SIRIUS MINERALS PLC

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North Yorkshire Polyhalite Project

Document Title:

Woodsmith Mine Phase 5 Works NYMNPA 60 and 79 Surface Water Drainage Scheme

NYMNPA

25/05/2018

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Sirius Minerals Plc

Woodsmith Mine - Phase 5 Works

NYMNPA 60, 79 and 81 Surface Water and Wastewater Drainage Schemes

40-ARI-WS-71-PA-RP-1055

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References

Appendices

Appendix A

Phase 5 - Surface Water Drainage Layout

1 Introduction

1.1 Overview

This document has been prepared on behalf of Sirius Minerals PLC and details the surface water and wastewater drainage schemes for the Phase 5 construction activity at Woodsmith Mine (Phase 5 Works). This is required to discharge conditions 60, 79 and 81 of the North York Moors National Park Authority (NYMNPA) planning permission NYM/2014/0676/MEIA, as subsequently varied by NYM/2017/0505/MEIA [1].

This report only details the works required at the Woodsmith Mine site.

The Phase 5 Works comprise:

- Construction of Service Shaft foreshaft chamber to a depth of 168.7m AOD;
- Construction of Service Shaft permanent winder foundations to a depth of 197.17m AOD;
- Construction of Service Shaft permanent winder basement to a depth of 194.17m AOD;
- Construction of Service Shaft permanent building foundations to 202.2m AOD;
- Dewatering of Service Shaft foreshaft and platform to facilitate excavations;
- Excavation and construction of a working platform area on the western edge of the Production Shaft platform, with an AOD of 203.7m.
- Stockpiling of extractive material for re-use.

1.2 Surface Water Drainage Strategy - Compliance with Conditions

The drainage strategy, calculations and surface water management plan described in the Phase 3 Surface Water Drainage Scheme [2] are still applicable during the Phase 5 works. The surface water system that will be in use during Phase 5 is shown on the general arrangement drawing 40-ARI-WS-71-CI-DR-1205 in Appendix A. The changes between Phases 3 and 5 do not have a significant impact on the surface water drainage design.

- The excavation of the service shaft chamber and associated winder basement in Phase 5 does have an interaction with the surface water drainage scheme and this is described in Section 2.1 of this report.
- All excavated material from the chamber and basement construction will be temporarily stockpiled in the inert material storage mound to the south of the construction platforms. This area was previously included as part of the Phase 3 works and therefore has no impact on the drainage strategy in Phase 5.

- The platform extension to the western edge of the production shaft platform and provision of a filter drain to drain this area increases the drained platform area by approximately 0.14ha. This is a relatively small increase in the overall site area that is positively drained. This can be accommodated within the existing drainage network without any modifications, whilst still achieving the permitted discharge rates and design basis.
- Surface water drainage from the earthwork bunds will continue to be collected via perimeter drainage swales and discharge into the site surface water drainage system, with ongoing site testing and pH correction where necessary prior to outfall via silt buster.

No other changes between Phases 3, and 5 impact on compliance with the conditions that were described in the Phase 3 report.

2 Phase 5 Design Amendments

2.1 Chamber Construction – Wastewater Drainage Strategy

The Moor Grit rock layer that is isolated by the diaphragm walls will already have been dewatered as part of the ongoing platform dewatering system included within the Phase 3 discharge conditions.

Water pumped from the chamber excavations as outlined within the CMS (Condition 94) will consist of groundwater from the Scarborough and Cloughton formations, isolated from the surrounding aquifer by the diaphragm walls. This will be discharged to the site wide surface water drainage system, following treatment if required.

Hydrological modelling has been carried out to determine the flow rate required to dewater the foreshaft during excavation. Based on the current programme and an effective porosity of 35% (refer to FWS 'Hydrogeological Baseline Report for the Dove's Nest Minesite', Rev 1, dated May 2016), it is estimated that a maximum flow rate of 50m^3/day will be required for an approximate duration of up to six months. On this basis there is no requirement for an abstraction license.

Abstracted water will be sampled prior to outfall into the surface water drainage system to confirm any requirements for treatment. Possible treatment includes de-silting and pH correction. This will include the use of portable 'Silt Buster' type equipment similar to that already used on site. This water will then be attenuated within the drainage attenuation ponds to ensure that the overall discharge from site does not exceed the approved discharge rate.

All surface water discharged from the site will be monitored in accordance with the 'Surface and Ground Water Monitoring Scheme' submitted to discharge Condition 46. Qualitative triggers for the discharge are included within this scheme.

3 Conclusions

3.1 Surface Water Management Scheme

There are no changes between Phases 3 and 5 that adversely impact the surface water drainage design. The Phase 3 Surface Water Drainage Scheme [2] is still applicable during Phase 5.

The additions of the excavation of the service shaft basement and chamber in Phase 5 does have an interaction with the surface water drainage, but the mitigation proposed minimises the risk to an acceptable level.

The platform extension to the west, does not impact on the drainage strategy and does not increase the risk of flooding on site.

This report demonstrates that the Surface Water Drainage design and management during the Phase 5 Works meets the requirements of conditions 60 and 79 of the North York Moors National Park Authority (NYMNPA) planning permission NYM/2014/0676/MEIA, as subsequently varied by NYM/2017/0505/MEIA.

No new land drainage consents are required for the Phase 5 works because there are no new outfalls or works near watercourses proposed.

3.2 Wastewater Management Scheme

Section 2.1 outlines the wastewater management scheme relevant to this phase of construction.

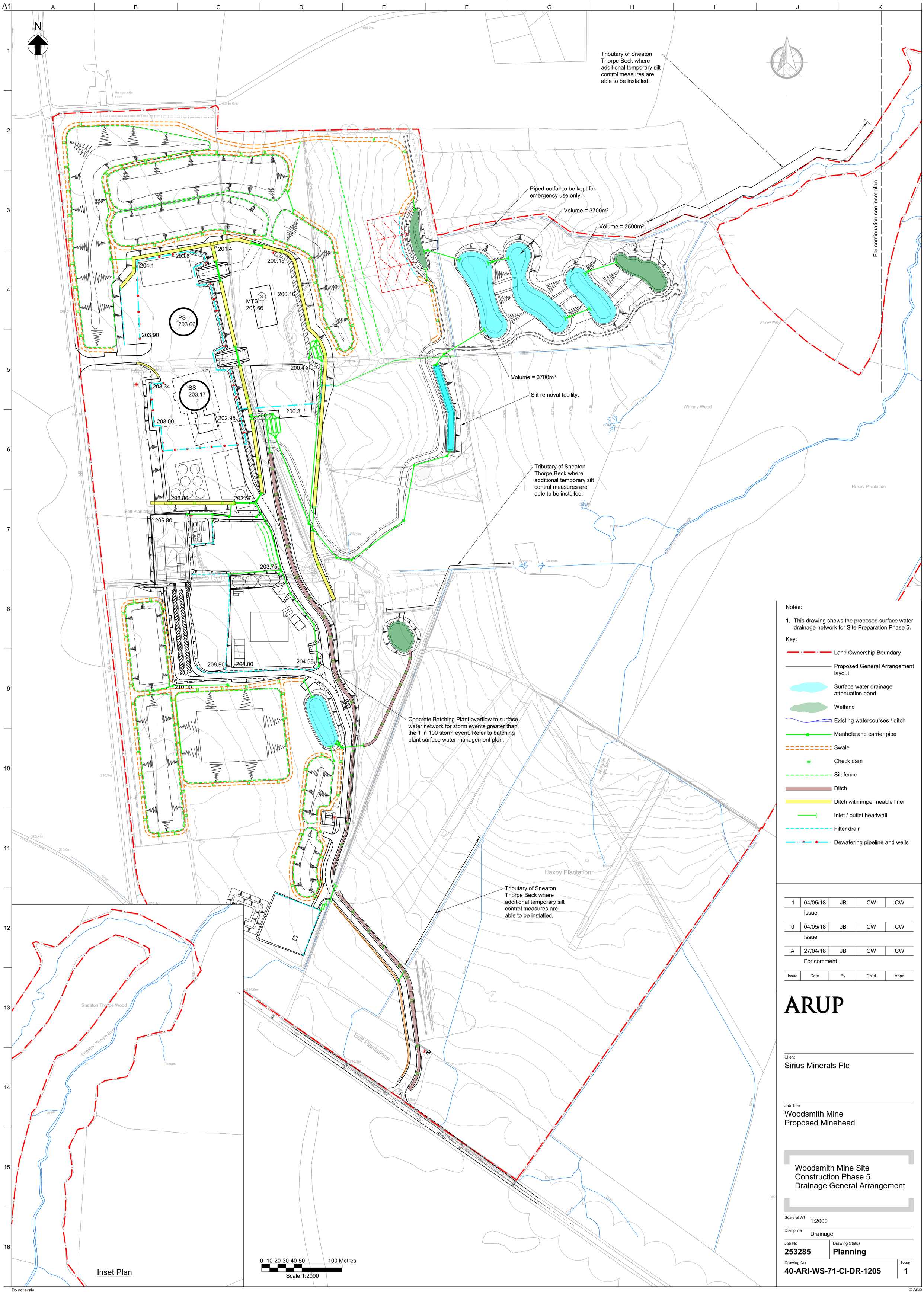
References

[1] North York Moors National Park Authority planning permission NYM/2014/0676/MEIA and as subsequently varied by NYM/2017/0505/MEIA.

[2] NYMNPA 60 and 79 Surface Water Drainage Scheme, 40-ARI-WS-71-PA-RP-1050_0_IFU_20170403 SWD DoC 60_79, Rev 0, Arup, April 2017.

Appendix A

Phase 5 - Surface Water Drainage Layout



Notes:

1. This drawing shows the proposed surface water drainage network for Site Preparation Phase 5.

Key:

- Land Ownership Boundary
- Proposed General Arrangement layout
- Surface water drainage attenuation pond
- Wetland
- Existing watercourses / ditch
- Manhole and carrier pipe
- Swale
- Check dam
- Silt fence
- Ditch
- Ditch with impermeable liner
- Inlet / outlet headwall
- Filter drain
- Dewatering pipeline and wells

Issue	Date	By	Chkd	Appd
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	Issue			
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Client
Sirius Minerals Plc

Job Title
Woodsmith Mine
Proposed Minehead

Woodsmith Mine Site
Construction Phase 5
Drainage General Arrangement

Scale at A1 1:2000

Discipline Drainage

Job No **253285**

Drawing Status **Planning**

Drawing No **40-ARI-WS-71-CI-DR-1205**

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