

MOSH Industry Dust Bowtie Analysis

Gold – Crystalline Silica (Underground)

Short Version of Threats and Controls

Hazard name:	Dust- Respirable Crystalline Silica)
Top event:	Liberation of Dust - Crystalline Silica
Affects:	Health
Description:	Dust containing respirable crystalline silica content, generated by various mining activities.

Threats

Cement Mixing - (Construction& Maintenance Works, shotcrete etc.)	
Controls	<ul style="list-style-type: none"> Remote Premixed Cement (Cementation Process) Wet-Creting
Falls of Ground & Barring	
Controls	<ul style="list-style-type: none"> Watering Down
Drilling (Underground)	
Controls	<ul style="list-style-type: none"> Surface Wetting (Dry Drilling-Concrete) Wet Drilling



Rock breaking - Blasting	
Controls	<ul style="list-style-type: none">• Waterblast• Reef Boring• Oscillated Disc Cutting
Sweepings & Vampings	
Controls	<ul style="list-style-type: none">• In-Stope Atomization for Dust Suppression• Fogging Dust Suppression System• Water-Jetting• High Vacuum Machine• Watering Down
Scraping	
Controls	<ul style="list-style-type: none">• In-Stope Atomization for Dust Suppression• Watering Down
Ore Loading & Tipping	
Controls	<ul style="list-style-type: none">• Watering Down
Tramming	
Controls	<ul style="list-style-type: none">• Fogging Dust Suppression System• Footwall/Sidewall Treatment• Watering Down• Rolling Stock Washing Bays

Rock breaking (Hydraulic Impact Breakers/Pickers)	
Controls	<ul style="list-style-type: none"> • Fogging Dust Suppression System (Manual/Automated) • Dust Filtration System • Watering Down
Tipping (Main tips)	
Controls	<ul style="list-style-type: none"> • Multi-Stage Filtration System • Fogging Dust Suppression System • Tip Filtration System • Tip Water Sprays • Exhaust-Water Scrubber • Tip Covers
Ore Hoisting	
Controls	<ul style="list-style-type: none"> • Ore Wetting Sprays • Shaft Mist Sprayers
Ore Conveyance (Conveyor Belts)	
Controls	<ul style="list-style-type: none"> • Fogging Dust Suppression System • Conveyor Belt Water Sprayers • LEV Filtration System (Tipping pts)



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Backfilling

Controls

- Waterdown
- Good housekeeping (Wash into drains)
- Footwall treatment System (Nozzle + surfactant)

Opening of Old Workings

Controls

- Watering Down
- Fogging Dust Suppression System

Consequences

Dust Inhalation - Acute Exposure	
Controls	<ul style="list-style-type: none"> • Real Time Dust Monitoring • Respiratory PPE • Ventilation Control System • Re-Entry Period • Centralized / Out-of-Sequence Blasting • Enclosed Cabins • Remote Loading (Tele-Remote)
Dust Inhalation - Chronic Exposure	
Controls	<ul style="list-style-type: none"> • Exhausting air directly to RAW • Water Spray Curtain (Fogger System) • Job Re-Classification • Personal Dust Monitoring • Respiratory PPE • Ventilation Control System • Re-Entry Period • Centralized / Out-of-Sequence Blasting • Enclosed Cabins • Remote Loading (Tele-Remote) • Scraper Winch Covers
Business Continuity Disruptions	
Controls	<ul style="list-style-type: none"> • Business Continuity Management Plan



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Stakeholder Relations	
Controls	<ul style="list-style-type: none">• Stakeholder Management Plan