total flow of 1.6% on the A465. This would not result in any perceptible increase in traffic noise on this road. Given this, it is considered that HGV movements during the construction phase will not result in any significant noise impacts.

10.61 It is reiterated that no HGVs will be travelling west along Rhigos Road.

Operational phase

10.62 The operational phase of the development has the potential to increase noise levels at the nearby receptor locations. The main factors associated with the operational phase which could generate noise impacts are identified below:

- operational plant and equipment located within the building envelope during both the daytime and night-time periods;
- operational plant and equipment outside the building envelope during both the daytime and night-time periods;
- vehicle movements on site roads within the site boundary;
- vehicle movements to / from the site including HGV movements and staff vehicles on the surrounding road network.

10.63 It is reiterated that the operational period is not considered to generate significant levels of ground borne vibration.

10.64 The assessment is based on the proposed operational parameters of the facility and the existing measured background noise climate during the operational daytime and night-time periods. These periods are defined as follows:

- Daytime Period: 07:00 to 23:00hrs; and,
- Night-time Period 23:00 to 07:00hrs.

10.65 The Enviroparks facility would be operational in some capacity 24 hours per day, 365 days per year. However, HGV deliveries would take place only during typical daytime hours, identified in the transport assessment as 08:00 to 18:00 hours.

PREDICTION OF IMPACT MAGNITUDE

Operational phase

10.66 An assessment in line with BS4142: 2014 has been undertaken to the nearest noise sensitive receptor locations. The assessment of noise impacts during the operational phase includes noise generated by the following:

- internal plant associated with the Gasification Hall, Fuel Storage Hall and Turbine Hall;
- HGV movements within the site boundary; and,
- external fixed plant and equipment.

10.67 The methodology of BS4142: 2014 includes consideration of factors such as tonality, impulsivity, intermittency and any other characteristics associated noise source through corrections applied to the specific noise level, giving the rating level, L_{Ar} .

10.68 In this instance, the noise generated by the proposed development is generally considered to be broadband noise with no distinguishable tonal or impulsive content. The internal plant and equipment would operate at all times of the day and week with no intermittency or impulsivity, and any tonal content would be attenuated by the building envelope and masked by external noise sources. There is an element of demand response with the gasification hall roof fans and the ACC fan unit. However both noise sources would operate in some capacity at all times and any element of intermittency would be masked by the remaining operational elements. To that end it is considered that there are no corrections to be applied in the calculation of the rating level.

10.69 Details of the plant and equipment and assumptions included in the noise modelling assessment are presented in Appendix 10.3 of this chapter. The information was provided by the relevant equipment providers to EWL including FBW Engineering and Biomass Power Limited.

10.70 The daytime assessment includes noise generated by HGV movements within the site area and internal building operations based on information provided by Biomass Power Limited. A night-time assessment has been made without the effect of the HGV movements and with some plant operating at reduced capacity.

10.71 The assessment includes the incorporated mitigation measures as explained above.

10.72 Predicted noise contours are presented in Figures 10.3 and 10.4 appended to this document. These present the daytime and night-time operational noise contours.

10.73 The impact assessment of the daytime operational phase is as follows.

Table 10.8: Daytime noise impact assessment

<i>Assessment Location</i>	<i>Predicted Specific Noise Level, dB</i>	<i>Rating Noise Level, L_{Ar} dB</i>	<i>Typical Background Sound Level, L_{A90} dB</i>	<i>Difference relative to background, dB</i>
AL01	29	29	39	-10
AL02	33	33	41	-8
AL03	36	36	42	-6
AL04	32	32	41	-9
AL05	33	33	41	-8

10.74 The assessment of the daytime period, summarised in table 10.8 above, indicates that noise generated by the proposed development would fall between 6dB and 10dB below the typical background sound level of the area. In summary, there would be no significant noise effect from daytime operation of the plant.

10.75 The assessment of the night-time period is presented in table 10.9 below. Discussions with the relevant equipment providers indicates that the ACC fan unit and the roof fans would operate at a reduced capacity during the night-time period. In addition, there would be no HGV movements during the night.

Table 10.9: Night-time noise impact assessment

<i>Assessment Location</i>	<i>Predicted Specific Noise Level, dB</i>	<i>Rating Noise Level, L_{Ar} dB</i>	<i>Typical Background Sound Level, L_{A90} dB</i>	<i>Difference relative to background, dB</i>
AL01	25	25	29	-4
AL02	28	28	33	-5
AL03	33	33	32	+1
AL04	29	29	34	-5
AL05	31	31	32	-1

10.76 The assessment presented above indicates that noise from the proposed development would fall between 1dB above, and 5dB lower than the typical background sound level at the receptor locations. There would therefore be a minor effect for night-time operation resulting in an increase

in background noise at the nearest receptors. However, noise levels are low in absolute terms and within the +3dB limit recommended by Natural Resources Wales.

Off-Site traffic movements

10.77 Traffic data for the surrounding road network have been supplied by EWL's transport consultant and are presented as part of the transport assessment in chapter eight of this ES addendum.

10.78 HGVs servicing the site will do so from the east, via the A4061, Main Avenue and Fifth Avenue. Commitments are already in place that stipulate that HGVs serving the site must not approach or leave via the west. Cars may do so, although it is considered that the majority of operational staff will likely also enter the estate from the east. Given this, the assessments presented within this section of the report assume that all vehicles will approach the site from the east.

10.79 The assessments presented below are separated into two discrete assessments: assessment of vehicle movements on the industrial estate roads; and vehicle movements on the main trunk road (A465).

Vehicle movements within the Industrial Estate

10.80 Baseline traffic data have been analysed for a two hour peak periods for two sections of road on Hirwaun Industrial Estate: Fifth Avenue between the site and the junction with Main Avenue; and Main Avenue to the junction with A4061. The traffic data were established in 2008 through traffic count points located on the roads and factored using appropriate growth factors to give base traffic data for 2015.

10.81 Comparison of the baseline data and the projected trip generation of the Enviroparks site (including cars and HGVs) during the operational period indicates the following:

- an increase in traffic flow of 63% on the Fifth Avenue to Main Ave Junction; and,
- an increase in traffic flow of 36% on Main Ave to A4061 junction.

10.82 Both the baseline and cumulative hourly flows on these sections of road are too low to calculate a noise level in line with CRTN, although percentage increases in traffic flow of this magnitude are likely to result in perceptible increase in road traffic noise if this road is considered in isolation. However, there are no residential receptors within 600m of either sections of road and noise from the A465 Heads of the Valleys Road will dominate noise levels. As such, it is considered that the effect of the changes in road traffic flow on these sections of road is considered to be neutral.

Vehicle movements on the A465 Heads of the Valleys Road

10.83 The A465 is a major trunk road in the area and runs broadly north-east/south-west approximately 200m to the south of the proposed site.

10.84 Traffic data for A465 were obtained from the local planning authority and are presented as AADT movements for each direction.

Table 10.10: Traffic noise assessment for the A465

<i>Road Segment</i>	<i>Baseline Vehicle Movements</i>	<i>Calculated Basic Noise Level $L_{10, 18hr}$ dB*</i>	<i>Daily Operational HGVS Movements **</i>	<i>Cumulative Vehicle Movements</i>	<i>Calculated Basic Noise Level $L_{10, 18hr}$ dB *</i>	<i>Change in BNL, dB</i>
A465 (West of Estate)	10,852	69.5	33	10,918	69.5	+/-0.0
A465 (East of Estate)	20,552	72.2	33	20,618	72.2	+/-0.0

* The Basic Noise Level is calculated in line with Chart 3 in CRTN. While not strictly accurate, as chart 3 requires AAWT 18 hour traffic data, it does provide a useful indication as to the potential change in noise level.
 ** The site is understood to generate 66 HGVS movements per day during the operational period. Of these it is assumed 50% would head west and 50% would head east along the A465.

10.85 The assessment summarised above indicates that there would be no change in noise levels on the A465 as a result of the proposed EWL site.

Cumulative impact

High Energy Use Building

10.86 The precise use of the HEU has not been identified at this time and, as such, consideration of the noise impact both directly and cumulatively, cannot be concluded. It is recommended that further calculations be undertaken once the end use has been determined.

Fuel Preparation Hall

10.87 The Fuel Preparation Hall was assessed in the 2008 ES and has not been directly assessed in this ES addendum. That said, there is the potential that noise arising from both aspects of the development could result in cumulative impacts at nearby receptor locations.

10.88 However, it is noted that the original noise assessment included HGVS movements for the entire site and noise from the previous iteration of the Enviroparks plant. Furthermore, the noise levels calculated in the 2008 ES did not take any account of the screening influence afforded by the larger and more extensive buildings now proposed. Given this, the cumulative effects of both elements cannot be calculated by a simple addition of the predicted noise levels from both assessments.

10.89 To facilitate the cumulative assessment, the internal noise level of the Fuel Preparation Hall has been calculated from information provided by OKAY Engineering, presented in Appendix 10.3. In this instance it is considered pertinent to assess the potential for cumulative noise effects during the night-time period as this would be the period when noise impacts are most acute.

10.90 For the purposes of this assessment it had been assumed that the cladding for the Fuel Preparation Hall would afford a minimum level of sound reduction index of R_w 25dB and the roof would afford R_w 44dB in line with the assumptions for the other buildings. In addition it is assumed the shutter access doors would afford R_w 15dB.

10.91 Given the above assumptions, indicative noise levels have been predicted to the receptor locations identified earlier. Table 10.11 below presents the predicted noise levels and gives an indication of the potential cumulative noise level arising from the sum of predicted levels arising from both aspects of the site.

Table 10.11: Indicative cumulative impact – Fuel Preparation Hall

Assessment Location	Indicative Noise Levels for the Fuel Preparation Hall L_{Aeq} dB	EWL Noise Predictions (Ion Acoustics), L_{Aeq} dB	Cumulative Noise Level* dB(A)	Typical Background Sound Level, L_{A90} dB	Difference relative to background, dB
AL01	12	25	25	29	-4
AL02	15	28	28	33	-5
AL03	11	33	33	32	+1
AL04	13	29	29	34	-5
AL05	>10	31	31	32	-1

* Cumulative noise level has been calculated through the logarithmic addition of noise levels from the Fuel Prep Hall and the EWL site

10.92 The assessment summarised in Table 10.11 indicates that noise from within the Fuel Preparation Hall would be very low when predicted to the nearest receptor locations. When combined with the predicted levels from the revised EWL site, the levels from the Fuel Preparation Hall do not change the overall predicted noise impact, with a maximum difference between the existing background and the predicted cumulative noise level of +1dB.

Hirwaun power station

10.93 The Hirwaun power station is a gas powered, 299MW, peaking power plant which will provide electrical power to the national grid during periods of peak demand. The facility is to be located within the Hirwaun industrial estate, to the south of the A465. The proposed development was assessed in an Environmental Statement prepared by Parsons Brinckerhof (PB) in March 2014.

Construction noise

10.94 Noise generated by construction activities at the power station site has been assessed in the PB document by means of indicative noise calculations of specific items of plant to each of the noise sensitive receptor locations considered. The calculations are indicative in nature and based on distance attenuation alone. No information is provided on the specific construction programme and as such, detailed consideration of cumulative noise from construction activities is not possible.

10.95 The construction period for the power station is expected to begin in November 2017 and will see an average of 152 vehicle movements per day, with a maximum of 175 vehicle movements in May 2019, including both HGVs and staff vehicles.

10.96 The information provided in the PB document indicates that vehicles are likely to access the power station site via the A465, the A4061 and the industrial estate roads.

10.97 The assessment presented below considers the potential change in noise level as a result of cumulative construction traffic on the A465. The assessment considers traffic associated with both the Hirwaun power station and the EWL site.

Table 10.12: Indicative cumulative traffic noise impact – Hirwaun Power Station

Road Segment	Baseline Vehicle Movements	Calculated Basic Noise Level $L_{10, 18hr}$ dB*	Daily Cumulative Construction vehicles Movements*	Cumulative Vehicle Movements	Cumulative Basic Noise Level $L_{10, 18hr}$ dB *	Change in BNL, dB
A465 (West of Estate)	10,852	69.5	335	11187	69.6	+/-0.1
A465 (East of Estate)	20,552	72.2	335	20887	72.3	+/-0.1

* The Basic Noise Level is calculated in line with Chart 3 in CRTN. While not strictly accurate, as chart 3 requires AAOT 18 hour traffic data, it does provide a useful indication as to the potential change in noise level.
 ** The maximum daily two way vehicle movements is understood to be 670 vehicle movements per day during the construction period. Of these it is assumed 50% would travel west and 50% would travel east along the A465.

10.98 The assessment summarised above indicates there would be no perceptible change in noise level on the A465 as a result of the cumulative construction traffic.

Operational noise

10.99 A review of the PB document indicates only one common receptor between the assessments; at Tai cwplau farm. This is identified as Location 5 in the PB document and AL03 in this ES addendum.

10.100 Table 10.13 below presents a cumulative noise assessment for the daytime and night-time operational periods. The cumulative noise levels have been calculated by the logarithmic addition of the noise levels predicted in the PB environmental Statement and those calculated in this ES addendum.

Table 10.13: Indicative cumulative noise impact – Hirwaun Power Station

Assessment Location	Assessment Period	Calculated Noise level from PB ES Chapter L_{Aeq} dB	EWL Noise Predictions (Ion Acoustics), L_{Aeq} dB	Cumulative Noise Level dB(A)	Typical Background Sound Level, L_{A90} dB	Difference relative to background, dB
AL03	Daytime	35 (34.5)	36	39	42	-3
	Night-time	35 (34.5)	33	37	32	+5

10.101 The cumulative noise levels calculated in Table 10.13 above are broadly in line with those calculated in Table 7.11 of the Parsons Brinckerhof environmental statement.

10.102 The assessment presented above indicates that cumulative noise from the Hirwaun Power station and the proposed EWL site would lie 3dB below the typical background sound level during the daytime and 5dB above during the night-time, at Tai cwplau farm.

10.103 With regard to the night-time period, it is important to consider the context of the assessment specifically, that it represents a night-time period when residents would typically be within the dwelling either asleep or attempting to get to sleep, rather than outside. As such, it is pertinent to consider the ingress of noise in to the dwelling at Tai cwplau farm during this period.

10.104 A window, open for ventilation, would typically afford between 10 and 15dB of attenuation of external noise. Using a conservative 12dB of noise reduction for the window, it is possible to calculate that cumulative noise ingress would result in a predicted internal ambient noise level of 25dB L_{Aeq} at Tai cwplau. This would fall well below the design guidance detailed in BS8233 and would not result in any detrimental noise effects on the residents at the farm.

10.105 Given this it is considered that the cumulative noise impact of the Hirwaun power station would be of neutral impact.

Abergorki wind farm (construction)

10.106 The Abergorki wind farm site is located some 8km to the south east of the Enviroparks site so it is not possible for cumulative noise to arise during the operational period. There might be cumulative impacts during the construction phase of the wind farm development, primarily through vehicle movements on the surrounding transport network. These effects would occur on the A465 Heads of the Valleys Road and not on roads in Hirwaun Industrial Estate.

10.107 The main construction phase for the Abergorki wind farm is expected to last for approximately twelve months so the cumulative impact would be minimal. That said, the cumulative

traffic movements during this period could coincide with the construction period of the Enviroparks development.

10.108 The traffic information provided indicates that cumulative movements for the Enviroparks site and the Abergorki wind farm peak at 825 vehicle movements per day. Considering the base traffic flow on the A465, identified above, this would indicate a potential increase in overall flow of between 4% and 8% depending on whether the vehicles travel west or east along the A465. In either case, this increase in flow would result in no perceptible increase in traffic related noise and would therefore be considered to be of neutral impact.

ASSESSMENT OF IMPACT SIGNIFICANCE

Construction phase

10.109 With the mitigation measures recommended within this report and adherence to the noise limits presented within Table 10.6 above, it is considered that the noise impact during the construction phase will be of **negligible significance**. This assumes that there is no impact-driven piling.

Operational phase

10.110 The assessments presented within Table 10.8 and 10.9 indicate that noise associated with the Enviroparks facility in operation would be of **negligible significance during the daytime and minor during the night-time**.

10.111 Noise associated with off-site vehicle movements during the operational phase is also shown to be of **neutral significance**.

Cumulative impacts

High Energy Use Building

10.112 Insufficient information is available at this time to conclude the magnitude of the impact arising from the High Energy Use building. However, assuming further calculations are undertaken, and the consideration employed in the 2008 ES are factored in, it is considered likely that the potential impact of the HEU building would be of **neutral to minor significance**.

Fuel Preparation Hall

10.113 The assessment summarised in Table 10.11 indicates that the cumulative impact of the Enviroparks site with the Fuel Preparation Hall would be of **neutral significance**.

Hirwaun power station

10.114 Insufficient information is available at this time to assess the potential cumulative noise impacts associated with construction related activities at the Hirwaun power station and the EWL site. The cumulative noise impact of construction traffic movements would be of **neutral significance**.

10.115 The assessment of the cumulative impact of the Enviroparks site with the Hirwaun power station during the operational phase would be of **neutral significance** when the context of the area is considered.

Abergorki wind farm (construction)

10.116 The cumulative impact of the Abergorki Wind farm would result through vehicle movements on the A465. The assessment summarised above indicates that the impact would be of **neutral significance**.

RESIDUAL EFFECTS

10.117 For consistency with the preceding assessment, a summary of residual impacts is presented in Table 10.14 below.

Table 10.14: Summary of Residual Impacts

Resource	Phase	Residual Effect	Sensitivity of Receptor	Magnitude of Impact	Duration	Nature	Significance	Geographical Level of Importance of Issue				
								I	N	R	D	L
Noise and Vibration	Construction	Construction Noise and Vehicle Movements	High	Slight to Moderate	Short Term	adverse	Neutral					✓
	Operation	Road Traffic Noise	High	No Significant Change	Permanent	adverse	Minor to Neutral					✓
		Daytime Operational Noise										✓
		Night-time Operational Noise										✓
Key: I = International N = National R = Regional D = District L = Local												

CONCLUSIONS

10.118 The short term effects of the construction operations will be controlled by a section 61, 'prior consent for work on construction sites' agreement. This will ensure that any noise impacts during the construction phase are suitably controlled.

10.119 As with the preceding assessment, the long term noise and vibration impacts are predicted to be **neutral** at the identified receptor locations.

REFERENCES

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HMSO. Environmental Protection Act, Chapter 43, Part III, 1974

Welsh Assembly Government. Technical Advice Note (TAN) 11, Noise, October 1997

British Standards Institution – BS5228-1:2009+A1:2014. Code of practice for noise and vibration control on construction and open sites – Part 1: Noise

British Standards Institution – BS5228-2:2009+A1:2014. Code of practice for noise and vibration control on construction and open sites – Part 2: Vibration

British Standards Institution – BS6472: Pt 1: Guide to Evaluation of human exposure to vibration in buildings: Vibration sources other than blasting, 2008

British Standards Institution – BS7385-1 (ISO 4866). Evaluation and measurement for vibration in buildings. Guide to measurement of vibrations and evaluation of their effects on buildings, 1990

British Standards Institution – BS4142:2014. Methods for Rating and assessing industrial and commercial sound, 2014

HMSO. The department of Transport/ Welsh Office. Calculation of Road Traffic Noise