



**Discharge of Planning
Condition 15 –
Blast Monitoring Scheme**

Metcalfe Farms, Leyburn


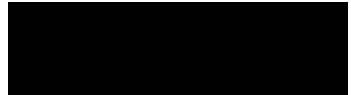
WARDELL ARMSTRONG LLP

**R24.12244/1/DW
Date of Report: 13 June 2024**

REPORT DETAILS

Client	Wardell Armstrong LLP
Report Title	Discharge of Planning Condition 15 - Blast Monitoring Scheme
Site Address	Metcalfe Farms, Leyburn
Report Ref.	R24.12244/1/DW
Vibrocock Contact	vibrocock@vibrocock.com

QUALITY ASSURANCE

Issue No.	Issue Date	Author	Technical Review
1	13/06/24	 D Williams MIEpE Director	 R Kennedy MIOA Director

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1.0 INTRODUCTION

- 1.1 Planning consent for mineral extraction operations was granted by North Yorkshire County Council in June 2022 (C1/22/00123/CMNY/2021/0165/FUL). The consent contains a number of conditions, of which Condition No. 15 states the requirement for a scheme for monitoring ground vibration and air overpressure from blasting operations.
- 1.2 The discharge of planning conditions is being undertaken by Wardell Armstrong LLLP on behalf of the site operator Metcalfe Farms.
- 1.3 Wardell Armstrong LLP have engaged Vibrock Limited, an independent, national, environmental consultancy to prepare the necessary blast monitoring scheme to discharge the relevant planning condition.

2.0 BLAST MONITORING SCHEME

Introduction

2.1 Conditions 15 to 17 of the planning permission relate to blasting operations at the site, with Condition 15 stating that a scheme of blast ground vibration and air overpressure monitoring is agreed with the Planning Authority.

2.2 Conditions 15, 16 and 17 have been reproduced as follows:

15. Prior to the commencement of mineral extraction within the proposed cutting annotated as '1' on Drawing NT14232-106 REV A dated 6 July 2021, a scheme for the monitoring of ground vibration and air over pressure levels, including the maximum instantaneous charge, total charge weight, the blast location, number of holes, the hole diameter and depth, the face height, the type of detonator, the burden and hole spacing and the weather conditions, shall be submitted to and approved by the County Planning Authority. Thereafter, monitoring shall be undertaken in accordance with the approved scheme and if the results of monitoring show that the limit as stated in condition 16 to this permission is exceeded, blasting practice at the site shall be modified to ensure compliance with the limit specified in conditions 16 and 17 to this permission. The results of monitoring shall be retained at Washfold Farm for a period of 12 months and made available to the County Planning Authority on request.

Reason: This is a pre-commencement condition necessary to monitor the operations and protect the amenities of the area.

16. Blasting operations to create the proposed cutting annotated as '1' on Drawing no. NT14232-106 REV A dated 6 July 2021 shall be designed and executed such that ground vibrations from 95% of all blasts in a calendar year shall not exceed a peak particle velocity of 6mm/second peak particle velocity as measured at the nearest façades of Sycamore House and Yarker Bank Farm. In the event that the limits are exceeded, blasting practice at the site shall be modified to ensure compliance with the limits specified.

Reason: To protect the amenities of the area.

17. Notwithstanding condition 8, the vibrations from any blast to create the proposed cutting annotated as '1' on Drawing NT14232-106 REV A dated 6 July 2021 shall not exceed 9mm/sec peak particle velocity at any time when measured at the nearest façades of Sycamore House and Yarker Bank Farm House.

Reason: To protect the amenities of the area.

The Control of Blast Operations

- 2.3 All blasts at the site shall be designed to take account of the requirements of Part V: Explosives, Quarries Regulations 1999. The blast specification prepared to satisfy the requirements of Regulation 25 will ensure that the risk of flyrock being projected outside the declared danger zone is as low as reasonably practicable and will state any special precautions required to achieve this.

Methods to Minimise Air Overpressure

- 2.4 There are 5 principal sources of air overpressure from blasting at surface mineral sites:
- The use of detonating cord which can produce high frequency and hence audible energy within the air overpressure spectrum.
 - Stemming release, seen as a spout of material from the boreholes, gives rise to high frequency air overpressure.
 - Gas venting through an excess of explosives leading to the escape of high-velocity gases, give rise to high frequency air overpressure.
 - Reflection of stress waves at a free face without breakage or movement of the rock mass. In this case the vertical component of the ground-vibration wave gives rise to a high-frequency source.
 - Physical movement of the rock mass, both around the boreholes and at any other free faces, which gives rise to both low and high-frequency air overpressure.
- 2.5 Having regards to the above principal sources of air overpressure the following measures shall be employed to minimise air overpressure effects:
1. No secondary blasting shall be permitted at the site.
 2. The use of detonating cord on the surface of the blast shall be prohibited on site.
 3. The stemming material used shall be angular chippings and each borehole shall contain sufficient stemming material to adequately confine its explosive charge.
 4. All faces and boreholes shall be inspected and, if necessary, the blast design shall be altered to take account of any deviation from that originally planned.
 5. Account shall be taken in the blast design of any local weaknesses in the strata.
 6. Particular care shall be employed if explosives are being loaded through fissured or broken ground to ensure that over charging does not occur.

Blast Monitoring Methodology

- 2.6 Monitoring of ground vibration and air overpressure would take place utilising at least two instruments. These will be used to monitor the effects of blasting at Sycamore House and Yarker Bank Farm House. The monitoring will be undertaken in accordance with the principles of BS ISO 4866: 2010.
- 2.7 The instrument, if practicable, will be set up on a hard, flat surface at ground level within the vicinity of residential properties. The instrument will not be set up on paving slabs or block paving.
- 2.8 The prevailing weather conditions shall be noted at the time of the blast.
- 2.9 The results from the blast monitoring shall be retained at the site for a period of 12 months.
- 2.10 Monitoring results shall be reviewed after every blast to provide valuable input to the design of future blasts.

Instrumentation

- 2.11 The monitoring equipment used shall be a Vibrock V9000 Seismograph or similar instrument. These instruments record ground vibration in terms of peak particle velocity in three mutually perpendicular planes of measurement and air overpressure in decibels.
- 2.12 The instrumentation will have valid certificates of calibration.

Monitoring Locations

- 2.13 Each production and cutting blast shall be monitored at the nearest façade at the following locations:

Sycamore House
Yarker Bank Farm House

Monitoring Results

- 2.14 Details of the blast monitored and the results obtained shall be noted on the form in Appendix 1.
- 2.15 The results shall be reviewed against the site vibration criterion of 6 mms^{-1} at a 95% confidence level with no blast to exceed 9 mms^{-1} . If required the blast design shall be modified to comply with the site vibration criterion.

Complaints Procedure

2.16 Should complaints be made to the quarry management and / or the Planning Authority relating to high levels of blast vibration, then these shall be immediately investigated and, where necessary, further measures to control the effects shall be implemented.

2.17 All such complaints shall be recorded in a log held at the quarry office, which will be available for inspection by the Planning Authority. The log shall include the following information:

The name, address and telephone number of the complainant;

The date and time the complaint was received;

The nature of the complaint, and

Details of any action taken as a result of investigation into the complaint.

APPENDIX 1 – DETAILS TO BE RECORDED

TABLE 1

Blast Details

Date:	
Time:	
Weather Conditions: (temperature, wind speed and direction, % cloud cover, details of any precipitation)	
Closest Separation Distance, blast to property:	
Closest Property:	
Grid Reference of Blast Location:	
No. of Holes:	
Hole Depth (m):	
Hole Diameter (mm)	
Burden (m):	
Spacing (m):	
Maximum Instantaneous Charge Weight (kg):	
Total Explosive Charge Weight (kg):	
Explosive Type:	
Initiation:	

TABLE 2

Vibration Levels Produced by Blasting

Day/Date of Survey:

Monitoring Position	Peak Particle Velocity (mms^{-1})			Air Overpressure (dB)
	Long	Vert	Trans	
1) Sycamore House				
2) Yarker Bank Farm House				