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SILICA EXPOSURE CONTROL

Purpose

The purpose of the silica exposure control plan (ECP) is to set out our approach to protecting workers from harmful exposure to respirable crystalline silica.

A combination of control measures will be required to achieve this objective. We commit to being diligent in our efforts to select the most effective control technologies available, and to ensure that the best practices, as described in this Exposure Control Plan (ECP), are followed at Burnt Mountain Services (the Company) worksites.

The work procedures we establish will protect not only our workers but all workers on our worksites.

Key Responsibilities

Due to the significant risk posed by respirable crystalline silica, it is critical that all personnel involved in operations that could potentially create silica dust take specific action to ensure that, as much as possible, a hazard is not created.

The Company is responsible for:

- Make a copy of the ECP available at the worksite (BMS Support Center).
- Substitution of less hazardous products for those that contain crystalline silica is required where feasible.
- Ensuring that the materials (e.g., tools, equipment, personal protective equipment) and other resources (i.e., worker training materials) required to fully implement and maintain this exposure control plan (ECP) are readily available where and when they are required.
- Providing a job specific ECP for each project, which outlines in detail the work methods and practices that will be followed on each site. Considerations will include:
 - Availability and delivery of all required tools/equipment
 - o Scope and nature of grinding work to be conducted
 - Control methods to be used and level of respiratory protection required
 - Coordination plan
- Conducting a periodic review of the effectiveness of the ECP. This would include a review of the available dust-control technologies to ensure these are selected and used when practical.
- Initiating sampling of worker exposure to concrete dust when there are non-standard work practices for which the control methods to be used have not been proven to be adequately protective.
- Ensuring that all required tools, equipment, and personal protective equipment are readily available and used as required by the ECP.
- Ensuring supervisors and workers are educated and trained to an acceptable level of competency.
- Maintaining records of training, fit-test results, crew talks, and inspections (equipment, PPE, work methods/practices).
- Coordinating the work with the prime contractor and other employers to ensure a safe work environment.
- Ensuring that a copy of the written exposure control plan is available to all employees. The written
 exposure control plan must be available for examination and copying by each employee. Copies may be
 available electronically or physically, depending on location needs and requirements.



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The supervisor (foreman and lead hand) is responsible for:

- Selecting, implementing, and documenting the appropriate site-specific control measures
- Providing adequate instruction to workers on the hazards of working with silica-containing materials (e.g., concrete) and on the precautions specified in the job-specific plan covering hazards at the location
- Ensuring that workers are using the proper respirators and have been fit-tested, and that the results are recorded
- Directing the work in a manner that ensures the risk to workers is minimized and adequately controlled
- Communicating with the prime contractor and other sub-contractors to ensure a safe work environment

The worker is responsible for:

- Knowing the hazards of silica dust exposure
- Using the assigned protective equipment in an effective and safe manner
- Setting up the operation in accordance with the site-specific plan
- Following established work procedures as directed by the supervisor
- Reporting any unsafe conditions or acts to the supervisor
- Knowing how and when to report exposure incidents

Crystalline Silica Properties

Crystalline silica is a common mineral found in many naturally occurring materials and used in many industrial products and at construction sites. Materials like sand, concrete, stone, and mortar contain crystalline silica. Crystalline silica is also used to make products such as glass, pottery, ceramics, bricks, concrete, and artificial stone. Industrial sand used in certain operations, such as foundry work and hydraulic fracturing (fracking), is also a source of crystalline silica exposure. Amorphous silica, such as silica gel, is not crystalline silica.

Inhaling very small ("respirable") crystalline silica particles, causes multiple diseases, including silicosis, an incurable lung disease that can lead to disability and death. Respirable crystalline silica also causes lung cancer, chronic obstructive pulmonary disease (COPD), and kidney disease.

List of Tasks That Expose Employees to Respirable Crystalline Silica

A list or description of tasks in the workplace that expose employees to respirable crystalline silica must be in place. Tasks include activities like the below and anything else that is likely to expose employees to respirable crystalline silica:

- Sawing
- Drilling
- Grinding
- Abrasive blasting (e.g., of concrete structures)
- Jackhammering, chipping, or drilling rock or concrete
- Cutting brick or tiles
- Sawing or grinding concrete
- Tuck point grinding
- Road construction

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- Loading, hauling, and dumping gravel
- Demolition of structures containing concrete
- Sweeping concrete dust

The list of tasks shall be included in the job hazard assessment or any other form of prework hazard assessment.

Health Hazards

Exposure to respirable crystalline silica has been shown to cause silicosis, lung cancer, pulmonary tuberculosis, and other airway diseases. Crystalline silica dust can cause a disabling, sometimes fatal disease called silicosis. The fine particles are deposited in the lungs, causing thickening, and scarring of the lung tissue. The scar tissue restricts the lungs' ability to extract oxygen from the air. This damage is permanent, but symptoms of the disease may not appear for many years.

A worker may develop any of three types of silicosis, depending on the concentrations of silica dust and the duration of exposure:

- Chronic silicosis—develops after 10 or more years of exposure to crystalline silica at relatively low concentrations
- Accelerated silicosis—develops 5 to 10 years after initial exposure to crystalline silica at high concentrations
- Acute silicosis—develops within a few weeks, or 4 to 5 years, after exposure to very high concentrations
 of crystalline silica

Initially, workers with silicosis may have no symptoms; however, as the disease progresses, a worker may experience:

- Shortness of breath
- Severe cough
- Weakness

These symptoms can worsen over time and lead to death. Exposure to silica has also been linked to other diseases, including bronchitis, tuberculosis, and lung cancer.

Exposure Assessments

Exposure assessments must be conducted for those employees who are expected to be exposed to respirable crystalline silica at or above the action level. The exposure of each employee who is or is expected to be exposed to respirable crystalline silica at or above the action level (8-hour TWA of $25\mu g/m^3$) must be assessed. This assessment can be performed by monitoring employees individually or taking a representative sample from employees.

The key step in developing a silica exposure control plan is to identify the work activities that would put workers at risk of exposure.

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- Work activities that may generate airborne silica dust—for silica, the route of exposure is through the inhalation of airborne dust. The employer should have a qualified person review the planned work activities to identify those that may generate airborne silica.
- Identify workers at risk of exposure—For example, workers who finish concrete would be at greater risk of exposure than plumbers or electrical workers.
- Amount of exposure—some work activities generate more dust than others, and the amount of exposure should be estimated. Published resources are available that provide air sampling data and compare silica dust levels from various construction activities.
- Duration of exposure—Workers who grind concrete for a full shift would be at greater risk than workers jackhammering for an hour.

Engineering and Work Practice Controls

Engineering and work practice controls shall be used to reduce and maintain employee exposure to respirable crystalline silica to the lowest feasible level and maintain it at that level when required.

The following hierarchy of control measures must be followed:

- Elimination/substitution (e.g., using products with less silica or using work methods that would eliminate the need for surface grinding)
- Engineering controls (e.g., water, local exhaust ventilation, enclosure)
- Administrative controls (e.g., coordination of tasks with subcontractors, signage)
- The use of proper PPE such as gloves, coveralls and eye protection when exposed to silica. Personal protective equipment such as gloves, coveralls and eye protection will be used to control silica exposure.

Our firm commits to developing knowledge and expertise about these controls, and to establishing policies/procedures to protect workers from harmful exposure and to minimize reliance on respirators. Effective engineering controls such as HEPA vacuum attachments and wetting methods, which control silica dust at its source, are readily available. These controls have been proven to reduce airborne dust levels significantly when selected and operated in accordance with best practices. We know that engineering controls alone do not reduce airborne silica to safe levels; so, in most cases other control measures, including respiratory protection, will be necessary.

If we take on a job that could release an unusually high amount of dust, and we are unsure of the adequacy of our control measures, we will conduct air sampling to ensure that control methods are protective.

We will reduce or eliminate worker exposure to silica dust by selecting a combination of the following controls listed in order of preference:

- Elimination and substitution Engineering
- Administrative Personal protective equipment

Elimination and Substitution

We recognize the importance of planning the work to minimize the amount of silica dust generated. During the project planning phase, we will advocate for the use of methods that reduce the need for cutting, grinding, or drilling of concrete surfaces (e.g., formwork planning). Whenever possible, we will schedule work when concrete is still wet, because we know that much less dust is released at that time.



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Engineering Control of Dust

Selecting an appropriate control measure depends on the specifics of the operation. In some cases, local exhaust ventilation (LEV) is more effective at controlling exposure (e.g., during grinding operations) than wetting methods. In a different application, wetting may be more effective (e.g., during cutting operations) than LEV. However, using LEV may reduce the amount of final cleaning required, as the silica dust is captured.

Our dust control systems may employ three well-established techniques:

- Local exhaust ventilation (LEV)
- Wet dust suppression (WDS)
- Restricting or isolating the work activity with barriers or full enclosures (this may be the only option where LEV or WDS is not practical or effective)

Local Exhaust Ventilation (LEV)

When LEV is used in our work, we will employ the following systems and safe work practices:

- Vacuum attachment systems to capture and control the dust at its source whenever possible.
- Dust control systems (used regularly and well maintained).
- Grinding wheels operated at the manufacturers' recommended rpm (operating more than this can generate significantly higher airborne dust levels).
- Retrofit shrouds or exhaust cowlings for corner grinding; use manufacturer-specified rpm speeds and a well-maintained HEPA vacuum.
- Diamond stone grinders, which allow for the use of a more efficient suction casing on the grinder, whenever practicable.
- HEPA or good quality, multi-stage vacuum units approved for use with silica dust. [The vacuum units should create a target airflow of at least 70 cfm. This should achieve a face velocity at the shroud of about 1.3 m/s (260 fpm)—the higher the face velocity, the more dust captured at source.]
- Work planning, so that concrete grinding can be completed when wet (dust release can be significantly reduced).
- Train workers and supervisors on how to properly use and maintain the equipment.

Wet methods for Dust Control

When water spray systems are used in our work, we will follow these safe work practices:

- Pneumatic grinders will be used instead of electric-powered grinders if water is the method of control.
- Pressure and flow rate of water will be controlled in accordance with tool manufacturers' specifications (for cutting saws, a minimum of 0.5 liters of water per minute should be used).
- When sawing concrete or masonry, we will use only saws that provide water to the blade.
- Wet slurry will be cleaned from work surfaces when the work is completed, using a wet vacuum or wet sweeping.



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<u>Barriers and Enclosures</u> - When barriers or enclosures are used in our work the site foreman will determine the type and design of barrier or enclosure (based on the work activity and the work area) and ensure it is constructed in accordance with the work plan. Barriers may be simple hazard-flagging ribbon or more restrictive barriers.

Administrative Controls

We will follow these safe work practices:

- Exposure control plans and the site risk assessment/work plan will be submitted to the general contractor prior to the start of work.
- Housekeeping Measures Put in Place to Limit Employee Exposure to Respirable Crystalline Silica A
 description of housekeeping measures used to limit exposure to respirable crystalline silica must be in
 place (and included in the prework hazard assessment). This can include vacuuming, sweeping, wetting
 and other techniques used to limit the amount of respirable crystalline silica exposure during
 housekeeping activities. Vacuums with high-efficiency particulate air (HEPA) filters are required.
- We will establish procedures for housekeeping, restricting work areas, personal hygiene, worker training, and supervision.
- As part of our project planning, we will assess when silica dust may be generated and plan to eliminate or control the dust at the source. We recognize that awareness and planning are key factors in the prevention of silicosis.
- Warning signs will be posted to warn workers about the hazards of silica and to specify any protective equipment required (for example, respirators).
- Work schedules will be posted at the boundaries of work areas contaminated with silica dust.
- Work that generates silica dust will be conducted after hours, when access to other unprotected workers cannot be restricted.
- We will develop a site-specific exposure control plan to cover project-specific issues (e.g., scope of work, project location and site-specific hazards) and to be kept available at the worksite.

Personal Protective Equipment

Respiratory Protection

- When required, respirators must be provided to employees that are exposed to respirable crystalline silica.
- Respirators must be provided to employees who are or will be exposed to actionable levels of respirable
 crystalline silica. If an employee is performing a task listed in Table 1 of 1926.1153 (c) that does not
 require the use of a respirator then they are not required. All other tasks not covered by Table 1 must be
 accounted for by providing respirators if necessary.
- Link for Table 1 https://www.osha.gov/pls/oshaweb/owadisp.show_document?p table=STANDARDS&p id=1270#1926.1153(c)
- All workers who wear respirators will do so in adherence with our respiratory protection program.
- Respirators must be selected based upon measured exposure levels and the assigned protection factor of respirators.
- Only approved respirators will be used.
- Workers who wear respirators will be clean-shaven. Filtering face piece respirators give little or no protection to workers with beards, and even a minor growth of stubble can severely reduce the effectiveness of respiratory protection.

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- All workers who wear respirators will be fit-tested.
- Workers will be properly trained in the use of respirators, and a high standard of supervision, inspection, and maintenance will be followed.

Protective clothing

The Company will provide workers in a restricted area with protective clothing that protects other clothing worn by the worker from silica contamination, ensure that silica does not contaminate workers' street clothing, and ensure that a worker does not leave a restricted area until the worker has been decontaminated.

Documentation

Records must be kept of the following:

- All workers who are exposed to respirable silica dust while on the job
- Worker education and training sessions
- Respirator fit-testing
- Equipment maintenance and repair
- Worksite inspections
- Medical surveillance when required

Annual Assessment

The written program's effectiveness must be reviewed at least annually. The written exposure control plan must be evaluated at least once per year and as necessary. Situations where reevaluation may be necessary include regulatory updates, changes in equipment and exposure incidents.

Medical Surveillance

A medical surveillance program for all employees whose exposure is equal to or exceeds the action level for 30 or more days per year is required. A medical surveillance program must be established for employees who are exposed to the action level of 8-hour TWA of $25\mu g/m^3$ of respirable crystalline silica. A baseline medical assessment must be available to exposed employees within 30 days of initial assignment unless they have previously received a suitable medical examination in the past three years. This applies to employees who would be required to wear a respirator more than 30 days per year or who are exposed to action level respirable crystalline silica for more than 30 days per year. A suitable prescreen that meets the same requirements is also acceptable.

The basics of the medical examination include:

If the employee needs to go to a qualified health care professional, have an exam, and obtain a written medical opinion which is shared with the Company. This written opinion needs to contain:

- The date of the exam
- A statement that the exam has specifically checked for silica exposure per the requirements of the standard.
- Any recommended limitations on the employee's exposure to respirable crystalline silica as a result of the exam's findings



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The employee may learn other medical information from his or her physician during the visit, but this is private and not required to be shared with the Company.

The exam conducted by the qualified healthcare provider must include the following:

- A review of the patient's medical and work history.
- A physical examination with special emphasis on the respiratory system.
- A chest x-ray.
- A pulmonary function test administered by a certified spirometry.
- Testing for latent tuberculosis.
- Any other tests deemed appropriate by the healthcare provider.

Information required to be given to the heathcare provider:

- A copy of the OSHA respirable crystalline silica rule.
- Construction Standard https://www.osha.gov/silica/SilicaConstructionRegText.pdf
- Construction Medical https://www.osha.gov/silica/AppendixBtosect1926.1153.pdf
- General Industry/Maritime Standard https://www.osha.gov/silica/SilicaGeneralIndustryRegText.pdf
- General Industry/Maritime Medical https://www.osha.gov/silica/AppendixBtosect1910.1053.pdf
- A description of the employee's former, current, and anticipated duties as they relate to the employee's occupational exposure to respirable crystalline silica.
- The employee's former, current, and anticipated levels of occupational exposure to respirable crystalline silica.
- A description of any personal protective equipment used or to be used by the employee, including when and for how long the employee has used or will use that equipment.
- Information from records of employment-related medical examinations previously provided to the employee and currently within the control of the Company.

Records

Applicable records must be kept. Accurate records of all air monitoring data, objective data, and medical surveillance shall be maintained as required by the regulation.

Training

Employees must be provided with training.

A training program shall be provided for all employees who are exposed to action level respirable crystalline silica. The training shall ensure that employees covered by the written exposure control plan can demonstrate knowledge and understanding of the health hazards associated with respirable crystalline silica, the specific tasks in the workplace that could result in exposure to respirable crystalline silica, the specific measures taken to protect employees from exposure to crystalline silica, the contents of the respirable crystalline silica rule, and the purpose of the medical surveillance program.



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CONTROL PLAN

		CONTR	OL PLAN				
Date control plan completed:							
Prime contractor:		Superintendent:					
Project manager:			CSO/First aid attendant:				
Project:	Add	ress:					
Company completing work:							
Address:				Conta	ict:		
Contact phone:			Contact fa	x:			
On-site supervisor(s):							
Worker(s):							
Scope of work to be completed:	l				l		
Work start date:			Duration:		☐ Days ☐ Months [☐ Years	
Employer responsible for:							
Supervisor responsible for:							
ouper ties i esperiolare terr							
Worker responsible for:							
HAZARDS IDENTIFIED (other than si	ilica co i	NTROL MEAS	SURF(S)				
□ Falls		111102111271	30112(3)				
☐ Slipping							
☐ Confined space							
☐ Workers above							
☐ Workers below							
□ Noise							
☐ Electrical							
Overview of work procedure (How are	vou going	to work saf	elv?):				
oreinen of norw procedure (now are you going to work surely:).							
Workers trained in (training records mu	Workers trained in (training records must be available for review):						
Proper use of grinding equipment Y□ N□ Proper use of admin controls Y□ N□					Y□ N□		
Proper use of engineering controls		Y□N□			Y□ N□		
Proper disposal methods		Y□N□	Other (fall p	rotectio	n, swing stages, etc.)	Y□N□	
Respirators (Refer to ECP for respirator requirements)							
Required: Y□ N□	Available	e: Y□ N□			Fit-tested: Y□ N□		



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PP	E require	ed for sc	ope of work (othe	er than res	spirator)					
☐ Coveralls ☐ Gloves ☐ Rubber boots ☐ Eye protection ☐ Reflective vest ☐ Hearing protection										
Do	cuments	s to be a	ttached to contro	ol plan (⊡	1 if present)					
	Exposur	e contro	l program □ Res	piratory	protection pr	ogram 🗆	Training rec	ords 🗆 SV	VP (tools and	d equipment)
Pro	oject ma	nageme	nt signature			Positio	า:		Date:	
Со	ntractor	supervis	sor signature			Positio	n:		Date:	
Tas	sk/risk m	nanagem	ent matrix (relati	ng to silica	a dust) use tabl	e 1 for co	des, separate	with a com	ma (,)	
#	Date/D	uration	Task		Controls				PPE	Supplies/
					Engineering		Administrative	!		Equipment
NI-	+ /5	 -/-:-	l management matri		1 # 4- 1			.1.44		
140	(101)	tasky risk i	management matri	ix above. v	ose # to malear	ic willer t	ask the note it	lates to.j		
SIT	E INSPE	CTION C	HECKLIST (comple	ete pre-wo	ork & periodica	lly during	project)			
En	gineerin	g contro	ls		Problem noted (DETAIL)		Problem corrected (DETAIL)		(DETAIL)	
Ava	ailable at	site	•	Y N N						
Ор	erating co	orrectly	•	Y N N						
Use	ed approp	oriately	•	Y N N						
Effective in dust control Y□ N□										
Administrative controls										
Available at site Y□ N□										
Used appropriately Y□ N□										
In place before work start Y□ N□										
Effective Y□ N□										
Cle	Cleanup									
Vacuum used properly Y□ N□										

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Large pieces picked up	Y□N□	
Vacuum capacity maintained	\square N \square	
Pre-filters in place	$Y \square N \square$	
Vacuum attachments used	Y□ N□	
Collection bags in place	$Y \square N \square$	
Waste properly disposed of	Y□N□	

TABLE 1 (Codes for task/risk management matrix)									
Engineering controls		Adn	Administrative controls		PPE		Supplies/Equipment		
1	Exhaust fan	1	Signage	1	Respirator	1	Hand grinder		
2	LEV	2	After hours work	2	Gloves	2	Ceiling grinder		
3	Wetting	3	Scheduling	3	Coveralls	3	Floor grinder		
4	Partial enclosure			4	Hearing protection	4	Disposal bags		
5	Full enclosure			5	Eye protection	5	HEPA filter (vacuum)		
6	Shroud			6	Reflective vest	6	HEPA filter (respirator)		
7	Barriers			7	Rubber boots (CSA)	7	Shovel		
				8	Fall arrest	8	Lifeline		
				Ī					



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SITE-SPECIFIC SILICA EXPOSURE CONTROL PLAN

Location:		Date:
Work description:		
	(check those options used and explai	
	rocedures or products that do not cre	eate silica; must review MSDSs)
Different products:		
Other substitutions:		
Engineering controls (when us	sing ventilation, draw air out and do	not expose others to exhaust dusts)
Vacuuming:		
Wetting:		
Ventilation:		
Isolation:		
Other means:		
Work schedule:		
econdary silica control optior	ns (check those options used and exp	plain use if needed)
Personal protective equipme	ent	
Half-mask		
respirators:	Cartridge type:	Fit tests confirmed:
Full-face respirators:	Cartridge type:	Fit tests confirmed:
Supplied air units:		
Coveralls required:		
Hygiana and docontamination	on antions (raduaing avnasuras aff	ter work has stopped or during breaks)
Water or washing facilities		ter work has stopped or during breaks)
Vacuuming clothing/self:	on site.	
vacuuming ciotimig/sen.		
Safe work procedures	and other	
details:		

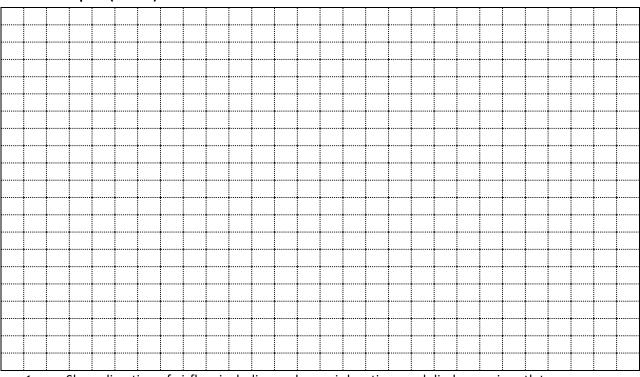


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Ventilation plan (sketch)



Show direction of airflow including makeup air locations and discharge air outlets Area or location in building of ventilation plan (e.g., floor #, wing) Date plan was reviewed by workers and posted for workers to see

Ventilation safety checklist

	Makeup air free of contaminants		Workers not placed between contaminants created and exhaust inlet ports
	Exhaust fan operation has failure warning		Discharge air not affecting others
□ □ Note	Dilution fans not stirring up dust Wetting of materials used to keep dust down E: Attach additional sheets if needed or other documents if required do	□ ue to	All workers equipped with approved respirators hazards or work conditions.
Prin	t supervisor's name	_ :	Supervisor's signature

Types of neg. air fans & no.'s *
* Indicate on plan by number the location of the negative air fans