

Glyn Rhonwy Pumped Storage Development Consent Order

Deadline 3 – Noise Management Plan



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Noise Management Plan

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1 INTRODUCTION

1.1 Introduction

- 1.1.1 The objective of this Noise Management Plan (NMP) is to support the Code of Construction Practice (CoCP) in detailing the principles to be followed in the management of noise throughout the construction period, as well as throughout the operational period of the Development.
- 1.1.2 The NMP is designed to ensure that the requirements of legislation, the Requirements of the DCO, the Environmental Statement (ES) and Snowdonia Pumped Hydro (“the Applicant”) Environmental Policies are complied with. It shall be the policy of the Applicant to ensure the project is executed in a manner that demonstrates its commitment to the care and protection of the environment.
- 1.1.3 This draft NMP has been developed by the Applicant and will be adopted the Principal Contractor (PC) upon the award of the contract. All personnel and sub-contractors working on the project shall perform their duties in accordance with the requirements of the NMP.
- 1.1.4 The NMP will be in accordance with Requirement 6 of the DCO and is also in line with conditions as provided by Gwynedd Council (GC) for the approved scheme.
- 1.1.5 It is proposed that this NMP will be finalised in line with the CoCP and submitted to Gwynedd Council for approval, as per the Requirement 6 of the DCO. The finalised NMP must be read in conjunction with the approved CoCP and Construction Traffic Management Plan (CTMP).

1.2 Noise and Vibration Guidance

- 1.2.1 The NMP takes into account good practice guidance contained within, but not limited to, the following documents:
- BS 4142:1997 Method for Rating Industrial Noise Affecting Mixed Residential and Industrial areas;

- BS 5228: Code of practice for Noise and Vibration Control on Construction and Open Sites (2009) Parts 1 and 2;
- BS 6472-1: 2008. 'Guide to evaluation of human exposure to vibration in buildings. Vibration sources other than blasting';
- BS 6472-2: 2008. 'Guide to evaluation of human exposure to vibration in buildings. Blast-induced vibration';
- BS 8233: Sound Insulation and Noise Reduction for Buildings (1999)
- Minerals Planning Guidance (MPG) 11: "The control of noise at surface mineral workings"; and
- Design Manual for Roads and Bridges Volume 11 Section 3 Part 7 HD 213/11 (revision 1) 'Noise and Vibration'.

2 MANAGEMENT OF CONSTRUCTION NOISE

2.1 Introduction

2.1.1 This section describes the principle noise and vibration control techniques for the management of noise and vibration that will be encountered during the construction of the Development.

2.1.2 This NMP identifies mitigation measures to be adopted on the project.

2.2 Construction Working Hours

2.2.1 Normal construction hours will be 07:00-19:00 Monday to Friday and 07:00-13:00 Saturday and no working on Sundays and Bank Holidays. HGVs will be further restricted to a delivery window from 08:30 to 16:30. Consent from GC will be required for works outside normal hours and noisy activities will be scheduled early in the week to avoid weekend overruns.

2.2.2 Prior consent under Section 61 of the Control of Pollution Act 1974 (CoPA) will be sought for any works that need to be undertaken outside of the normal construction hours, and noisy activities will be scheduled early in the week to avoid weekend overruns.

2.3 Construction Noise and Vibration Limits

2.3.1 Construction noise and vibration limits have been recommended in Chapter 13 of the submitted ES (Doc Ref: 6.02). Construction noise and vibration limits set out in Conditions 33, 35, 37, 39, 40, 44 and 46 of the approved scheme will also be reviewed and further consultation will be undertaken with Gwynedd Council to agree the construction noise and vibration limits as part of this plan as required by Requirements 6 and 11 of the DCO.

2.3.2 These limits will be required to be approved by Gwynedd Council prior to the commencement of development.

2.4 Piling Construction Statement

- 2.4.1 This Statement will be completed by the PC when the detailed design has been confirmed for the design of the above ground power house. No other piling is anticipated. Careful consideration will be given to selecting the most appropriate piling methods to minimise the adverse impact on Noise Sensitive Receptors (NSRs).

2.5 Construction Vibration, Overpressure and Blasting Risk Assessment

- 2.5.1 This will be completed by the PC but will have due regard to the limits set out in Conditions 33, 37 and 39 of the approved scheme and finalised through Requirements 6 and 11 of the DCO. This will also include reference to the CTMP where residential properties on Ffordd Cefn Du may require vibration monitoring during the construction phase at Q1.
- 2.5.2 All access roads should be kept in good condition as most vibration effects occur from irregularities of road surfaces – this will be part of the s278 agreement between the Applicant and Gwynedd Council for improvements on Ffordd Cefn Du which will also provide for ongoing inspection and maintenance or repair works during construction. The finalised CTMP will determine a speed limit for HGVs which will be applied to this road given the short distance to NSRs. It is not considered that vibration effects will cause cosmetic or structural damage to the properties. Sources including Transport and Road Research Laboratory document "Traffic Induced Vibrations in Buildings" (1990) (TRL RR 246) have been consulted. A summary of findings from the document shows that research has shown that traffic induced ground borne vibrations do not cause significant damage to buildings. However due to local concerns and the location and condition of the road and properties currently, road vibration will be monitored as appropriate to further inform the adequacy of mitigation measures.

2.6 Mitigation Measures

- 2.6.1 'Best Practicable Means' ('BPM') (as per the Control of Pollution Act 1974) will be adopted in order to mitigate against the construction phase noise effects at neighbouring dwellings.

2.6.2 The mitigation measures will be confirmed by the PC but will include the following as necessary and as a minimum:

- All work will be in accordance with the mitigation measures reported in ES Chapter 13, and summarised in ES Chapter 18 Summary of Mitigation (Doc. Ref: 6.02);
- Inherently quiet plant will be selected where appropriate and where possible use will be made of electrical items of plant instead of diesel, especially in sensitive locations;
- Construction activities will be planned for the beginning of the week where reasonably practicable so that any delays in construction do not result in particularly noisy activities being conducted on Saturdays;
- Vehicles and plant will be regularly maintained and fitted with exhaust silencers. Unless otherwise directed, items or plant in intermittent use will be shut down during idle periods;
- Audible warning systems, such as vehicle reversing sirens, will normally be set to as low a setting as is compatible with safety requirements; white noise alarms will be used where possible;
- Where plant has been designed to operate with engine covers to reduce noise, these will be used and remain closed while the plant is in operation.
- Plant and equipment liable to create noise and/or vibration whilst in operation will, as far as reasonably practicable, be located away from sensitive receptors or in locations where acoustic screening is provided by site cabins, buildings or barriers;
- On sites where a generator is required for prolonged periods of time, consideration will be given to the use of a silent generator;
- All blasting will be carried out using BPM where available, to ensure that the resultant noise, vibration and air overpressure are minimised in accordance with current British Standards and Mineral Guidelines;

- No employees, subcontractors and persons employed on the site will cause unnecessary noise from their activities e.g. excessive 'revving' of vehicle engines, music from radios, shouting and general behaviour etc.
- Road surfaces will be properly maintained, paying particular attention to the filling of any 'potholes' as these are the main cause of vibration;
- Structural surveys will be undertaken of properties who are concerned about vibration from construction traffic. This will be recorded and managed through the Environmental Liaison Officer (ELO) and any appropriate complaints dealt with accordingly.
- Contractors will be required to adhere to the codes of practice for construction working and piling set out in BS 5228 where appropriate;
- Plant that is not required to be mobile will be located and orientated with a localised barrier to provide attenuation to NSRs.
- Site layouts and screening will follow good practice for minimising noise and noise reduction techniques will be included in staff inductions.
- Equipment will be maintained regularly to manufacturer's requirements and fitted with silencers or barriers to minimise noise and turned off when not in use.

2.7 Community Consultation

- 2.7.1 The Applicant, the appointed PC and the Environmental Liaison Officer (ELO) will work with local communities and businesses within the villages of Waunfawr, Croesywaun, Brynrefail, Cwm-y-Glo, Fachwen, Dinorwig, Llanberis and Groeslon to ensure the phasing of the construction works is designed to minimise effects on the local community wherever reasonably practicable.
- 2.7.2 The ELO will be the main point of contact between the PC, the Applicant and also the public. They will be the focal point for any community liaison committees, project meetings, reporting and also communication on critical activities of the Development. This will include communicating when enabling

works are likely to commence and then keeping the local communities aware of the continuing activities which will occur during the construction phase, such as blasting, delivery of equipment on abnormal loads and regular updates on progress.

2.7.3 Consultation and communication with the local community throughout the construction period also serves to publicise the works schedule, giving warning to residents regarding periods when higher levels of noise may occur during specific operations, and providing them with lines of communication where complaints can be addressed.

2.7.4 Should any reasonable and specific complaint regarding vibration due to construction activities be received, reasonable endeavours will be undertaken to investigate the source, this will include:

- Identification of the activity that triggered the complaint, where possible;
- If an activity can be readily identified, identification and execution of any obvious remedial measures (e.g. filling potholes) to address the source of vibration within a reasonable timeframe (subject to Highway Authority where required);
- If the vibration is persistent and/or remedial measures cannot immediately be identified, reasonable further investigation will be undertaken to help identify the source; and
- Identification and execution of appropriate remedial measures, where required.

2.8 Training and Awareness

2.8.1 All project personnel, subcontractors and consultants attending site will be required to complete induction training which shall be arranged by the Principal Contractor. This will include a noise and vibration component to reinforce the important management issues and the measures that will be implemented to protect prevent adverse noise impacts. Ongoing toolbox talks

will highlight specific environmental requirements associated with activities underway at the time.

2.8.2 Examples of topics that may be covered during project induction and toolbox talks include:

- Normal work hours;
- What activities can and can't take place outside of these working hours;
- The process for seeking approval for out of hours works, including consultation;
- Location of noise sensitive areas;
- The employment of high standards of working, reasonable and feasible noise mitigation measures; and
- Roles and responsibilities of the Project team related to noise and vibration.

3 MANAGEMENT OF OPERATIONAL NOISE

- 3.1.1 An operational noise assessment will be undertaken once the items of turbines and related equipment are confirmed during the detailed design stage as part of the operational noise management plan required by Requirements 7 and 11.
- 3.1.2 Potential operational noise sources are limited to the above ground power house and underground turbine hall and include:
- Turbines & Generators;
 - Transformers & Switchgear; and
 - Workshop.

3.2 Operational Noise Limits

- 3.2.1 Operational noise limits have been determined using the BS 4142 assessment methodology, based on the measured daytime and night time background noise level at the representative NSRs. A difference of zero between the background and rating sound levels has been set as a target so as to achieve a magnitude of effects no greater than negligible (i.e. rating sound level equals the measured background noise level).
- 3.2.2 Note that as per BS 4142 guidance, the target rating sound level includes any potential character corrections (due to characteristics such as tonality, impulsivity and intermittency) to the specific sound level based on the aforementioned rating sound level targets. At this stage information on the characteristics of the sound sources (e.g. any tonal features) are yet to be determined, however these will be considered during detailed design.
- 3.2.3 The operation noise limits recommended in ES Chapter 13 (Doc. Ref: 6.02) are set out below. The operational noise limits set out in Condition 40 of the

approved scheme will also be reviewed. The operational noise limits will be confirmed following further discussions with GC and require to be approved by the Council as part of the operational noise management plan.

Recommended Operational Noise Limits *				
Location	Daytime 07:00 – 23:00		Night-time 23:00 – 07:00	
	Representative Background sound level dB $L_{A90,T}$	Operational Limit (Rating sound level) dB ($L_{Ar,1 h}$)	Representative Background sound level dB $L_{A90,T}$	Operational Limit (Rating sound level) dB ($L_{Ar,15 min}$)
1	29	29	30	30
2	31	31	32	32
3	42	42	42	42
4	44	44	45	45
5	38	38	36	36
6	37	37	33	33
7	37	37	36	36
8	44	44	n/a**	n/a**

* All values are in dB re 20µPa, Free-field, fast time-weighting. L_{A90} has been calculated using the 10th percentile of the $L_{A90,5min}$ noise levels during the respective time periods, which is representative of the lower range of background levels

** Not open at night- commercial/leisure premises.

3.3 Operational Noise Mitigation

- 3.3.1 The actual design of noise control to meet appropriate operational noise limits will need to be finalised during detailed design; these will likely comprise measures such as orientation away from NSRs, vent attenuators, acoustic lining within the vent shaft, and acoustic louvres at intake and extract terminals.
- 3.3.2 Requirement 11 requires an operational noise assessment which will include noise monitoring at agreed NSRs to be included within the operation noise management plan.

3.4 Low Frequency Noise

- 3.4.1 There may be potential for LFN from the operation the turbines but this deemed unlikely due to the advancement in technology, the depth of the turbines and the attenuation and building design. However Low Frequency noise (LFN) will be considered during the detailed design phase. A method to determine if there is a significant element of LFN as stated in NANR 45 is to compare the A-weighted noise levels (dB(A)) and the C-weighted noise levels (dB(C)) for each item of plant. If the difference between dB(A) and dB(C) is greater than 20 dB, it is an indication of low frequency noise and appropriate mitigation will be required to minimise the effects LFN. It should be noted that the (dBC - dBA) noise level difference cannot be used as an annoyance predictor, yet is a simple indicator as to whether further investigations of LFN may be necessary).
- 3.4.2 A further assessment of low frequency noise (LFN) will be carried out by the Operator and requirements for mitigation measures and noise control will be determined once the detailed design is finalised as DCO Requirement 5 and 11. Careful selection of equipment, use of mitigation measures such as vibration isolation, mufflers, attenuators, etc. will be considered during the design phases.

4 MONITORING, AUDITING AND INCIDENT RESPONSE

4.1 Introduction

- 4.1.1 This section describes what actions to take in the event of a noise incident and the method of reporting.
- 4.1.2 Monitoring of the noise and vibration during construction and operational phases will enable the effectiveness of environmental mitigation to be evaluated and also allow unforeseen problems to be identified and responded to at an early stage.

4.2 Noise & Vibration Monitoring

- 4.2.1 Monitoring of noise and vibration will be carried out as necessary and requirements for monitoring will be reviewed as further consents and licences are received and consultations completed.
- 4.2.2 Before construction starts, noise-sensitive locations shall be identified and pre-construction monitoring undertaken to re-assess the baseline noise environment. This will allow for appropriate mitigation measures put in place. Monitoring will then be undertaken during construction to ensure compliance with the stated noise limits identified in Chapter 13 of the ES (Doc Ref: 6.02).

4.3 Nuisance Management

- 4.3.1 As outlined in the Statement in Respect of Statutory Nuisance (Document Ref: 5.02) it is considered that nuisance as a result of noise or vibration is unlikely to arise due to the implementation of the NMP and overall CoCP. The Statement does however, outline the procedure to be followed should a nuisance complaint be made or an event occur.

4.4 Non Compliance and Corrective Actions

- 4.4.1 Where complaints due to construction works noise and vibration are received, the cause/source of excessive noise/ vibration generation will be identified,

the Principal Contractor will review the works in progress, and if it is identified that construction works are resulting in non-compliance then the infringement will be stopped immediately. Any additional reasonable and feasible measures available shall be implemented to either reduce noise and vibration emissions, or reduce impacts on receivers.

- 4.4.2 An example Incident Procedure Flowchart (Appendix A) should there be any complaints due to construction works noise and vibration during works.

APPENDIX A: INCIDENT PROCEDURE FLOWCHART

