

REPORT

Phase 4a - Woodsmith Mine Construction Environmental Management Plan

Woodsmith Mine Phase 4a - CEMP

Client: Sirius Minerals PLC

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HASKONINGDHV UK LTD.

Rightwell House
Rightwell East
Bretton
Peterborough
PE3 8DW
Industry & Buildings
VAT registration number: 792428892

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Author(s): Charlotte Goodman

Drafted by: Charlotte Goodman

Checked by: Matthew Hunt

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Approved by: Matthew Hunt

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1 Introduction

1.1 Purpose of Document

- 1.1.1 In 2014 a planning application (reference NYM/2014/0676/MEIA) was submitted to the North York Moors National Park Authority (NYMNPA) for permission to develop a polyhalite mine and underground Mineral Transport System (MTS). Planning permission was subsequently granted in 2015 subject to conditions, as varied in February 2018 by NYM/2017/0505/MEIA.
- 1.1.2 This Construction Environmental Management Plan (CEMP) has been prepared on behalf of Sirius Minerals plc (Sirius Minerals) to address the changes associated with amended Phase 4 Works (herein 'Phase 4a') at Woodsmith Mine (as described in **paragraph 1.2.1** below).
- 1.1.3 This document is intended to be read in conjunction with the Phase 4 CEMP (reference 40-RHD-WS-70-EN-RP-0026), and the information herein supersedes the Phase 4 documentation only where specified.
- 1.1.4 This document is required to partially discharge NYMNPA-93, and has been prepared in accordance with current good practice. This planning condition states that:

Table 1-1 Condition NYMNPA-93: Construction Environmental Management Plan

NYMNPA-93	Compliance with Condition NYMNPA 93
<p>Prior to the commencement of each Phase of Construction in accordance with the approved Phasing Plan at either Dove's Nest Farm or Lady Cross Plantation, an updated CEMP shall be based on the approved Construction Method Statement (CMS) and shall be submitted to and approved in writing by the MPA in consultation with the Environment Agency in respect of the area concerned. The CEMP shall include details of:</p>	<p>This version of the CEMP is for Phase 4a as defined in Section 1.2 below.</p> <p>Earlier versions of the CEMP have been produced for preceding works.</p> <p>As stated in Section 1.1.3 above, this version of the CEMP should be read in conjunction with 40-RHD-WS-70-EN-PL-0023 (Phase 4 CEMP).</p>
<p>The size, location and design of any site compounds, including how any potentially polluting materials will be stored to minimise the risk of pollution;</p>	<p>Section 3.2, 3.3, Section 3.6 and Section 11.2 Phase 4a Construction Method Statement 40-SMP-WS-1000-CN-MS-00001 Phase 4 CEMP</p>
<p>An Incident Response Plan to deal with any pollution that may occur during the course of construction;</p>	<p>Phase 4 CEMP</p>
<p>A scheme for the recycling/disposing of waste resulting from demolition and construction works;</p>	<p>Section 11 Phase 4 CEMP</p>
<p>Storage of waste not covered by the Mine Waste Directive;</p>	<p>Phase 4 CEMP</p>
<p>Measures to control the glare from on-site lighting;</p>	<p>Phase 4 CEMP</p>

NYMNP-93	Compliance with Condition NYMNP 93
Measures to manage deliveries by HGV including routing and timing for deliveries and details of the penalty system for breaches of the agreed control;	Phase 4 CEMP
Temporary traffic management;	Not applicable to this Phase
<p>The provision of a Dust Management Plan relating to Phase 1 of the construction period (earth works and bund formation) and Polyhalite handling and stockpiling to include dust generation modelling so as to identify sensitive receptors; likely dust generation and its disposition during the construction Phases and operation over time and under different weather conditions; the avoidance and mitigation measures required to ensure dust deposition levels at the sensitive receptors are maintained at the residual levels identified in the approved EIA, and monitoring arrangements. The Dust Management Plan must comply with the criteria set out in the 'Dust and Air Emission Mitigation Measures' best practice guidance for control of dust on construction sites from the Institute of Air Quality Management 2012. The monitoring arrangements will include dust deposition or dust flux or real-time PM₁₀ continuous monitoring locations; baseline dust monitoring at least three months before construction commences; daily on-site and off-site inspections at monitoring locations with results recorded in a log to be made available to the MPA on request, and more frequent monitoring during periods of high dust generation;</p>	Phase 4 CEMP
<p>In the event that there is insufficient clay within the Lady Cross Plantation site to form the 1m deep basal layer beneath the spoil storage area, a contingency plan to address the importation of clay, including the source, quantity and quality of such material, and how adverse effects on the water environment would be avoided;</p>	Lady Cross Plantation is not covered in this CEMP as works at that site have been deferred.
<p>How the requirements of the approved CEMP will be disseminated to all relevant staff/ Contractor's throughout the construction period;</p>	Phase 4 CEMP
<p>The location of the site notice board;</p>	Phase 4 CEMP
<p>A scheme for parking, loading, unloading during construction;</p>	Phase 4 CEMP
<p>A scheme for security and lighting during construction;</p>	Phase 4 CEMP

NYMNPA-93	Compliance with Condition NYMNPA 93
A protocol for the replenishment of tanks and containers including that all refuelling of vehicles, generators, plant and equipment shall be supervised and shall take place within a suitable bunded, impervious hardstanding;	Phase 4 CEMP
Contingency proposals for if fuel cannot be delivered for the generators, e.g. due to adverse weather;	Phase 4 CEMP
How those artificial or historically straightened ephemeral surface water channels referenced in sections 15.7.22-15.7.24 of chapter 15 of part 2 of the ES are to be retained wherever possible, and enhanced to increase their capacity (e.g. through the introduction of meanders) and to increase their ability to capture sediment (e.g. through suitable planting);	40-FWS-WS-70-CI-PL-0002 – Phase 3 Surface Water Management Plan 40-RHD-WS-70-EN-PL-0014 - Phase 3 – Woodsmith Mine CEMP
Proposals / contingency plans for waste not managed as part of the Mine Waste Permit comprising the storage and management of temporary mining waste stored on-site for less than three years (e.g. Pyritic Mudstone); non-inert and non-hazardous materials stored for less than one year, and unexpected hazardous waste stored for less than six months, including measures to prevent the dispersal of dust, leachate and surface water runoff;	Phase 4 CEMP
A Precautionary Method of Working for Site Clearance (PMWSP) which shall be submitted to and agreed in writing by the MPA prior to commencement of Preparatory Works and shall be adhered to thereafter. The PMSWP shall set out proposals for tree clearance and the demolition of structures and shall include that between March and September each year surveys of areas to be cleared should occur no less than 48 hours before clearance occurs so that occupied wild bird nests can be identified and prevented from being destroyed;	Phase 4 CEMP
Alarms fitted to mobile plant and vehicles for the purposes of warning pedestrians of their movements.	Phase 4 CEMP

1.1.5 This document also provides the information necessary to partially discharge condition NYMNPA-68 for Phase 4a. This planning condition states that:

Table 1-2 Condition NYMNPA-68: Final Details of Temporary Structures

NYMNPA-68	Compliance with Condition NYMNPA 68
Final details of all temporary structures, including samples of materials proposed including colour shall be submitted to and approved by the MPA prior to construction. The temporary Structures as approved shall be implemented in complete accordance with the details agreed.	Section 3 Appendix 1
For the avoidance of doubt this also includes colours of generator stacks.	No generator stacks are required for Phase 4a in addition to those supplied on the plant itself.

1.1.6 Additional Conditions addressed in this CEMP are detailed in **Table 1-3**.

Table 1-3 Additional Planning Conditions Addressed in the CEMP

Condition	Topic	Compliance with Condition
NYMNPA-52	Protected species	All Works take place on a constructed working platform and will not interact with protected species. See Section 7.1 Refer to Protected Species Management Plans: 40-RHD-WS-70-EN-PL-0010 Ph3 PSMP for Reptiles; 40-RHD-WS-70-EN-PL-0011 Ph3 PSMP for Badgers; 40-RHD-WS-70-EN-PL-0012 Ph3 PSMP for Birds; and 40-RHD-WS-70-EN-PL-0013 Ph3 PSMP for Bats. These remain applicable for Phase 4a
NYMNPA-57	Landscape and ecological management	No works of landscape or ecological management relating to the long-term environment of the mine site will be undertaken during Phase 4a. See Section 7.4 . Refer to the Phase 3 Landscape and Ecological Management Plan (LEMP) (40-RHD-WS-70-EN-PL-0008) as this remains applicable for Phase 4a
NYMNPA-70	Trees and vegetation	No vegetation removal will occur during Phase 4a. See Section 7.2 . Refer to Tree Protection and Clearance (40-RHD-WS-70-EN-MS-0002 (Phase 3) as this remains applicable for Phase 4a
NYMNPA-73	Woodland management	The Phase 4a Works do not involve any management of the Haxby and Belt plantations or Whinny Wood.
NYMNPA-76	Soil management	No soil stripping will be undertaken as part of the Phase 4a Works. See Section 10 .
NYMNPA-95	Archaeological written scheme of investigation	As all Phase 4a Works take place on a pre-constructed working platform or areas stripped during previous phases, there is no requirement for an update of the approved WSI. The procedures set out for unexpected archaeological discoveries established in Phases 3 and 4 will continue to be implemented, as required. See Section 8 .
NYMNPA-97	Shaft diameters and spoil management	This condition is addressed in the Phase 4a Construction Method Statement (40-SMP-WS-1000-CN-MS-00001) and the Woodsmith Mine Construction Phase 4a Masterplan (40-ARI-WS-71-CI-DR-1090)

1.1.7 This document only details the additional activities required for Phase 4a at Woodsmith Mine associated with the Sirius Minerals North Yorkshire Polyhalite Project ('the project'). It does not include any activities at Lady Cross Plantation as these Works have been deferred. Updates to this plan will be prepared for subsequent construction Phases and following any design or method change. The NYMNPA, as well as the Environment Agency and Natural England agreed that they support this approach in meetings held in April 2016.

1.2 Phase 4a

1.2.1 The scope of Phase 4a described by this document is as per Phase 4 with the exception that no D-Walling will be undertaken at the MTS shaft, and instead the following activities will be implemented:

- Mobilisation to site;
- Use of a Vertical Shaft-sinking Machine (VSM) at the MTS Shaft, in place of the previously planned D-Walling machines;
- Construction of the guide wall and strand jacks for the operation;
- Installation of ancillary equipment;
- Machine setup and installation of VSM;
- Excavation to -55m below platform level (bpl);
- Excavation to -120m bpl;
- Deposition of limited extractive material from within the first 120m of the MTS shaft into earthworks bunds; and
- Grouting of Annulus.

1.3 Scope of this Document

1.3.1 This CEMP details how the Phase 4a Works will be planned, monitored and managed in an environmentally responsible manner. It outlines the management framework for the environmental requirements, commitments, and performance targets associated with the planning and implementation of Phase 4a of the project only in accordance with planning permission NYM/2014/0676/MEIA (as amended by NYM/2017/0505/MEIA).

1.3.2 This CEMP refers to several management plans, which have been prepared to partially discharge a number of planning conditions. Collectively these plans incorporate all mitigation measures relevant to Phase 4a as identified in the original planning application (condition NYMNPA-06 refers). For completeness, in addition to being read in conjunction with the Phase 4 CEMP, this Phase 4a CEMP should be read together with the documentation submitted to partially discharge the following conditions:

- Condition NYMNPA-18: *Noise and Vibration Management Plan* (40-RHD-WS-70-EN-PL-0025 (Phase 4a));
- Condition NYMNPA-34: *Construction Traffic Management Plan* (40-RHD-WS-70-CI-PL-0006 (Phase 4a));
- Condition NYMNPA-46: *Hydrogeological Risk Assessment* (40-FWS-WS-70-WM-RA-0005 (Phase 4a));
- Condition NYMNPA-47: *Groundwater Management Plan* (40-FWS-WS-70-WM-PL-0014 (Phase 4a));

- Condition NYMNPA-52: *Protected Species Management Plans* (400-RHD-WS-70-EN-PL-0010 Ph3 PSMP Reptiles; 40-RHD-WS-70-EN-PL-0011 Ph3 PSMP Badger; 40-RHD-WS-70-EN-PL-0012 Ph3 PSMP Birds; 40-RHD-WS-70-EN-PL-0013 Ph3 PSMP Bats as these remain applicable for Phase 4a);
 - Condition-NYMNPA-60: *Surface Water Drainage Scheme* (40-ARI-WS-71-PA-RP-1050 (Phase 3)) as this remains applicable for Phase 4a and is supplemented by Woodsmith Mine - Phase 4a Works NYMNPA 60 and 79 Surface Water Drainage Scheme (40-ARI-WS-71-PA-RP-1054);
 - Condition NYMNPA-70: *Tree Protection and Clearance* (40-RHD-WS-70-EN-MS-0002 (Phase 3) as this remains applicable for Phase 4a);
 - Condition NYMNPA-76: *Soil Management Plan* (40-AMC-W-71-EN-PL-0006 (Phase 4));
 - Condition NYMNPA-79: *Surface Water Management Plan* (40-ARI-WS-71-PA-RP-1050 (Phase 3)) as this remains applicable for Phase 4a and is supplemented by Woodsmith Mine - Phase 4a Works NYMNPA 60 and 79 Surface Water Drainage Scheme (40-ARI-WS-71-PA-RP-1054);
 - Condition NYMNPA-91: *Emissions to Atmosphere* (40-RHD-WS-70-EN-RP-0003 (Phase 4a));
 - Condition NYMNPA-92: *Construction Vehicle and Plant Management Plan* (40-RHD-WS-70-CI-PL-0007 (Phase 4a)); and
 - Condition NYMNPA-95: *Written Scheme of Investigation* (40-COT-WS-70-EN-PL-0002 (Phase 3) as this remains applicable for Phase 4a).
- 1.3.3 Where other more detailed documentation about environmental issues exists, this CEMP summarises and references those documents.
- 1.3.4 The CEMP will remain a live document, being reviewed and updated in consultation with the appointed Contractors or sub-Contractor(s) as required. Each of these updated CEMPs will be submitted to NYMNPA for approval prior to the start of each Phase of construction.

2 Environmental Management Framework

2.1 Structure and Responsibilities

2.1.1 This CEMP addresses those environmental matters within the responsibility of Sirius Minerals and the Contractors engaged on its behalf to deliver the Phase 4a Works, which are not covered by the CEMP produced for Phase 4. While overall responsibility for compliance with environmental and approvals requirements will remain with Sirius Minerals, the Contractors working on site are accountable for undertaking the construction activities in line with the requirements of this CEMP as well as all legal and other requirements imposed via permits and licences.

2.2 Environmental Aspects and Impacts

2.2.1 These remain unchanged from Phase 4.

2.3 Environmental Management Plan

2.3.1 This remains unchanged from Phase 4.

2.4 Objectives and Targets

2.4.1 These remain unchanged from Phase 4.

2.5 Training, Awareness and Competence

2.5.1 The Phase 4 CEMP (Table 2-2) remains applicable for Phase 4a.

2.6 Internal Communication

2.6.1 The Phase 4 CEMP (Table 2-2) remains applicable for Phase 4a.

2.7 External Communication

2.7.1 This remains unchanged from Phase 4.

Site Notice Boards

2.7.2 This remains unchanged from Phase 4.

Traffic Management Liaison Group

2.7.3 This remains unchanged from Phase 4.

2.8 Monitoring of Compliance

2.8.1 All construction and installation activities for Phase 4a Works will be supervised by the Contractors' Project Managers with the support of members of their teams on a daily basis using the same procedures as detailed in the Phase 4 CEMP.

2.9 Complaints Procedure

2.9.1 This remains unchanged from Phase 4.

3 Description of Site

3.1 Fencing and Security of the Site

3.1.1 This remains unchanged from Phase 4.

3.2 Site Layout and Compounds

3.2.1 Minor revisions to the site layout for Phase 4a, associated with the VSM, are detailed in drawing reference 40-ARI-WS-71-CI-DR-1090 and the Phase 4a Construction Method Statement (40-SMP-WS-1000-CN-MS-00001). The details of the site compounds at Woodsmith Mine and their layouts are detailed in the Phase 4 CEMP and the majority of this remains valid for the Phase 4a Works.

3.3 Welfare Facilities

3.3.1 These remain unchanged from Phase 4.

3.4 Lighting

3.4.1 Lighting will be required around the MTS shaft for operation of the VSM during hours of darkness. This will be controlled in the same manner as detailed for Phase 4 to minimise light pollution (i.e. directional task lighting will be used, and turned off when not in use).

3.5 Materials Storage

3.5.1 Details of the locations for storage of plant and materials remain unchanged from Phase 4. Where additional storage is required, this will be local to the Works on the MTS Shaft platform. Materials will be stored appropriately in accordance with the approach detailed in the Phase 4 CEMP.

3.6 Wheel Washing Facilities

3.6.1 These remain unchanged from Phase 4.

3.7 Site Housekeeping

3.7.1 Good housekeeping measures that will be implemented on site remain as for Phase 4.

4 Traffic

4.1 Construction Traffic Management Plan (CTMP)

4.1.1 A Phase 4a Construction Traffic Management Plan (CTMP) has been prepared for Woodsmith Mine, (40-RHD-WS-70-CI-PL-0006) and submitted to partially discharge condition NYMNPA-34. The CTMP contains a range of measures for the management of transport during Phase 4a.

Parking and Deliveries to Site

4.1.2 Details of parking, deliveries and unloading at Woodsmith Mine remain unchanged from Phase 4.

Pedestrians and cyclists

4.1.3 The procedures set out in the Phase 4 CEMP are applicable to Phase 4a.

4.2 Enforcement Systems for Breaches of Traffic Management Requirements

4.2.1 These remain unchanged from Phase 4.

5 Noise and Vibration

5.1 Noise and Vibration Management Plan

5.1.1 A Phase 4a Noise and Vibration Management Plan (40-RHD-WS-70-EN-PL-0025) has been prepared and submitted to the NYMNPA to partially discharge condition NYMNPA-18. It includes details of the noise sensitive receptors, agreed noise limits, monitoring to be undertaken and the mitigation measures to be implemented.

6 Air Quality and Dust Management

6.1.1 Measures developed to reduce the impact of construction on air quality and, as part of this, to manage dust, remain unchanged from Phase 4. No additional dust control measures are required for Phase 4a.

6.2 Construction Vehicle and Plant Management Plan

6.2.1 A Phase 4a Construction Vehicle and Plant Management Plan (40-RHD-WS-70-CI-PL-0007), has been prepared to enable the partial discharge of planning condition NYMNPA-92.

6.2.2 Mitigation measures identified in the Phase 4 CVPMP (40-RHD-WS-70-CI-PL-0005) to minimise particulate emissions remain applicable for Phase 4a.

7 Nature Conservation

7.1 Protected Species and Precautionary Method of Working for Site Clearance

7.1.1 Protected Species Management Plans (PSMP) were produced for bats, reptiles, badgers and birds to partially discharge planning condition NYMNPA-52 for Phase 3. These remain applicable for the Phase 4a works. There is no site clearance planned in Phase 4a and so no precautionary method of working for site clearance is required.

7.2 Tree Protection Area

7.2.1 The Arboricultural Method Statement (AMS), with an accompanying Tree Protection Plan (TPP) that was prepared to partially discharge NYMNPA-70 for Phase 3 remains applicable for Phase 4a.

7.3 Protected Habitats within the North York Moors Natura 2000 Site

7.3.1 Woodsmith Mine is located adjacent to the North York Moors Special Area of Conservation (SAC) and Special Protection Area (SPA), which includes Sneaton Low Moor and Ugglebarnby Moor. Surveys have concluded that the species recorded in the SAC / SPA do not make up groundwater dependent moor plant communities with the exception of one localised area.

7.3.2 Phase 4a will employ an alternative construction methodology for groundwater control within the first 120m of the MTS shaft and will not trigger the need for mitigation measures to prevent adverse impacts. This is discussed in more detail in the report 'Hydrogeological Risk Assessment for Phase 4a Works at Woodsmith Mine' (40-FWS-WS-70-WM-RA-0005) which was prepared to allow the partial discharge of condition NYMNPA-46.

7.4 Environmental Enhancement

7.4.1 The Phase 3 Landscape and Ecological Management Plan (LEMP) (40-RHD-WS-70-EN-PL-0008) was prepared to partially discharge condition NYMNPA-57 and remains applicable for Phase 4a.

8 Archaeology

8.1.1 The Written Scheme of Investigation (WSI) referenced in the Phase 4 CEMP (40-COT-WS-70-EN-PL-0002) remains valid for Phase 4a and will be applied to the limited earthworks being undertaken in this Phase.

9 Hydrogeology, Water Quality and Drainage

9.1 Introduction and Generic Water Protection Issues

- 9.1.1 Measures to prevent pollution of the water environment remain unchanged from Phase 4.
- 9.1.2 Specific mitigation to protect surface water and ground water was developed and this is discussed in **Sections 9.2 – 9.4** inclusive below.

9.2 Groundwater Management

- 9.2.1 The process for groundwater management is described in the Phase 4a Construction Method Statement (40-SMP-WS-1000-CN-MS-00001) and Groundwater Management Plan (40-FWS-WS-70-WM-PL-0014).

9.3 Surface Water Management

- 9.3.1 The Phase 4 Surface Water Drainage Scheme (40-ARI-WS-71-PA-RP-1052) and the information contained in the Phase 4 CEMP remains applicable for Phase 4a. Waste water from the VSM operation will be discharged to the surface water drainage system following treatment. Additional water quality monitoring will be implemented (as detailed in the Phase 4a Ground and Surface Water Monitoring Plan (40-FWS-WS-70-WM-PL-0013) to monitor the quality of the water and enable any adverse surface water quality impacts to be avoided.

9.4 Silt and Pollutant Management

- 9.4.1 These measures remain unchanged from Phase 4.

10 Soils and Contaminated Land

- 10.1.1 Soil management procedures remain unchanged from Phase 4.

11 Materials and Waste

- 11.1.1 Details of the materials and waste materials stored on site are provided in the Phase 4 CEMP and remain applicable for Phase 4a.
- 11.1.2 Extractive material will be removed from the slurry water using the de-sanding plant at the surface. The extractive material will be discharged onto a concrete apron where further moisture content reduction will take place to ensure the material has suitable geotechnical properties to enable placement as landscape fill. More detail is provided in the Phase 4a Construction Method Statement (40-SMP-WS-1000-CN-MS-00001).
- 11.1.3 Construction water within the excavation will be managed in accordance with the detail provided in the Phase 4a Construction Method Statement (40-SMP-WS-1000-CN-MS-00001).

11.2 Fuel Oil Storage and Refuelling on Site

11.2.1 This remains unchanged from Phase 4.

11.3 General Management of Non-Extractive Waste

11.3.1 This remains unchanged from Phase 4.

12 Incident and Emergency Planning

12.1.1 This remains unchanged from Phase 4.

Appendix 1 Temporary Structures

The temporary structures identified in the Temporary Structures Appendix (Appendix 3) of the Phase 4 CEMP (40-RHD-WS-70-EN-PL-0023) will remain on site during Phase 4a.

The following additional temporary structures will be installed locally to the MTS Shaft to facilitate the operation of the VSM:

- Up to 8 Strand Jacks (circa 3m height) – These will be bolted to the top of the guide wall;
- 1 Winch Tower (circa 5m height) – This will be bolted to the guide wall;
- 3 Pushing Units (circa 4m height) – These will be bolted to the guide wall;
- 1 Extractive Materials Filtration (circa 6m height) – This will be located on the MTS platform adjacent to eastern bund;
- 1 Generator (circa 3m height) - This will be located on the MTS platform adjacent to eastern bund;
- 1 Control Room (circa 3m height) – This will be placed locally to the shaft; and
- 1 Bentonite silo (circa 5m height) – This will be located on the MTS platform adjacent to the eastern bund.

The layout of these structures is detailed on drawing 40-ARI-WS-71-CI-DR-1090 Woodsmith Mine Construction Phase 4a Masterplan. Photographs of typical equipment are provided below.

Where existing Herrenknecht containers and control rooms etc. are not RAL6008 on delivery they will be painted on site as required.



Strand Jacks



Winch Tower



Pushing unit



Extractive materials filtration
(de-sander/de-silter)



Bentonite silo



Generator



Control Room

Strand Jacks, Winch Tower, Filtration and Control Room are used with permission © Herrenknecht

Generator used with permission © Aggreko

Bentonite silo © Sirius Minerals