Drakelands Restoration

HEMERDON MINE

Noise Management Plan for Minerals Processing Facility

OCTOBER 2023

CONFIDENTIAL

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Noise Management Plan for Minerals Processing Facility

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WSP

4th Floor
6 Devonshire Square
London
EC2M 4YE

Phone: +44 20 7337 1700

WSP.com

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1 INTRODUCTION

1.1 INTRODUCTION

1.1.1. This Noise Management Plan (NMP) is for the Hemerdon Mine site operated by Drakelands Restoration Limited (DRL). The mine was formally operated by Wolf Minerals which is referenced in some sections of this NMP.

1.1.2. DRL was acquired by Tungsten West (TW) in 2019 and is the principal operating company at the Hemerdon mine. This NMP relates to the control of both Low Frequency Noise (LFN) and audible noise from the Hemerdon Mine Mineral Processing Facility (MPF).

1.1.3. The NMP has been written by WSP in conjunction with DRL with input from Shann Pitts Consulting (an environmental permitting consultancy) and Eatec Dynamics (acoustics engineers).

1.1.4. This ~~first~~ second version of the NMP has been written to support the environmental permit application to the Environment Agency (EA) (Permit application reference EPR/AP3203ML/A001) for the operation of the MPF. It is a working document which will be updated in line with any Environment Agency comments and changes as the site moves into the operational phase.

1.1.5. This second version of the document includes updates resulting from a Notice of request for more information (i.e. a Schedule 5 notice) – see Section 1.5 below. Changes to the text are highlighted in yellow for ease of reference and relate to:

- Active noise control; and
- A procedure for reducing operations to avoid serious noise pollution.

1.2 SITE DESCRIPTION

1.2.1. The Site consists of the Hemerdon Deposit located to the north-west of Plymouth in Devon and north of the villages of Hemerdon and Sparkwell.

1.2.2. The Site is located in a rural area and includes isolated residential and commercial uses within 500 metres of the site boundaries. The topography in the area is undulating with the site generally being at the highest elevation in comparison to the immediately surrounding areas.

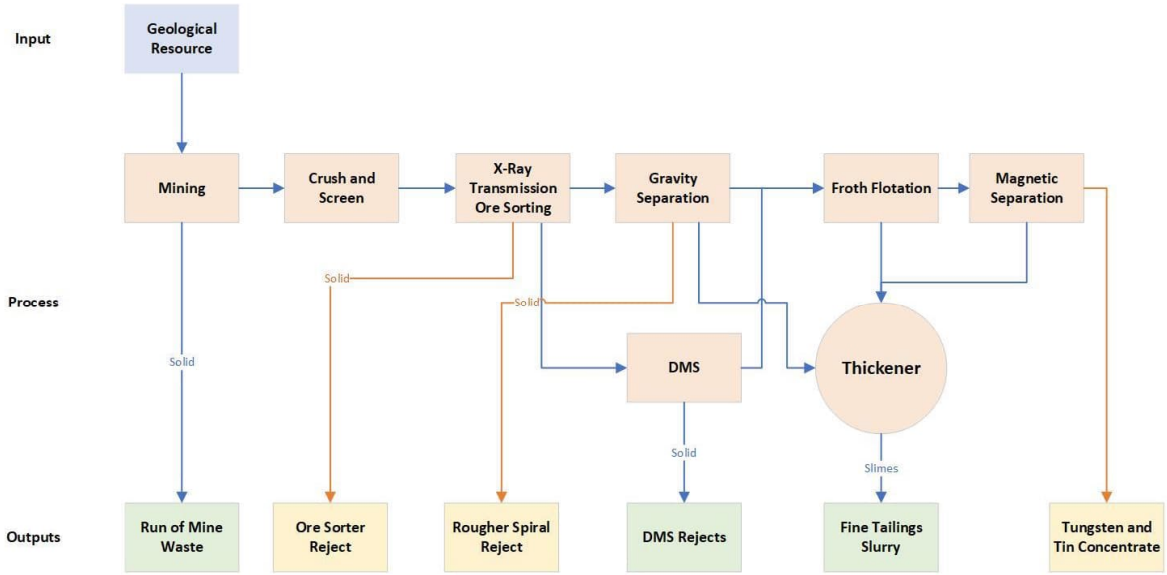
1.2.3. The plan in Figure 1-1 below shows a simplified layout of the processing plant area, including existing and new buildings/areas.

1.2.4. Under the previous operator, screening was concentrated within the Mineral Processing Facility primarily within Area 120 – Washing and Screening; and Area 140 – Dense Media Separation. As a result of the Project Trident work, and decommissioning of the old Area 110 – Primary and Secondary rolls, and replacement of this with a semi-mobile primary jaw and secondary cone crushing circuit, provisions and locations for mineral sizing screening have changed.

1.2.5. The primary change in screening infrastructure has occurred through the decommissioning of Area 120 within the Mineral Processing Facility and introduction of X-ray transmission (XRT) ore-sorting. Screening for the preparation of ore-sorting and tertiary crushing requires the addition of eight new screens, seven of which will be located in new buildings within Areas 125 – Ore Sorting and Area 130 – Tertiary Crushing. The introduction of these new screens will be at the expense of the two previously operated screens in Area 120 – The Scrubber and Product Screens.

1.2.6. As a result of the reduced throughputs from the introduction of XRT ore sorting, four screens in Area 140 will not be required for the startup of operations, and all other screens will see reduced throughput rates from previous operations. The outcome of the above has resulted in a total screening area of 120.2 m^2 compared to 172.08 m^2 under the previous operator.

Figure 1-1 - Simplified Process Flow



1.2.7. The main activities to be undertaken at the MPF comprise:

- Primary, secondary and tertiary crushing and screening of mineral ore; and
- Processing of mineral ore to produce non-ferrous mineral concentrates.

1.2.8. The MPF will comprise a 20 unit operation. This includes seven unchanged unit operations from the previous development under Wolf Minerals, eight unchanged unit operations but with reduced duty and five new unit operations. A summary of the revised operations is provided below.

Primary and Secondary Crushing

1.2.9. The existing primary and secondary hybrid roll crushers will not be capable of crushing hard Hemerdon ore and will be replaced with a new mobile jaw crusher, complete with a pre-screen and a secondary cone crusher in closed circuit with a screen. Cone crushers are not a significant source of low frequency noise.

1.2.10. The primary jaw crusher will be mounted on a wheeled frame and include a screen to filter out ore that is the correct size for secondary crushing. This screen is a static (non vibratory) screen and is not a source of LFN. The oversized ore will be crushed through Metso Outotec's Nordberg C130 jaw crusher located in Area 115. The secondary cone crusher shall be a Metso Outotec's Nordberg GP300s, also in Area 115.

Ore Sorting

1.2.11. The ore sorting infrastructure will be installed to the northeast of the existing Area 130 building in the new Area 125.

1.2.12. The ore sorter sizing screen will be fed via conveyor and consist of a double deck screen inside a standalone cladded building. The screen will be conducted wet, with pebble and cobble being conveyed to two separate storage hoppers. Ore of less than 10 mm will be pumped to the tertiary crusher dewatering screen.

1.2.13. From each hopper two conveyors will draw material to a dewatering screen ahead of the four ore sorters. A sump pump will pump the underflow from the dewatering screens back to the tertiary dewatering screen.

Tertiary Crushing

1.2.14. The tertiary dewatering screen will be housed in a cladded building on the north-eastern side of the tertiary crusher building in Area 130A.

1.2.15. Material larger than 8 mm will be conveyed using the existing 130-CV-05 screen to the tertiary sizing screen. On this screen material less than 8 mm will be removed and a short shuttle conveyor will place it on to the existing extended 140-CV-06 screen. It will be conveyed via 140-CV-07 to the DMS feed bin (140-BN-01). The screen oversize will be conveyed by the existing 130-CV-04 to the pre-existing tertiary crushers (2 x Sandvik CH 440) in a close circuit configuration.

1.3 MAINTENANCE AND REVIEW OF THE NOISE MANAGEMENT PLAN

MAINTENANCE OF NMP

1.3.1. The NMP forms part of the Environmental Management System for the wider site which is accredited under ISO14001. It is a working document which will be reviewed every 2 years at a minimum, or sooner, in light of any operational changes or substantiated complaints.

1.3.2. The Environment Agency will be provided with a current version of the NMP and, for any external parties, it will be made available on request.

RESPONSIBILITIES AND TRAINING

1.3.3. The implementation of the NMP is the responsibility of the Process Plant Manager who, under the Quarry Regulations (8.1c), is the nominated responsible person for this area. In the absence of the Process Plant Manager, responsibility will be delegated to the Deputy Process Plant Manager (8.1.d under the Quarry Regulations).

1.3.4. The NMP will be stored on the DRL shared drive and communicated to all staff and contractors involved in maintenance and operations.

1.3.5. The training will be in the form of toolbox talks for process plant operatives and included in the new starter process for operational staff. Operational staff will repeat the training once a year. Toolbox talks will also be extended to contractors involved in maintenance and operations (including the Mining Services Contractor who undertakes the load and haul operation).

1.3.6. The training will be delivered internally by DRL and, initially, by the Environment, Social and Governance (ESG) department. The medium to long term vision is for the Process Supervisors to deliver the training to their teams.

1.3.7. The complaints procedure is detailed in Section 5, including those responsible for maintaining a log of the complaints and investigations.

1.3.8. The responsibilities associated with monitoring noise levels is detailed in Section 4.3.

1.4 RELEVANT SECTOR GUIDANCE ON WHICH THIS NOISE MANAGEMENT PLAN IS BASED

1.4.1. The relevant guidance upon which this NMP is based is listed below. A summary of the documents is provided in Appendix A.

LEGISLATIVE FRAMEWORK

1.4.2. The following legislation is relevant to this NMP:

- The Control of Pollution Act (1974)[1]
- Environmental Protection Act (1990)[2]
- The Environmental Permitting (England and Wales) Regulations (2016)[3]

POLICY

1.4.3. The following national policy is considered relevant to this NMP:

- National Planning Policy Framework (NPPF) (2021)[4]
- Noise Policy Statement for England (NPSE) (2010)[5]

GUIDANCE

1.4.4. The following national guidance is of relevance to this NMP:

- Guidance – Minerals (2014)[6]
- Planning Practice Guidance – Noise (PPG-N) (2019)[7]
- Noise and Vibration Management: Environmental permits (2022)[8]
- Guidelines for Environmental Noise Impact Assessment (2014)[9]

TECHNICAL STANDARDS

1.4.5. There are various relevant technical standards relevant to this NMP, as follows:

- Acoustics – Description, measurement and assessment of environmental noise (ISO 1996-2:2017)[10]
- Acoustics – Attenuation of sound during propagation outdoors - Part 2: General method of calculation (ISO 9613 :1996)[11]

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[1] UK Government (1974) Control of Pollution Act 1974. Available at: Control of Pollution Act 1974 (legislation.gov.uk)

[2] UK Government (1990. Environmental Protection Act 1990. Available at: Environmental Protection Act 1990 (legislation.gov.uk)

[3] https://www.legislation.gov.uk/uksi/2016/1154/contents/made

[4] UK Government (2012). Available at: National Planning Policy Framework - GOV.UK (www.gov.uk)

[5] Department for Environment, Food and Rural Affairs (DERA) (2010). Noise Policy Statement for England (NPSE), 2010 Available at: Noise policy statement for England - GOV.UK (www.gov.uk)

[6] UK Government (2014). Guidance – Minerals. Available at: Minerals - GOV.UK (www.gov.uk)

[7] UK Government (2014) – Guidance – Noise. Available at: Noise - GOV.UK (www.gov.uk)

[8] Environment Agency (EA) (2022). Noise and vibration management: environmental permits Available at: https://www.gov.uk/government/publications/noise-and-vibration-management-environmental-permits/noise-and-vibration-management-environmental-permits

[9] Institute of Environmental Management & Assessment (2014). Guidelines for Environmental Noise Impact Assessment.

[10] International Organization for Standardization (2017). Description, Measurement and Assessment of Environmental Noise (ISO 1996-2:2017)

[11] International Organization for Standardization (1996). Acoustics - Attenuation of sound during propagation outdoors - Part 2: General method of calculation (ISO 9613:1996)

- Guidance on sound insulation and noise reduction for buildings (BS 8233:2014)[12]
- Description and measurement of environmental noise – Part 1: Guide to quantities and procedures (BS 7445: 2003)[13]
- Methods for rating and assessing industrial and commercial sound (BS 4142: 2014+A1:2019)[14]

1.5 SCHEDULE 5 NOTICE

1.5.1. There are ~~two~~ three Notice of request for more information or 'Schedule 5 notices' issued by the EA, as below, which relate to the application number EPR/AP3203ML/A001 and these have also informed this NMP. The Schedule 5 notices are provided in Appendix B.

- Schedule 5, Environment Agency, 3 February 2023.[15]
- Schedule 5, Environment Agency, 1 March 2023.[16]
- Schedule 5, Environment Agency, 5 October 2023[17]

[12] The British Standards Institution (2014). Guidance on Sound Insulation and Noise Reduction for Buildings (BS 8233:2014)

[13] The British Standards Institution (2003). Description and Measurement of Environmental Noise – Part 1: Guide to quantities and procedures (BS 7445: 2003)

[14] The British Standards Institution (2019). Methods for rating and assessing industrial and commercial sound (BS 4142:2014+A1: 2019)

[15] Environment Agency (03/02/2023). Notice of request for more information. The Environmental Permitting (England & Wales) Regulations 2016

[16] Environment Agency (01/03/2023). Notice of request for more information. The Environmental Permitting (England & Wales) Regulations 2016

[17] Environment Agency (05/10/2023). Notice of request for more information. The Environmental Permitting (England & Wales) Regulations 2016

2 RECEPTORS

2.1 RECEPTOR LIST

2.1.1. Eighteen noise sensitive receptors have been identified which are considered to represent those closest to, or most exposed to, operations on the site. The receptor locations are described in Table 2-1 below and shown in Figure 2-1. These are the same receptors as those used in the two Noise Impact Assessments (NIA) submitted with the application[18].

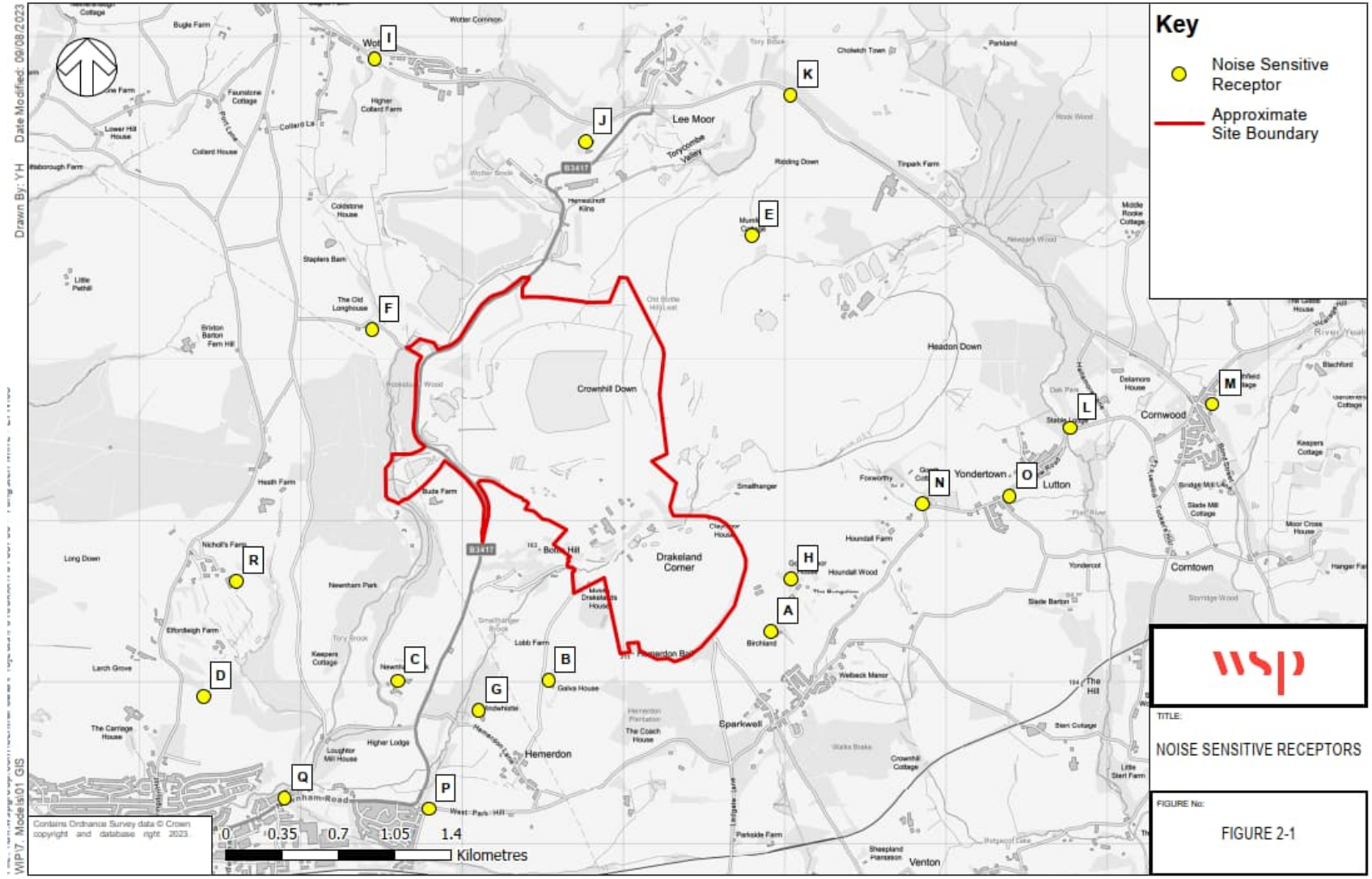
Table 2-1 – Nearest Noise Sensitive Receptors

Receptor Reference	Land Use	Compass Direction from the Site	Approximate Distance to Closest Site Boundary (m)	Approximate Distance to the Mineral Processing Facility (m)
A: Birchland Farm	Residential	South-east	300	1,100
B: Galva House	Residential	South-west	480	950
C: Newnham House	Residential	South-west	1,000	1,475
D: Boringdon Hall	Hotel and spa	South-west	760	3,000
E: Mumford Cottage	Residential	North-east	820	2,000
F: Portworthy Farmhouse	Residential	North-west	200	1,900
G: Windwhistle Farm	Residential property and hotel	South-west	950	1,400
H: Dartmoor Zoo	Zoo	South-east	320	1,250
I: Wotter	Residential	North-west	1,640	3,245
J: Broadoaks Cottages	Residential	North	990	2,390
K: East of Lee Moor	Public land	North-east	1,520	2,900
L: Lutton	Residential	East	2,120	2,930
M:Cornwood Inn	Pub and restaurant	East	3,050	3,820
N: Gorah Cottages	Residential	East	1,150	1,950

[18] Two NIAs have been submitted; one for low frequency noise (LFN) and one for audible noise. The LFN assessment is presented in WSP report *Low Frequency Noise Impact Assessment*, dated August 2023. The audible assessment is presented in SLR report *Noise Impact Assessment*, dated November 2022.

O: Yondertown	Residential	East	1,680	2,490
P: Road Junction	Public land	South-west	1,530	2,070
Q: Colebrook	Public land	South-west	1,150	2,480
R: Elfordleigh Hotel	Hotel	West	1,070	2,340

Figure 2-1 - Site Location and Noise Sensitive Receptors



2.2 OFF-SITE MONITORING LOCATIONS

2.2.1. Off-site noise monitoring will be undertaken at eight locations. The purpose of the noise monitoring is to confirm that noise emission levels comply with any consented noise limits. The off-site noise monitoring locations are shown below.

Table 2-2 – Off-site monitoring locations

Monitoring Location	Description of Existing Noise Climate
A: Birchland Farm*	Faint distant road traffic noise and natural sounds such as wind in trees and birdsong.
B: Galva House*	Distant road traffic noise and natural sounds such as cattle and birdsong.
C: Newnham House*	Distant road traffic noise and natural sounds such as wind in trees and birdsong.
D: Boringdon Hall*	Distant road traffic noise and natural sounds such as wind in trees and birdsong.
E: Mumford Cottage*	Noise from Sibelco Site at Headon Works. Natural sounds such as wind in trees, livestock and birdsong.
F: Portworthy Farmhouse	Faint distant road traffic noise and natural sounds such as wind in trees and birdsong.
G: Windwhistle Farm	Faint distant road traffic noise and natural sounds such as wind in trees and birdsong.
H: Dartmoor Zoo	Some noise from the zoo is audible at the location
*Note: as per the description provided in the SLR Noise Impact Assessment for Receptors A to E	

Key

- Off-site Monitoring Location
- Approximate Site Boundary

Mumford Cottage
Portworthy Farmhouse
Dartmoor Zoo
Birchland Farm
Newnham Park
Galva House
Windwhistle Farm
Boringdon Hall

Collard House
Coldstone House
Staplers Barn
Little Pethill
Brixton Barton
Fern Hill
Wotter Brook
B3417
Herreschoff Kilns
Torycombe Valley
Ridding Down
Tinpark Farm
Old Bottle Hill/Leat
Crownhill Down
Hooksbury Wood
Heath Farm
Bude Farm
Smallhanger
Foxworthy
Gorah Cottages
Yondertown
New Road
Lutton
Stable Lodge
Oak Park
Piall River
Claymoor House
Houndall Farm
Yondercot
Slade Barton
Drakeland Corner
Middle Drakelands House
The Bungalow
Goodamoor
Nicholl's Farm
Long Down
Newnham Park
Elfordleigh Farm
Tory Brook
Smallhanger Brook
Lobb Farm
Keepers Cottage
Larch Grove
Botha Hill
Hemerdon Ball
Welbeck Manor
Walks Brake
Crownhill Cottage
Sparkwell
Hemerdon Plantation
The Coach House
Hemerdon
Higher Lodge
Loughtor Mill House
The Carriage House
Ledgate Lane
West Park Hill

0 0.3 0.6 0.9 1.2 Kilometres

TITLE:
OFF-SITE MONITORING LOCATIONS

FIGURE No:
FIGURE 2-2

Drawn By: YH
Date Modified: 14/08/2023
File: \\uk.wspgroup.com\central data\Projects\70108xxx\70108756 - Tungsten Mine - LFN\03 WIP\7. Models\01 GIS

3 NOISE SOURCES AND PROCESSES

3.1 NOISE IMPACT ASSESSMENT CONCLUSIONS

3.1.1. The conclusions of two noise impact assessments are considered; the audible noise assessment and the LFN noise assessment (both submitted with the application).

AUDIBLE NOISE ASSESSMNENT

3.1.2. The audible noise impact assessment concludes the following:

- The modelled noise levels, when compared to the background noise level (defined via noise monitoring) show that there will be rating levels during the daytime of between -9 to +5 dB and during the night-time from -10 to +6 dB depending on the receptor location. The higher rating levels are experienced at Birchland Farm and Galva House, as expected as these are the closest receptors to the site which have been used in the audible noise assessment.
- When the context of the predicted audible noise is considered (including the previous and existing industrial/commercial operations in the area, the low absolute noise levels and the low change in noise levels resulting from the MPF), the assessment concludes that the noise levels from the MPF are unlikely to have an effect or be noticeable at the receptors.
- The audible noise levels from MPF are expected to result in a betterment when compared to the noise historically generated by the Wolf Minerals operation.
- Considering the above, the assessment concludes that noise levels from the mine are likely to result in a “low impact” in accordance with British Standard 4142.

LFN ASSESSMENT

3.1.3. The LFN assessment concludes the following:

- In order to reduce assumptions and uncertainty arising from LFN modelling, LFN trials were conducted using an acoustic enclosure around a screen with and without cladding. The results of the trial show a proven (and conservative) reduction of 11 dB at the fundamental frequency of the MPF screen when utilising acoustic enclosures (without cladding) around the screens. The reduction resulting from deck venting is an additional 6 dB. The use of acoustic enclosures and deck venting have been identified as inherent mitigation in the LFN prediction.
- Considering the reduction from the acoustic enclosures, the deck venting and the new screens, a reduction in noise level at the fundamental frequency of the screens of approximately 17 dB is predicted.
- When the noise levels from the 12 operational screens (including inherent mitigation) are analysed at the receptors, they are not visible amongst the background LFN.
- Of the screens producing LFN, the most dominant at the receptors are 140-SN-12, 110-SN-01, 120-SN-11, 130-SN-13 and 140-SN-01 (see Table 3-1 for description of these screens).
- The assessment has concluded that the reduction achieved in comparison to the Wolf Minerals’ operation and the predicted absolute LFN being low results in an acceptable outcome.

3.2 NOISE SOURCES

3.2.1. A complete inventory of noise generating sources identified in the audible noise impact assessment and the LFN impact assessment are provided in Table 3-1 below. The grey cells identify where plant has not been considered in the LFN assessment. All sources were considered in the audible noise assessment, although where there are grey cells identified in the “Audible Noise Assessment” column, these sources are included within a building which is identified in the table with a noise emission assigned to the building (including all noise generating plant within it).

3.2.2. Where available, the information provided includes a descriptor of the source emissions from each plant item and a description of the source location.

Table 3-1 – Description of Audible Noise and LFN Emitting Sources

Noise Source ID	Noise Source	Audible Noise Assessment	LFN Level at Fundamental Frequency			Operating Condition	Comments including location
		Sound Power Level, dB L_{wA}	Sound Pressure Level, dBZ	Fundamental Frequency, Hz	Screen RPM		
Fixed Plant							
FP1	Dense Media Separation (DMS) feed prep screen		122.8	16	936.12	Operational 24/7	Area 140 (DMS) (140-SN-01) Existing processing plant building
FP2	Secondary DMS screen		115.4	16	990.96	Operational 24/7	Area 150 (DMS) (140-SN-06) Existing processing plant building
FP3	Scavenger DMS screen		115.4	16	990.96	Operational 24/7	Area 150 (DMS) (140-SN-07) Existing processing plant building
FP4	Primary mill sizing screen		120.2	16	948.54	Operational 24/7	Area 150 (Primary Milling) (150-SN-01) Existing processing plant building

FP5	Secondary Crushing Scalping Screen*		131.3	12.5	740	Operational from 07:00 to 22:00 hours	Area 115 Primary / Secondary Crushing (110-SN-01) 115-SN-02 External (new)
FP6	Ore Sorter Sizing Screen		129.1	12.5	738	Operational 24/7	Area 125A (125-SN-11) New Ore Sorting Sizing Screen Building
FP7	Pebble Ore Sorter 1 Dewatering Screen		116	12.5	960	Operational 24/7	Area 125B (125-SN-01) New Ore Sorting Building
FP8	Pebble Ore Sorter 2 Dewatering Screen		116	12.5	960	Operational 24/7	Area 125B (125-SN-02) New Ore Sorting Building
FP9	Cobble Ore Sorter 1 Dewatering Screen		116	12.5	960	Operational 24/7	Area 125B (125-SN-03) New Ore Sorting Building
FP10	Cobble Ore Sorter 2 Dewatering Screen		116	12.5	960	Operational 24/7	Area 125B (125-SN-04) New Ore Sorting Building
FP11	Tertiary Crusher Sizing Screen		131.3	12.5	740	Operational 24/7	Area 130B (130-SN-12) New Tertiary sizing Screen Building
FP12	Tertiary Crusher Dewatering Screen		126.3	12.5	740	Operational 24/7	Area 130A (130-SN-13) New Tertiary Dewatering Screen Building

FP13	Primary Crusher	119	114	3.7	N/A	Operational from 07:00 to 22:00 hours	Area 115 (115-CV-15) External (new Area and plant)
FP14	Primary Crusher module transfer conveyor	92.8				Operational from 07:00 to 22:00 hours	Area 115 (115-CV-16) External (new)
FP15	Secondary crusher module feed conveyor	93.8				Operational from 07:00 to 22:00 hours	Area 115 (115-CV-17) External (new)
FP16	Secondary crusher discharge conveyor	92.7				Operational from 07:00 to 22:00 hours	Area 115 (115-CV-18) External (new)
FP17	Secondary Crusher	118				Operational from 07:00 to 22:00 hours	Area 115 (115-CR-02) External (new)
FP18	Secondary Crusher product stockpile feed	98.8				Operational from 07:00 to 22:00 hours	Area 115 (115-CV-19) External (new)
FP19	Secondary Crusher product stockpile feed	93				Operational from 07:00 to 22:00 hours	Area 115 (115-CV-20) External (new)
FP20	Secondary crusher product stockpile reclaim	66				Operational 24/7	Area 115 (115-FE-01) External (Reclaim tunnel)
FP21	Secondary crusher product stockpile reclaim	66				Operational 24/7	Area 115 (115-FE-02) External (Reclaim tunnel)

FP22	Ore Sorter Sizing Feed Conveyor Magnet	88		Operational 24/7	Area 115 (115-MG-02) External (existing)
FP23	Ore Sorter Sizing Screen Feed Conveyor	96.9		Operational 24/7	Area 125 (125-CV-21) External (existing)
FP24	Cobble Transfer conveyor motor	71		Operational 24/7	Area 125A (125-CV-22) New Ore Sorting Building
FP25	Cobble Transfer conveyor	90.1		Operational 24/7	Area 125 (125-CV-22) External (existing)
FP26	Pebble Transfer conveyor motor	71		Operational 24/7	Area 125A (125-CV-23) New Ore Sorting Building
FP27	Pebble Transfer conveyor	90		Operational 24/7	Area 125 (125-CV-23) External (existing)
FP28	Ore Sorter Sizing Screen U/S transfer pump	78		Operational 24/7	Area 125A (125-PP-01) New Ore Sorting Sizing Screen Building
FP29	Pebble Ore Sorter 1 Feeder	66		Operational 24/7	Area 125 (125-FE-01) External (new)
FP30	Pebble Ore Sorter 2 Feeder	66		Operational 24/7	Area 125 (125-FE-02) External (new)

FP31	Cobble Ore Sorter 1 Feeder	66		Operational 24/7	Area 125 (125-FE-03) External (new)
FP32	Cobble Ore Sorter 2 Feeder	66		Operational 24/7	Area 125 (125-FE-04) External (new)
FP33	Pebble Ore Sorter 1 Feed Conveyor motor	71		Operational 24/7	Area 125B (125-CV-24) New Ore Sorting Building
FP34	Pebble Ore Sorter 1 Feed Conveyor	94.6		Operational 24/7	Area 125 (125-CV-24) External (new)
FP35	Pebble Ore Sorter 2 Feed Conveyor motor	71		Operational 24/7	Area 125B (125-CV-25) New Ore Sorting Building
FP36	Pebble Ore Sorter 2 Feed Conveyor	95.1		Operational 24/7	Area 125 (125-CV-25) External (new)
FP37	Cobble Ore Sorter 1 Feed Conveyor motor	71		Operational 24/7	Area 125B (125-CV-26) New Ore Sorting Building
FP38	Cobble Ore Sorter 1 Feed Conveyor	95.1		Operational 24/7	Area 125 (125-CV-26) External (new)
FP39	Cobble Ore Sorter 2 Feed Conveyor motor	71		Operational 24/7	Area 125B (125-CV-27) New Ore Sorting Building

FP40	Cobble Ore Sorter 2 Feed Conveyor	94.6		Operational 24/7	Area 125 (125-CV-27) External (new)
FP41	Pebble Ore Sorter 1 dewatering screen	93		Operational 24/7	Area 125B (125-SN-01) New Ore Sorting Building
FP42	Pebble Ore Sorter 2 dewatering screen	93		Operational 24/7	Area 125B (125-SN-02) New Ore Sorting Building
FP43	Cobble Ore Sorter 1 dewatering screen	93		Operational 24/7	Area 125B (125-SN-03) New Ore Sorting Building
FP44	Cobble Ore Sorter 2 dewatering screen	93		Operational 24/7	Area 125B (125-SN-04) New Ore Sorting Building
FP45	Pebble Ore Sorter 1	106		Operational 24/7	Area 125B (125-OS-01) New Ore Sorting Building
FP46	Pebble Ore Sorter 2 Ore Sorter building	106		Operational 24/7	Area 125B (125-OS-02) New Ore Sorting Building
FP47	Cobble Ore Sorter 1	106		Operational 24/7	Area 125B (125-OS-03) New Ore Sorting Building
FP48	Cobble Ore Sorter 2 Ore	106		Operational 24/7	Area 125B (125-OS-04) New Ore Sorting Building

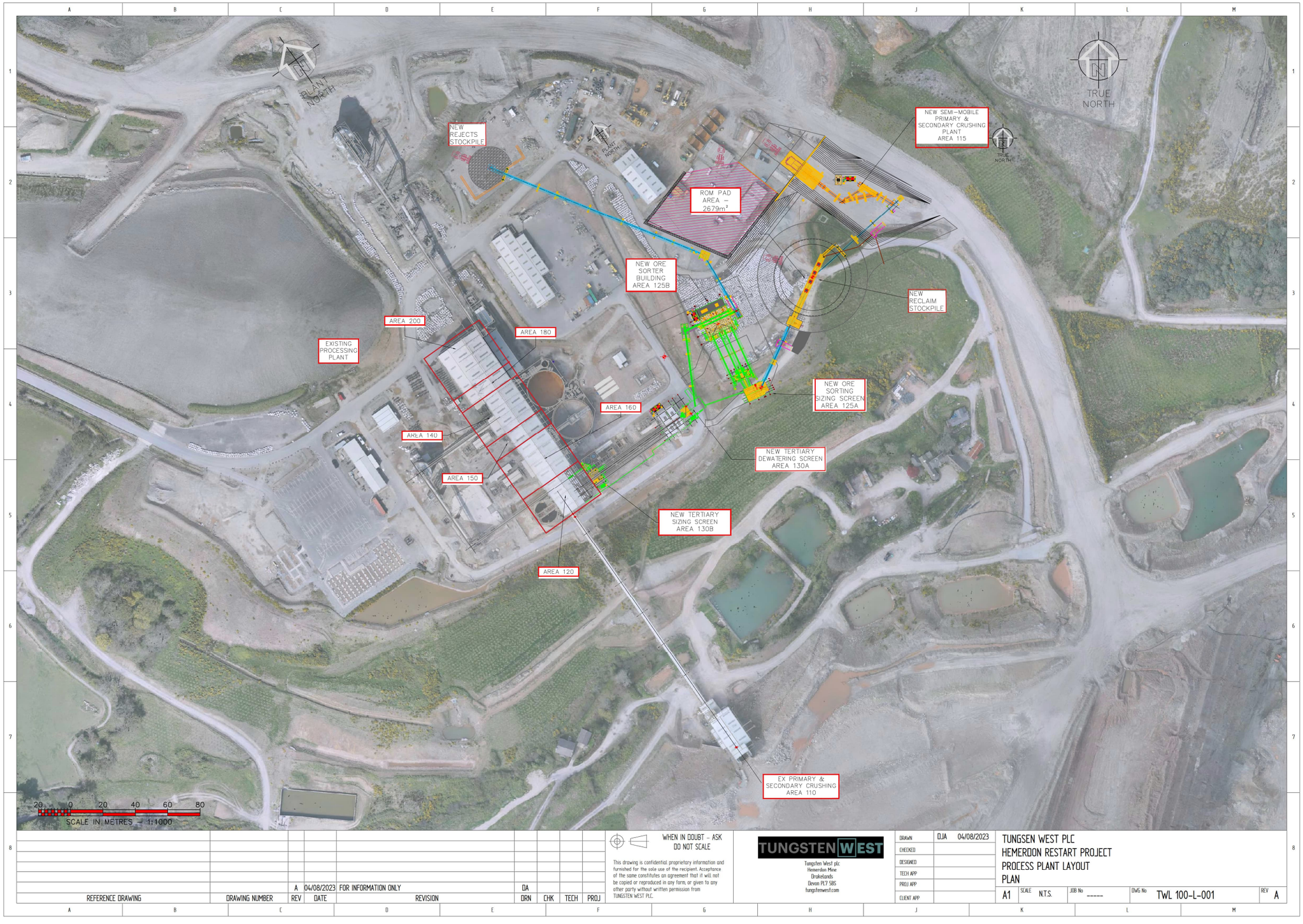
FP49	Pebble Ore Sorter Dewatering screen sump	70		Operational 24/7	Area 125B (125-PP-04) New Ore Sorting Building
FP50	Cobble Ore Sorter Dewatering screen sump	70		Operational 24/7	Area 125B (125-PP-03) New Ore Sorting Building
FP51	Ore Sorter Reject Conveyor motor	71		Operational 24/7	Area 125 (125-CV-28) External (new)
FP52	Ore Sorter Reject Conveyor	98		Operational 24/7	Area 125B (125-CV-28) New Ore Sorting Building
FP53	Ore Sorter Product Conveyor 1 motor	71		Operational 24/7	Area 125 (125-CV-29) External (new)
FP54	Ore Sorter Product Conveyor 1	90.9		Operational 24/7	Area 125B (125-CV-29) New Ore Sorting Building
FP55	Ore Sorter Product Conveyor 2	96.6		Operational 24/7	Area 125 (130-CV-30) External (new)
FP56	Ore Sorter Air Compressor 1	83		Operational 24/7	Area 125B (125-AC-01) New Ore Sorting Building
FP57	Ore Sorter Air dryers	80		Operational 24/7	Area 125B (125-AD-01) New Ore Sorting Building

FP58	Tertiary Crusher Sizing Screen	93		Operational 24/7	Area 130 (130-SN-12) New Tertiary Sizing Screen Building
FP59	Tertiary Crusher	108		Operational 24/7	Area 130 (130-CR-03) Existing crusher building
FP60	Tertiary Crusher Feeder	98		Operational 24/7	Area 130 (130-FE-01) Tertiary Crushing Building (new)
FP61	Tertiary crusher surge bin	93		Operational 24/7	Area 130 (130-BN-02) Tertiary Crushing Building (new)
FP62	Tertiary Crusher sizing screen U/S transfer	97.5		Operational 24/7	Area 130A (130-PP-02) New Tertiary Dewatering Screen Building
FP63	Tertiary Crusher Feed Conveyor	97.8		Operational 24/7	Area 130 (130-CV-04) External (new)
FP64	Tertiary Crusher dewatering screen	93		Operational 24/7	Area 130A (130-SN-13) New Tertiary Dewatering Screen Building
FP65	Tertiary crusher dewatering screen transfer	81		Operational 24/7	Area 130A (130-PP-02) New Tertiary Dewatering Screen Building

FP66	DMS Bin Feed Conveyor 1	97.5				Operational 24/7	Area 140 (external) (140-CV-06) – existing
FP67	DMS Bin Feed Conveyor 2	97				Operational 24/7	Area 140 (external) (140-CV-07) – existing
FP68	DMS Feed Conveyor	96.6				Operational 24/7	Area 140 (external) (140-CV-08) – existing
Mobile Plant – Directly Associated with Feed of the Plant							
MP1	CAT 745 articulated dump truck	107	-	-	Moving point source	07:00 to 19:00	Direct tip into jaw crusher
MP2	CAT 988 loading shovel	112	-	-	Moving point source	19:00 to 22:00	Operating on ROM pad between the cessation of direct tipping (19:00) and cessation of jaw crusher operation (22:00)

* FP5 Secondary Crushing Scalping Screen is part of the same unit as FP17 Secondary Crusher. The sound power level provided for the audible noise assessment for FP5 is for the one unit which includes both FP5 and FP17.

Figure 3-1 - Site Layout



3.3 OVERVIEW OF NOISE PROCESSES AND EMISSIONS

3.3.1. Figure 3-1 has been provided by DRL and shows a simplified site layout for the main processing plant area. The plan is conceptual as many of the buildings for the new plant are yet to be constructed.

3.3.2. The main processes undertaken and activity areas associated with the MPF are described in the below section, with reference to Figure 3-1. The operating hours stated are in accordance with sites operational noise limits as outlined within the planning permission(s).

3.3.3. The plant identified in Table 3-1 have been noted for each of the main process descriptions below using the “Noise Source ID”.

RUN OF MINE (ROM) PAD

3.3.4. A new RoM pad will be located to the north of the tertiary crusher building with access to the RoM pad from the north off the haul road.

3.3.5. The RoM pad will operate via direct tip from articulated dump trucks between 07:00 and 19:00 hours from Monday to Saturday and via a front end loader between 19:00 and 22:00 hours Monday to Saturday and 07:00 to 22:00 hours on Sundays.

3.3.6. A single wheeled loader will operate on the RoM Pad transferring ore from the stockpiles to the feed hopper of the primary crusher between 19:00 and 22:00 Monday to Saturday and 07:00 to 22:00 on Sunday.

PRIMARY AND SECONDARY CRUSHING (FP5, FP13, FP17)

3.3.7. The primary and secondary crushing plant will be located to the northeast of the MPF, parallel to the haul road and is to be known as Area 115. This activity will operate between 07:00 and 22:00 hours, seven days a week. Once material has been loaded into the primary jaw crusher, all transfer of material is undertaken via conveyor.

3.3.8. The crushing activities from the primary and secondary crusher are the loudest audible noise sources on the mineral processing site.

STOCKPILE

3.3.9. The new reclaim stockpile is to be located between the new Area 115 and the ore sorting area, to the north, northeast of the tertiary crusher building.

3.3.10. There is a new rejects stockpile which is located to the north-west of the RoM Pad area.

ORE SORTING

3.3.11. The ore sorting infrastructure will be installed within Area 125. The ore sorter sizing screen will be fed via conveyor (FP23) and consist of a double deck screen (FP6) inside a standalone cladded building. This activity will operate 24 hours a day, seven days a week.

TERTIARY CRUSHING

3.3.12. The tertiary dewatering screen (FP64) will be housed in its own cladded building on the north-eastern side of the tertiary crusher building (Area 130). This activity will operate 24 hours a day, seven days a week.

The tertiary crushing activity located in Area 130B will produce high levels of LFN emissions. This is relation to the screening operation (FP58) and not the crusher itself (FP59); the crusher does not produce LFN.

DENSE MEDIA SEPARATION (DMS)

3.3.13. The dense media separation circuit will operate within Area 140 and Area 150 and will operate 24 hours a day, seven days a week. The DMS activity is noted to produce high levels of LFN emissions.

3.3.14. Plant items FP1 to FP3 (see table 3-1 above) operate in this area.

4 CONTROL MEASURES AND PROCESS MONITORING

4.1 APPROPRIATE MEASURES / BEST AVAILABLE TECHNIQUES (BAT)

4.1.1. The following details the actions and procedures to achieve appropriate measures / BAT. The mitigation measures and actions identified for the site are summarised in Table 4-1 overleaf.

4.1.2. If, following the deployment of all appropriate measures, there is still preventable, or significant adverse, noise impact which has been substantiated, then the Operator will consider reducing, altering or stopping noisy activities until circumstances have changed or other appropriate measures are in place.

Table 4-1 – Actions and procedures to Achieve Appropriate Measures/BAT

Noise Producing Activity	Operational Hours/Days	Control Measures (Appropriate Measure/BAT)	For Audible and/or LFN	Contribution to Overall Impact	Action Taken if Outside Optimum Process Parameters
DMS: Feed Control, Control Loops and Critical Control Parameters	24 hours per day	Equipment within the area to be operated under controlled and steady state conditions. Supervisory Control and Data Acquisitioning (SCADA) is programmed to perform certain control decisions based on data collected – control functions could include turning power on/off, adjusting temperature, decreasing, or increasing speed, and regulating a variety of processes.	Audible and LFN	High	Review of SCADA process to ensure that control decisions result in noise emissions within the optimum process parameters. If control measure found to be the cause of increased noise emissions, the fault and potential remedy of the fault, a timeline for completion and potential impacts of the fault to be reported to the EA
Primary and Secondary Crushing	07:00 – 22:00	Relocation of primary and secondary crusher to the north-east of the MPF, parallel to the haul road (Area 115) which is further from receptors than the previous crushing in Area 110. “Low noise” crusher to be used. Daily visual inspection, yearly full mechanical inspections, trained staff using equipment. Regular toolbox sessions on standard procedures. Regular site walks by site managers checking on procedures.	Audible	High	Crushing plant to be inspected additional to the daily checks to identify any potential faults causing increased noise emissions. Noise barrier installed to be inspected to ensure it is functioning as expected.

		Noise attenuating barrier to be installed on the southern and western boundaries of the crusher area			
Processing within buildings	24 hours per day	Enhanced cladding to new buildings, as listed below, to reduce noise breakout. <u>Kingspan 8W KS1000 RW/40+I+L:</u> ▪ New Ore Sorting Sizing Screen Building (Area 125A). Fitted down to floor. Pedestrian / forklift access at base. Reduced conveyor openings. ▪ New Ore Sorting building (Area 125B). Suspended flooring and cladding down to this flooring. Building open underneath. Pedestrian doors. Reduced conveyor openings. ▪ New Tertiary sizing Screen Building (Area 130B). Suspended flooring and cladding down to this flooring. Building open underneath for conveyors. Pedestrian doors. Reduced conveyor openings. ▪ Tertiary dewatering screen building (Area 130A). Suspended flooring and cladding down to this flooring. Building open underneath for vehicle access. Pedestrian doors. Reduced conveyor openings. <u>Existing process plant cladding. 24g 0.63-gauge steel</u> ▪ Tertiary Crushing Building (Area 130) and Main Process Plant Building (various areas). Down to floor.	Audible and LFN	High	If a fault is identified that is anticipated to cause an increase in noise emissions, the fault is to be reported to the EA along with an estimate of the impact at sensitive receptors and timeline for remedying the issue.

		Roller shutter door and pedestrian doors. Reduced conveyor openings. Building cladding to be routinely inspected in accordance with manufacturer's recommendations to ensure no fault or damage is present.			
Processing building shutter doors	24 hours per day	Following the DRL Standard Operating Procedure *Mobile Plant Entering & Exiting MPF* to reduce noise breakout from roller shutter doors when closed (see Appendix C).	Audible	High	Shutter doors to be routinely inspected to ensure no fault or damage is present. Any faults identified, reported to the EA along with an estimate of the impact at sensitive receptors and timeline for remedying the issue.
Process building pedestrian doors	24 hours per day	Pedestrian doors will only be opened for personnel to enter/exit the building; they will not be propped open.	Audible	High	
Ore sorter feeder building and ore sorter building	24 hours per day	Enhanced cladding to new buildings: Reducing noise breakout from any new buildings. Building cladding to be routinely inspected in accordance with manufacturer's recommendations to ensure no fault or damage is present.	Audible and LFN	High	If a fault is identified that is anticipated to cause an increase in noise emissions, the fault is to be reported to the EA along with an estimate of the impact at sensitive receptors and timeline for remedying the issue.
Conveyor openings	24 hours per day	Noise attenuating mitigation to be applied to conveyor entries and openings.so that they are mitigated to achieve a 10 dB reduction.	Audible	Low	Conveyor openings to be visually checked to ensure they are functioning correctly. Any faults identified,

					reported to the EA along with an estimate of the impact at sensitive receptors and timeline for remedying the issue.
DMS: Screens **Area 140 (DMS):** - 140-SN-01 DMS feed prep screen - 140-SN-06 secondary DMS screen - 140-SN-07 scavenger DMS screen - 150-SN-01 primary mill sizing screen Ore Sorting **Area 125B**: - 125-SN-01 Pebble Ore Sorter 1 Dewatering Screen - 125-SN-02 Pebble Ore Sorter 2 Dewatering Screen - 125-SN-03 Cobble Ore Sorter 1 Dewatering Screen - 125-SN-04 Cobble Ore Sorter 2 Dewatering Screen - 125-SN-11 Ore Sorter Sizing Screen	24 hours per day	Acoustic enclosure with a chute for the material infeed and a chute for the discharge. The enclosure is designed to have a fundamental frequency of at least 20% above that of the screen which it encloses. Provides a proven reduction of 11dB at the natural frequency. However, a noticeably higher reduction is likely in practice as the infeed will also include a chute. Enclosures will be routinely inspected to proactively identify any areas of damage or degradation.	LFN primarily (also likely to reduce audible noise)	High	Enclosure to be inspected to ensure no fault or damage is present. Review of SCADA process to ensure that control decisions result in noise emissions within the optimum process parameters. If a fault is identified that is anticipated to cause an increase in noise emissions, the fault is to be reported to the EA along with an estimate of the impact at sensitive receptors and timeline for remedying the issue.

Tertiary Crushing **Area 130:** ▪ 130-SN-12 Tertiary Crusher Sizing Screen ▪ 130-SN-13 Tertiary Crusher Dewatering Screen Secondary Crushing **Area 115:** ▪ 115-SN-02 Secondary Crushing Scalping Screen	24 hours per day	Acoustic enclosure with a chute for the material infeed and a chute for the discharge. The enclosure is designed to have a natural frequency of at least 20% above that of the screen which it encloses. Provides a proven reduction of 11dB at the natural frequency. However, a noticeably higher reduction is likely in practice as the infeed will also include a chute. Enclosures will be routinely inspected to proactively identify any areas of damage or degradation.	LFN primarily (also likely to reduce audible noise)	High	Enclosure to be inspected to ensure no fault or damage is present. If a fault is identified that is anticipated to cause an increase in noise emissions, the fault is to be reported to the EA along with an estimate of the impact at sensitive receptors and timeline for remedying the issue.

4.2 LOW FREQUENCY NOISE MITIGATION OPTIONS APPRAISAL REPORT

4.2.1. A LFN Options Appraisal Report[19] has been submitted with the application and revised following the October 2023 Schedule 5 notice[20]. The mitigation which is assessed in the Options Appraisal Report and the outcome of the assessment is summarised below.

4.2.2. The 32 mitigation options presented in the Wolf Minerals' Options Evaluation Process[21] were screened and, of these, three were included for further consideration. Altogether, a total of five mitigation options were ranked. In accordance with the findings of the noise impact assessment the two highest scoring options which mitigate noise at the fundamental frequency will be implemented as mitigation; these being the acoustic enclosure for screens and deck venting. The remaining options are presented in Table 4-1 below and may be implemented, if proven to be required, once the MPF is operational. Note that one option (underpan venting) was discounted after the ranking exercise as it does not work in combination with deck venting which is to be employed.

Table 4-2 – Additional Mitigation Options

LFN Mitigation Option	Detail of Mitigation Option
Active noise control	An active system which generates a pressure waveform close to the screen deck that is of the same magnitude and in anti-phase with the pressure being generated from the screen. This option is also known as noise cancelling. Provides a proven reduction of 10dB at the fundamental frequency in accordance with tests undertaken in August 2020 (see Options Appraisal Report for further details). During the design stage, the technical detail of the active noise control system (to work in combination with the acoustic enclosure for the screens and deck venting) will be developed and will achieve a reduction of approximately 10dB.
Acoustic enclosure for screen with Kingspan cladding	Acoustic enclosure with the inclusion of Kingspan insulation on the outside of the enclosure. This option is targeted at reducing the 2nd harmonic and, through the site trials in June and July 2023, was shown to be ineffective in reducing noise at the fundamental frequency of the screens. The Kingspan product is the same as that identified in the BS 4142 assessment undertaken by SLR, dated November 2022. Provides a proven reduction of 4.2dB at the 2nd harmonic as shown in the site trials in June and July 2023. No reduction in noise level is achieved at the fundamental frequency (See Options Appraisal Report for further details).

[19] WSP report *Low Frequency Noise Mitigation Options Appraisal Report*, dated August 2023
[20] WSP report *Low Frequency Noise Mitigation Options Appraisal Report*, dated October 2023
[21] Wolf Minerals (UK) Ltd report *Low Frequency Noise options Evaluation Process*, January 2018

4.3 NOISE MONITORING PROCEDURES

4.3.1. This section provides information relating to noise monitoring program associated with the Hemerdon Mine site. Noise monitoring during the mine operation will be undertaken to assess whether the noise emissions from the mine achieve those predicted in the Noise Impact Assessment for both audible and LFN.

4.3.2. The discussion of the monitoring program provided below is split into three separate sections:

- General monitoring requirements;
- On-site monitoring; and
- Off-site monitoring.

4.3.3. Where a specific requirement for on-site or off-site monitoring is required, they are identified within the text below.

GENERAL MONITORING REQUIREMENTS

Equipment Specification and Calibration

4.3.4. Measurement equipment including microphone(s), cable(s), windscreen(s), recording devices and other accessories will conform to BS EN 61672-1, Class 1, for free-field application, as appropriate. Sound calibrators will confirm to BS EN 60942, Class 1.

4.3.5. Sound calibrators are calibrated at intervals not exceeding 1 year, conformity of the measuring systems with BS EN 61672-1 is verified at intervals not exceeding two years.

4.3.6. An accredited laboratory will calibrate the sound level meters every two years and the calibrator annually. Re-calibration will be considered if a sound level meter or calibrator has been subject to accidental damage. Any new equipment installed for the noise monitoring would have a factory calibration certificate and be calibrated by an accredited laboratory within two years.

4.3.7. A field calibration is to be undertaken at the beginning and end of each measurement exercise, in accordance with the manufacturer's instructions, by means of a sound calibrator. Where the difference between the initial calibration value, any subsequent calibration check, and a final calibration check on completion of measurements exceeds 0.5 dB, treat with caution the results of measurements obtained for any period to which this relates. If any fault is likely, the equipment will be sent for laboratory calibration.

Measurement Locations

4.3.8. Monitoring is to be undertaken at outdoor measurement locations at a height of 1.2 m to 1.5 m above the ground.

4.3.9. Where practical, the influence of reflections should be minimised by making the measurements at least 3.5 m from any reflecting surface other than the ground.

4.3.10. Monitoring will be undertaken at the locations identified in Figure 4-1 and Figure 2-2 for on-site and off-site monitoring, respectively.

Monitoring Conditions

4.3.11. An on-site meteorological station will collect long-term information relating to wind speed and direction for analysis alongside on-site noise monitoring results.

4.3.12. Records of the prevailing weather conditions will also be noted during measurements at off-site monitoring locations during noise measurements. Wind speeds will be monitored using an anemometer at the measurement locations, with records of the wind speed and direction logged alongside noise monitoring results.

4.3.13. Off-site noise measurements will not be undertaken in poor weather conditions such as wind speeds greater than 5 m/s.

ON-SITE MONITORING

4.3.14. On site noise monitoring will be undertaken continuously at four separate locations.

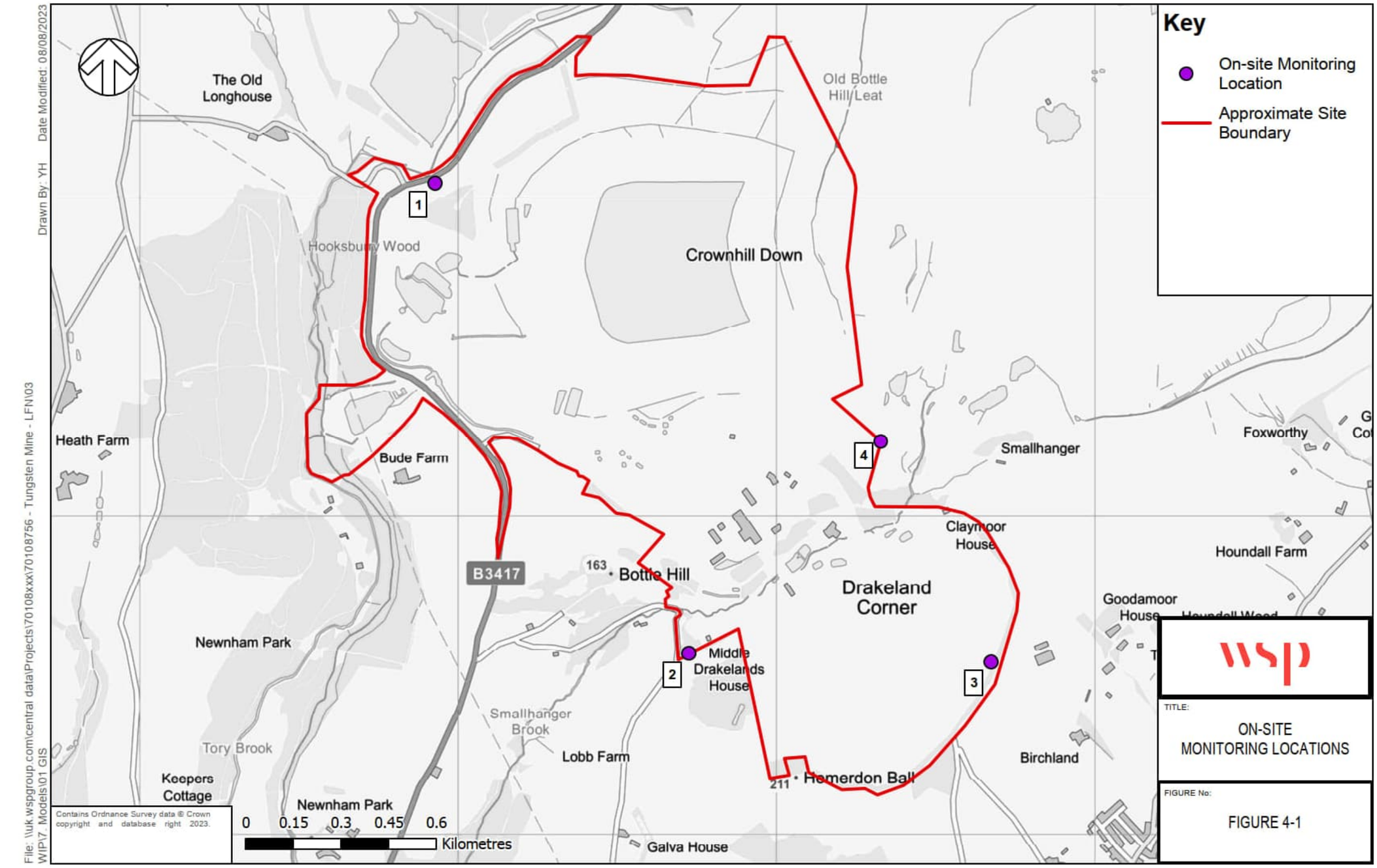
4.3.15. The four on-site monitoring locations are identified in Figure 4-1 overleaf.

4.3.16. Monitoring equipment proposed for the on-site monitoring will include real time and historic noise data storage available on a web platform, allowing for an adaptable understanding and management of noise emissions from the site.

4.3.17. On-site boundary monitoring will be used as control locations to assist in determining the mine noise emissions at the off-site sensitive receptors.

Table 4-3 - Monitoring Locations used to Measure Sound from the Site

Measurement Location	Frequency of Measurement	Minimum Measurement Duration	Measurement Period	Site Operating Conditions	Expected Specific Sound Level
1	Continuous measurement	dB $L_{Aeq, 1\ hour}$ dBZ in one-third octave centre frequency bands	24 hours a day	Full operation	Noise limits provided in **Table 4-6** and **Table 4-7**.
2					
3					
4					


Key
On-site Monitoring Location
Approximate Site Boundary
The Old Longhouse
Old Bottle Hill/Leat
Hooksbury Wood
Crownhill Down
Heath Farm
Bude Farm
Smallhanger
Foxworthy
Claymoor House
Houndall Farm
B3417
163 Bottle Hill
Drakeland Corner
Goodamoor House
Newnham Park
Middle Drakelands House
Smallhanger Brook
Tory Brook
Lobb Farm
Birchland
Keepers Cottage
211 Homerdon Ball
Galva House
Contains Ordnance Survey data © Crown copyright and database right 2023.
0 0.15 0.3 0.45 0.6
Kilometres
TITLE:
ON-SITE MONITORING LOCATIONS
FIGURE No:
FIGURE 4-1
Date Modified: 08/08/2023
Drawn By: YH
File: \\uk.wspgroup.com\central data\Projects\70108xxx\70108756 - Tungsten Mine - LFN03 WIP\7. Models\01 GIS

F

ON SITE PROCESSES

4.3.18. The processes described in **Table 4-4** are intended to maintain noise emissions from the site below the relevant noise limits for the site.

4.3.19. In instances where noise emissions do increase for any reason, the processes identified in **Table 4-4** will both assist in the identification of the cause of the increased noise emissions as well as how to respond.

Table 4-4 – On-site Processes to Ensure Impacts do not Increase

Description of Procedure	Procedure	When this will be carried out	Corrective Action
Staff training	Training of site personnel to raise awareness of noise at nearby sensitive receptors and the control measures within the current NMP	Periodic training for all staff and induction training for new starters	Training provision will be reviewed if it is identified that it can be improved to maximise control of noise emissions.
Good practice on site	All vehicles and plant will be switched off when not in use. Use of less intrusive alarms, such as broadband vehicle reversing warnings. Plant items that comply with the relevant UK noise limits applicable to that equipment will be used.	Continuously as part of the NMP	Periodic training
Safety checks	Plant operators are required to undertake checks as part of operating procedures	Before the start of each shift	Should a noticeable increase in noise occur during a shift, the operator is required to report it to the Process Plant Manager.
Visual checks	Operators are required to undertake checks as part of operating procedures	Before the start of each shift	Should a noticeable increase in noise occur during a shift, the operator is required to report it to the Process Plant Manager.
Maintenance, servicing and repair	Plant will be operated and maintained appropriately, having regard to the	As prescribed by the manufacturer and in accordance with planned	Should a noticeable increase in noise occur, the operator is required

	manufacturer's written recommendations or using other appropriate operation and maintenance programmes which reduce noise emissions	preventative maintenance schedules	to report it to the Process Plant Manager. Following the report of increased noise, further investigation of the plant item will be undertaken to establish the cause of the increased noise emission and identify a suitable solution.
DMS: Feed Control, Control Loops and Critical Control Parameters	Equipment within the area to be operated under controlled and steady state conditions.	Continuously	Supervisory Control and Data Acquisitioning (SCADA) is programmed to perform certain control decisions based on data collected – control functions could include turning power on/off, adjusting temperature, decreasing, or increasing speed, and regulating a variety of processes.
On-site noise monitoring	Noise monitoring is proposed at four locations at the site boundary.	Continuously	If noise trigger levels are exceeded, an investigation to the cause of the exceedance is required. If a fault is identified that is anticipated to cause an increase in noise emissions from a process or plant item on site, the fault is to be reported to the EA along with an estimate of the impact at sensitive receptors and timeline for remedying the issue.

4.4 MONITORING OFF SITE SOUND

4.4.1. Noise monitoring will be undertaken at the locations shown on the plan in Figure 2-2. Where permission is not granted by the land owners, monitoring will be undertaken at an alternative and representative location.

Table 4-5 – Offsite Monitoring Locations used to Measure Sound from the Site

Measurement Location	Frequency of Measurement	Minimum Measurement Duration	Measurement Period	Site Operating Conditions	Expected Specific Sound Level
See Figure 4-2	Within first two months of operation continuous logging for an initial 24/48 hour period; and every six months thereafter	dB $L_{Aeq, 1\ hour}$ dBZ in one-third octave centre frequency bands	Continuous logging	Full operation	Noise limits provided in **Table 4-6** and **Table 4-7**.

4.4.2. Any measurement or assessment of noise emissions from the site will be carried out by a competent person who is either a full member of the Institute of Acoustics (IOA) or has successfully completed the IOA certificate of competence in environmental noise course.

4.4.3. Measures identified in Table 4-1 are permanent solutions to the noise emissions from the site which will result in emissions being below the applicable noise limits in the long-term. The permanent monitoring and use of the Supervisory Control and Data Acquisitioning (SCADA) will provide both monitoring and control of emissions from the site in real time, allowing for immediate response to increases in noise emissions from the site in the short-term.

4.4.4. Equipment used on site will be replaced in accordance with manufacturers guidance or on the identification of a fault that cannot be rectified.

Trigger Action Levels and Noise Limits

4.4.5. Audible noise limits are provided within Condition 5 and 6 of the planning permission decision from February 2017 (DCC/3823/2015). These limits have been reproduced in **Table 4-6** for information:

Table 4-6 – Noise Limits at Noise Sensitive Receptors

Time (hhmm)	Day	Noise Level (dB)*
0700 – 1900 hours	Monday to Saturday	50 dB $L_{Aeq, 1\ hour}$
1900 to 2200 hours	Monday to Saturday	45 dB $L_{Aeq, 1\ hour}$
2200 to 0700 hours	Monday to Sunday	42 dB $L_{Aeq, 1\ hour}$
0700 to 2200 hours	Sunday or on any Bank or Public Holiday	45 dB $L_{Aeq, 1\ hour}$
Note: * Free field measurement location		

4.4.6. Low frequency noise limits are provided in Table 4-7 below and are based on the 17 dB reduction in noise emissions compared with the previous Wolf Mineral noise levels measured at the monitoring locations.

Table 4-7 – Low Frequency Noise Limits at Noise Sensitive Receptors

Monitoring Location	Time (hhmm)	Noise Level (dBZ)*
A: Birchland Farm*	24 hours a day/7 days a week	58
B: Galva House*		60
C: Newnham House*		54
D: Boringdon Hall*		41
E: Mumford Cottage*		49
F: Portworthy Farmhouse		50
G: Windwhistle Farm		54
H: Dartmoor Zoo		59
Note: * Measured in the 12.5 Hz or 16 Hz One Third Octave Centre Frequency Band		

4.4.7. Both audible and LFN limits are required to be measured at the noise sensitive locations identified in Table 2-2.

Reporting

4.4.8. Monitoring reports will be provided to the EA within a month following the completion of offsite monitoring.

4.4.9. The reports will include the following information:

- Statement of qualifications, competency, professional memberships and relevant experience of the persons undertaking the monitoring;
- Dates and times of the measurements undertaken;
- Measured sound levels at each location including measurement time intervals and one third octave centre band results;
- Description of the locations where monitoring has been undertaken;
- A description of the on-site operations during the noise monitoring period;
- Details of the sound measurement equipment used, including calibration details; and
- Weather conditions during the monitoring period, including wind speed and direction.

4.4.10. Data from the continuous monitoring locations will be prepared into reports on a monthly basis, stored by DRL and made available to the EA on request.

Response Procedure

4.4.11. For the audible noise continuously measured on the site boundary, a trigger level will be set at 5 dB below the levels stated in Table 4-5 above and the action level will be equal to the levels in Table 4-5.

4.4.12. Exceedance of the trigger level will be responded to as follows:

- If, during site activities, trigger levels are exceeded this will be reported to the designated process plant manager and, if appropriate, the ES manager.
- Investigate the works being undertaken, to see if the correct plant and equipment are being used in accordance with Appropriate Measures/BAT.
- If the work, plant and equipment are not being used correctly the works will be stopped and corrective action taken.
- If high levels are being generated due to unforeseen circumstances and the correct methodology, plant and Appropriate Measures/BAT have been observed, the Environment Agency (and, if appropriate, affected neighbours) will be notified and the reasons and timescales explained.
- The response procedure and outcome will be recorded by site personnel.

4.4.13. Exceedance of the action level will be responded to as follows:

- If, during site activities, action levels are exceeded this will be reported to the designated Process and Plant Manager and, if appropriate, the ESG manager.
- Corrective action will be taken such that levels are minimised before works can re-start. Where this is not possible, the Environment Agency will be notified with a view to continuing operation of the mine in a controlled manner and in line with the Noise Management Plan.

5 COMPLAINTS REPORTING

5.1 PREVENTION

5.1.1. In order to reduce nuisance to local residents, staff at the site will engage with the local community through a determined channel of communication, and operate in a transparent manner. This will ensure local residents are aware of the site's operations and understand the processes on site. Potential noise sources will be indicated and the measures to control them explained. It is hoped that effective communication will reduce the number of potential complaints and help to create a level of noise tolerance, particularly during working hours.

5.2 COMPLAINT MANAGEMENT

5.2.1. A dedicated telephone number and designated staff contact is available on the DRL's website, both in and out of operational hours to respond to any complaints or queries. Complaints may be received from either members of the public or through regulatory bodies. All complaints will be investigated.

5.2.2. Investigations may involve monitoring noise at receptor locations around the site, including the location of the noise complaint itself. If the source of the noise is found to be from routine noise from the plant and the impact from the noise is found to be persistent, further mitigation will be considered and incorporated into the noise management plan.

5.2.3. If the source of the noise is found to be from non-routine operation i.e. plant malfunction, remedial action will be taken as soon as reasonable practicable.

5.2.4. Complaints received within working hours will be investigated and included in a complaints log on the same working day. Complaints received out of hours will be logged at the earliest opportunity and by the very latest on the next working day.

5.2.5. The Process Plant Manager or designated personnel is responsible for ensuring that:

- The complaint is investigated by carrying out an off-site noise assessment, if appropriate, and the findings are recorded in the complaints log.
- A record of the complaint is made in the complaints log, which is kept on the site's server including the following information:
  - Location of detected noise and description;
  - Time and date of the complaint;
  - Weather conditions including wind direction at the time of the complaint;
  - Any non-routine activities on site;
  - Results of any investigation; and
  - Remedial actions taken.
- The EA are notified of any substantiated noise complaints via a Schedule 5 Notification in accordance with the Environmental Permit within 24 hours.
- The findings of the noise investigation and any remedial action is communicated to the complainant within 48hours of the complaint being received.

Appendix A

SUMMARY OF RELEVANT GUIDANCE

NATIONAL PLANNING POLICY FRAMEWORK

The NPPF (as amended July 2021) provides guidance and key objectives for local policy development. Relevant policies are outlined below:
Paragraph 11 states (inter alia):

Plans and decisions should apply a presumption in favour of sustainable development…

For decision-taking this means:...

- *approving development proposals that accord with an up-to-date development plan without delay;*
- *or where there are no relevant development plan polices, or the policies which are most important for determining the application are out-of-date, granting permission unless:*
  - *the application of policies in this Framework* [i.e. the NPPF] *that protect areas or assets of particular importance provides a clear reason or refusing the development proposed; or*
  - *Any adverse impacts of doing so would significantly and demonstrably outweigh the benefit, when assessed against the policies in this Framework* [i.e. the NPPF] *taken as a whole"*

Paragraph 174 (inter alia):

"Planning polices and decisions should contribute to and enhance the natural local environment by:…

- *e) Preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of…noise…*

Paragraph 185 (inter alia):

"Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should:

a) mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life;
b) identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason".

NOISE POLICY STATEMENT FOR ENGLAND (NPSE)

The NPSE was published in March 2010 by the Department for Environment Food and Rural Affairs (Defra) and is the overarching statement of noise policy for England. It applies to all forms of noise other than occupational noise, setting out the long-term vision of Government noise policy, which is to:

"Promote good health and a good quality of life through the effective management of noise within the context of Government policy on sustainable development."

That vision is supported by the following aims which are reflected in the aims for planning policies and decisions in Paragraphs 170 and 180 of the NPPF (see above):

"Through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development:

- *avoid significant adverse impacts on health and quality of life;*
- *mitigate and minimise adverse impacts on health and quality of life; and*
- *where possible, contribute to the improvement of health and quality of life."*

PLANNING PRACTICE GUIDANCE FOR NOISE

This is a web-based resource issued for use by the Department for Levelling up, Housing and Communities (DLUHC). The purpose of the guidance is to complement the NPPF and provide advice on how to deliver its policies.

The section on noise (https://www.gov.uk/guidance/noise--2) was last updated on the 22 July 2019. This includes guidance including a table that summarises "the noise exposure hierarchy, based on the likely average response" and which offers "examples of outcomes" relevant to the NOEL (No Observed Effect Level), LOAEL (Lowest Observed Adverse Effect Level) and SOAEL(Significant Observed Adverse Effect Level) effect levels described in the NPSE (see above). It also introduced the concept of UAEL (Unacceptable Adverse Effect Level) above which the effects of noise are so severe they must be prevented. These outcomes are in descriptive form and there is still no numerical definition of the NOEL, LOAEL, SOAEL and UAEL, or detailed advice regarding methodologies for their determination. There is also no reference to the further research that was identified as necessary in the NPSE regional planning policy.

NOISE AND VIBRATION MANAGEMENT: ENVIRONMENTAL PERMITS

This is a web-based resource issued by the Environment Agency (EA). The guidance provided covers:

- how the EA will assess noise from certain industrial processes
- what the law says you must do to manage noise and vibration
- advice on how to manage noise – in particular, how to carry out a noise impact assessment and what operators should include in a noise management plan.

BS 4142:2014+A1:2019 is identified as the appropriate assessment methodology but it is highlighted that *"BS 4142 is unlikely to be the appropriate methodology on its own to assess low frequency noise".*

In relation to Noise Management Plans (NMP), the EA highlight the benefits of having a good NMP and provides details of the minimum information that should be provided within an NMP, such as:

- *"a clear statement that you understand and accept your responsibilities for controlling noise impact, and that you will regularly review the effectiveness of your NMP*
- *a commitment that either you, or your contractors or subcontractors, will make sure that any noise control equipment is designed, operated and maintained appropriately so it controls noise effectively at all times*
- *a risk assessment of noise problems from normal and abnormal situations, including worst case scenarios due to, for example, weather, temperature, breakdowns and accidents*
- *details of the appropriate controls (both physical and management) needed to manage the identified risks*
- *confirmation of the level of monitoring that should be in place*
- *details of the actions you will take, contingencies, and responsibilities, when problems arise (it is particularly important that you include expected actions resulting from exceptional circumstances or where serious pollution may occur)*

- *confirmation of the procedures in place to consider reducing or stopping operations to avoid serious noise pollution*
- *a procedure for engaging with neighbours to minimise their concerns and respond to complaints"*

BS 4142:2014+A1:2019

The standard provides a method for the rating and assessment of sound from an industrial nature, such as the sound from industrial processes, mobile plant and vehicles and is applicable to the determination of rating levels and the assessment at existing dwellings used for residential purposes. The standard is not intended to be applied to the assessment of indoor sound levels.

The standard compares a calculated Rating Level with the existing background sound level at potentially affected NSRs. The difference between these noise levels is taken as an indication of the magnitude of the noise impact, subject to 'context' considerations.

To derive a Rating Level for the Proposed Development, the specific sound level can be adjusted, by adding feature corrections for one or more distinctive characteristics. The feature corrections are summarised below:

- Tonality up to 6 dB
- Impulsivity up to 9 dB
- Other sound characteristics up to 3 dB
- Intermittency 3 dB.

An initial estimate of the impact of the specific sound is obtained by subtracting the measured background sound level from the rating level. The results of this comparison are assessed against the following guidance:

- *"Typically, the greater this difference, the greater the magnitude of the impact;*
- *A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context;*
- *A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context; and*
- *The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the Rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context."*

It is noted that the 'context' of an assessment is an important consideration in an assessment. The examples included in BS 4142:2014 Annex A illustrate the contextual factors that may be of importance, for example:

- The magnitude of the differences between rating level and Background Sound
- The character of the existing noise environment at receptors
- The history of noise issues (e.g. complaints) associated with the operator or the site of the specific source under assessment
- The diurnal period during which impacts are identified, and the relevance to the type of receptor
- The location at which actual impacts on the receptor could occur, i.e. indoor or outdoor.

BS 4142:2014 provides guidance on minimising and reporting factors likely to contribute to uncertainty in the assessment. This includes following best practice guidance with regards to measurement and calculation of sound levels.

ATTENUATION OF SOUND DURING PROPAGATION OUTDOORS (ISO 9613:1996)

ISO 9613:1996, titled Part 2 ‘Acoustics – Attenuation of Sound During Propagation Outdoors’, specifies an international engineering method to calculate the attenuation of noise propagating outdoors under meteorological conditions favourable for propagation.

The conditions for propagation are downwind, or equivalent, under a moderate ground-based temperature inversion, such as that encountered at night.

The method consists of octave band algorithms to calculate the propagation originated from a point source, or several sources, taking into account the following physical effects:

- geometrical divergence
- atmospheric absorption
- ground effect
- reflection from surfaces
- screening by obstacles.

DESCRIPTION AND MEASUREMENT OF ENVIRONMENTAL NOISE (BS7445: 2003)

BS7445:2003 'Description and Measurement of Environmental Noise' defines and prescribes best practice during recording and reporting of environmental noise. It is inherently applied in all instances when making environmental noise measurements and is applicable to all noise measurements undertaken in association with this project. The document advises that the information to be reported should include:

- measurement technique
- conditions prevailing during measurements
- qualitative data
- connotation of the sound.

Appendix B

RELEVANT SCHEDULE 5 NOTICES

SECTION 5 – DATED 03/02/2023

"*Schedule:*

1. *"Noise Management Plan*

   (a) *Provide a Noise Management Plan (NMP), produced in accordance with Environment Agency Guidance:*
   Noise and vibration management: environmental permits - GOV.UK (www.gov.uk)

We recommend using the NMP template provided by the Environment Agency as a basis for the NMP. If a bespoke format NMP is produced, please ensure that it addresses the information within the Environment Agency template as a minimum.

Consistency with the noise assessments

The NMP should be consistent with the details stated in the BS4142 assessment, and Low Frequency Noise Assessment.

You should ensure that all mitigation measures have been detailed in the NMP, along with sufficient evidence of their performance specification, and how they will be implemented.

This should include performance specifications for the following proposed mitigation measures: noise barriers, upgraded cladding to buildings, roller shutter doors and conveyor openings.

The NMP should also provide clear operational procedures for ongoing minimisation of operational sound emissions. For example, the restriction on opening of roller shutter doors during day and night periods).

Procedures

When writing procedures for the site within the NMP, ensure they are; specific, measurable, achievable, relevant, and time-bound. This format is to avoid vague statements.

(b) *Within the NMP, provide detailed additional measures that could be implemented at the site to reduce audible and low frequency noise.*

These are additional measures that are not already stated within the BS4142 assessment, or low frequency noise assessment.

These measures should also have sufficient evidence of their performance specification, and details of how they will be implemented.

When stating contingency measures within the NMP, please ensure that the following is clearly stated:

- *The cause or 'trigger' that would lead to a contingency measure being implemented;*

- *The timescales for the implementation of the contingency measure;*
- *How the success of the measure would be determined, following implementation;*
- *What would happen in the event of further or continued issues."*

SECTION 5 – DATED 01/03/2023

Schedule:

"*Noise and Vibration Impact Assessment, Ref PS134446 dated 29/11/2022 (referred to from here on as NVIA).*

1. *Please provide a revised NVIA to address the following issues:*

   (a) *Within the NVIA report, provide a non-technical summary and conceptual plan of the proposal with regards to low frequency noise impact, covering the following areas:*

   - *The potential sources of low frequency noise, and location;*
   - *New equipment at the site, the location and mitigation;*
   - *Disused equipment at the site, and location; and,*
   - *Main mitigation measures."*

This summary is needed to provide additional clarity to identify historic changes to the site and proposals. We acknowledge that some of this information is currently provided within the NVIA report, and will also likely be in the Noise Management Plan, but a summary at the front of the NVIA report would be useful for both members of the Environment Agency,

and also members of the public that may read the NVIA.

(b) *Amend the NVIA to include all potential sources of low frequency noise, or provide a justification for the exclusion of potential sources of noise from the assessment.*

You have stated that Tungsten West has updated the BS4142 background noise assessment to consider the impact of noise from a proposed Primary Jaw and Secondary Cone crushing arrangement. This does not justify its exclusion from the NVIA.

All potential sources need to be included in the NVIA, or provide a written justification as to why it is not. The new proposed jaw crushers are expected to be significant sources of LFN/infrasound. It is not known at what mechanical frequency those items of plant operate, nor the sound power at those frequencies. Any effects from these additional sources are therefore not currently quantified or understood.

(c) *Amend the NVIA to include the impact at 20Hz 1/3 octave band for completeness.*

(d) *Provide further information to justify the chosen acoustic radiation efficiency of 0.1 for all screens, or justify and use a more conservative assumption for the assessment.*

Table 17 of in the previous NVIA report (Ref TWL-CP-PA-EN-006.2.23 dated 18/08/2021) identified an Acoustic Efficiency (AE) range of 0.005 to 0.819. Whilst it is understood that J5510B and J5645B screens are excluded, it is not clear why the higher AE figures from Table 17 have not been considered.

(e) *Include additional mitigation options within the NVIA.*

A previous Schedule 5 notification (dated 16/02/2022) requested a more comprehensive appraisal (including consideration of costs and benefits) of all available control options.

You have stated that this written appraisal shall be included as part of the Noise Management Plan. We also require these options to be assessed within the NVIA to justify your selection of appropriate measures to prevent or where that is not practicable minimise emissions of infrasound/low frequency noise.

It is noted that previously discussed mitigation measures such as antiphase speakers, enclosure of sources, and Innova J57 building cladding proposed under previous operation, have not yet been considered for the assessment, and the currently modelled insertion loss of the proposed double-layer concrete building cladding system is zero for sound frequencies in the 12.5 Hz, 16 Hz, and 25 Hz third octave bands.

(f) Provide additional information on the proposed cladding, and ensure that this is consistent with the BS4142 assessment and any Noise Management Plan.

It is currently unclear what cladding is proposed for the different Mineral Processing Facility buildings, equipment housing or extensions. Whilst we expect that further detail shall be provided in the Noise Management Plan, it must be ensured that this information is also clear in the NVIA. The BS4142 assessment and NVIA currently contain insufficient and conflicting detail on the proposed cladding. You must identify clearly in the Application what control measures are proposed in order to enable us to make a determination.

(g) Provide an assessment of amplification within the receptors, or provide a justification for why this has not been provided.

Amplification has not been considered within the NVIA, although you have acknowledged in your previous submissions that this can occur. The potential for this will be considered by the Environment Agency when we determine the potential impact. Therefore, should you want to provide further information with regards to amplification that shall support your application, please do so.

The absence of any further recognition or assessment within the NVIA of the risks presented by this manifestation of increased sound pressure levels at certain low frequencies within residential properties is a serious omission in the NVIA.

(h) Provide consideration and quantification of the uncertainty of the propagation model, including the source sound power uncertainties and directivities. Consider the quantitative effect of constructive and destructive interference at different locations at distance arising from operation of coherent, or nearly coherent (as opposed to non-coherent) sound sources operating at low frequencies. Consider the worst-case scenarios, and what impact these would have on the identified receptors.

Uncertainty has not been considered within the NVIA. We are concerned that the known uncertainty of the measured acoustic efficiencies, together with the unknown uncertainty of the propagation model, could fail to correctly identify the impact on receptors. Operation of coherent sound sources (e.g. large mechanical screens running at the same low frequencies) will generate interference patterns of areas of constructive and destructive interference (higher and lower sound pressure level) at distance at those sound frequencies.

Slight differences in operating frequencies will also introduce beating patterns at distant locations, repeating changes to the interference pattern over short periods of time. We need to understand if

and how the chosen model accounts for this, and how this is likely to affect sound pressure levels which will be experienced at distant locations."

SECTION 5 – DATED 05/10/2023

Schedule:

"1. Noise Impact Assessment

The following questions relate to the Noise Impact Assessment (dated August 2023). Submission of the requested information can be provided in a separate addendum to the assessment.

a) Provide an explanation of how the screens and enclosures will be orientated to avoid directionality of the overall LFN emissions.

The Noise Impact Assessment report (dated August 2023) states that as 'there will be multiple screens operating at Hemerdon… they will not be oriented in the same direction' which will negate the issue of directionality.

Using a mean average to derive the stated 11 dB reduction for enclosures, would mean that the enclosures would be less effective than 11 dB in certain directions. For instance, the report showed that the 'enclosure and discharge chute' (Figure 5-15) had less than an 11 dB reduction compared to the 'open' scenarios, between 115 degrees and 286 degrees (Figure 5-4 and 5-5). One result appears to show that the 'enclosure and discharge chute' scenario had a higher level in one direction compared to the 'open' scenarios showed in Figure 5-4 and 5-5.

There is therefore a concern that directionality of emissions is unpredictable, and the enclosure's assumed 11 dB reduction is reliant on the correct collective orientation of all screens.

b) Provide an explanation of how the chute design that has been tested, would be replicated on site for all relevant screens.

It is unclear that the chute design, as tested, could be practically replicated for all screens. This would include the distance between the end of the chute to a solid surface or processed material, and the dimensions of any open area at the end of the chute. If this scenario could not be replicated then there is concern that the estimated 6 dB additional reduction could not be achieved.

c) Provide the results of any tests which were carried out with alternative chute outlet configurations.

d) Provide a full dataset (including excel spreadsheet) of results from testing the screen with and without various enclosure scenarios described at section 5.2.3 showing sound pressure levels at the fundamental frequency 12.5 Hz, the second harmonic frequency 25 Hz, and the third harmonic frequency 37.5 Hz, recorded at each nearfield monitoring point for each test scenario.

e) Provide separate graph plots for each frequency of sound level vs compass angle (like Figure 5-9) showing the results of all the tests carried out on the screen without enclosure, and with all the various enclosure combinations which shall indicate directionality of source at the different frequencies. Provide a full explanation of results.

f) Provide an explanation of why the enclosure appears to have resulted in an increase in average near field sound pressure levels in one test scenario, and why another test scenario resulted in almost no reduction in average near field sound pressure levels, at the fundamental frequency 12.5 Hz, (Figures 5-10, 5-13, 5-16) and any impact this has on uncertainty of conclusions.

g) Show how data presented in Table 5-3 has been derived for each result. Provide an explanation of why the enclosure appears to have resulted in an increase in far field sound pressure levels at the fundamental frequency 12.5 Hz in multiple test scenarios (Table 5-3) and any impact this has on the uncertainty of conclusions. What results were obtained for the test scenario with outlet chute which is absent from Table 5-3 and explain how that data has been derived?

h) Are the results in Table 5-5 for the scenario with outlet chute directly comparable to the results in Table 5-3 (noting the commentary at section 5.3.19) for other test scenarios for the three common locations? Provide an explanation of the results of far field monitoring in the test scenario with outlet chute in place (section 5.3.23 and Table 5-5) in comparison with results of far field monitoring for other test scenarios for the common locations (section 5.3.19 and Table 5-3).

i) Provide an explanation of why the enclosure appears to have resulted in an increase in near field sound pressure levels at the second harmonic frequency 25 Hz in multiple test scenarios, including (marginally) the scenario with outlet chute (section 5.3.18 and Figure 5-17). What results were obtained for measurements in the far field at this frequency? Provide an explanation of any impact this has on uncertainty of conclusions. What results were obtained for sound pressure levels at the third harmonic 37.5 Hz? Provide an appropriate explanation of these results.

A complete set of results from the near field and far field measurements during tests of different enclosure scenarios has not been presented. Results appear to have been presented selectively, and in a way which makes direct comparison of different scenarios difficult.

There is an incomplete explanation of how content of the various results Tables has been calculated/derived. The test results which have been presented for different enclosure scenarios raise material questions over the effectiveness of the intended technique of steel enclosure at reducing emissions of low frequency noise; some test scenarios appear to have resulted in increased sound pressure levels measured in the near field and in the far field compared with the scenario of no enclosure.

Discussion of the test results is selective and incomplete, and ignores and fails to explain some results which indicate the possibility of enclosure scenarios increasing sound pressure levels measured in the near field and in the far field. Incomplete presentation and discussion and explanation of test results significantly limits confidence in the conclusions presented.

j) Provide justification for the 6 dB reduction by deck venting.

We could not identify where the 6 dB reduction for deck venting derived from. It was not clear in the referenced Appendix O.

k) Provide justification that the different control measures (steel enclosure, deck venting and active noise control) would work in-combination.

There is concern that the different control measures may not lead to linear improvement, but may have a more complicated effect on results.

l) Confirm if the active noise control would be located within the enclosure, if it was installed, and provide an assessment of any likely directional effects

Active noise control has previously been tested with an operational screen without an enclosure, and its performance assessed with a single microphone location. Operation of coherent sound sources in close proximity results in directional effects (and constructive and destructive interference patterns), demonstrated by previous operation of phase-matched adjacent screens.

m) Please provide full derivation and justification for the sound pressure levels for each screen quoted in Table 6-1.

You have stated that the assessment is based on manufacturer source data for some screens. For some screens, a comparison of measured versus manufacturer data has been undertaken and measured levels are lower. We need to know clearly where the assumptions for each screen have come from.

n) Provide an explanation of why you consider the proposed enclosure will be effective for screens operating at 16 Hz as well as screens operating at 12.5 Hz, considering the precautions taken in design and construction for the test enclosure.

The screen and enclosure have been tested with a screen running at 12.5 Hz. The Application includes some screens running at around 16 Hz, a scenario which has not been tested. Precautions taken in constructing the test enclosure for the screen running at 12.5 Hz included appropriate specification of panel natural frequency.

2. Verification Testing

a) Submit a written plan, stating how you would test the low frequency noise emitting screens, and control measures, once they have been installed in order to demonstrate emissions do not exceed sound pressure levels specified in the Application e.g., those set out at Table 6-1 of the Low Frequency Noise Impact Assessment and Table 3-1 of the Noise Management Plan. The plan must include details of:

- *the experience or qualifications of those carrying out the testing;*
- *the monitoring standards being worked to;*
- *the approach to testing of near field and far field;*
- *how directionality of emissions will be considered;*
- *monitoring of background levels and any identifying in-combination effects;*
- *the effectiveness of the abatement on all screens;*
- *how the impact of wind conditions shall be considered;*
- *the timescales required for monitoring and reporting;*
- *how beating effects would be captured; and,*
- *how this information will be reported to the Environment Agency.*

We would require verification testing of the screens and control measures stated in the Noise Impact Assessment (dated August 2023). The plan would be to verify the emissions of low frequency noise, and confirm they are aligned with the assumptions and results in the Noise Impact Assessment.

3. Noise Management Plan

a) Within your Noise Management Plan, provide a procedure for consideration of reducing or stopping operations to avoid serious noise pollution.

Our guidance on noise and vibration management: environmental permits states that ….'all noise management plans should, as a minimum, include…. confirmation of the procedures in place to consider reducing or stopping operations to avoid serious noise pollution'.

Our guidance further states that 'appropriate measures to reduce or control noise should include…reducing, altering or stopping noisy activities until circumstances have changed, or you have put other appropriate measures in place, so operations can re-start without preventable, or significant adverse, noise impact'."

Appendix C

STANDARD OPERATING PROCEDURE: MOBILE PLANT ENTERING AND EXITING MPF

Mobile Plant Entering & Exiting MPF.

1. Revision History

Revision No.	Date	Amendment Summary	Reviewed by
1	07/09/23	General Revision	D.Andrews

TUNGSTEN WEST

TW-SOP

Mobile Plant Entering & Exiting MPF.

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1. Basic Details

Operation Title	Mobile Plant Entering & Exiting MPF		
Site	Tungsten West		
Site Location	Mineral Processing Facility		
Task/Activity	Mobile Plant Entering & Exiting MPF		
Prepared by	Tom Watt	**Date**	05/09/2023

2. Site Contacts

Mineral Processing Facility Manager - Eero Heikkinen -eero.hakkinen@tungstenwest.com

Operations Captain - Damian Andrews – damian.andrews@tungstenwest.com

Head of Health & Safety - Spenser Owen - Spenser.Owen@tungstenwest.com

Engineering SHEQ Supervisor – Adrian Skelley - Adrian.Skelley@tungstenwest.com

3. Abbreviations

		LCS	Local Control Station
CRO	Control Room Operator	**MPF**	Mineral Processing Facility
		OPR	Operator

4. Standard PPE

5. Additional PPE

6. Equipment / Tools

Radio

Forklift

7. Hazards

Slips, Trips and Falls

Slips are the result of too little friction or a lack of traction between the footwear and the floor surface.

Noise

Plant equipment produces high noise. Anything over 85dB is doing damage to your hearing.

Pinch Point A pinch point or pinch point hazard is a common class of mechanical hazard where injury or damage may be done by one or more objects moving towards each other, crushing or shearing whatever comes between them. A nip point is a type of pinch point involving rotating objects, such as gears and pulleys.	
Dust Exposure to dust can cause irritation to the eyes, skin and respiratory tract, and prolonged exposure can lead to a range of serious lung diseases.	
Mobile Plant Hazards associated with plant generally arise from: The plant itself. For example, hazards associated with a forklift would include hazards relating to its mobility, its electrical, hydraulic and mechanical power sources, its moving parts, its load-carrying capacity and operator protection.	
Reagents Chemical hazards and toxic substances pose a wide range of health hazards (such as irritation, sensitization, and carcinogenicity) and physical hazards (such as flammability, corrosion, and explosibility).	
Access and Egress Falls from heights is defined as falling from one level to another and can be as small a distance as falling from the first rung of a ladder, or as high as falling from a high-rise building.	
Pedestrians **BE AWARE** of pedestrians.	

8. Reactive Measures

ALWAYS carry out **PRE-START** checks on all items of equipment before starting / operating:

- **CHECK** Safety Devices (Emergency Stops / Pull Cords)
- **CHECK** Supply (Water / Air / Power)
- **CHECK** Hatches (OPEN / CLOSED)
- **CHECK** Valves (OPEN / CLOSED)
- **CHECK** Availability (Isolations / Interlocks)
- **CHECK** Guards are fitted
- **CHECK** Upstream and Downstream

IMMEDIATELY SHUT DOWN the item of equipment if safe to do so and report to your line manager for further investigation if any of the following occur:

- The equipment is not Safe.
- The equipment is not functioning or performing correctly.
- The equipment doesn't look normal whilst running.
- The equipment doesn't smell normal whilst running.
- The equipment doesn't sound normal or is louder than usual.
- The equipment is excessively vibrating more than usual.
- The equipment is leaking any type of fluid.
- The equipment is damaged in any way.

9. Overview

This procedure is a step-by-step guide for Managing Audible Noise while entering and exiting the MPF. To manage and minimise our audible noise coming from the MPF we will keep **ALL** doors in the **CLOSED** position at **ALL** times. The MPF Shift Supervisor/2IC will ensure this by checking on regular intervals. Large equipment movement and any media or reagents that might be foreseen to be required during the night shift should be moved into the MPF and placed in a safe laydown area near where it should be needed this will all be well planned and conducted during day shift.

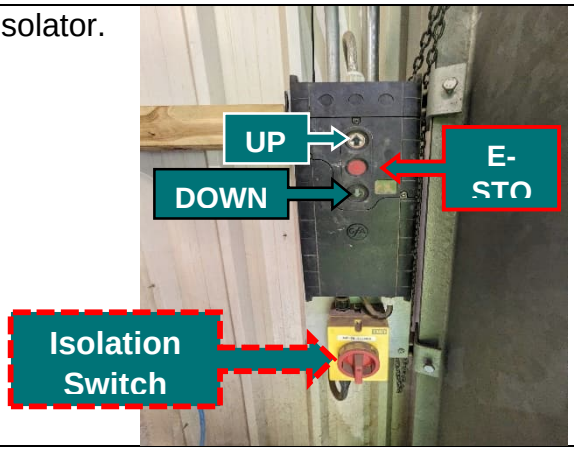
Times Doors can be open:

Day Shift - 30 Mins Every 1 Hour Period

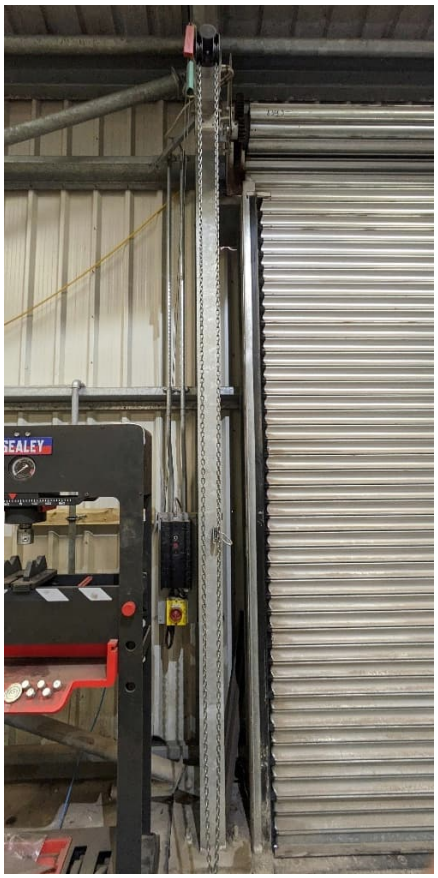
Night Shift – 2.5 Mins Every 15 Mins.

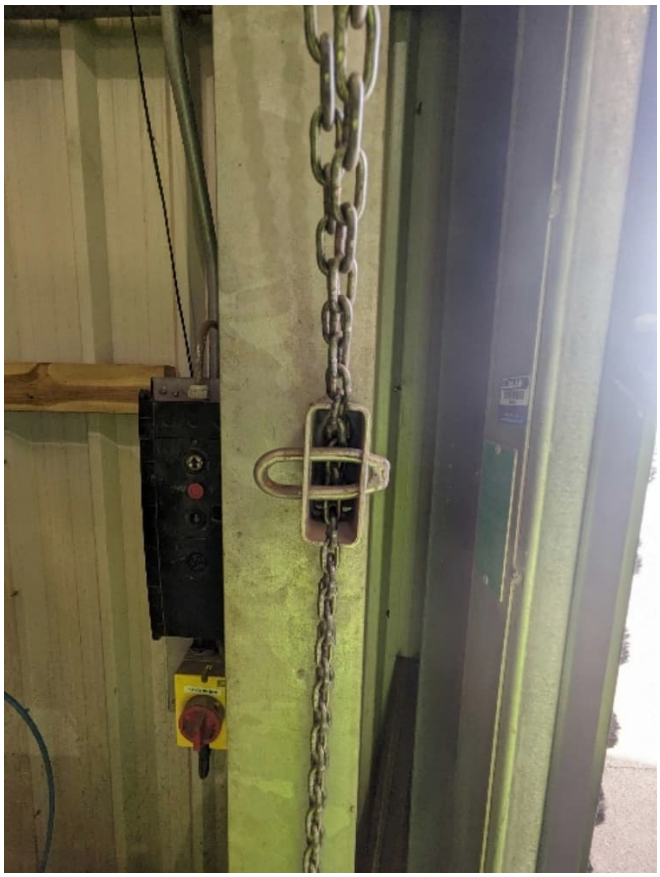
10. Major Equipment Items

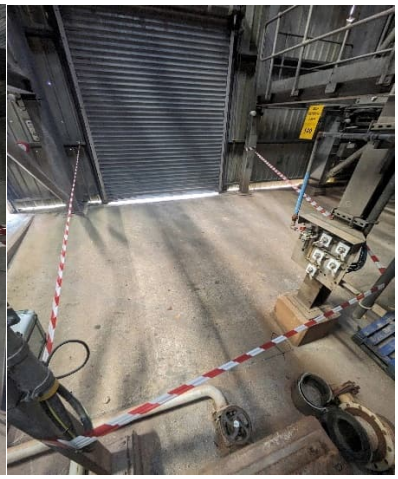
Roller Shutter Door Local Control Panel & Isolator.

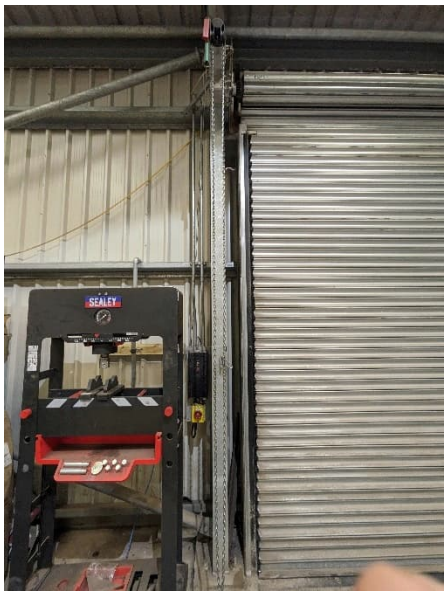


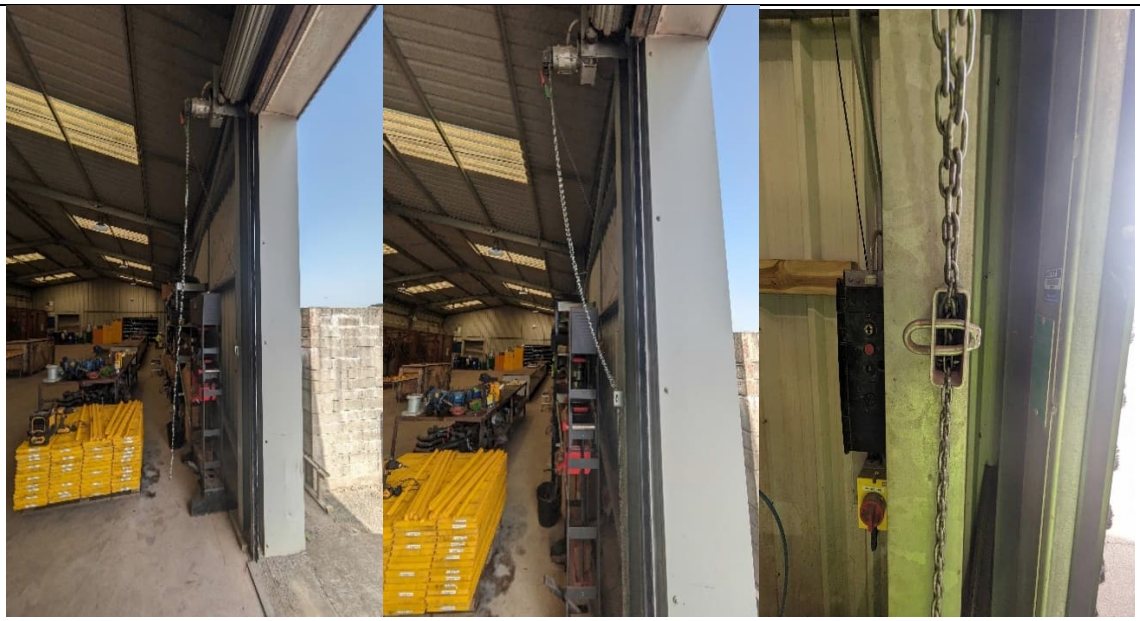
Roller Shutter Door Manual Chain & Chain Lock.





11. Process	
1.	Inform MPF Shift Supervisor of the task that is being under taken and find out if any other planned tasks **(PROCESSING,ENGINEERING & METALLURGY)** can be conducted at the same time to reduce the amount of time the doors are open.
2.	Confirm door needed to open and ensure your route is completely clear and what the load you are transporting is safe or if a load is coming in to the MPF then your final lay down area needs to be clear. Load should be left in a safe way and without causing any obstruction.
2.	Cordon off the area you need to drive into where there is a safe lay down area for the load and mobile plant.  

5.	Park the mobile plant being used at a safe distance from the door. 
6.	Enter building and locate the manual chain or the LCS and ensure they are in good condition and good working order. On the electronic roller door LCS ensure the Isolator is in the on position.  
7.	Open the door fully and if using the manual chain ensure it is secured using the chain securing bracket and lock it in.

	
8.	Safely and slowly enter the MPF sounding two short sharp bursts on the horn to alert anyone nearby of your movements a call over the radio to personnel is also good practice. 
9.	Safely Park mobile plant in designated laydown/parking area and close the roller doors immediately.

	
11.	Repeat steps 5 – 9 for exiting the MPF.
12.	Remove all cordons and inform personnel the mobile plant movements are complete and MPF doors are resealed. Note down the times doors were opened and closed for MPF Shift Supervisor Shift Log.

12. Management Change

If changes to the scope of work occur that are not covered by this document, work must STOP. The approved Management of Change procedure must be followed. Doc No TBC

All changes must be risk assessed with relevant personnel consulted, changes documented and approved by authorized site personnel prior to their implementation ensuring that all change complies with Tungsten West Safety Management System requirements and all applicable Legislation.

13. Reference Documents

- House Keeping
- Mobile Plant Operation (Forklift/Telehandler)
- COSHH
- Reagents
- Audible Noise Management.
- Waste Management
- LOLER
- Daily Vehicle Log Book
- MPF Shift Supervisor Shift Log

4th Floor
6 Devonshire Square
London
EC2M 4YE

wsp.com