

SIRIUS MINERALS PLC - DISCHARGE OF PLANNING CONDITIONS FOR PLANNING PERMISSION NYM/2014/0676/MEIA (AS VARIED BY NYM/2017/0505/MEIA), NORTH YORKSHIRE POLYHALITE PROJECT

CONDITION	NYMNPA 47
REPORT	CONSTRUCTION AND OPERATION PHASE GROUND AND SURFACE WATER MONITORING SCHEME (NYMNPA 47 – Phase 4a)
SITE	PHASE 4a WORKS AT WOODSMITH MINE, NORTH YORKSHIRE
DOCUMENT NUMBER	40-FWS-WS-70-WM-PL-0012 Rev 3

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NYMNPA

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PROJECT NUMBER	1433Dev	
PROJECT TITLE	NORTH YORKSHIRE POLYHALITE PROJECT	
CLIENT	Sirius Minerals Plc Resolution House Lake View Scarborough YO11 3ZB	
REPORT TITLE	Construction and Operation Phase Ground and Surface Water Monitoring Scheme (NYMNP 47 – Phase 4a)	
REPORT REFERENCE	1433DevOR379 Rev 3	
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CONTENTS

1 INTRODUCTION1

1.1 General Background..... 1

1.2 Phase 4a Works..... 1

1.3 Compliance with Conditions 1

2 MONITORING3

2.1 General..... 3

2.2 Additional Phase 4a Surface water Quality Monitoring 4

3 MONITORING REPORTING5

4 REFERENCES6

APPENDICES

1 DRAWINGS
1433DevOD339 PHASE 4a – SURFACE WATER MONITORING LOCATIONS

CONSTRUCTION AND OPERATION PHASE GROUND AND SURFACE WATER MONITORING SCHEME (NYMNP 47 – Phase 4a)

1 INTRODUCTION

1.1 General Background

This document has been prepared on behalf of Sirius Minerals Plc (Sirius Minerals) and provides an addendum to the Construction and Operation Phase Groundwater and Surface Water Monitoring Scheme (GW&SWMS) for the Phase 4 Works at Woodsmith Mine (Ref. 1). It presents details of the additional groundwater and surface water monitoring required to supplement the Phase 4 monitoring regime to address the amended Phase 4a construction methodology. This document is required to discharge Condition 46 of the North York Moors National Park (NYMNP) planning permission NYM/2014/0676/MEIA (as varied by NYM/2017/0505/MEIA).

1.2 Phase 4a Works

The works to be completed as part of Phase 4a, comprise the following, as shown on Arup Drawing 40-ARI-WS-71-CI-DR-1082 and detailed in Ref. 2:-

A summary description of the VSM construction methodology for the MTS shaft to be undertaken as part of the Phase 4a Works is:-

- Use of a 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 shaft platform level (bspl).
- Excavation to -120m bspl.
- Deposition of limited extractive material from within the first 120m of the MTS shaft into earthworks bunds; and
- Grouting of Annulus.

1.3 Compliance with Conditions

Table 1 sets out the wording of Planning Condition 46 to Planning permission Ref No. NYM/2014/0676/MEIA (as varied by NYM/2017/0505/MEIA) and details where the relevant material, to comply with this condition, has been provided within this report:-

Table 1 - Summary of Planning Condition 46 and where Relevant Details are provided in the Report

NYMNP 46	Compliance with Condition 46
The scheme shall include: -	
Details of the number, type and location of monitoring points;	Section 2
A protocol for the removal and replacement of any existing monitoring points;	Phase 4 GW&SWMS (Ref.1)
Details of the frequency of monitoring during construction and operation;	Section 2
A list of the ground and surface water determinands to be tested for;	Section 2
Monitoring of ground water levels and spring flows;	Phase 4 GW&SWMS (Ref.1)
Monitoring of surface water quality including sediment, BOD, ammonia, pH;	Section 2
Geomorphology in Sneaton Thorpe Beck	Phase 4 GW&SWMS (Ref.1)
A list of SAC/SSSI habitat measures to be tested for;	Phase 4 GW&SWMS (Ref.1)
Groundwater quality and level triggers;	Phase 4 GW&SWMS (Ref.1)
Surface water quality triggers;	Section 2
Surface water geomorphology triggers;	Phase 4 GW&SWMS (Ref.1)
SAC/SSSI habitat triggers	Phase 4 GW&SWMS (Ref.1)
Monitoring of groundwater quality against groundwater triggers;	Phase 4 GW&SWMS (Ref.1)
A scheme for periodic review and refinement of the monitoring regime to take account of any approved changes to site layout/design, construction methods and monitoring data;	Phase 4 GW&SWMS (Ref.1)
A protocol for notifying the MPA of any breach of the Trigger Values, including the timing of any such notification;	Section 3
Details of the method and frequency with which monitoring results will be shared with the MPA, Natural England and the Environment Agency;	Section 3
The approved scheme shall thereafter be implemented in full, with monitoring continuing in accordance with the approved scheme until such time that it is agreed in writing by the MPA in consultation with Natural England and the Environment Agency that monitoring may cease.	Section 3

2 MONITORING

2.1 General

In the following sections, the requirements for undertaking additional monitoring for the Phase 4a Works are presented in terms of the monitoring locations, frequency of monitoring, determinants to be analysed for, Control and Compliance Trigger Values and reporting procedures.

The monitoring requirements have been determined specifically to enable monitoring of the Phase 4a Works, as outlined in the Phase 4a Groundwater Management Scheme (Ref. 3) and the Phase 4a Surface Water Drainage Scheme (Ref. 4). The changes from the existing Phase 4 monitoring scheme (Ref. 1) are summarised as follows:-

Meteorology	No changes.
Groundwater levels	No changes - the Phase 4 monitoring scheme is sufficient to monitor changes in groundwater levels from the Phase 4a Works that may affect the receptors.
Groundwater Quality	No changes - the Phase 4 monitoring scheme is sufficient to monitor changes in groundwater quality from the Phase 4a Works that may affect the receptors.
Springs	No Changes - the Phase 4 monitoring scheme is sufficient to monitor flow rates and spring quality from the Phase 4a Works that may affect the receptors.
Surface Water	<p>Additional surface water monitoring will be undertaken of the discharge from the VSM operation into the Shaft Platform surface water drainage scheme, and drains from the site into Sneaton Thorpe Beck, as described in Section 2.2.</p> <p>The Phase 4 monitoring scheme is sufficient to monitor changes in surface water quality that may arise from surface runoff from areas of lime stabilised VSM excavated material placed in Bund A.</p>
Ecology	No Changes - the Phase 4 monitoring scheme is sufficient to monitor the ecological receptors.

2.2 Additional Phase 4a Surface water Quality Monitoring

2.2.1 Objectives

From the results of the Hydrogeological Risk Assessment (Ref. 5) and the Surface Water Drainage Scheme (Ref. 4), pollution impacts could arise on Sneaton Thorpe Beck from the discharge of treated construction waters pumped out of the shaft during VSM shaft construction. The purpose of this addendum to the surface water monitoring strategy (Ref 1) is to detect chemical impact on surface waters within Sneaton Thorpe Beck caused by the Phase 4a Works, so that appropriate remedial measures can be adopted, should detrimental impacts arise.

2.2.2 Monitoring Locations

To meet the above objectives, two locations (SD 1 and SD 2), as detailed in Table 2 and shown on Drawing 1433DevOD282, will be sampled for insitu testing, as detailed in Section 2.3.4.

Table 2 – Additional Surface Water monitoring locations – Sneaton Thorpe Beck

Monitoring Location	Coordinates	Monitoring
SD 1	489469.4 505380.1	Temporary discharge from VSM into the concrete lined perimeter Shaft Platform drain
SD 2	489631.9 505267.9	Discharge point into the Silt removal facility.

2.2.3 Monitoring Frequency

Sampling for insitu surface water quality analysis will be undertaken on a daily basis during the discharge of construction waters.

2.2.4 Surface Water Data

Construction surface water discharge will be monitored insitu for the following suite of analysis:

- pH.
- Electrical Conductivity.
- Total Dissolved Solids.
- Turbidity.
- Hydrocarbons by visual observations for oily sheens.

2.2.5 Assessment Control and Compliance Trigger Values

Surface Water Quality (SWQ) Control and Compliance Trigger Values will be as set out in the Phase 4 Construction and Operation Groundwater and Surface Water Monitoring Scheme (Ref. 1).

3 MONITORING REPORTING

Reporting of the Phase 4a monitoring will be undertaken as set out in the Phase 4 Construction and Operation Groundwater and Surface Water Monitoring Scheme (Ref. 1).

R IZATT-LOWRY
DIRECTOR

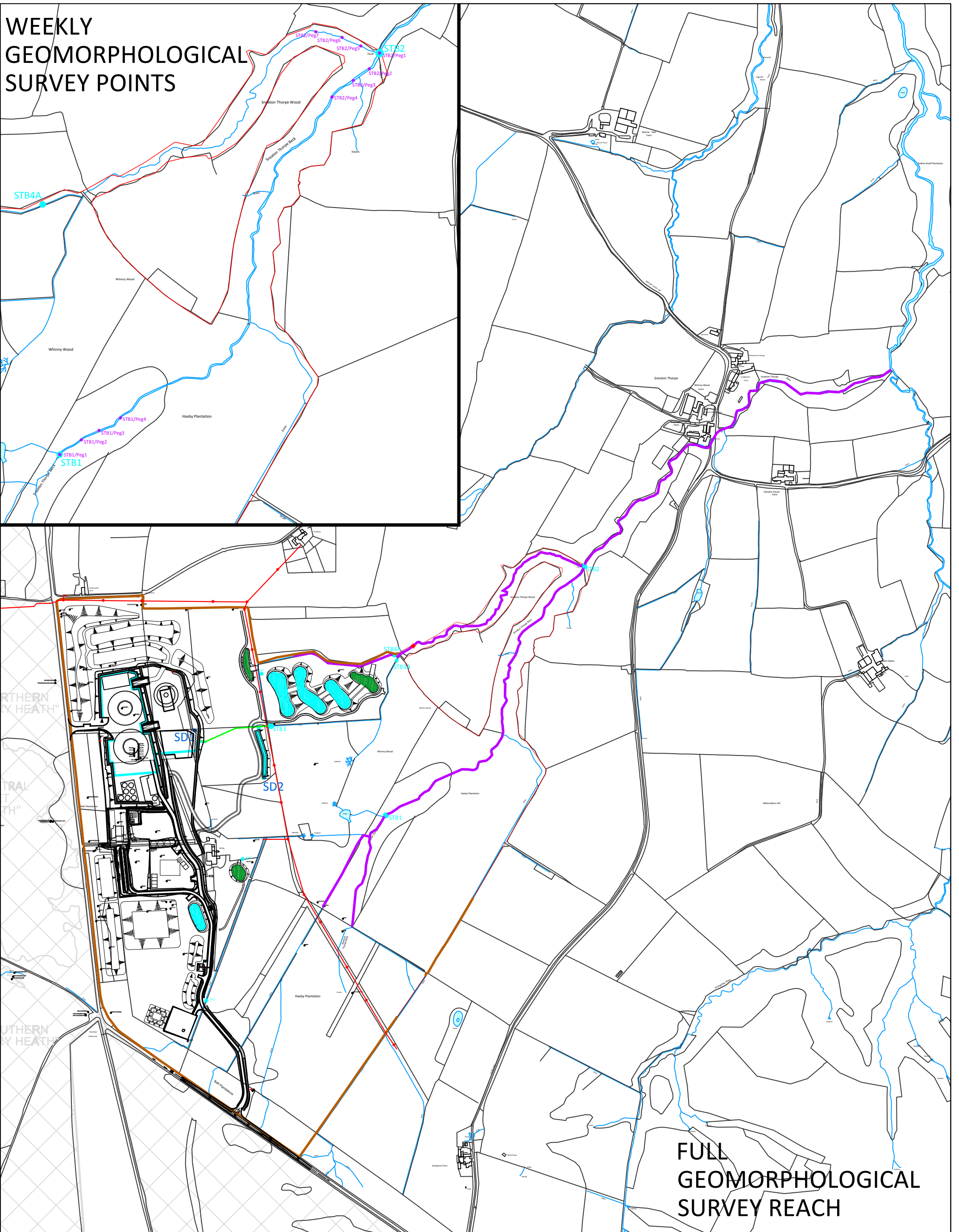
4 REFERENCES

- 1 FWS Consultants Ltd, 2017. Construction and Operation Groundwater and Surface Water Monitoring Scheme for Woodsmith Mine Phase 4 Works. Doc. Ref. No. 1433DevOR206.
- 2 Sirius Minerals Plc NYMNPA 94 - Construction Method Statement (Phase 4a) Document No. 40-SMP-WS-1000-CN-MS-00001.
- 3 FWS Consultants Ltd, 2018. Groundwater Management Scheme for Woodsmith Mine Phase 4a Works. Doc. Ref. No. 1433DevOR381.
- 4 Arup, December 2018. NYMNPA 60 & 79 Surface Water Drainage Scheme. Ref. 40-ARI-WF-71-PA-RP-1054.
- 5 FWS Consultants Ltd, 2018. Hydrogeological Risk Assessment for Phase 4a Works at Woodsmith Mine, North Yorkshire. Doc. Ref. No. 1433DevOR378.

APPENDIX 1

DRAWINGS

WEEKLY GEOMORPHOLOGICAL SURVEY POINTS



**FULL
GEOMORPHOLOGICAL
SURVEY REACH**

NOTES / KEY SITE OWNERSHIP BOUNDARY — NYM SAC SURFACE WATER — BOREHOLES ⊕ GCBH01 SURFACE WATER MONITORING LOCATIONS ● SD1 GEOMORPHOLOGY SURVEY —	DRAWING TITLE PHASE 4A SURFACE WATER QUALITY MONITORING POINTS INSET - WEEKLY GEOMORPHOLOGICAL SURVEY REACH	CLIENT SIRIUS MINERALS PLC	FWS Geological & Geo-Environmental Consultants Merrington House Merrington Lane Industrial Estate Spennymoor County Durham DL16 7UT
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