njd

Environmental Associates

Noise Impact Assessment

Caer Glaw Quarry

August 2023

Hogan Group

Noise Impact Assessment

Caer Glaw Quarry

Client: **Hogan Group**

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Report Version	Prepared By	Reviewed By
Draft	NJD	NJD
Final	NJD	NJD

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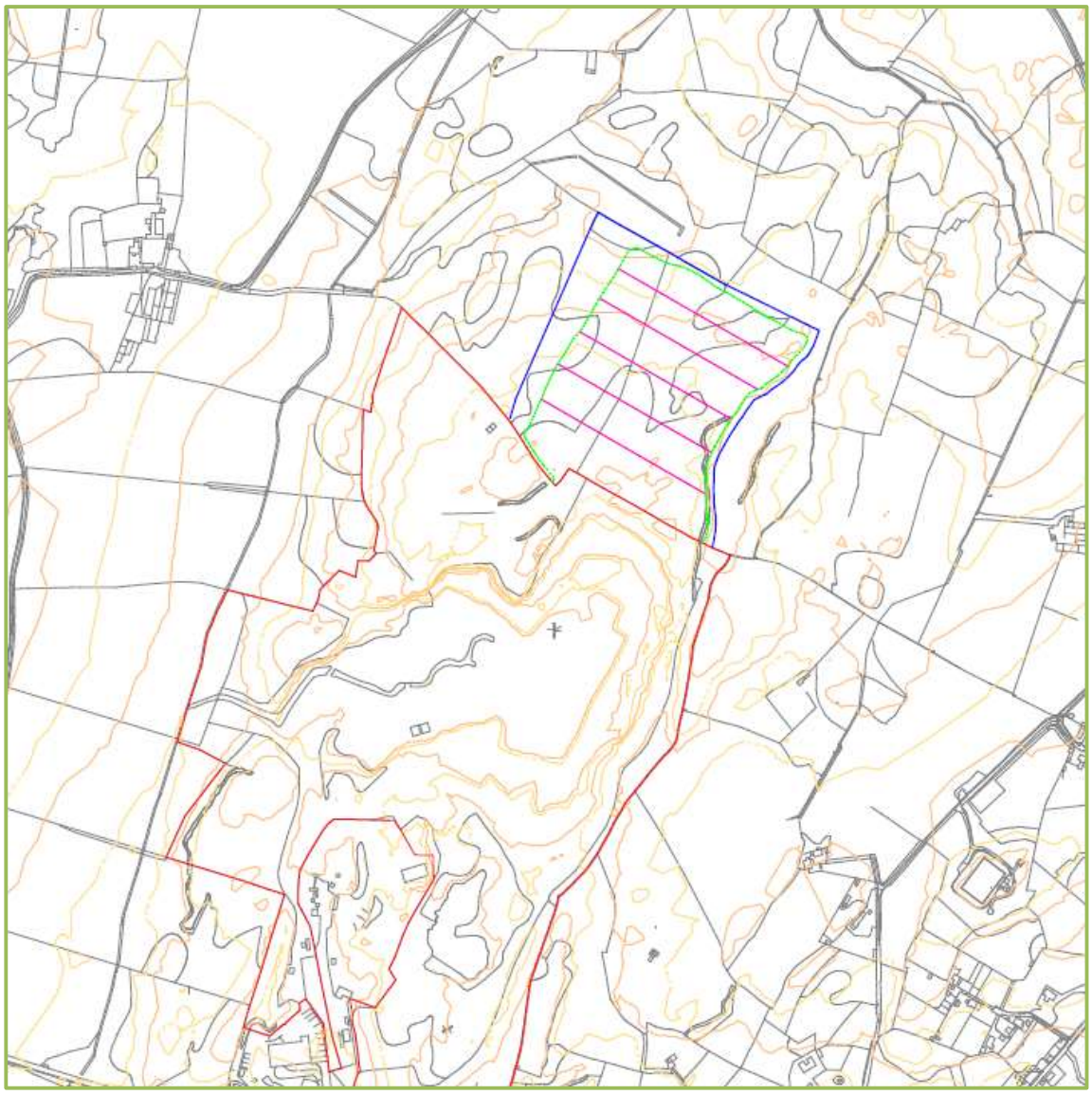
FIGURES

1 INTRODUCTION

1.1 Background

1.1.1 NJD Environmental Associates LTD was instructed by Hogan Group to undertake a noise impact assessment for a proposed extension to Caer Glaw Quarry at Gwalchmai, Anglesey. The site location and proposed extension is provided below in Drawing 1.



Drawing 1: Site location and proposed extension

1.1.2 A noise report has been prepared in support of the planning application, with calculations performed using noise modelling software in order to consider the sources of noise associated with the proposed quarry operations, and the results interpreted in accordance with the relevant standards.

2 PLANNING POLICY AND GUIDANCE

2.1 Planning Policy Wales (PPW)

2.1.1 Planning Policy Wales (PPW, Edition 11, February 2021) sets out the land use planning policies of the Welsh Government. It is supplemented by a series of Technical Advice Notes (TANs), Welsh Government Circulars, and policy clarification letters, which together with PPW provide the national planning policy framework for Wales. PPW, the TANs, MTANs and policy clarification letters comprise national planning policy.

2.1.2 PPW outlines relevant considerations in making planning decisions for potentially polluting development are likely to include:

- location, including the reasons for selecting the chosen site itself;
- impact on health and amenity;
- effect of pollution on the natural and built environment and the enjoyment of areas of landscape and historic and cultural value;
- impact on groundwater and surface water quality;
- effect on biodiversity and ecosystem resilience, including where there may be cumulative impacts on air or water quality which may have adverse consequences for biodiversity and ecosystem resilience;
- the risk and impact of potential pollution from the development, insofar as this might lead to the creation of, or worsen the situation in, an air quality management area, a noise action planning priority area or an area where there are sensitive receptors; and,
- impact on the road and other transport networks, and in particular on traffic generation, particularly where the proposed development is not transport infrastructure itself.

2.1.3 **Minerals Technical Advice Note 1: Aggregates (MTAN1)**

2.1.4 MTAN1, issued in March 2004, adopts the following five principles for sustainable minerals planning;

a) To provide positively for the working of mineral resources to meet societies needs;

b) To protect areas of importance to the natural and built heritage from inappropriate mineral development;

c) To reduce the impact of mineral extraction;

d) To achieve a high standard of restoration;

e) To encourage the efficient use of minerals by promoting the appropriate use of high-quality materials.

2.1.5 MTAN1 states that where aggregates extraction and related operations occur close to areas that are sensitive to noise, particularly residential areas, noise impact must be minimised to acceptable levels.

2.1.6 The effects of noise should be fully considered in formulating future proposals for aggregates extraction and noise emissions should be monitored throughout the permitted mineral activity. Paragraph 88 of MTAN1 states that:

"Noise limits should relate to the background noise levels subject to a maximum daytime noise limit of 55 dB(A) where background noise levels exceed 45 dB(A). 55 dB(A) is the lower limit of the daytime noise levels where serious annoyance is caused. Where background noise is less than 45 dB(A), noise limits should be defined as background noise levels plus 10 dB(A)."

3 METHODOLOGY

3.1 Introduction

3.1.1 The application seeks permission for an extension to the north of the existing quarry. The base of the existing quarry lies at some 55m AOD. It is proposed that the quarry will be extended northwards to the 65m AOD contour.

3.1.2 To the west of the quarry, there is higher ground which reaches 76m AOD. This high ground will be retained to ensure that it provides a natural topographical flank to the quarry extension and will completely screen the quarry void from any views from the west of the site. The eastern boundary of the extension will be formed by an existing dry valley. From the dry valley the land rises eastwards to 75m AOD, thus screening the quarry from any views from the east of the site.

3.1.3 It is proposed to commence the extension concurrently with quarrying within the existing site. The extension will be worked in five defined phases at a rate of 200,000 tonnes per annum. The extension will be restored progressively as

benches are worked out, thus by the time that extraction is completed, the site will already be largely restored.

3.1.4 Mineral extraction from the northern extension will be processed in close proximity to where it is extracted through the use of mobile crushers. The resultant material will be graded into different product sizes by means of mechanical screening. The product will then be stockpiled according to size within designated areas of the quarry floor prior to distribution to customers.

3.2 Assessment Data

3.2.1 The noise impact assessment will closely follow the scope of works presented as part of the December 2019 approval (ref. 48C79J) for the north-west extension.

3.2.2 The report that supported the 2019 application was authored by AB Acoustics and presented baseline noise measurements at existing receptor locations to the east and west of the proposed extension as follows:

- ML1 – Near Clegir Mawr Farm
- ML2 – Near Clegir Farm Cottage

Drawing 2: Noise monitoring locations

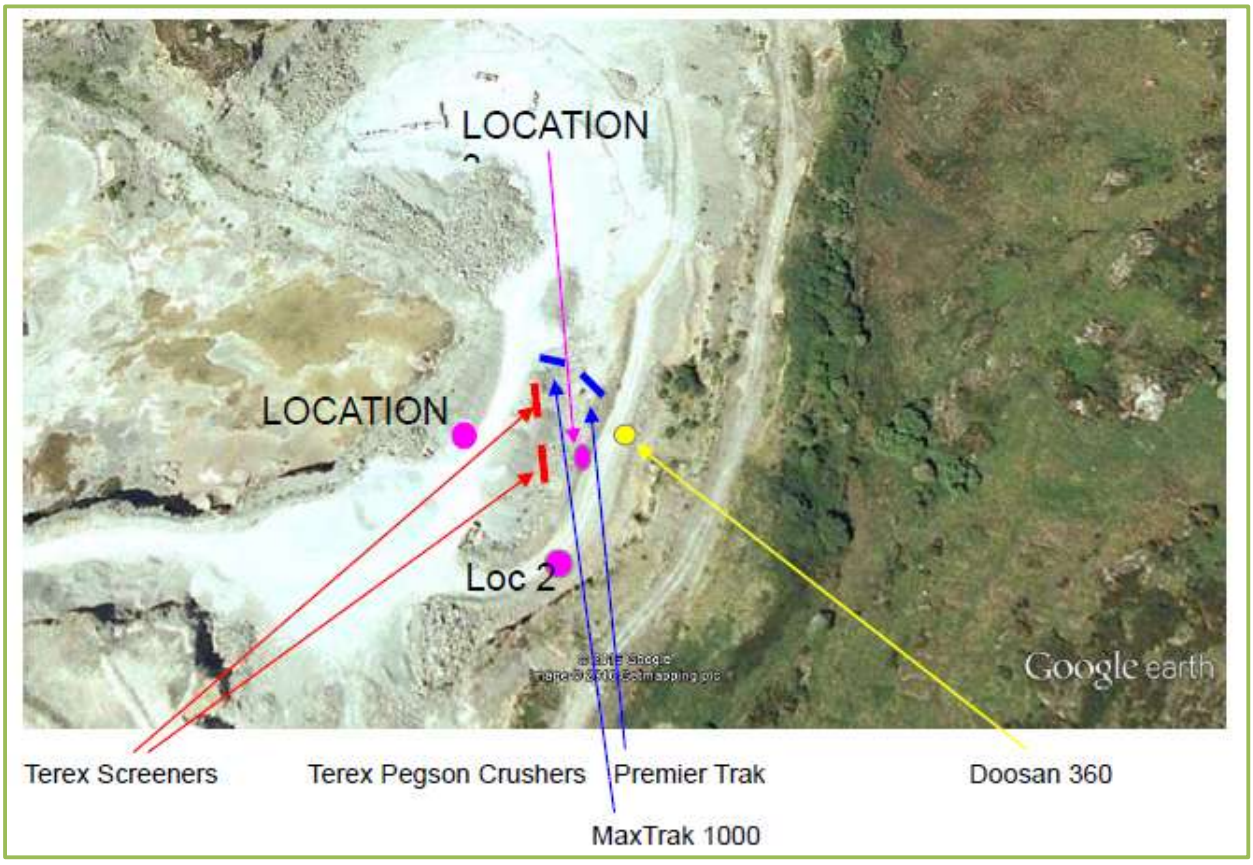
3.2.3 As per the AB Acoustics report, baseline measurements were taken on 22nd April 2016 using a calibrated Bruel & Kjaer 2260 Type 1 Sound Level Meter. The measurements were carried out at the locations shown at a height of 1500mm above the ground and away from reflecting surfaces.

3.2.4 Calibration was undertaken using a Bruel & Kjaer type 4231 calibrator before and after the measurements, with no notable drift reported.

3.2.5 The results from the identified monitoring locations are summarised in Table 1 below.

Table 1: Summary of Measured Daytime Noise Levels (dBA)		
Location	**Daytime LAeq***	**Daytime LA90****
ML1	38	35
ML2	38	34
*LAeq Equivalent continuous sound pressure level. A measure of the average sound pressure level during a period of time, t, in dB with 'A' weighting.		
**LA90 The noise level exceeded for 90% of the measurement period with 'A' frequency weighting calculated by statistical analysis		

3.2.6 Further measurements were taken of operational plant on the 21st April 2016 at the locations shown in Drawing 3, with the results summarised as follows:



Drawing 3: Spot measurement locations identified in the AB Acoustics report

Table 2: Summary of Mobile Plant Noise Measurements (dBA)			
Plant Items	**LAeq**	**Distance**	**Calculated Sound Power Level**
Volvo A25D Dump Truck	76dB	5m	98dB
Scania R450 Loaded with 30T	75dB	4m	95dB
Terex Loading Shovel Drive Past Loaded	70dB	5m	92dB
Doosan DL 400 Drive past Loaded	69dB	5m	91dB
Doosan DL 400 Loading @Stockpile	73dB	5m	95dB

Table 3: Summary of Processing Plant Noise Measurements (dBA)			
Plant Items	**LAeq**	**Distance**	**Calculated Sound Power Level**
Terex screeners, Terex Pegson Crushers, Premier Trak, Doosan 360	78dB	10m	106dB
	73dB	30m	111dB
	84dB	6m	107dB

3.3 Noise Sensitive Receptors

3.3.1 The AB Acoustics report for the north-western extension identified two noise sensitive receptor locations, as discussed in the previous section.

3.3.2 As part of the current application, the study area has been expanded in order to consider additional receptors further to the north and east. The Existing Sensitive Receptors (ESRs) are therefore summarised in Table 4 below and identified on Figures 1 to 5.

Table 4: Existing Sensitive Receptors Considered				
ID	**X Coordinate**	**Y Coordinate**	**Distance from Site Boundary (m)**	**Direction from Site**
ESR1	237846	377530	340m	West
ESR2	238695	376789	220m	East
ESR3	239066	377135	420m	East
ESR4	239136	377417	410m	North-east

3.4 Noise Limits

3.4.1 The measured background noise levels are summarised in Table 5 and compared to the noise limits set out in the MTANs, in order to identify appropriate limits during normal operations.

Table 5: ESR Noise Limits

ID	Associated Monitoring Location	Background dB LA90	MTAN1 Criteria	Proposed Limit dB LAeq,T
ESR1	ML1	35	Background +10dB	45
ESR2	ML2	34	Background +10dB	44
ESR3	ML2	34	Background +10dB	44
ESR4	ML2	34	Background +10dB	44

4 CADNAA NOISE MODELS

4.1 Input Data

4.1.1 Noise levels associated with the proposed operations have been predicted in accordance with ISO9623-2:1996 *'Acoustics – Attenuation of sound during propagation outdoors – General method of calculation'*. The noise model takes into account the following factors:

- Geometric divergence;
- Air absorption;
- Reflecting obstacles;
- Screening; and
- Ground absorption.

4.1.2 Topographic data of the surrounding land has been incorporated into the noise models using Lidar 5m resolution data, with proposed phasing plan contours provided by the project surveyor.

4.1.3 The models have been programmed to assess scenarios based on the operational daytime hours (0700 to 1800h), with receiver and grid calculation heights set to 1.5m.

4.1.4 For the purpose of these calculations, the ground absorption has been set to G=0.5 (which represents a mixture of acoustically soft and hard ground around the development site), with buildings and roads set to G=0 (acoustically hard and reflective), with two orders of reflection considered.

4.1.5 The sound power levels of operational plant have been determined from the AB Acoustics data presented in the previous section.

4.1.6 The screening and crushing plant have been programmed as an area source, calibrated to reflect the highest sound power level outlined in Table 3.

4.1.7 Mobile plant (such as excavators and front-loading shovels etc.) have been positioned at the quarry face and at the stockpile area, where they will be used for excavation, loading of lorries and loading of the screening and crushing plant.

4.1.8 The lorries/dump trucks have been programmed as moving point sources, operating at an estimated speed of 20km/h, with a frequency of 10 movements per hour between the quarry face and the stockpile.

4.1.9 For the purposes of the assessment, the worst-case locations of plant have been assumed, i.e., all plant continually operating simultaneously at locations generally closest/least screened relative to the receptor locations.

5 IMPACT ASSESSMENT

5.1 Normal Operations

5.1.1 Table 6 below presents an assessment of potential noise from normal operations associated with the proposed scheme.

Table 6: Worst Case Predicted Noise Levels – Normal Operations

Figure	Scenario	ESR			
		1	2	3	4
	MTAN Noise Limit→	45	44	44	44
1	Phase 1	22	36	37	36
2	Phase 2	24	36	37	36
3	Phase 3	24	36	37	36
4	Phase 4	24	36	37	36
5	Phase 5	24	36	37	36
Noise Limit Achieved?		**YES**	**YES**	**YES**	**YES**

5.1.2 Based on the above predicted noise levels, assuming worst case scenarios for each phase, adherence to the appropriate noise limit is comfortably achieved.

5.1.3 As observed across the different phases, the predicted noise levels remain largely unchanged at the receptor locations throughout the different phases. This is due to the relative dominance of the screening and crushing plant that is

located within the void of the quarry, at the same location throughout the phases.

5.1.4 Should the screening and crushing plant be moved as the excavation advances, then it is possible that the resultant levels will change at the receptor locations. However, it is anticipated that any variance will remain comfortably within the limits, so long as the processing plant remains within the quarry void.

5.2 Short Term Operations

5.2.1 MTAN1 permits a temporary daytime noise limit of 67dB(A) LAeq, 1h (free field) for periods of up to 8 weeks in a year to facilitate short-term activities such as essential site preparation and restoration work.

5.2.2 With regards to the proposed extension, any temporary operations such as these will be typically be at the start of a phase (i.e. when soil is being stripped and bunds formed etc.). This process is transient in nature and will generally decrease as the phase advances (i.e. the plant will descend into the void being created and/or be screened by any bund formation).

5.2.3 In light of the above, the limit for temporary operations should not be exceeded at any ESR location.

6 MITIGATION AND BEST PRACTICE MEASURES

6.1.1 With regards to general site activities, the site operator will follow best practicable means to minimise potential off site noise impacts.

6.1.2 The following measures will be implemented for the site:

(a) All plant and equipment will comply with the relevant statutory requirements regarding noise emissions;

(b) There will be strict adherence to the operating hours of the site and site working hour restrictions will be effectively communicated to all site staff and subcontractors;

(c) Audible reversing warning systems on mobile plant and vehicles will be of a type which, whilst ensuring that they give proper warning, have a minimum noise impact on persons outside the site;

(d) Machinery will be regularly well maintained and where appropriate fitted with exhaust silencers. Any defective items will not be used;

(e) Any period of idling required to warm up mobile plant at the start of the working day will be undertaken in locations away from residential premises;

(f) Avoidance of unnecessary horn usage and revving of engines;

g) Equipment will be switched off or throttled down to a minimum when not required;

(h) Any covers, panels or enclosure doors to engines will be kept closed during operation;

(i) Drop heights of materials will be minimised;

(j) Operatives will be trained to employ appropriate techniques to keep site noise to a minimum, and will be effectively supervised to ensure that best working practice in respect of noise minimisation is followed;

(k) Regular inspections of plant will be undertaken to identify any faults or wear and tear that may be resulting in excessive noise;

(l) Internal haul routes will be kept clear and well maintained. Regularly inspections of routes for potholes will be undertaken and repaired as necessary.

7 CONCLUSION

7.1.1 NJD Environmental Associates has undertaken a noise impact assessment for a proposed extension to Caer Glaw Quarry at Gwalchmai, Anglesey.

7.1.2 Noise propagation modelling has been undertaken for normal operations during the daytime period (0700-1800h), in order to predict noise levels at the closest ESRs.

7.1.3 The predicted noise levels have been considered alongside the noise limits provided within MTAN1 for normal operations. The results demonstrate that the proposed scheme can be implemented by the operator without exceeding the appropriate noise limits for all phases of the development.

7.1.4 Best practice control measures will be implemented to ensure noise is controlled appropriately by the operator.

7.1.5 It is concluded that noise should not be a prohibitive factor in the determination of this planning application.

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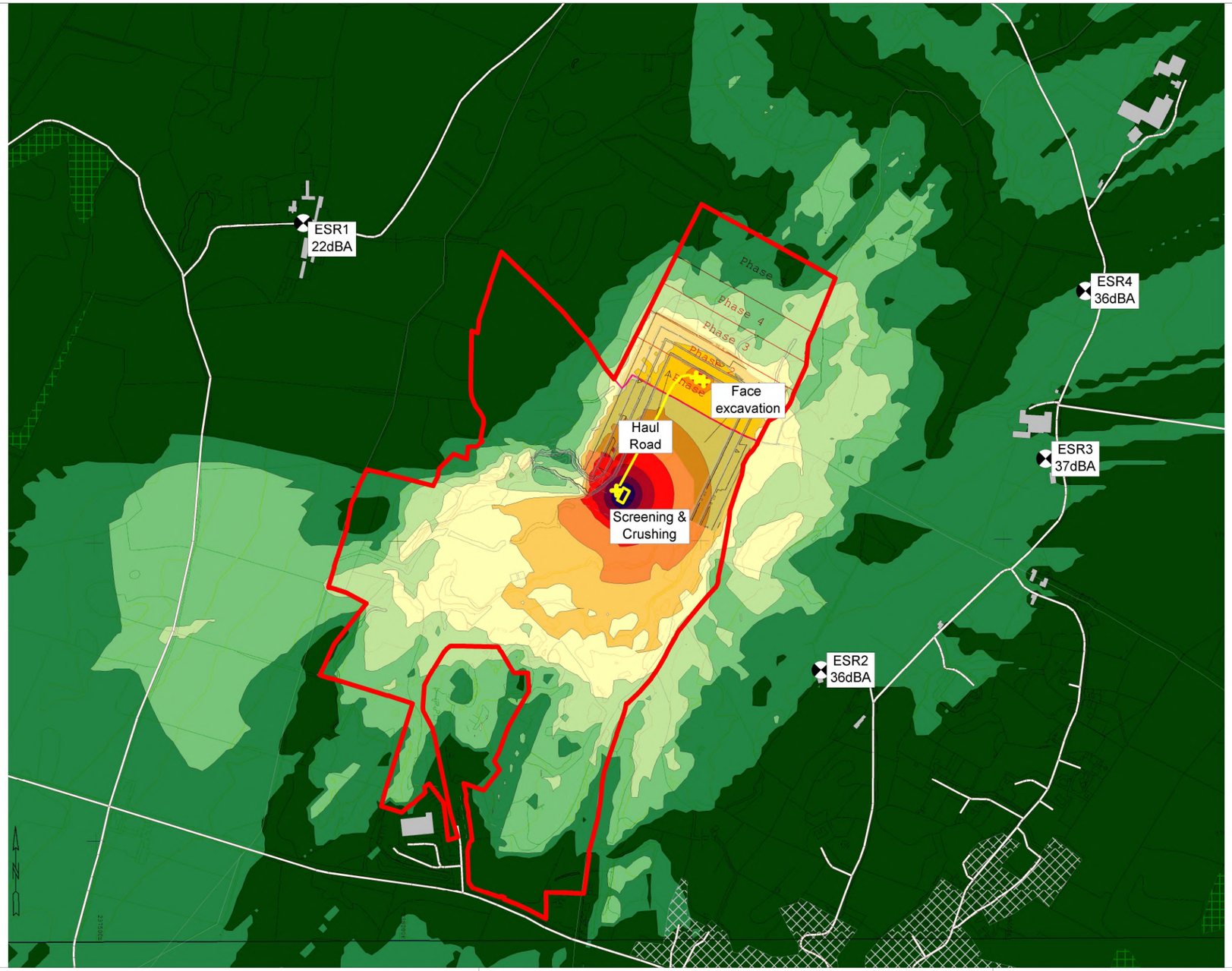

njd Environmental Associates	Client: Hogan Group	Figure 1: Phase 1 - Daytime dB LAeq,T (1.5m receptor height)	0 <= ... < 35 35 <= ... < 40 40 <= ... < 45 45 <= ... < 50 50 <= ... < 55 55 <= ... < 60 60 <= ... < 65 65 <= ... < 70 70 <= ... < 75 75 <= ... < 80 80 <= ...
	Job Title: NJD20-0058-002R Caer Glaw Quarry North Extension	Drawn By: NJ Dennon	Date: Nov 2021

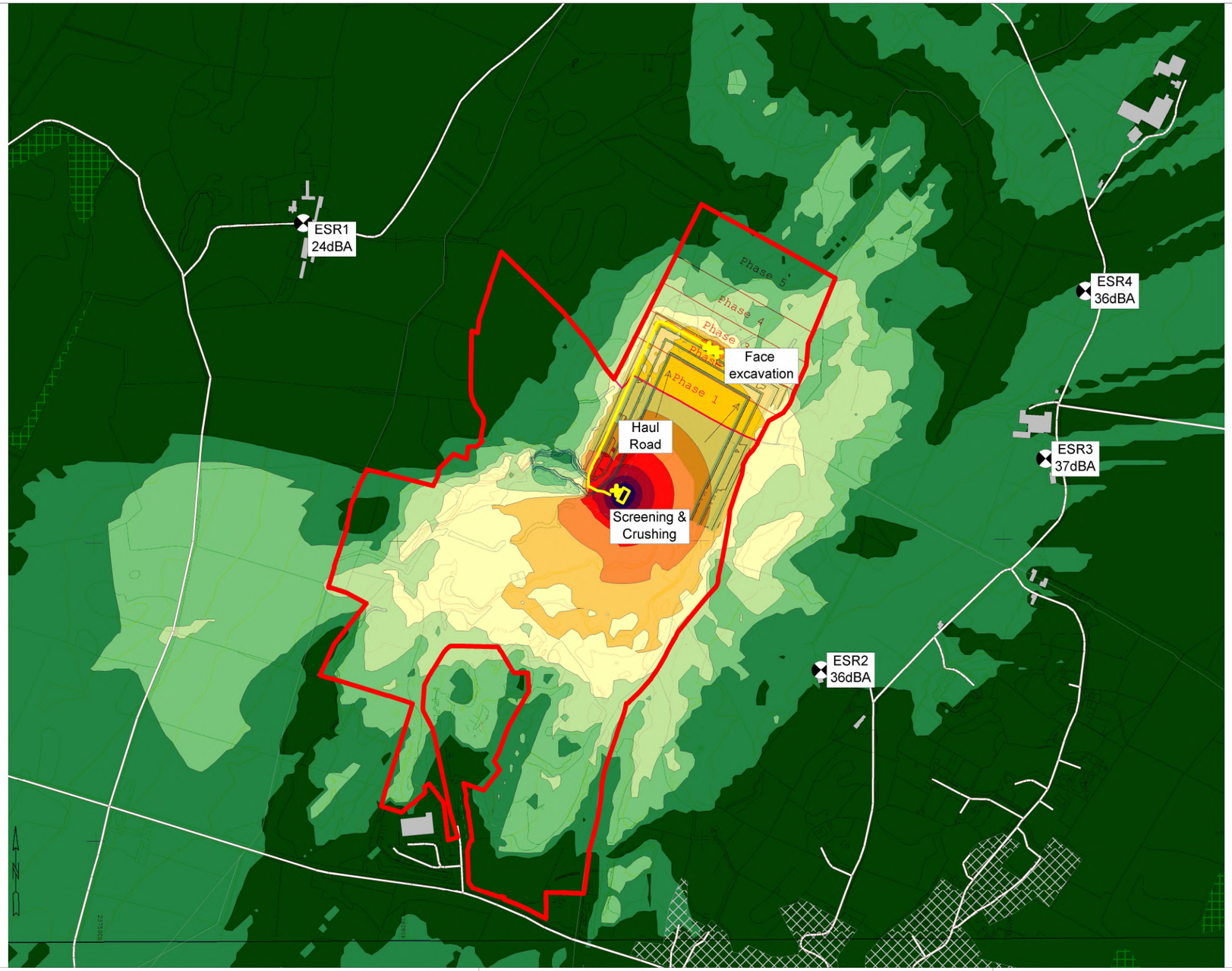

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Figure 2:
Phase 2 - Daytime dB LAeq,T
(1.5m receptor height)

0 <= ... < 35
35 <= ... < 40
40 <= ... < 45
45 <= ... < 50
50 <= ... < 55
55 <= ... < 60
60 <= ... < 65
65 <= ... < 70
70 <= ... < 75
75 <= ... < 80
80 <= ...

Job Title:
NJD20-0058-002R
Caer Glaw Quarry
North Extension

Drawn By:
NJ Dennon

Date:
Nov 2021

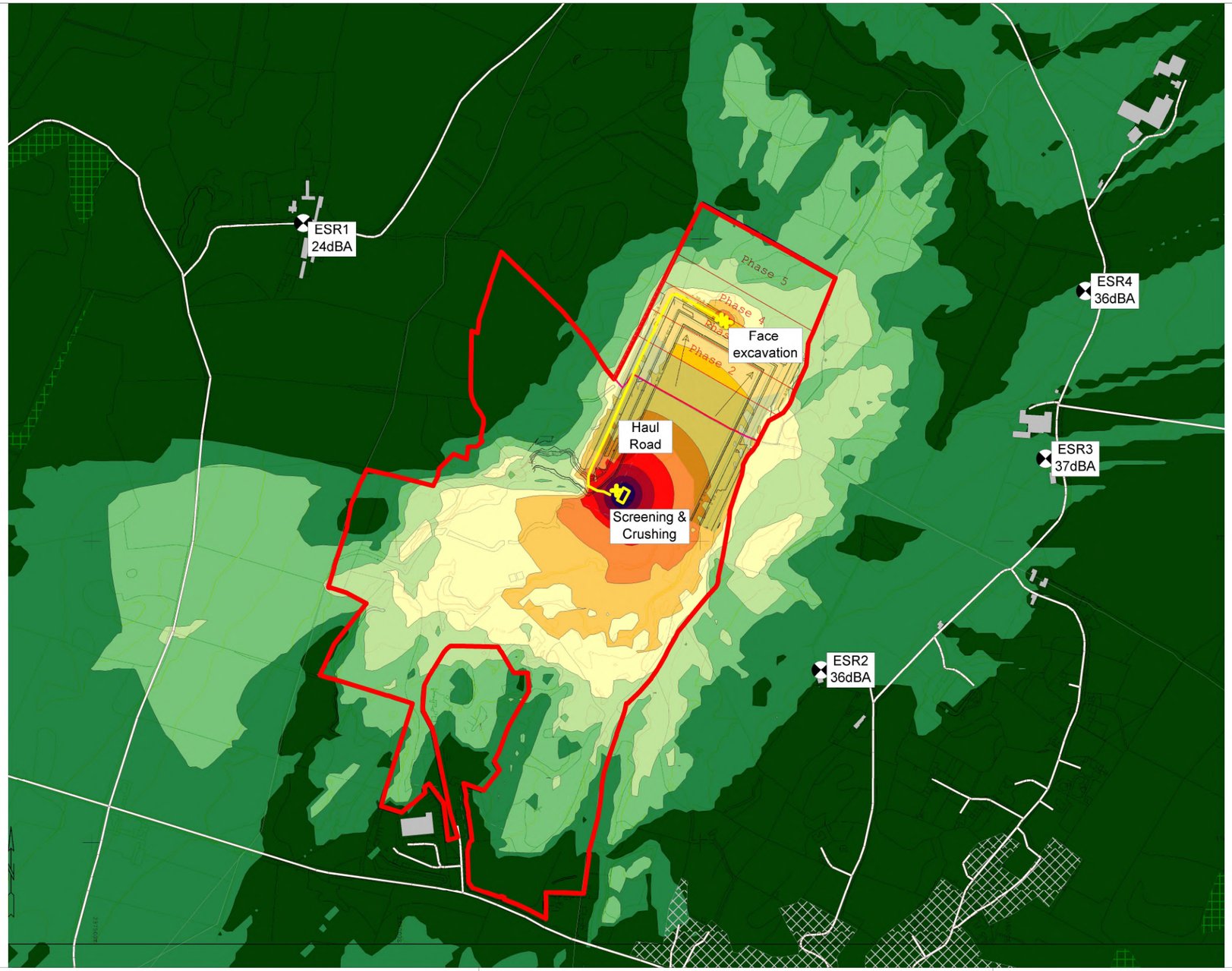

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Figure 3:
Phase 3 - Daytime dB LAeq,T
(1.5m receptor height)

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Caer Glaw Quarry
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NJ Dennon

Date:
Nov 2021

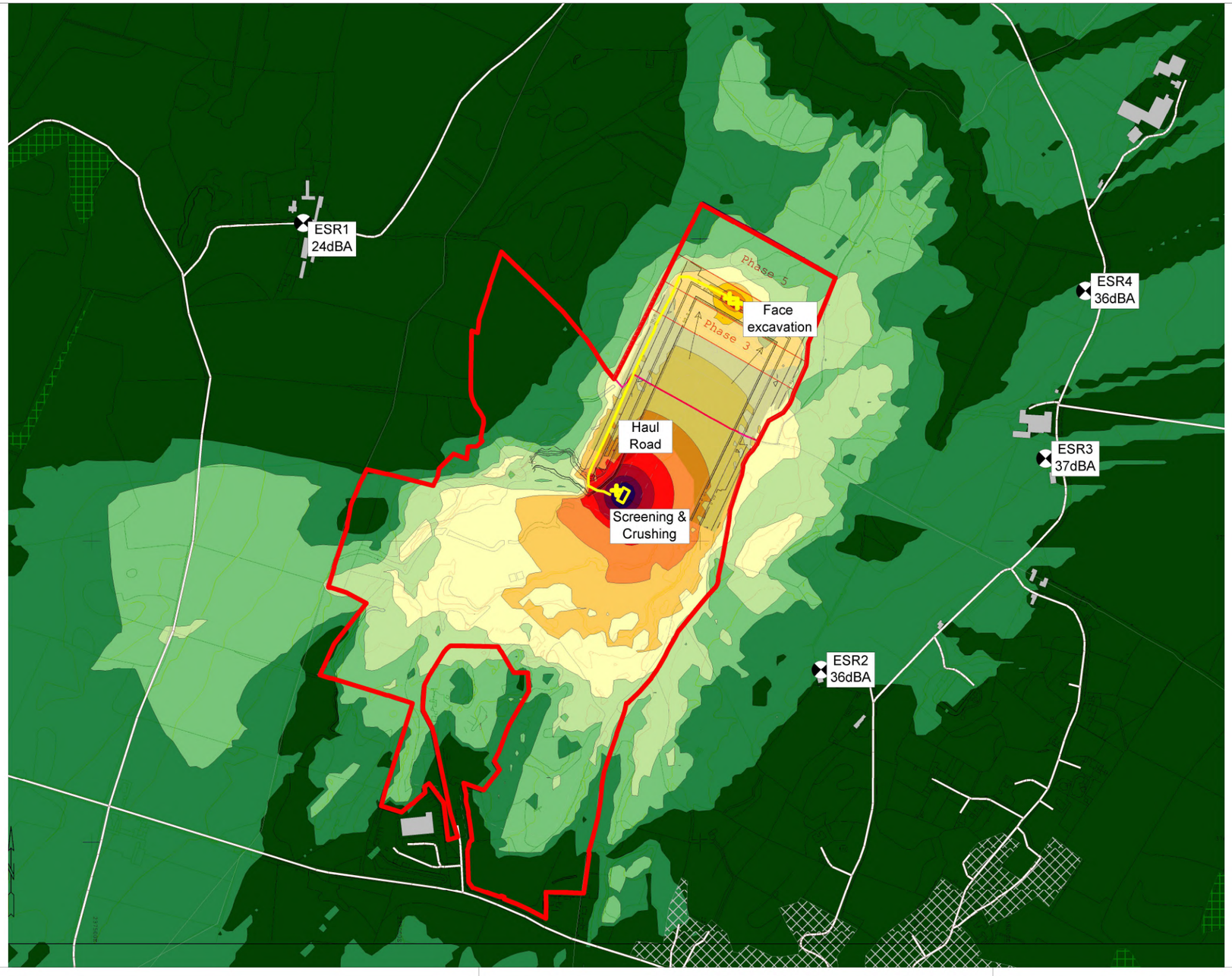

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Figure 4:
Phase 4 - Daytime dB LAeq,T
(1.5m receptor height)

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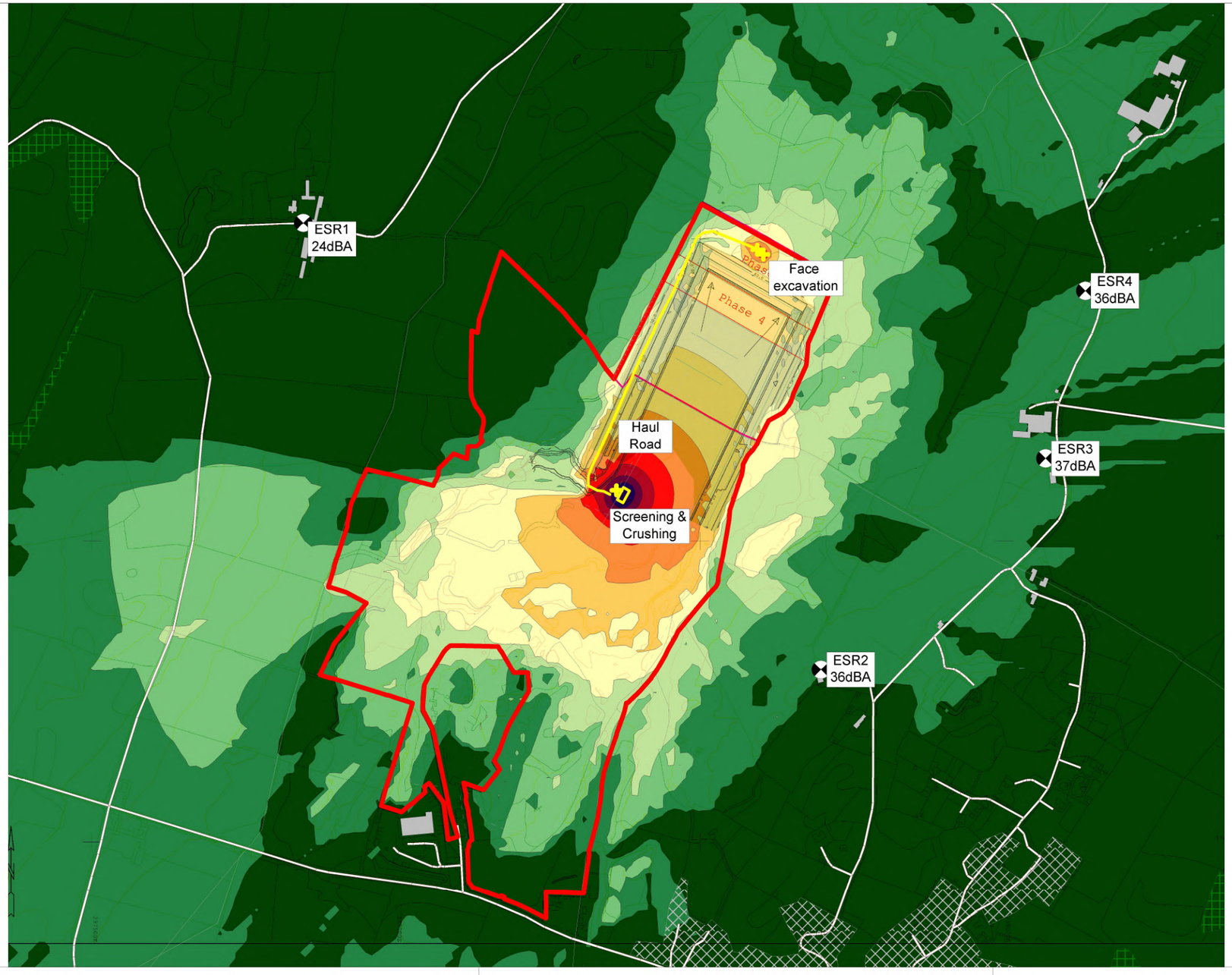

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Figure 5:
Phase 5 - Daytime dB LAeq,T
(1.5m receptor height)

0 <= ... < 35
35 <= ... < 40
40 <= ... < 45
45 <= ... < 50
50 <= ... < 55
55 <= ... < 60
60 <= ... < 65
65 <= ... < 70
70 <= ... < 75
75 <= ... < 80
80 <= ...

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