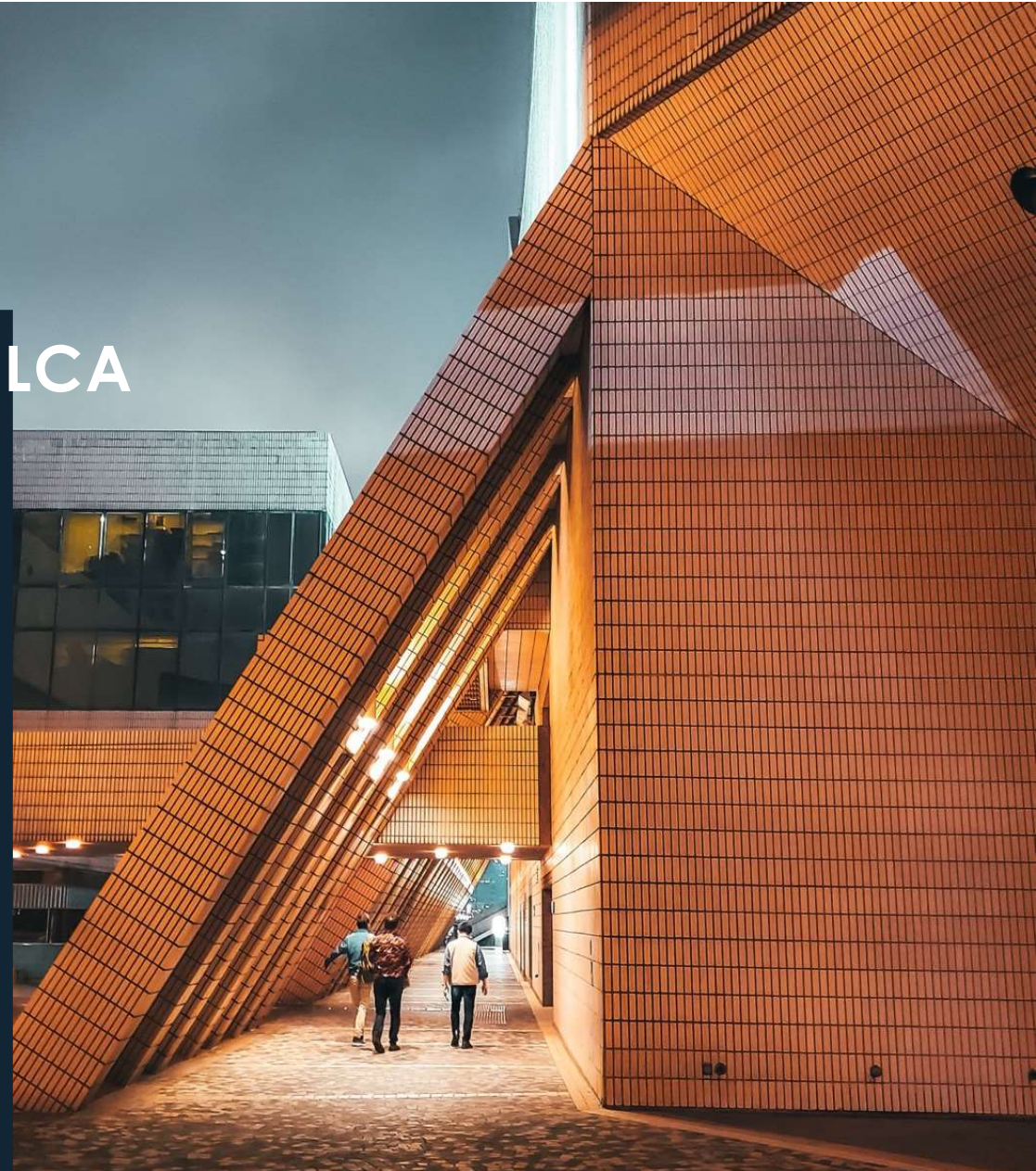




RESPIRABLE CRYSTALLINE SILICA PRESENTATION

HANSON WOLFFDENE QUARRY
OUR JOURNEY



CONTENTS

1. Hanson Wolfdene Quarry
2. The Inspectorate
3. Our Dust Management Strategy
4. Where Our Dust Control Starts Onsite
5. Water Cart and Hi-Flow Cannon
6. Dust Collectors
7. Cool Fog / Water Sprays / PPE
8. Real Time Project
9. Additional Actions / Real Time Monitoring









2017-2018 RCS PERFORMANCE

2017

- 38 samples collected 15 exceedances, exceedance rate 39.47%.
- Highest result recorded 0.64mg/m³ (maintenance SEG).

2018

- 28 samples collected 9 exceedances, exceedance rate 32.14%
- Highest result recorded 0.84mg/m³, many more not far behind.
- All exceedances were from Maintenance SEG.
- 2018 Hanson realised we were not performing well, then kicking off the RCS working group and subsequent internal actions.



DIRECTIVE FROM THE INSPECTORATE 16.03.2018

Title: Reduce RCS in the Work Environment

Directive Given:

The quarry has reported nine exceedances to RCS in recent exposure monitoring.

Pursuant to section 135 of the Mining and Quarrying Safety and Health Regulation 2017 (MQSHR), the SSE must ensure a worker's exposure to a hazard (RCS) is below the occupational exposure limit (OEL) and is as low as reasonably achievable.

Similarly under section 3.1 of QGL02 Guideline for Management of Respirable Crystalline Silica in Mineral Mines and Quarries, the SSE is required to '...implement control measures to reduce the exposure to an acceptable level for any activity or task that may create an unacceptable RCS exposure'.

To wit, the SSE is directed to implement a dust (RCS) management system to reduce RCS in work environment to an acceptable level.

The system must include engineering control measures with consideration given to the installation of local exhaust ventilation (LEV).

The system must also include the implementation of interim control measures until the engineering control measures have been proven to be effective.

The system should be supported by a documented plan and audit process covering both the long term and interim control measures.

The SSE is required to submit an outline of the work plan within 1 month of the issue of this directive and provide updates every two months until the completion of the planned capital



OUR DUST MANAGEMENT STRATEGY

- Revised Regional Standard Operating Procedure for all NR Quarries.
- Modernised Requirements for Exceedance Investigations (ICAM)
- Implemented and Enforced Facial Hair Rules and Mandatory RPE Areas
- Site Specific Management Requirements and Management Plans
- Engaged with Maintenance Contractor to Standardise their Approach
- We Use Critical Control Checks and Annual Control Inspections
- Procurement of New RPE
- Increased Training of Staff
- Continual Review and Feedback From Operations.



DUST CONTROL STARTS IN THE PIT





THINK OUTSIDE THE BOX







PRIMARY CRUSHING PLANT CONTROLS

- Dust Extraction was re energised in late 2017 with a lot of remedial works required.
- Cool Fog Sprays
- Water Sprays on belts and transfer points
- Conditioned material from the pit
- Restricted access
- Adjusted maintenance work hours
- Wash down work area before conducting maintenance activities
- Moving plant control room away from primary area
- Remove monitoring of production/processing



COOL FOG IN USE AT PRIMARY BOOT





PRIMARY CRUSHING PLANT 2015/2019





PRIMARY CRUSHING PLANT- Current



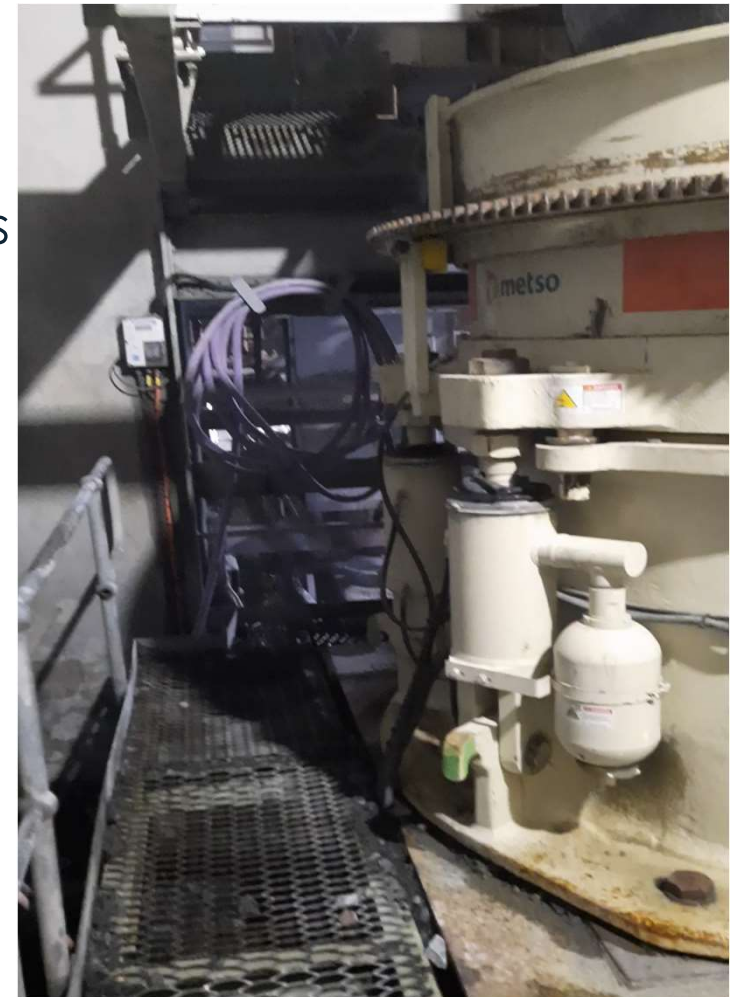
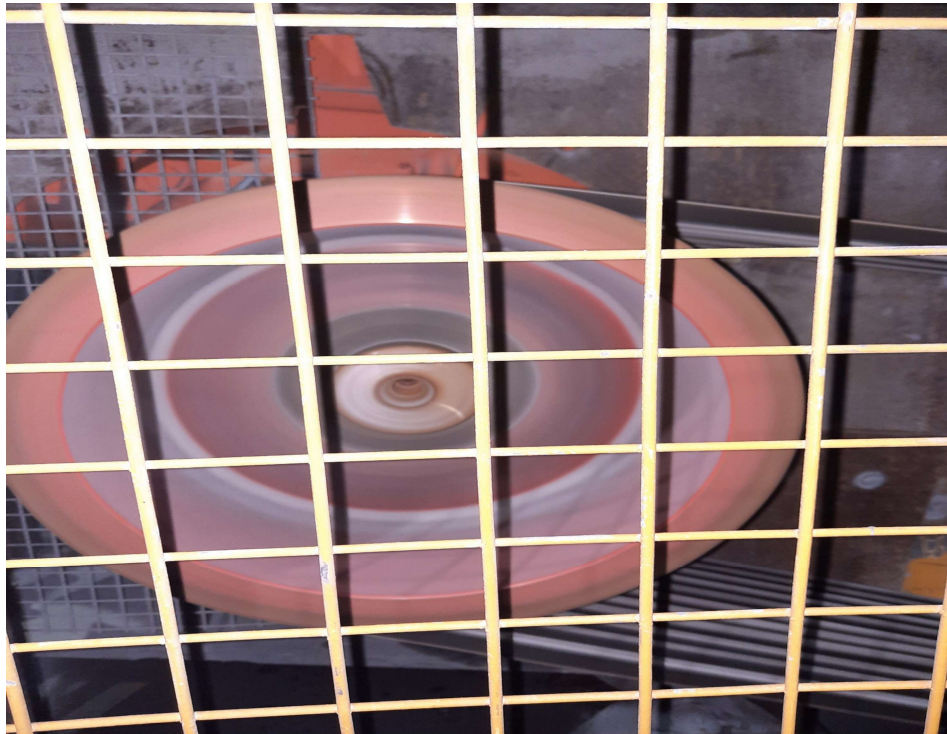
■
Crushing Plant Operating at 700tph 10.30am

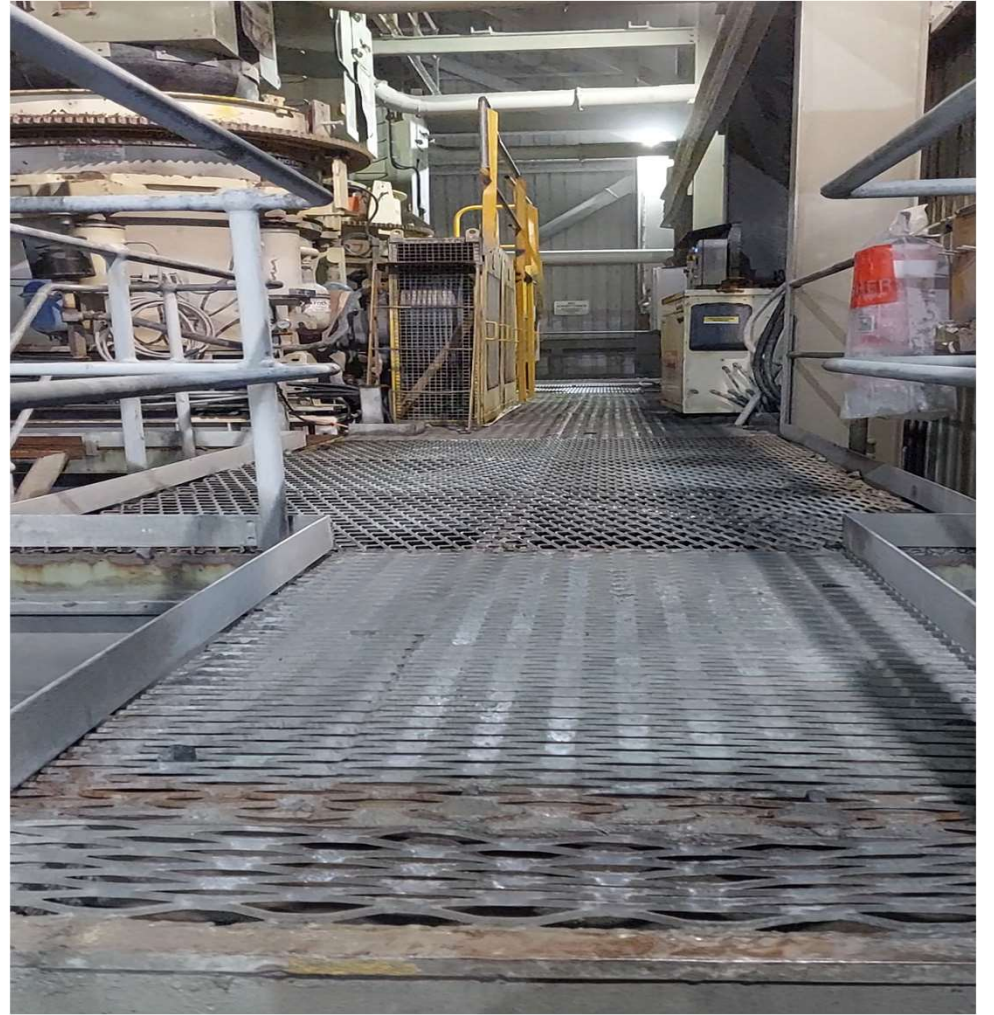




SECONDARY CRUSHING PLANT

- A Simple control, regular cleaning crusher pulleys





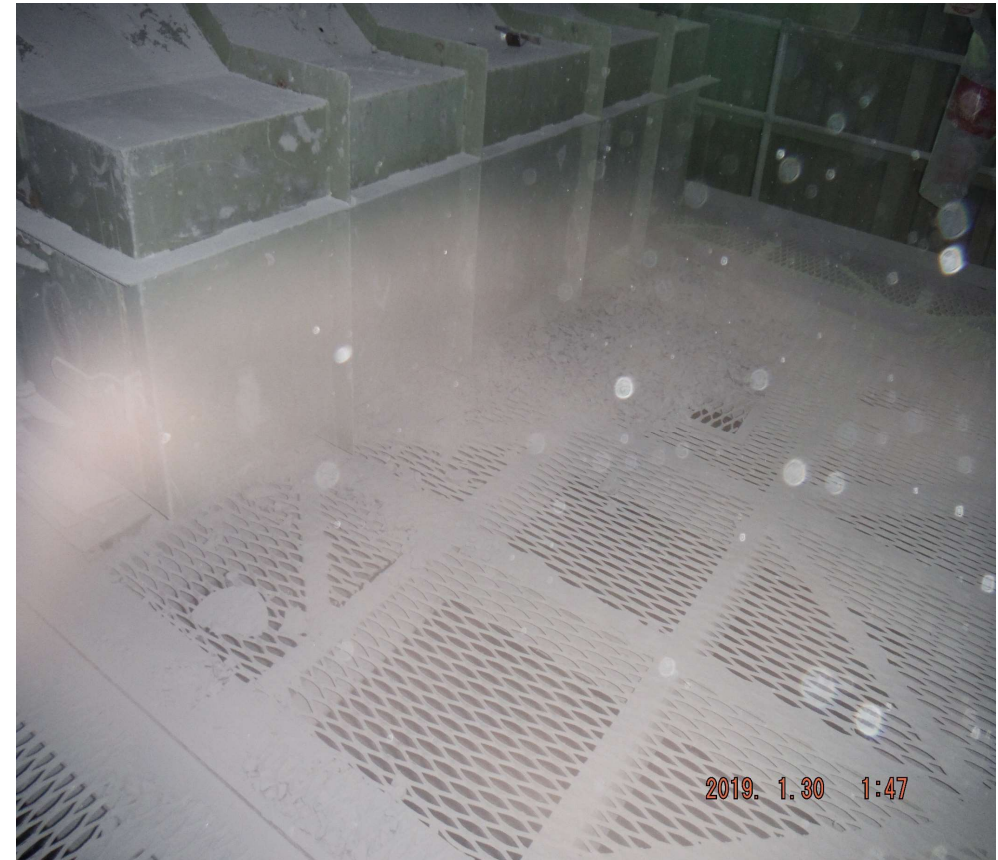


New Screen House Dust Collector System





Screen House Before





Screen House at Full Production







PPE



BAT BOOTH



■ Dedicated Resource to Assist with QGL02

- Nick Dennis,
 - Bachelor Social Science & Enviro Science
 - Cert 4 Project Management
 - Grad Dip Occupational Health & Safety
- Hanson Management Development Program
 - 12 Month Quarry rotation at Wolffdene
 - Experienced across various hard-rock and sand operations
- Worked alongside the Risk and Operational Functions
 - Lead regional approach to RCS management under QGL02





Gap Analysis

- Gap Analysis Completed 2019
 - Findings identified numerous failures in operational performance
- Highlighted the lack of understanding of the issue, and lack of support we were being provided.
 - Hanson realised we needed more from our Hygienists and we back to market to find a company that could provide us with the support we needed
- Needed to increase training/education in the space
- Needed a significant cultural shift.



Additional Actions

- Developed online training modules for all staff, and more intensive training programs for the more high risk sites/workers
- Developed Standard Operating Procedures and Management Plans
- Developed new tools for auditing and assessing operational performance
- Procured new RPE and began fit testing
- Increased the level of investigation applied to any high level results or exceedances (ICAM).
- Looked into new technology that could help us understand exposure risk and apply direct control.

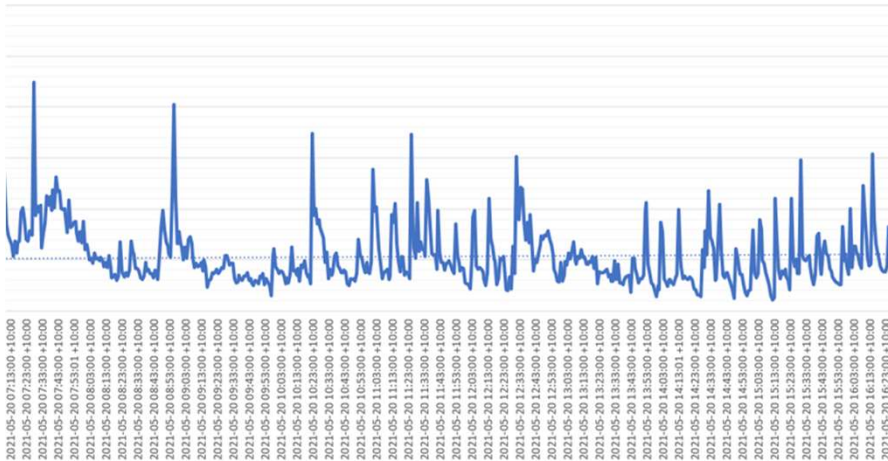
Real-Time Monitoring

Static Atmospheric Monitoring

- Completed in all enclosed buildings to understand atmospheric respirable dust concentrations.
- Used to validate control performance
- Understand production variables e.g. water on shot rock
- Validated access to building requirements and mask requirements



Building 1: 20 May 0545-1815



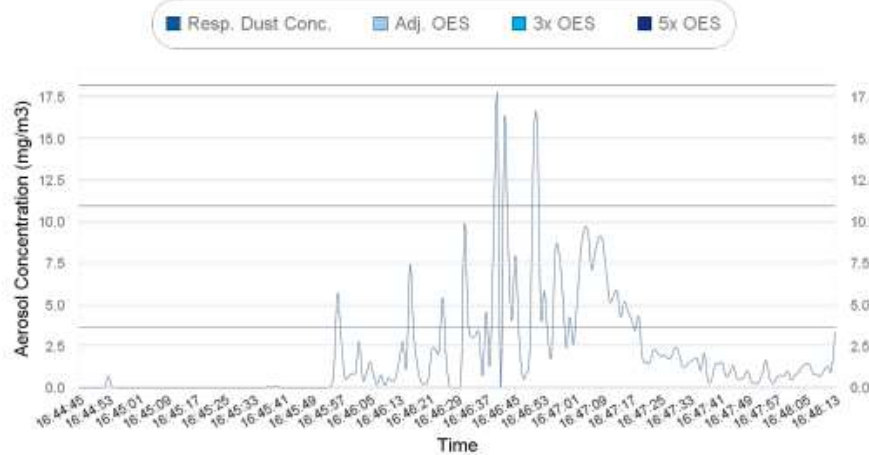
Building 2: 21 May 1800-0500



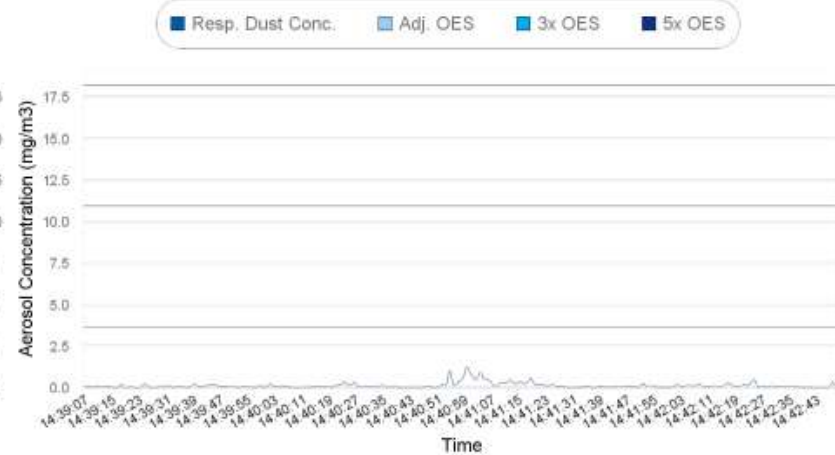
Task Based Real-Time Assessments

Real-time Results Graph

Measurement 1 - Pre Control - Air compressor filter blowouts (worker perspective)



Measurement 2 - Representative - Filter changeout and wash (worker perspective)

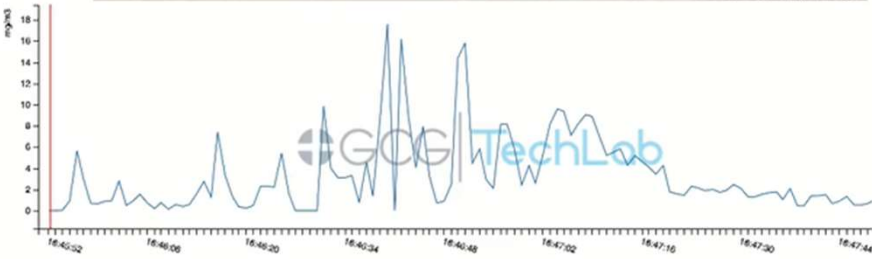


Analysis of Peaks:

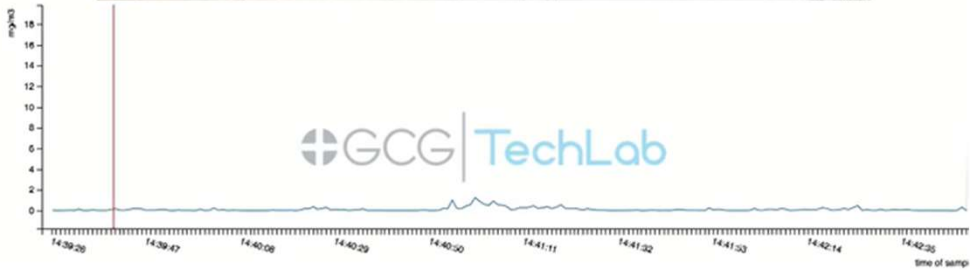
Time:	Peak:	Comment:
16:46:40	17.591	Residual airborne dust within enclosure.
16:46:42	16.194	Residual airborne dust within enclosure.
16:46:51	15.824	Residual airborne dust within enclosure.
16:47:04	9.579	Compressed air use into filter, blown back at worker.

Time:	Peak:	Comment:
14:41:00	1.258	Filter falls over, worker gets close to source.

Air Compressor Filter Maintenance



Compressed Air Method



Washable Filter + Hose Method

Post Control Performance

Exceedance rate reduced from 40% in 2017 to 0% YTD





QUESTIONS



THANK YOU