CENTRAL ARIZONA PROJECT

RESPIRABLE CRYSTALLINE SILICA EXPOSURE CONTROL PROGRAM

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1.0 PURPOSE

The purpose of this program is to reduce employee exposure to respirable crystalline silica (RCS), thereby eliminating any potential for employees to contract silicosis or other debilitating disease as a result of exposure to RCS. This program meets the requirements for a written exposure control program found in OSHA's RCS standard, 1910.1053(f)(2) and provides – among other things – the following information:

1.1 A description of tasks at Central Arizona Project that involve exposure to RCS;
1.2 A description of the engineering controls, work practices and respiratory protection used to limit employee exposure to RCS for each task; and
1.3 A description of the housekeeping measures used to limit employee exposure to RCS.

2.0 SCOPE

The OSHA standard for respirable crystalline silica applies to all exposures except those where there is objective data demonstrating that employee exposures will remain below OSHA's action level of 25 $\mu g/m^3$ as an 8-hour, time-weighted average under any foreseeable conditions. Accordingly, this program applies to all CAP employees who are known or suspected to have exposures to RCS above the OSHA action level (without the use of engineering controls).

Where employees perform tasks that involve exposure to respirable crystalline silica for a very short duration of time, exposures for those tasks are expected to be below the action level. For example, an employee using a hand-held drill to drill two or three holes into a concrete or block wall over the course of 15 minutes (or less) would be expected to have an 8-hour TWA exposure below the action level, assuming no exposure for the remainder of the work shift. In such instances, the OSHA standard does not apply.

Many CAP employees perform tasks during their work shift that fall into this category and those employees are not covered within the scope of this program, so long as their total work shift exposure is represented in the performance of such short-duration tasks. Plant mechanics, maintenance workers, electricians, and similar employees are examples of those that would perform these tasks involving exposures below the OSHA Action Level and who would not be covered by this program.

3.0 RESPONSIBILITIES

3.1 CAP EH&S Department: The CAP EH&S department has overall responsibility for administering this program, including the following:

- Conducting all necessary monitoring to quantify employee exposures to RCS.
- Working with field crews to ensure adequate control measures are in place to reduce employee exposure to RCS.

- Assisting in identifying appropriate engineering controls to reduce workplace exposures to RCS.
- Providing training to CAP employees, as necessary and in accordance with the requirements of the OSHA RCS standard. Ensuring evidence of training is provided to the Centralized Learning and Development Department for appropriate tracking.
- Assisting CAP project managers and inspectors to ensure that contractors have appropriate procedures in place to ensure protection for their employees.
- Annually reviewing the program to ensure any changes to engineering controls, work practices and tasks involving exposure to RCS are included.

3.2 **Supervisors and Managers**: CAP supervisors and managers are responsible for understanding the requirements of this program and the effective implementation of those requirements within their work groups.

3.3 **Employees**: Employees who perform tasks that create or otherwise result in potential exposure to RCS above the OSHA action level are responsible for complying with the requirements of this program, including the use of appropriate engineering controls, work practices and personal protective equipment that will reduce those exposures.

Note: Although respiratory protection is only required during the performance of very specific tasks, nothing in this program prohibits an employee from voluntarily wearing a filtering facepiece respirator. Where an employee voluntarily chooses to wear a filtering facepiece respirator, he/she must first read and sign Appendix D to the OSHA respiratory protection standard. See the EH&S Department for assistance.

4.0 WORKPLACE TASKS INVOLVING EXPOSURES TO RESPIRABLE CRYSTALLINE SILICA

The following tasks (sections 4.1 through 4.8) performed by CAP maintenance crews are known to create silica-containing dust. The creation of that dust has the potential to expose employees to RCS. However, not all work results in exposures at or above the OSHA action level of 25 $\mu g/m^3$ as an 8-hour time-weighted average. Where the work is known or suspected to result in exposures above the AL, the OSHA standard applies, and the listed exposure control methods are to be followed. Where exposures are below the AL, no control methods are required. Nevertheless, even where exposures are below the AL, employees are encouraged to utilize work methods that will minimize their exposure to RCS-containing dust.

OSHA's general industry standard on RCS allows employers to comply with the OSHA construction standard requirements in those instances where the task performed is indistinguishable from a construction task listed in Table 1 of 29 CFR 1926.1153(c), and the task will not be performed regularly in the same environment and conditions. Therefore, where work performed by CAP employees is indistinguishable from a task listed in Table 1, and is not

performed regularly in the same environment and conditions, the Table 1 control methods are listed and will be followed by CAP.

Notwithstanding the specific requirements for a listed task in this section, employees must ***always*** do/ensure the following:

- For tasks performed indoors or in enclosed areas, provide a means of exhaust, as necessary, to minimize the accumulation of visible, airborne dust. (Where there is no visible, airborne dust, no exhaust method is required.)
- For tasks performed using wet methods, apply water at flow rates sufficient to minimize the release of visible dust.
- For tasks performed using a vacuum shroud dust collection system, ensure the flow rate is sufficient to maximize the capture of visible dust.
- For protective measures that include an enclosed cab or booth, ensure the cab or booth:
    - Is maintained as free as practicable from settled dust;
    - Has door seals and closing mechanisms that work properly;
    - Has gaskets and seals that are in good condition and working properly;
    - Is under positive pressure maintained through the continuous delivery of fresh air;
    - Has intake air that is filtered through a filter that is 95% efficient in the 0.3-10 µm range (e.g., MERV-16 or better); and,
    - Has heating and cooling capabilities.

Control measures for specific tasks: When performing the following tasks, the listed engineering and work practice control measures are required, unless it can be shown that exposures to RCS are below the OSHA Action Level.

4.1 Saw cutting of concrete slabs with a walk-behind saw

Engineering and Work Practice Controls:

- Use a saw equipped with an integrated water delivery system that continuously feeds water to the blade.
- Operate and maintain the tool in accordance with the manufacturer's instructions to minimize dust emissions.
- Ensure proper water flow to the blade.
- Watch for increased dust emissions – a sign that water flow is inadequate

Respiratory Protection:

	≤ 4 hours/shift	> 4 hours/shift
Used outdoors	None	None
Used indoors or encl. area	APF 10	APF 10

4.2 Saw cutting of concrete slabs or block with a handheld power saw

Engineering and Work Practice Controls:

- Use a saw equipped with an integrated water delivery system that continuously feeds water to the blade.
- Operate and maintain the tool in accordance with the manufacturer's instructions to minimize dust emissions.
- Ensure proper water flow to the blade.
- Watch for increased dust emissions – a sign that water flow is inadequate

Respiratory Protection:

	≤ 4 hours/shift	> 4 hours/shift
Used outdoors	None	APF-10
Used indoors or encl. area	APF 10	APF 10

4.3 Core sawing or drilling through concrete floors or walls, or block walls:

Engineering and Work Practice Controls:

- Use a tool equipped with an integrated water delivery system that supplies water to the cutting surface.
- Operate and maintain the tool in accordance with the manufacturer's instructions to minimize dust emissions.
- Watch for increased dust emissions and other signs the water delivery system is not functioning as required.

Respiratory Protection:

	≤ 4 hours/shift	> 4 hours/shift
Used indoors and outdoors	None	None

4.4 Using handheld and stand-mounted drills, including impact and rotary hammer drills for drilling holes in concrete slabs or walls, or block walls for installation of davit arm bases, shelf anchors, fall protection anchors and similar items:

Engineering and Work Practice Controls:

- Use a saw equipped with a commercially available shroud or cowling with dust collection system.
- Operate and maintain the tool in accordance with the manufacturer's instructions to minimize dust emissions.
- Dust collector must provide the air flow recommended by the tool manufacturer, or greater, and have a filter with 99% or greater efficiency and a filter-cleaning mechanism.

• Use a HEPA-filtered vacuum when cleaning out drilled holes.
Required Respiratory Protection: NONE

4.5 Using jack hammers and handheld power chipping tools to break up concrete or block, remove floor tile and thinset, and similar tasks (two options):

Engineering and Work Practice Controls: Option 1: • Use a tool with a water delivery system that supplies a continuous stream or spray of water at the point of impact.		
Required Respiratory Protection for Option 1		
	≤ 4 hours/shift	> 4 hours/shift
Used outdoors	None	APF 10
Used indoors or encl. areas	APF 10	APF 10

Engineering and Work Practice Controls: Option 2 • Use a tool equipped with a commercially available shroud and dust collection system. • Operate and maintain the tool in accordance with the manufacturer's instructions to minimize dust emissions. • Dust collector must provide the air flow recommended by the tool manufacturer, or greater, and have a filter with 99% or greater efficiency and a filter-cleaning mechanism.		
Required Respiratory Protection for Option 2		
	≤ 4 hours/shift	> 4 hours/shift
Used outdoors	None	APF 10
Used indoors or encl. areas	APF 10	APF 10

4.5 Using handheld grinders for any task other than mortar removal (two options):

Engineering and Work Practice Controls: Option 1 • For tasks performed outdoors only: Use a grinder equipped with an integrated water delivery system that continuously feeds water to the grinding surface. • Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.
Required Respiratory Protection for Option 1: NONE

Engineering and Work Practice Controls: Option 2

- Use grinder equipped with commercially available shroud and dust collection system.
- Operate and maintain the tool in accordance with the manufacturer's instructions to minimize dust emissions.
- Dust collector must provide 25 cubic feet per minute (cfm) or greater of airflow per inch of wheel diameter and have a filter with 99% or greater efficiency and a cyclonic pre-separator or filter-cleaning mechanism.

Required Respiratory Protection for Option 2

	≤ 4 hours/shift	> 4 hours/shift
Used outdoors	None	None
Used indoors or encl. areas	None	APF 10

4.6. Mixing concrete or mortar in a portable mixer, wheelbarrow or trough:

Engineering and Work Practice Controls:

- Use a hose or other method to deliver a water spray to the mixer, wheelbarrow or trough as the concrete or mortar is dumped out of the bag. Continue adding water (spray) as the product is mixed until any visible dust is minimized.
- Employees dumping the bagged product or involved in the mixing process must stand upwind of the mixing container.

Required Respiratory Protection

	≤ 4 hours/shift	> 4 hours/shift
Mixed outdoors	None	None
Mixed indoors or encl. area	None	APF 10

4.7 Using heavy equipment and utility vehicles for tasks such as grading and excavating (but not demolishing, abrading, or fracturing silica-containing materials) (two options):

Required Engineering and Work Practice Controls: Option 1

- Apply water and/or dust suppressants as necessary to minimize dust emissions

Required Respiratory Protection for Option 1: NONE

Required Engineering and Work Practice Controls: Option 2 • When the equipment operator is the only employee engaged in the task, operate equipment from within an enclosed cab (see requirements for enclosed cabs under 4.0 above. • Note that this option must not be used if there will be other employees engaged in the task but not inside of enclosed cabs meeting the requirements of 4.0 above.
Required Respiratory Protection for Option 2: NONE

4.8. Abrasive blasting on concrete, block or other silica-containing materials:

Required Engineering and Work Practice Controls: Option 1 • Blasting must be conducted in a containment under negative pressure with ventilation exhausted to a filtration unit. Use a HEPA-filtered vacuum when removing blast media.
Required Respiratory Protection for Option 1: Full Face Supplied Air Respirator

Required Engineering and Work Practice Controls: Option 2 • Use a vapor blasting system that introduces a water mist at the abrasive blast nozzle in outdoor settings. The unit should be utilized per the manufacturer's specifications to ensure adequate delivery of water mist.
Required Respiratory Protection for Option 2: Full Face APR

4.9. Cleaning of engine filters, radiators or cabs of heavy equipment:

Required Engineering and Work Practice Controls: Option 1 • Do not use compressed air for cleaning, unless you are an authorized employee (see option 2 below). • Cabs must be cleaned using a vacuum equipped with a HEPA filter. The cab can also be wiped down using damp towels. • Radiators can be washed with pressurized water so long as there is sufficient time for the unit to dry before next use. • Engine filters should be removed in a manner that minimizes visible dust, and replaced with a clean filter.
Required Respiratory Protection for Option 1: NONE

Required Engineering and Work Practice Controls: Option 2 • The use of compressed air for cleaning equipment radiators must only be done by authorized employees. Those employees must wear a powered-air purifying respirator (PAPR**)** equipped **with a HEPA filter** during the time compressed air is used and they must be included in CAP's respiratory protection program.
Required Respiratory Protection for Option 2: PAPR

5.0 ADMINISTRATIVE CONTROLS: When any of the tasks listed in section 4.0 are performed, appropriate steps must be taken to restrict access to the work areas, as necessary, to limit the number of employees exposed to respirable crystalline silica. Accordingly, when other employees or crews will be working in an area where one of the above tasks will be performed, the silica dust-generating work should be rescheduled. If rescheduling is not an option, one or more of the following precautions should be taken:

- Employees not involved in the work that creates the silica-containing dust must stay clear of the area where the work is performed so as not to be exposed to the dust.
- Signs and/or barricades should be installed to keep employees out of the work area.

Whenever a Section 4.0 task is performed that requires the use of respiratory protection, all other employees not engaged in the task must be kept clear of the work area, particularly those areas where visible dust is present.

6.0 HOUSEKEEPING: Appropriate housekeeping methods during and after the performance of silica dust-generating work are critical to reducing employee exposures. Therefore, the following practices are always required, even for work that does not result in exposures at or above the OSHA AL.

6.1 Cleanup of dust containing silica must be performed using wet sweeping or HEPA-filtered vacuuming. Dry sweeping or dry brushing is prohibited unless these other methods are not feasible.

6.2 Compressed air must not be used for cleaning, including the cleaning of clothing, if such activity could contribute to employee exposure to RCS, unless the compressed air is used in conjunction with a ventilation system that effectively captures the dust cloud created by the compressed air or no alternative cleaning method is feasible.

7.0 MEDICAL MONITORING:

7.1 Although CAP does not anticipate the need to perform medical monitoring of employees because of respirable crystalline silica exposure, initial and/or periodic medical examinations will be offered to any employee with expected exposures at or above the OSHA action level for 30 or more days per year. Any employee(s) meeting that criterion will be offered a medical examination:

- Within 30 days of initial assignment to a position where he/she is expected to be exposed to RCS above the action level for 30 or more days a year; and
- Every three years from the employee's last examination that met the requirements of the silica standard (or more frequently if recommended by the healthcare

professional), if the employee will continue to perform tasks that result in exposures above the action level for 30 or more days a year.

7.2 Following any medical monitoring exam, the medical professional performing the exam must provide both the employee and CAP with certain information. If the medical professional does not already do so, CAP will provide the employee with a copy of the written medical opinion sent to CAP.

7.3 Where the medical professional performing the initial or periodic medical examinations believes the employee needs to see a specialist, CAP will arrange that medical appointment within 30 days of receiving the recommendation. The specialist examination will be provided at no cost to the employee.

8.0 EMPLOYEE INFORMATION and TRAINING: Employee training is an essential part of any program to protect employees from workplace hazards. Training provides employees with the knowledge and power necessary to take control over their own health and safety in the workplace.

8.1 Employees performing work tasks that are known or could potentially result in exposures to respirable crystalline silica at or above the OSHA AL will be provided with training on those work tasks, as well as the methods used to limit exposure to RCS. Employees will also be trained on the following:

- The use of any required PPE;
- Required housekeeping practices;
- The health hazards associated with exposure to RCS;
- The contents of the OSHA standard; and
- The purpose and description of the medical surveillance program required by the OSHA standard.

8.2 All training will be provided before an employee engages in a task that results in (or may result in) exposure at or above the AL.

8.3 Refresher training will be provided:

- At least every three years
- When observations indicate employees do not understand or are not complying with appropriate engineering or administrative controls, or the proper use of PPE.

9.0 PROGRAM EVALUATION and AVAILABILITY: This program shall be stored within Content Server and shall be accessible to all employees. The program will be reviewed at least once per year by the EH&S manager or designee and the program updated with any changes to work tasks that involve respirable crystalline silica exposure, engineering controls, administrative controls and necessary PPE.

10.0 RECORDKEEPING: The following records will be maintained:

10.1 Exposure measurements: Records will be kept of all air monitoring conducted to determine employee exposure to RCS. Records will include the date of the sampling, the specific task monitored, the sampling and analytical methods used, the type of PPE worn by employees, and the names and other identifying information of all employees represented by the monitoring.

10.2 Objective data: Any objective data used by CAP to comply with the requirements of the OSHA standard will be kept by the EH&S department. Such data may include the crystalline silica-containing material in question, the source of the objective data, the testing protocol and results of any testing.

10.3 Medical exams: Information related to any medical exams conducted under this program will be maintained as required by the OSHA standard.