



ACOUSTIC
CONSULTANTS LTD

Construction Noise Assessment (BS5228)

**Ffos-y-Fran Land Reclamation
Merthyr Tydfil, CF48 4AE**

Reference: 11919/LN

Client:

Merthyr South Wales Limited

Document Control

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The report has been prepared in good faith, with all reasonable skill and care, based on information provided or available at the time of its preparation and within the scope of work agreement with the Client. We disclaim any responsibility to the Client and others in respect of any matters outside the scope of the above. The report is provided for the sole use of the named Client and is confidential to them and their professional advisors. No responsibility is accepted to other parties.

The report limits itself to addressing solely on the noise or vibration aspects as included in this report. We provide advice only in relation to noise, vibration and acoustics. It is recommended that appropriate expert advice is sought on all the ramifications (e.g. CDM, structural, condensation, fire, legal, etc.) associated with any proposals in this report or as advised and concerning the appointment. It should be noted that noise predictions are based on the current information as we understand it and on the performances noted in this report. Any modification to these parameters can alter the predicted level. All predictions are in any event subject to a degree of tolerance of normally plus or minus three decibels. If this tolerance is not acceptable, then it would be necessary to consider further measures.

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1. Introduction

Acoustic Consultants Limited have been appointed to undertake a comparison of the predicted impact of noise due to works to be undertaken at the Ffos-y-Fran land reclamation scheme in, Merthyr Tydfil, CF48 4AB.

The proposals at the site have previously been agreed upon and approved by the Local Authority via appeal (Ref: APP/U6925/A/10/2129921), from which the noise criterion was determined by another acoustic consultancy.

Since this approval, the operational phase of opencast mining has ceased with the mine closing in November 2023. Restoration of the mine has progressed, but an alternative restoration strategy is now proposed that will significantly reduce the need for bulk earthworks to complete the restoration scheme.

As a result, the proposal of groundworks has decreased significantly, from 27 million m³ of overburden (original 2003 scheme) down to 2.2 million m³ of overburden for the revised 2025 scheme of works.

Since the scheme has been revised, the EHO has confirmed that they would like to see a comparison of noise impact to ensure that predicted levels of noise caused by machines undertaking bulk earthworks and de-watering operations does not impact or exceed the previously agreed noise limits.

This report provides information on the noise related planning conditions along with any previous information deemed relevant. The report provides an assessment of noise at each noted noise sensitive receiver detailed in the conditions.

The author of this report is a Full Member of the Institute of Acoustics (MIOA) with over five years of experience within the field of noise and acoustics. This report has been reviewed by a Full Member of the Institute of Acoustics (MIOA) with over sixteen years of experience within the field of noise and acoustics.

2. The Site and Development

The Ffos-y-Fran site is approximately 400 hectares in total. The reclamation scheme is being undertaken to repurpose the site which was previously an opencast coal mine. Much of the works have been completed, with the remaining restoration works being undertaken to the north-east and centre of the site. This is indicated in the figures below.

The following figures provide the proposed areas of works over separate months as follows:

- April to May 2027 (Location OB1)
- July to August 2027 (Location OB1 & central to site)
- May 2028 (Central to site & Location OB3)

Figure 1: Areas of Work, April – May '27 (OB1)

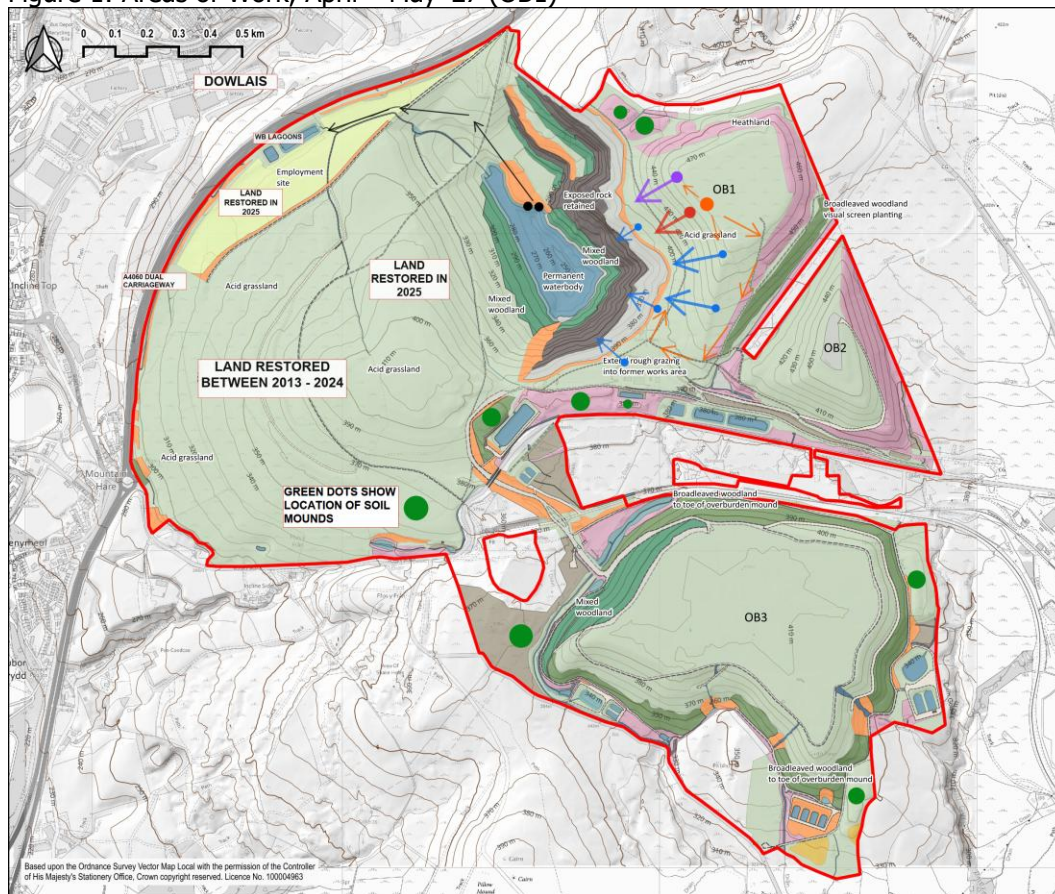


Figure 2: Areas of Work, July – August '27 (OB1 & Central to site)

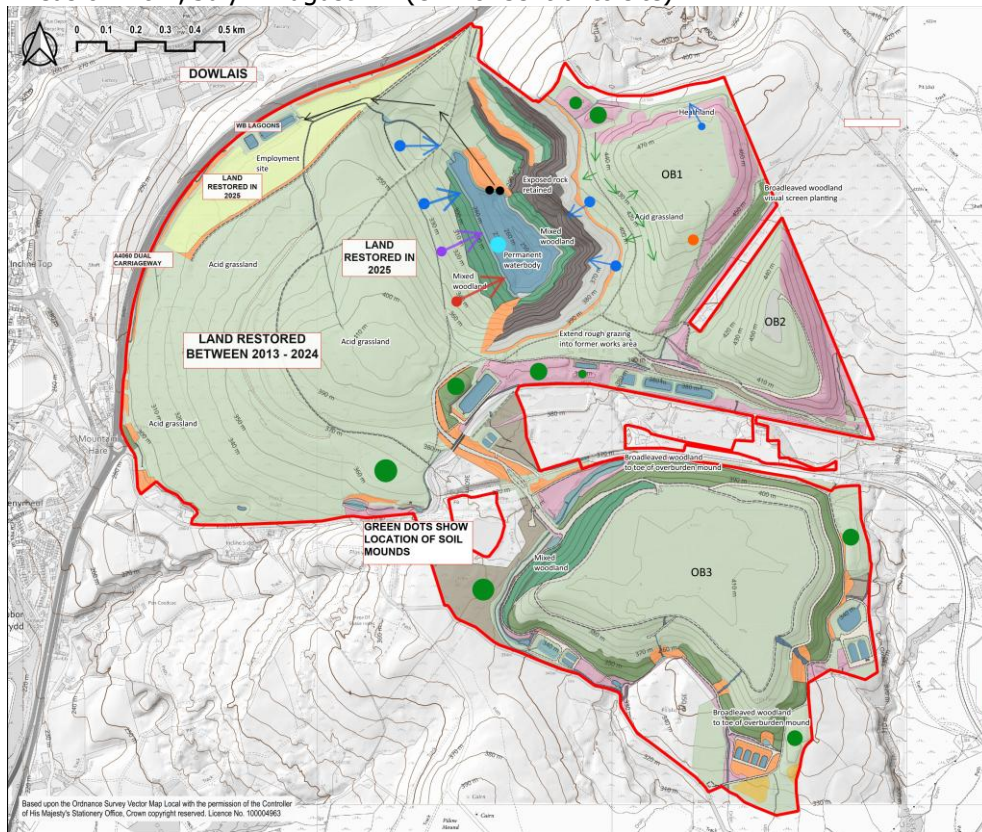
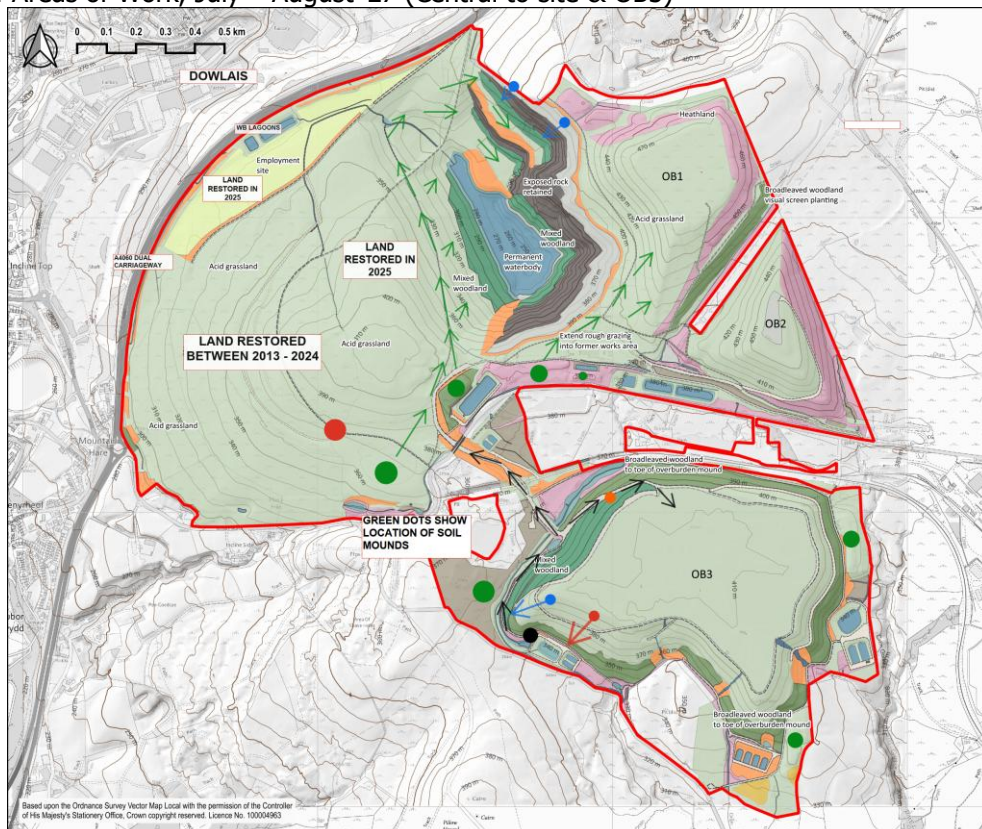


Figure 3: Areas of Work, July – August '27 (Central to site & OB3)



3. Planning Conditions

The following noise related planning conditions are sourced from the approved planning appeal (Ref: APP/U6925/A/10/2129921).

3.1. Condition 17

Noise

17(1) With the exception of those activities indicated in conditions 18 and 22 below, any noise arising from the development hereby permitted shall not exceed the following *dB LAeq, 1hr* by reference to the following specific noise monitoring locations.

Ref No.	Location	0700-1900 hrs	1900-2300 hrs
1	Blaen Dowlais	55	42
2	Japonica Drive	54	42
3	Mount View	55	42
4	Incline Side	55	42

We note that the above criteria have likely been derived from Annex E.5 of BS5228, 'Construction works involving long-term substantial earth moving'.

From this, we expect that a typographical error is made for Japonica Drive, 0700-1900 hours, which we expect should state a criterion of 55 dB *L_{Aeq,1hour}*.

3.2. Condition 18

18. During baffle mound construction and removal, soil stripping and removal of soil heaps, noise levels shall not exceed a daytime noise level of 70 *dB LAeq, 1hr* over periods not exceeding eight weeks in any one year.

3.3. Condition 19

19. Efficient silencing equipment shall be fitted to and used by all vehicles and other plant and machinery on site and shall be efficiently maintained in accordance with the manufacturer's recommendations.

3.4. Condition 20

20. All haul roads in direct line of sight and within 500 metres of any dwelling shall be adequately screened, where practicable, to attenuate noise levels.

3.5. Condition 21

21. Equipment operating on a 24-hour basis, such as pumps, shall be placed in acoustic enclosures and positioned away from noise sensitive locations where practicable.

3.6. **Condition 22**

22. The rating level of noise emitted from such pump enclosures shall not exceed the existing background noise level by more than an amount to be agreed in writing by the Local Planning authority before the development hereby permitted starts.

4. Noise Survey

A baseline noise survey was carried out around the site to obtain up to date baseline noise data. This was carried to ensure the conditioned criteria were still appropriate given the duration of time that has elapsed since the original survey was completed (2002).

The survey was conducted on Thursday 26th March 2026 and was fully attended during daytime hours only.

4.1. Monitoring Locations

The figure below provides the monitoring locations chosen for the attended survey.

Figure 4: Monitoring Locations



The locations chosen for the survey were deemed representative of all noted NSRs.

Location 1 is positioned away from Blaen Dowlais, however is a worst-case location that is still representative of the Blaen Dowlais street, due to its distance from the

main A4060 road that is the dominant source of noise affecting the NSRs located at this location.

4.2. Monitoring Equipment

Sound Pressure Levels were measured using a Class 1 sound level meter with a half-inch condenser microphone, using the 'fast' setting. The equipment is checked regularly using a Quality System meeting the requirements of British Standard EN ISO/IEC 17025:2017 "General requirements for the competence of testing and calibration laboratories"; in accordance with British Standard EN 10012:2003 "Measurement management systems. Requirements for measurement processes and measuring equipment"; and traceable to the National Standards.

This equipment was checked and calibrated as noted below and the certificates are available for inspection.

Table 1: Equipment and Calibration Status

Equipment Description / Manufacturer / Type	Serial Number	Date of Calibration	Calibration Certification Number
SLM, NTI, XL2	A2A-09705-E0	10/09/2025	UK-25-118
Pre-Amp, NTI, MA220	5332	10/09/2025	UK-25-118
Microphone, NTI, MC230A	A14374	10/09/2025	UK-25-118
Calibrator, NOR-1251	35230	10/11/2025	1515319-2

The measurement system was calibrated before and after the survey and checked for drift. No significant drift was measured, and the data is not expected to be affected by the calibration.

4.3. Weather Conditions

During the fully attended survey, wind speed was less than 5m/s, from an easterly direction.

The air temperature was 9 degrees Celsius on average, with approximately 20% cloud coverage and no rain.

These weather conditions are not expected to have adversely affected the measured noise data.

4.4. Monitoring Procedure

Noise measurements were carried out in free-field positions at each location. The microphone was mounted on a tripod approximately 1.5m above the ground.

The sound level meter was set to obtain 15-minute repeat periods with a 1-second log trace.

Measurements were carried out between 11.15 and 16.45 hours across the site, with a minimum of 1-hour at each location.

4.5. Measured Noise Levels

The table below summarises the relevant measured noise levels at each location.

Table 2: Measured Baseline Noise Levels at NSRs

Monitoring Location	Time	Measured Noise Level, dB		
		L _A F _{max}	L _A eq, 15mins	L _A 90, 15 min
1 (Blaen Dowlais/Japonica Drive)	11:15-11:30	76	50	45
	11:30-11:45	61	48	44
	11:45-12:00	59	48	44
	12:00-12:15	70	49	46
	12:15-12:30	64	49	45
	12:30-12:45	64	48	44
2 (Mount View)	13:15-13:30	85	63	58
	13:30-13:45	76	64	58
	13:45-14:00	77	64	58
	14:00-14:15	78	64	59
	14:15-14:30	89	65	58
	14:30-14:45	72	62	55
3 (Incline Side)	15:15-15:30	77	60	42
	15:30-15:45	81	61	42
	15:45-16:00	75	61	44
	16:00-16:15	76	61	45
	16:15-16:30	74	61	45
	16:30-16:45	75	61	45

The measured equivalent noise levels are similar to those previously obtained in the original baseline noise survey.

The criteria provided above are therefore still appropriate for the proposed works and assessment.

5. Construction Method

An indicative plan and areas of work have been provided to us via Merthyr South Wales Limited. The plan of works is separated into phases across different months:

1. April to May 2027 (Location OB1)
2. July to August 2027 (Location OB1 & central to site)
3. May 2028 (Central to site & Location OB3)

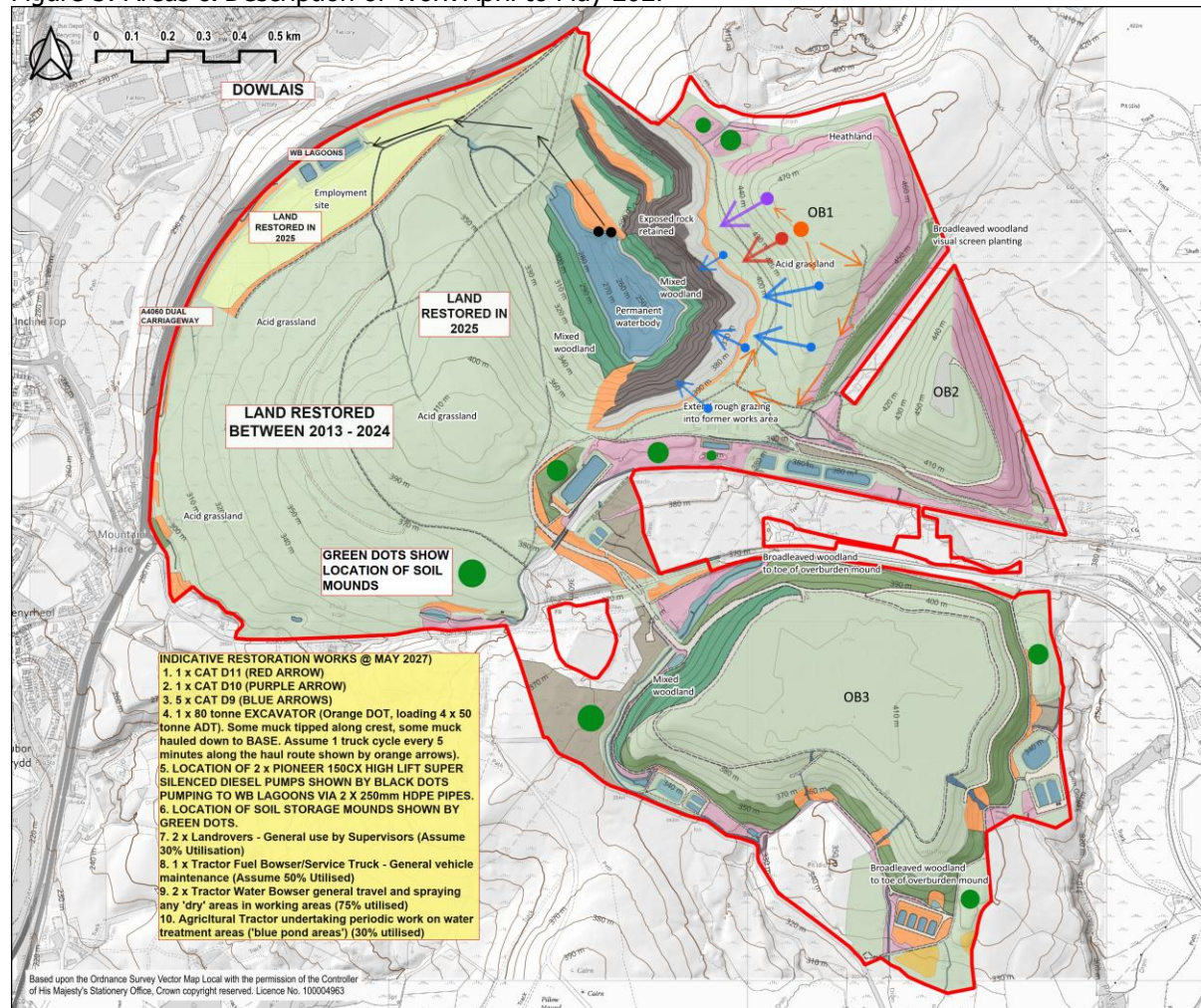
Each phase will be assessed individually to ensure a robust assessment is provided.

5.1. Phases of Work

The following figures provide the areas and notes of work that are to be assessed in terms of noise impact.

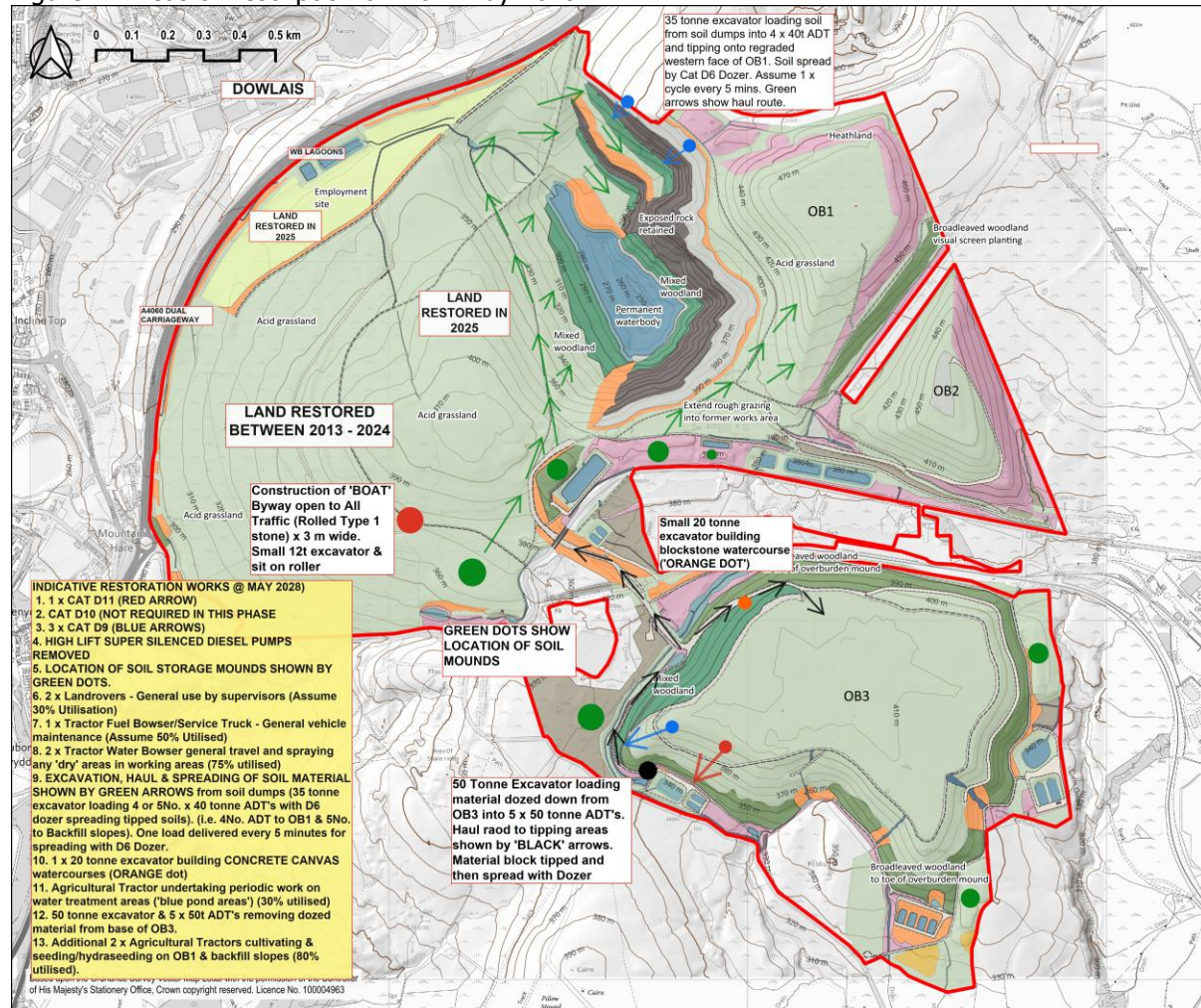
5.1.1. April to May 2027

Figure 5: Areas & Description of Work April to May 2027



5.1.3. May 2028

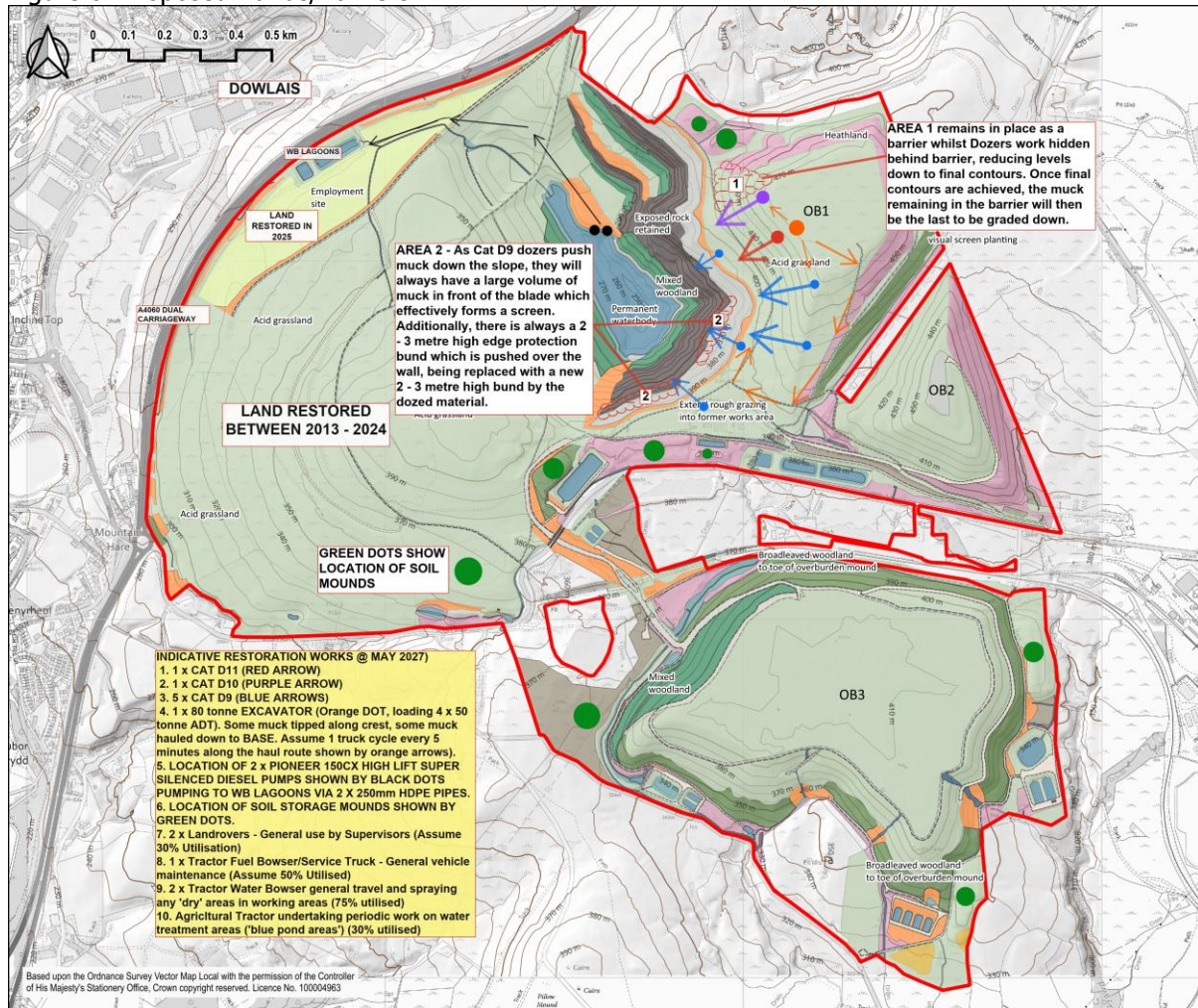
Figure 7: Areas & Description of Work May 2028



5.1.4. Proposed Bunds: April to May 2027

We have been provided with the following information on bunding to act as barriers.

Figure 8: Proposed Bunds/Barriers



In addition to the above, our client has provided us with topographical data of existing and proposed site levels.

5.2. Equipment

During all phases, the main plant on site is a range of dozers, excavator, and articulated dump trucks (ADTs).

Indicative works information shows that each dozer could work for up to 50-minutes within a 1-hour period of assessment (83%).

The equipment used for each phase is provided below:

5.2.1. April to May 2027

Equipment with operational times as a percentage of 1-hour is as follows:

Table 3: April to May '27

Plant	Quantity	% Use over 1-hour Period
Cat D11 Dozer (107t)	1	83
Cat D10 Dozer (71t)	1	83
Cat D9 Dozer (49t)	5	83
Excavator (80t)	1	83
Pioneer 150CX Pumps	2	100
Agricultural tractor	1	30
Water bowser tractor	2	75
Fuel bowser tractor	1	50

5.2.2. July to August 2027

Equipment with operational times as a percentage of 1-hour is as follows:

Table 4: July to August '27

Plant	Quantity	% Use over 1-hour Period
Cat D11 Dozer (107t)	1	83
Cat D10 Dozer (71t)	1	83
Cat D9 Dozer (49t)	5	83
Excavator (35t)	1	83
Cat D6 Dozer (18t)	1	83
ADT (40t)	4	83
Pioneer 150CX Pumps	2	100
Agricultural tractor	1	30
Water bowser tractor	2	75
Fuel bowser tractor	1	50

5.2.3. May 2028

Equipment with operational times as a percentage of 1-hour is as follows:

Table 5: May '28

Plant	Quantity	% Use over 1-hour Period
Cat D11 Dozer (107t)	1	83
Cat D9 Dozer (49t)	3	83
Excavator (35t)	1	83
Cat D6 Dozer (18t)	1	83
Excavator (20t)	1	83
ADT (40t)	9	83
Agricultural tractor	1	30
Water bowser tractor	2	75
Fuel bowser tractor	1	50
Excavator (50t)	1	83
ADT (50t)	5	83

6. Proposed Plant Noise Levels

Based on the above, the tables below provide the operational noise levels from our own survey work, BS5228 or manufacturers data.

6.1.1. April to May 2027

Table 6: Noise Levels of Proposed Equipment, April to May 2027

Plant	Phase: April to May 2027			
	L _{WA}	Source of Noise Data	% On Time Per Hour	Quantity
Cat D11 Dozer (107t)	118	Table C.6, 15 of BS5228	83	1
Cat D10 Dozer (71t)	112	Table C.2, 3 of BS5228	83	1
Cat D9 Dozer (49t)	108	Table C.2, 10 of BS5228	83	5
Excavator (80t)	108	Table C.2, 2 of BS5228	83	1
Pioneer 150CX Pumps	98	Manufacturer Data	100	2
Agricultural tractor	97	Table C.4, 75 of BS5228	30	1
Water bowser tractor	101	Table C.6, 38 of BS5228	75	2
Fuel bowser tractor	101	Table C.6, 38 of BS5228	50	1

6.1.2. July to August 2027

Table 7: Noise Levels of Proposed Equipment, July to August 2027

Plant	Phase: July to August 2027			
	L _{WA}	Source of Noise Data	% On Time Per Hour	Quantity
Cat D11 Dozer (107t)	118	Table C.6, 15 of BS5228	83	1
Cat D10 Dozer (71t)	112	Table C.2, 3 of BS5228	83	1
Cat D9 Dozer (49t)	108	Table C.2, 10 of BS5228	83	5
Excavator (35t)	105	Table C.4, 63 of BS5228	83	1
Cat D6 Dozer (18t)	103	Table C.2, 1 of BS5228	83	1
ADT (40t)	107	Table C.6, 26 of BS5228	83	4
Pioneer 150CX Pumps	98	Manufacturer Data	100	2
Agricultural tractor	97	Table C.4, 75 of BS5228	30	1
Water bowser tractor	101	Table C.6, 38 of BS5228	75	2
Fuel bowser tractor	101	Table C.6, 38 of BS5228	50	1

6.1.3. May 2028

Table 8: Noise Levels of Proposed Equipment, May 2028

Plant	Phase: May 2028			
	L _{WA}	Source of Noise Data	% On Time Per Hour	Quantity
Cat D11 Dozer (107t)	118	Table C.6, 15 of BS5228	83	1
Cat D9 Dozer (49t)	108	Table C.2, 10 of BS5228	83	3
Excavator (35t)	105	Table C.4, 63 of BS5228	83	1
Cat D6 Dozer (18t)	103	Table C.2, 1 of BS5228	83	1
Excavator (20t)	99	Table C.2, 21 of BS5228	83	1
ADT (40t)	107	Table C.6, 26 of BS5228	83	Up to 9
Agricultural tractor	118	Table C.4, 92 of BS5228	30	1
Water bowser tractor	101	Table C.6, 38 of BS5228	75	2
Fuel bowser tractor	101	Table C.6, 38 of BS5228	50	1
Excavator (50t)	107	Table C.2, 14 of BS5228	83	1
ADT (40t)	104	Table C.6, 26 of BS5228	83	5

7. Construction Noise Predictions

Predictions have been completed using the standard formulas for outdoor noise propagation and predictions along with the operational times and quantities of plant noted above.

The assessment considers each phase of work, as noted above. The predictions are split between each sensitive receiver noted in Condition 17 of the granted planning appeal.

Assessment of topography is considered in propagation attenuation. Information provided to us on bunding around the site is also considered in terms of barrier attenuation.

Distance corrections are typically applied from the closest boundary to the NSR, from the area of use per phase.

In some instances, the distance of plant such as the Cat D11 dozer are in the region of 500m to 1000m greater than the closest boundary of the main phase of works; this is considered in the calculation with additional distance correction applied to the specific plant item.

In some instances, only the worst-case sources of noise are considered based on distance from receiver and topography. Where this is the case, the omitted sources would have a negligible effect on the prediction.

7.1. Blaen Dowlais

7.1.1. April to May 2027

The predictions are as follows:

Table 9: Predicted Level of Impact at Blaen Dowlais, April to May Phase

Plant Type and Operation	L _{WA}	Time Correction	Quantity Correction	Distance Correction	Barrier Correction	dB L _{Aeq} (1hr)
Cat D11 Dozer (107t)	118	-1	0	-65	-15	37
Cat D10 Dozer (71t)	112	-1	0	-65	-15	31
Cat D9 Dozer (49t)	108	-1	7	-65	-15	34
Excavator (80t)	108	-1	0	-65	-15	27
Pioneer 150CX Pumps	98	0	3	-65	-15	21
Agricultural tractor	97	-5	0	-65	-15	11
Water bowser tractor	101	-1	3	-70	-15	17
Fuel bowser tractor	101	-3	0	-70	-15	13
Cumulative Level dB L_{Aeq}(1hr)						40

Based on the levels above, whilst the bund is being built, using the equipment above, condition 18 can be achieved.

7.1.2. July to August 2027

Table 10: Predicted Level of Impact at Blaen Dowlais, July to August Phase

Plant Type and Operation	L _{WA}	Time Correction	Quantity Correction	Distance Correction	Barrier Correction	dB L _{Aeq} (1hr)
Cat D11 Dozer (107t)	118	-1	0	-68	-15	34
Cat D10 Dozer (71t)	112	-1	0	-66	-15	30
Cat D9 Dozer (49t)	108	-1	7	-63	-15	36
Excavator (35t)	105	-1	0	-63	-15	26
Cat D6 Dozer (18t)	103	-1	0	-63	-15	24
ADT (40t)	107	-1	6	-63	-15	34
Pioneer 150CX Pumps	98	0	3	-63	-15	23
Agricultural tractor	97	-5	0	-63	-15	14
Water bowser tractor	101	-1	3	-70	-15	17
Fuel bowser tractor	101	-3	0	-70	-15	13
Cumulative Level dB L_{Aeq}(1hr)						41

7.1.3. May 2028

Table 11: Predicted Level of Impact at Blaen Dowlais, May Phase

Plant Type and Operation	L _{WA}	Time Correction	Quantity Correction	Distance Correction	Barrier Correction	dB L _{Aeq} (1hr)
Excavator (35t)	105	-1	0	-62	-10	32
ADT (40t)	107	-1	6	-62	-10	40
Cumulative Level dB L_{Aeq}(1hr)						41

7.2. Japonica Drive

7.2.1. April to May 2027

The predictions are as follows:

Table 12: Predicted Level of Impact at Japonica Drive, April to May Phase

Plant Type and Operation	L _{WA}	Time Correction	Quantity Correction	Distance Correction	Barrier Correction	dB L _{Aeq} (1hr)
Cat D11 Dozer (107t)	118	-1	0	-68	-10	40
Cat D10 Dozer (71t)	112	-1	0	-68	-10	34
Cat D9 Dozer (49t)	108	-1	7	-68	-10	37
Excavator (80t)	108	-1	0	-68	-10	30
Pioneer 150CX Pumps	98	0	3	-68	-10	23
Agricultural tractor	97	-5	0	-73	-10	9
Water bowser tractor	101	-1	3	-73	-10	20
Fuel bowser tractor	101	-3	0	-73	-10	15
Cumulative Level dB L_{Aeq}(1hr)						42

7.2.2. July to August 2027

Table 13: Predicted Level of Impact at Japonica Drive, July to August Phase

Plant Type and Operation	L _{WA}	Time Correction	Quantity Correction	Distance Correction	Barrier Correction	dB L _{Aeq} (1hr)
Cat D11 Dozer (107t)	118	-1	0	-71	-10	36
Cat D10 Dozer (71t)	112	-1	0	-69	-10	32
Cat D9 Dozer (49t)	108	-1	7	-71	-10	33
Excavator (35t)	105	-1	0	-66	-10	28
Cat D6 Dozer (18t)	103	-1	0	-66	-10	26
ADT (40t)	107	-1	6	-66	-10	36
Pioneer 150CX Pumps	98	0	3	-66	-10	25
Agricultural tractor	97	-5	0	-73	-10	9
Water bowser tractor	101	-1	3	-73	-10	20
Fuel bowser tractor	101	-3	0	-73	-10	15
Cumulative Level dB L_{Aeq}(1hr)						41

7.2.3. May 2028

Table 14: Predicted Level of Impact at Japonica Drive, May Phase

Plant Type and Operation	L _{WA}	Time Correction	Quantity Correction	Distance Correction	Barrier Correction	dB L _{Aeq} (1hr)
Excavator (35t)	105	-1	0	-66	-10	28
ADT (40t)	107	-1	6	-66	-10	36
Cumulative Level dB L_{Aeq}(1hr)						37

7.3. Mount View

7.3.1. April to May 2027

The predictions are as follows:

Table 15: Predicted Level of Impact at Mount View, April to May Phase

Plant Type and Operation	L _{WA}	Time Correction	Quantity Correction	Distance Correction	Barrier Correction	dB L _{Aeq} (1hr)
Cat D11 Dozer (107t)	118	-1	0	-73	-10	34
Cat D10 Dozer (71t)	112	-1	0	-73	-10	28
Cat D9 Dozer (49t)	108	-1	7	-73	-10	31
Excavator (80t)	108	-1	0	-73	-10	24
Pioneer 150CX Pumps	98	0	3	-73	-10	18
Agricultural tractor	97	-5	0	-78	-10	3
Water bowser tractor	101	-1	3	-78	-10	14
Fuel bowser tractor	101	-3	0	-78	-10	10
Cumulative Level dB L_{Aeq}(1hr)						37

7.3.2. July to August 2027

Table 16: Predicted Level of Impact at Mount View, July to August Phase

Plant Type and Operation	L _{WA}	Time Correction	Quantity Correction	Distance Correction	Barrier Correction	dB L _{Aeq} (1hr)
Cat D11 Dozer (107t)	118	-1	0	-71	-10	36
Cat D10 Dozer (71t)	112	-1	0	-71	-10	30
Cat D9 Dozer (49t)	108	-1	7	-71	-10	33
Excavator (35t)	105	-1	0	-71	-10	23
Cat D6 Dozer (18t)	103	-1	0	-71	-10	21
ADT (40t)	107	-1	6	-71	-10	31
Pioneer 150CX Pumps	98	0	3	-71	-10	20
Agricultural tractor	97	-5	0	-78	-10	3
Water bowser tractor	101	-1	3	-78	-10	14
Fuel bowser tractor	101	-3	0	-78	-10	10
Cumulative Level dB L_{Aeq}(1hr)						40

7.3.3. May 2028

Table 17: Predicted Level of Impact at Mount View, May Phase

Plant Type and Operation	L _{WA}	Time Correction	Quantity Correction	Distance Correction	Barrier Correction	dB L _{Aeq} (1hr)
Cat D11 Dozer (107t)	118	-1	0	-73	-10	35
Cat D9 Dozer (49t)	108	-1	5	-73	-10	29
Excavator (35t)	105	-1	0	-73	-10	22
Cat D6 Dozer (18t)	103	-1	0	-73	-10	20
Excavator (20t)	99	-1	0	-73	-10	16
ADT (40t)	107	-1	10	-73	-10	33
Agricultural tractor	118	-5	0	-73	-10	30
Water bowser tractor	101	-1	3	-73	-10	20
Fuel bowser tractor	101	-3	0	-78	-10	10
Excavator (50t)	107	-1	0	-78	-10	18
ADT (40t)	104	-1	7	-78	-10	22
Cumulative Level dB L_{Aeq}(1hr)						39

7.4. Incline Side

7.4.1. April to May 2027

The predictions are as follows:

Table 18: Predicted Level of Impact at Incline Side, April to May Phase

Plant Type and Operation	L _{WA}	Time Correction	Quantity Correction	Distance Correction	Barrier Correction	dB L _{Aeq} (1hr)
Cat D11 Dozer (107t)	118	-1	0	-72	-10	36
Cat D10 Dozer (71t)	112	-1	0	-72	-10	30
Cat D9 Dozer (49t)	108	-1	7	-72	-10	33
Excavator (80t)	108	-1	0	-72	-10	26
Pioneer 150CX Pumps	98	0	3	-72	-10	19
Agricultural tractor	97	-5	0	-77	-10	5
Water bowser tractor	101	-1	3	-77	-10	16
Fuel bowser tractor	101	-3	0	-77	-10	11
Cumulative Level dB L_{Aeq}(1hr)						38

Based on the levels above, whilst the bund is being built, using the equipment above, condition 18 can be achieved.

7.4.2. July to August 2027

Table 19: Predicted Level of Impact at Incline Side, July to August Phase

Plant Type and Operation	L _{WA}	Time Correction	Quantity Correction	Distance Correction	Barrier Correction	dB L _{Aeq} (1hr)
Cat D11 Dozer (107t)	118	-1	0	-70	-10	38
Cat D10 Dozer (71t)	112	-1	0	-72	-10	30
Cat D9 Dozer (49t)	108	-1	7	-78	-10	27
Excavator (35t)	105	-1	0	-78	-10	17
Cat D6 Dozer (18t)	103	-1	0	-70	-10	23
ADT (40t)	107	-1	6	-70	-10	33
Pioneer 150CX Pumps	98	0	3	-70	-10	21
Agricultural tractor	97	-5	0	-77	-10	5
Water bowser tractor	101	-1	3	-77	-10	16
Fuel bowser tractor	101	-3	0	-77	-10	11
Cumulative Level dB L_{Aeq}(1hr)						40

7.4.3. May 2028

Table 20: Predicted Level of Impact at Incline Side, May Phase

Plant Type and Operation	L _{WA}	Time Correction	Quantity Correction	Distance Correction	Barrier Correction	dB L _{Aeq} (1hr)
Cat D11 Dozer (107t)	118	-1	0	-72	-10	36
Cat D9 Dozer (49t)	108	-1	5	-72	-10	30
Excavator (35t)	105	-1	0	-72	-10	23
Cat D6 Dozer (18t)	103	-1	0	-72	-10	21
Excavator (20t)	99	-1	0	-72	-10	17
ADT (40t)	107	-1	7	-72	-10	32
Agricultural tractor	118	-5	0	-72	-10	31
Water bowser tractor	101	-1	3	-72	-10	21
Fuel bowser tractor	101	-3	0	-77	-10	11
Excavator (50t)	107	-1	0	-77	-10	20
ADT (40t)	104	-1	7	-77	-10	24
Cumulative Level dB L_{Aeq}(1hr)						39

7.5. Summary of Predictions

The following table summarises the predicted level per phase and NSR. The criterion for 07.00 to 19.00 hours is 55 dB L_{Aeq,1hour}. The criterion for 19.00 to 23.00 hours is 42 dB L_{Aeq,1hour}.

Table 21: Summary of Construction Noise Predictions

NSR Location	Phase	Predicted Level L _{Aeq} (1hr)	Within Criteria?	
			07.00 to 19.00	19.00 to 23.00
Blaen Dowlais	April to May 2027	40	YES	YES
	July to August 2027	41	YES	YES
	May 2028	41	YES	YES
Japonica Drive	April to May 2027	42	YES	YES
	July to August 2027	41	YES	YES
	May 2028	37	YES	YES
Mount View	April to May 2027	37	YES	YES
	July to August 2027	40	YES	YES
	May 2028	39	YES	YES
Incline Side	April to May 2027	38	YES	YES
	July to August 2027	40	YES	YES
	May 2028	39	YES	YES

As can be seen from the table above the predictions indicate that the noise impact will fall within the criteria noted in Condition 17.

There are one instance where the evening criterion is just met at Japonica Drive during the first phase.

When comparing the predicted levels to those from disposition 4 from the original noise survey from the approved strategy of 2003, the predicted levels at each location are lower. The disposition is provided below.

Table 22: Disposition 4 Predicted levels.

Receiver	Predicted Noise Level, dB LAeq
Blaen Dowlais	48
Japonica Drive	44
Mount View	45
Ffos-y-fran Cottages (Incline Side)	43

The Client has also informed us that restoration work will normally take place between the hours of 07.00 - 19.00 in which case noise levels are significantly lower than required by Condition 17 and the predicted noise levels for restoration of the original scheme (Disposition 4).

However, the Client would give consideration to evening work providing noise levels and other issues were acceptable to the local authority, as this would maximise operational efficiency and minimise the duration of the scheme.

The contractor will follow the mitigation measures detailed below and will be alerted to any exceedances as required via the real time monitoring.

In any instances of exceedances during the evening periods of work (if the period is applicable), the main source of noise effecting the level of impact is due to the Cat D11 dozer.

The predictions indicate that the Cat D11 dozer could be limited to 30-minutes of work during a 1-hour period, between the hours of 19.00 and 23.00, and the level of impact could be further reduced to minimise meeting / exceeding the 42 dB LAeq,1hour criterion.

The Client has also informed us that they would be willing to park up the Cat D11 dozer should the need arise after 19.00 which would ensure any evening work could progress below the maximum permitted levels at all times.

Based on the levels above, whilst the bund is being built, using the equipment above, condition 18 is expected to be achieved.

Also, based on the above predictions, pump noise levels within the proposed indicative plan and areas of work are expected to be compliant with planning condition 22.

We would also recommend that the contractors adhere to the comments made in conditions 19-21.

Where activities are different to the location plan above, a reassessment will be required to be undertaken.

8. Noise Control Measures

8.1. Community Liaison

Communication with the local residents and businesses is important and will ensure any concerns about the adverse impacts due to works are reduced.

The main contractor should ensure that a site notice board is clearly visible, this will ensure that local residents and business have a main point of contact for any complaints or questions.

8.2. Best Practical Means

It is advised Best Practical Means is employed throughout the construction process to reduce the likelihood of noise complaints. All contractors and sub-contractors should be made aware of the working practices implemented to reduce complaints. This should be informed at all site inductions.

We are advised by the Client that they followed a robust Complaints procedure during operation of the Ffos-y-fran opencast site where all complaints were thoroughly investigated and reported back to individuals. We would advise that the proposals with regard to general noise mitigation would be in accordance with BPM as specified in BS 5228-1:2009 and would comprise of the following, where possible:

- a) Investigate the cause of complaint
- b) Investigate as to whether the agreed limits have been exceeded
- c) Provide a response regarding the complaint

It is advised Best Practical Means is employed throughout the construction process to reduce the likelihood of noise complaints. All contractors and sub-contractors should be made aware of the working practices implemented to reduce complaints. This should be informed at all site inductions. The proposals with regard to general noise and vibration mitigation would be in accordance with BPM as specified in BS 5228-1:2009 and would comprise of the following, where necessary and possible:

- Good communication with the adjacent residents is required, especially during periods of high noise.
- Switching off engines where vehicles are standing for a significant period of time.
- Fitting of acoustic enclosures to suppress noisy equipment when required. This can achieve up to 15dB reduction for plant.
- Operating plant at low speeds and incorporating automatic low speed idling
- Where practicable, give consideration to selecting electrically driven equipment in preference to internal combustion power, hydraulic power in preference to pneumatic and wheeled in lieu of tracked plant

- Properly maintaining all plant (greased, blown silencers replaced, saws kept sharpened, teeth set and blades flat, worn bearings replaced, etc.)
- If necessary, give consideration that real time noise monitoring is installed during the duration of the disruptive works. The monitoring system should have instant alerts when the agreed limits are exceeded. The Client has informed us that a continuous noise monitor was located in Dennithorne Close during opencast operations however, this has now been removed and due to the low level of noise complaints received during the last 5 years of operations, and the relatively lower noise predictions now forecast, this requirement needs to be discussed and agreed with the local authority.
- Reducing working hours to avoid disruption when an alert is received.

9. Summary and Conclusions

Acoustic Consultants Limited have been appointed to undertake a comparison of the predicted impact of noise due to works to be undertaken at the Ffos-y-Fran land reclamation scheme in, Merthyr Tydfil, CF48 4AE.

The proposals at the site have previously been agreed upon and approved by the Local Authority via appeal (Ref: APP/U6925/A/10/2129921), from which the noise criterion was determined by another acoustic consultancy.

Information of the phased plans of works are provided in the main text above. Detailed information of plant and mobile plant that will be used, along with working durations across a 1-hour period, have been provided to us by the client.

Appropriate noise data for each plant item has been sourced via BS5228 and manufacturer's technical data.

Assessment of noise impact has been carried out at each NSR, during each phase of work and is provided in the report.

Predicted noise levels for the alternative restoration scheme are lower than those predicted for the original and approved restoration scheme.

There is one instance where the evening criterion is just met (but not exceeded), as fully detailed above. However, the need for evening working is likely to be reduced from the previous scheme due to a reduced requirement for bulk earthworks operations.

All other predictions indicate that the Condition 17 criteria is expected to be achieved and to be within the criteria and limits previously consented for substantial long term earthmoving operations

Whilst the bund is being built, using the equipment above, condition 18 is expected to be achieved.

Also, based on the above predictions, pump noise levels within the proposed indicative plan and areas of work are expected to be compliant with planning condition 22.

We would also recommend that the contractors adhere to the comments made in conditions 19-21.

Where activities are different to the location plan above, a reassessment will be required to be undertaken.

10. Appendix 1 – Glossary of Acoustic Terminology

A-weighted sound pressure p_A – value of overall sound pressure, measured in pascals (Pa), after the electrical signal derived from a microphone has been passed through an A-weighting network

A-weighted sound pressure level, L_{pA} - quantity of A-weighted sound pressure given by the following formula in decibels (dBA)

$$L_{pA} = 10 \log_{10} (p_A/p_0)^2$$

where:

p_A is the A-weighted sound pressure in pascals (Pa);
 p_0 is the reference sound pressure (20 μ Pa)

Background sound level, $L_{A90,T}$ – A-weighted sound pressure level that is exceeded by the residual sound assessment location for 90% of a given time interval, T, measured using weighting F and quoted to the nearest whole number of decibels

Break-in - noise transmission into a structure from outside.

Decibel (dB) – The decibel is the unit used to quantify sound pressure levels. The human ear has an approximately logarithmic response to acoustic pressure over a very large dynamic range (typically 20 micro-Pascals to 100 Pascals). Therefore, a logarithmic scale is used to describe sound pressure levels and also sound intensity and power levels. The logarithms are taken to base 10. Hence an increase of 10 dB in sound pressure level is equivalent to an increase by a factor of 10 in the sound pressure level (measured in Pascals). Subjectively, this increase would correspond to a doubling of the perceived loudness of sound.

Equivalent continuous A-weighted sound pressure level, $L_{Aeq,T}$ – value of the A-weighted sound pressure level in decibels of continuous steady sound that, within a specified time interval, $T = t_2 - t_1$, has the same mean-squared sound pressure as a sound that varies with time, and is given by the following equation:

$$L_{Aeq,T} = 10 \log_{10} \left\{ (1/T) \int_{t_1}^{t_2} [p_A(t)^2/p_0^2] dt \right\} \quad (1)$$

where:

p_0 is the reference sound pressure (20 μ Pa); and

$p_A(t)$ is the instantaneous A-weighted sound pressure (Pa) at time t

NOTE The equivalent continuous A-weighted sound pressure level is quoted to the nearest whole number of decibels.

Facade level – sound pressure level 1 m in front of the façade. Facade level measurements of L_{pA} are typically 1 dB to 3 dB higher than corresponding free-field measurements because of the reflection from the facade.

Free-field level – sound pressure level away from reflecting surfaces. Measurements made 1.2 m to 1.5 m above the ground and at least 3.5 m away from other reflecting surfaces are usually regarded as free-field. To minimize the effect of reflections the measuring position has to be at least 3.5 m to the side of the reflecting surface (i.e. not 3.5 m from the reflecting surface in the direction of the source).

Octave and Third Octave Bands – The human ear is sensitive to sound over a range of frequencies between approximately 20 Hz to 20 kHz and is generally more sensitive to medium and high frequencies than to low frequencies within the range. There are many methods of describing the frequency content of a noise. The most common methods split the frequency range into defined bands, in which the mid-frequency is used as the band descriptor and in the case of octave bands is double that of the band lower. For example, two adjacent octave bands are 250 Hz and 500 Hz. Third octave bands provide a fine resolution by dividing each octave band into three bands. For example, third octave bands would be 160 Hz, 250 Hz, 315 Hz for the same 250 Hz octave band.

Sound pressure level – Sound pressure level is stated on many of the charts. It is the amplitude of the acoustic pressure fluctuations in a sound wave, fundamentally measured in Pascals (Pa), typically from 20 micro-Pascals to 100 Pascals, but commonly simplified onto the decibel scale.

Sound reduction index, R – laboratory measure of the sound insulating properties of a material or building element in a stated frequency band.

Specific sound level, $L_s = L_{Aeq,T_r}$ – equivalent continuous A-weighted sound pressure level produced by the specific sound source at the assessment location over a given reference time interval, T_r .

Structure-borne noise – audible noise caused by the vibration of elements of a structure, the source of which is within a building or structure with common elements

Rating level, L_{A_r,T_r} – Specific sound level plus any adjustment for the characteristic features of the sound.

Reverberation Time, T – The reverberation time is defined as the time taken for a noise level in an enclosed space to decay by 60 dB from a steady level, once the noise source has stopped. It is measured in seconds. Often a 60 dB decay cannot be measured so the reverberation time is measured over a lesser range and corrected back to the time for a 60 dB drop assuming a constant decay rate. Common parameters are T20 (time taken for a 20 dB decay multiplied by three) and T30 (time taken for a 30 dB decay multiplied by two).

Vibration Dose Value, VDV – measure of the total vibration experienced over a specified period of time.

Estimated Vibration Dose Value, $eVDV$ – estimation of the total vibration experienced over a specified period of time. This is usually based on the number of events and shortened measurement data.

Weighted sound reduction index, R_w – Single-number quantity which characterizes the airborne sound insulating properties of a material or building element over a range of frequencies. The weighted sound reduction index is used to characterize the insulation of a material or product that has been measured in a laboratory (see BS EN ISO 717-1).



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