

## REPORT

# RHDHV007 Phase 2 Dove's Nest Farm Noise and Vibration Management Plan

Client: Sirius Minerals plc

Reference: RHDHV007 rev 1

Revision: 01/Final

Date: 13 January 2017

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Project related



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**Document Sign-Off**

This document forms the Noise and Vibration Management Plan (NVMP) to address construction works associated with the Phase 2 Site Preparation Works at Dove’s Nest Farm. The NVMP was produced to address the requirements of Planning Condition NYMNPA-18.

The contractor hereby commits to comply with all noise and vibration management approaches and procedures detailed herein,

.....  
(Contractor) (Date)

The remainder of this document contains technical information to support the NVMP and address the requirements of the Planning Condition. The document may be revised and updated as the project progresses.

## 1 Introduction

### 1.1 Purpose of this report

- 1.1.1 In 2014 a planning application (reference NYM/2014/0676/MEIA) was submitted to North York Moors National Park Authority for permission to develop a mine, underground Mineral Transport System (MTS) and Materials Handling Facility (MHF). Planning consent was subsequently granted in 2015 subject to conditions.
- 1.1.2 This document has been prepared on behalf of Sirius Minerals plc (Sirius Minerals) and details the requirements with respect to noise and vibration management for Phase 2 Works at Dove's Nest Farm (see paragraph 1.1.4 below). This document is required to partially discharge condition 18 of the NYMNPA planning permission NYM/2014/0676/MEIA and has been prepared in accordance with current good practice. This planning condition states that:

Table 1-1– Condition NYMNPA 18 Noise and Vibration Management Plan.

NYMNPA 18	Compliance with Condition 18
Prior to the commencement of the development at Dove's Nest Farm or Lady Cross Plantation, a Noise and Vibration Management Plan (NVMP) for the control, mitigation and monitoring of noise and vibration for both construction and operational phases at the two sites shall be submitted to and approved in writing by the MPA in consultation with the SBC EHO. The scheme shall set out the following:	This document addresses Phase 2 Works at Dove's Nest Farm. Works at Lady Cross Plantation are deferred and are therefore not addressed in this Plan.
Noise-sensitive receptors for which predictions shall be made and at which the noise and vibration limits shall apply and which shall include recreational receptors.	Section 4.1
Predicted noise levels at the noise-sensitive receptors from noise and vibration generated at the DNF and LCP sites for the key construction phases during the forthcoming year including any periods in which the higher daytime limit of 70 dB $L_{Aeq}$ shall apply (permitted 56 days for temporary works to create noise-reducing bunds and/or barriers as per Conditions 16 and 18).	Section 4.2 and 4.3.
The best practicable means which will be used to control noise and vibration levels on site including such measures proposed in the Environmental Statement and Supplementary Environmental Information. Such measures shall include, but are not limited to: the use of the quietest available plant, equipment and techniques; the regular maintenance and inspection of such plant and equipment; the use of cladding, attenuators and barriers to reduce noise levels from noisy plant and operations; the specification of appropriate reversing alarms to minimise annoyance; and, measures to reduce vibration and air overpressure during blasting.	Section 6
Details of the noise and vibration monitoring system to be installed around the DNF and LCP sites to continuously log noise levels during construction and operation. The system shall include at least six noise monitors installed around the boundary of the Dove's Nest site and at least four monitors at key residential receptors near the Dove's Nest site and at least four noise monitors around the Lady Cross Plantation Site and at least three monitors at key residential receptors near the Lady Cross Plantation site.	Section 5
The precise number and location of noise monitors shall be set out in the NVMP. The developer shall use reasonable endeavours to obtain access to the residential receptor properties for the installation of noise monitors and only if access cannot be obtained the number or location of noise monitors	Section 5 and Figure B.1

NYMNPA 18	Compliance with Condition 18
may be reduced. The MPA and the SBC EHO and/or their advisers shall be granted access to inspect the noise and vibration data whenever required, records of the data should be kept for a reasonable period and these records should be accessible by the public.	
Details of the procedure to be followed in the event that the noise predictions detailed in the NVMP or the noise limits detailed in conditions 16 to 19 are exceeded. Such procedures shall require the investigation of the reasons for the breach of the limits and the cessation of the activity causing the breach until such a time as additional mitigation can be provided.	Section 6
Details of how the residents will be informed and consulted about the site operations and progress, particularly in regard to blasting and especially noisy operations including details of complaints logging and management procedures and a 24-hour telephone incident hotline. Details of the procedure for investigating complaints and informing complainants of the results of such investigations and of any actions resulting from them.	Section 6
The NVMP shall be adhered to at all times unless agreed previously in writing by the MPA.	A document sign off section has been included within this report requiring the Contractor to commit to compliance with the NVMP
The NVMP shall be updated and agreed whenever appropriate to reflect changes in the programme during construction and operation and at intervals not less than 6 months after the initial start on site and thereafter annually.	Comment to this effect included within Section 1

1.1.3 The Noise and Vibration Management Plan (NVMP) only details the works required for the Phase 2 Works at Dove's Nest Farm and it does not include any activities at Lady Cross Plantation as these works have been deferred. The NYMNPA has confirmed that it supports this approach.

1.1.4 The Phase 2 Works comprise the following:

- General site clearance including tree clearance for the welfare road and scrub clearance, as shown on drawing YP-P10-DNF-CX-009;
- Construction of an acoustic fence/environmental barrier and installation of fencing, gates and security, as shown on drawing YP-P10-DNF-CX-004;
- Excavation and construction of the two tiered working platform with a western upper level at around 204m Above Ordnance Data (AOD) and an eastern lower level at around 200m AOD, as shown in drawing YP-P10-DNF-CX-004;
- Excavation and construction of the site roads, as shown on drawing YP-P10-DNF-CX-004;
- Construction of temporary and permanent soil mound including the environmental screening bund (Bund A) along the western boundary, as shown on drawing YP-P10-DNF-CX-010;
- Construction of surface water drainage, a silt removal facility and an attenuation pond with outfalls to an existing drain, as shown on drawing YP-P10-DNF-CD-001; and
- Construction of a site compound to the east of the welfare access road.

## 1.2 Planning Conditions

- 1.2.1 In addition to Condition NYMNPA 18, two further conditions relating to noise limits are relevant to this NVMP.
- 1.2.2 Conditions NYMNPA 20 and 21 relating to noise limits at the DNF site are reproduced below:

**“Condition NYMNPA 20:**

*Day-time (07.00 hrs to 19.00 hrs) noise levels  $L_{Aeq\ 1hr}$  from mine construction at the Dove’s Nest site, excluding blasting operations, shall not exceed 55 dB  $L_{Aeq\ 1hr}$  and for short-term, construction activities solely relating to the demolition of existing buildings and erection of new structures excluding earth mound and bunds shall not exceed 65dB  $L_{Aeq\ 1hr}$ . An upper limit of 70 dB  $L_{Aeq\ 1hr}$  for the purposes of temporary noisy operations to provide noise-reducing earth bunds and / or barriers may be permitted for up to 56 days in any calendar year provided such temporary operations are specified and agreed in the NVMP described in Condition 14 (sic<sup>1</sup>). Each calendar day when the higher temporary noise level is exceeded shall be counted as one day. Noise levels shall be measured in accordance with BS 4142: 2014 and the limits apply at the curtilage boundary of residential properties and at the following recreational receptors: Falling Foss tea room, Lound House Camp / Caravan site, Sneaton Foss Lane Caravan site and at any location on the Wainwright Coast to Coast walk footpath as illustrated in drawing number PB1110-P2-7-002 which is Figure 7.2 of Part 2 of the York Potash Project Mine, MTS and MHF Environmental Statement dated September 2014.”*

**“Condition NYMNPA 21:**

*Evening (19.00 hrs to 22.00 hrs) and night-time (22.00 to 07.00 hrs) noise levels  $L_{Aeq\ 1hr}$  from mine construction at the Dove’s Nest site, excluding blasting operations, shall not exceed 42 dB  $L_{Aeq\ 1hr}$ . Noise levels shall be measured in accordance with BS 4142: 2014 and the limits apply at the curtilage boundary of residential properties and at the following recreational receptors: Lound House Camp / Caravan site and Sneaton Caravan site.”*

- 1.2.3 This NVMP will be submitted to the NYMNPA for approval before the commencement of the site preparation works. The approved version of this NVMP will then be implemented and adopted by the Contractor.
- 1.2.4 Updates to this plan will be prepared and submitted to the NYMNPA for approval in advance of subsequent construction phases and following any design or method change.
- 1.2.5 In reference to this document, the term ‘construction’ includes all physical and related engineering and construction activities associated with the Phase 2 Works, as described in paragraph 1.1.4.

<sup>1</sup> The NVMP is required by Condition 18



## 2 Guidance

### 2.1 Legislation and British Standards

2.1.1 As a minimum the Contractor will adhere to the following legislation and standards:

- Environmental Protection Act 1990;
- The Control of Pollution Act 1974 (COPA);
- BS 7445 – Description and measurement of environmental noise; and
- BS 5228 – Code of Practice for noise and vibration control on construction and open sites.

### 2.2 Construction noise limits

2.2.1 Based on the conditions (NYMNPA 20 and 21) described in Section 1.2 the standard day time construction noise limit was agreed as 55dB  $L_{Aeq,1hr}$  for activities to be carried out in Phase 2.

2.2.2 There is no planned 'evening' or 'night-time' working in Phase 2. Should evening working become necessary any construction activities will be managed such that they comply with the 42dB  $L_{Aeq,1hr}$  limit.

### 3 Construction Method

- 3.1.1 The Contractor for the Phase 2 Works has provided details of the construction masterplan, number and type of plant items to be used and location/duration of construction activities within the site.
- 3.1.2 The Contractor's Method Statement (document reference 44394-PH2-RAMS-01), and supporting information, details the proposed construction methodology. Predictions of noise levels based upon these details have been undertaken and assessed within this NVMP.

## 4 Predicted Construction Noise and Vibration Levels

### 4.1 Baseline Receptor Locations

4.1.1 The Environmental Statement (ES) which accompanied the planning application included (Part 2, Chapter 8, Noise and Vibration) an assessment of construction noise at the following nearby residential locations:

- Parkdown Bungalow, approximately 180m from the nearest site boundary;
- Thornhill, approximately 467m from the nearest site boundary;
- Moor House Farm, approximately 445m from the nearest site boundary;
- Moorside Farm, approximately 489m from the nearest site boundary; and
- Soulsgrave Farm, approximately 400m from the nearest site boundary.

4.1.2 For the purposes of this NVMP the receptors detailed above are the receptors named in Conditions 20 and 21, at which the noise limits in Conditions 20 and 21 apply, and for which predictions of construction noise were undertaken.

4.1.3 The following recreational receptors were also included within the construction noise calculations:

- Wainwright Coast to Coast walk footpath, approximately 500m from the nearest site boundary;
- Lound House Farm Camp / Caravan site, approximately 750m from the nearest site boundary;
- Falling Foss tea room, approximately 1250m from the nearest site boundary; and
- Seaton Foss Lane Caravan site, approximately 400m from the nearest site boundary.

### 4.2 Predicted Noise Levels

4.2.1 The Control of Pollution Act and BS 5228 define a set of Best Practice working methods and mitigation measures, referred to as Best Practicable Means (BPM). BPM, as detailed in Section 6 of this NVMP, will be adopted.

4.2.2 **Table C.1** in **Appendix C** outlines the results of the construction noise assessment predictions for the Phase 2 Works.

4.2.3 Noise levels due to construction activities in the Phase 2 Works were not predicted to exceed the agreed construction noise limits at any of the identified noise-sensitive receptors during the daytime.

### 4.3 Vibration

- 4.3.1 Ground borne vibration assessments can be drawn from the empirical methods detailed in BS5228-2, in the Transport and Road Research Laboratory Research Report (TRRL) 246: Traffic induced vibrations in buildings<sup>2</sup> and within the Transport Research Laboratory (TRL) Report 429 (2000): Ground borne vibration caused by mechanical construction works<sup>3</sup>.
- 4.3.2 A series of calculations, following the methodologies referred to above, were carried out based on typical construction activities, applying reasonable worst-case assumptions, in order to determine set-back distances at which critical vibration levels may occur. These were presented in the ES
- 4.3.3 **Table C.2, Appendix C** lists the minimum set-back distances at which vibration levels of reportable significance are predicted to occur for typical construction activities that may occur on the site. Where applicable in the relevant calculation methods, a 66.6% certainty factor was included in order to provide a conservative approach.
- 4.3.4 All identified sensitive receptors are at least 180m from the nearest site boundary, indicating that the only potential source of perceptible vibration at a sensitive receptor would be HGV movements.
- 4.3.5 The main haul route through the mine site is shown on Drawing YP-P10-DNF-CX-004, Dove's Nest Farm Construction Phase 2 Masterplan. The minimum distance between the primary haul route and any of the surrounding receptors is over 400m.
- 4.3.6 Ground-borne vibration levels are therefore predicted to be significantly lower than 0.3mm/s at all nearby sensitive receptors, i.e. below levels which are considered to be 'just about perceptible in residential environments'.

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<sup>2</sup> Watts, GR (1990). Traffic induced vibrations in building. Department for Transport, Transport and Road Research Laboratory Research Report (TRRL), Research Report 246.

<sup>3</sup> Hillier, DM and Crabb GI, (2000). Ground borne vibrations caused by mechanised construction works. Highways Agency, Transport Research Laboratory, TRL report 429.

## 5 Noise and Vibration Monitoring Programme

### 5.1 Vibration Monitoring

5.1.1 As detailed within **Section 4.3** of this NVMP, it is anticipated that construction activities during Phase 2 will not give rise to significant levels of vibration at nearby sensitive receptors. Vibration monitoring is therefore not proposed during this phase. This approach has been agreed with the SBC<sup>4</sup> Environmental Health Officer (EHO) and the NYMNPA<sup>5</sup>.

### 5.2 Noise Monitoring

5.2.1 Condition NYMNPA 18 specifies that continuous noise monitoring is undertaken during construction and operation at four key residential receptor locations near the DNF site and at six boundary locations around the DNF site. The four key residential receptor monitoring locations are:

- NM1 – Parkdown Bungalow;
- NM2 – Thornhill;
- NM3 – Moorhouse Farm/Moorside Farm; and
- NM4 – Soulsgrave Farm.

5.2.2 The six boundary monitoring locations will be at points in line with the four key residential receptor locations and the additional recreational receptors identified in the condition:

- BML1 – Site boundary at closest point to Parkdown Bungalow;
- BML2 – Site boundary at closest point to Thornhill;
- BML3 – Site boundary at closest point to Moorhouse Farm/Moorside Farm;
- BML4 – Site boundary at closest point to Soulsgrave Farm/Wainwright Coast to Coast Walk;
- BML5 – Site boundary at closest point to Lound House Farm Camp / Caravan Site; and
- BML6 – Site boundary at closest point to Sneaton Foss Caravan Site / Falling Foss tea room.

5.2.3 The residential and boundary noise monitoring locations are presented in Appendix B, Figure B1.

5.2.4 The redline boundary shown on Figure B1 is the land ownership boundary. The boundary monitoring locations will be located in proximity to the perimeter fence.

5.2.5 Continuous noise monitoring will be undertaken at each location throughout Phase 2. The noise measurements will be conducted in accordance with the guidance contained in BS 7445 parts 1 and 2.

<sup>4</sup> Meeting held on 1<sup>st</sup> December 2016 with Graham Middleton and Julie Pierson (SBC) and meeting held on 17th March 2016 with Graham Middleton, minutes CRM-0293\_H3\_AF\_SBC meeting 2016 03 17

<sup>5</sup> Meeting held on 27<sup>th</sup> April 2016 with Mark Hill, Rona Charles and Chris France of NYMNPA

- 5.2.6 The sound level meters will be fully calibrated, traceable to UKAS standards and will satisfy the requirements of BS EN 61672-1: 2013<sup>6</sup> for a 'Class 1' Sound Level Meter (SLM).
- 5.2.7 The SLMs will record  $L_{Aeq}$ ,  $L_{Amax}$ ,  $L_{A90}$ , and  $L_{A10}$  data with a 'fast' time constant and A-weighting. **Appendix A** presents descriptions of these terms.
- 5.2.8 The noise measurements will be conducted in accordance with BS 7445 with the SLM mounted on a tripod at 1.5m above ground level and 3.5m away from any reflecting surface other than the ground. The instruments will be calibrated before the survey using a portable field calibrator and at monthly intervals during the monitoring period. The instruments will be calibrated before and after any battery change. Any deviation in the calibration level will be noted.
- 5.2.9 Monitoring of weather conditions including wind speed and direction, rainfall, temperature and humidity will be carried out simultaneously at the Dove's Nest Farm site.
- 5.2.10 Reports will be provided monthly to SBC and NYMNPA. The report will contain details of the type and system of sound level meters used and a summary of the measured noise data at each location with corresponding weather data and survey notes. The full data will be presented in an appendix to the report in tabular and graphical format.

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<sup>6</sup> British Standards Institution (2013). BS EN 61672-1:2013 Electroacoustics. Sound level meters. Specifications. BSI, London

## 6 Mitigation and Procedures

### 6.1 Purpose of this section

6.1.1 This section outlines measures to be taken by the Contractor to limit, and manage the impact of, noise. This section also outlines the Best Practicable Means and specific mitigation actions to be adopted.

### 6.2 Best Practice Measures

6.2.1 The Control of Pollution Act and BS 5228 define a set of Best Practice working methods and mitigation measures, referred to as Best Practicable Means (BPM). The following measures will be adopted:

- locating temporary plant so that it is screened from receptors by on-site structures, such as site cabins;
- using modern, quiet equipment and ensuring such equipment is properly maintained (see Section 6.2.8 below) and operated by trained staff (see Section 6.2.10 below);
- applying enclosures to particularly noisy equipment where possible;
- ensuring that mobile plant is well maintained such that loose body fittings or exhausts do not rattle or vibrate;
- ensuring plant machinery is turned off when not in use;
- providing local residents with 24-hour contact details for a site representative in the event that disturbance due to noise from the construction works is perceived, this number to be displayed at the site entrances (see Section 6.4.7);
- informing local residents about the construction works, including the timing and duration of any particularly noisy elements (see Section 6.4.8); and
- keeping noisy deliveries, such as skips and concrete, to the middle of the day.

#### **Machinery enclosure design**

6.2.2 Covers and any enclosures will enclose machines as fully as possible and possess adequate insulation such that sound energy does not readily pass through them. Covers will be lined inside with an efficient sound absorbent material so that noise is not built up within them or reflected out through openings.

#### **Management Structure and Responsibilities**

6.2.3 The Contractor's Operations Manager (or deputy) will be on site during working hours and will be responsible for robust implementation of noise management and mitigation measures.

6.2.4 The key management roles with regard to the design and implementation of noise control at the construction site are the Project Manager and Operations Manager. Their roles include but are not limited to:

### **Project Manager**

- 6.2.5 The Project Manager is responsible for implementation of the appropriate Environmental Policy and CEMP through:
- compliance with contractual requirements regarding environmental matters;
  - adherence to the NVMP and associated control measures;
  - designated responsibility for environmental control during the works;
  - regular meetings with project team members to review environmental matters;
  - regular reporting to the employer on environmental matters; and
  - ensuring adequate resources are made available.

### **Operations Manager**

- 6.2.6 The Operations Manager is directly responsible to the Project Manager for the day to day administration of environmental issues. This shall include, but not be limited to:
- managing and advising on environmental matters affecting the Project with the assistance of the Environmental Manager, Site Environmental Coordinators and Environmental Inspector;
  - reporting to the Project Manager on implementation of the NVMP;
  - carrying out regular internal audits and procedure review on environmental matters;
  - reviewing and mitigating all environmental impacts identified in submitted method statements;
  - recording and maintaining all environmental matters/incidents in accordance with reporting procedures; and
  - ensuring all team members work in accordance with the NVMP.

### **Maintenance**

- 6.2.7 Maintenance of plant will be carried out routinely and in accordance with the manufacturers' guidance.
- 6.2.8 A regular inspection of all plant and equipment will be undertaken as a minimum to ensure that, as a minimum:
- all plant is in a good state of repair and fully functional;
  - any plant found to be requiring interim maintenance has been identified and taken out of use;
  - acoustic enclosures fitted to plant are in a good state of repair;
  - doors and covers remain closed during operation (self-closing doors/covers are recommended); and
  - any repairs are being undertaken by a fully qualified maintenance engineer.



### Training

- 6.2.9 The site induction programme and site rules will include good working practice instructions for site staff, managers, visitors and contractors to help minimise noise whilst working on the site.
- 6.2.10 Good working practice guidelines/instructions will include, but not be limited to, the following points:
- avoid unnecessary revving of engines;
  - plant used intermittently will be shut-down between operational periods, where possible;
  - avoid reversing wherever possible;
  - report any defective equipment/plant as soon as possible so that corrective maintenance can be undertaken; and
  - handle material in a manner that minimises noise.

## 6.3 Specific Mitigation

### Bunds

- 6.3.1 The bund area at Bund A and the temporary storage bunds to the north-east of the main platform will be constructed by first pushing the top soils to the outer perimeter of the bund to form a temporary bund. This will provide screening between the residential receptor and the continuing formation of the main bunds.
- 6.3.2 As the internal structure of the bund is built up in sections, the outer topsoil bund will be 'pulled' back over the bund for final restoration. This procedure will be repeated with sub-soils forming the temporary bunds, until the full bund is completed with top-soils claimed from other areas of the site, loose-laid over the bund area.
- 6.3.3 This process ensures that the majority of the more noisy plant associated with constructing the bunds, i.e. the bulldozers and compactors, benefit from some degree of visual and acoustic screening. Only the initial deposits and final restoration works which do not require compaction will take place on the top and outer faces of the bunds.
- 6.3.4 Where dumper trucks move from the main haul routes, across earth bunds and up to the position in which they deposit spoil loads, they will do so without driving directly over a bund at more than a 1:10 slope angle. Where bund sides are steeper than this, movements shall either navigate around bund edges or the bunds will be formed to include a 'cutting' through which dumper trucks can pass at an appropriate incline.

### Activity timing, barriers, screens and enclosures

- 6.3.5 At Parkdown Bungalow the predicted noise level is, on occasion, close to the agreed limit during daytime activities. The predictions assumed a worst case whereby vegetation clearance and site boundary fencing activities were undertaken concurrently at the site boundary nearest to this receptor.
- 6.3.6 As a precautionary approach these works will be considered to require the application of the upper limit of 70 dB  $L_{Aeq,1hr}$  detailed within Condition NYMNPA 20 for those periods when works to create earth bunds around the platform area are undertaken concurrently with vegetation clearance and fencing activities at the site boundary. Such activities are to be carried out during daytime hours only.
- 6.3.7 Fixed, close boarded 3m high timber screens will be installed along the western flank of the Site boundary as shown on drawing **YP-P10-DNF-CX-004**.
- 6.3.8 Where applicable, any enclosures, temporary screens or barriers (including, for example, through the use of straw bales) will possess adequate insulation such that sound energy does not readily pass through them.

## 6.4 Communications

### Procedure for complaints or breach of limits

- 6.4.1 If the noise limits are exceeded as a result of the works, or a complaint is received from a local resident, an investigation will be instigated by the Operations Manager as soon as possible, consistent with safe operational practices and, as a minimum, within one working day to identify the cause of the non-compliance or complaint.
- 6.4.2 Such an investigation may involve the identification and cessation of the activity or activities considered to be the cause of the non-compliance/complaint (where operationally safe to do so) and/or the investigation of mitigation measures to reduce the noise emission levels from the activity or activities, for example the replacement of noisy plant with quieter alternatives and/or the use of temporary screens.
- 6.4.3 Any recommended deviation from agreed working practices will be identified immediately and conformance to the working practice reinstated.
- 6.4.4 A complaints response system will be maintained for the site enabling any complaints regarding noise to be reported and appropriate action taken.
- 6.4.5 The complainant will receive acknowledgement of their complaint from the Contractor/Operations Manager within 24 hours of receipt of the complaint. An update as to the progress of the investigation and details of any remedial actions proposed or taken will be provided to the complainant by the Contractor/Operations Manager every five working days until the resolution of the complaint.

### Public relations

- 6.4.6 It is essential to maintain good public relations with local residents in nearby noise-sensitive receptors.
- 6.4.7 A Community and Stakeholder Engagement Framework (CSEF) is found in an appendix to the CEMP and details actions to be taken by Sirius Minerals plc and the Contractor. The main actions specified within the CSEF are summarised below:

Table 6-1– CSEF Actions.

	Pre-briefing activities	Ongoing management
<b>Sirius Minerals plc</b>	<ul style="list-style-type: none"> <li>Establish Liaison Group Forum and Traffic Management Liaison Group</li> <li>Project update newsletter</li> <li>Media, website update, social media</li> <li>Briefings with site neighbours, landowners, community representatives and other key stakeholders as identified</li> <li>Produce leaflet detailing upcoming construction activities</li> <li>Send letters to stakeholders likely to be immediately affected</li> <li>Hold public open days / exhibitions</li> </ul>	<ul style="list-style-type: none"> <li>Chair Liaison Group Forum and Traffic Management Liaison Group</li> <li>Manage 24-hour community helpline and <a href="mailto:info@yorkpotash.co.uk">info@yorkpotash.co.uk</a></li> <li>Attend parish and town council meetings quarterly</li> <li>Regular updates to site neighbours, landowners, community representatives and interest groups</li> <li>Media, website update, social media</li> <li>Manage complaints procedure</li> </ul>
<b>Construction contractor</b>	<ul style="list-style-type: none"> <li>Install information board and signage at construction sites / transport routes</li> <li>Provide information to YPL to be used in leaflets, letters, web content, etc., as required</li> <li>Attend public open days/exhibitions and meetings with stakeholders as required</li> </ul>	<ul style="list-style-type: none"> <li>Attend liaison groups, parish council and other meetings as required</li> <li>Provide information to support on-going community and stakeholder relations</li> <li>Participate in media events as required</li> <li>Adherence to complaints procedure, media protocol and crisis response procedure</li> </ul>

6.4.8 A display board (i.e. a site information board) will be erected at the entrance to the Dove's Nest Farm site to keep local residents and stakeholders informed of the Works and their schedule. The site information board will identify key personnel, contact addresses and telephone numbers, as well as showing visually the progress of Works. These signs will be erected two weeks before the Works commence and will remain in situ until all of the Phase 2 Works are completed.

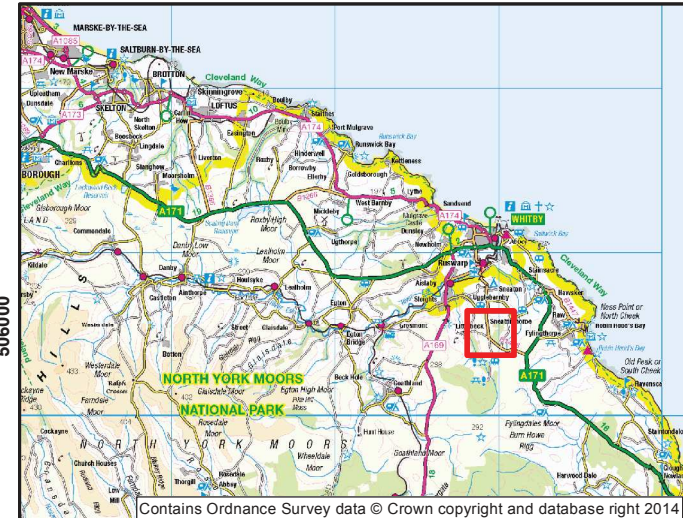
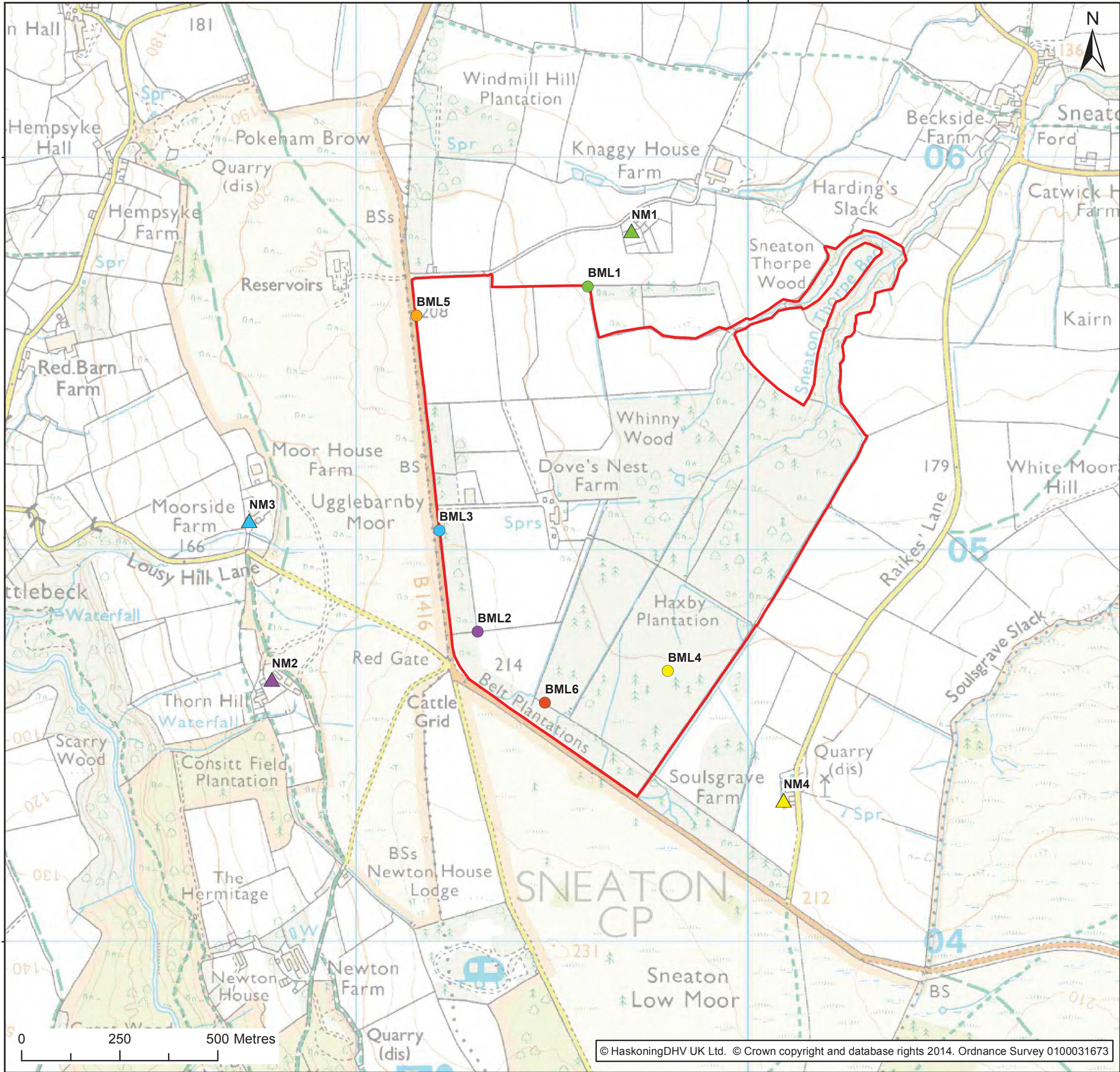
## Appendix A Acoustic Terminology

Term	Definition
Noise sensitive receptors	People, property or designated sites for nature conservation that may be at risk from exposure to noise and vibration that could potentially arise as a result of the proposed development/project
Noise and Vibration study area	The area assessed for noise and vibration impacts during this assessment
Baseline scenario	Scenarios with the proposed development/project not in operation
Decibel (dB)	A unit of noise level derived from the logarithm of the ratio between the value of a quantity and a reference value. It is used to describe the level of many different quantities. For sound pressure level the reference quantity is 20 $\mu$ Pa, the threshold of normal hearing is 0dB, and 140dB is the threshold of pain. A change of 1dB is only perceptible under controlled conditions. Under normal conditions a change in noise level of 3dB(A) is the smallest perceptible change.
dB(A)	Decibels measured on a sound level meter incorporating a frequency weighting (A weighting) which differentiates between sounds of different frequency (pitch) in a similar way to the human ear. Measurements in dB(A) broadly agree with people's assessment of loudness. A change of 3 dB(A) is the minimum perceptible under normal conditions, and a change of 10 dB(A) corresponds roughly to halving or doubling the loudness of a sound. The background noise level in a living room may be about 30 dB(A); normal conversation about 60 dB(A) at 1 metre; heavy road traffic about 80 dB(A) at 10 metres; the level near a pneumatic drill about 100 dB(A).
$L_{Aeq,T}$	The equivalent continuous sound level – the sound level of a notionally steady sound having the same energy as a fluctuating sound over a specified measurement period (T). $L_{Aeq,T}$ is used to describe many types of noise and can be measured directly with an integrating sound level meter.
$L_{A10,T}$	The A weighted noise level exceeded for 10% of the specified measurement period (T). $L_{A10}$ is the index generally adopted to assess traffic noise
$L_{A90,T}$	The A weighted noise level exceeded for 90% of the specified measurement period (T). In BS 4142:2014 it is used to define the 'background' noise level.
$L_{Amax}$	The maximum A-weighted sound pressure level recorded during a measurement.
PPV	Instantaneous maximum velocity reached by a vibrating element as it oscillates about its rest position.
'A' weighting	A frequency weighting to compensate for the varying sensitivity of the human ear to sound at different frequencies.

Term	Definition
Fast time constant	Sound level meters have two conventional time weightings, F = Fast and S = Slow with time constants of 125 ms and 1000 ms respectively. Fast time constant relates to the response time of the meter which allows rapid variations in noise level to be registered.



## Appendix B Figures



- Legend:
- Land Ownership Boundary
  - Receptor Monitoring Locations**
    - ▲ NM1 - Parkdown Bungalow
    - ▲ NM2 - Thornhill
    - ▲ NM3 - Moorside Farm
    - ▲ NM4 - Soulsgrave Farm
  - Site Boundary Monitoring Locations**
    - BML1 - Parkdown Bungalow
    - BML2 - Thornhill
    - BML3 - Moorside Farm
    - BML4 - Soulsgrave Farm/Wainwright Coast to Coast Walk
    - BML5 - Lound House
    - BML6 - Sneaton Foss/Falling Foss

Client:	Project:
Sirius Minerals plc	Sirius North Yorkshire Polyhalite Project

Title: Proposed Residential Receptor and Boundary Noise Monitoring Locations

Appendix: B	Figure: B.1	Drawing No: PB1110-RHDHV007-D001
Rev: A	Date: 12/01/2017	Drawn: GC
	Checked: AB	Size: A3
		Scale: 1:10,000

Co-ordinate system: British National Grid


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## Appendix C Predicted Construction Noise and Vibration Levels

Table C.1 Calculated noise levels – Phase 2

Receptor Location	Daytime (07:00–19:00)	
	Limit $L_{Aeq,1hr}$ dB	Maximum $L_{Aeq,1hr}$ dB
Parkdown Bungalow	55	54.4
Moor House Farm	55	48.2
Moorside Farm	55	46.7
Thornhill	55	46.5
Soulsgrave	55	48.7
Wainwright Coast to Coast Path	55	46.3
Sneaton Foss Caravan Park	55	48.2
Falling Foss Tearooms	55	26.2
Lound House Caravan Park	55	42.1

**Table C.2 Predicted Distances at which Specific Vibration Levels Occur**

Activity	Set-back Distance at which Vibration Level (PPV) occurs			
	0.3 mm/s	1.0 mm/s	10 mm/s	15 mm/s
Vibratory Compaction (Start-up)	166m*	65m	9m	6m
Vibratory Compaction (Steady State)	102m	44m	8m	6m
Vibratory Piling (Start-up)	154m*	56m	8m	6m
Vibratory Piling (Steady State)	75m	32m	6m	5m
Tunnelling	137m*	54m	9m*	7m*
HGV Movement on uneven Haul Route	277m	60m	3m	2m

*Note\* These predicted distances are outside the limitations of the calculations and are therefore provided for information only.*



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