

**OCCUPATIONAL EXPOSURE TO BERYLLIUM AND BERYLLIUM COMPOUNDS  
STANDARD IN THE SHIPYARD SECTOR (29 CFR 1915.1024)  
1218-0272**

**Attachment A - Excerpts from Occupational Exposure to Beryllium and Beryllium  
Compounds in Construction and Shipyard Sectors Final Rule Describing Significant  
Substantive Comments and Significant Changes Related to the ICR  
(OMB Control No. 1218-073)**

**In the final rule excerpts below, OSHA provides a summary of the discussion of public  
comments that pertain to the ICR.**

**§ 1915.1024(d) -- Exposure Assessment**

**Performance Option.**

Final paragraph (d)(2) the performance option requires the employer to assess the 8-hour time-weighted average (TWA) exposure and the 15-minute short-term exposure for each employee on the basis of any combination of air monitoring data and objective data sufficient to accurately characterize airborne exposure to beryllium. The agency did not receive any comments on this provision and therefore, these provisions will go forward to the final as proposed.

**Scheduled Monitoring Option.**

In final paragraph (d)(3)(iii) where several employees perform the same 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 the requirements of paragraph (d)(3). In representative sampling, the employer must sample the employee(s) expected to have the highest airborne exposure to beryllium.

The agency did not receive any comments on this provision and did not make any changes from the proposal to the final. Therefore, these provisions will go forward to the final as proposed.

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**Reassessment of Exposure.**

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Final paragraph (d)(4) requires the employer to reassess airborne exposure whenever a change in the production, process, control equipment, personnel, or work practices may reasonably be expected to result in new or additional airborne exposure at or above the action level or STEL, or when the employer has any reason to believe that new or additional airborne exposure at or above the action level or STEL has occurred.

The agency did not receive any comments on this provision and did not make any changes from the proposal to the final. Therefore, these provisions will go forward to the final as proposed.

**Employee Notification of Assessment Results.**

Final paragraph (d)(6)(i) requires the employer to notify each employee whose airborne exposure is represented by the assessment of the results of that assessment individually in writing or post the results in an appropriate location that is accessible to each of these employees within 15 working days after completing an exposure assessment.

In final paragraph (d)(6)(ii), the employer is required to describe in the written notification the corrective action being taken to reduce airborne exposure to or below the exposure limit(s) exceeded where feasible corrective action exists but had not been implemented when the monitoring was conducted whenever an exposure assessment indicates that airborne exposure is above the TWA PEL or STEL.

The agency did not receive any comments on this provision and did not make any changes from the proposal to the final. Therefore, these provisions will go forward to the final as proposed.

**§ 1915.1024(f)–**

**Methods of Compliance – --- Written Exposure Control Plan.**

Final paragraph (f)(1)(i) requires the employer to establish, implement, and maintain a written exposure control plan, which must contain:(A) A list of operations and job titles reasonably expected to involve exposure to beryllium;  
(B) A list of engineering controls, work practices, and respiratory protection required by paragraph (f)(2) of this standard; (C) A list of personal protective clothing and equipment required by paragraph (h) of this standard; and(D) Procedures used to ensure the integrity of each containment used to minimize exposures to employees outside of the containment.

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Final paragraph (f)(1)(ii) requires the employer to review and evaluate the effectiveness of each written exposure control plan at least annually and update it, as necessary, when: (A) Any change in production processes, materials, equipment, personnel, work practices, or control methods results, or can reasonably be expected to result, in new or additional airborne exposure to beryllium; (B) The employer is notified that an employee is eligible for medical removal in accordance with paragraph (l)(1) of this standard, referred for evaluation at a CBD diagnostic center, or shows signs or symptoms associated with airborne exposure to beryllium; or (C) The employer has any reason to believe that new or additional airborne exposure is occurring or will occur.

Final paragraph (f)(1)(iii) requires the employer to make a copy of the written exposure control plan accessible to each employee who is, or can reasonably be expected to be, exposed to airborne beryllium.

*Paragraph (f) Methods of Compliance*

Paragraph (f) of the beryllium standards for construction and shipyards requires employers to implement methods for reducing employee exposure to beryllium through a detailed written exposure control plan, engineering and work practice controls, and a prohibition on rotating employees to achieve compliance with the PEL. In the 2017 final rule, OSHA determined that written plans would “be instrumental in ensuring that employers comprehensively and consistently protect their employees” (82 FR at 2668). OSHA also concluded that requiring reliance on engineering and work practice controls, rather than on respirator use, is consistent with good industrial hygiene practice and with OSHA’s traditional approach to health standards (82 FR at 2672).

While extending these provisions to the construction and shipyards industry in the 2017 final rule, OSHA acknowledged that exposures to beryllium in these industries are limited primarily to a few operations, abrasive blasting in construction and shipyards and some welding operations in shipyards (82 FR at 2637-38). With respect to abrasive blasting, while the extremely high exposures to airborne particulate during the blasting operation can expose workers to beryllium in excess of the PEL, the blasting materials contain only trace amounts of beryllium (materials such as coal slag normally contain approximately 0.11 µg/g or 0.00001%) (see 2017 FEA, Document ID 2042, p. IV-632, Table IV.69; 82 FR at 2638). Moreover, OSHA had evidence of beryllium exposure during only limited welding operations in shipyards (only 4 of 127 sample results showed detectable levels of airborne beryllium) (see 2017 FEA, Document ID 2042, p. IV-580). Nonetheless, OSHA applied the same requirements to these industries as to general

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industry, where the operations with beryllium exposure are significantly more varied and employees are exposed to materials with significantly higher beryllium content.

In the 2019 NPRM, OSHA proposed to revise the requirements in paragraph (f) in light of the very narrow set of affected operations and the limited extent of beryllium exposure in the construction and shipyards industries. OSHA explained that some provisions in paragraph (f)—although appropriate in the general industry context—may be unnecessary to protect employees in the construction and shipyards industries (84 FR at 53909-10). Likewise, OSHA preliminarily determined that provisions relating solely to dermal contact with beryllium should not apply in the construction and shipyards industries, where exposures primarily involve materials containing only trace amounts of beryllium (84 FR at 53909) or, in the case of welding, where OSHA believes the process and materials do not present a dermal contact risk (see 84 FR at 53906). Accordingly, OSHA proposed several revisions to both paragraph (f)(1) (Written exposure control plan) and (f)(2) (Engineering and work practice controls) in the construction and shipyards standards.

For both the construction and shipyards beryllium standards, paragraph (f)(1) in this final rule requires the employer to establish, implement, and maintain a written exposure control plan that includes: a list of operations and job titles reasonably expected to involve exposure to beryllium; a list of engineering controls, work practices, and respiratory protection required by paragraph (f) (2); and a list of personal protective clothing and equipment required by paragraph (h) (see paragraphs (f)(1)(i)(A), (B) and (C), respectively). For the construction standard, the written plan must also include procedures to restrict access to work areas where exposures to beryllium could reasonably be expected to exceed the TWA PEL or STEL (paragraph (f)(1)(i)(D)). Both the construction (paragraph (f)(1)(i)(E)) and shipyards (paragraph (f)(1)(i)(D)) standards require the employer to include procedures to ensure the integrity of each containment used to minimize exposures to employees outside of containments (such as tarps or structures used to keep sandblasting debris within an enclosed area during abrasive blasting operations). Paragraphs (f) (1)(ii) and (iii) further provide requirements for maintaining, reviewing, and evaluating the written exposure control plan and providing access to the plan to each employee who is, or can reasonably be expected to be, exposed to airborne beryllium. In the construction standard, the written exposure control plan must be implemented by a competent person, as defined by paragraph (b) (paragraph (e)(2)).

Paragraph (f)(1) in this final rule contains several changes from the prior standards, as proposed in the December 2019 NPRM. First, OSHA proposed to revise paragraph (f)(1)(i)(A) by removing the words “airborne” and “or dermal contact with” as qualifiers for exposure to beryllium, so as to require simply a list of operations and job titles reasonably expected to involve exposure to beryllium. Second, OSHA proposed to revoke paragraphs (f)(1)(i)(B) and

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(C), which required additional lists of operations and job titles involving exposure at or above the action level and above the TWA PEL or STEL, respectively. OSHA reasoned that, given the small number of operations with beryllium exposure in construction and shipyards, the list of operations and job titles in these categories would be the same as those required by paragraph (f)(1)(i)(A). As such, any additional lists would be unnecessary and redundant (84 FR at 53910-11).

OSHA also proposed to revoke the requirements that the employer include in the written exposure control plan procedures for minimizing cross-contamination (paragraph (f)(1)(i)(D)) and procedures for minimizing the migration of beryllium within or to locations outside the workplace (paragraph (f)(1)(i)(E)) (84 FR at 53910). OSHA explained that the original intent of these requirements was to ensure that workers not involved in beryllium-related operations would not be unintentionally exposed to beryllium in excess of the PEL. With respect to the construction standard, OSHA reasoned that the requirement to include procedures in the written exposure control plan to restrict access to work areas where exposures to beryllium could reasonably be expected to exceed the TWA PEL or STEL (formerly paragraph (f)(i)(E), renumbered as (f)(i)(D)), along with the requirement that these procedures be implemented by a competent person (paragraph (e)(2)), would be sufficient to control cross-contamination and migration of beryllium from abrasive blasting operations. For the shipyard standard, OSHA retained requirements for regulated areas (paragraph (e)), which require that employers designate areas where exposures to beryllium could exceed the PELs and limit access to authorized employees. To further limit cross-contamination and migration, OSHA proposed to add a new paragraph in both the construction ((f)(1)(i)(E)) and shipyards ((f)(1)(i)(D)) standards to require that the written exposure control plan include procedures to ensure the integrity of each containment used to minimize exposures to employees outside the containment (such as tarps or structures used to keep sandblasting debris within an enclosed area during abrasive blasting operations).

OSHA next proposed to remove the requirement that the employer include in the written exposure control plan procedures for removing, laundering, storing, cleaning, repairing, and disposing of beryllium-contaminated personal protective clothing and equipment, including respirators (paragraph (f)(1)(i)(H)), because the agency had also proposed to remove several requirements pertaining to such procedures (84 FR at 53911). Specifically, OSHA proposed to remove the requirements that the employer ensure that: beryllium-contaminated PPE is stored and kept separate from street clothes and that storage facilities prevent cross-contamination as specified in the written exposure control plan (paragraph (h)(2)(iii)); beryllium-contaminated PPE is only removed from the workplace by employees who are authorized to do so for the purpose of laundering, cleaning, maintaining, or disposing of such PPE (paragraph (h)(2)(iv)); PPE removed from the workplace for laundering, cleaning, maintenance, or disposal be placed in closed, impermeable bags or containers and labeled appropriately (paragraph (h)(2)(v)); and any

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person or business entity who launders, cleans or repairs PPE required by the standards be informed, in writing, of the potentially harmful effects of beryllium and of the need to handle the PPE in accordance with OSHA's beryllium standards (paragraph (h)(3)(iii)). With the proposed removal of those paragraphs, the remaining requirements that would relate to paragraph (f)(1)(i) (H) include paragraphs (h)(2)(i) and (h)(2)(ii), pertaining to removal of PPE; paragraph (h)(3)(i), pertaining to cleaning and maintenance of PPE; and paragraph (h)(3)(ii), pertaining to methods of removing beryllium from PPE. In light of the proposed removal of several of the requirements for removing, laundering, storing, cleaning, repairing, and disposing of beryllium-contaminated PPE, OSHA stated that it believed it unnecessary to include such procedures in the written plan (84 FR at 53911).

Finally, as with paragraph (f)(1)(i)(A), OSHA proposed to revise paragraph (f)(1)(ii)(B) to refer simply to "exposure to" rather than "airborne exposure to or dermal contact with" beryllium (84 FR at 53911).<sup>1</sup> OSHA's proposal to revise this paragraph, which previously required the employer to review, evaluate, and update the written exposure control plan, as necessary, when notified that an employee shows signs or symptoms associated with airborne exposure to or dermal contact with beryllium, is consistent with other paragraphs where the agency is simplifying the language in a similar manner (e.g., paragraphs (k)(3)(ii)(A) and (k)(4)(i), Medical surveillance) and is not intended to alter the meaning of the provision.

OSHA received a number of comments on its proposed revisions to paragraph (f). These comments and OSHA's final determinations are discussed below.

*Comments on the Nature and Extent of Beryllium Exposure in the Construction and Shipyards Industries*

A primary issue raised by several commenters, both with respect to the proposed changes to paragraph (f) and to the rest of the proposal, involved whether OSHA has appropriately characterized the jobs and operations in the construction and shipyards industries that present beryllium exposures of concern. On the one hand, the National Electrical Contractors Association (NECA), the National Demolition Association (NDA), and the Construction Industry Safety Coalition (CISC) argued that a written exposure control plan is unnecessary in the construction industry in light of the limited operations that create exposures of concern. Specifically, NECA contended that beryllium exposure in construction is limited to abrasive

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<sup>1</sup> In the Amendments to Standards section of the NPRM (84 FR at 53951-54), which identifies precisely how the proposal would amend the Code of Federal Regulations, OSHA inadvertently failed to remove the word "airborne" as a qualifier for "exposure" in paragraph (f)(1)(ii)(B) of both standards. However, the summary and explanation of paragraph (f) clearly identified OSHA's intent to remove both "airborne" and "dermal contact with" from the provision and leave simply "exposure to beryllium" (see 84 FR at 53911). The only commenter to address the change referred to the correct language (NJH, Document ID 2211, p. 9). Accordingly, OSHA considers this a harmless error and has corrected the appropriate language in the Amendments to Standards section of this final rule.

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blasting, and therefore “promulgating a rule that would require all employers to document and implement a written exposure control plan for beryllium creates additional and undue burdens on employers and employees in the construction industry” (Document ID 2209, p. 1). CISC and NDA both stated that, in order to create a written exposure control plan, construction employers “will be required to assess all workplace exposures, jobs, tasks, and work to be performed to determine whether beryllium is present in trace amounts” (Document ID 2203, p. 16; 2205, p. 2). According to CISC, this is a particular problem in the construction industry because of the “range of exposures that could exist as a result of naturally occurring beryllium or airborne exposures of beryllium from aggregate or other components of construction material containing trace amounts of beryllium” (Document ID 2203, p. 2). Like NECA, CISC argued that it would be inappropriate to require employers to engage in the “daunting task” of analyzing beryllium exposures on their worksites, given that OSHA has not identified exposures of concern in construction outside of abrasive blasting with certain media (Document ID 2203, p. 16). NDA echoed CISC, asserting that this would be an “unnecessary burden” and “inappropriate” in the construction industry (Document ID 2203, p. 2).

CISC suggested that, instead of including a written exposure control plan provision in the beryllium standard for construction, OSHA should consider adding new requirements to paragraph (f) of the ventilation standard for construction (29 CFR 1926.57) that set forth additional protective measures to be used when abrasive blasting with media containing <0.1 percent by weight of beryllium. These new provisions, CISC stated, could include the requirements of written exposure control plans, regulated areas, specified PPE, and other provisions to protect workers in and around such abrasive blasting (Document ID 2203, p. 16).

While industry representatives NECA, NDA, and CISC argued that OSHA’s approach to the written exposure control plan is too broad, other commenters representing unions and public health organizations argued that the proposal is too narrow. Specifically, these commenters took issue with OSHA’s focus on abrasive blasters and welders. Several commenters suggested potential exposure sources apart from abrasive blasting and welding operations and argued that some of these exposures could involve beryllium in greater than trace amounts. For example, NJH contended that there are “other operations, jobs and tasks that can generate beryllium exposure in the construction and shipyard sectors, not limited to abrasive blasting and welding” (Document ID 2211, p. 7). NJH cited studies involving demolition operations at an Army site in Ohio (<https://www.lrb.usace.army.mil/Missions/HTRW/FUSRAP/Luckey-Site>); construction trades workers exposed to beryllium in DOE facilities (Welch et al., 2004 & 2013); workers performing clean-up of beryllium-using sites (Sackett et al., 2004); workers grinding beryllium-composite tools (Kreiss et al., 1993); and workers resurfacing copper-beryllium tools (Mikulski et al, 2011) (Document ID 2211, p. 7) (see detailed discussion of studies later in this section).

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NJH also noted, anecdotally, that it has diagnosed CBD in contract construction workers who worked in primary beryllium and beryllium manufacturing facilities (Document ID 2211, p. 7).

AFL-CIO similarly indicated that construction workers such as laborers, welders, carpenters, surveyors, and electricians involved in demolition, renovation, maintenance, repair, and construction projects performed in general industry sites where beryllium was previously used, as well as those who may use non-sparking tools, could be exposed to beryllium (Document ID 2210, p. 5; 2239, p. 1). ACOEM likewise argued that workers in the construction industry can be exposed from decommissioning and demolition work (Document ID 2213, p. 3). Some members of Congress also identified the maintenance of non-sparking tools and working with unspecified beryllium alloys in high-tech naval vessels as activities that expose workers to materials containing beryllium above trace levels (Document ID 2208, p. 6).

Relying largely on studies performed at Department of Energy nuclear weapon sites (some of the same studies cited by NJH), NABTU commented that workers performing maintenance, renovation, repair, and demolition in beryllium processing facilities may be exposed to residual beryllium in ventilation systems, floors, insulation materials, and in floor crevices (Document ID 2202, p. 2; 2240, p. 3). Referencing OSHA's decision in the 2017 final rule to apply the construction standard to all occupational exposures to beryllium, rather than limiting the requirements to abrasive blasting operations, NABTU contended that OSHA's proposal departs from the agency's prior conclusions without explaining this supposed departure. According to NABTU, OSHA has abandoned its position that the construction standard should "cover all occupational exposures to beryllium" and instead "decided only to address the 'primary' means of exposure" (Document ID 2240, pp. 2-5).

In addition to potential exposures from existing operations, USW contended that the proposed revisions to the construction and shipyard standards fail to account for "all future operations" that might use beryllium. By tailoring the standards to the specific exposures in abrasive blasting and welding operations, USW contends that OSHA is making a "dangerous assumption" that it makes "in no other health standard" (Document ID 2212, p. 2). According to USW: "If a new chemical product is synthesized from 1,3-butadiene, the 1,3-butadiene standard will apply in its entirety. If arsenic finds a new use in semiconductors, the employer will be expected to comply with the entire arsenic standard. . . . However, under the OSHA proposal, if metallic beryllium, a beryllium alloy, ceramic or other compound is someday used on a construction site or in a shipyard, exposed workers will lack important protections enjoyed by their counterparts in general industry" (Document ID 2212, p. 2). USW echoed NABTU's assertion that OSHA's proposal neglects workers beyond abrasive blasters and welders and concluded that "[o]nly by including all the



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general industry protections in the shipyard and construction standards can OSHA fulfill [its] mandate” to protect all workers (Document ID 2212, p. 4).

Those commenters who participated in the public hearing also raised these concerns in their testimony. Specifically, both NJH and USW again identified potential exposures from beryllium-containing non-sparking tools (Document ID 2222, Tr. 17-19, 48) and NJH discussed their organization’s past diagnoses of CBD in contract construction workers in the primary beryllium and manufacturing industries (Document ID 2222, Tr. 48). USW again expressed concern about possible future applications of beryllium-containing materials in construction and shipyard work (Document ID 2222, Tr. 17-19). NABTU and AFL-CIO both reiterated their position that construction workers are exposed through activities other than abrasive blasting, particularly demolition, renovation, cleanup, and similar work in facilities that make and use beryllium-containing alloys (Document ID 2222, Tr. 84, 114-15). NABTU concluded that construction workers operating in facilities that use beryllium “are not only potentially exposed to beryllium, but also, they will have dermal exposure to dust and debris that can contain beryllium at greater than trace amounts” (Document ID 2222, Tr. 84-85).

On the whole, these commenters contend that, because there are work processes other than abrasive blasting and welding that could expose construction and shipyard workers to beryllium, OSHA should not remove or modify provisions of the beryllium standards—such as the written exposure control plan requirements—to tailor the standards to abrasive blasting and welding operations.

After reviewing all of these comments and the record as a whole, OSHA has determined that the record continues to lack sufficient data for the agency to characterize the nature, locations, or extent of beryllium exposure in application groups in current-day construction and shipyards sectors other than abrasive blasting and certain welding operations. Further, although OSHA continues to recognize the possibility of exposures beyond abrasive blasting and welding, the agency has reason to believe concerns regarding construction workers’ dermal exposure to more than trace beryllium at general industry sites, although potentially justified in the past, likely do not reflect current exposures in these contexts.

As a result, OSHA finds that it is appropriate to follow through with its proposal to tailor certain provisions of the beryllium standards for construction and shipyards—including the written exposure control plan requirements—to those operations for which the agency has data. At the same time, OSHA disagrees with NECA, NDA, and CISC that the agency should strictly limit application of the beryllium standards to abrasive blasting and welding operations. Accordingly, both standards will continue to cover all occupational exposures to beryllium in these industries

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that meet the requirements of paragraph (a). OSHA's reasoning and the agency's response to each of the comments received on these topics is explained below.

*Comments Specific to Paragraph (f)(1)*

In addition to these broader comments about the appropriate application group in the construction and shipyards sectors, OSHA received a number of additional comments specifically addressing the written exposure control plan requirements of paragraph (f)(1). Two stakeholders commented broadly on the importance of written exposure control plans. The AFL-CIO and NABTU stated that written exposure control plans are essential to providing employers with a clear plan for exposure identification and control (Document ID 2210, p. 6; Document ID 2202, p. 5). NABTU emphasized the importance of the written plan's description of engineering controls, work practices, and substitute materials for each task and a description of how employers will protect workers not engaged directly in beryllium-exposed tasks, by limiting access to work areas where beryllium-exposed tasks such as abrasive blasting occur (Document ID 2202, p. 6). Without a written plan, both groups asserted, employers are unlikely to adequately control beryllium exposure (Document ID 2210, p. 6; Document ID 2202, p. 6). NABTU further emphasized that when planning for worker protection during tasks involving beryllium, employers must account for the unique toxicity of beryllium by creating a written exposure control plan specifically addressing beryllium exposures (Document ID 2202, p. 5).

The remainder of this section details the comments received with respect to each proposed revision in paragraph (f)(1) and provides OSHA's final determination.

OSHA's proposed revisions to paragraph (f)(1)(i)(A) received no comment apart from the general concerns discussed above regarding OSHA's assessment of beryllium exposures outside of abrasive blasting and welding. Therefore, OSHA is finalizing its proposal to modify paragraph (f)(1)(i)(A) to refer simply to "exposure" rather than "airborne exposure to or dermal contact with" by removing the words "airborne" and "or dermal contact with" as qualifiers for exposure to beryllium. OSHA notes that these changes are consistent with other paragraphs where the agency is simplifying the language in a similar manner (e.g., paragraphs (k)(3)(ii)(A) and (k)(4)(i), Medical surveillance), and is not intended to alter the meaning of the provision.

OSHA is also finalizing its proposal to revoke paragraphs (f)(1)(i)(B) and (C) of both the construction and shipyards standards, which previously required lists of operations and job titles involving exposure above the action level and above the TWA PEL or STEL, respectively. OSHA's proposals to revoke these paragraphs received little comment apart from the general concerns discussed above regarding the potential for exposures in contexts other than abrasive blasting and welding. As discussed there, OSHA has concluded that it is appropriate to tailor

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certain aspects of the beryllium standards for construction and shipyards to the limited number of operations known to involve beryllium exposure in construction and shipyards. Given the small number of operations with known beryllium exposure in these industries, OSHA maintains that the operations and job titles in these categories would be largely the same as those for which exposure to beryllium is reasonably expected. OSHA therefore believes it sufficient to require that an employer identify those operations and job titles that result in exposure to beryllium in any form and that fall within the scope of the standards, and that any additional lists would be unnecessary and redundant.

With respect to OSHA's proposal to add a new paragraph in both the construction ((f)(1)(i)(E)) and shipyards ((f)(1)(i)(D)) standards to require that the written exposure control plan include procedures used to ensure the integrity of each containment used to minimize exposures to employees outside the containment, no commenter objected to the addition of this requirement, while NJH supported it (Document ID 2211, p. 8). As OSHA explained in the NPRM, this requirement will ensure that any containment used is not compromised such that employees outside of the containment are potentially exposed to beryllium at levels above the TWA PEL or STEL. The need for this requirement is reinforced by comments from USW identifying issues with gaps and leaks from "make shift containment" (Document ID 2124, page 10) and noting that beryllium can escape from abrasive blasting containments (Document ID 2222, Tr. 27-28). After considering the comments and the record as a whole, OSHA is finalizing this provision as proposed.

AFL-CIO disagreed with OSHA's proposal to remove paragraphs (f)(1)(i)(D) and (E) of the standards, which required the employer to include in the written exposure control plan procedures for minimizing cross-contamination and migration of beryllium within or to locations outside the workplace. AFL-CIO characterized these provisions as "essential to reduce cumulative exposure to beryllium for workers in high exposure operations and to protect other workers who do not perform beryllium tasks but would be exposed to beryllium due to the lack of cross contamination and migration minimization procedures" (Document ID 2210, p. 6).

AFL-CIO also argued that OSHA's proposed requirement for written exposure control plans to include procedures used to ensure the integrity of each containment used to minimize exposures to employees outside of containments would be insufficient to control the migration of beryllium (Document ID 2210, p. 6). AFL-CIO stated that "OSHA is requiring containments that would create a higher concentration of beryllium dust inside the enclosure [and] relying on the protection of PPE," while revising paragraph (f) and paragraphs (h)(2) and (h)(3) to no longer require employers to use specific procedures to ensure that PPE is safely doffed. According to AFL-CIO, this will increase the cumulative exposure risk for abrasive blasters and increase the

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risk of cross-contamination and migration of beryllium, thereby exposing workers with no respiratory or dermal protection (Document ID 2210, p. 7).

OSHA disagrees, firstly, with AFL-CIO's contention that the proposed requirement for written exposure control plans to include procedures used to ensure the integrity of each containment would lead to increased beryllium exposures to workers inside the enclosure. This final rule does not require the use of containments, but rather requires that when an employer chooses to use a containment, it is used in such a way that employees outside of the containment are not exposed to beryllium at levels above the TWA PEL or STEL. In other words, this requirement merely ensures that containments, when used, accomplish their intended function. Workers inside the containment continue to receive the protections of the requirements for use of PPE (paragraph (h)(1)) and respiratory protection (paragraph (g)(1)(ii)-(iii)), as well as the requirements that PPE not be removed or cleaned in a manner that releases beryllium into the air (paragraph (h)(2)(ii), (h)(3)(ii)). For this reason, OSHA finds that adding a requirement that the written control plan include such procedures will not lead to increased beryllium exposures to workers inside such containments.

Furthermore, OSHA disagrees with AFL-CIO's position that the previous requirements to document procedures for minimizing cross-contamination and migration in the written exposure control plan are necessary to protect workers in the context of the specific exposures in construction and shipyards sectors. In the general industry context, requirements relating to cross-contamination and migration serve to address concerns about both airborne and dermal exposures (see 82 FR at 2668-69). At the same time, OSHA has explained that it does not intend provisions aimed at protecting workers from the effects of dermal contact to apply in the case of materials containing only trace amounts of beryllium absent significant airborne exposures (84 FR at 53906). OSHA maintains that the primary exposures in construction and shipyards are from abrasive blasting with material containing trace amounts of beryllium and limited welding operations. Moreover, as explained above, while the agency recognizes the potential for other exposure sources in these sectors, the record does not demonstrate that potential exposures involve a risk of dermal contact to beryllium in more than trace amounts.

In the 2017 final rule, OSHA tailored portions of the written exposure control plan requirements in construction and shipyards to the particular exposures in abrasive blasting operations. Specifically, the agency chose not to include in the construction and shipyards standards a requirement that employers keep surfaces as free as practicable of beryllium, as it had done in the general industry standard, finding that such a requirement would be impracticable in abrasive blasting operations (82 FR at 2669). At the same time, the agency applied other provisions, developed for the general industry context, without appropriately accounting for the trace amounts of beryllium in the construction and shipyards sectors. In these sectors, where the record

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evidence on dermal exposure in modern-day worksites is limited to trace amounts of beryllium and where the agency otherwise has reason to believe dermal contact is not an exposure source of concern, OSHA now finds that it is appropriate to further tailor these provisions to focus on ensuring that workers not involved in beryllium-related operations are not exposed to airborne beryllium in excess of the PELs.

Several provisions of both standards work together to protect workers near abrasive blasting and welding operations from exposures above the PELs. In the construction standard, the written exposure control plan must include procedures to restrict access to work areas where exposures to beryllium could reasonably be expected to exceed the TWA PEL or STEL (renumbered in this final rule as paragraph (f)(1)(i)(D)), and the requirement that these procedures are to be implemented by a competent person (paragraph (e)(2)). In the shipyard standard, requirements for regulated areas (paragraph (e)) require that employers designate areas where exposures to beryllium could exceed the PELs and limit access to authorized employees. OSHA has retained these requirements in this final rule. Further, the housekeeping requirements of both standards (paragraph (j)) require cleaning methods that minimize the likelihood of re-entrainment of beryllium-containing dust when cleaning up dust produced by abrasive blasting operations.

In addition, as discussed above, OSHA is finalizing its proposal to add a new paragraph in both the construction ((f)(1)(i)(E)) and shipyards ((f)(1)(i)(D)) standards to require that the written exposure control plan include procedures used to ensure the integrity of each containment (such as tarps or structures used to keep sandblasting debris within an enclosed area) used to minimize exposures to employees outside the containment. This requirement will further limit airborne exposures for employees outside of the containment where an employer uses a containment. Finally, both standards require the employer to ensure that personal protective clothing and equipment required by the standard is not removed in a manner that disperses beryllium into the air (paragraph (h)(2)(ii)), which will serve to limit migration of beryllium and reduce airborne exposure from re-entrainment.

With respect to the AFL-CIO's assertion that procedures regarding the integrity of containments are insufficient to protect workers, OSHA makes two points. First, comments in the record indicate that containments can be effective in containing dust during abrasive blasting, if appropriate procedures are used to ensure their integrity. As noted by the USW and AFL-CIO, there are times that the abrasive blasting media can compromise the integrity of the containment (Document ID 2124, pp. 10-11, 13; 1756, Tr. 246-49; 2210, p. 6). However, under these circumstances OSHA expects that operations would be suspended to repair the containment. According to the testimony from USW during the public hearing for the 2017 final rule, this practice already takes place in some shipyard operations (Document ID 1756, Tr. 262-63). USW further identified the use of negative pressure with containments as a feasible and effective way

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to ensure their integrity; a method that is already used in the context of bridge repair (Document ID 1756, Tr. 264).

Second, OSHA reiterates that it does not intend for the added provision on containments alone to protect workers from exposures exceeding the PEL. Rather, the agency intends this added provision to complement the written plan's procedures to restrict access to work areas where exposures to beryllium could reasonably be expected to exceed the TWA PEL or STEL (renumbered as paragraph (f)(1)(i)(D) of the construction standard), the requirement that these procedures are to be implemented by a competent person (paragraph (e)(2) of the construction standard) and requirements for regulated areas (paragraph (e) of the shipyard standard), to ensure that workers not directly involved in beryllium-related operations would not be exposed to beryllium above the PELs.

OSHA has determined that these requirements will adequately ensure that workers in shipyards and construction not directly involved in beryllium-related work will not be exposed to beryllium in excess of the TWA PEL or STEL, and is therefore finalizing its proposal to revoke the requirements that the employer include in the written exposure control plan procedures for minimizing cross-contamination (former paragraph (f)(1)(i)(D)) and procedures for minimizing the migration of beryllium within or to locations outside the workplace (former paragraph (f)(1)(i)(E)).

The AFL-CIO also disagreed with OSHA's proposal to remove paragraph (f)(1)(i)(H), which in the 2017 rule required employers to document procedures for removing, laundering, storing, cleaning, repairing, and disposing of beryllium-contaminated PPE, from the written exposure control plan. The AFL-CIO argued that these procedures protect workers from further exposing themselves to beryllium when putting on and removing PPE and prevent cross-contamination and migration of beryllium to other areas of the worksite (Document ID 2210, p. 6). NJH similarly argued that procedures should be in the written exposure control plan to identify and minimize beryllium exposures to workers involved in cleaning and maintaining PPE, as well as containments. If exposures are generated in a process, they stated, then PPE to protect the worker is contaminated and should be handled as required in the 2017 final rule (Document ID 2211, p. 9).

OSHA disagrees with the AFL-CIO and NJH that all of the 2017 final rule's requirements for removing, laundering, storing, cleaning, repairing, and disposing of beryllium-contaminated PPE are necessary in the construction and shipyards context.

In light of OSHA's decision to eliminate several of the requirements in paragraph (h), OSHA believes that it is unnecessary to require the employer to document all of the procedures that

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were previously included in paragraph (f)(1)(i)(H). However, OSHA finds that it is appropriate to retain those requirements of paragraph (f)(1) that pertain to provisions that OSHA has not eliminated. Specifically, the construction and shipyards standards still require the employer to ensure that PPE required by the standard is not removed in a manner that disperses beryllium into the air (paragraph (h)(2)(ii)). Both standards still require the employer to ensure that all reusable personal protective clothing and equipment required by this standard is cleaned, laundered, repaired, and replaced as needed to maintain its effectiveness (paragraph (h)(3)(i)). And, both standards still require the employer to ensure that beryllium is not removed from PPE required by the standard by blowing, shaking or any other means that disperses beryllium into the air (paragraph (h)(3)(ii)). In addition, OSHA has decided to revise former paragraph (h)(2)(iv) (renumbered as (h)(2)(iii)) to require that the employer ensure that no employee with reasonably expected exposure above the TWA PEL or STEL removes personal protective clothing or equipment from the worksite unless it is first cleaned in accordance with paragraph (h)(3) (see the Summary and Explanation for paragraph (h)).

OSHA's 2017 final rule would have required employers in construction and shipyards to include information pertaining to these provisions in their written exposure control plans. For these provisions, OSHA agrees with the aforementioned commenters that paragraph (f)(1) should retain the documentation requirements that were promulgated in the 2017 final rule. Therefore, OSHA is adding a requirement for employers to include, in their written exposure control plans, procedures for removing, cleaning, and maintaining personal protective clothing and equipment in accordance with paragraph (h) of this standard. Specifically, OSHA is finalizing its proposal to remove paragraph (f)(1)(i)(H), and is adding a new paragraph (f)(i)(F) to each standard, instructing employers that their written exposure control plans must include such procedures.

NABTU also expressed its belief that OSHA must retain the standards' procedures for minimizing cross-contamination and migration of beryllium, and urged OSHA to retain paragraph (f)(1)(i)(H) (Document ID 2240, pp. 5-6). In support, NABTU noted that some workers at a beryllium producing facility studied by Virji et al. (2019) who were not directly involved in beryllium-related operations nevertheless became sensitized to beryllium, including some involved in shutdown maintenance, and that the study authors found a strong association between dermal exposure and beryllium sensitization (Document ID 2240, pp. 5-6). As discussed above in this Summary and Explanation for paragraph (f)(1), OSHA does not agree that the Virji study indicates that employees in the construction and shipyards industries are currently exposed to dermal contact with beryllium in greater-than-trace concentrations. OSHA has determined that it is appropriate to tailor these standards to abrasive blasting and welding operations, and preventing cross-contamination and migration of beryllium-containing dust in such operations, where the dust contains only trace amounts of beryllium, is only necessary to prevent beryllium-containing dust from being re-entrained and creating an additional inhalation risk to workers who

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already have airborne exposure to beryllium at levels of concern (e.g., workers in and around beryllium-releasing operations, rather than workers in distant areas of the worksite or downstream from beryllium-releasing operations).

OSHA received one comment on its proposal to revise paragraph (f)(1)(ii)(B) to refer simply to “exposure to” rather than “airborne exposure to or dermal contact with” beryllium (84 FR at 53911), consistent with other paragraphs in which OSHA proposed to simplify the language in a similar manner (e.g., paragraph (f)(1)(i)(A), Written exposure control plan; paragraphs (k)(3)(ii)(A) and (k)(4)(i), Medical surveillance). As revised, the paragraph requires the employer to review and evaluate the effectiveness of each written exposure control plan and update it, as necessary, when notified an employee shows signs or symptoms associated with exposure to beryllium. NJH agreed that the proposed change would simplify the reading of the standard (Document ID 2211, p. 9). Having received no comments opposing this change, OSHA is finalizing this provision as proposed.

NJH also suggested that if OSHA makes this change, the agency should also provide a definition of the term “exposure” (Document ID 2211, p. 9). OSHA disagrees. The term “exposure” and closely related terms such as “exposed” appear in nearly every paragraph of the standard, referring variously to airborne exposure, dermal exposure, or both. OSHA has carefully written the regulatory text and the accompanying summary and explanation to clearly indicate which meaning of exposure is intended in each instance, typically by including a qualifier such as “airborne” or “dermal” when a specific type of exposure is involved. Because the intended meaning of the term varies somewhat from instance to instance, the agency finds that adding a definition of “exposure” to the standard may lead to confusion and misunderstanding regarding many provisions of the standard, and maintains that explaining the agency’s meaning in each instance of the term is appropriate. With respect to paragraph (f)(1)(ii)(B), by including no qualifier for the term exposure, OSHA ensures that the provision will be triggered whenever an employee shows signs or symptoms associated with any type of exposure to beryllium.

**§ 1915.1024(h)**

**Personal Protective Clothing and Equipment -- Removal and Storage – REMOVED**

Paragraph (h)(2)(v) requires the employer to ensure that when personal protective clothing or equipment required by this standard is removed from the workplace for laundering, cleaning, maintenance or disposal that the personal protective clothing and equipment are stored and



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transported in sealed bags or other closed containers that are impermeable and are labeled in accordance with paragraph (m)(3) of this standard and the HCS (29 CFR 1910.1200).

**Personal Protective Clothing and Equipment -- Cleaning and Replacement -- REMOVED**

Paragraph (h)(3)(iii) requires the employer to inform in writing the persons or the business entities who launder, clean, or repair the personal protective clothing or equipment required by this standard of the potentially harmful effects of exposure to beryllium and that the personal protective clothing and equipment must be handled in accordance with this standard.

As OSHA explains in the summary and explanation for paragraph (h), Personal Protective Clothing and Equipment, OSHA has determined that it is appropriate to remove certain requirements pertaining to laundering, storing, and disposal of PPE from the construction and shipyard standards. Specifically, OSHA is removing three provisions from paragraphs (h)(2) and (h)(3): the requirement to ensure that each employee stores and keeps beryllium-contaminated PPE separate from street clothing and that storage facilities prevent cross-contamination as specified in the written exposure control plan (paragraph (h)(2)(iii)); to ensure that PPE removed from the workplace for laundering, cleaning, maintenance, or disposal be placed in closed, impermeable bags or containers labeled in accordance with the standards' employee information and training requirements and the Hazard Communication standard (paragraph (h)(2)(v)); and to inform, in writing, any person or business entity who launders, cleans, or repairs PPE required by the standards of the potentially harmful effects of exposure to airborne beryllium and dermal contact with beryllium, and of the need to handle the PPE in accordance with the standards (paragraph (h)(3)(iii)). OSHA is removing paragraph (h)(2)(iii) because it applies only to "beryllium contaminated" PPE (i.e., contaminated with beryllium in concentrations greater than or equal to 0.1 percent by weight), and thus would never be triggered by the operations to which OSHA is tailoring these standards and because the sanitation standards applicable to construction and shipyards provide the necessary protections for the storage of PPE (see further discussion below in the summary and explanation for paragraph (i)). OSHA is removing paragraphs (h)(2)(v) and (h)(3)(iii) because they protect downstream handlers of PPE who (to OSHA's knowledge) are not engaged in any tasks that could generate airborne exposures at levels of concern. Accordingly, OSHA has determined these provisions are unnecessary and should be removed. Therefore, the removal of these provisions will go forward to the final as proposed.

**§ 1915.1024(k)**

**Medical Surveillance.**

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Final paragraph (k)(1)(i) requires the employer to make medical surveillance available at no cost to the employee, and at a reasonable time and place, to each employee: (A) Who is or is reasonably expected to be exposed at or above the action level for more than 30 days per year; (B) Who shows signs or symptoms of CBD or other beryllium-related health effects;

Or (C) Whose most recent written medical opinion required by paragraph (k)(6) or (k)(7) recommends periodic medical surveillance. Also in final paragraph (k)(1)(ii) the employer must ensure that all medical examinations and procedures are performed by, or under the direction of, a licensed physician.

Final paragraph (k)(2) requires the employer to provide a medical examination: (i) Within 30 days after determining that: (A) An employee meets the criteria of paragraph (k)(1)(i)(A), unless the employee has received a medical examination, provided in accordance with this standard, within the last two years; or (B) An employee meets the criteria of paragraph (k)(1)(i)(B). And Final paragraph (k)(2)(ii) requires at least every two years thereafter for each employee who continues to meet the criteria of paragraph (k)(1)(i)(A), (B), or (D) of this standard. Final paragraph (k)(2)(iii) requires at the termination of employment for each employee who meets any of the criteria of paragraph (k)(1)(i) of this standard at the time the employee's employment terminates, unless an examination has been provided in accordance with this standard during the six months prior to the date of termination. Each employee who meets the criteria of paragraph (k)(1)(i)(C) and who has not received an examination since exposure to beryllium during the emergency must be provided an examination at the time the employee's employment terminates. Final paragraph (k)(2)(iv) requires for an employee who meets the criteria of paragraph (k)(1)(i)(C): (A) If that employee has not received a medical examination within the previous two years pursuant to paragraph (k)(1)(i), then within 30 days after the employee meets the criteria of paragraph (k)(1)(i)(C); or (B) If that employee has received a medical examination within the previous two years pursuant to paragraph (k)(1)(i), then at least one year but no more than two years after the employee meets the criteria of paragraph (k)(1)(i)(C).

*Paragraph (k) Medical Surveillance*

Paragraph (k) of the beryllium standard for construction and shipyards addresses medical surveillance requirements. The paragraph specifies which employees must be offered medical surveillance, as well as the frequency and content of medical examinations. It also sets forth the information that must be provided to the employee and employer. The purposes of medical surveillance for beryllium are (1) to identify beryllium-related adverse health effects so that

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appropriate intervention measures can be taken; (2) to determine if an employee has any condition that might make him or her more sensitive to beryllium exposure; and (3) to determine the employee's fitness to use personal protective equipment, such as respirators. The inclusion of medical surveillance in the beryllium standards for the construction and shipyard industries is consistent with Section 6(b)(7) of the OSH Act (29 U.S.C. 655(b)(7)), which requires that, where appropriate, medical surveillance programs be included in OSHA health standards to aid in determining whether the health of employees is adversely affected by exposure to the hazards addressed by the standard.

In the 2019 NPRM, OSHA proposed several revisions to paragraph (k). First, OSHA proposed removing paragraph (k)(1)(i)(C), which requires medical surveillance after exposure to beryllium during an emergency, to coincide with the removal of the term "emergency" from the standards (84 FR at 53918-19). Second, OSHA proposed minor revisions to paragraphs (k)(3)(ii)(A) and (k)(4)(i) to replace the phrase "airborne exposure to and dermal contact with beryllium" in these provisions with the simpler phrase "exposure to beryllium" (84 FR at 53919). Finally, OSHA proposed two revisions to paragraph (k)(7)(i) to make it consistent with recent changes to the beryllium general industry standard<sup>2</sup> (84 FR at 53919).

With respect to OSHA's proposal to remove paragraph (k)(1)(i)(C), as discussed previously in the Summary and Explanation for paragraph (b), OSHA proposed to remove references to emergencies in the shipyards and construction standards because OSHA expects that any emergency in these industries (such as a release resulting from a failure of the blasting control equipment, a spill of the abrasive blasting media, or the failure of a ventilation system during welding operations in shipyards) would occur only during the performance of routine tasks already associated with the airborne release of beryllium; i.e., during the abrasive blasting or welding process. Therefore, employees would already be protected from exposure in such circumstances. Accordingly, OSHA preliminarily determined that no requirements should be triggered for emergencies in construction and shipyards and proposed to remove references to emergencies in provisions related to respiratory protection, paragraph (g); medical surveillance, paragraph (k); and hazard communication, paragraph (m). The agency also preliminarily determined that without these provisions it would be unnecessary to define the term *emergency* in paragraph (b) (84 FR at 53909).<sup>3</sup>

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<sup>2</sup> OSHA also proposed a number of minor, non-substantive edits to paragraph numbering and references to account for the addition of a new paragraph (k)(7)(ii).

<sup>3</sup> Due to the removal of paragraph (k)(1)(i)(C), OSHA is also adding the word "or" at the end of paragraph (k)(1)(i)(B) (following the semi-colon); removing a reference to paragraph (k)(1)(i)(C) from paragraph (k)(2)(i)(B); and redesignating paragraph (k)(1)(i)(D) as paragraph (k)(1)(i)(C). Consistent with that redesignation, OSHA is replacing the reference to paragraph (k)(1)(i)(D) in paragraph (k)(2)(ii) with a reference to paragraph (k)(1)(i)(C).

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Some commenters objected to the proposed removal of provisions relating to emergencies. Specifically, these commenters took issue with OSHA's preliminary determination that an uncontrolled release of beryllium in the construction and shipyards industries would not create exposures that differ from normal operations. For a full discussion of these comments and the agency's response, see the Summary and Explanation for paragraph (g). In short, the agency is not persuaded that the types of uncontrolled releases that necessitated emergency provisions in the general industry standard are present in the construction and shipyards industries. Accordingly, OSHA is finalizing its proposal to remove all references to "emergency" or "emergencies" throughout the construction and shipyards standards. Because those terms no longer appear in the standards' requirements, OSHA is also finalizing its proposal to remove the definition of the term "emergency" from paragraph (b).

AFL-CIO, NABTU, and NJH specifically commented on the proposed removal of the emergency exposure trigger for a medical examination in paragraph (k). AFL-CIO opposed the removal of the emergency provisions and argued that medical surveillance should be required following an emergency (Document ID 2210, p. 9). NABTU commented that a failure of a containment used for abrasive blasting would be considered an emergency (Document ID 2222, Tr. 85-86, 91-92). NABTU also noted situations where construction workers could experience emergency exposures to beryllium in manufacturing and processing facilities, and it urged OSHA to retain the definition for emergency and other related protections, such as the trigger for an emergency examination. (Document ID 2240, p. 7). NABTU also commented that questions about emergency exposures should "be included in the medical and work histories, to ensure that pertinent information about potential exposures is not overlooked." (Document ID 2240, p. 8). In contrast, NJH agreed with OSHA that emergencies might not occur, but recommended that if the trigger for emergency exposure is removed, any exposure above the PEL should trigger medical surveillance (Document ID 2211, p. 11). Specifically, NJH commented: "Jobs and tasks that would generate beryllium exposure (demolition, repair, clean up, abrasive blasting, welding, cleaning and grinding of beryllium containing tools, etc.) may only be done periodically and meeting the "30 days over the action level" in order to qualify for medical surveillance may not be easy to quantify or may require extensive recordkeeping as workers move from job to job or contract to contract. Therefore, any exposures above the PEL should trigger the medical surveillance and hazard communication provisions." (Document ID 2211, p. 11). Lisa Barker from NJH further testified that persons who are genetically susceptible can become sensitized from limited exposures (Document ID 2222, Tr. 56-57).

As explained in the Summary and Explanation for paragraph (g), OSHA is not reinstating a definition for emergency, and readers should refer to that section for a complete explanation. In response to NABTU's comment that emergency exposures should be included in medical and work histories, OSHA does not specify the individual questions to include in a medical and work

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history. Instead, OSHA simply requires that medical and work histories include “past and present exposure to beryllium.” An unexpected exposure, such as would occur with a containment failure, would therefore be included in the medical and work history for an employee who undergoes medical surveillance under the beryllium standard. In addition, paragraph (k)(4)(i) requires the employer to inform the PLHCP about former and current levels of airborne exposure. OSHA would expect the employer to inform the PLHCP if the employee experienced an incident where he or she was exposed to levels of beryllium that exceeded the employee’s typical exposure levels.

In response to NJH’s suggestion that, if the emergency provision is removed, OSHA should require medical surveillance for any exposure above the PEL, OSHA notes that NJH’s position is not limited to exposures in an emergency but to any exposures any exposures above the PEL that occur for fewer than 30 days. In other words, NJH asks OSHA to reconsider the appropriateness of the 30-day exposure-duration trigger generally. OSHA evaluated the appropriateness of the 30-day trigger in the 2017 final rule. At that time, NJH and other stakeholders opposed the 30-day exposure-duration trigger for medical surveillance. After careful consideration of comments and other evidence in the record, OSHA decided to maintain the 30-day exposure-duration trigger because it is consistent with the agency’s risk assessment showing increasing risk of health effects from exposure at increasing cumulative exposures, which considers both exposure level and duration (82 FR at 2528-40, 2698). OSHA found a 30-day trigger to be a reasonable benchmark for capturing increasing risk from cumulative effects caused by repeated exposures. Between that rulemaking and the present, OSHA has not received any additional evidence demonstrating that this benchmark is inappropriate. Finally, OSHA notes that the 30-day exposure-duration trigger is consistent with the general industry beryllium standard and other OSHA health standards, such as the standards for chromium (VI) (29 CFR 1910.1026), cadmium (29 CFR 1910.1027), lead (29 CFR 1910.1025), asbestos (29 CFR 1910.1001), and respirable crystalline silica (29 CFR 1910.1053) (82 FR at 2698).

With respect to NJH’s related concern regarding the tracking of exposures in the construction industry -- where tasks may be performed intermittently at different locations -- similar concerns were raised during the respirable crystalline silica rulemaking. In that rulemaking, OSHA acknowledged that tracking exposures in construction can be challenging. However, it pointed to evidence in the record showing that some construction employers were able to determine which employees were exposed above the PEL based on employee schedules and task-based hazard assessments. (81 FR 16285, 16815-16 (March 25, 2016)). Indeed, an employer can determine eligibility for medical surveillance based on information from exposure assessments for the various tasks and knowledge about how often the task is performed. Compliance officers can also determine if employees who were exposed at or above the action level for 30 or more days a year were not offered medical surveillance by questioning employees about how often they

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perform certain tasks. As such, OSHA finds it is possible to quantify exposure for employees that are only periodically exposed to beryllium without extensive recordkeeping. Accordingly, OSHA believes it is appropriate to maintain the 30-day trigger and that this will not create undue burdens with respect to recordkeeping.

Moreover, employees experiencing signs or symptoms or other beryllium-related health effects after intermittent or unexpected exposures to beryllium can ask for an examination under paragraph (k)(1)(i)(B). Paragraph (m)(2)(i)(A) requires the employer to provide information and training in accordance with the Hazard Communication Standard (HCS), 29 CFR 1910.1200(h), for each employee who has, or can reasonably be expected to have, airborne exposure to beryllium. Paragraph (m)(2)(ii) also requires employers to ensure that these employees can demonstrate knowledge and understanding of a number of specified topics, including the signs and symptoms of CBD. Thus, employees who are intermittently exposed should possess the knowledge necessary to determine whether they should request an examination. In summary, OSHA has determined that the evidence presented does not support reinstating triggers for an emergency exposure or reconsidering the 30-day exposure-duration as a trigger for medical surveillance.

The second set of changes that OSHA proposed were minor revisions to paragraphs (k)(3)(ii)(A) and (k)(4)(i). Paragraph (k)(3)(ii)(A) previously required the employer to ensure that the employee is offered a medical examination that includes a medical and work history, with an emphasis on, among other things, past and present airborne exposure to or dermal contact with beryllium. Paragraph (k)(4)(i) previously required the employer to ensure that the examining PLHCP (and the agreed upon CBD diagnostic center, if an evaluation is required under paragraph (k)(7) of this standard) had certain information, including a description of the employee's former and current duties that relate to the employee's airborne exposure to and dermal contact with beryllium, if known. In the 2019 NPRM, OSHA proposed to clarify these provisions by replacing the phrase "airborne exposure to and dermal contact with beryllium" with the simpler phrase "exposure to beryllium" (84 FR at 53919). OSHA reasoned that employees with beryllium exposure of any kind should have access to records of their exposure, and this information should also be made available to an examining PLHCP and CBD diagnostic center, if applicable. OSHA intended for this proposed change to alleviate any unnecessary confusion created by the use of the term "dermal contact," which is defined in the general industry standard but not in the construction and shipyards standards.

AFL-CIO and NABTU commented on OSHA's proposed changes to paragraphs (k)(3) and (k)(4). AFL-CIO opposed OSHA's proposed revision to paragraph (k)(4)(i), arguing that it is important for the physician to be informed about both airborne and dermal exposures and that removing that clarification would increase confusion by putting the burden on the employer and

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physician to understand OSHA's intent (Document ID 2210, p. 9). In further support of retaining provisions that provide protection from dermal exposure, AFL-CIO referenced a previous comment from NABTU stating that the skin should be examined because beryllium exposure can result in "skin irritation, skin bumps, and sores that won't heal." (Document ID 2244, pp. 8-9; 1679, Attachment A, p. 1). NABTU commented that OSHA should retain the "protections against airborne exposures" in paragraph (k)(3) (Document ID 2240, p. 6).

OSHA clarifies that it does not intend to change the requirements for the type of information provided to the physician, and if the employee does have the potential for dermal exposure, the employer is to provide that information to the physician. OSHA proposed this change not to limit the type of information provided to physicians, but instead, to make clear that employers and employees should inform physicians about *any* type of beryllium exposure. OSHA continues to believe that the change will reduce confusion by removing terminology—the reference to dermal contact—that is not used in the construction and shipyards standard. In addition, the requirement for the PLHCP to examine the skin for rashes is retained in paragraph (k)(3)(ii)(C). Consistent with the 2017 final rule, OSHA continues to believe that it is important to examine the skin for rashes because it could be a sign that dermal sensitization or exposures that put the employee at risk of sensitization have occurred (82 FR at 2471). OSHA disagrees with AFL-CIO that simplifying the language of these provisions will result in confusion, because the revised text clearly encompasses all exposure to beryllium. Accordingly, OSHA has decided to finalize the changes to paragraph (k)(3)(ii)(A) and (k)(4)(i) as proposed.

**§ 1915.1024(k)(7)**

**CBD Diagnostic Center.**

Final paragraph (k)(7)(i) requires the employer to provide an evaluation at no cost to the employee at a CBD diagnostic center that is mutually agreed upon by the employer and the employee. The employer must also provide, at no cost to the employee and within a reasonable time after the initial consultation with the CBD diagnostic center, any of the following tests if deemed appropriate by the examining physician at the CBD diagnostic center: pulmonary function testing (as outlined by the American Thoracic Society criteria), bronchoalveolar lavage (BAL), and transbronchial biopsy. The initial consultation with the CBD diagnostic center must be provided within 30 days of: (A) The employer's receipt of a physician's written medical opinion to the employer that recommends referral to a CBD diagnostic center; or (B) The employee presenting to the employer a physician's written medical report indicating that the

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employee has been confirmed positive or diagnosed with CBD, or recommending referral to a CBD diagnostic center.

Final paragraph (k)(7)(ii) requires the employer to ensure that the employee receives a written medical report from the CBD diagnostic center that contains all the information required in paragraph (k)(5)(i), (ii), (iv), and (v) that the PLHCP explains the results of the examination to the employee within 30 days of the examination.

Final paragraph (k)(7)(iii) requires the employer to obtain a written medical opinion from the CBD diagnostic center within 30 days of the medical examination. The written medical opinion must contain only the information in paragraph (k)(6)(i), as applicable, unless the employee provides written authorization to release additional information. If the employee provides written authorization, the written opinion must also contain the information from paragraphs (k)(6)(ii), (iv), and (v), if applicable.

Final paragraph (k)(7)(iv) requires the employer to ensure that each employee receives a copy of the written medical opinion from the CBD diagnostic center described in paragraph (k)(7) of this standard within 30 days of any medical examination performed for that employee.

The final set of changes that OSHA proposed to the construction and shipyard standards' medical surveillance requirements is in paragraph (k)(7), which contains the requirements for an evaluation at a CBD diagnostic center. In this final rule, OSHA is amending paragraph (k)(7) in three ways. First, OSHA is revising paragraph (k)(7)(i) to require that the evaluation be scheduled within 30 days, and occur within a reasonable time, of the employer receiving one of the types of documentation listed in paragraph (k)(7)(i)(A) or (B). Second, OSHA is adding a provision in paragraph (k)(7)(ii), which clarifies that, as part of the evaluation at the CBD diagnostic center, the employer must ensure that the employee is offered any tests deemed appropriate by the examining physician at the CBD diagnostic center, such as pulmonary function testing (as outlined by the American Thoracic Society criteria), bronchoalveolar lavage (BAL), and transbronchial biopsy. The new provision also states that if any of the tests deemed appropriate by the examining physician are not available at the CBD diagnostic center, they may be performed at another location that is mutually agreed upon by the employer and the employee. Third, OSHA is making a number of minor, non-substantive revisions to the numbering and cross-references in paragraph (k)(7) to account for the addition of new paragraph (k)(7)(ii). Specifically, OSHA is renumbering current paragraphs (k)(7)(ii), (iii), (iv), and (v) as (k)(7)(iii), (iv), (v), and (vi), respectively, and is adding a reference to new paragraph (k)(7)(ii) to the newly renumbered paragraph (k)(7)(vi). These proposed changes are consistent with changes the agency proposed to paragraph (k)(7)(i) of the beryllium standard for general industry in December 2018.



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Each of these final revisions differ in some way from the proposed amendments based on stakeholder feedback. With regard to the first change concerning the timing of the exam, the previous standard required employers to provide the examination within 30 days of the employer receiving one of the types of documentation listed in paragraph (k)(7)(i)(A) or (B). The purpose of the 30-day requirement was to ensure that employees receive the examination in a timely manner. However, since the publication of the 2017 final rule, stakeholders have raised concerns that it is not always possible to schedule and complete the examination and any required tests within 30 days (84 FR at 53919).

To address this concern, OSHA proposed that the employer provide an initial consultation with the CBD diagnostic center, which could occur via telephone or virtual conferencing methods, rather than the full evaluation, within 30 days of the employer receiving one of the types of documentation listed in paragraph (k)(7)(i)(A) or (B). OSHA explained that providing a consultation before the full examination at the CBD diagnostic center would demonstrate that the employer made an effort to begin the process for a medical examination. OSHA also noted that the proposed change would also (1) allow the employee to consult with a physician to discuss concerns and ask questions while waiting for a medical examination, and (2) allow the physician to explain the types of tests that are recommended based on medical findings about the employee and explain the risks and benefits of undergoing such testing. In both the 2019 NPRM for construction and shipyards (84 FR at 53919) and the 2018 NPRM for general industry (83 FR at 63758), OSHA requested comments on the appropriateness of providing the initial consultation within 30 days and on the sufficiency of a consultation via telephone or virtual conference.

OSHA received several comments on the proposed changes from NJH, AFL-CIO, and Materion. NJH commented that an examination at the CBD diagnostic center should not be required to occur within 30 days of the referral because openings at clinics may not be available within a 30-day period (Document ID 2211, p. 12). NJH further noted that “[i]t is common practice in most diagnostic centers to schedule specialty exams within a 3-month window due to the need to coordinate worker time away from work and home, physician visits, pulmonary function testing, chest imaging, bronchoscopy and other testing for one clinical evaluation visit” (Document ID 2211, p. 12). At the public hearing, NJH testified that an evaluation can take up to three days when an employee undergoes procedures such as bronchoscopy because the employee has to be cleared for testing, undergo testing on the following day, and then spend the night locally to ensure there are no adverse effects before discharge (Document ID 2222, Tr. 54).<sup>4</sup>

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<sup>4</sup> In response to the 2018 NPRM for general industry, OSHA received similar comments on the proposed timeline for the evaluation at the CBD Diagnostic Center from ATS, NJH, and Materion (Document ID OSHA-2018-0003-0021, p. 3; OSHA-2018-0003-0022, pp. 5-6; OSHA-2018-0003-0038, p. 34). DOD recommended that the evaluation at the CBD Diagnostic center be scheduled within seven days (Document ID OSHA-2018-0003-0029, p. 2), but OSHA found that this would not give employees enough time to consider obligations and have discussions

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NJH also opposed the proposed requirement for a consultation that can be performed via telephone or virtual conferencing within 30 days of the employer receiving documentation recommending a referral. NJH commented: “A video or phone consultation adds cost and logistics to scheduling and is not necessary as the PLHCP who sees the employee for screening provides information on the clinical evaluation. HIPAA privacy issues of a phone or video conference also exist. A full clinical evaluation including review of both the available medical and exposure data and hands-on medical assessment are essential to providing the best, most efficient care—from a time and financial perspective.” (Document ID 2211, pp. 12-13.)

Lisa Barker from NJH further testified that workers who are sensitized but feel well may decide to forgo additional testing following a video consultation (Document ID 2222, Tr. 54-55). These workers would miss the opportunity to determine if they have the disease, and if so, receive treatments to slow progression upon initial confirmation of sensitization (Document ID 2222, Tr. 54-55). NJH also expressed concerns related to the expertise and availability of a PLHCP who might perform the consultation and about workers who may not have a health care provider to facilitate a phone or video consultation (Document ID 2243, p. 6)

NJH recommended that the employer be required to schedule the appointment within 30 days, but that the actual evaluation can take place beyond 30 days of the confirmed abnormal result (Document ID 2211, p. 13). AFL-CIO agreed with NJH on the proposed timeline for an evaluation at a CBD diagnostic center (Document ID 2210, p. 9). Materion agreed with NJH that an evaluation at the CBD diagnostic center should be scheduled within 30 days after sensitization is confirmed and documented; however, it noted that employees can withhold test results from employers (Document ID 2237, p. 5).<sup>5</sup>

After considering these comments, OSHA is convinced that scheduling a phone or virtual consultation with the CDB diagnostic center is an unnecessary step that adds logistical complications and costs. OSHA finds that the scheduling approach suggested by NJH addresses both the logistical difficulties and the timing concerns with respect to the requirements in the current standard. Moreover, OSHA finds that employees will have enough information (through trainings under paragraph (m) and discussions with the PLHCP) to allow them to decide whether to choose to be evaluated at the CBD diagnostic center without the need for an additional

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with family members. The agency also found the 30-day trigger to be administratively convenient because it is consistent with other triggers in the beryllium standard (85 FR 42621).

<sup>5</sup> In response to the NPRM for general industry, Materion found OSHA’s proposed change for a consultation with a CBD diagnostic center more workable than an evaluation at a CBD Diagnostic Center within 30 days, but similar to the comments provided for this construction and shipyards NPRM, ATS and NJH disagreed with the requirement for a consultation (Document ID OSHA-2018-0003-0038, p. 34; OSHA-2018-0003-0021, p. 3; OSHA-2018-0003-0022, pp. 5-6).

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consultation.<sup>6</sup> OSHA is therefore amending paragraph (k)(7)(i) to require that the employer schedule an examination at a CBD diagnostic center within 30 days of receiving one of the types of documentation listed in paragraph (k)(7)(i)(A) or (B). In response to Materion’s concern that an employee can choose to withhold the recommendation for an evaluation at a CBD diagnostic center from the employer, the paragraph makes clear that the appointment must be scheduled within 30 days of the “employer’s receipt” of the appropriate documentation. That means that the employer’s obligations do not commence until the employer receives the documentation for an evaluation at a CBD diagnostic center following the employee’s authorization.

To achieve the intent of the 2017 final rule and the 2019 NPRM that evaluation at a CBD diagnostic center occurs in a timely manner, OSHA is adding that the evaluation must occur within a reasonable time. Requiring that the evaluation occur within a reasonable time ensures that the evaluation be done as soon as practicable based upon availability of openings at the CBD diagnostic center and the employee’s preferences. This revision better addresses OSHA’s original intent that the employee be examined within a timely period, while providing employees and employers with maximum flexibility and convenience.

The second change that OSHA proposed to paragraph (k)(7)(i) relates to the contents of the examination at the CBD diagnostic center. As discussed in more detail above, the former definition of *CBD diagnostic center*—which stated that the evaluation at the diagnostic center “must include” a pulmonary function test as outlined by American Thoracic Society criteria, bronchoalveolar lavage (BAL), and transbronchial biopsy—could have been misinterpreted to mean that the examining physician was required to perform each of these tests during every clinical evaluation at a CBD diagnostic center. That was not OSHA’s intent. Rather, the agency merely intended to ensure that any CBD diagnostic center has the capacity to perform any of these tests, which are commonly needed to diagnose CBD. Therefore, OSHA proposed revising the definition to clarify that the CBD diagnostic center must simply have the ability to perform each of these tests when deemed appropriate.

To account for that proposed change to the definition of *CBD diagnostic center* and to ensure that the employer provides those tests if deemed appropriate by the examining physician at the CBD diagnostic center, OSHA proposed expanding paragraph (k)(7)(i) to require that the employer provide, at no cost to the employee and within a reasonable time after consultation with the CBD diagnostic center, any of the three tests mentioned above, if deemed appropriate by the examining physician at the CBD diagnostic center (84 FR at 53919). OSHA explained that the revision would also clarify the agency’s original intent that, instead of requiring all three

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<sup>6</sup> Under paragraph (k)(6)(i)(D), the employer is to ensure that the PLHCP explains the results of the medical examination to the employee, including results of tests conducted and medical conditions related to airborne beryllium exposure that require further evaluation or treatment.

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tests to be conducted after referral to a CBD diagnostic center, the standard would allow the examining physician at the CBD diagnostic center the discretion to select one or more of those tests as appropriate (84 FR at 53919).

OSHA received comments addressing the types of tests that should be conducted for the evaluation of CBD. NJH commented that at a minimum, a clinical evaluation for CBD should include “full pulmonary function testing (including lung volumes, spirometry and diffusion capacity for carbon monoxide) and chest imaging” (Document ID 2211, p. 4); that the examination should include “bronchoalveolar lavage and biopsy, whether or not a person shows signs or symptoms of frank, chronic beryllium disease” (Document ID 2222, Tr. 56); and that “the services should be available at the center” (Document ID 2211, p. 12). NJH recommended that OSHA follow the American Thoracic Society guidelines recommending that beryllium sensitized individuals undergo “[Pulmonary function testing] and chest imaging (either a chest radiograph or chest CT [computerized tomography] scan,” with consideration of bronchoscopy, depending on “absence of contraindications, evidence of pulmonary function abnormalities, evidence of abnormalities on chest imaging, and personal preference of the patient” (Document ID 2211, pp. 2, 4, 12). Similarly, NABTU submitted a description of the Building Trades National Medical Screening Program recommending that sensitized persons without clinical signs of CBD undergo pulmonary function testing and a high resolution chest CT, with lavage or biopsy only if the pulmonary function tests or CT scans suggest CBD or if the patient prefers to undergo lavage or biopsy (Document ID 2202, Attachment 4, PDF page 97). Lisa Barker from NJH testified that if OSHA does not specify such tests, medical directors may not order some tests because of a lack of education or information or because the worker feels well and is not interested in an evaluation (Document ID 2222, Tr. 66-68).<sup>7</sup>

After reviewing these comments and the remainder of the record on this issue, OSHA remains convinced that pulmonary function testing, BAL, and transbronchial biopsies are important diagnostic tools but finds that the examining physician at the CBD diagnostic center is in the best position to determine which diagnostic tests are appropriate for particular workers. The agency believes that the modified definition of the term *CBD diagnostic center*, which requires the centers to have the capacity to perform these three tests, will serve to ensure that healthcare providers at the centers are aware of the importance of and are able to perform these tests.

However, OSHA understands that the proposed provision could be misinterpreted to mean that the employer does not have to make available additional tests that the examining physician deems appropriate for reasons such as diagnosing or determining the severity of CBD. That was never the agency’s intent. In fact, OSHA noted the potential for other tests, as deemed necessary

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<sup>7</sup> Similar comments regarding the need for certain tests to diagnose CBD were submitted in response to the general industry NPRM by ATS, NJH, and AOEC (Document ID OSHA-2018-0003-0021, p. 3; OSHA-2018-0003-0022, p. 3; OSHA-2018-0003-0028, p. 2).

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by the CBD diagnostic center physician, at several points in the preamble to the 2017 final rule (see, e.g., 82 FR at 2709, 2714). Similar to paragraph (k)(3)(ii)(G), which provides that the employer must ensure that the employee is offered as part of the initial or periodic medical examination any test deemed appropriate by the PLHCP, OSHA intends for the employer to ensure the employee is offered any tests deemed appropriate by the examining physician at the CBD diagnostic center, including tests for diagnosing CBD, for determining its severity, and for monitoring progression of CBD following diagnosis. Allowing the physician at the CBD diagnostic center to order additional tests that are deemed appropriate is also consistent with most OSHA substance-specific standards, such as respirable crystalline silica (29 CFR 1910.1053) and chromium (VI) (29 CFR 1910.1026).

To clarify the agency's intent that the physician at the CBD diagnostic center has discretion to order appropriate tests, and to further respond to stakeholder concerns regarding the necessity of pulmonary function testing, BAL, and transbronchial biopsies, OSHA is adding a new subparagraph (k)(7)(ii), which focuses on the content of the examination. This new provision requires that the evaluation include any tests deemed appropriate by the examining physician at the CBD diagnostic center, such as pulmonary function testing (as outlined by the ATS criteria), BAL, and transbronchial biopsy. OSHA intends for the new provision to make clear that the employer must provide additional tests, such as those recommended by NJH, ATS guidelines, and by Building Trades National Medical Screening Program, at no cost to the employee, if those tests are deemed necessary by the examining physician. The agency also believes that explicitly naming the three examples of tests that may be appropriate will further emphasize their importance to examining physicians at the CBD diagnostic centers.

Consistent with OSHA's original intent, those tests are only required to be offered if deemed appropriate by the physician at the CBD diagnostic center. For example, if lung volume and diffusion tests were performed according to ATS criteria as part of the periodic medical examination under paragraph (k)(3), and the physician at the CBD diagnostic center found them to be of acceptable quality, those tests would not have to be repeated as part of a CBD evaluation. The addition of paragraph (k)(7)(ii) clarifies that the employer must, however, offer any test that the PLHCP deems appropriate. Consistent with previous health standards and the meaning of the identical phrase in paragraph (k)(3)(ii)(G), OSHA intends the phrase "deemed appropriate" to mean that additional tests requested by the physician must be both related to beryllium exposure and medically necessary, based on the findings of the medical examination (see 82 FR at 2709; Occupational Exposure to Respirable Crystalline Silica, 81 FR 16286, 16514 (March 25, 2016)). Because of the technical expertise that a facility must have in order to meet the definition of a CBD diagnostic center, OSHA is also confident that physicians at those facilities will have the expertise to identify additional tests that may be useful to diagnose or assess the severity of CBD.

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New paragraph (k)(7)(ii) also addresses the possibility that a test that is deemed appropriate by the examining physician at the CBD diagnostic center might not be available at that center. Although OSHA's intention has been to require any testing to be provided by the same CBD diagnostic center unless the employer and employee agree to a different CBD diagnostic center (see 83 FR at 63758), there may be cases where the CBD diagnostic center does not perform a type of test deemed appropriate by the examining physician. In such a case, OSHA wants to ensure that the employee can receive the appropriate test. Therefore, OSHA is also including in paragraph (k)(7)(ii) a requirement that if any of those tests deemed appropriate by the physician are not available at the CBD diagnostic center, they may be performed at another location that is mutually agreed upon by the employer and the employee. This other location does not need to be a CBD diagnostic center as long as it is able to perform tests according to requirements under paragraph (k).

In summary, final paragraph (k)(7)(i) requires that the employer provide an evaluation at no cost to the employee at a CBD diagnostic center that is mutually agreed to by the employer and the employee. The evaluation must be scheduled within 30 days and must occur within a reasonable time of the employer receiving one of the types of documentation listed in paragraph (k)(7)(i)(A) or (B). Final paragraph (k)(7)(ii) requires that the evaluation include any tests deemed appropriate by the examining physician at the CBD diagnostic center, such as pulmonary function testing (as outlined by the ATS criteria), BAL, and transbronchial biopsy. Paragraph (k)(7)(ii) further requires that if any of the tests deemed appropriate by the examining physician are not available at the CBD diagnostic center, they may be performed at another location that is agreed upon by the employer and employee and at no cost to the employee.<sup>8</sup>

**§ 1915.1024(m)**

**Communication of hazards.**

Final paragraph (m)(1)(i) requires chemical manufacturers, importers, distributors, and employers must comply with all requirements of the HCS (29 CFR 1910.1200) for beryllium.

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<sup>8</sup> OSHA is also making a number of minor, non-substantive revisions to the numbering and cross-references in paragraph (k)(7) to account for the addition of new paragraph (k)(7)(ii). Specifically, OSHA is renumbering current paragraphs (k)(7)(ii)-(v) as (k)(7)(iii), (iv), (v), and (vi), and is adding a reference to new paragraph (k)(7)(ii) to the newly renumbered paragraph (k)(7)(vi).

The addition of paragraph (k)(7)(ii) and consequential renumbering of current paragraphs (k)(7)(ii)-(v) also affects two other cross-references in the standard. Paragraphs (l)(1)(i)(B) and (l)(1)(ii) reference paragraphs (k)(7)(ii) and (k)(7)(iii), respectively. In this final rule, OSHA is updating those references to reflect the renumbering in paragraph (k)(7).

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Final paragraph (m)(1)(ii) requires employers to include beryllium in the hazard communication program established to comply with the HCS. Employers must ensure that each employee has access to labels on containers of beryllium and to safety data sheets, and is trained in accordance with the requirements of the HCS (29 CFR 1910.1200) and paragraph (m)(3) of this standard.

The agency did not receive any comments on this provision and therefore, these provisions will go forward to the final as proposed.

**Warning Signs.**

Final paragraph (m)(2)(i) requires the employer to provide and display warning signs at each approach to a regulated area so that each employee is able to read and understand the signs and take necessary protective steps before entering the area.

Final paragraph (m)(2)(ii) requires two sign specifications (A) The employer must ensure that the warning signs required by paragraph (m)(2)(i) of this standard are legible and readily visible and (B) The employer must ensure each warning sign required by paragraph (m)(2)(i) of this standard bears the following legend:

**DANGER  
REGULATED AREA  
BERYLLIUM  
MAY CAUSE CANCER  
CAUSES DAMAGE TO LUNGS  
AUTHORIZED PERSONNEL ONLY  
WEAR RESPIRATORY PROTECTION AND  
PERSONAL PROTECTIVE CLOTHING  
AND EQUIPMENT IN THIS AREA**

The agency did not receive any comments on this provision and therefore, these provisions will go forward to the final as proposed

**Warning labels – REMOVED**

Paragraph (m)(3) referring to warning labels, OSHA is removing this requirement from the standard. Consistent with the HCS (29 CFR 1910.1200), the employer is required to label each bag and container of clothing, equipment, and materials contaminated with beryllium, and must, at a minimum, include the following on the label:

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**DANGER  
CONTAINS BERYLLIUM  
MAY CAUSE CANCER  
CAUSES DAMAGE TO LUNGS  
AVOID CREATING DUST  
DO NOT GET ON SKIN**

The agency did not receive any comments on this provision and therefore, these provisions will go forward to the final as proposed.

*Paragraph (m) Communication of Hazards*

Paragraph (m) of the beryllium standards for construction and shipyards sets forth the employer's obligations to comply with OSHA's Hazard Communication Standard (HCS) (29 CFR 1910.1200) relative to beryllium, and to take additional steps to warn and train employees about the hazards of beryllium. Under the HCS, beryllium manufacturers and importers are required to evaluate the hazards of beryllium and prepare labels and safety data sheets (SDSs) and provide both documents to downstream users. Employers whose employees are exposed to beryllium in their workplace must develop a hazard communication program and ensure that employees are trained on the hazards of beryllium. These employers must also ensure that all containers of beryllium are labeled and that employees are provided access to the SDSs. In addition to the requirements under the HCS, paragraph (m)(1)(ii) of the beryllium standards specify certain criteria that must be addressed in classifying the hazards of beryllium. In the standard for shipyards, paragraph (m)(2) requires employers to provide and display warning signs with specified wording at each approach to a regulated area. Paragraph (m)(3) of the shipyards standard, and paragraph (m)(2) of the construction standard, details employers' duties to provide information and training to employees.

In the 2019 NPRM, OSHA proposed three changes to paragraph (m) of the construction and shipyard standards to align with proposed changes to other provisions in these standards. First, OSHA proposed to remove the paragraph (m) provisions that require specific language for warning labels applied to bags and containers of clothing, equipment, and materials contaminated with beryllium (paragraph (m)(2) in construction and paragraph (m)(3) in shipyards).<sup>9</sup> This is consistent with OSHA's proposal to remove the corresponding requirements to provide such warning labels from paragraphs (h)(2)(v) and (j)(3). As explained in the 2019 NPRM, and earlier in this Summary and Explanation with regard to paragraphs (h)(2)(v) and (j)(3), OSHA proposed to remove the requirements in both standards to label PPE removed from

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<sup>9</sup> As a result, OSHA proposed to renumber paragraph (m)(4) in the shipyards standard (29 CFR 1915.1024) as (m)(3), renumber paragraph (m)(3) in the construction standard (29 CFR 1926.1124) as (m)(2), and revise the references in paragraph (m)(1)(ii) of both standards accordingly.



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the workplace for laundering, cleaning, maintenance, or disposal and to label beryllium-containing material destined for disposal in accordance with the labeling requirements in paragraph (m) of the 2017 final rule. The agency proposed these changes to reflect its intent that provisions aimed at protecting workers from the effects of dermal contact need not apply to materials containing only trace amounts of beryllium—like all beryllium-containing material used in abrasive blasting in the construction and shipyards industries—in the absence of significant airborne exposure. OSHA applied the same rationale to the limited welding operations in shipyards, where the agency had evidence that at most only trace amounts of particulate beryllium will form (84 FR at 53906); see also the Summary and Explanation for paragraphs (h) and (j)). Accordingly, the agency preliminarily determined that labels are not necessary to protect employees in the context of trace beryllium in construction and shipyards, and, therefore, the provisions of paragraph (m) mandating specific language for such labels are likewise unnecessary.

National Jewish Health (NJH) objected to OSHA’s proposal, stating that all PPE and waste that is contaminated with or contains beryllium should be labeled as such. “It is not always the case that the contamination contains only trace amounts of beryllium. . . . It cannot be overlooked that workers in the construction industries may be involved in demolition and disassembly of beryllium contaminated buildings, machines and materials” (Document ID 2211, p. 13). NJH further noted that DOE beryllium training materials state, “Laundry workers and personnel who are responsible for the cleaning and maintenance of respirators have a high potential for being exposed to airborne beryllium dust” (Document ID 2211, p. 13; COMMUNICATING HEALTH RISKS WORKING SAFELY WITH BERYLLIUM: Training Reference for Beryllium Workers and Managers/Supervisors Facilitator Manual, Beryllium Health Risk Communication Task Force, DOE, April 2002, [https://www.energy.gov/sites/prod/files/2014/09/f18/communicating\\_0.pdf](https://www.energy.gov/sites/prod/files/2014/09/f18/communicating_0.pdf)). AFL-CIO similarly expressed concern that without the labeling requirements of the 2017 standard, downstream recipients of contaminated PPE and scrap materials generated during renovation or demolition of beryllium manufacturing sites would not be informed of the potential for airborne beryllium exposure for workers handling these items (Document ID 2210, pp. 8-9; 2222, pp. 118-19).

AFL-CIO also raised concerns about the removal of labeling requirements for construction materials that are contaminated with beryllium that are dumped in landfills (Document ID 2244, pp. 3-4). AFL-CIO indicated that landfill workers are at risk of exposure to airborne dust that may be created by their work activities. Without label information on beryllium-containing waste materials sent from construction activities, they argue, landfill workers may not don appropriate PPE to protect themselves from beryllium exposure while performing their work duties. In their comments, NABTU also included landfill employees as a group of workers with potential beryllium exposure from construction activities (Document ID 2202, p. 4).

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OSHA has no evidence that laundry or landfill workers who handle PPE or materials designated for disposal from construction sites or shipyards would engage in tasks that generate airborne exposure of concern. First, the agency believes that NJH's reliance on DOE's 2002 instruction manual is misplaced. The manual is directed specifically to DOE facilities; facilities that processed materials containing beryllium in more than trace quantities. In fact, for purposes of DOE's own beryllium regulations, the agency defines *beryllium* as any insoluble beryllium compound or alloy *containing 0.1 percent beryllium or greater* that may be released as an airborne particulate (10 CFR 850.3). The DOE manual is therefore not relevant to the construction and shipyards context.

Furthermore, evidence in the record demonstrates that, with respect to materials containing only trace quantities of beryllium, airborne dust concentrations must be very high for exposures to approach even the action level (AL). For dust containing less than 4 ppm beryllium, airborne dust concentrations would have to exceed 25 mg/m<sup>3</sup> to reach the beryllium AL of 0.1 µg/m<sup>3</sup>. This level of dust would significantly exceed the OSHA PEL for nuisance dust, or Particulate Not Otherwise Classified (PNOC), of 15mg/m<sup>3</sup> (see Document ID 2235, p. 2; FEA for the 2017 Final Rule, Chapter IV, p. IV-640). OSHA has no reason to suspect that residual dust on PPE and other materials from construction and shipyards sites is likely to create this level of airborne dust from laundry or landfill operations. Therefore, the agency has determined that recipients of PPE or waste from these worksites are not expected to be exposed at airborne levels of concern from re-entrainment of trace beryllium from these materials. And, as explained previously, provisions aimed at protecting workers from the effects of dermal contact need not apply to materials containing only trace amounts of beryllium unless those workers are also exposed to significant airborne beryllium.

OSHA has retained certain provisions that protect construction and shipyard employees whose work activities involve exposures exceeding the PEL, such as abrasive blasters, from further airborne exposure via re-entrainment of beryllium-containing dust from PPE or other surfaces in the workplace. These include requiring the employer to ensure that each employee removes personal protective clothing and equipment required by this standard at the end of the work shift or at the completion of all tasks involving beryllium, whichever comes first (paragraph (h)(2)(i)); requiring the employer to ensure that personal protective clothing and equipment required by this standard is not removed in a manner that disperses beryllium into the air (paragraph (h)(2)(ii)); requiring the employer to ensure that all reusable personal protective clothing and equipment required by this standard is cleaned, laundered, repaired, and replaced as needed to maintain its effectiveness (paragraph (h)(3)(i)); requiring the employer to ensure that beryllium is not removed from personal protective clothing and equipment required by this standard by blowing, shaking or any other means that disperses beryllium into the air (paragraph (h)(3)(ii)); and

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requiring the employer to include procedures for removing, cleaning, and maintaining personal protective clothing and equipment in accordance with paragraph (h) of this standard in their written exposure control plan(s) (paragraph (f)(i)(F)).

OSHA proposed to remove those provisions which would apply only to employees whose work activities do not involve airborne exposure above the PEL, for whom potential exposure to re-entrained beryllium from materials containing trace amounts is not a significant concern. As OSHA explained in the Summary and Explanation for paragraphs (h)(2)(v) and (j)(3), this approach is consistent with the general industry standard as modified by the DFR, which does not require labeling for materials that contain only trace quantities of beryllium and are designated for disposal, recycling, or reuse.

In the case where construction workers are removing materials from a beryllium manufacturing site covered by the general industry standard, beryllium-contaminated materials destined for disposal must be cleaned and labeled by the host employer pursuant to paragraph (j)(3) of the beryllium standard for general industry. Indeed, even without the specific requirement in the beryllium standard, OSHA has had a long-standing interpretation that the HCS requires upstream suppliers to pass on any information they have regarding known contaminants of scrap transferred to downstream recipients (see Letter to Edward L. Merrigan, from John Miles, Jr., Directorate of Field Operations (May 23, 1986), available at <https://www.osha.gov/laws-regs/standardinterpretations/1986-05-23>).

Finally, AFL-CIO quoted a comment previously submitted by Washington Group International (WGI) (see Document ID 0324) which includes the proposition that “it is crucial that government/industrial buildings be screened for beryllium process operations” and appears to suggest that, similar to DOE facilities, all facilities should do air monitoring and wipe sampling and pass this information on to future facility users (Document ID 2244, p. 4). It is unclear whether AFL-CIO intended their presentation of WGI’s quote to suggest that all government and industrial buildings should air-monitor and sample surfaces for the presence of beryllium. OSHA believes that this approach may be appropriate for DOE, which has a limited number of sites that are known to have processed beryllium. However, requiring all government and industrial sites to do air monitoring and wipe sampling would be of little value since the likelihood of finding beryllium would be minuscule. Beryllium, unlike lead and asbestos, is not found in common building materials or coatings (see Document ID 2237, pp. 2-3). Therefore unless a manufacturing site has evidence that beryllium is present through the review of SDSs, the likelihood that workers will encounter materials contaminated with beryllium is low. And, as noted above, where construction workers are removing materials from a beryllium manufacturing site covered by the general industry standard, beryllium-contaminated materials

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destined for disposal must be cleaned and labeled by the host employer pursuant to paragraph (j) (3) of the beryllium standard for general industry.

Accordingly, OSHA has determined that the previous labeling provisions in paragraph (m) (paragraph (m)(2) in construction and (m)(3) in shipyards) are not necessary in the construction and shipyards contexts and is finalizing the removal of these provisions as proposed.

OSHA next proposed to revise the provisions of paragraph (m) for employee information and training to remove requirements related to emergency procedures ((m)(3)(ii)(D) in construction and (m)(4)(ii)(D) in shipyards)<sup>10</sup> and personal hygiene practices ((m)(3)(ii)(E) in construction and (m)(4)(ii)(E) in shipyards). These proposed revisions correspond with OSHA's proposed removal of emergency procedures and personal hygiene practices from the construction and shipyard standards. As discussed in the 2019 NPRM and earlier in this Summary and Explanation, OSHA proposed to remove references to emergencies in the shipyards and construction standards because OSHA expects that any emergency in these industries (such as a release resulting from a failure of the blasting control equipment, a spill of the abrasive blasting media, or the failure of the ventilation system for welding operations in shipyards) would occur only during the performance of routine tasks already associated with the airborne release of beryllium; i.e., during the abrasive blasting or welding process (84 FR at 53917; see also the Summary and Explanation for paragraph (g)). As such, any uncontrolled release of beryllium in these operations would not create exposures that differ from the normal conditions of work and workers will already be protected by the other provisions of paragraph (g). OSHA also proposed to remove the hygiene provisions of the construction and shipyard standards due to overlap with existing OSHA standards, the limited operations where beryllium exposure may occur in construction and shipyards, and the trace quantities of beryllium present in these operations (84 FR at 53920; see also the Summary and Explanation for paragraph (i)). As with the previously discussed labeling requirement, OSHA reasoned that the removal of these provisions would render the correlating training requirements unnecessary.

In response to OSHA's proposal to remove the hygiene provisions and related training requirements from both standards in favor of OSHA's general sanitation standards, NJH stated that "beryllium exposure poses a unique hazard for workers." As such, NJH argued that employees should continue to be trained on beryllium-specific hygiene practices (Document ID 2211, p. 13). AFL-CIO objected to the removal of requirements on training for both emergency and hygiene provisions, though they did not provide any additional explanation of their opposition (Document ID 2210, p. 10). As stated above, OSHA proposed to remove the training

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<sup>10</sup> OSHA proposed to renumber the provisions of paragraph (m)(3)(ii) in construction and (m)(4)(ii) in shipyards to reflect the removal of this paragraph.

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requirements related to emergencies and hygiene areas and practices from paragraph (m) because the agency proposed to remove the underlying requirements from the regulatory text.

With respect to emergencies, OSHA has determined that the operations with known beryllium exposure in the construction and shipyards sectors do not have emergencies in which exposures differ from the normal conditions of work. As such, workers in these operations are already protected by other provisions of the beryllium standards and emergency-specific provisions are not necessary (see the Summary and Explanation for paragraph (g)). OSHA has also determined that partial overlap between the hygiene requirements of the beryllium standards for construction and shipyards and those of existing OSHA standards, combined with the trace quantities of beryllium present in these industries, make beryllium-specific hygiene requirements unnecessary in the construction and shipyards standards (see the Summary and Explanation for paragraph (i)). OSHA is finalizing the regulatory text as proposed for these provisions. In light of OSHA's decision to remove these requirements, OSHA finds that it is unnecessary to maintain the beryllium-specific training requirements for these provisions. Accordingly, OSHA is finalizing the removal of training provisions on emergency procedures ((m)(3)(ii)(D) in construction and (m)(4)(ii)(D) in shipyards) and hygiene areas and practices ((m)(3)(ii)(E) in construction and (m)(4)(ii)(E) in shipyards), as proposed.

OSHA also proposed to revise paragraphs (m)(3)(i) in construction and (m)(4)(i) in shipyards—renumbered in the final standards as (m)(2)(i) and (m)(3)(i), respectively—to remove dermal contact as a trigger for training. The 2017 final standards for general industry, construction, and shipyards originally provided for limited training for each employee who has, or can reasonably be expected to have, airborne exposure to or dermal contact with beryllium. Specifically, paragraph (m)(3)(i)(A) in construction and (m)(4)(i)(A) in shipyards provided for training for each such employee in accordance with the requirements of the HCS (29 CFR 1910.1200(h)), including specific information on beryllium as well as any other hazards addressed in the workplace hazard communication program.<sup>11</sup> However, in the 2017 final rule, OSHA recognized that beryllium exposure in construction and shipyard industries is narrowly limited to trace quantities contained in certain abrasive blasting media and to exposure during some welding operations in shipyards (82 FR at 2690; see also the 2017 FEA, Document ID 2042, p. III-66). OSHA clarified in the 2018 DFR for general industry that it did not intend for provisions aimed at protecting workers from the effects of dermal contact to apply in the case of materials containing only trace amounts of beryllium (83 FR at 19938). Therefore, OSHA preliminarily determined in the 2019 NPRM for construction and shipyards that training in accordance with the HCS should be provided to each employee who has, or can reasonably be expected to have, airborne exposure to beryllium, without regard to dermal contact. OSHA noted that both

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<sup>11</sup> Paragraph (m)(3)(ii) in the 2017 construction standard and paragraph (m)(4)(ii) in the 2017 shipyard standard required the employer to ensure that each employee who is or can reasonably be expected to be exposed to airborne beryllium can demonstrate knowledge of all nine enumerated categories of information.

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standards already exempt materials containing less than 0.1 percent beryllium by weight where the employer has objective data demonstrating that employee exposure to beryllium will remain below the action level as an 8-hour TWA under any foreseeable conditions (See 29 CFR 1926.1124(a)(3) (construction) and 29 CFR 1915(a)(3) (shipyards)). OSHA reasoned that the HCS training requirements in proposed paragraph (m)(2) for construction and proposed paragraph (m)(3) for shipyards would continue to apply to all workers that are covered under these standards, regardless of the potential for dermal contact (84 FR at 53920-21). OSHA did not receive any comments on the removal of dermal contact as a trigger for training in accordance with the HCS and is therefore finalizing it as proposed.

OSHA also proposed to revise renumbered paragraphs (m)(2)(ii)(A) in the construction standard and (m)(3)(ii)(A) in the shipyards standard to remove references to “airborne exposure” and “dermal contact” and instead to require training on the health hazards associated with “exposure to beryllium.” OSHA likewise proposed to revise renumbered paragraphs (m)(2)(ii)(D) in the construction standard and (m)(3)(ii)(D) in the shipyards standard to require training on measures employees can take to protect themselves from “exposure to beryllium.” These revisions, OSHA explained, would maintain OSHA’s intent that training must cover both airborne and skin exposure while both resolving an inconsistency between the shipyards and construction standards with respect to references to dermal contact and simplifying the provisions (84 FR at 53921).

AFL-CIO commented that “OSHA should not alter the requirement for employers to train workers on the health hazards associated with airborne and dermal exposure to beryllium.” According to the AFL-CIO, it is important for a worker to be provided with all potential exposure scenarios, including airborne and dermal exposures, so they can understand the full risk of exposure (Document ID 2210, p. 10). As the agency emphasized in the 2019 NPRM, the phrase “exposure to beryllium” is intended to encompass both airborne and skin exposure to beryllium (84 FR at 53921). Thus, the proposed language maintains the requirement to train workers on both airborne and dermal exposures. By resolving an inconsistency in the previous standards regarding dermal contact, OSHA intends the proposed change to ensure that employers include dermal contact when training workers on the specific hazards of beryllium.

In previously submitted comments, NABTU has expressed concern that they do not see a high level of awareness about hazards related to beryllium among workers in the construction industry apart from abrasive blasters and contract workers for DOE, citing a survey the union performed with trainers in the construction industry (Document ID 2202, Attachment 1, p. 8). OSHA believes that a few factors could explain this lack of awareness outside DOE and abrasive blasting. First, as explained earlier in this preamble, abrasive blasting is the primary source of exposure in the construction industry and even the agency has been unable to obtain reliable data

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about any additional sources of exposure in the construction industry. This suggests that exposures in other contexts, if they occur, are rare (see the summary and explanation for paragraph (f)). Second, OSHA notes that while DOE has had a specific beryllium standard in place since 1999 (10 CFR Part 850) due to the particular risks of exposure in its facilities, OSHA's comprehensive standards were only promulgated in 2017.

OSHA included hazard communication and training provisions in these standards specifically to ensure awareness in those industries covered by the standards. As employers implement the beryllium standards for general industry, construction, and shipyards, the agency expects this lack of awareness to dissipate. Furthermore, paragraph (e)(2) of the HCS (29 CFR 1910.1200) requires employers who produce, use, or store hazardous chemicals at a workplace to ensure that workers have access to safety data sheets and to inform workers of any precautionary measures needed during "normal operation conditions or foreseeable emergencies." These requirements of the HCS further serve to raise awareness among potentially exposed workers.

OSHA has considered the comments in the record and, for the reasons explained above, is finalizing the changes to paragraph (m) as proposed.

**§ 1915.1024(n)**

**Recordkeeping.**

**Air Monitoring Data.**

Final paragraph (n)(1)(i) requires the employer to make and maintain a record of all exposure measurements taken to assess airborne exposure as prescribed in paragraph (d) of this standard.

In final paragraph (n)(1)(ii) requires this record to include at least the following information: (A) The date of measurement for each sample taken; (B) The task that is being monitored; (C) The sampling and analytical methods used and evidence of their accuracy; (D) The number, duration, and results of samples taken; (E) The type of personal protective clothing and equipment, including respirators, worn by monitored employees at the time of monitoring; and (F) The name and job classification of each employee represented by the monitoring, indicating which employees were actually monitored.

Final paragraph (n)(1)(iii) requires the employer to ensure that exposure records are maintained and made available in accordance with the Records Access standard (29 CFR 1910.1020).

**Medical Surveillance.**

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Final paragraph (n)(3)(i) requires the employer to make and maintain a record for each employee covered by medical surveillance under paragraph (k) of this standard.

Final paragraph (n)(3)(ii) The record must include the following information about the employee: (A) Name and job classification;(B) A copy of all licensed physicians' written medical opinions for each employee; and (C) A copy of the information provided to the PLHCP as required by paragraph (k) (4) of this standard.

Final paragraph (n)(3)(iii) requires the employer to ensure that medical records are maintained and made available in accordance with the Records Access standard (29 CFR 1910.1020).

**Training.**

Final paragraph (n)(4) (i) At the completion of any training required by this standard, the employer must prepare a record that indicates the name and job classification of each employee trained, the date the training was completed, and the topic of the training.

Final paragraph (n)(4)(ii) This record must be maintained for three years after the completion of training.

*Paragraph (n) Recordkeeping*

Paragraph (n) of the beryllium standards for construction and shipyards requires employers to make and maintain records of air monitoring data, objective data, medical surveillance, and training. It also requires employers to make all required records available to employees, their designated representatives, and the Assistant Secretary in accordance with OSHA's records access standard, 29 CFR 1910.1020. The 2017 final rule required employers to include employees' Social Security Numbers (SSNs) in air monitoring data ((n)(1)(ii)(F)), medical surveillance ((n)(3)(ii)(A)), and training ((n)(4)(i)) records. In the 2019 NPRM, OSHA proposed to revise paragraphs (n)(1)(ii)(F), (n)(3)(ii)(A), and (n)(4)(i) of both the construction and shipyards standards to remove those requirements (84 FR at 53921). This final rule adopts the proposed revisions, eliminating the requirements to include employee SSNs in monitoring data, medical surveillance, and training records.

In the 2015 beryllium NPRM which led to the 2017 final rule, OSHA proposed to require inclusion of employee SSNs in records related to air monitoring, medical surveillance, and training, as it had done in several existing substance-specific health standards (80 FR 47566, 47806 (August 7, 2015)). In their comments, some stakeholders objected to the proposed requirements based on concerns about employee privacy and the risk of identity theft (82 FR at 2730). In the 2017 final rule, OSHA acknowledged these concerns, but concluded that, due to the agency's past consistent practice of requiring an employee's SSN on records, any change to such



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requirements should be comprehensive and apply to all OSHA standards, not just the standards for beryllium (82 FR at 2730).

After OSHA published the 2015 beryllium proposal but before issuing the 2017 final beryllium rule, OSHA published its Standards Improvement Project-Phase IV (SIP-IV) proposed rule (81 FR 68504, 68526-28 (October 4, 2016)), in which the agency proposed to delete all requirements for employers to include employee SSNs in records required by the agency's substance-specific standards. Because the beryllium standards had not yet been finalized, they were not included in the SIP-IV proposal. Accordingly, the 2017 final rule for beryllium included the SSN requirements. However, OSHA acknowledged in the preamble that the SIP-IV rulemaking was ongoing and stated that it would revisit its decision to require employers to include SSNs in beryllium records in light of the SIP-IV rulemaking, if appropriate (82 FR at 2730).

After promulgating the 2017 final rule, OSHA finalized Phase IV of its Standards Improvement Project (SIP-IV), which removed from OSHA standards all requirements for employee SSNs in employer records (84 FR 21416, 21439-40 (May 14, 2019)).<sup>12</sup> As OSHA explained in the SIP-IV final rule, removing requirements for SSNs results in additional flexibility for employers and allows employers to develop systems that best work for their unique situations (84 FR at 21440). OSHA also explained that the change would protect employee privacy and lower the risk of identity theft (84 FR at 21439-40). Consistent with the SIP-IV final rule, OSHA proposed in the 2019 NPRM to modify the beryllium standards for construction and shipyards by removing the requirements to include SSNs in the recordkeeping provisions in paragraphs (n)(1)(ii)(F) (air monitoring data), (n)(3)(ii)(A) (medical surveillance) and (n)(4)(i) (training) (84 FR at 53921).

Two commenters, the AFL-CIO (Document ID 2210, p. 10) and NJH (Document ID 2211, p. 14), expressed general support for the proposed removal of the requirements to include employees' SSNs in these three sets of records. No commenter opposed the proposed revisions. However, after stating their support for the change, NJH noted that "it is important that there is an identifying link between exposure monitoring data and medical surveillance data in order to identify areas of increased risk" (Document ID 2211, p. 14).

OSHA acknowledges NJH's concern but notes that the beryllium standards have never required employers to link their exposure monitoring to medical surveillance data in this way. Even so, employers remain free to utilize SSNs, or any other unique employee identifier, if doing so helps them to identify areas of increased risk. Regardless, the agency believes that areas of increased

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<sup>12</sup> Eliminating requirements to include SSNs in records is also responsive to a directive from OMB that calls for federal agencies to identify and eliminate unnecessary collection and use of SSNs in agency systems and programs (See Memorandum from Clay Johnson III, Deputy Director for Management, Office of Management and Budget, to the Heads of Executive Departments and Agencies Regarding Safeguarding Against and Responding to the Breach of Personally Identifiable Information (M-07-16), May 22, 2007 (available at: <https://www.whitehouse.gov/sites/whitehouse.gov/files/omb/memoranda/2007/m07-16.pdf>).

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risk will be identifiable based on the medical surveillance records alone. Paragraph (k)(6) requires that, with the employee's consent, the licensed physician's written medical opinion for the employer must include the PLCHP's recommendations regarding limitations on the employee's airborne exposure to beryllium, referrals to a CBD Diagnostic Center, continued medical surveillance, and medical removal. This information will alert the employer to possible increased risk of exposure in the processes in which that employee works and the need to reevaluate these processes. It may also trigger the requirement in paragraph (f)(1)(ii) that the employer review and evaluate the effectiveness of its written exposure control plan. Therefore, OSHA has determined that the proposed revisions to paragraph (n) will not impair the identification of areas of increased risk within a worksite or facility.

NJH's comment also touches on a related concern regarding the removal of requirements to record workers' SSNs in exposure monitoring and medical records. As OSHA explained in the SIP-IV NPRM, the agency originally required the collection of employee SSNs in its standards because SSNs are assigned at birth and do not change over time. SSNs are therefore useful for research that tracks employees over time, as is done in some epidemiological studies of workplace populations (81 FR at 68527). While OSHA acknowledged the usefulness of SSNs for such research, the agency further noted that other tracking methods have emerged that allow researchers to conduct these studies without the use of SSNs. OSHA stated that due to the seriousness of the threat of identity theft and the availability of other methods for tracking employees for research purposes, it was appropriate to reexamine the SSN collection requirements in its standards (81 FR at 68527). Weighing these considerations in the SIP-IV final rule, OSHA determined that it was appropriate to remove from OSHA standards all requirements for employee SSNs in employer records (84 FR at 21439-40). OSHA reaffirms its conclusions on this issue here.

Accordingly, OSHA is finalizing the proposed changes to paragraph (n) in this final rule, which will align the beryllium standards for construction and shipyards with OSHA's other substance-specific standards by removing the requirements to include employees' SSNs in air monitoring data ((n)(1)(ii)(F)), medical surveillance ((n)(3)(ii)(A)), and training ((n)(4)(i)) records. OSHA expects that compliance with paragraph (n) as revised will be straightforward for construction and shipyard employers who already comply with other OSHA standards that no longer contain requirements to include employee SSNs in records. Lastly, OSHA notes, as it did in the SIP-IV final rule, that by removing the requirements to include SSNs in records, OSHA is not requiring employers to delete SSNs from existing records or prohibiting employers from using SSNs in records if they wish to do so (see 84 FR at 21439-40).