

**OREGON OCCUPATIONAL SAFETY AND HEALTH DIVISION
DEPARTMENT OF CONSUMER AND BUSINESS SERVICES**

PROGRAM DIRECTIVE

Program Directive A-300
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SUBJECT: Silica

AFFECTED CODES/

DIRECTIVES: [437-002-1053 through 437-002-1065 Silica](#)
[437-002-0382 Oregon Rules for Air Contaminants](#)
[1910.1200 Hazard Communication](#)
[1910.134 Respiratory Protection](#)

PURPOSE: This directive describes policies and procedures for implementing Division 2/Z 437-002-1053 through 437-002-1065.

SCOPE: This directive applies all of Oregon OSHA.

REFERENCES: [Oregon OSHA Field Inspection Reference Manual \(FIRM\)](#)
Oregon OSHA Technical Manual

BACKGROUND:

Rulemaking background

This directive establishes Oregon OSHA's field inspection procedures designed to ensure uniformity when addressing silica exposures in the workplace for enforcement and consultation activities. On March 25, 2016, federal OSHA published two standards, general industry/maritime (29 CFR 1910.1053), and construction (29 CFR 1926.1153), in the Federal Register. On September 23, 2016, Oregon OSHA adopted a combined standard for both general industry and construction, with an effective date of July 1, 2018.

The standard adopted a new permissible exposure limit (PEL) of 50 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$) that is expressed as a gravimetric measurement of respirable crystalline silica.

Beginning on July 1, 2018, construction and general industry employers must be in compliance with all of the standard's provisions. Employers must offer medical surveillance to general industry employees who will be exposed above the PEL of 50 $\mu\text{g}/\text{m}^3$ for 30 or more days a year. On July 1, 2020, this requirement expands to include employees who will be exposed at/or above the 25 $\mu\text{g}/\text{m}^3$ action level (AL) for 30 or more days a year. Employers engaged in construction or construction like activities will be required to offer medical surveillance to employees who will use a respirator for 30 or more days a year. Oregon OSHA proposed a clarification to the previous rulemaking to make sure that the combined standard spelled out this difference and is consistent with the federal standards.

Silica background

The term “silica” refers broadly to the mineral compound silicon dioxide (SiO₂), which can be crystalline or amorphous in molecular structure. The Silica standards apply only to crystalline silica - not amorphous silica. Quartz is the most common form of crystalline silica, and cristobalite is also sometimes encountered in the workplace. OSHA’s focus was on the issues related to the inhalation of respirable dust, which is generally defined as particles that are capable of reaching the pulmonary region of the lung (i.e., particles less than 10 microns (µm) in aerodynamic diameter), in the form of either quartz or cristobalite.

Exposure to crystalline forms of silica is associated with a number of health effects, including silicosis (an irreversible and potentially deadly lung disease), other non-malignant respiratory diseases (such as chronic bronchitis, emphysema, and chronic obstructive pulmonary disease), lung cancer, kidney disease, immunological effects, and activation of latent tuberculosis (TB) infections. Crystalline silica has been classified as a Group 1 carcinogen – Carcinogenic to Humans – by the International Agency for Research on Cancer (IARC) [IARC, 2012], <http://monographs.iarc.fr>. The National Toxicology Program (NTP) has also listed respirable crystalline silica as a known human carcinogen since 2000 [NTP 2014]. Appendix D of this Instruction provides further information on silica, including its sources, and industrial uses, as well as on the adverse health effects of silica exposure.

Occupational exposure to crystalline silica occurs in a variety of workplace settings, including mining, manufacturing, construction, shipyard, and agriculture. Processes historically associated with high rates of silicosis include sandblasting, sand-casting in foundry operations, mining, tunneling, cement cutting and demolition, masonry work, and granite cutting

Reducing and ultimately eliminating the workplace-related incidence of silicosis has been a primary goal of federal OSHA since its inception. In 1972, federal OSHA issued guidelines for conducting inspections in workplaces with significant crystalline silica exposure. In the early 1980s, OSHA placed a special emphasis on the prevention of silicosis in foundries, and in 1996 OSHA implemented a Special Emphasis Program (SEP) to reduce the workplace incidence of silicosis. Twelve years later, on January 24, 2008, OSHA implemented an NEP to identify and reduce or eliminate the health hazards associated with occupational exposure to crystalline silica.

Significant Changes

The new PEL is 50 µg/m³ for construction and general industry. It applies to all three major forms of crystalline silica (i.e., quartz, cristobalite, and tridymite) covered under previous Oregon OSHA PELs. The new PEL represents a change from the preceding PELs, which were based on formulas and inconsistent between industries and forms of crystalline silica.

The preceding PELs were also not supplemented by additional protective provisions-such as medical surveillance requirements-as are included in other Oregon OSHA standards. The final standards do contain these provisions, bringing the Silica standards into line with other Oregon OSHA substance-specific standards.

ACTION: Enforcement managers must ensure that compliance officers follow the procedures established by this instruction.

CLARIFICATION

OF STANDARD: The guidance that follows relates to specific provisions of OAR 437-002-Subdivision Z-Silica and is provided to assist compliance officers in conducting inspections where the standard may be applicable.

Sections of this directive follow the subdivision:

A. SCOPE AND APPLICATION:

B. DEFINITIONS (437-002-10054)

C. PERMISSIBLE EXPOSURE LIMIT (PEL) (437-002-10055)

D. EXPOSURE ASSESSMENT (437-002-1056)

E. SPECIFIED EXPOSURE CONTROL METHODS (437-002-1057)

F. REGULATED AND RESTRICTED ACCESS AREAS (437-002-1058)

G. METHODS OF COMPLIANCE (437-002-1059)

H. RESPIRATORY PROTECTION (437-002-1060)

I. HOUSEKEEPING (437-002-1061)

J. MEDICAL SURVEILLANCE (437-002-1062)

K. COMMUNICATION OF HAZARDS (437-002-1063)

L. RECORDKEEPING (437-002-1064)

A. SCOPE AND APPLICATION

The silica standards apply to all exposures to silica in general industry and construction, with some limited exceptions:

- These rules do not apply to agricultural operations covered by Division 4.
- These rules do not apply to forest activities covered by Division 7.
- Exposures that result from the processing of sorptive clays. Sorptive clays are a discreet subset of deposits found in certain regions of the U.S. that exists as either amorphous silica or as geologically ancient, occluded quartz.

Note: In the cases listed above, refer to the limits in Table Z-3 of the applicable air contaminants rule.

The silica standard *does not apply* where the employer has objective data demonstrating that employee exposure to respirable crystalline silica will remain below 25 µg/m³ as an 8-hour TWA under any foreseeable conditions. CSHOs presented with an employer claiming exclusion from the standard on the basis of objective data shall determine sufficiency by evaluating whether the data meet the standard's three key requirements:

First, the data must demonstrate that employee exposure will remain below 25 µg/m³ as an 8-hour TWA under *any foreseeable conditions*.

When using the phrase “*any foreseeable conditions*,” Oregon OSHA is referring to situations that can reasonably be anticipated. For example, the malfunction or failure of engineering controls is generally foreseeable. Although engineering controls are usually a reliable means for controlling employee exposures, equipment does occasionally fail. Thus, the exception does not apply where exposures below 25 µg/m³ as an 8-hour TWA are expected or achieved, but only because engineering or other controls are being used to limit exposures.

Second, the data must reflect workplace conditions *closely resembling or with a higher exposure potential than* the processes, types of material, control methods, work practices, and environmental conditions in the employer's current operations.

Oregon OSHA's term "*closely resembling*" has been defined in other standards as circumstances where the major workplace conditions which have contributed to the levels of historic exposure are no more protective than in the current workplace. However, in the Silica standard, the conditions under which the employer's data was collected has to closely resemble the Oregon OSHA inspection (e.g., similar in the process, types of materials, control methods, work practices, and environmental conditions in the workplace). Oregon OSHA's intent is to allow data reflecting past exposures to be used to predict current exposures only when the conditions of the earlier job were not more protective, (i.e., it would not be acceptable to use objective data obtained from a task performed outdoors to assess exposures when the task is performed indoors).

Third, the data must be sufficient to *accurately characterize* employee exposures to respirable crystalline silica. See below for the discussion on objective data, inspection and citation guidelines for air sampling and exposure assessments.

Examples of tasks where employee exposure can reasonably be anticipated to remain below 25 µg/m³ as an 8-hour TWA under any foreseeable conditions (and, thus, the standard typically will not apply, unless the CSHO has reason to believe that higher exposures may occur) include:

- Tasks involving the cutting, drilling, grinding, chipping, milling, crushing, abrading, fracturing, or demolition of crystalline silica-containing materials (i.e., tasks listed in Table 1 where such tasks are performed for a total of 15 minutes or less during a shift;
- Use of heavy equipment and utility vehicles for tasks such as grading and excavating (i.e., tasks listed in Table 1) where such tasks are performed for a total of 15 minutes or less during a shift, or for any duration of time where such use does not create a significant amount of visible dust;
- Tasks that do not involve the cutting, drilling, grinding, chipping, milling, crushing, abrading, fracturing, or demolition of crystalline silica-containing materials (e.g., pouring concrete footers, slab foundation, and foundation walls; removing concrete formwork);
- Tasks involving only the use of manual (i.e., non-powered) tools such as sledgehammers, brick cutters, and chisels; and

- Sanding of drywall where < 1% silica joint compounds are used (joint compounds and other mixtures must be classified as carcinogens under the HCS if they contain >0.1% crystalline silica as an ingredient).
- Although exposures to respirable crystalline silica may be low during drywall finishing when low crystalline silica content joint compound is used, CSHOs should be aware of the potential for exposures to exceed the PEL for particulates not otherwise regulated.

Note: The exclusion of some short-term tasks is based on an individual employee’s exposures to respirable crystalline silica from all sources and must take into account all conditions that may add or contribute to the employee’s overall exposure levels. Exposures could exceed 25 µg/m³ if the employee is engaged in a combination of short-term construction tasks that collectively result in a longer duration of exposure.

When preparing for a silica-related inspection, CSHO’s should be prepared and ready to perform air monitoring on the first day of the inspection.

B. DEFINITIONS (437-002-10054)

1. **Action level (AL)** means a concentration of airborne respirable crystalline silica of 25 µg/m³, calculated as an 8-hour TWA.

Note: Actual or reasonably expected employee exposure at or above the action level trigger requirements for exposure assessment in the construction and the general industry. The medical surveillance requirement in the general industry requirements (but not the requirements for construction) is triggered by employee exposure at or above the action level for 30 or more days per year.

2. **Air monitoring data** means any air monitoring conducted by the employer and analyzed according to the procedures in Appendix A of 437-002-1056, and does not include historical “air monitoring data.”

Note: Historical monitoring data may be considered “objective data” if it is obtained during work operations conducted under conditions closely resembling the processes, control methods and work practices in the employer’s current work operations.

3. **Competent person** means an individual who is capable of identifying existing and foreseeable respirable crystalline silica hazards in the workplace and who has the authority to take prompt corrective measures to eliminate or minimize them. The competent person must have the knowledge and ability necessary to fulfill the responsibilities set forth in the Silica standard for construction activities (e.g., make frequent and regular inspections of job sites, materials, and equipment to implement the written exposure control plan (ECP)).

Note: The employer can designate any employee to be a competent person if the employee is qualified, including the employee who does the work on a jobsite. As such, an employee who participates in silica-generating tasks on a job could be designated a competent person if he/she is trained and knowledgeable on how to properly implement the employer’s written ECP (e.g., knows the tasks involving silica exposure; the engineering controls, work practices, and respiratory protection needed to limit exposure; procedures used to restrict access, where necessary to limit exposures to silica) and has the required authority.

The training needed for a competent person is performance-oriented. The employer is responsible for providing sufficient training to equip the competent person with the knowledge and ability to implement the written ECP. The training needed will depend on the types of work done. In some cases, e.g., for small construction companies, successfully completing training required under the Silica standard and the HCS may be enough. In other cases, additional training may be needed.

- 4. Objective data** means information – such as air monitoring data from industry-wide surveys or calculations based on the composition of a substance – demonstrating employee exposure to respirable crystalline silica associated with a particular product or material or a specific process, task, or activity. The data must reflect workplace conditions closely resembling or with a higher exposure potential than the processes, types of material, control methods, work practices, and environmental conditions in the employer's current operations.

Note 1: Objective data can include data developed using area sampling results or results from direct-reading instruments, and their use must characterize the worker's full-shift exposure. Employers could also rely on exposure mapping, historical air monitoring data, or information generated by other alternative exposure measurement and characterization strategies. It is the employer's burden to show that the data is sufficient to accurately characterize employee exposure to respirable crystalline silica.

The employer can characterize employee exposure within a range, in order to account for variability in exposures. For example, a general industry or maritime employer could use the performance option and determine whether an employee's exposure is between the action level and the PEL.

Note 2: The Silica standards do not limit when objective data can be used to characterize exposure. Oregon OSHA permits employers to rely on objective data for meeting their exposure assessment obligations, even where exposures reflected in the objective data may exceed the action level or PEL. Oregon OSHA's intent is to allow employers flexibility to assess employee exposures to respirable crystalline silica, and to ensure that the data used are accurate in characterizing employee exposures.

- 5. Permissible exposure limit (PEL)** means a concentration of airborne respirable crystalline silica of 50 $\mu\text{g}/\text{m}^3$ calculated as an 8-hour TWA.
- 6. Physician or other licensed healthcare professional (PLHCP)** means an individual whose legally permitted scope of practice (i.e., license, registration, or certification) allows him or her to independently provide or be delegated the responsibility to provide some or all of the particular health care services required by the standard.

Note: Any PLHCP can conduct medical examinations and procedures required under the Silica standard when he or she is licensed, registered, or certified by state law to do so. Licensing and scope of practice definitions may vary from state to state. Questions regarding PLHCPs and their scopes of practice may be directed to their respective State of Oregon boards of practice.

7. **Respirable crystalline silica** means quartz, cristobalite, and/or tridymite contained in airborne particles that are determined to be respirable by a sampling device designed to meet the characteristics for respirable-particle-size-selective samplers specified in the International Organization for Standardization (ISO) 7708:1995: Air Quality-Particle Size Fraction Definitions for Health-Related Sampling.

Note: Amorphous silica (also know as; Diatomaceous earth, Diatomaceous silica, Diatomite, Precipitated amorphous silica, Silica gel, and Silicon dioxide (amorphous)) is not covered by this standard.

8. **Specialist** means an American Board Certified Specialist in Pulmonary Disease or an American Board Certified Specialist in Occupational Medicine.
9. All other definitions in the standard are for terms previously used by Oregon OSHA in other health standards, and the terms are similarly defined and used in the Silica standard.

C. **PERMISSIBLE EXPOSURE LIMIT (PEL) (437-002-10055)**

General information: The silica standard establishes an 8-hour TWA PEL of 50 $\mu\text{g}/\text{m}^3$, and an AL of 25 $\mu\text{g}/\text{m}^3$. The Silica standards do not prohibit employee rotation as a means of achieving the PEL. This does not affect that prohibition in other standards.

Note: For construction tasks, where employers have fully and properly implemented the specified exposure control methods including respiratory protection for tasks listed in Table 1, the exposure assessment requirements of the standard do not apply. Therefore, the employer is not required to conduct exposure assessments or otherwise comply with the PEL for those specific tasks.

Inspection guidelines: Review the employer's air monitoring records, or other data used by the employer to characterize exposures, to determine what exposure levels might be expected before entering the work area. If review of the employer's air monitoring records indicates that overexposures may have occurred, then the CSHO shall document these overexposures by obtaining copies of the employer's exposure data and placing them in the case file. Any other related attachments or separate documents, such as laboratory analytical results or chain of custody sample forms, should also be placed into the case file.

A violation is established if the measured exposure exceeds the PEL after applying corrections for possible sampling and analytical error (SAE) and applying a 95 percent limit (refer to SAE instructions in the [Oregon OSHA Technical Manual](#)). The CSHO shall document silica exposures by ensuring that all available exposure data whether provided by the employer or obtained during the inspection are copied to the case file.

Note: Refer to [Section II of the Oregon OSHA Technical Manual](#) for more detailed instructions for collecting air samples.

If a construction employer is doing a task or using equipment that is not listed in Table 1 then the employer should have done an exposure assessment under 437-002-1056. If there is no employer exposure data for a CSHO to review or the CSHO believes that the employer's exposure data may not be representative, the CSHO shall collect personal air samples. Collect samples and calculate the 8-hour TWA for those construction

tasks/operations using tools not listed in Table 1 that are likely to generate silica exposures. Some examples of tools and tasks not in Table 1:

- Reciprocating cutting tools
- Concrete chain saws
- Wire saws
- Abrasive blasting
- Tunnel boring

If deficiencies relating to the respirable crystalline Silica standards are suspected, but the operations/processes are not in operation during the inspection, CSHOs shall request from the employer the next available time the processes will resume and return to monitor.

If the processes is not resuming and the CSHO could not sample, but the employer performed recent sampling that indicated an overexposure and took no corrective actions, then the employer's own exposure data can be used to show the employer has knowledge of the hazardous condition. In such cases:

- Review the employer's exposure data collected for that processes.
- Ensure that the employer's monitoring was conducted in accordance with the Silica standards. If so, then CSHOs should be able to cite certain violations. Citations that could exist include the employer's failure to implement engineering controls and/or deficiencies of the respiratory protection program. Any citations issued should be consistent with the guidance provided in this directive.

For any air sampling performed by CSHOs, if they must enter a regulated area or other areas where anticipated exposures are above the PEL, they shall wear the personal protective equipment (PPE) and clothing required by the employer or as appropriate for the CSHOs inspection or sampling activity. Since CSHOs have no instrumental method for screening airborne concentrations of silica, they should be conservative about time spent in areas where high concentrations exist or are suspected. Still, when CSHOs are sampling employee exposures, they should frequent the work areas often enough to keep the sampling under surveillance.

In construction, CSHOs may encounter situations where employees perform tasks listed on Table 1 using the specified exposure control methods for those tasks, and during the same shift perform tasks that are not listed on Table 1 or do not utilize the specified exposure control methods listed on Table 1:

- Where the employer is fully and properly implementing the specified controls on Table 1 tasks, there is no requirement for the CSHO to collect personal air samples for those tasks.
- Where employees are conducting *only* Table 1 tasks and the employer *has not* fully and properly implemented the specified controls for one or more of the Table 1, the CSHO shall collect personal samples to measure the 8-hour TWA for one or more employees engaged in the tasks for which the employer has not implemented the specified controls.

- Where the employer *has not* fully or properly implemented the specified controls for one or more Table 1 tasks and an employee doing those tasks is also performing a non-Table 1 task during the same shift, the CSHO will collect representative personal samples to measure the 8-hour TWA for one or more employees engaged in those combined tasks that are likely to exceed the PEL.
- In a situation where the employer *has* fully and properly implemented specified controls for Table 1 tasks but is also performing non-Table 1 tasks during the same shift, the CSHO should adjust sampling strategy, if possible, to collect air samples for the task/operations that are not in Table 1 and are likely to exceed the PEL.
- Where sampling strategy adjustment is not feasible, CSHOs should collect full-shift personal samples and make every effort to document duration of the times spent in the separate tasks/operations.

Variability in sampling: Oregon OSHA recognizes that differences in exposure can occur due to workplace variables. See the [Oregon OSHA Technical Manual](#) Oregon OSHA strives for representative sampling and is committed to a fair enforcement policy. Therefore, when an employer's air monitoring data suggest that sampling results obtained during an Oregon OSHA inspection are not representative of normal exposure levels at the site, CSHOs may use their discretion and in consultation with their manager, decide whether to conduct a follow-up inspection if the same operation is continuing. This discretion is in addition to Oregon OSHA's standard practice of accounting for sampling and analytical error by providing a margin of error above the PEL before Oregon OSHA issues a citation for violating the PEL.

- If an employer provides previous measurements (i.e., air monitoring data and/or objective data) as evidence that a CSHO's measurement over the PEL is unrepresentative and does not justify a citation, review the employer's data to ascertain their documented exposure pattern. Look to see whether those records were obtained for tasks/operations that are representative of those under Oregon OSHA's evaluation. Compare the employer's exposure data with Oregon OSHA's sampling results, and, using discretion, determine whether the sampling results are comparative.
- In these situations, the employer is expected to provide data consisting of a series of full-shift or other representative measurements, or objective data, related to specific job activity or tasks representative of the exposure of the employees under consideration. The data must have been obtained under conditions which closely resemble or have a higher exposure potential than that of the Oregon OSHA inspection. Such measurements should show that random fluctuations in the TWA exposures above the PEL occur due to circumstances beyond the control of the employer (e.g., environmental conditions or air movement).
- After reviewing the employer's sampling/documentation, the CSHO should confer with their manager with regard to existence (or not) of a violation or whether it is feasible or prudent to re-sample or re-inspect at a later time to confirm.

- In general, a re-sampling would rarely be necessary. The employer is responsible for demonstrating that the CSHO's one-day sample is unrepresentative of normal exposure levels.
- In the event that Oregon OSHA conducts a re-sampling and finds that the Agency's high exposure measurement resulted from unpreventable random circumstances, then the CSHO should confer with their manager for final determination in the case.
- If an overexposure is found and it appears that the employer was using appropriate engineering controls and work practices to the extent feasible:
- Evaluate the employer's respiratory protection program. Any deficiencies should be addressed in accordance with the respiratory protection section of this Directive. 1910.134 (437-002-0134)
- Where CSHO documents an employee exposure exceeding the PEL, but all feasible engineering and work practice controls were instituted, and all appropriate personal protective equipment was provided, as required under the Silica standard, then a violation of the PEL may not be cited. Oregon OSHA expects this situation to occur in only rare situations, such as inside a confined space or within a construction work site containment area or enclosure. The CSHO's assessment of feasibility must be made on a case-by-case basis.

Note: See also OSHA Letter, [Use of feasible engineering/work practice controls for exposure to Cr\(VI\) for welding in confined spaces; housekeeping and disposal of large/bulky waste materials](#), May 31, 2007.

If the CSHO does not have an opportunity to re-inspect/resample (e.g., construction site, or operation ceased), then the CSHO and their manager should consider the following factors and then determine whether or not to issue a citation based on the circumstances:

- Whether the PEL can be achieved (based on air monitoring data and/or objective data) in the task/operation for the majority of time that the work is performed (e.g., exposures above the PEL would be very rare occurrences).
- Whether the employer was appropriately maintaining and/or monitoring feasible engineering controls and ensuring adherence to work practice controls.
- If the employer's previous exposure monitoring records adequately demonstrate the exposure pattern for tasks/operations that are representative of those under Oregon OSHA's evaluation.

Citation guidelines: Citations for violations of the PEL shall be issued as follows:

For general industry employers:

- If samples show that employees are exposed to respirable crystalline silica over the PEL of 50 µg/m³, and the employer has instituted all feasible engineering and work practice controls and employees are adequately protected by an effective respiratory protection program, then no PEL violation shall be cited.

- Cite paragraph 437-002-1059(1) when the employer did not implement the appropriate engineering controls to reduce the employee exposure to or below the PEL.
- Cite paragraph 437-002-1060(1)(c) when the employer did not implement an effective respiratory protection program to reduce exposures to or below the PEL.

For construction employers:

- Citations for exposure above the PEL will not normally be cited when:
 - The employer has fully and properly implemented the measures for a Table 1 task; or
 - Employees are exposed above the PEL, and the employer has implemented all feasible engineering and work practice controls and implemented an effective respiratory protection program.

Follow-up inspections:

To determine whether the employer has eliminated hazards or reduced exposures below the PEL, follow-up inspections must be conducted in accordance with the FIRM.

For those employers where follow-ups are not done, the employer will need to provide written updates documenting the progress of their abatement efforts in a Letter of Corrective Action(LOCA).

D. **EXPOSURE ASSESSMENT (437-002-1056)**

437-002-1056(1) requires employers to assess the exposure of each employee who may reasonably be expected to be exposed to respirable crystalline silica at or above the action level. The purposes of requiring an assessment of employee exposures to respirable crystalline silica include determination of the extent and degree of exposure at the worksite; identification and prevention of employee overexposure; identification of the sources of exposure to respirable crystalline silica; collection of exposure data so that the employer can select the proper control methods to be used; and evaluation of the effectiveness of those selected methods. Requiring exposure assessments also facilitates employee notification about occupational exposures.

Note: For construction inspections (or inspections involving a general industry task that is indistinguishable from a Table 1 construction task and is not performed regularly in the same environment and conditions), employers need not assess employee exposure if they are fully and properly implementing the Table 1 specified methods identified under 437-002-1057 for each employee who is or may reasonably be expected to be exposed to respirable crystalline silica at or above the action level.

Assessment options: Employers can assess employee exposures using either the Performance Option or the Scheduled Monitoring Option.

Performance option: This option provides the employer with some flexibility to assess the 8-hour TWA exposure of each employee on the basis of any combination of air monitoring data or objective data sufficient to accurately characterize each employee's exposure to respirable crystalline silica. The burden is on the employer to show that the

data comply with the requirements.

To meet their exposures assessment burdens, employers choosing the performance option must:

- Be able to demonstrate that employee exposures have been accurately characterized;
- Make sure that the exposure assessment reflects the exposures of employees on each shift, for each job classification, in each work area; and
- Comply with the remaining exposure assessment provisions, where applicable (i.e., reassessment of exposures, methods of sample analysis for air monitoring, employee notification of assessment results, and observation of monitoring. For more details, see discussion of these requirements below.
- Employers can characterize employee exposure within a range to account for variability in exposure (e.g., employee exposure is between the AL and the PEL). Employers can also use this option to show that exposures exceed the PEL by a certain level (such as less than 10 times the PEL) after using all feasible controls. The employer would then know that he or she must provide respiratory protection with an assigned protection factor (APF) of at least 10.
- There is no time limit for historical air monitoring data to be used as objective data to characterize employee exposures. For example, historical monitoring data obtained 18 or more months prior to the July 1, 2018 effective date, could be used to determine employee exposures, but only if the employer is able to demonstrate that the data were obtained during work operations conducted under workplace conditions closely resembling or with a higher exposure potential than the processes, types of material, control methods, work practices, and environmental conditions in the employer's current operations.
- Under the performance, an employer could determine that there are no differences between the exposure of an employee in a certain job classification who performs a task in a particular work area on one shift and the exposure of another employee in the same job classification who performs the same task in the same work area on another shift. In this case, the employer could characterize the exposure of the second employee based on the characterization of the first employee's exposure.
- If objective data show exposure above either the AL or PEL, then the standard does not require periodic monitoring for employers following the performance option. However, the employer has to reassess if any new or additional exposures at or above the action level are reasonably expected. As such, the employer must ensure that the objective data used accurately characterize the employees' exposures.
- An employer's objective data may be used for meeting exposure assessment obligations even where exposures may exceed the AL or PEL. Nonetheless, the employer is still responsible for ensuring that all feasible controls are used to reduce exposures to or below the PEL and that appropriate respiratory protection is used if feasible controls cannot reduce exposures to a level at or below the PEL.

- To ensure the greatest level of employee protection, the objective data must represent current exposures only when the conditions of the earlier job were not more protective, (i.e., it would not be acceptable to use objective data obtained from a task performed outdoors to assess exposures when the task is performed indoors). For objective data to accurately characterize exposures in the employer's workplace, it is critical that the employer's processes, controls and facility configuration as well as the type of material and environmental conditions, are sufficiently similar to those of the source data or that the workplace conditions of the source data have a higher exposure potential than the employer's current operations. Objective data may be from industry organizations, trade associations, professional societies and academic institutions.

Scheduled monitoring option: This option requires initial monitoring and periodic monitoring at specific intervals based on monitoring results. Monitoring must be done to assess the 8-hour TWA exposure for each employee on the basis of one or more personal breathing zone air samples that reflect the exposures of employees on each shift and in each job classification and work area.

Where several employees perform the same job tasks on the same shift and in the same work area, the employer may sample a representative fraction of these employees in order to meet this requirement. In representative sampling, the sample must be representative of the employees who are expected to have the highest exposure to respirable crystalline silica. The employer may use these results to represent several employees who perform similar work with silica exposure of similar duration and magnitude. For example, this could involve monitoring the respirable crystalline silica exposure of the employee closest to an exposure source. The exposure result may then be attributed to other employees in the group who perform the same tasks on the same shift and in the same work area.

Employers using the scheduled monitoring option must conduct initial monitoring as soon as work begins so that they are aware of exposure levels and where control measures are needed.

Under the scheduled monitoring option:

- If initial monitoring measures exposures below the AL of 25 $\mu\text{g}/\text{m}^3$, the employer may discontinue monitoring for employees whose results are represented by that monitoring.
- If the most recent exposure monitoring measures exposures at or above the AL, but at or below the PEL, the employer must repeat monitoring within six months of the most recent monitoring.
- If the most recent exposure monitoring measures exposures above the PEL, the employer shall repeat monitoring within three months of the most recent monitoring.

If the most recent (non-initial) exposure monitoring indicates exposure levels are below the AL, monitoring must be repeated within six months until two consecutive measurements, taken seven or more days apart, are below the AL. At that time, the employer may discontinue monitoring for those employees whose exposures are represented by such monitoring, except as otherwise

provided in paragraph 437-002-1056(4).

Employers have to continue monitoring at the applicable required frequencies (three or six months) until two consecutive monitoring results, taken seven days or more days apart, are below the AL.

Inspection guidelines:

Review all air monitoring and/or objective data the employer relied on to assess employee exposure. Determine whether the employer has accurately characterized the employees' exposures and the CSHO must verify that the employer's assessment was conducted in accordance with either the performance option or the scheduled monitoring option.

Employers that perform air monitoring must ensure that samples are collected in the employee's breathing zone, i.e., the sampling device is attached to or near the collar or lapel near the employee's face.

CSHOs need to be mindful that multiple operations/tasks occurring at the same time in the same area may result in higher worker exposures than those found on individual operations/tasks.

Interview employees to determine which shifts and tasks have the greatest exposures, and review the time periods for the samples collected to determine whether the sample times were representative of the work hours and also whether samples were collected in the employee's breathing zone.

The 8-hour TWA exposure is generally best measured by collecting at least one 8-hour air sample from the representative employee, or by collecting two consecutive 4-hour samples.

However, there are some situations, e.g., where multiple and different silica exposure tasks are performed throughout the work shift, in which it is more effective to collect a short-term sample during each task.

Although it is preferable to sample between 7-hours and 8-hours of exposure, if an employee's silica exposure is known to be limited to a small portion of the 8-hour work shift, the employer may determine exposure by sampling only during the exposure period and documenting that there was no additional silica exposure during the remainder of the employee's work shift.

Alternatively, for any un-sampled exposure time (for example, if 7- hours were sampled and 1-hour was un-sampled), the employer may assume the same exposure measured by the sampled period also occurred during the un-sampled period.

If the CSHO determines that the employer's assessment of an employee's full-shift exposure is inadequate because of insufficient sampling time and/or insufficient documentation, then a violation of the exposure assessment provision, 437-002-1056(1) will be cited.

If an air sampling filter becomes overloaded with dusts or other air contaminants while sampling, the result will not be valid. To avoid this situation where high loading of the filter is likely (such as when sampling abrasive blasting

operations or jackhammer operations), the exposure monitoring should be conducted using consecutive air samples over shorter sampling periods.

When CSHOs air sample “dusty” operations, such as abrasive blasting operations or jackhammering, they should periodically inspect their sampling apparatus. If a sampling pump begins to sound different because of heavy loading of the filter, or if the filter appears fully brown with particulates, then the sampling cassette should be replaced. Such overloading may occur in as short a time as 30 minutes or within a few hours for some operations.

If there is uncertainty regarding whether sample times were representative, CSHOs should consider requesting and reviewing the general industry employer’s production records to aid in determining whether the employer’s monitoring was representative.

If there is any uncertainty regarding employee exposures during an Oregon OSHA compliance inspection, and/or the employer’s exposure assessment data is inadequate, CSHO must conduct personal sampling.

Citation guidelines:

If no air monitoring or objective data records exist and employees are or may reasonably be expected to be exposed to respirable crystalline silica at or above the AL, then CSHOs must cite this documented deficiency under 437-002-1056(1).

If the employer is using the performance option and the CSHO determines that significant differences exist between the air monitoring and/or objective data and current conditions which could cause the employees exposures to be underestimated or the employer’s assessment was inadequate because the employer failed to reflect exposures on all shifts for each job in each work area (e.g., the data do not meet the criteria discussed above), cite 437-002-1056(2).

If the employer is using the scheduled monitoring option, but samples are area (environmental) samples and not personal samples, or if the employer’s personal air samples are not representative of employees on each shift, each job and in each work area, then cite 437-002-1056(3)(a).

If the employer is using the scheduled monitoring option and the employer failed to repeat required monitoring within the specified timeframe, cite 437-002-1056(3)(d) or (e), whichever is applicable to the situation.

Reassessment of exposure:

If there are any changes in the production, process, control equipment, personnel or work practices, that may be reasonably expected to result in new or additional respirable crystalline silica exposures at or above the AL, or when the employer has any reason to believe that new or additional exposures at or above the action level have occurred, then the employer shall reassess exposures based on air monitoring and/or objective data.

Employers do not have to reassess exposures if the change is not reasonably expected to result in new or additional exposures to respirable crystalline silica

at or above the AL. For example, reassessment is not required when a task is moved from an indoor to an outdoor location, or when a product is replaced with another product that has lower-crystalline silica content in the same process. However, a new exposure assessment is required whenever an employee performs a different operation and/or moves to a different work location that may result in new or additional exposures at/or above the AL unless the original determination considered these operations.

Inspection guidelines:

When the employer's exposure assessment does not reflect the exposures being observed, inquire whether there were any changes in the production, process, control equipment, personnel or work practices that could affect the respirable crystalline silica exposures. If changes were made, review documentation of the employer's assessment of its new exposure scenario.

During employee interviews, ask the employees if there have been any changes that may have resulted in new or additional exposures at or above the AL.

CSHOs may conduct exposure air monitoring to determine whether employers have accurately characterized the exposure of each employee to respirable crystalline silica, and to document exposures the employer failed to assess.

When sampling is warranted, conduct air sampling even if it is for less than an 8-hour period. Based on the specific situation or conditions observed, CSHOs can use their discretion to determine whether or not to sample for a full-shift.

Citation guidelines:

If the employer failed to reassess exposures when there was a change (in the production, process, control equipment, personnel or work practices that may reasonably be expected to result in new or additional exposures at or above the AL), cite 437-002-1056(4).

Methods of sample analysis: Appendix A to 437-002-1056 requires that all air monitoring samples are evaluated as outlined in the Appendix A of the standard. The silica standard allows employers to use any sampling device that conforms to the ISO/CEN convention. Oregon OSHA uses the SKC cyclone sampler with a flow rate of 2.5 liters per minute (L/min). Employers can rely on a statement from the laboratory confirming that the specified requirements in Appendix A of the standard were met when the laboratory is an accredited lab with a certification from AIHA Laboratory Accreditation Programs AIHA maintains a website where the public can check on the accreditation status of labs at:

<http://www.aihaaccreditedlabs.org/AccreditedLabs/Pages/default.aspx>.

Citation guidelines:

Cite 437-002-1056(5) if the employer did not follow the requirements for sample analysis in Appendix A of 437-002-1056.

Employee notification:

437-002-1056(6) requires employers to notify each affected employee individually, in writing, of the results of the exposure assessment within 5

working days for construction employers (NAICS code 23), and 15 working days for all other employers. The employer has the option to post the results where they are accessible to all affected employees.

Note: For purposes of this rule, the term “affected” means all employees for which an exposure assessment has been conducted, either individually or as part of representative monitoring. It includes employees whose exposure was assessed based on other employees who were sampled, and employees whose exposures have been assessed on the basis of objective data.

When the exposure assessment shows exposures above the PEL, 437-002-1056(6)(b) requires that the written notification includes the corrective action the employer is taking to reduce exposures to or below the PEL.

Note: The 5-day and 15-day periods for notification start when:

1. An employer following the performance option finishes the exposure assessment/reassessment; or
2. An employer following the scheduled monitoring approach receives the monitoring results.

Inspection guidelines:

The CSHO will ask employees whether and when they were given copies of the results of their exposure assessment, or when and where the results were posted.

Citation guidelines:

If employees have not been notified of their exposure assessment results within timeframes specified above, or the employer does not have a dated copy of the letter or posting of the results, cite 437-002-1056(6)(a). If the employer’s written notification did not explain corrective action being taken for exposures exceeding the PEL, cite 437-002-1056(6)(b).

Observation of monitoring: 437-002-1056(7) provides for employees or their representatives to observe monitoring and provide protection for the observers. This provision is consistent with Oregon OSHA's other substance-specific health standards. While this provision requires the employer to provide affected employees or their designated representatives with the right to observe monitoring, the observation should not seriously disrupt production or the sampling itself.

437-002-1056(7)(a) requires that, whenever the employer performs respirable crystalline silica air monitoring to comply with the requirements of these sections, the employer must provide affected employees or their designated representatives an opportunity to observe.

437-002-1056(7)(b) requires, when observation of monitoring requires entry into an area where the use of protective clothing or equipment is required for any workplace hazard, the employer must provide the observer with protective clothing and equipment at no cost and shall ensure that the observer uses such clothing and equipment.

Inspection guidelines:

Ask affected employees or their designated representative if they were given the opportunity to observe any monitoring of employee exposure, and whether they were provided with the appropriate protective clothing and equipment.

Citation guidelines:

If an employee or the employees' designated representative were not given the opportunity to observe monitoring for personal samples, cite 437-002-1056(7)(a). If the employer failed to provide the employees or their designated representatives with appropriate protective clothing or equipment, cite 437-002-1056(7)(b).

E. SPECIFIED EXPOSURE CONTROL METHODS (437-002-1057)

For construction activities, the standard provides employers with an alternative to exposure monitoring for achieving compliance while performing some specified silica-generating construction tasks. This approach uses Table 1 which identifies 18 common construction tasks and equipment that are known to generate high exposures to respirable crystalline silica, and specifies appropriate and effective engineering controls, work practices and respiratory protection for each identified task.

Note: Although many common silica-generating tasks appear on Table 1, not all construction tasks that can result in silica exposures appear on the Table. Thus the requirement for exposure monitoring applies both where the employer does not fully and properly implement the controls, practices, and respiratory protection described on Table 1 *and* for tasks not listed on Table 1.

General industry employers can use Table 1 instead of the exposure assessment for those tasks when the task is indistinguishable from the construction tasks listed in Table 1 and is not performed regularly in the same environment and conditions. Those employers must follow the same requirements for construction work when performing a Table 1 task.

Indistinguishable tasks mean those tasks that are performed primarily during maintenance and repair activities in general industry or maritime settings, and involve an activity described in the construction standard's Table 1. These tasks have to be of the same nature and type as the construction tasks.

Not performed regularly means those tasks that are not performed in a relatively stable and predictable environment. The Table 1 accommodation is intended to accommodate those situations where the tasks will be performed in different environments and conditions.

CSHOs presented with an employer claiming this exception shall evaluate the claim based on the standard's three key requirements:

- First, the employer must be in compliance with *all* of the applicable provisions of the construction standard. Thus, an employer must not only fully and properly implement the engineering controls, work practices, and respiratory protection specified for the relevant task on Table 1, but also must comply with all other applicable provisions for construction (e.g., designate a competent person, written exposure control plan).

- Second, the task performed must be *indistinguishable* from a construction task. Indistinguishable tasks should not be merely parallel or complementary to or occurring at the same time and place as the construction tasks listed on Table 1, but rather should be of the same nature and type as those construction tasks. This exception will apply primarily to maintenance and repair tasks performed in general industry or maritime settings.

An example of an indistinguishable task includes use of a handheld drill during repair or maintenance of existing power delivery lines which is considered a general industry activity, while the installation of new power delivery lines is considered a construction task, even though a handheld drill may be used to drill a hole into the concrete during both activities.

- Third, the task *cannot be performed regularly in the same environment and conditions*. For example, an employer whose business includes chipping out concrete from inside the drums of ready-mixed concrete trucks using pneumatic chipping tools may not follow the construction standard, because that task will be regularly performed in a relatively stable and predictable environment that would not qualify for the accommodation under Table 1, which is intended in part to accommodate situations where the tasks will be performed in different environments and conditions. Another example is the sanding or cutting of concrete blocks in a concrete block manufacturing plant.
- Employees “*Engaged*” in a Table 1 Task. For employers following the specified exposure control methods in Table 1, the respiratory protection specified applies to all employees *engaged* in a task listed on Table 1. This includes not only the equipment operator, but also laborers and other employees (including supervisors) who are assisting with the task or have some responsibility for the completion of the task, even if they are not directly operating the equipment. For example, where an employee is assisting another employee operating a walk-behind saw indoors by guiding the saw, both the saw operator and the helper who is assisting the operator are considered engaged in the task and would need to wear a respirator. Similarly, employees assisting (e.g., a crew member using a water hose to spray and wet the concrete) a worker jackhammering outdoors would be considered to be engaged in the task and would also be required to wear a respirator for work lasting more than four hours. Alternatively, an employee directing traffic around another employee jackhammering would not be considered “engaged in the task,” and therefore, would not be covered by Table 1.
- For each employee engaged in a task identified on Table 1, the employer is required to fully and properly implement the engineering controls, work practices, and respiratory protection specified for the task on Table 1, unless the employer assesses and limits the exposure of the employee to respirable crystalline silica in accordance with paragraph (d) of the standard for construction. If the employer fully and properly implements the engineering controls, work practices, and respiratory protection specified for each employee engaged in a task identified on Table 1, the employer is not required to conduct exposure assessments or otherwise comply with the PEL for those employees.

Specified controls: Paragraph (1) applies where employees are engaged in a task identified on Table 1. For each employee engaged in a task identified in Table 1, this paragraph requires employers to fully and properly implement the engineering controls, work practices, and respiratory protection specified for the task on Table 1, *unless* the employer assesses and limits the exposure of the employee to respirable crystalline silica in accordance with 437-002-1056.

Engineering Controls and Work Practices Specified in Table 1. Table 1 prescribes the use of a variety of engineering and work practice controls for particular tasks or pieces of equipment. The following guidance applies to particular types of engineering controls and work practices or specific pieces of equipment listed on the Table 1.

Vacuum dust collection systems: Seven of the entries on Table 1 specify the use of a tool “equipped with a vacuum dust collection system.” For example, one of the required engineering controls in paragraph (c)(xi) for employees using a handheld grinder for mortar removal (i.e., tuck-pointing) is using a grinder equipped with a commercially available shroud and dust collection system.

A vacuum dust collection system typically consists of an industrial vacuum with an exhaust filter, a hose that connects the vacuum to the tool, and a shroud or cowling or, in the case of milling machines and vehicle-mounted drilling rigs, an enclosure that contains the source of the dust. Full and proper implementation of a vacuum dust collection system typically includes the following:

- The shroud or cowling must be properly sized, intact and installed in accordance with the manufacturer’s instructions;
- The hose connecting the tool to the vacuum must be intact and without kinks or tight bends that reduce the suction (extension hoses or the addition of multiple inlets will reduce the air flow);
- The filters on the vacuum must be cleaned or changed in accordance with the manufacturer’s instructions to prevent clogging, which reduces suction;
- The vacuum system must provide the air flow specified on Table 1 or recommended by the equipment manufacturer;
- The vacuum system must have a filter with a 99% or greater efficiency;
- The vacuum system must have a filter-cleaning mechanism; in some cases (i.e., (c)(1)(xi) handheld grinders for mortar removal and (c)(1)(xii) handheld grinders for uses other than mortar removal) a cyclonic pre-separator can be used as an alternative to a filter-cleaning mechanism. If so equipped, it may be necessary to activate a back-pulse filter cleaning mechanism several times during the course of a shift; and
- The dust collection bags/container must be emptied to avoid overfilling, which would prevent the vacuum system from operating effectively.

Note: OSHA requires that the dust collection systems specified in Table 1 be “commercially available.” This ensures that employers use equipment that is appropriately designed for the tool being used and that will be effective in capturing dust generated from using the tool. Products that are custom made by aftermarket manufacturers which are intended to fit the make and model of the tool are considered

to be “commercially available.” The requirement is intended to exclude do-it-yourself on-site attempts at dust control using substandard or otherwise inappropriate control equipment. Employers who use controls other than those specified in Table 1, must follow 437-002-1056.

Wet methods: Fourteen of the eighteen entries on Table 1 specify the use of wet methods to control exposures. For example, the Table 1 task on small drivable milling machines (less than half-lane) specifies the use of a machine equipped with supplemental water sprays designed to suppress dust.

Some of the entries on Table 1 that specify the use of wet methods require that the delivery system must be “integrated” into the tool. For example, the Table 1 task on stationary masonry saws requires the use of a saw equipped with an integrated water delivery system that continuously feeds water to the blade. An “integrated water delivery system” is one developed in conjunction with the tool. Integrated systems are more likely to control dust emissions effectively by applying water at the appropriate dust emission points based on tool configuration.

Where Table 1 requires an integrated control system, employers who use a non-integrated system (e.g., a worker spraying water from a hose on material that another worker is cutting with a stationary masonry saw) have not “fully and properly implemented” the controls specified on Table 1 and must follow all the requirements of 437-002-1056 instead.

Where wet methods are implemented for dust control, full and proper implementation of controls under Table 1 involves ensuring the following:

- The availability of a sufficient supply of water on-site to suppress the dust. Where connection to a water main or faucet is not available, water must be provided using portable tanks or water trucks.
- That a steady spray of water is directed at the point of dust generation at the flowrate as specified by the manufacturer.
- That a water delivery system is fully and properly implemented, the employer should establish and follow procedures to assess reliability of the system, such as:
 - Frequent checking for clogging of the spray nozzles;
 - Checking that the water is directed towards the emission source;

Note: Given the use of water, the possibility for freezing must be taken into consideration. Precautions must be taken to ensure the use of water in freezing temperatures does not create a slip hazard. Also, a ground fault circuit interrupter and waterproof electrical connectors must be used for electrical tools and other equipment on the construction site.

Enclosed cabs: Eight of the entries on Table 1 specify the use of an enclosed cab or booth. For example, the Table 1 task on heavy equipment and utility vehicles used to abrade or fracture silica-containing materials (e.g., hoe-ramming, rock ripping) or used during demolition activities involving silica-containing materials) specifies that the equipment must be operated from within an enclosed cab. As discussed in more detail below, paragraph (3) of the standard contains additional requirements that apply for measures implemented that include an enclosed cab or booth.

Manufacturer's instructions: Twelve of the entries on Table 1 specify that the equipment must be operated and maintained in accordance with manufacturer's instructions to minimize dust emissions. Oregon OSHA interprets this to mean that the employer will follow instructions that relate to minimizing airborne dust levels. For example, manufacturer's instructions that influence the effectiveness of the tool and controls with regard to minimizing dust emissions might include additional specifications for water flow rates, air flow rates, vacuum equipment, rotation of the blade, maintaining and changing blades, and frequencies for changing water.

It is not Oregon OSHA's intention to enforce manufacturers' instructions that are unrelated to dust control or ones that are inconsistent with the standard. For example, it would not be our intent to cite for failure to adhere to procedures for transport and storage of equipment or the instructions to use respiratory protection when respiratory protection is not otherwise required by the standard.

Heavy equipment and utility vehicles: The Table 1 task specifies the engineering controls, work practices, and respiratory protection to be used when heavy equipment or utility vehicles are used to abrade or fracture silica-containing materials (e.g., hoe-ramming, rock-ripping buckets, graders, bulldozers) or used during demolition activities involving silica-containing materials. Employees engaged in this task operate a variety of wheeled or tracked vehicles ranging in size from large heavy construction equipment, such as bulldozers, scrapers, loaders, cranes and road graders, to smaller and medium sized utility vehicles, such as tractors, bobcats and backhoes, with attached tools that are used to move, fracture, or abrade rock and demolition debris. For example, equipment operators typically perform activities such as the demolition of concrete or masonry structures, hoe-ramming, rock ripping, and the loading, dumping, and removal of demolition debris, which may include the loading and dumping of rock, and other demolition activities.

Note: Abrading means scraping or wearing away silica-containing materials through friction.

When operating heavy equipment and utility vehicles used to abrade or fracture silica-containing materials or used for demolition activities involving silica-containing materials, the equipment operator must be in an enclosed cab. The use of an enclosed cab as the only control is an option if the operator is the only employee engaged in the task. When other employees are engaged in the task, water sprays, dust suppressants, or both must also be applied as necessary to minimize visible dust emissions. Some types of modern heavy equipment already come equipped with enclosed, filtered cabs that meet the requirements of Table 1.

When the operator exits the enclosed cab and is no longer actively performing the task, the operator is considered to have stopped the task. However, if other abrading, fracturing, or demolition work is continuing by other heavy equipment and utility vehicles in the area while an operator is outside the cab, that operator and any other laborers assisting with the task are considered to be employees "engaged in the task" and must be protected by the application of water and/or dust suppressants.

Note 1: Heavy equipment operators working in a compliant enclosed cab that meets the requirements of paragraph (3) (discussed in more detail below) are not required to wear respirators while they are in the enclosed cab. When water and/or dust suppressants are

used, laborers who assist heavy equipment operators during demolition activities where silica-containing materials are abraded or fractured are not required to wear respirators.

Note 2: Table 1 includes a task for heavy equipment and utility vehicles for tasks such as grading and excavating but not including: demolishing, abrading, or fracturing silica-containing materials. Heavy equipment and utility vehicles used for tasks such as grading and excavating do not typically generate high levels of dust. Thus, Table 1 does not prescribe the use of respiratory protection for these tasks.

Table 1 specifies that water and/or dust suppressants must be applied as necessary to minimize dust emissions. For example, where the moisture content of the soil is not sufficient to prevent the release of respirable dust when heavy equipment is used for tasks such as grading and excavating, water and/or dust suppressants must be applied to control exposures. If the equipment operator is the only employee engaged in the task, Table 1 specifies that the operator can operate the equipment from within an enclosed cab (instead of using wet methods and/or dust suppressants)

Note: The railroad industry also uses heavy equipment to dump and grade silica-containing ballast in track work to support the ties and rail spurs. Such track work is generally subject to Oregon OSHA's standards including the Silica standards for those employees working *outside* the cab, while the employee *inside* the cab is covered by Federal Railroad Administration standards.

Respiratory protection: Six of the entries on Table 1 specify the use of respiratory protection in certain specified circumstances and indicates the minimum assigned protection factor (APF). The key factors in determining if respiratory protection is required by Table 1 are: (1) task location and (2) task duration.

- Task location. To determine if respiratory protection is required, the employer must determine whether the task is to be conducted indoors or in an enclosed area. Indoors and enclosed areas can include locations inside buildings, as well as work locations that are surrounded by walls or barriers that restrict air movement. For example, a work area with only a roof that does not affect the dispersal of dust would not be considered enclosed; however, an open-top structure with three walls and limited air movement or a roof that does limit dispersal would be considered enclosed. Examples of enclosed areas include parking decks, and pits or trenches.

If respiratory protection is dependent in part on task location, the relevant entry on Table 1 references the task location (i.e., outdoors, indoors, or in an enclosed area) and the corresponding entry in the respiratory protection columns specify whether respiratory protection is required for the task location and, if so, the minimum APF required.

- Task duration. To determine if respiratory protection is required, the employer must also determine the anticipated duration of the task before the task begins. Table 1 divides task durations into two time periods: (1) tasks that are performed for less than or equal to four hours in a shift and (2) tasks that are performed for more than four hours. If respiratory protection is required for either or both of these time periods, the applicable column in the respiratory protection column on Table 1 specifies the minimum APF required.

If Table 1 indicates that respiratory protection is required when the anticipated task duration exceeds four hours, employees engaged in the task must wear the respirator during the entire period of time the task is conducted—not just the period of time that exceeds four hours.

For the purpose of determining the task duration, the duration begins when the tool or equipment is first put into operation, and continues until the tool is no longer in use. For tasks conducted on an intermittent basis during a shift separated by extended intervals, the time interval between uses, during which the employee performs tasks not listed in Table 1, is not included in the task duration.

In determining whether respiratory protection will be needed due to the duration of the task, employers must make a good-faith judgment of the task's anticipated duration over the work shift, whether performed continuously or intermittently, based on previous experience and all other available information. For example, if an employer anticipates that respiratory protection will not be required because a task will take four hours or less, but then encounters unforeseen difficulties that make it likely that the task will be performed more than four hours, the employer is required to provide the required respiratory protection as soon as it becomes evident that the duration of the task may exceed the 4-hour limit, measured from the beginning of the task.

Note: As discussed in more detail below, paragraph (4) of the standard details how the “task duration” factor should be calculated where an employee performs more than one task on Table 1 during the course of a shift. In brief, paragraph (4) provides that:

- If the total duration of all the employee's tasks combined is more than four hours, the required respiratory protection for each task is the respiratory protection specified for more than four hours per shift;
- If the total duration of all tasks on Table 1 combined is less than four hours, the required respiratory protection for each task is the respiratory protection specified for less than four hours per shift.

Inspection guidelines for Table 1- Specified Exposure Control Methods.

Paragraph (1)-Table 1: The CSHO must determine whether any employees are engaged in a task listed in Table 1 or using the tools or equipment listed on Table 1 on materials containing crystalline silica. If so, the CSHO should consult Table 1 to determine whether the employees are using the engineering controls, work practices, and respiratory protection specified on Table 1 for that particular task or piece of equipment:

If the CSHO determines that the employees are *not* using the engineering controls, work practices, and respiratory protection specified in Table 1 for that particular task or piece of equipment, then the CSHO shall conduct air sampling.

If the CSHO determines that the employees *are* using the engineering controls, work practices, and respiratory protection specified in Table 1 for that particular

task or piece of equipment, then the CSHO must determine whether the employer has “fully and properly implemented” the specified controls, practices, and respiratory protection. See this directive’s Appendix A, *Flow Charts for Evaluating Employer Methods of Control*.

To determine if the employer is fully and properly implementing the engineering controls, work practices, and respiratory protection described in Table 1, the CSHO should:

- Interview employees to gather all pertinent information regarding the employees tasks including the materials used, the length of time spent on the tasks and take pictures of tools/equipment and controls.
- Request and review the employer’s written exposure control plans (ECP) and other relevant programs (*e.g.*, respiratory protection program, hazard communication program, etc.), observe the work operation(s) and determine whether the engineering controls, work practices, and respiratory protection required by Table 1 and described in the ECP have been fully and properly implemented.

Note: An employer’s ECP must list the specific tasks that involve exposure to respirable crystalline silica, and for each task, a description of engineering, work practice controls, and the respiratory protection that will be implemented.

- Where the applicable entry on Table 1 references the manufacturer’s instructions, request and view the manufacturers’ instructions.
- Visually observe the level of dust generated during the performance of a Table 1 task. The presence of large amounts of visible dust generally indicates that controls may not be fully and properly implemented. A small amount of dust can be expected from equipment that is operating as intended by the manufacturer; however, a noticeable increase in dust generation during the operation of the equipment is an indication that the dust controls are not operating correctly.

Construction tasks/operations that are not included in Table 1 and Table 1 tasks where the employers have implemented controls other than those specified in Table 1 would be covered under 437-002-1056. This includes the need to conduct employee exposure assessment.

Note: Employers using controls other than those specified in Table 1 can request a variance. If an employer chooses to request a variance the employer should be made aware that for Oregon OSHA to evaluate their request, the employer has to provide evidence showing the effectiveness of the controls being implemented. For example:

- Representative exposure monitoring data showing the achievable levels with use of the control methods; and
- Evidence that the employer's proposed alternate methods, conditions, practices, operations, or processes would provide workers with protection that is at least equivalent to the protection afforded to them by the standard from which the employer is seeking the variance.

Additional information on the data federal OSHA used to determine the tasks and controls listed on Table 1 can be obtained from the Silica standards

Preamble:

https://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=FEDERAL_REGISTER&p_id=260

If an employer appears to have fully and properly implemented the controls specified in Table 1 and a CSHO still observes a hazardous condition (e.g., excessive silica dust), the CSHO should conduct air monitoring to determine the level of exposure. On those rare occasions where a CSHO monitors and the monitoring results show silica levels above 50 $\mu\text{g}/\text{m}^3$, the CSHO needs to evaluate the employer's equipment maintenance program and their respiratory protection program to assure all steps are taken to fully comply.

Note: CSHOs should be aware that some operations on Table 1 (i.e., handheld saws used indoors or >4 hours; dowel drilling on concrete and grinders for mortar removal) will likely exceed the PEL.

Citation guidelines for Table 1:

Where an employer is performing a task listed in Table 1, and the employer is not following the specified controls, the employer must limit and assess exposure in accordance with 437-002-1056. If such an employer fails to implement controls sufficiently to reduce employee exposure to or below the PEL, a citation for 437-002-1059(1), (*not* 437-002-1057), and any other noted deficiencies must be cited.

Where the employer is not fully and properly implementing the Table 1 controls but the CSHO is *unable* to collect a silica sample, then cite for violation of 437-002-1057(1) and any other noted deficiencies (e.g., respiratory protection, hazard communication).

For example, an employee is dry cutting with a stationary masonry saw (no water is used) and no exposure assessment was conducted, and the CSHO was unable to sample, then there would be a violation of 437-002-1057(1).

Where the employer is not fully and properly implementing the Table 1 controls but the CSHO is *able* to collect a silica sample and found an overexposure, then cite 437-002-1056(1), 437-002-1055 and any other noted deficiencies (e.g., respiratory protection, hazard communication).

- For example, an employee is using a hand held power saw with no controls and no exposure assessment conducted by the employer, and the CSHO samples and measures exposures below the PEL, the employer could still be cited for 437-002-1056 and 437-002-1057(1).
- If CSHO sampling results show employee exposures above the PEL, then cite 437-002-1055, 437-002-1057(1), and 437-002-1059(1).

CSHOs may encounter multiple tasks being performed in close proximity.

Where it appears that one or more tasks are not fully and properly controlled by following Table 1, CSHOs must sample the uncontrolled tasks. Where results show an overexposure, the employer shall be cited, as appropriate, for the

overexposure along with failure to restrict access to work areas (437-002-1058(2)(a) and any observed deficiencies related to competent person oversight (4437-002-1058(2)(b)).

437-002-1057(2): For tasks performed using wet methods, employers that are implementing the control measures specified in Table 1 must provide water at flow rates sufficient to minimize release of visible dust. Adequate dust capture is dependent on a variety of factors such as dust particle size, velocity, spray nozzle size and location, use of surfactants or other binders, and environmental factors (water hardness, humidity, weather, etc.) that must be considered when implementing wet methods.

Paragraph 437-002-1057(3): For control measures on Table 1 that include an enclosed cab or booth, employers that are implementing the control measures specified on Table 1 must ensure that the enclosed 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 work properly;
- Is under positive pressure maintained through continuous delivery of fresh air;
- Has intake air through a filter that is 95% efficient in the 0.3-10.0 μm range (e.g., MERV-16 or better); and,
- Has heating and cooling capabilities.

Citation guidelines:

- The CSHO should determine the task location through employee interviews and observation (e.g., whether an area is indoor, outdoors, or enclosed). If a task is performed indoors or in an enclosed area, the CSHO should document the task location by taking pictures of the structure and any accumulation of airborne dust. The CSHO should also ask the employees whether airborne dust builds up while they are performing their tasks.
- The CSHO should determine whether the particular task on Table 1 requires the use of control measures that include an enclosed cab or booth. If so, the CSHO should request and review the equipment owner's manual, inspect the equipment, and interview employees to determine whether the equipment complies with 437-002-1057(3)(A)-(F).

437-002-1057(4): As noted above, where an employee performs more than one task on Table 1 during the course of a shift, and the total duration of all tasks combined is less than 4 hours, the required respiratory protection (if any) for each task is the respiratory protection specified in the 4 hours or less column. If the total duration of all Table 1 tasks combined is more than 4 hours per shift, the required respiratory protection for each task is the respiratory protection specified in the more than 4 hours per shift column.

The following examples illustrate this concept:

- **Example 1:** An employee plans to use a handheld grinder (see Table 1) for 3 hours outdoors to grind/smooth concrete surfaces, and then run a chipping hammer (see Table 1, (x) for 2 hours outdoors, for a total duration of five hours. No respirator is required when grinding outdoors using a grinder equipped with either a water delivery system or a vacuum dust collection system. However, the combined duration of both tasks is 5 hours and, therefore, a respirator is required the entire time the employee uses the chipping hammer.
- **Example 2:** An employee plans to use a handheld grinder indoors for 3 hours with a dust collector to grind/smooth concrete walls, and then use a chipping hammer outdoors for 2 hours during the same shift. The combined duration is 5 hours. The employee must use respiratory protection during the entire 5 hours performing both tasks because both tasks require a respirator for more than 4 hours/shift.
- **Example 3: An employee plans to use a handheld grinder with a dust collector to grind/smooth concrete for 3 hours indoors in the morning, and then for 2 hours for mortar removal (i.e., tuck-pointing), outdoors in the afternoon. The combined duration is 5 hours. The use of a respirator is required for both tasks because the first task requires a respirator with an APF of 10 for more than 4 hours and the second task requires a respirator with an APF of 25 for task durations greater than 4 hours. In this scenario, the employee must either wear the respirator with an APF of 10 while using the grinder to grind/smooth concrete and a respirator with an APF of 25 while using the grinder for mortar removal or tuck-pointing, or use a respirator with an APF of 25 for the entire 5 hours.**

Note: If multiple tasks are estimated to last 4 hours or less, but it becomes evident that the tasks will take more than four hours total, the employer must immediately re-examine the respiratory protection requirements. to determine whether a respirator, or a respirator with a higher assigned protection factor is needed.

Inspection guidelines: CSHOs will interview employees and the employer representative/competent person to determine which task(s) employees are engaged in, how long each task is estimated to take, how long the tasks actually take (took), and whether the employer provided respirators in accordance with Table 1, whether the employees wore respirators while engaged in the task(s), and, if so, what the APF was for the respirators worn.

Citation guidelines: If the CSHO determines that an employee performs tasks requiring the use of respirators because the total duration of all tasks combined exceeds 4 hours, and the required respiratory protection is not used, the employer falls under 437-002-1057(4) and the CSHO must conduct air sampling to determine whether there is an overexposure, and shall cite all applicable sections.

F. **REGULATED AND RESTRICTED ACCESS AREAS (437-002-1058)**

Establishing regulated areas: 437-002-1058(1) requires general industry employers to establish a regulated area wherever an employee's exposure to respirable crystalline silica is, or can reasonably be expected to be, in excess of the PEL.

The purpose of a regulated area is to ensure that the employer makes employees aware of the presence of respirable crystalline silica above the PEL, and to limit silica exposure to as few employees as possible. In addition to posting the required signs, the employer may use any method to demarcate the regulated area as long as it effectively warns employees that they are not to enter unless authorized. The employer may use ropes, markings (such as lines, textured flooring, or warning signs), temporary barricades, gates, or more permanent enclosures to demarcate and limit access to these areas.

Inspection guidelines:

CSHOs will determine whether the employer is complying with the requirement to establish a regulated areas wherever an employee's exposure to respirable crystalline concentrations is, or can reasonably be expected to be, in excess of the PEL.

Citation guidelines:

If the employer is not complying with the above requirement, cite 437-002-1058(1)(a).

Demarcating regulated areas: 437-002-1058(1)(b) requires general industry employers to demarcate the regulated area from the rest of the workplace in a manner that minimizes the number of employees exposed to respirable crystalline silica within the regulated area, and requires employers to post signs at entrances to regulated areas. These signs must state:

DANGER
RESPIRABLE CRYSTALLINE SILICA
MAY CAUSE CANCER
CAUSES DAMAGE TO LUNGS
WEAR RESPIRATORY PROTECTION IN THIS AREA
AUTHORIZED PERSONNEL ONLY

Note: Employers may choose to include additional information on the signs required by the standard, provided that the additional information included is not confusing or misleading and does not detract from warnings required by the standard.

Inspection guidelines:

If a general industry employer has established a regulated area, observe the demarcation and persons entering and exiting the area. Determine whether the employer has adequately demarcated a regulated area and whether the demarcation effectively warns employees not to enter unless they are authorized.

CSHOs should document by way of photographs when there are instances where regulated areas are not demarcated.

CSHOs should also verify that employers have posted signs at entrances to regulated areas and that the posted signs bear the required message. CSHOs should document by way of photographs when there are entrances where signs are not posted or where the required message is not included on the sign.

Citation guidelines:

If the employer is not complying with the above requirement to demarcate the regulated area, or if the employer has not posted signs that bear the specified message at all entrances to the regulated areas, cite 437-002-1058(1)(b).

Limiting access to regulated areas: 437-002-1058(1)(c) requires employers to limit access to the regulated areas to the following:

Persons authorized by the employer and required by work duties to be present in the regulated area;

Any person entering such an area as a designated representative of employees for the purpose of exercising the right to observe monitoring procedures under 437-002-1056; and

Any person authorized by the Occupational Safety and Health Act or regulations issued under it to be in a regulated area.

Inspection guidelines:

Interview available employees entering and exiting the regulated area to determine if their access is authorized.

Citation guidelines:

If the employer is not complying with the requirement to limit access to authorized persons, cite 437-002-1058(1)(c).

Respiratory protection: 437-002-1058(1)(d) requires that employers must provide each employee and the employee's designated representative entering a regulated area with an appropriate respirator in accordance with 437-002-1056 and requires each employee and the designated representative to use the respirator while in the regulated area, regardless of the length of time spent in the regulated area.

Inspection guidelines:

CSHOs should observe employees when they are entering and working inside the regulated areas.

CSHOs should interview employees, as well as their designated representatives, and document by way of photographs when there are instances where employees are seen entering or working inside a regulated area without the use of respiratory protection.

Citation guidelines:

Cite 437-002-1058(1)(d) when an employee or designated representative enters or works in a regulated area without appropriate respiratory protection.

Restricted access areas:

437-002-1058(2)(a) requires construction employers to establish and implement procedures used to restrict access to work areas, when necessary, to minimize the number of employees exposed to respirable crystalline silica and their level of exposure, including exposure generated by other employers or sole proprietors. Restricting access is necessary where respirator use is required under Table 1 or an exposure assessment reveals that exposures are in excess of the PEL. The competent person (discussed below) may identify additional situations where limiting access is necessary. A description of the procedures used to restrict access to such work areas must be contained in the employer's written ECP, as required by 437-002-1059(2).

Employees on the work site not engaged in the task, (for example, an electrician installing an electrical box near the jackhammering area), but still likely to be exposed to silica dust, must be protected from exposure by procedures for restricting access to any areas with high silica dust concentrations.

Examples of the ways a construction employer could restrict access, are: scheduling high-exposure tasks when others will not be in the area, instructing employees to stay away from high-exposure areas, demarcating high-exposure areas, instructing employees on the distance to keep from high-exposure areas.

Inspection guidelines:

As part of the ECP review as required by 437-002-1059(2) (discussed in the next section of this directive), interview affected employees and the competent person to assess the effectiveness of the procedures.

Citation guidelines:

- If the employer has no ECP, cite 437-002-1058(2)(a) and 437-002-1059(2) and group them.
- If the employer has an ECP that does not include provisions for restricted access, cite 437-002-1058(2)(a).
- If the employer has an ECP but deficiencies are found in the implementation of the restricted access area, document those deficiencies and cite 437-002-1058(2)(a).
- If the employer does not have a competent person, or if the competent person failed to implement the restricted access procedures, cite 437-002-1058(2)(b).

Note: Review the ECP requirements of 437-002-1059 (contained in the next section of this directive) as additional deficiencies may be noted as part of that review.

G. METHODS OF COMPLIANCE (437-002-1059)

Engineering and work practice controls: 437-002-1059(1) establishes that engineering and work practice control methods must be used by employers to comply with the PEL. In the case of construction, as with the PEL and exposure assessment requirements discussed above, these requirements apply for tasks not listed in Table 1, or where the employer does not fully and properly implement the engineering controls, work practices, and respiratory protection described in Table 1. The Silica standard requires that employers institute effective engineering and work practice controls as the primary means to reduce and maintain employee exposures to respirable crystalline silica to levels at or below the PEL unless the employer can demonstrate that such controls are not feasible. Such controls may not be feasible during some maintenance and repair operations or during emergency operations. Where the employer demonstrates that such controls are not feasible, the standards require the employer to institute engineering and work practice controls to reduce exposures to the lowest feasible level. The employer is then required to supplement these controls with respiratory protection to achieve the PEL.

Engineering controls address silica-containing dust particles at the source of exposure and include process modification, enclosure or containment, substitution of less toxic materials, worker isolation, general and local ventilation with dust collection systems, and dust suppressants like water. Work practice controls systemically modify how employees perform an operation, and often relate to the way employees use engineering controls, such as periodic inspection and maintenance of process and control equipment or housekeeping. If a particular engineering or work practice control not already implemented is feasible, the control must be considered as an appropriate abatement method.

Inspection guidelines: The CSHO shall observe employees using (or ask the employer to describe and/or demonstrate) the engineering controls and/or work practice controls to ensure that the controls are present and appropriate.

If exposures are still over the PEL and the employer claims that additional engineering or work practice controls are infeasible, the burden is on the employer to support a claim of infeasibility. The CSHO should ask the employer to provide information specific to the particular operation that is relevant to the employer's claim of infeasibility.

In construction, for tasks not listed on Table 1 or where the employer has not fully and properly implemented the controls and respiratory protection on Table 1, the CSHOs must conduct personal sampling and measure an 8-hour TWA to determine if exposures exceed the PEL in order to determine whether the employer has complied with the methods of compliance.

Where employees do not know whether the employer is following Table 1 or where it appears that controls are not being fully and properly implemented, CSHOs must conduct personal sampling and measure an 8-hour TWA.

Where the employees are only performing tasks outlined in Table-1 and the employer is fully and properly implementing the protections described in the table, the exposure assessment requirements of 437-002-1957 are not applicable. There is no requirement for the CSHO to collect air samples in this situation. See Table 1 Flow Chart in

Appendix A of this directive to determine compliance with paragraph (c) for those following Table 1.

Where construction employers perform tasks that are not listed on Table 1, or do not fully and properly implement the control methods listed on Table 1, the employer must comply with the exposure assessment requirements of 437-002-1057.

Citation guidelines:

If a general industry employer's engineering and work practice controls are not reducing employee exposures to levels at or below the PEL, or a construction employer is not performing a Table 1 task, and the employer cannot demonstrate infeasibility, then, where appropriate, cite 437-002-1059(1) and group it with the violation of the PEL 437-002-1055.

Where construction employees are performing a task listed in Table 1, and the specified controls have not been fully and properly implemented, and the employer has not conducted an exposure assessment, the employer should be cited for violation of 437-002-1057(1) and grouped with the violation of the PEL in 437-002-1055.

Written exposure control plan: 437-002-1059(2) establishes the requirement for a written ECP. These requirements are applicable to all covered entities.

- All employers covered by the Silica standards are required to establish and implement a written ECP regardless of which exposure control method is used.
- Written ECPs in both general industry/maritime and construction must include:
- Descriptions of tasks in the workplace that involve silica exposure.
- The description must include a list of all tasks that employees perform that could expose them to respirable crystalline silica dust;
- **Note 1:** This section of the written ECP could also include a description of factors that affect exposures, such as types of silica-containing materials handled in those tasks (e.g., concrete, tile);
- **Note 2:** And this part of the ECP might include a description of environmental factors such as weather (e.g., wind, humidity) and soil compositions (e.g., clay versus rock), and could also specify the location of the task, (e.g., task is performed in an enclosed space);
- Description of engineering controls, work practices, and respiratory protection used to limit employee exposures;
- The purpose of this requirement is to ensure that exposures to respirable crystalline silica hazards are consistently controlled. Therefore, the written ECP must include information such as types of controls used (e.g., dust collector with manufacturer's recommended air flow and a filter with 99 percent efficiency), effective work practices (e.g., positioning local exhaust over the exposure source), and, if required, appropriate respiratory protection (e.g., a respirator with an APF of 10) for each task.
- **Note 1:** This section could also include signs that controls are not working

effectively, procedures used to verify whether the controls are working effectively, and schedules for conducting maintenance checks.

- **Note 2:** For employers fully and properly implementing the controls and protections on Table 1, the ECP may include the manufacturer's instructions for operating controls and minimizing emissions. For example, a description of the amount of exhaust needed, the appropriate flow rate for wet methods, and the procedures for maintaining and cleaning an enclosed cab or booth.

Description of housekeeping measures used to limit employee exposures:

This requirement ensures that employers identify and implement appropriate cleaning methods such as, HEPA-filtered vacuums, wet sweeping and use of sweeping compounds (e.g., non-grit suppression method) to protect employees from respirable crystalline silica dust that can become airborne while performing housekeeping activities.

- **Note 1:** This description could include a description of acceptable and prohibited cleaning methods and when housekeeping is necessary.
- **Note 2:** Ensuring safe housekeeping methods helps to consistently control exposures and hazards related to respirable crystalline silica. Housekeeping encompasses other types of work practices (e.g., maintaining exposed surfaces free of silica-contaminated dust, not using compressed air to clean silica-contaminated surfaces, and, refraining from blowing or shaking silica-contaminated clothing to remove the dust) that can reduce employee exposures.

Inspection guidelines:

- CSHOs will request and review the employer's ECP. The plan must be tailored to cover the specific work tasks and practices in the workplace.
- CSHOs will review the written ECP and interview affected employees, including the competent person, as part of the overall assessment of the employer's implementation of its ECP.
- Compliance with the ECP should be verified during the walk-around by personal observation and employee interviews. Questions asked during the interview should focus on determining how familiar the person is with the ECP.

Citation guidelines:

- If the employer has no written ECP, or deficiencies are found in the implementation of the ECP, cite 437-002-1059(2) as serious.
- 437-002-1059(2)(a) through (c) contains the specific required elements of the ECP. If any required element of the ECP is missing or deficient, cite the deficiency as serious.

Exposure control plan evaluation: 437-002-1059(d) requires the employer to review and evaluate the effectiveness of the written ECP at least annually and update as necessary.

Inspection guidelines:

- The CSHO should evaluate how well the written ECP is being implemented in the workplace. Observed deficiencies in the plan and evaluation procedures should be discussed with the construction employer's competent person to determine what previous efforts may have been made to evaluate how well the employer's plan was working.
- The written ECP could also address how items such as filled vacuum bags will be handled and how slurry created when using water to control silica-containing dust will be managed to minimize employee exposure. The employer must ensure that procedures described in the exposure control plan are followed.
- Deficiencies should also be discussed with the employees to determine how long any deficiency existed and how often the ECP is reviewed.

Citation guidelines:

- Multiple deficiencies found during the inspection, especially long-term deficiencies, could indicate inadequate evaluation or updating. Inadequate plan evaluation and updating should be cited under 437-002-1059(d).

Competent person (construction activity only): 437-002-1059(e) requires the employer to designate a competent person to make frequent and regular inspections of job sites, materials, and equipment, and to implement the written ECP. There is no "competent person" requirement for general industry, except for construction-like activities, as described in 437-002-1057. However, the standard does not preclude having such a person to administer the written ECP.

- The competent person must be suitably trained and have the appropriate accountability and responsibility to manage the written ECP. The competent person must be familiar with and capable of ensuring that the controls and other protections specified in the plan are implemented in the written exposure control plan.
- The competent person is expected to make routine observations such as, visually evaluating dust generated from tasks being conducted. Where increases in visible dust occur, the competent person's assigned role is to take prompt corrective action.
- It is the responsibility of the competent person to make frequent and regular inspections as necessary to identify existing and foreseeable respirable crystalline hazards in the workplace, and to implement the written exposure control plan (i.e., to ensure that engineering controls, work practices, and respiratory protection are used, as appropriate; housekeeping requirements are followed; and procedures to restrict access are implemented, when necessary).

Note: There is no requirement that a competent person be present at a construction jobsite at all times. However, it is the responsibility of the competent person to make those inspections necessary to identify situations that could result in hazardous conditions (e.g., indications of failure of engineering controls, and then to insure that corrective measures are taken. Therefore, the conditions present at each individual worksite would dictate whether or not a competent person is needed at the jobsite at all times.

- The competent person must be a person who is qualified and retains the accountability and responsibility for the day-to-day implementation of the written ECP for the site under his/her control.
- The identity of the competent person is not required to be listed in the written ECP because it could change daily. However, construction employees must be able to identify the competent person in situations where they have a question or concern about the subjects covered in the written ECP. For example, if an engineering control is not working properly, an employee should know the identity of the competent person to contact for help in addressing the problem.

Inspection guidelines:

A competent person is required to implement the written ECP and to ensure that controls are functioning effectively.

The extent of training or experience required for the competent person could vary based on the complexity of the hazards in the worksite. Where significant deficiencies are discovered, CSHOs should ask the competent person questions about the ECP to assess whether the competent person has the knowledge to implement the ECP and is familiar with the engineering controls, work practices, respiratory protection, and housekeeping methods for the worksite, and, he or she has actually implemented the ECP.

For example:

- Ask the employer and employees the identity of the competent person on a jobsite.
- Ask the employer and employees how often the competent person conducts inspections of the site, materials, equipment and what those inspections involve.
- Ask the identified competent person how often he or she conducts inspections of the site, materials, equipment and what those inspections involve.
- Ask the employer and the competent person about his or her level of training.
- Ask the competent person about the tasks involving silica exposure and how the employer controls them.
- Ask the competent person how he or she determines that controls are working.
- Ask the competent person how the employer restricts access to high-exposure areas.
- Ask the competent person about authority to address silica hazards.

Citation guidelines:

An employer's failure to designate a competent person, or an employer's designation of a competent person who is not qualified, or a competent person's failure to conduct frequent and regular inspections of job sites, materials, and

equipment to implement the ECP shall be cited under 437-002-1059(e), and the violation will normally be classified as serious.

Access to exposure control plan: 437-002-1059(2)(f) requires the employer to make the ECP available to employees, employee representatives, OSHA and the National Institute for Occupational Safety and Health (NIOSH).

Inspection guidelines:

The written ECP is an effective method for communicating protections to employees and their designated representatives. CSHOs shall request a copy of the ECP from the employer and inquire of the employees and/or their representatives whether a copy of the ECP was made available to them. Making the written ECP readily available to employees and their designated representatives upon request empowers and protects employees by giving them and their representatives the information to effectively discuss implementation and maintenance of controls with their employer.

Citation guidelines:

An employer's failure to make the plan readily available as required should be cited as serious under 437-002-1059(2)(f).

Abrasive blasting: 437-002-1059(3) requires the employer to comply with other Oregon OSHA standards, if applicable, when performing abrasive blasting operations using crystalline silica-containing blasting agents (e.g., Starblast XL (staurolite), Black Beauty and Black Diamond) or where abrasive blasting is conducted on substrates that contain crystalline silica. Examples of such standards include:

Oregon OSHA's general industry and construction ventilation standards, 1910.94 and 1926.57, respectively – in their requirements for operations where abrasive blasting of coated materials may create exposures to hazardous dusts, require the employer to keep the concentration of respirable dust or fume in the breathing zone of the abrasive-blasting operator below the levels specified in the air contaminants rules. However, employers now must comply with the new silica PEL of 50 µg/m³.

Inspection guidelines:

- CSHO shall observe and evaluate an employer's abrasive blasting operation for compliance with applicable Oregon OSHA standards. In addition to the inspection guidelines listed throughout this directive, the following procedures shall apply to abrasive blasting operations where crystalline silica-containing blasting agents are being used, or where abrasive blasting is conducted on substrates that contain crystalline silica.
- Conduct monitoring to determine employee exposure to metals, such as: lead, arsenic, beryllium, manganese, chromium, cadmium, copper, and magnesium. (Abrasive blasters may be exposed to metals either from the surface being blasted or from non-silica abrasive media.)
- The air sampling device (cyclone) must be placed within the breathing zone, outside any protective equipment including the abrasive blasting respirator.

- Conduct exposure monitoring of potentially exposed employees not engaged in abrasive blasting but still working close to the blasting operation.
- Conduct noise exposure monitoring outside the hood as appropriate.
- Determine whether the ventilation systems for abrasive blasting rooms and containment structures prevent escape of dust and provide prompt clearance of dust-laden air.
- Determine whether each blast cleaning nozzle is properly equipped with an operating valve that must be held open manually.
- For supplied-air respirators, evaluate breathing air quality and use. For oil-lubricated compressors, ensure that the compressor is equipped with a high-temperature or carbon monoxide alarm, or both, to ensure that carbon monoxide levels remain below 10 parts per million (ppm). See 1910.134(i).

Note: Using an abrasive blasting hood while wearing a filtering face piece respirator violates the NIOSH approval for both respirators.

- When compressors are used to supply air, ensure that in-line absorbent beds are used and maintained.
- Review electrical grounding.
- Review pressure controls.
- Determine whether the abrasive blasters have adequate PPE, such as canvas or leather gloves and aprons, to protect against injury from material impact.
- Where an alternative abrasive material is being used such as glass beads which do not contain crystalline silica, steel grit and shot, sawdust and shells, ensure that an appropriate evaluation of the hazards associated with the material has been conducted.

Citation guidelines:

- If overexposures to metals or noise are found, the applicable air contaminant or noise standard shall be cited.
- If the ventilation system for a blast cleaning enclosure is found to be inadequately designed or ineffective at controlling dust, then the applicable section of 1910.94(a) or 1926.57 shall be cited and grouped 437-002-1059(3).
- If blast cleaning nozzles are not properly equipped with operating valves that must be held open manually, then paragraph 1910.244(b) or paragraph 1926.302(b)(10) shall be cited for the relevant industry.
- Violations related to respiratory protection for abrasive blasting operations shall be cited under 1910.94(a)(5) and grouped with the applicable sections of 1910.134, as well as, the 437-002-1059(3) requirements.
- Violations related to personal protective equipment (PPE) should be cited under 1910.94(a)(5), 437-002-0134, or 437-003-0134 as appropriate.

H. **RESPIRATORY PROTECTION (437-002-1060)**

437-002-1060(1) establishes requirements for respiratory protection.

437-002-1060(2) requires employers to provide employees with appropriate respiratory protection that complies with the requirements of these paragraphs and Oregon OSHA's respiratory protection standard, 1910.134.

Respiratory protection is required:

- Where exposures exceed the PEL during periods necessary to install or implement feasible engineering and work practice controls;
- Where exposures exceed the PEL during tasks, such as certain maintenance and repair tasks, for which engineering and work practice controls are not feasible;
- During tasks for which an employer has implemented all feasible engineering and work practice controls and such controls are not sufficient to reduce exposures to or below the PEL;
- During periods when the employee is in a regulated area; and
- In construction, respiratory protection is required where specified by Table 1:
- The Respiratory Protection standard includes assigned protection factors (APFs) (see 1910.134(d)(3)(i)(A)) outlined in a table. This table shows the level of respiratory protection that a given respirator or class of respirators is expected to provide when the users are properly fitted and trained, and the employer has implemented a continuing, effective respiratory protection program.
- 437-002-1060(2) requires employers to provide each employee the appropriate respirator under 1910.134. For tasks listed in Table 1, if the employer fully and properly implements the engineering controls, work practices, and respiratory protection specified on Table 1, the employer is considered in compliance with this rule and the requirements for selection of respirators under 1910.134(d)(1) and (d)(3) with respect to silica exposure.

Inspection guidelines:

- CSHOs must evaluate whether respiratory protection is being used when required as described above. CSHOs must also review the employer's ECP to ensure a description of the respiratory protection used to limit employee exposure to respirable crystalline silica for each task included.
- The CSHO shall evaluate the adequacy of respiratory protection when the employer requires respirator use and when the employer has made an exposure assessment (or the CSHO has measured an exposure) exceeding the PEL. The assigned protection factor of the respirator shall be high enough to maintain the employee's exposure to respirable crystalline silica at or below the maximum use concentration (MUC) (e.g., the product of multiplying the APF of the respirator by the PEL for silica). (See 1910.134(d)(3)(i)(B)(1).)
- The CSHO shall also review medical evaluation results that are authorized under the Respiratory Protection standard (1910.134), and conduct interviews to

determine whether there are any employees wearing respirators who should not be. For guidance on inspection procedures for 29 CFR 1910.134, refer to Program Directive A-233, Respiratory Protection: General Guidelines.

Citation guidelines:

- Where respirator use is required, 437-002-1060(1) requires the employer to institute a respiratory protection program in accordance with Oregon OSHA's Respiratory Protection standard (1910.134). 29 CFR 1910.1053(g)(2) and 437-002-1060(2) makes it clear to employers covered by the Silica standards that they must also comply with the Respiratory Protection standard when respirators are provided to employees.
- If the employer does not provide appropriate respiratory protection for employees in the above situations, cite 437-002-1060(1) as serious.

For example, when the employer has provided a respirator with an APF that does not maintain an employee's exposure to respirable crystalline silica at or below the MUC (or does not provide a respirator at all), cite 437-002-1060(1) and group it with the applicable provisions under 1910.134(d)-(m).

For construction and construction-like activity, if the employer is not providing respiratory protection as specified in Table 1, but the employer has otherwise fully and properly implemented the controls/protection on Table 1, CSHOs are to cite for non-compliance with 437-002-1060(1)(d), but the CSHOs have to show that respirators are required.

Inspection guidelines:

The CSHO shall verify that the employer has established and implemented an appropriate respiratory protection program that contains all the required elements. Compliance with the program shall be verified through a review of the employer's written program, visual observation during a walk-around, and employee interviews.

Citation guidelines:

- If employees are required to wear respirators, then the employer shall have a written respiratory protection program. If the employer has not implemented the program or elements of it are deficient or missing, cite 437-002-1060(2). Also, if elements are deficient or missing, the CSHO shall group where appropriate and cite the applicable subparagraphs under 1910.134.
- If there is a discrepancy between the written respiratory protection program and implemented work practices for use of respirators at the work site, cite 437-002-1060(2) and group it with applicable paragraphs under 1910.134(d)-(m).

Note: All employers covered by the standards, including those employers following Table 1, must still comply with all other provisions of 1910.134, as applicable. This means workers must be medically evaluated, fit-tested, trained and the employer must ensure proper use and maintenance of the respirators.

I. HOUSEKEEPING (437-002-1061)

437-002-1061(1) prohibits dry sweeping and dry brushing where such activities could contribute to employee exposures to respirable crystalline silica unless wet sweeping, HEPA-filtered vacuuming, or other methods that minimize exposures are not feasible.

The employer bears the burden of showing that wet methods, HEPA-filtered vacuums, or other methods that minimize exposure are not feasible. For example, these cleaning methods may not be feasible when they cause damage, create a new hazard, or are not effective.

The use of sweeping compounds (e.g., non-grit, oil or waxed based), HEPA-filtered vacuums and wet sweeping are acceptable housekeeping methods.

Ensuring safe housekeeping methods helps to consistently control exposures and hazards related to respirable crystalline silica. Housekeeping encompasses other types of work practices (e.g., maintaining exposed surfaces free of silica-contaminated dust, not using compressed air to clean silica-contaminated surfaces, and, refraining from blowing or shaking silica-contaminated clothing to remove the dust) that can reduce employee exposures.

Procedures for cleaning the cab or booth, and for frequent and regular inspections of the cabs and booths, should be included in the employer's written ECP which is implemented by the competent person.

Note 1: The term "dry brushing" as used in the silica standards is intended to restrict dry brushing activity that is comparable to dry sweeping, such as using a brush as a tool to clean clothing or surfaces. The standards do not prohibit employees from using their hands to remove small amounts of visible dust from their clothing.

Note 2: CSHOs should be aware that some employers use sweeping compounds that contain quartz silica. If that is the case, CSHOs should review the safety data sheets (SDSs) and evaluate the dry sweeping operations. If CSHOs observe that the use of the sweeping compound could not have contributed to the employee's exposure (i.e., the sweeping activity would not have fractured the quartz particles), then the use of the silica sweeping compound would not be subject to the restrictions in the silica standard.

Inspection guidelines: 437-002-1061(1)

Review the employer's written ECP to ensure that the employer's housekeeping practices are included. The CSHO shall interview and/or observe employees who are cleaning dust that could contribute to respirable crystalline silica exposures (e.g., small particles created when cutting, drilling, crushing, etc.) to inspect for approved methods. The CSHO shall also observe the handling of cleaning equipment, such as HEPA-filtered vacuums. Employers should have procedures to clean and/or replace vacuum filters in a way so as to minimize exposures. It may be necessary for the CSHO to collect a bulk sample and/or personal air samples to document that the substance contained crystalline silica.

Citation guidelines: 437-002-1061(1)

If an employer allows dry sweeping or dry brushing for cleaning where such activity could contribute to employee exposure to respirable crystalline silica,

and cannot demonstrate that wet sweeping, HEPA-filtered vacuuming, or other cleaning methods that minimize the likelihood for exposure to respirable crystalline silica are not feasible, cite 437-002-1061(1).

437-002-1061(2) prohibits the use of compressed air for cleaning clothing, or cleaning surfaces when other feasible method exists for cleaning surfaces.

When cleaning surfaces, compressed air may be used to capture dust *only* if no alternative method is feasible. For example, it may not be feasible for employers to use an alternative method to clean out-of-reach crevices. However, Oregon OSHA expects that employers will typically be able to use an alternative cleaning method or compressed air with an appropriate ventilation system; the circumstances in which no other alternative method is feasible are expected to be rare. The employer bears the burden of showing that no alternative method is feasible.

Alternative cleaning methods may not be feasible when they cause damage, create a new hazard, or are not effective.

Inspection guidelines: 437-002-1061(2)

- Interview and/or observe employees who are responsible for housekeeping to evaluate any use of compressed air. CSHOs should use videos, photographs and/or air monitoring to document improper use of compressed air. It may be necessary for the CSHO to collect a bulk sample for crystalline silica analysis.
- If employees are using compressed air to clean surfaces and it appears that it could contribute to employee exposure and the compressed air is not being used with a ventilation system that effectively captures the dust cloud created by the compressed air, the CSHO should ask the employer about whether any other alternative cleaning method is feasible and should gather any other evidence that relates to the feasibility of other cleaning methods.

Citation guidelines: 437-002-1061(2)

If employers are allowing employees to use compressed air to remove respirable crystalline silica from surfaces without a ventilation system to capture the blown dust (or with a ventilation system that fails to effectively capture the dust cloud) and without demonstrating that alternative methods are infeasible, cite 437-002-1061(2).

J. MEDICAL SURVEILLANCE (437-002-1062)

General Information. 437-002-1062 sets forth requirements for the provision of medical surveillance.

- 437-002-1062(1)(a) applies to construction (or construction like) activities and requires medical surveillance to be made available to employees who will be required to wear a respirator for 30 or more days a year.
- 437-002-1062(1)(b) and (c) apply to general industry employers, and includes the implementation dates from 437-002-1065.
- 437-002-1062(1)(b) requires medical surveillance for all workers who are exposed to levels above the PEL for 30 or more days per year, between July 1,

2018 and June 30, 2020.

- 437-002-1062(1)(c)) requires medical surveillance for all workers who are exposed to levels at or above the AL for 30 or more days per year, and does not take effect until July 1, 2020.

Note: Any partial day of respirator use (i.e., even if for only one hour or less) is considered one day of respirator use.

- 437-002-1062(2) requires employers to make the offered surveillance available at *no cost*, and at *a reasonable time and place*.

If participation requires travel away from the work site, the employer must bear the cost of travel. Employees must be paid for time spent undergoing a medical examination and any tests, including travel time.

- 437-002-1062(3) requires that medical surveillance is performed by a physician or other licensed healthcare professional (PLHCP)
- 437-002-1062(4) requires employers to make available to all employees who meet the trigger for medical surveillance, medical examinations within 30 days after initial assignment (unless the employee has received a medical examination in accordance with the standards within the past 3 years).
- 437-002-1062(5) requires employers to make medical exams available at least every three years or more frequently if recommended by the PLHCP for employees who meet the trigger for medical surveillance.

A PLHCP might recommend more frequent medical examinations based on factors, such as high exposure levels, or a medical finding, such as an X-ray suggesting silicosis.

An exam by a specialist must be provided within 30 days after a PLHCP's written medical opinion recommends that examination.

When an employer has previously determined that an employee does not require surveillance because their anticipated exposure was fewer than 30 days per year, but a change in process or task or the frequency of a process or task occurs that results in the employee meeting the trigger for 30 or more days per year, then medical surveillance shall be made available to that employee within 30 days of that realization.

Employers such as staffing agencies and subcontractors with employees who work for short periods at host workplaces or construction work sites where they are exposed to silica during their short-term work for fewer than 30 days at any one site, but more than 30 days over a 12-month period at multiple work sites, must determine if these employees meet the medical surveillance trigger criteria above.

If so, the staffing agency or subcontractor must either make medical surveillance available for those employees who meet the criteria for inclusion in medical surveillance under the respective standard, or ensure that the host employer offers the medical surveillance.

Employers are required to ensure that the employee receives a copy of the written medical opinion. The employer may accept a copy of a written opinion as proof of prior medical surveillance for exposures to respirable crystalline silica.

For newly-hired employees, employers are not required to count days of exposure with any former employer within the previous 12 months. The trigger for medical surveillance is with each particular employer, not past employers. However, the 30-day-per-year exposure-duration trigger would apply when an employer hires a particular employee for more than one short-term assignment during a year, totaling 30 days or more.

- 437-002-1062(4) also includes the required components of the initial (baseline) examination. The exam must consist of the following:
 1. A medical and work history including special emphasis on the employee's history related to exposure to silica, and other agents that affect the respiratory system, history of respiratory system dysfunction, including signs and symptoms of respiratory diseases (e.g., shortness of breath, cough, wheezing), history of tuberculosis, and smoking status, and history);
 2. A physical examination with special emphasis on the respiratory system;
 3. A chest X-ray (interpreted and classified by a NIOSH-certified B Reader). For a listing of certified B-Readers, medical providers should visit NIOSH's website at:
<https://www.cdc.gov/niosh/topics/chestradiography/breader-list.html>;
 4. A pulmonary function test (administered by a spirometry technician with a current certificate from a NIOSH-approved spirometry course). For a listing of certified spirometry technician, medical providers should visit NIOSH's website at: www.cdc.gov/niosh/topics/spirometry/approved-course.html;
 5. Testing for latent tuberculosis infection, and;
 6. Any other tests deemed appropriate by the PLHCP.
- As explained above, periodic examination must be made available at least every 3 years or more frequently if recommended by the PLHCP for employees who meet the trigger for medical surveillance. The periodic examination shall include all the components of the initial examination noted above, *except* the testing for latent tuberculosis infection.
- 437-002-1062(6) requires the employer to ensure that the PLHCP or any specialist (within 30 days from the referral) has:
 1. A copy of the standard;
 2. A description of the employee's former, current, and anticipated duties and levels of exposures, as they relate to respirable crystalline silica;
 3. A description of any PPE used or to be used by the employee, including when and for how long the employee has used or will use that equipment; and
 4. Information from records of employment-related medical examinations previously provided to the employee that are currently within the employer's control.

- 437-002-1062(7) and 10(b) require employers to ensure that the PLHCP or any specialist explains to the employee the results of the medical examination and provides a written medical report to each employee within 30 days of their exam. This report is to contain the results of the medical examination, including any medical condition that would place the employee at increased health risk from exposure to silica, and any conditions that require further evaluation or treatment; any recommended limitations on the employee's use of respirators; any recommended limitations on exposure to silica; and any PLHCP's recommendations for a specialist evaluation. If the chest X-ray is classified as 1/0 or higher by a NIOSH-certified B Reader, the PLHCP shall recommend the employee be examined by a specialist.
- 437-002-1062(8) and (11)(c) require employers to obtain from the PLHCP or any specialist a written medical opinion within 30 days of their examination of an employee, and to ensure the employee receives a copy within 30 days of the exam. The medical opinion must contain only the date of the exam, a statement from the PLHCP that the exam met the requirements of the standard, and any limitations on the employee's use of respirators.
- If the employee provided the PLHCP or specialist with *written authorization*, then the written medical opinion for the employer must also contain any recommended limitations on the employee's continued exposure to silica, and/or any PLHCP's recommendation that the employee should be referred to a specialist. Oregon OSHA made the release of this information dependent on the employee's authorization to protect employee privacy and encourage employees to participate in medical surveillance by minimizing fears about retaliation or discrimination based on medical findings. Appendix A of 437-002-1062 includes templates for both the written medical opinion and the written authorization.

Note: CSHOs should be aware that the PLHCP's written opinion for the employer differs from that in Oregon OSHA's previous substance-specific standards. For the Silica standards, the difference is that the employee must provide written authorization for the release of certain information. Under previous health-specific standards, there was no employee authorization required.

Inspection guidelines:

- The CSHO shall make sure that the employer has included the appropriate employees in the medical surveillance program. For example, CSHOs should review the employer's exposure assessment and interview employees to determine whether the employer provided a medical exam and its components as required and also about respirator use.
- The CSHO shall ask employees if they were offered medical examinations by their employer. Appendix F of this directive contains a suggested health questionnaire for CSHOs to use.
- Employers must continue to offer a medical examination to each employee who meets the trigger for medical surveillance whenever it comes due again, even if

the employee has previously declined such an examination. The CSHO should:

1. Ask employees if the examination took place prior to or within 30 days of beginning their silica work assignments.
 2. Ask employees if examinations are offered at no cost, if employees are paid for time spent taking examinations, if the employer pays the cost of travel (if any), and if medical testing is offered at reasonable times and places.
 3. Ask employees if the PLHCP explained the results of their examination and provided them with a written medical opinion.
 4. Ask employees if they received a copy of the written medical opinion, either from the employer or from the PLHCP.
- If an employee was not offered medical surveillance, then CSHOs should ask employees about the types and frequency of tasks they do and ask construction employees how often they perform those tasks that require respirator use under the silica standard to determine whether they should have been offered medical surveillance. Employees should also be asked whether the employer assessed their exposure.
 - Employers have to make and maintain records for each employee covered by the standard, including the requirements for medical surveillance, in accordance with 437-002-1064. These records include a copy of the medical opinion. The CSHO need to request from the employer copies of the medical surveillance records including the medical opinions.
 - Whenever reviewing medical reports or opinions, the CSHO shall follow Program Directive A-266, Access to Medical Records by Oregon OSHA.
 - Medical records are often kept at a medical provider's office. Therefore, to verify the content of the medical opinion that is not available on-site, CSHOs must contact the medical provider.
 - PLHCPs may also be contacted to determine whether the appropriate information was provided by the employer.

Citation guidelines:

- If medical surveillance was not made available at no cost, and at a reasonable time and place by employers to their employees, cite 437-002-1062(2).
- Cite 437-002-1062(1)(a) for construction employees if no medical surveillance was provided when the employee was required to wear a respirator by the silica standard for 30 or more days a year.
- Cite 437-002-1062(1)(b) if no medical surveillance was provided when general industry employees were exposed above the PEL for 30 or more days a year between July 1, 2018 and June 30, 2020.
- Cite 437-002-1062(1)(c) if no medical surveillance was provided when general industry employees were exposed at or above the action level for 30 or more

days a year after June 30, 2020. CSHOs should have exposure assessment data to support these citations for general industry employers and for construction employers not following Table 1.

- Cite 437-002-1062(4), or applicable subparagraphs if initial medical examinations were not provided.
- Cite 437-002-1062(5) if the employer did not make periodic examinations available at least every three years, or more frequently if recommended by a PLHCP. Also, cite this rule if the employer did not provide the appropriate procedures and tests as part of the employee's periodic examination.
- Cite 437-002-1062(6) if the examining PLHCP was not provided the required information by the employer. Where one or more of the required elements listed in paragraph (6)(a)-(d) are missing or deficient, cite the appropriate subparagraph for the element(s) not provided.
- Cite 437-002-1062(7) if the written report was not provided to the employee, or if it was not provided within 30 days.
- Cite 437-002-1062(7) if the written report was not obtained by the employer. If the employer cannot produce a requested written opinion, see the citation guidance for 437-002-1064 below.

If any information is missing from the reports or opinions, CSHOs shall cite the appropriate paragraphs.

Note: When a staffing agency supplies temporary workers to a business, typically, the staffing agency and the staffing agency's client (commonly referred to as the host employer) are considered joint employers of those workers. Both employers are responsible for determining the conditions of employment and complying with the law to ensure that their employees are protected against exposures to respirable crystalline silica. Therefore, in joint employer worksites, a staffing agency and a the host may both be cited for failure to provide the medical surveillance.

However, the employers may decide that a division of the compliance responsibility may be appropriate. In doing so, the staffing agency and host employer should jointly review the task assignments and job hazards. The details of the protections to be provided can be clearly established in the contract language between the employers. While the employers may agree to divide responsibilities, neither employer may avoid its ultimate responsibilities under the Oregon Safe Employment Act by shifting responsibilities to the other employer.

K. COMMUNICATION OF HAZARDS (437-002-1063)

General information. 437-002-1063 sets forth requirements intended to ensure that the dangers of respirable crystalline silica exposure are communicated to employees.

The hazard communication requirements of the Silica standards complement existing requirements of Oregon OSHA's Hazard Communication Standard (HCS), 1910.1200, which covers employees exposed to respirable crystalline silica. The standards thus

refer to the HCS requirements for labels, SDSs, and training; identify the hazards that need to be addressed in the employer's hazard communication program (HCP) and include *additional specific requirements needed to protect employees exposed to respirable crystalline silica*.

437-002-1063(1) explains how the silica standards relate to the HCS. It requires the following:

- Employers shall include respirable crystalline silica in the program established to comply with the HCS.
- Employers must ensure that each employee has access to labels on containers of crystalline silica, safety data sheets, and is trained in accordance with the provisions of HCS and this rule.

For example, HCS paragraphs 1910.1200(h)(2)(ii) and (h)(3)(ii)-(iii) require employers to provide employees using hazardous chemicals with information and training on the following:

- Any operations in their work area where hazardous chemicals are present;
- The physical and health hazards of chemicals in the work area; and,
- Measures that employees can take to protect themselves from exposure to hazardous chemicals, including work practices, emergency procedures, and PPE.

Note: For more information on HCS's training requirements, see Program Directive A-150, Hazard Communication.

- Employers must, at a minimum, communicate to their employees about the respirable crystalline silica hazards of cancer and the effects to the lungs, immune system and kidneys.

437-002-1063(2) requires employers to ensure that covered employees can demonstrate knowledge and understanding of:

- The health hazards associated with respirable crystalline silica exposure;
- Workplace tasks that could expose them to respirable crystalline silica;
- Specific measures, such as engineering controls, work practices, respirators, that the employer has in place to protect workers from respirable crystalline silica exposures;
- The contents of the Silica standards;
- The purpose and a description of the medical surveillance program. Oregon OSHA recommends employers inform employees that they cannot be retaliated against for participating in medical surveillance;
- The standard also requires employers to ensure that, when a competent person is required, employees can demonstrate knowledge and understanding of the identity of the competent person.

437-002-1063(3) requires employers to make a copy of the standard *readily available* at no cost to each covered employee.

The employees need to be familiar with and have access to the respirable crystalline silica standard and be aware of the employer's obligations to comply with the requirements.

Note: The silica standards' provisions for employee information and training apply to each employee *covered by this subdivision*. Thus, the application of these provisions is aligned with the scope of the rules.

For example, training is required for all employees who are or could foreseeably be exposed to respirable crystalline silica at or above the action level of 25 $\mu\text{g}/\text{m}^3$ as an 8-hour time-weighted average. Therefore, actual or foreseeable exposure at or above the action level is used to determine which employees are covered by the rule, and covered employers are required to provide training for any employee covered by the rules.

Conversely, the HCS applies to employees exposed or potentially exposed to respirable crystalline silica, even if exposures are below the AL.

Inspection guidelines:

- The CSHO will review the employer's written HCP to determine whether it includes information and training on respirable crystalline silica hazards and control measures. The required training must be provided at no cost to the employee, and employees must be paid for time spent in training.
- The CSHO will question covered employees to establish whether they have ever had training on the Silica standard. For example, CSHO should ask employees questions, such as:
 1. When they were trained;
 2. How the training was conducted;
 3. Whether they were able to ask questions and receive answers;
 4. Whether the training was conducted in a language and manner they could understand;
 5. What engineering controls/work practices are used to control respirable crystalline silica exposures and if the employees can demonstrate how to operate/maintain controls on the equipment they use.
 6. If they understand the medical surveillance program.
 7. For employees in the construction industry, who the competent person is.
- The CSHO will determine whether an employee can "demonstrate knowledge and understanding" by using professional judgment based on answers given during an employee interview. Employees should know:
 1. The health hazards associated with respirable crystalline silica;
 2. The tasks in the workplace that could result in exposure and the specific measures taken to control exposure in the workplace;

3. The contents of the Silica standard; and,
 4. Description of the medical surveillance program.
 5. Employees covered under the construction standard should also know the identity of the competent person.
- CSHOs will also question covered employees to determine whether a copy of the applicable Silica standard was *made available* to them.

Note: An employer has the option of providing these standards by means of a printed or electronic copy in a central location, company website, or a direct link to the standards on Oregon OSHA’s website. However, when access is provided electronically, the employee must receive training on accessing the computers and the computers must be available at all times without any hindrance.

Citation guidelines:

- If respirable crystalline silica hazards were not communicated by employers to their employees in accordance with paragraph (1), then the appropriate subparagraph(s) will be cited.
- HCS paragraphs 1910.1200(h)(2)(ii) and 1910.1200(h)(3)(ii-iii) will be cited and grouped with 437-002-1063(1) and 437-002-1063(2).
- When covered employees received inadequate respirable crystalline silica information or training, for example, when the covered employees cannot demonstrate knowledge and understanding of required information, cite paragraph (2).
- If the employer did not make a copy of the relevant Silica standard readily available to affected employees without cost, cite paragraph (3).

L. RECORDKEEPING (437-002-1064)

General. 437-002-1064 requires employers to make and maintain records of air monitoring data, objective data, and medical surveillance. Oregon OSHA used the words “make and maintain” in the silica standards to clarify that the employer's obligation is to *create and preserve* such records.

- This rule requires employers to ensure that air monitoring data, objective data, and medical surveillance records are maintained and made available in accordance with 1910.1020. Therefore, employers must grant access to these records upon request by employees and their designated representatives, and by Oregon OSHA, as per 1910.1020(e).

Note: As discussed in more detail below, the requirement to make and maintain air monitoring and objective data records only arise where the employer relies upon such data to comply with the requirements of the silica rules.

- This rule requires that air monitoring data and medical surveillance records include the employee's social security number. If the employer provides other parties access to the exposure records, the social security numbers may be expunged from the records prior to allowing access.

Note: Federal OSHA has established a process, the Standards Improvement Project (SIP), to improve and streamline OSHA standards. Federal OSHA has

proposed that requirements for social security numbers on exposure, medical and other records be removed from all of its health standards, including the respirable crystalline silica standards, as part of its [Notice of Proposed Rulemaking for the Standards Improvement Project -- Phase IV \(see 81 FR 68504, 68526-68528 \(October 4, 2016\)\)](#).

- The Access to Employee Exposure and Medical Records standard, [1910.1020](#), requires that employee exposure records be preserved for at least 30 years and that an employee's medical records be kept for the duration of the employee's employment plus an additional 30 years.

Note: Medical Record retention exceptions: There are special rules that may apply to the retention of employee medical records under certain circumstances:

1. For employees who have worked for the employer for less than one year the employer need not retain the medical records beyond the term of employment if they are provided to the employee upon the termination of employment.
2. Medical record retention requirements generally apply to records regardless of whether they are in the possession of the employer or the PLHCP.
3. For records that are in the possession of the PLHCP, employers can generally fulfill their obligations for record retention by including the retention requirement in the agreement between the employer and the PLHCP.
4. If an examination meeting the requirements of the Silica rules was offered to the employee by a previous employer and a new employer accepts a written medical opinion as proof of the examination, the new employer is *not* responsible for record retention by the PLHCP who conducted the examination for the previous employer; however, the new employer must maintain the written opinion he/she accepted from the employee or PLHCP of the former employer.
5. In accordance with 1910.1020(h)(1), employers ceasing to do business must transfer all employee exposure and medical records to the successor employer, whenever applicable.

Specific requirements:

- 437-002-1064(1) requires employers who perform air monitoring to assess employee exposures, to make and maintain accurate records of such monitoring that identify the monitored employee and all employees whose exposures are represented by the monitoring. The employer is required to keep records for each exposure measurement taken. Specifically, paragraph (1)(b) requires the records to include the following information:
 1. The date of measurement for each sample taken;
 2. The task involving exposure to respirable crystalline silica that was monitored;

3. Sampling and analytical methods used;
 4. The number, duration, and results of samples taken;
 5. Identity of the laboratory that performed the analysis;
 6. The type of PPE used by the employees monitored; and,
 7. The name, social security number, and job classification of all employees represented by the monitoring, indicating which employees were actually monitored.
- 437-002-1064(2) requires employers who use objective data to characterize employee exposures to maintain records of this data. Specifically, paragraph (2)(b) requires the records to include the following specific information:
 1. The crystalline silica-containing material in question;
 2. The source of the objective data;
 3. The testing protocol and results of testing;
 4. A description of the process, task, or activity involved; and
 5. Other data relevant to the process, task, activity, material, or employee exposures on which the objective data were based.
 - 437-002-1064(3) requires employers to establish and maintain an accurate medical surveillance record for each employee subject to the medical surveillance requirements. Specifically, paragraph (3)(b) requires the records to include the following specific information:
 1. The employee's name and social security number;
 2. A copy of the PLHCPs' and specialists' written medical opinions; and
 3. A copy of the information provided to the PLHCPs and specialists.

Inspection guidelines:

- The CSHO will review the employer's recordkeeping including the employers' air monitoring and objective data records.
- If the employer is following the scheduled monitoring option for exposure assessment, the CSHO will review the employer's air monitoring data to determine whether the employer is keeping an accurate record of all measurements taken as set forth in this recordkeeping paragraph. If the employer is following the performance option (any combination of air monitoring data or objective data sufficient to accurately characterize employee exposures), or is using objective data to support a determination that the silica standard does not apply (as per 437-002-1053(2)), then the CSHO will ask the employer for relevant records.
- The CSHO will also review the employer's medical surveillance records for employees exposed to respirable crystalline silica.
- Retention: The records will be examined to determine if the employer is keeping

employee exposure records up to 30 years and employee medical records for the duration of employment plus 30 years.

Citation guidelines:

- If respirable crystalline silica exposure and medical records were not kept by employers, then the appropriate paragraphs will be cited.
- If the employer claims exemption from the silica standard based on 437-002-1053(2) but the CSHO sees evidence that it is not exempt, then the CSHO should conduct air monitoring. If the sampling indicates that there are respirable crystalline silica exposures at or above the AL, then all applicable violations of the rules will be cited.
- If the employer has not maintained the required air monitoring records or are missing certain required elements:
 1. Cite 437-002-1064(1)(a) for not maintaining the monitoring records; and
 2. Cite 437-002-1064(1)(b) if the air monitoring records are missing certain elements.
- Cite 437-002-1064(2)(a) if the employer is following the performance option but has not maintained records of objective data supporting its exposure assessment.
- Cite 437-002-1064(2)(b) if the employer's objective data records are missing certain required elements.
- Cite 437-002-1064(3)(a) if the employer does not have any of the required medical surveillance records or are missing certain required elements.
- Cite 437-002-1064(3)(b) if the records are missing certain required elements (e.g., physician's written opinion).
- If the employer is not maintaining records of air monitoring data, objective data, or medical surveillance records (for example, if employees' air monitoring records were not being maintained for at least 30 years):
 1. For air monitoring data, cite 437-002-1064(1)(c)
 2. For objective data, cite 437-002-1064(2)(c)
 3. For medical records, cite 437-002-1064(3)(c)

Note: All appropriate subparagraphs shall be cited, if the records are missing any of the required elements.

Training for Oregon OSHA personnel

- For all inspections on a site where silica exposures are expected, CSHOs and Oregon OSHA consultants are expected to be knowledgeable of:
 1. Potential hazards which may be encountered at the site, including the potential hazards of silica.

2. Contents of the silica standards and this directive.
3. Appropriate PPE to be worn. Each CSHO who will be expected to use PPE shall be trained in the proper care, use, and limitations of the PPE. Use of PPE and respiratory protection by Oregon OSHA personnel is addressed in Oregon OSHA Policy #28, Personal Protective Equipment and Policy #44, Oregon OSHA Respiratory Protection Policy, respectively.

Medical examinations for Oregon OSHA personnel

- Oregon OSHA's Respiratory Protection Policy includes medical evaluation requirements for Oregon OSHA personnel allowed to wear respiratory protection. The policy requires that CSHOs be medically evaluated and found eligible to wear the respirator selected prior to fit testing and first-time use of the respirator in the workplace.

Protection of Oregon OSHA personnel

- CSHOs are reminded to use appropriate PPE when they are exposed to a hazard. CSHOs are not to enter a respirable crystalline silica-regulated area, or other area where exposures are likely to exceed the PEL, unless it is absolutely necessary. For inspection and air sampling activities, remote operations are encouraged when practical.

Personal protective equipment (PPE)

- Field managers will ensure that appropriate PPE is available for CSHOs.
- CSHOs will wear appropriate respiratory protection in the unlikely event of entering a respirable crystalline silica-regulated area or other area where exposures are likely to exceed the PEL.
- In some instances, a CSHO may find that an employer's exposure assessment is inadequate, has not been performed at all, the employer has not fully and properly implemented Table 1 controls, or exposures may exceed the PEL, professional judgment may be needed in anticipating exposure during a brief entry into a silica-related work area for inspection. CSHOs will comply with the Oregon OSHA respiratory protection program.
- Respirators will be selected in accordance with the respirator selection procedures in Oregon OSHA's Respiratory Protection Policy.

Multi-employer

Overview.

- In a situation where workers from different employers are simultaneously exposed to respirable crystalline silica hazards, enforcement may be subject to the OSHA multi-employer citation policy. These scenarios are most likely to occur on construction sites. Program Directive A-257, Multi-Employer Workplace Citation Guidelines provides citation policies for employers on multi-employer worksites. The citation policies provide specific information on the need to coordinate and communicate the hazardous conditions that workers

might be exposed to when working with respirable crystalline silica.

- As outlined in the policy, on multi-employer worksites (in all industry sectors), more than one employer may be citable for a hazardous condition that violates an Oregon OSHA standard. A two-step process must be followed in determining whether more than one employer is to be cited:

Step 1: Determine whether the employer is a creating, exposing, correcting, or controlling employer. Refer to PD A-257 for more information about and examples of each of these types of employers. If the employer falls into one of these categories, it has obligations under the Silica rules.

Step 2: Determine if the employer's actions were sufficient to meet those obligations. The extent of the actions required of employers varies based on which category applies.

- CSHOs should carefully evaluate scenarios where a single silica-related task exposes employees of multiple employers. Ensure employees are protected, including that they are provided with and wear the appropriate PPE.

Note: Employers engaged in construction activity must restrict access, when necessary (e.g., when respirator use is required) according to the procedures in the employers' written ECP.

Inspection guidelines:

- All the inspection procedures outlined in this directive apply to multi-employer work sites. During all silica-related inspection opening conferences, CSHOs should inquire from the general contractor the names of all the contractors that are working near the respirable crystalline silica-generating activity. CSHOs should also perform the following:
 1. Determine the names of companies generating the respirable crystalline silica exposure, and/or ones whose employees are engaged in such tasks.
 2. Review relevant documentation including, but not limited to, the minutes from safety meeting where respirable crystalline silica exposures were discussed; as well as the ECP and a copy of the written hazard communication program.
 3. Determine (during the interview and through observation) whether other contractors are exposed to the health hazards. If so, proceed as instructed in the applicable sections of this directive.
 4. If the inspection is not silica-related, the CSHO should pay attention to possible silica activities on the worksite while conducting the walk-around.
 5. For other scenarios such as joint employers, day laborers/transient workers, and temporary agencies, CSHOs should evaluate on a case-by-case basis with input from their respective field manager.

Citation guidelines:

- All the citation guidelines mentioned in this directive apply to the multi-employer citations (i.e., when applicable several employers can be cited for the same violation).

Example: Two workers engaged in a sandblasting activity are exposed to respirable silica exposure levels that exceed the PEL. While doing the walk around, the CSHO also observed carpenters working in the area exposed to the silica hazards. If violations are encountered for the silica standard, both employers can be cited, the sandblasting contractor for creating exposures and exposing workers, and the carpenters contractor for exposing them. Follow the multi-employer policy to determine whether more than one employer may be cited for a hazardous condition.

History: Issued 10-30-2018 Revised 7-19-19