Cadmium in General Industry Standard (29 CFR 1910.1027)
1218-0185
September 2019

Note

OSHA has completed a regulatory review of its existing safety and health standards in response to the President's Executive Order 13563, "Improving Regulation and Regulatory Review" (76 FR 3821). This review, the Standards Improvement Project–Phase IV (SIP-IV), was the fourth in a series of rulemaking actions to improve and streamline OSHA standards. OSHA's Standards Improvement Projects remove or revise individual requirements in safety and health standards that are confusing, outdated, duplicative, or inconsistent. The goal of this rulemaking was to reduce regulatory burden while maintaining or enhancing worker safety and health.

As part of the SIP-IV rulemaking, OSHA updated the chest x-ray requirements for several of its standards, including the Cadmium standard for general industry, 29 CFR 1910.1027, by adding the option of digital radiography to its existing standards because digital radiography systems are rapidly replacing traditional analog film-based systems in medical facilities. OSHA also removed the provisions in its standards, including Cadmium in general industry, that require employers to collect and record employees' social security numbers. Finally, the Agency revised Appendix D of the general industry Cadmium standard to replace the phrase "deformed offspring" in the occupational health history interview form with more sensitive, medically-accurate language.

This ICR seeks OMB approval for changes to the collection in accordance with the SIP-IV Final Rule. As noted above and described in more detail in this ICR, the SIP-IV Final Rule is expected to reduce the paperwork burden borne by employers.

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SUPPORTING STATEMENT FOR THE INFORMATION COLLECTION REQUIREMENTS IN THE CADMIUM IN GENERAL INDUSTRY STANDARD (29 CFR 1910.1027)[1] OFFICE OF MANAGEMENT AND BUDGET (OMB) CONTROL NO. 1218-0185 (May 2019)

A. JUSTIFICATION

1. Explain the circumstances that make the collection of information necessary. Identify any legal or administrative requirements that necessitate the collection. Attach a copy of the appropriate section of each statute and regulation mandating or authorizing the collection of information.

The main objective of the Occupational Safety and Health Act ("OSH Act" or "Act") is to "assure so far as possible every working man and woman in the Nation safe and healthful working conditions and to preserve our human resources" (29 U.S.C. 651). To achieve this objective, the OSH Act specifically authorizes "the development and promulgation of occupational safety and health standards" (29 U.S.C. 651). The Act states further that "[t]he Secretary . . . shall prescribe such rules and regulations as [he/she] may deem necessary to carry out [his/her] responsibilities under this Act, including rules and regulations dealing with the inspection of an employer's establishment" (29 U.S.C. 651).

To protect worker health, the OSH Act authorizes the Occupational Safety and Health Administration ("OSHA" or "Agency") to develop standards that provide for "monitoring or measuring worker exposure" to occupational hazards and "prescribe the type and frequency of medical examinations and other tests which shall be made available [by the employer] to workers exposed to such hazards . . . to most effectively determine whether the health of such workers is adversely affected by such exposure" (29 U.S.C. 655). Moreover, the Act directs the Agency to "issue regulations requiring employers to maintain accurate records of worker exposures to potentially toxic materials or other harmful physical agents which are required to be monitored and measured," and further specifies that such regulations provide "for each worker or former worker to have access to such records as will indicate [their] own exposure to toxic materials or harmful physical agents" (29 U.S.C. 657). In addition, the OSH Act mandates that "[e]ach employer shall make, keep and preserve, and make available to the Secretary [of Labor] . . . such records regarding [his/her] activities relating this Act as the Secretary . . . may prescribe by regulation as necessary or appropriate for the enforcement of this Act or for developing information regarding the causes and prevention of occupational accidents and illnesses" (29

1The purpose of this Supporting Statement is to analyze and describe the burden hours and costs associated with provisions of this Standard that contain paperwork requirements; it does not provide information or guidance on how to comply with, or how to enforce the Standard.

U.S.C. 657).

Under the authority granted by the OSH Act, the Agency published a standard for general industry that regulates worker cadmium (Cd) exposure (§1910.1027; the "Standard"). OSHA based the Standard on a determination that occupational exposure to Cd poses a hazard to workers. This determination showed Cd exposure may cause lung cancer, prostate cancer, non-malignant respiratory disease, acute pneumonitis, fever and chest pain, severe weakness, coughing and tightness of the chest, and kidney disease. Items 2 and 12 below list and describe the specific information collection requirements of the Standard.

2. Indicate how, by whom, and for what purpose the information is to be used. Except for a new collection, indicate the actual use the Agency has made of the information received from the current collection.

Exposure Monitoring (§1910.1027(d))

General (§1910.1027(d)(1)(i)) - Each employer who has a workplace or work operation covered by this section shall determine if any employee may be exposed to cadmium at or above the action level.

§1910.1027(d)(1)(ii) - Determinations of employee exposure shall be made from breathing zone air samples that reflect the monitored employee's regular, daily 8-hour TWA exposure to cadmium.

§1910.1027(d)(1)(iii) - Eight-hour TWA exposures shall be determined for each employee on the basis of one or more personal breathing zone air samples reflecting full shift exposure on each shift, for each job classification, in each work area. Where several employees perform the same job tasks, in the same job classification, on the same shift, in the same work area, and the length, duration, and level of cadmium exposures are similar, an employer may sample a representative fraction of the employees instead of all employees in order to meet this requirement. In representative sampling, the employer shall sample the employee(s) expected to have the highest cadmium exposures.

Initial Monitoring (§1910.1027(d)(2)(i)) - Except as provided for in paragraphs (d)(2)(ii) and (d)(2)(iii) of this section, the employer shall monitor employee exposures and shall base initial determinations on the monitoring results.

(§1910.1027(d)(2)(ii)) - Where the employer has monitored after September 14, 1991, under conditions that in all important aspects closely resemble those currently prevailing and where that monitoring satisfies all other requirements of this section, including the accuracy and confidence levels of paragraph (d)(6) of this section, the employer may rely on such earlier monitoring results to satisfy the requirements of paragraph (d)(2)(i) of this section.

Purpose: Initial monitoring assists employers in identifying areas of operation that may require additional efforts to reduce exposure and come into compliance with the Standard. Initial monitoring results also assist employers in determining the need for engineering controls, instituting or modifying work practices, and in selecting appropriate respiratory protection to prevent workers from overexposure. This information also determines whether the employer must perform periodic monitoring.

§1910.1027(d)(2)(iii) - Where the employer has objective data, as defined in paragraph (n)(2) of this section, demonstrating that employee exposure to cadmium will not exceed the action level under the expected conditions of processing, use, or handling, the employer may rely upon such data instead of implementing initial monitoring.

Purpose: By eliminating the need for initial monitoring, this alternative encourages employers to use operations that substantially reduce worker exposures to Cd. (See discussion of paragraph (n)(2) for additional information on using objective data.)

Monitoring Frequency (Periodic Monitoring) *(§1910.1027(d)(3))*

§1910.1027(d)(3)(i) - If the initial monitoring or periodic monitoring reveals employee exposures to be at or above the action level, the employer shall monitor at a frequency and pattern needed to represent the levels of exposure of employees and where exposures are above the PEL to assure the adequacy of respiratory selection and the effectiveness of engineering and work practice controls. However, such exposure monitoring shall be performed at least every six months. The employer, at a minimum, shall continue these semi-annual measurements unless and until the conditions set out in paragraph (d)(3)(ii) are met.

§1910.1027(d)(3)(ii) - If the initial monitoring or the periodic monitoring indicates that employee exposures are below the action level and that result is confirmed by the results of another monitoring taken at least seven days later, the employer may discontinue the monitoring for those employees whose exposures are represented by such monitoring.

Purpose: Periodic monitoring is necessary because relatively minor changes in tasks, work practices, and environmental conditions may affect airborne concentrations of Cd. Employers may use these monitoring results to evaluate the effectiveness of selected control methods. In addition, these measurements remind both the employer and workers of the need to protect workers against the effects of overexposure to Cd. These monitoring data also will inform the examining physician of the existence and extent of a worker's Cd exposures for use in assessing the worker's medical condition.

Additional Monitoring (§1910.1027(d)(4)) - The employer also shall institute the exposure monitoring required under paragraphs (d)(2)(i) and (d)(3) of this section whenever there has been a change in the raw materials, equipment, personnel, work practices, or finished products that may result in additional employees being exposed to cadmium at or above the action level or in employees already exposed to cadmium at or above the action level being exposed above the PEL, or whenever the employer has any reason to suspect that any other change might result in such further exposure.

Purpose: Additional monitoring ensures that the workplace is safe, or alerts the employer of the need to improve protection.

Worker Notification of Monitoring Results *(§1910.1027(d)(5))*

§1910.1027(d)(5)(i) - The employer must, within 15 working days after the receipt of the results of any monitoring performed under this section, notify each affected employee of these results either individually in writing or by posting the results in an appropriate location that is accessible to employees.

§1910.1027(d)(5)(ii) - Wherever monitoring results indicate that employee exposure exceeds the PEL, the employer shall include in the written notice a statement that the PEL has been exceeded and a description of the corrective action being taken by the employer to reduce employee exposure to or below the PEL.

Purpose: This provision assures that workers receive accurate exposure data and, in addition, provides them with information regarding the specific actions the employer is taking to lower their exposures and furnish them with a safe and healthful workplace in accordance with section 8(c)(3) of the Act.

Methods of Compliance (§1910.1027(f))

Compliance Program (§1910.1027(f)(2) and Mechanical Ventilation (f)(3))

§1910.1027(f)(2)(i) – Where the PEL is exceeded, the employer shall establish and implement a written compliance program to reduce employee exposure to or below the PEL by means of engineering and work practice controls, as required by paragraph (f)(1) of this section. To the extent that engineering and work practice controls cannot reduce exposures to or below the PEL, the employer shall include in the written compliance program the use of appropriate respiratory protection to achieve compliance with the PEL.

§1910.1027(f)(2)(ii) - Written compliance programs shall include at least the following:

§1910.1027(f)(2)(ii)(A) - A description of each operation in which cadmium is emitted; e.g., machinery used, material processed, controls in place, crew size, employee job responsibilities, operating procedures, and maintenance practices;

§1910.1027(f)(2)(ii)(B) - A description of the specific means that will be employed to achieve compliance, including engineering plans and studies used to determine methods selected for controlling exposure to cadmium, as well as, where necessary, the use of appropriate respiratory protection to achieve the PEL;

§1910.1027(f)(2)(ii)(C) - A report of the technology considered in meeting the PEL;

§1910.1027(f)(2)(ii)(D) - Air monitoring data that document the sources of cadmium emissions;

§1910.1027(f)(2)(ii)(E) - A detailed schedule for implementation of the program, including documentation such as copies of purchase orders for equipment, construction contracts, etc.;

§1910.1027(f)(2)(ii)(F) - A work practice program that includes items required under paragraphs (h), (i), and (j) of this section;

§1910.1027(f)(2)(ii)(G) - A written plan for emergency situations, as specified in paragraph (h) of this section; and

§1910.1027(f)(2)(ii)(H) - Other relevant information.

§1910.1027(f)(2)(iii) - The written compliance programs shall be reviewed and updated at least annually, or more often if necessary, to reflect significant changes in the employer's compliance status.

§1910.1027(f)(2)(iv) - Written compliance programs shall be provided upon request for examination and copying to affected employees, designated employee representatives as well as to the Assistant Secretary, and the Director.

§1910.1027(f)(4)(iv) - Procedures shall be developed and implemented to minimize employee exposure to cadmium when maintenance of ventilation systems and changing of filters is being conducted.

Purpose: This requirement commits the employer to evaluating worker Cd exposures and establishing an organized and complete program for reducing these exposures to the PEL; it does so prior to beginning a job to prevent unnecessary exposure to Cd, and to inform workers

regarding planned controls. The requirement to prepare and update the written compliance program ensures that employers continue to evaluate variable workplace conditions, including Cd exposures, and to implement feasible engineering and work-practice controls as required. OSHA has determined that the requirement for employers to make information available upon request to the Assistant Secretary is not a collection of information; OSHA typically requests access to records during an inspection, and information collected by the Agency during the investigation is not subject to the PRA under 5 CFR 1320.4(a)(2). While NIOSH may use records collected from employers for research purposes, the Agency does not anticipate NIOSH to request employers to make available records during the approval period. Therefore, the burden for the employer to make this information available to NIOSH is zero. OSHA is not taking burden for this activity under Item 12 of this Supporting Statement.

Respiratory Protection (§1910.1027(g))

Respiratory Program (§1910.1027(g)(2)(i)) - The employer must implement a respiratory protection program in accordance with 29 CFR 1910.134 (b) through (d) (except (d)(1)(iii)), and (f) through (m), which covers each employee required by this section to use a respirator.

Purpose: The purpose of these requirements is to ensure that employers establish a standardized procedure for selecting, using, and maintaining respirators for each workplace that requires respirator use. Developing written procedures ensures that employers implement the required respirator program in an effective and reliable manner that addresses the unique characteristics (including chemical hazards) of the workplace. The Agency accounts for the burden hours and costs resulting from the respirator-program requirements under the Information Collection for OSHA's Respiratory Protection Standard (§1910.134), Office of Management and Budget (OMB) Control Number 1218-0099.

Emergency Situations (§1910.1027(h)) - The employer shall develop and implement a written plan for dealing with emergency situations involving substantial releases of airborne cadmium. The plan shall include provisions for the use of appropriate respirators and personal protective equipment. In addition, employees not essential to correcting the emergency situation shall be restricted from the area and normal operations halted in that area until the emergency is abated.

Purpose: Emergency plans provide workers with information to maximize their personal protection and minimize Cd exposures under these conditions.

Protective work clothing and equipment (§1910.1027(i))

§1910.1027(i)(2)(iv) - The employer shall assure that bags or containers of contaminated protective clothing and equipment that are to be taken out of the change rooms or the workplace for laundering, cleaning, maintenance or disposal shall bear labels in accordance with paragraph

(m)(3) of this section.

Purpose: This information allows personnel who handle Cd-contaminated protective clothing or equipment to protect themselves from the harmful effects of Cd.

Cleaning, replacement, and disposal (§1910.1027(i)(3))

Notification of Laundry Personnel (§1910.1027(i)(3)(v)) - The employer shall inform any person who launders or cleans protective clothing or equipment contaminated with cadmium of the potentially harmful effects of exposure to cadmium and that the clothing and equipment should be laundered or cleaned in a manner to effectively prevent the release of airborne cadmium in excess of the PEL.

Purpose: This information allows such personnel to protect themselves from harmful Cd exposures.

Housekeeping (§1910.1027(k))

§1910.1027(k)(7) - Waste, scrap, debris, bags, containers, personal protective equipment, and clothing contaminated with cadmium and consigned for disposal shall be collected and disposed of in sealed impermeable bags or other closed, impermeable containers. These bags and containers shall be labeled in accordance with paragraph (m)(2) of this section.

Purpose: This information allows personnel who handle these articles to protect themselves from exposure to hazardous levels of Cd.

Medical Surveillance (§1910.1027(l))

General (§1910.1027(l)(1))

General (§1910.1027(l)(1)(A)- Currently Exposed- Employers must implement a medical-surveillance program for employees who are or who may be exposed to Cd at concentrations at or above the AL. However, medical surveillance is unnecessary if the employer can demonstrate that: an employee's exposure to airborne Cd at or above the AL occurs on 30 or fewer days per year (twelve consecutive months).

General (§1910.1027(l)(1)(B)- Previously Exposed- An employer must provide medical surveillance for an employee exposed to Cd at or above the action level by that employer prior to the effective date. Employers are exempt from this requirement when they can demonstrate that the employee did not work in jobs with exposure to Cd for an aggregated total of more than 60 months.

Initial Examination (§1910.1027(l)(2))

(§1910.1027(l)(2)(i)) - The employer shall provide an initial (preplacement) examination to all employees covered by the medical surveillance program required in paragraph (l)(1)(i) of this section. The examination shall be provided to those employees within 30 days after initial assignment to a job with exposure to cadmium or no later than 90 days after the effective date of this section, whichever date is later.

§1910.1027(l)(2)(ii) - The initial (preplacement) medical examination shall include:

> §1910.1027(l)(2)(ii)(A) - A detailed medical and work history, with emphasis on: past, present, and anticipated future exposure to cadmium; any history of renal, cardiovascular, respiratory, hematopoietic, reproductive, and/or musculo-skeletal system dysfunction; current usage of medication with potential nephrotoxic side-effects; and smoking history and current status; and
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> §1910.1027(l)(2)(ii)(B) - Biological monitoring that includes the following tests:
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> > §1910.1027(l)(2)(ii)(B)(1) - Cadmium in urine (CdU), standardized to grams of creatinine (g/Cr);
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> > §1910.1027(l)(2)(ii)(B)(2) - Beta-2 microglobulin in urine (B(2)-M), standardized to grams of creatinine (g/Cr), with pH specified, as described in Appendix F; and
> >
> > §1910.1027(l)(2)(ii)(B)(3) - Cadmium in blood (CdB), standardized to liters of whole blood (lwb).

§1910.1027(l)(2)(iii) - Recent Examination: An initial examination is not required to be provided if adequate records show that the employee has been examined in accordance with the requirements of paragraph (l)(2)(ii) of this section within the past 12 months. In that case, such records shall be maintained as part of the employee's medical record and the prior exam shall be treated as if it were an initial examination for the purposes of paragraphs (l)(3) and (4) of this section.

Actions Triggered by Initial Biological Monitoring (§1910.1027(l)(3))

If laboratory analyses of the initial biological monitoring results show that an employee's CdU, CdB, and/or β_2-MU exceed specified limits, this provision requires the employer to reassess an employee's Cd exposure within two weeks by evaluating the employee's work practices, personal hygiene, respirator use, smoking history and current smoking status, as well as hygiene facilities,

the respirator program, and the maintenance and effectiveness of the relevant engineering controls. Within 30 days after the reassessment, employers must take reasonable steps to correct any deficiencies found in the assessment that may be responsible for the employee's excessive Cd exposure. Employers also must provide the employee with a full medical examination within 90 days of receiving the abnormal biological-monitoring results, and then conduct biological monitoring either quarterly or semi-annually and administer medical examinations either annually or semi-annually.

§1910.1027(l)(3)(i) - If the results of the initial biological monitoring tests show the employee's CdU level to be at or below 3 µg/g Cr, β_2-M level to be at or below 300 µg/g Cr and CdB level to be at or below 5 µg/lwb, then:

> *§1910.1027(l)(3)(i)(A)* - For currently exposed employees, who are subject to medical surveillance under paragraph (l)(1)(i)(A) of this section, the employer shall provide the minimum level of periodic medical surveillance in accordance with the requirements in paragraph (l)(4)(i) of this section; and
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> *§1910.1027(l)(3)(i)(B)* - For previously exposed employees, who are subject to medical surveillance under paragraph (l)(1)(i)(B) of this section, the employer shall provide biological monitoring for CdU, β_2-M, and CdB one year after the initial biological monitoring and then the employer shall comply with the requirements of paragraph (l)(4)(v) of this section.
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> *§1910.1027(l)(3)(ii)(B)* - Within 30 days after the exposure reassessment, specified in paragraph (l)(3)(ii)(A) of this section, take reasonable steps to correct any deficiencies found in the reassessment that may be responsible for the employee's excess exposure to cadmium; and,
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> *§1910.1027(l)(3)(ii)(C)* - Within 90 days after receipt of biological monitoring results, provide a full medical examination to the employee in accordance with the requirements of paragraph (l)(4)(ii) of this section. After completing the medical examination, the examining physician shall determine in a written medical opinion whether to medically remove the employee. If the physician determines that medical removal is not necessary, then until the employee's CdU level falls to or below 3 µg/g Cr, β_2-M level falls to or below 300 µg/g Cr and CdB level falls to or below 5 µg/lwb, the employer shall:
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> > §1910.1027(l)(3)(ii)(C)(1) - Provide biological monitoring in accordance with paragraph (l)(2)(ii)(B) of this section on a semiannual basis; and
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> > §1910.1027(l)(3)(ii)(C)(2) - Provide annual medical examinations in accordance with paragraph (l)(4)(ii) of this section.

§1910.1027(l)(3)(iii) - For all employees who are subject to medical surveillance under paragraph (l)(1)(i) of this section, if the results of the initial biological monitoring tests show the level of CdU to be in excess of 15 µg/g Cr, or the level of CdB to be in excess of 15 µg/lwb, or the level of β_2-M to be in excess of 1,500 µg/g Cr, the employer shall comply with the requirements of paragraphs (l)(3)(ii)(A)-(B) of this section. Within 90 days after receipt of biological monitoring results, the employer shall provide a full medical examination to the employee in accordance with the requirements of paragraph (l)(4)(ii) of this section. After completing the medical examination, the examining physician shall determine in a written medical opinion whether to medically remove the employee. However, if the initial biological monitoring results and the biological monitoring results obtained during the medical examination both show that: CdU exceeds 15 µg/g Cr; or CdB exceeds 15 µg/lwb; or β_2-M exceeds 1500 µg/g Cr, and in addition CdU exceeds 3 µg/g Cr or CdB exceeds 5 µg/liter of whole blood, then the physician shall medically remove the employee from exposure to cadmium at or above the action level. If the second set of biological monitoring results obtained during the medical examination does not show that a mandatory removal trigger level has been exceeded, then the employee is not required to be removed by the mandatory provisions of this paragraph. If the employee is not required to be removed by the mandatory provisions of this paragraph or by the physician's determination, then until the employee's CdU level falls to or below 3 µg/g Cr, β_2-M level falls to or below 300 µg/g Cr and CdB level falls to or below 5 µg/lwb, the employer shall:

> *§1910.1027(l)(3)(iii)(A)* - Periodically reassess the employee's occupational exposure to cadmium;
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> *§1910.1027(l)(3)(iii)(B)* - Provide biological monitoring in accordance with paragraph (l)(2)(ii)(B) of this section on a quarterly basis; and
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> *§1910.1027(l)(3)(iii)(C)* - Provide semiannual medical examinations in accordance with paragraph (l)(4)(ii) of this section.

§1910.1027(l)(3)(iv) - For all employees to whom medical surveillance is provided, beginning on January 1, 1999, and in lieu of paragraphs (l)(3)(i)-(iii) of this section:

> *§1910.1027(l)(3)(iv)(A)* - If the results of the initial biological monitoring tests show the employee's CdU level to be at or below 3 µg/g Cr, β_2-M level to be at or below 300 µg/g Cr and CdB level to be at or below 5 µg/lwb, then for currently exposed employees, the employer shall comply with the requirements of paragraph (l)(3)(i)(A) of this section, and for previously exposed employees, the employer shall comply with the requirements of paragraph (l)(3)(i)(B) of this section;
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> *§1910.1027(l)(3)(iv)(B)* - If the results of the initial biological monitoring tests show the

level of CdU to exceed 3 µg/g Cr, the level of β_2-M to exceed 300 µg/g Cr, or the level of CdB to exceed 5 µg/lwb, the employer shall comply with the requirements of paragraphs (l)(3)(ii)(A)-(C) of this section; and,

§1910.1027(l)(3)(iv)(C) - If the results of the initial biological monitoring tests show the level of CdU to be in excess of 7 µg/g Cr, or the level of CdB to be in excess of 10 µg/lwb, or the level of β_2-M to be in excess of 750 µg/g Cr, the employer shall: Comply with the requirements of paragraphs (l)(3)(ii)(A)-(B) of this section; and, within 90 days after receipt of biological monitoring results, provide a full medical examination to the employee in accordance with the requirements of paragraph (l)(4)(ii) of this section. After completing the medical examination, the examining physician shall determine in a written medical opinion whether to medically remove the employee. However, if the initial biological monitoring results and the biological monitoring results obtained during the medical examination both show that: CdU exceeds 7 µg/g Cr; or CdB exceeds 10 µg/lwb; or β_2-M exceeds 750 µg/g Cr, and in addition CdU exceeds 3 µg/g Cr or CdB exceeds 5 µg/liter of whole blood, then the physician shall medically remove the employee from exposure to cadmium at or above the action level. If the second set of biological monitoring results obtained during the medical examination does not show that a mandatory removal trigger level has been exceeded, then the employee is not required to be removed by the mandatory provisions of this paragraph. If the employee is not required to be removed by the mandatory provisions of this paragraph or by the physician's determination, then until the employee's CdU level falls to or below 3 µg/g Cr, β_2-M level falls to or below 300 µg/g Cr and CdB level falls to or below 5 µg/lwb, the employer shall: periodically reassess the employee's occupational exposure to cadmium; provide biological monitoring in accordance with paragraph (l)(2)(ii)(B) of this section on a quarterly basis; and provide semiannual medical examinations in accordance with paragraph (l)(4)(ii) of this section.

Purpose: The purpose of initial biological monitoring is to determine the worker's existing cadmium exposure level to facilitate the early detection of potential effects associated with cadmium exposure and to evaluate the need for continued or follow-up monitoring of workers.

Periodic Medical Surveillance (§1910.1027(l)(4))

§1910.1027(l)(4)(i) - For each employee who is covered under paragraph (l)(1)(i)(A), the employer shall provide at least the minimum level of periodic medical surveillance, which consists of periodic medical examinations and periodic biological monitoring. A periodic medical examination shall be provided within one year after the initial examination required by paragraph (l)(2) and thereafter at least biennially. Biological sampling shall be provided at least annually, either as part of a periodic medical examination or separately as periodic biological monitoring.

§1910.1027(l)(4)(ii) - The periodic medical examination shall include:

§1910.1027(l)(4)(ii)(A) - A detailed medical and work history, or update thereof, with emphasis on: past, present and anticipated future exposure to cadmium; smoking history and current status; reproductive history; current use of medications with potential nephrotoxic side-effects; any history of renal, cardiovascular, respiratory, hematopoietic, and/or musculo-skeletal system dysfunction; and as part of the medical and work history, for employees who wear respirators, questions 3-11 and 25-32 in Appendix D;

§1910.1027(l)(4)(ii)(B) - A complete physical examination with emphasis on: blood pressure, the respiratory system, and the urinary system;

§1910.1027(l)(4)(ii)(C) - A 14 inch by 17 inch or other reasonably-sized standard film or digital posterior-anterior chest X-ray (after the initial X-ray, the frequency of chest X-rays is to be determined by the examining physician);

§1910.1027(l)(4)(ii)(D) - Pulmonary function tests, including forced vital capacity (FVC) and forced expiratory volume at 1 second (FEV(1));

§1910.1027(l)(4)(ii)(E) - Biological monitoring, as required in paragraph (l)(2)(ii)(B);

§1910.1027(l)(4)(ii)(F) - Blood analysis, in addition to the analysis required under paragraph (l)(2)(ii)(B), including blood urea nitrogen, complete blood count, and serum creatinine;

§1910.1027(l)(4)(ii)(G) - Urinalysis, in addition to the analysis required under paragraph (l)(2)(ii)(B), including the determination of albumin, glucose, and total and low molecular weight proteins;

§1910.1027(l)(4)(ii)(H) - For males over 40 years old, prostate palpation, or other at least as effective diagnostic test(s); and

§1910.1027(l)(4)(ii)(I) - Any additional tests deemed appropriate by the examining physician.

§1910.1027(l)(4)(iii) - Periodic biological monitoring shall be provided in accordance with paragraph (l)(2)(ii)(B) of this section.

§1910.1027(l)(4)(iv) - If the results of periodic biological monitoring or the results of biological monitoring performed as part of the periodic medical examination show the level of the

employee's CdU, β_2-M, or CdB to be in excess of the levels specified in paragraphs (l)(3)(ii) or (iii); or, beginning on January 1, 1999, in excess of the levels specified in paragraphs (l)(3)(ii) or (iv) of this section, the employer shall take the appropriate actions specified in paragraphs (l)(3)(ii)-(iv) of this section.

§1910.1027(l)(4)(v) - For previously exposed employees under paragraph (l)(1)(i)(B) of this section:

> §1910.1027(l)(4)(v)(C) - However, if the results of the follow-up tests specified in paragraph (l)(4)(v)(A) or (B) of this section indicate that the level of the employee's CdU, β_2-M, or CdB exceeds these same levels, the employer is required to provide annual medical examinations in accordance with the provisions of paragraph (l)(4)(ii) of this section until the results of biological monitoring are consistently below these levels or the examining physician determines in a written medical opinion that further medical surveillance is not required to protect the employee's health.

§1910.1027(l)(4)(vi) - A routine, biennial medical examination is not required to be provided in accordance with paragraphs (l)(3)(i) and (l)(4) of this section if adequate medical records show that the employee has been examined in accordance with the requirements of paragraph (l)(4)(ii) of this section within the past 12 months. In that case, such records shall be maintained by the employer as part of the employee's medical record, and the next routine, periodic medical examination shall be made available to the employee within two years of the previous examination.

Actions Triggered by Medical Examinations (§1910.1027(l)(5))

§1910.1027(l)(5)(i) - If the results of a medical examination carried out in accordance with this section indicate any laboratory or clinical finding consistent with cadmium toxicity that does not require employer action under paragraphs (l)(2), (3) or (4) of this section, the employer, within 30 days, shall reassess the employee's occupational exposure to cadmium and take the following corrective action until the physician determines they are no longer necessary:

> §1910.1027(l)(5)(i)C) - Provide semiannual medical reexaminations to evaluate the abnormal clinical sign(s) of cadmium toxicity until the results are normal or the employee is medically removed; and
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> §1910.1027(l)(5)(i)(D) - Where the results of tests for total proteins in urine are abnormal, provide a more detailed medical evaluation of the toxic effects of cadmium on the employee's renal system.

Examination for Respirator Use (§1910.1027(l)(6))

§1910.1027(l)(6)(i) - To determine an employee's fitness for respirator use, the employer shall provide a medical examination that includes the elements specified in (l)(6)(A)-(D). This examination shall be provided prior to the employee's being assigned to a job that requires the use of a respirator or no later than 90 days after this section goes into effect, whichever date is later, to any employee without a medical examination within the preceding 12 months that satisfies the requirements of this paragraph.

> §1910.1027(l)(6)(i)(A) - A detailed medical and work history, or update thereof, with emphasis on: past exposure to cadmium; smoking history and current status; any history of renal, cardiovascular, respiratory, hematopoietic, and/or musculo-skeletal system dysfunction; a description of the job for which the respirator is required; and questions 3-11 and 25-32 in Appendix D;
>
> §1910.1027(l)(6)(i)(B) - A blood pressure test;
>
> §1910.1027(l)(6)(i)(C) - Biological monitoring of the employee's levels of CdU, CdB and B(2)-M in accordance with the requirements of paragraph (l)(2)(ii)(B), unless such results already have been obtained within the previous 12 months; and
>
> §1910.1027(l)(6)(i)(D) - Any other test or procedure that the examining physician deems appropriate.

§1910.1027(l)(6)(ii) - After reviewing all the information obtained from the medical examination required in paragraph (l)(6)(i) of this section, the physician shall determine whether the employee is fit to wear a respirator.

§1910.1027(l)(6)(iii) - Whenever an employee has exhibited difficulty in breathing during a respirator fit test or during use of a respirator, the employer, as soon as possible, shall provide the employee with a periodic medical examination in accordance with paragraph (l)(4)(ii) to determine the employee's fitness to wear a respirator.

§1910.1027(l)(6)(iv) - Where the results of the examination required under paragraph (l)(6)(i), (ii), or (iii) of this section are abnormal, medical limitation or prohibition of respirator use shall be considered. If the employee is allowed to wear a respirator, the employee's ability to continue to do so shall be periodically evaluated by a physician.

Emergency Examinations (§1910.1027(l)(7))

§1910.1027(l)(7)(i) - In addition to the medical surveillance required in paragraphs (l)(2)-(6) of this section, the employer shall provide a medical examination as soon as possible to any employee who may have been acutely exposed to cadmium because of an emergency.

§1910.1027(l)(7)(ii) - The examination shall include the requirements of paragraph (l)(4)(ii), with emphasis on the respiratory system, other organ systems considered appropriate by the examining physician, and symptoms of acute overexposure, as identified in Appendix A of this section in paragraphs II(B)(1)-(2) and IV.

Termination of Employment Examination (§1910.1027(l)(8))

§1910.1027(l)(8))(i)- At termination of employment, the employer shall provide a medical examination in accordance with paragraph (l)(4)(ii) of this section, including a chest X-ray, to any employee to whom at any prior time the employer was required to provide medical surveillance under paragraphs (l)(1)(i) or (l)(7) of this section. However, if the last examination satisfied the requirements of paragraph (l)(4)(ii) of this standard and was less than six months prior to the date of termination, no further examination is required unless otherwise specified in paragraphs (l)(3) or (l)(5);

Purpose: Documentation and maintenance of the medical examination results required by the Standard provide a continuous record of worker health. Physicians use these records to determine the extent to which workers, since their last examination, experience health effects related to Cd exposure. Additionally, if signs and symptoms of potential Cd overexposure appear, the physician often needs information about a worker's previous medical condition to make an accurate diagnosis of the presenting condition, ascertain its apparent cause, and identify a course of treatment. Medical records also permit workers to determine whether they need treatment, or to evaluate the effectiveness of their employer's exposure-reduction program.

Information Provided to the Physician (§1910.1027(l)(9)) - The employer shall provide the following information to the examining physician:

§1910.1027(l)(9)(i) - A copy of this standard and appendices;

§1910.1027(l)(9)(ii) - A description of the affected employee's former, current, and anticipated duties as they relate to the employee's occupational exposure to cadmium;

§1910.1027(l)(9)(iii) - The employee's former, current, and anticipated future levels of occupational exposure to cadmium;

> §1910.1027(l)(9)(iv) - A description of any personal protective equipment, including respirators, used or to be used by the employee, including when and for how long the employee has used that equipment; and
>
> §1910.1027(l)(9)(v) - Relevant results of previous biological monitoring and medical examinations.

Purpose: Making this information available to physicians assists them in evaluating a worker's health and fitness for specific job assignments involving Cd exposure. In the case of medical examinations administered in response to emergency exposures, the physician can use the exposure information to devise appropriate treatment.

Physician's Written Medical Opinion (§1910.1027(l)(10))

§1027(l)(10)(i) - The employer shall promptly obtain a written, medical opinion from the examining physician for each medical examination performed on each employee. This written opinion shall contain:

> §1910.1027(l)(10)(i)(A) - The physician's diagnosis for the employee;
>
> §1910.1027(l)(10)(i)(B) - The physician's opinion as to whether the employee has any detected medical condition(s) that would place the employee at increased risk of material impairment to health from further exposure to cadmium, including any indications of potential cadmium toxicity;
>
> §1910.1027(l)(10)(i)(C) - The results of any biological or other testing or related evaluations that directly assess the employee's absorption of cadmium;
>
> §1910.1027(l)(10)(i)(D) - Any recommended removal from, or limitation on the activities or duties of the employee or on the employee's use of personal protective equipment, such as respirators;
>
> §1910.1027(l)(10)(i)(E) - A statement that the physician has clearly and carefully explained to the employee the results of the medical examination, including all biological monitoring results and any medical conditions related to cadmium exposure that require further evaluation or treatment, and any limitation on the employee's diet or use of medications.

§1910.1027(l)(10)(ii) - The employer promptly shall obtain a copy of the results of any biological monitoring provided by an employer to an employee independently of a medical

examination under paragraphs (l)(2) and (l)(4), and, in lieu of a written medical opinion, an explanation sheet explaining those results.

§1910.1027(l)(10)(iii) - The employer shall instruct the physician not to reveal orally or in the written medical opinion given to the employer specific findings or diagnoses unrelated to occupational exposure to cadmium.

Purpose: The purpose in requiring the employer to obtain a physician's written opinion is to provide the employer with medical information to use in determining the worker's initial job assignments, and to assess the worker's ability to use protective clothing and equipment. The physician's written opinion also informs the employer about whether the worker has a condition indicating Cd overexposure; the prohibition against providing the employer with information regarding conditions unrelated to Cd exposure ensures that discussions between the physician and patient are open and candid, thereby enhancing diagnosis and treatment. The requirement that the physician's opinion be in writing ensures that the information is available for future reference. Providing workers with a copy of the physician's written opinion informs them of the medical-examination results so that they can determine the need for, and evaluate the effectiveness of, treatments and other interventions.

Medical Removal Protection (MRP) (§1910.1027(l)(11))

> §1910.1027(l)(11)(i)(D) - For any employee who is medically removed under the provisions of paragraph (l)(11)(i) of this section, the employer shall provide follow-up biological monitoring in accordance with (l)(2)(ii)(B) at least every three months and follow-up medical examinations semi-annually at least every six months until in a written medical opinion the examining physician determines that either the employee may be returned to his/her former job status as specified under (l)(11)(iv)-(v) or the employee must be permanently removed from excess cadmium exposure.
>
> §1910.1027(l)(11)(v) - However, when in the examining physician's opinion continued exposure to cadmium will not pose an increased risk to the employee's health and there are special circumstances that make continued medical removal an inappropriate remedy, the physician shall fully discuss these matters with the employee, and then in a written determination may return a worker to his/her former job status despite what would otherwise be unacceptably high biological monitoring results. Thereafter, the returned employee shall continue to be provided with medical surveillance as if he/she were still on medical removal until the employee's levels of CdU fall to or below 3 µg/g Cr, CdB falls to or below 5 µg/lwb, and β_2-M falls to or below 300 µg/g Cr.

Purpose: Medical removal prevents medical impairments induced or exacerbated by Cd from

becoming worse. In addition, medical removal allows workers who have these impairments an opportunity to recuperate and return to their former jobs.

Medical Removal Protection Benefits (§1926.1027(l)(12)

(§1926.1027(l)(12)(iii))

> (A) The employer shall make available to the employee a medical examination pursuant to this section in order to obtain a final medical determination as to whether the employee may be returned to his/her former job status or must be permanently removed from excess cadmium exposure; and
>
> (B) The employer shall assure that the final medical determination indicates whether the employee may be returned to his/her former job status and what steps, if any, should be taken to protect the employee's health.

Multiple Physician Review (§1910.1027(l)(13))

§1910.1027(l)(13)(i) - If the employer selects the initial physician to conduct any medical examination or consultation provided to an employee under this section, the employee may designate a second physician to:

> §1910.1027(l)(13)(i)(A) - Review any findings, determinations, or recommendations of the initial physician; and
>
> §1910.1027(l)(13)(i)(B) - Conduct such examinations, consultations, and laboratory tests as the second physician deems necessary to facilitate this review.

§1910.1027(l)(13)(ii) - The employer shall promptly notify an employee of the right to seek a second medical opinion after each occasion that an initial physician provided by the employer conducts a medical examination or consultation pursuant to this section. The employer may condition its participation in, and payment for, multiple physician review upon the employee doing the following within fifteen (15) days after receipt of this notice, or receipt of the initial physician's written opinion, whichever is later:

> §1910.1027(l)(13)(ii)(A) - Informing the employer that he or she intends to seek a medical opinion; and
>
> §1910.1027(l)(13)(ii)(B) - Initiating steps to make an appointment with a second physician.

§1910.1027(l)(13)(iii) - If the findings, determinations, or recommendations of the second physician differ from those of the initial physician, then the employer and the employee shall assure that efforts are made for the two physicians to resolve any disagreement.

§1910.1027(l)(13)(iv) - If the two physicians have been unable to quickly resolve their disagreement, then the employer and the employee, through their respective physicians, shall designate a third physician to:

> §1910.1027(l)(13)(iv)(A) - Review any findings, determinations, or recommendations of the other two physicians; and
>
> §1910.1027(l)(13)(iv)(B) - Conduct such examinations, consultations, laboratory tests, and discussions with the other two physicians as the third physician deems necessary to resolve the disagreement among them.

§1910.1027(l)(13)(v) - The employer shall act consistently with the findings, determinations, and recommendations of the third physician, unless the employer and the employee reach an agreement that is consistent with the recommendations of at least one of the other two physicians.

Purpose: OSHA believes that multiple-physician review improves worker participation in an employer's medical-surveillance program, thereby increasing early detection and treatment Cd-related diseases. However, program participation is strictly voluntary on the part of workers. If the medical opinion provided by the employer's physician could result in job removal, and no opportunity exists for workers to obtain a second medical opinion, many of them would refuse to participate in the medical-surveillance program.

Information the Employer Must Provide the Employee (§1910.1027(l)(15))

§1910.1027(l)(15)(i) - The employer shall provide a copy of the physician's written medical opinion to the examined employee within two weeks after receipt thereof.

§1910.1027(l)(15)(ii) - The employer shall provide the employee with a copy of the employee's biological monitoring results and an explanation sheet explaining the results within two weeks after receipt thereof.

§1910.1027(l)(15)(iii) - Within 30 days after a request by an employee, the employer shall provide the employee with the information the employer is required to provide the examining physician under paragraph (l)(9) of this section.

Reporting (§1910.1027(l)(16)

§1910.1027(l)(16) - Reporting. In addition to other medical events that are required to be reported on the OSHA Form No. 200, the employer shall report any abnormal condition or disorder caused by occupational exposure to cadmium associated with employment as specified in Chapter (V)(E) of the Reporting Guidelines for Occupational Injuries and Illnesses[2]

Purpose: This medical information allows workers to determine the need for, and to evaluate the effectiveness of, treatments and other interventions.

Communication of Cadmium Hazards to Employees (§1910.1027(m))

§1910.1027(m)(1) - Communication of cadmium hazards to employees—(1) Hazard communication.—general.

§1910.1027(m)(1)(i) -Chemical manufacturers, importers, distributors and employers shall comply with all requirements of the Hazard Communication Standard (HCS) (§1910.1200) for cadmium.

§1910.1027(m)(1)(ii) - In classifying the hazards of cadmium at least the following hazards are to be addressed: Cancer; lung effects; kidney effects; and acute toxicity effects.

§1910.1027(m)(1)(iii)- Employers shall include cadmium in the hazard communication program established to comply with the HCS (§1910.1200). Employers shall ensure that each employee has access to labels on containers of cadmium and to safety data sheets, and is trained in accordance with the requirements of HCS and paragraph (m)(4) of this section. [3]

Warning Signs (§1910.1027(m)(2))

§1910.1027(m)(2)(i) - Warning signs shall be provided and displayed in regulated areas. In addition, warning signs shall be posted at all approaches to regulated areas so that an employee may read the signs and take necessary protective steps before entering the area.

§1910.1027(m)(2)(ii) - Warning signs required by paragraph (m)(2)(i) of this section shall bear the following legend:

2OSHA accounts for employer burden hours and costs resulting from its recordkeeping requirements under the Information Collection Request (ICR) for its Recordkeeping Rule (§1910.1904), OMB Control No. 1218-0176.

3The Agency accounts for the burden hours and costs associated with compliance with the HCS, such as the development of a hazard communication program, under the Information Collection Request (ICR) for the HCS. OMB Control No. 1218-0072.

DANGER
CADMIUM
MAY CAUSE CANCER
CAUSES DAMAGE TO LUNGS AND KIDNEYS
WEAR RESPIRATORY PROTECTION IN THIS AREA
AUTHORIZED PERSONNEL ONLY

§1910.1027(m)(2)(iii) - The employer shall ensure that signs required by this paragraph (m)(2) are illuminated, cleaned, and maintained as necessary so that the legend is readily visible.

§1910.1027(m)(2)(iv) - Prior to June 1, 2016, employers may use the following legend in lieu of that specified in paragraph (m)(2)(ii) of this section:

DANGER
CADMIUM
CANCER HAZARD
CAN CAUSE LUNG AND KIDNEY DISEASE
AUTHORIZED PERSONNEL ONLY
RESPIRATORS REQUIRED IN THIS AREA

The Standard provides specific language for the required signs and labels, therefore, the Agency is exempted from estimating the burden hours and costs of this provision under 5 CFR 1320.3(c)(2) ("Controlling paperwork burden on the public").

Purpose: Posting warning signs informs workers that they are entering a regulated area, and that they must have proper authorization before entering such an area. Warning signs allow workers and others to take the precautions necessary to avoid harmful Cd exposures; in addition, the signs supplement worker training by specifying the limits of regulated areas.

Warning Labels (§1910.1027(m)(3))

§1910.1027(m)(3)(i) - Shipping and storage containers containing cadmium or cadmium compounds shall bear appropriate warning labels, as specified in paragraph (m)(1) of this section.

§1910.1027(m)(3)(ii) – The warning labels for containers of contaminated protective clothing, equipment, waste, scrap, or debris shall include at least the following information:

DANGER
CONTAINS CADMIUM
MAY CAUSE CANCER

CAUSES DAMAGE TO LUNGS AND KIDNEYS
AVOID CREATING DUST

§1910.1027(m)(3)(iii) - Prior to June 1, 2015, employers may include the following information on shipping and storage containers containing cadmium, cadmium compounds, or cadmium contaminated clothing, equipment, waste, scrap, or debris in lieu of the labeling requirements specified in paragraphs (m)(1)(i) and (m)(3)(ii) of this section:

DANGER
CONTAINS CADMIUM
CANCER HAZARD
AVOID CREATING DUST
CAN CAUSE LUNG AND KIDNEY DISEASE

§1910.1027(m)(3)(iv) - Where feasible, installed cadmium products shall have a visible label or other indication that cadmium is present.

The Standard provides specific language for the required signs and labels, therefore, the Agency is exempted from estimating the burden hours and costs of this provision under 5 CFR 1320.3(c)(2) ("Controlling paperwork burden on the public").

Purpose: Warning labels inform downstream employers and workers of the hazards associated with Cd, and that they may need to implement special practices to prevent or reduce Cd exposure. Furthermore, the labels alert downstream employers that they may have an obligation to protect their workers under the Standard.

Employee Information and Training (§1910.1027(m)(4))

The requirement that employers provide training to workers under paragraph (m)(4), except for the access provision of (m)(4)(iv)(A) and (B), is not considered to be a collection of information

> §1910.1027(m)(4)(iv)(A) - The employer shall make a copy of this section and its appendices readily available without cost to all affected employees and shall provide a copy if requested.
>
> OSHA considers this requirement be a public disclosure of information originally supplied by the Federal government to the employer for the purpose of disclosure to the public; therefore PRA does not define this as a collection of information (5 CFR 1320.3(c)(2).

> §1910.1027(m)(4)(iv)(B) - The employer shall provide to the Assistant Secretary or the Director, upon request, all materials relating to the employee information and the training program.

As previously discussed under Methods of Compliance (§1910.1027(f)), OSHA has determined that the requirement for employers to make information available upon request to the Assistant Secretary during an investigation is not subject to the PRA. Also, the Agency does not anticipate NIOSH to request employers to make available records during the approval period. Therefore, the burden for the employer to make this information available to NIOSH is zero.

Exposure Monitoring (§1910.1027(n)(1))

§1910.1027(n)(1)(i) - The employer shall establish and keep an accurate record of all air monitoring for cadmium in the workplace.

§1910.1027(n)(1)(ii) - This record shall include at least the following information:

> §1910.1027(n)(1)(ii)(A) - The monitoring date, duration, and results in terms of an 8-hour TWA of each sample taken;
>
> §1910.1027(n)(1)(ii)(B) - The name and job classification of the employees monitored and of all other employees whose exposures the monitoring is intended to represent;
>
> §1910.1027(n)(1)(ii)(C) - A description of the sampling and analytical methods used and evidence of their accuracy;
>
> §1910.1027(n)(1)(ii)(D) - The type of respiratory protective device, if any, worn by the monitored employee;
>
> §1910.1027(n)(1)(ii)(E) - A notation of any other conditions that might have affected the monitoring results.

§1910.1027(n)(1)(iii) - The employer shall maintain this record for at least thirty (30) years, in accordance with 29 CFR 1910.1020.

Purpose: Establishing and maintaining exposure monitoring records permit employers, workers, OSHA, and other interested parties to identify the levels, durations, and extent of cadmium exposure. Maintaining these records also assist OSHA in determining whether employers are complying with the standard, thereby ensuring that workers are receiving adequate protection from cadmium exposure.

Objective Data for Exemption from Requirement for Initial Monitoring (§1910.1027(n)(2))

§1910.1027(n)(2)(i) - For purposes of this section, objective data are information demonstrating that a particular product or material containing cadmium or a specific process, operation, or activity involving cadmium cannot release dust or fumes in concentrations at or above the action level even under the worst-case release conditions. Objective data can be obtained from an industry-wide study or from laboratory product test results from manufacturers of cadmium-containing products or materials. The data the employer uses from an industry-wide survey must be obtained under workplace conditions closely resembling the processes, types of material, control methods, work practices and environmental conditions in the employer's current operations.

§1910.1027(n)(2)(ii) - The employer shall establish and maintain a record of the objective data for at least 30 years.

Purpose: Maintaining these records allows OSHA to ascertain whether employers are complying with the Standard, thereby ensuring that workers are receiving adequate protection from Cd exposure. In addition, workers and their representatives have access to these records, thereby providing assurance that the employer's use of the objective data is reasonable.

Medical Surveillance (§1910.1027(n)(3))

§1910.1027(n)(3)(i) - The employer shall establish and maintain an accurate record for each employee covered by medical surveillance under paragraph (l)(1)(i) of this section.

§1910.1027(n)(3)(ii) - The record shall include at least the following information about the employee:

§1910.1027(n)(3)(ii)(A) - Name and description of the duties;

§1910.1027(n)(3)(ii)(B) - A copy of the physician's written opinions and an explanation sheet for biological monitoring results;

§1910.1027(n)(3)(ii)(C) - A copy of the medical history, and the results of any physical examination and all test results that are required to be provided by this section, including biological tests, X-rays, pulmonary function tests, etc., or that have been obtained to further evaluate any condition that might be related to cadmium exposure;

§1910.1027(n)(3)(ii)(D) - The employee's medical symptoms that might be related to exposure to cadmium; and

§1910.1027(n)(3)(ii)(E) - A copy of the information provided to the physician as required by paragraph (l)(9)(ii)-(v) of this section.

§1910.1027(n)(3)(iii) - The employer shall assure that this record is maintained for the duration of employment plus thirty (30) years, in accordance with 29 CFR 1910.1020.

Purpose: These records permit employers, workers, and other interested parties (e.g., worker representatives) to assess the effectiveness of exposure controls by conducting a proper evaluation of worker health, identify the development of Cd-related diseases, determine appropriate treatment and follow-up, and assess the effectiveness of medical interventions. The prolonged retention period (i.e., duration of employment plus 30 years) is necessary because of the long latency periods associated with the manifestation of Cd-related diseases.

Availability (§1910.1027(n)(4))

§1910.1027(n)(4)(i) - Except as otherwise provided for in this section, access to all records required to be maintained by paragraphs (n)(1)-(3) of this section shall be in accordance with the provisions of 29 CFR 1910.1020.[4]

§1910.1027(n)(4)(ii) - Within 15 days after a request, the employer shall make an employee's medical records required to be kept by paragraph (n)(3) of this section available for examination and copying to the subject employee, to designated representatives, to anyone having the specific written consent of the subject employee, and after the employee's death or incapacitation, to the employee's family members.

Purpose: Workers and their designated representatives use exposure-monitoring and medical-surveillance records to assess worker medical status over the course of employment, to evaluate the effectiveness of the employer's exposure-reduction program, and for other reasons. Accordingly, access to these records is necessary to provide both direct and indirect improvements in the detection, treatment, and prevention of Cd-related medical effects.

Transfer of Records (§1910.1027(n)(5))

4 The Agency has determined that the requirement for employers to make records available upon request to the Assistant Secretary is no longer considered a collection of information. OSHA typically requests access to records during an inspection, and information collected by the Agency during the investigation is not subject to the PRA under 5 CFR 1320.4(a)(2). While NIOSH may use records collected from employers for research purposes, the Agency does not anticipate NIOSH to request employers to make available records during the approval period. Therefore, the burden for the employer to make this information available to NIOSH is zero.

Whenever an employer ceases to do business and there is no successor employer to receive and retain records for the prescribed period or the employer intends to dispose of any records required to be preserved for at least 30 years, the employer shall comply with the requirements concerning transfer of records set forth in 29 CFR 1910.1020(h).

Purpose: Paragraph (h) of § 1910.1020 requires employers who cease to do business to transfer medical and exposure-monitoring records to the successor employer, who then must receive and maintain the records. If no successor employer is available, the employer must, at least three months before ceasing business, notify current workers who have records of their right to access these records.

OSHA considers the employer's transfer of records to a successor employer to be usual and customary communications during the transition from one employer to a successor employer. In this regard, the employer would communicate the location of all records, including worker exposure-monitoring and medical records, at the facility to the successor employer during the transfer of business operations, as a matter of usual and customary business practice.

3. Describe whether, and to what extent, the collection of information involves the use of automated, electronic, mechanical, or other technological collection techniques or other forms of information technology, e.g., permitting electronic submission of responses, and the basis for the decision for adopting this means of collection. Also describe any consideration of using information technology to reduce burden.

Employers may use electronic information technology when establishing and maintaining the required records, with the exception of training records (which require a signature). The Agency wrote the paperwork requirements of the Standard in performance-oriented language, i.e., in terms of what data to collect, not how to record the data.

4. Describe efforts to identify duplication. Show specifically why any similar information already available cannot be used or modified for use for the purposes described in Item A.2 above.

The information collection requirements of the Standard are specific to each employer and worker involved, and no other source or agency duplicates these requirements or can make the required information available to the Agency (i.e., the required information is available only from employers).

5. If the collection of information impacts small businesses or other small entities, describe any methods used to minimize burden.

The information collection requirements of the Standard do not have a significant impact on a substantial number of small entities.

6. Describe the consequence to Federal program or policy activities if the collection is not conducted or is conducted less frequently, as well as any technical or legal obstacles to reducing burden.

The information collection frequencies specified by the Standard are the minimum frequencies that the Agency believes are necessary to ensure that employers and OSHA can effectively monitor the exposure and health status of workers, thereby preventing serious illness or death resulting from hazardous Cd exposure.

7. Explain any special circumstances that would cause an information collection to be conducted in a manner:

- **Requiring respondents to report information to the agency more often than quarterly;**
- **Requiring respondents to prepare a written response to a collection of information in fewer than 30 days after receipt of it;**
- **Requiring respondents to submit more than an original and two copies of any document;**
- **Requiring respondents to retain records, other than health, medical, government contract, grant-in-aid, or tax records, for more than three years;**
- **In connection with a statistical survey that is not designed to produce valid and reliable results that can be generalized to the universe of study;**
- **Requiring the use of a statistical data classification that has not been reviewed and approved by OMB;**
- **That includes a pledge of confidentiality that is not supported by authority established in statute or regulation, that is not supported by disclosure and data security policies that are consistent with the pledge, or which unnecessarily impedes sharing of data with other agencies for compatible confidential use; or**
- **Requiring respondents to submit proprietary trade secret, or other confidential information unless the agency can demonstrate that it has instituted procedures to protect the information's confidentiality to the extent permitted by law.**

Under paragraph (d)(5) of the Standard, employers must inform workers, either individually in writing or by posting the exposure monitoring results, no later than 15 working days after obtaining the results. If these results indicate that a worker's exposures are above the PEL, the notification must state this fact and describe what corrective actions the employer is taking to reduce the worker’s exposure to or below the PEL. (In addition, under OSHA’s Access to Employee Exposure and Medical Records Standard (§1910.1020), employers must maintain the exposure monitoring results for 30 years.

Additionally, paragraph (l)(15) of the Standard requires employers to provide workers with a

copy of the physician's written opinion regarding their medical examination and a copy of the worker's biological monitoring results, including a written explanation of the results, within two weeks of obtaining the results.

8. If applicable, provide a copy and identify the date and page number of publication in the Federal Register of the Agency's notice, required by 5 CFR 1320.8(d), soliciting comments on the information collection prior to submission to OMB. Summarize public comments received in response to that notice and describe actions taken by the Agency in response to these comments. Specifically address comments received on cost and hour burden.

Describe efforts to consult with persons outside the Agency to obtain their views on the availability of data, frequency of collection, the clarity of instructions and recordkeeping, disclosure, or reporting format (if any), and on the data elements to be recorded, disclosed, or reported.

Consultation with representatives of those from whom information is to be obtained or those who must compile records should occur at least once every 3 years-even if the collection of information activity is the same as in prior periods. There may be circumstances that may preclude consultation in a specific situation. These circumstances should be explained.

In accordance with 5 CFR 1320.11, OSHA has submitted a revised Cadmium in General Industry (29 CFR 1910.1027) Information Collection Request (ICR) to the Office of Management and Budget (OMB) for the Standards Improvement Project–Phase IV (SIP-IV) rulemaking.

OSHA sought public comment on revisions to this package when the Agency published the SIP-IV NPRM on October 4, 2016 (81 FR 68504). The Agency received no comments in response to this notice during the comment period for the NPRM.

This ICR seeks OMB approval for changes to the collection in accordance with the SIP-IV Final Rule, which is one of OSHA's Standards Improvement Projects. These projects review existing safety and health standards in response to Executive Order 13563, "Improving Regulation and Regulatory Review" (76 FR 3821). They are intended to improve and streamline OSHA standards by removing or revising requirements that are confusing or outdated, or that duplicate, or are inconsistent with, other standards. The goal of the SIP-IV Final Rule is to reduce regulatory burden while maintaining or enhancing worker safety and health.

9. Explain any decision to provide any payment or gift to respondents, other than remuneration of contractors or grantees.

The Agency will <u>not</u> provide payments or gifts to the respondents.

10. Describe any assurance of confidentiality provided to respondents and the basis for the assurance in statute, regulation, or agency policy.

To ensure that the personal information contained in medical records required by the Standard remains confidential, the Agency developed and implemented 29 CFR 1913.10 ("Rules of agency practice and procedure concerning OSHA access to worker medical records") to regulate access to these records.

11. Provide additional justification for any questions of a sensitive nature, such as sexual behavior and attitudes, religious beliefs, and other matters that are commonly considered private. This justification should include the reason sons why the agency considers the questions necessary, the specific uses to be made of the information, the explanation to be given to persons from whom the information is requested, and any steps to be taken to obtain their consent.

Perceived questions of a sensitive nature may be included in medical questionnaires. Information from medical questionnaires is necessary for the PLHCP or physician, or employer, to determine what protections an employer must take to ensure that the employee will have minimal occupational exposure to hazards such as, insufficient oxygen environments, harmful dusts, fogs, smokes, mists, gases, vapors, and sprays.

12. Provide estimates of the hour burden of the collection of information. The statement should:

- Indicate the number of respondents, frequency of response, annual hour burden, and an explanation of how the burden was estimated. Unless directed to do so, agencies should not conduct special surveys to obtain information on which to base hour burden estimates. Consultation with a sample (fewer than 10) of potential respondents is desirable. If the hour burden on respondents is expected to vary widely because of differences in activity, size, or complexity, show the range of estimated hour burden, and explain the reasons for the variance. Generally, estimates should not include burden hours for customary and usual business practices.

- If this request for approval covers more than one form, provide separate hour burden estimates for each form and aggregate the hour burdens.

- Provide estimates of annualized cost to respondents for the hour burdens for collections of information, identifying and using appropriate wage-rate categories.

An overview of the exposure profile underlying the calculations of burden hours is shown in Tables 1 and 2. A previous ICR update noted that this exposure profile was comprehensively updated in 2010. Because of this, the Agency based its updated estimates of the number potentially exposed workers on cadmium consumption estimates for the period from 2010 and 2014, as reported in the U.S. Geological Survey (USGS) *Mineral Commodity Summaries* (2011 and 2015), which report that U.S. domestic consumption of cadmium decreased over 57.3 percent since 2010 (from 572 to 244 metric tons).[5] The USGS Mineral Commodity Summary

5Documents available at: http://minerals.usgs.gov/minerals/pubs/mcs/2011/mcs2011.pdf and http://minerals.usgs.gov/minerals/pubs/mcs/2015/mcs2015.pdf .

from 2015 withheld data for the year 2014 in a number of places in order to avoid disclosing company proprietary data. Since the data was necessary to calculate updated exposure profile, average historic ratio of "Imports for Consumption (Metals only)" to "Consumption of metal, apparent" was used to calculate "Consumption of metal, apparent". Similarly, average historic ratio of "Production, refinery" to "Imports for consumption – Metal only" was used to calculate "Production, refinery" for 2014.[6] The USGS reports that the percentage of cadmium consumed globally for Nickel-Cadmium (NiCd) battery production has increased in recent years, while the percentages for other traditional end uses of cadmium—specifically coatings, pigments, and stabilizers—have gradually decreased in response to environmental and health concerns. However, the Agency estimates a decrease in the U.S. domestic consumption of cadmium batteries.[7]

From 2010 to 2014, the Agency estimates that workers in cross-country sectors exposed at or above the action level have increased from 35,926 to 40,476 workers and the number of workers exposed at or above the PEL in cross-country sectors has increased from 24,620 to 29,467 workers. In the specific-industry sectors the number of workers exposed at or above the action level increased from 11,072 to 11,201 and the number of workers exposed at or above the PEL in the specific industry sectors has increased from 10,828 to 11,088 workers. During this period, the Agency estimates that the number of cadmium-specific industry plants stayed the same at 4,887 plants. In addition, the Agency estimates that the number of cross-industry plants also stayed the same at 44,847, for the period from 2010 to 2014.

Additional information and discussion can be found in Tables 1 and 2. Table 3 below provides a summary of burden hour and cost estimates for the information collection requirements specified by the Standard.

Table 1. Exposure Profile for Cadmium: Specific Industry Sectors

Specific-Industry Sector[i]	2010 Estimates			2014 Estimates		
	# Plants [ii]	Total	Only those	# Plants [ii]	Total	Only those

6 Some of the terms used for reporting salient statistics for Cadmium were changed in USGS, 2015 from previous summary reports. "Metal", "Alloys" and "Scrap" have been renamed "Unwrought cadmium and powder", "Wrought cadmium and other articles (gross weight)", and "Cadmium waste and scrap (gross weight)" respectively.

7 USGS, 2015 reported that more than 80 percent of total cadmium is used in batteries. Hence, the agency estimated that 83 percent of total cadmium, which is the same as that reported in USGS 2009, is used in batteries. Although the percentage of cadmium use in batteries is assumed to stay the same from 2010 to 2014, because of the significant overall decrease in the U.S. domestic use of cadmium, use of batteries is estimated to have decreased over the same time period. (For additional information, see Table 1, endnote iii.)

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		EEs ≥ AL	EEs ≥ PEL		EEs ≥ AL	EEs ≥ PEL
NiCd Batteries[iii]	1	307	245	0	131	105
Zn/Cd Refining[iv]	3	647	518	2	324	259
Pigments[v]	1	16	13	0	7	6
Stabilizers[vi]	1	7	6	1	3	3
Lead Smelting/ Refining[vii]	3	303	303	3	292	292
Platers[viii]	98	74	25	42	32	11
Utilities[ix]	4, 700	4,059	4, 059	4, 762	4, 078	4, 078
Iron & Steel[x]	80	5,659	5, 659	77	6, 334	6, 334
Total	**4, 887**	**11,072**	**10, 828**	**4, 887**	**11, 201**	**11, 088**

[i] Those industries that have at least one plant with slightly different requirements due to a legal settlement agreement have been marked in italics.

[ii] Unless otherwise noted, the Agency was unable to locate updated information regarding the number of plants covered by the Standard. As such, previous estimates have been adjusted by the same proportion the consumption of cadmium changed from 2010 to 2014. (Because the estimated number of stabilizer establishments is less than 1, it was rounded to 1.)

[iii] The Agency estimates that cadmium consumption for batteries decreased by 57.3 percent from 2010 to 2014; the Agency assumes that the number of exposed workers has decreased by 57.3 percent as well. (USGS reports that of total cadmium consumption in 2010 (estimated at 572 metric tons), 83 percent was for batteries (estimated at 474.8 metric tons). It is assumed that of total cadmium consumption in 2014 (244 metric tons), 83 percent was for batteries (estimated at 202.52 metric tons) – the same percentage as for the year 2009, which is the latest data available. USGS,reported that cadmium use for NiCd batteries accounted for more than 80 percent of global consumption hence, the 83 percent from USGS, 2009 was used. The 57.3 percent decrease was calculated as follows: (474.76- 202.52 / 474.76). (Sources: 2015, http://minerals.usgs.gov/minerals/pubs/mcs/2009/mcs2009.pdf, http://minerals.usgs.gov/minerals/pubs/mcs/2011/mcs2011.pdf, http://minerals.usgs.gov/minerals/pubs/mcs/2015/mcs2015.pdf.)

[iv] USGS reports three companies in the United States produced refined cadmium in 2014. Cadmium production in the U.S. decreased by 39 percent from 2010 to 2014 while zinc production fluctuated slightly but remained relatively stable; because the Agency is unable to determine what percentage of potentially exposed workers are engaged in zinc or cadmium refining, the Agency assumes that the number of exposed workers has decreased by 50 percent. (Source: http://minerals.usgs.gov/minerals/pubs/mcs/2011/mcs2011.pdf, http://minerals.usgs.gov/minerals/pubs/mcs/2012/mcs2012.pdf, http://minerals.usgs.gov/minerals/pubs/mcs/2015/mcs2015.pdf.)

[v] The Agency estimates that cadmium consumption for pigments decreased by 57.3 percent from 2010 to 2014;

the Agency assumes that the number of exposed workers has decreased by 57.3 percent as well. (USGS reports that of total cadmium consumption in 2010 (estimated at 572 metric tons), 8 percent was for pigments (estimated at 45.76 metric tons). It is assumed that of total cadmium consumption in 2014 (244 metric tons), 8 percent was for pigments (estimated at 19.5 metric tons) – the same percentage as for the year 2009, which is the latest data available. Therefore, the 57.3 percent decrease was calculated as follows: (45.8 -19.5/ 45.8). (Sources: Same as endnote iii, above.)

[vi] USGS reports that cadmium consumption for use in stabilizers for plastics declined 57.3 percent from 2010 to 2014 (from an estimated 6.9 metric tons to 2.9 metric tons). The Agency assumes that the number of exposed workers has decreased by 57.3 percent as well. (Source: http://minerals.usgs.gov/minerals/pubs/mcs/2011/mcs2011.pdf and http://minerals.usgs.gov/minerals/pubs/mcs/2015/mcs2015.pdf.)

[vii] USGS reports that estimated employment at primary and secondary lead smelters and refineries decreased 3.5 percent from 2010 to 2014 (from an estimated 1,840 to 1,775 workers). The Agency assumes that the number of exposed workers has decreased by 3.5 percent as well. (Source: http://minerals.usgs.gov/minerals/pubs/mcs/2011/mcs2011.pdf and http://minerals.usgs.gov/minerals/pubs/mcs/2015/mcs2015.pdf.)

[viii] USGS reports that cadmium consumption for use in coatings and plating decreased by 57.3 percent from 2010 to 2014 (from 40.04 metric tons to 17.08 metric tons). The Agency assumes that the number of plants and exposed workers has decreased by 57.3 percent as well. (Source: http://minerals.usgs.gov/minerals/pubs/mcs/2011/mcs2011.pdf and http://minerals.usgs.gov/minerals/pubs/mcs/2015/mcs2015.pdf.)

[ix] U.S. Census Bureau, County Business Patterns Survey reports that the total number of workers employed in NAICS 221 has increased 0.5 percent from 2010 to 2012, while the total number of establishments has increased by1.3 percent. The Agency assumes that the number of exposed workers and plants has increased by 0.5 percent and increased by 1.3 percent, respectively.

[x] US Census Bureau, County Business Patterns Survey reports that the total number of workers employed in NAICS 331110 has increased 11.92 percent from 2010 to 2012, while the total number of establishments has decreased 4.3 percent over the same time period[8]. The Agency assumes that the number of exposed workers has increased11.92 percent as well, while the number of plants has decreased 4.3 percent.

8 2007 NAICS 331111Iron and Steel Mills no longer exists. The NAICS is now included under 2012 NAICS 331110 Iron and Steel Mills and Ferroalloy Manufacturing, which also includes 2007 NAICS 331112 Electrometallurgical Ferroalloy Product Manufacturing.

Table 2. Exposure Profile for Cadmium: Cross Industry Occupation [xi]

Cross-Industry Occupations	2010 Estimates		2014 Estimates	
	# EEs ≥ AL	# EEs ≥ PEL	# EEs ≥ AL	# EEs ≥ PEL
Chemical Mixers[xii]	2,056	1,370	877	584
Electroplaters[xiii]	151	76	64	32
Furnace Operators[xiv]	2,022	1,347	2,772	1,846
Kiln/Kettle Operators[xv]	77	77	86	86
Heat Treaters[xvi]	409	293	469	336
Equipment Cleaners [xvi]	97	39	70	29
Metal Machining[xvii]	4,669	4,669	8,131	8,131
Painters[xviii]	815	543	348	232
Repair/Utilities[xix]	14,498	5,074	14,566	5,098
Weld/Braze/Solders[xx]	11,132	11,132	13,093	13,093
Total	**35,926**	**24,620**	**40,476**	**29,467**

[xi] Given that the number of plants estimated in Table 1 remained the same, , the Agency estimates that for the ten cross-industry occupations, the number of plants using cadmium also remained the same at 44,847.

[xii] Given the overall 57.3 percent decrease in cadmium consumption from 2010 to 2014, the Agency assumes that the number of exposed chemical mixers has declined 57.3 percent as well. (Source: http://minerals.usgs.gov/minerals/pubs/mcs/2009/mcs2009.pdf, http://minerals.usgs.gov/minerals/pubs/mcs/2011/mcs2011.pdf and http://minerals.usgs.gov/minerals/pubs/mcs/2015/mcs2015.pdf.)

[xiii] As described above in endnote viii to Table 1, the consumption of cadmium for use in coating and plating decreased by 57.3 percent from 2010 to 2014. The Agency assumes that the number of electroplaters exposed to cadmium declined by 57.3 percent as well. (Source: http://minerals.usgs.gov/minerals/pubs/mcs/2009/mcs2009.pdf, http://minerals.usgs.gov/minerals/pubs/mcs/2011/mcs2011.pdf and http://minerals.usgs.gov/minerals/pubs/mcs/2015/mcs2015.pdf.)

[xiv] According to the BLS Occupational Employment Statistics Program (OES), National Occupational Employment and Wage Estimates, total employment for metal-refining furnace operators and tenders (SOC 51-4051) increased by 37.1 percent from 2010 to 2014. The Agency assumes that the total number of exposed workers in this occupational category has declined by 37.1 percent as well.

[xv] According to BLS' OES, total employment for furnace, kiln, oven, drier, and kettle operators and tenders (SOC 51-9051) increased by 11.54 percent from 2010 to 2014. The Agency assumes that the total number of exposed workers in this occupational category has increased by 11.5 percent as well.

[xvi] According to BLS' OES, total employment for "heat treating equipment setters, operators, and tenders, metal and plastic" (SOC 51-4191) increased by 14.6 percent from 2010 to 2014. The Agency assumes that the total number of exposed workers in this occupation category has increase by 14.6 percent as well.

[xvi] OSHA calculated the percentage change from 1999 to 2014 of the number of employees exceeding the AL (decrease of 28 percent) and the PEL (decrease of 27 percent) for all occupations in Table 2 other than Equipment Cleaners and applied the percentage changes to the baseline/1999 values for Equipment Cleaners.

[xvii] According to BLS' OES, total employment in machine operating, setting, and tending occupations (SOC 51-4021 through 51-4035) increased by 74.1 percent from 2010 to 2014. The Agency assumes that the total number of exposed workers in this occupational category has increased by 74.1 percent as well.

[xviii] Given the 57.3 percent decline in cadmium consumption for pigments from 2010 to 2014 as discussed in endnote 5, the Agency assumes that the total number of exposed workers in this occupational category has declined 57.3 percent as well.

[xix] As discussed in endnote iv to Table 1, the total number of workers employed in NAICS 221 increased 0.5 percent from 2010 to 2012. The Agency assumes that the number of exposed workers has increased 0.5 percent as well.

[xx] According to BLS' OES, total employment in SOC 51-4121 (Welders, Cutters, Solderers, and Brazers) has increased by 17.6 percent from 2010 to 2014. The Agency assumes that the total number of exposed workers in this occupational category has increased by 17.6 percent as well.

BURDEN HOUR AND COST DETERMINATIONS

The Agency adopted the mean wage rates from *"National Occupational Employment and Wage Estimates, May 2014,"* U.S. Department of Labor, Bureau of Labor Statistics.[9] Total compensation for these occupational categories includes an adjustment of 31.7 percent for fringe benefits[10]; this figure represents the average level of fringe benefits for the civilian workers. The costs of labor used in this analysis are, therefore, estimates of total hourly compensation. These hourly wages[11] are:

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9 Source: Bureau of Labor Statistics, *National Occupational Employment and Wage Estimates United States, May 2014*. http://www.bls.gov/oes/release_archive.htm.

10 Source: Bureau of Labor Statistics. *National Compensation Survey*. *Employer Costs for Employee Compensation – March 2015*. (Source: http://www.bls.gov/news.release/archives/ecec_06102015.htm).

11The occupational codes for these wage categories are as follows: for supervisors, 51-1011, "First-Line Supervisors of Production and Operating Workers"; for non-supervisory production workers, 51-0000, "Production Occupations"; for secretarial workers, 43-0000, "Office and Administrative Support Occupations"; and for industrial hygienist technicians, 29-2011 and 29-2012, "Medical and Clinical Laboratory Technologists" and "Medical and Clinical Laboratory Technicians" respectively.

- Supervisors $41.57
- Non-supervisory production workers $24.98
- Secretarial workers $25.01
- Industrial hygienist technicians $35.65

Exposure monitoring (§1910.1027(d))

General and Initial Monitoring (§1910.1027(d)(1) and (d)(2)(i))

While some new plants (utility companies) are estimated in Table 1, it is expected that these employers, based on the experiences and objective data of others in their industry, will assume that exposures above the action level will occur for the same types of occupations, and will act accordingly in terms of performing periodic and additional monitoring, which is reflected in the estimates below. Thus, no new burden is shown for the initial determination.

Objective Data (§1910.1027(d)(2)(iii))

As noted above, new utility plants are assumed to rely on objective data of others in the industry. The number of utility plants has increased from 4,700 (estimate from the 2012 ICR) to 4,762, approximately 16 per year. OSHA estimates that a supervisor at each new facility spends one hour to gather the necessary documentation to meet the objective data requirements:

Burden hours: 16 new firms x 1 hour = 16 hours
Cost: 16 hours x $41.57 = $665

Periodic Monitoring (§1910.1027(d)(3))

Based on the data in Tables 1 and 2, OSHA estimates that 51,677 workers are exposed above the AL, and that an industrial hygiene technician can monitor 10 workers with one sample. Each sample (every six months) takes 30 minutes (0.5 hour) for an industrial hygienist technician to collect and mail to a laboratory for analysis. Thus, the estimated burden hours and cost of this provision each year are:

Burden hours: (51,677 workers ÷ 10) × 2 samples/year × 0.5 hour = 5,168 hours
Cost: 5,168 hours × $35.65= $184,291

Additional Monitoring (§1910.1027(d)(4))

The Agency estimates that an additional 103 monitoring samples (one percent of the 10,335 periodic monitoring samples (51,677/10 x 2 samples/year)) are performed each year by an industrial hygiene technician. The yearly burden hours and cost of this requirement are estimated as:

Burden hours: 103 monitoring samples × 0.5 hour = 52 hours
Cost: 52 hours × $35.65= $1,854

Employee Notification of Monitoring Results (§1910.1027(d)(5))

The Agency believes that a secretary takes five minutes (0.08 hour) to post and maintain the worker exposure-monitoring results. Each of the 4,887 specific-industry establishments involved with cadmium (see Table 1) have workers exposed above the PEL and must conduct at least semi-annual monitoring. In addition, the Agency estimates that each of the 44,847 cross-industry plants (see Table 2, footnote xi) conduct semi-annual exposure monitoring. Finally, the Agency assumes each of the 103 additional monitoring samples is in a separate plant. Thus, the annual estimated burden hours and cost for this provision are:

Burden hours: ((4,887 + 44,847) × 2 semi-annual) + 103) × 0.08 hours = 7,966 hours
Cost: 7,966 hours × $25.01 = $199,230

Compliance Program (§1910.1027(f)(2))

Employers must review and update their written compliance plans at least annually. The Agency estimates that a supervisor spends 1.5 hours updating the program, resulting in a yearly burden-hour and cost estimate of:

Burden hours: 4,887 plants × 1.5 hours = 7,331 hours
Cost: 7,331 hours × $41.57 = $304,750

For the 10 cross-industry occupations, located in 44,847 plants, a written compliance plan is required for those plants for which exposures are above the PEL. The Agency estimates that 20% of the 44,847 plants must be covered by a written compliance plan, yielding 8,969 plants. Because plants with cross-industry occupations generally have limited cadmium exposures, the compliance plan is expected to be less extensive than plans for the specific industry sector plants. Therefore, OSHA estimates that it takes only one hour to update and revise the written plan. The yearly burden-hour and cost estimates for this requirement are:

Burden hours: 8,969 plants × 1 hour = 8,969 hours
Cost: 8,969 hours × $41.57 = $372,841

Emergency Situations (§1910.1027(h))

OSHA believes that no substantial releases of Cd occur under emergency situations. Therefore, the Agency is assuming that this provision imposes no annual burden hours or cost on employers.

Notification of Laundry Personnel (§1910.1027(i)(3)(v))

The Agency assumes that employers change laundries infrequently; accordingly, the need to provide the specified information to those who clean and launder Cd-contaminated protective clothing or equipment is minimal. Thus, OSHA concludes that this requirement results in no burden hours or cost to employers.

Medical Surveillance (§1910.1027(l))

Initial Examination; Actions Triggered by Initial Biological Monitoring; Periodic Medical Surveillance; Actions Triggered by Medical Examinations; Examinations for Respirator Use; Emergency Examinations; and Termination of Employment Examination (§1910.1027(l)(2) through (§1910.1027(l)(8))

The Standard requires that employers must provide at least one medical exam to the 51,677 workers who are exposed to cadmium above the AL once every two years. The Agency assumes that it will take 1.5 hours of worker time (at $24.98 per hour) to have a medical exam (which includes 30 minutes of travel time). The annual burden hours and cost estimated for these requirements are:

Burden hours: 51,677 workers ÷ 2 × 1.5 hours = 38,758 hours[12]
Cost: 38,758 hours × $24.98 = $968,175

Based on the 1992 Regulatory Impact Analysis (RIA), in conjunction with updated employment data, OSHA believes that an additional 208 medical exams are administered each year.[13] These 208 exams cover the following areas: respirator use, emergencies, medical removal, multiple physician review, alternate physician determination, and termination of employment. The yearly burden-hour and cost estimates for these exams are:

12 These hours include the 15 minutes to fill out the forms at the doctor's office. (51,677 workers ÷ 2 x 0.1667 = 6,460 hours of form time)

13Based on data presented in Tables 1 and 2, the Agency is estimating a total increase in employment of 19.7 percent from 2010 to 2014; the Agency assumes that the total number of additional medical exams will increase by 19.7 percent as well.

Burden hours: 208 examinations × 1.5 hours = 312 hours[14]
Cost: 312 hours × $24.98 = $7,794

Based on the 1992 RIA, in conjunction with the updated employment data, OSHA estimates that 2,441 biological-monitoring tests are administered each year.[15] The 2,441 tests consist of 814 tests for each of the following: β_2-MU, CdU, and CdB. A worker can receive all three tests in one visit to the physician. The Agency estimates that it will take 45 minutes (0.75 hour) for a worker to receive the three biological tests, including 30 minutes (0.5 hour) of worker travel time. The estimated burden hours and cost each year for these tests are:

Burden hours: 2,441 ÷ 3 tests per visit × 0.75 hour = 610 hours
Cost: 610 hours × $24.98 = $15,238

Information Provided to Physician (§1910.1027(l)(9))

The Agency assumes that employers provide the required information to the physician prior to each medical examination and biological-monitoring collection (i.e., urine and blood collections combined). Therefore, employers must provide this information before the total 26,861 medical examinations and biological tests (25,839 annual examinations + 208 additional medical examinations + 814 worker visits for 3 biological tests). Assuming that a secretary requires five minutes (0.08 hour) to compile and send the information to the physician prior to each administration, and to maintain the information, the annual burden-hour and cost estimates for this paperwork requirement are:

Burden hours: 26,861 administrations × 0.08 hour = 2,149 hours
Cost: 2,149 hours × $25.01 = $53,746

Physician's Written Medical Opinion (§1910.1027(l)(10))

OSHA assumes that the physician writes an opinion for each medical examination and one opinion for the biological-monitoring tests administered (for a total of 26,861 written opinions annually), and that a secretary takes five minutes (0.08 hour) to distribute a written opinion to a worker and maintain the record. The estimated yearly burden hours and costs of this requirement are:

14 These hours include the 15 minutes to fill out the forms at the doctor's office. (208 x 0.25 = 52 hours of form time. The grand total of form time is 6,460 hrs. + 52 hrs. = 6,512 hours)

15As discussed in footnote 12, the Agency estimates a total increase in employment of 19.7 percent; the Agency assumes that the total number of biological monitoring tests will increase by 19.7 percent as well.

Burden hours: 26,861 written opinions × 0.08 hour = 2,149 hours
Cost: 2,149 hours × $25.01 = $53,746

Communication of Cadmium Hazards to Employee (§1910.1027(m))

Warning Signs and Labels (§1910.1027(m)(2) and (m)(3))

See Item 2, above.

Employee Information and Training (§1910.1027(m)(4))

See Item 2, above.

Recordkeeping (§1910.1027(n))

Exposure Monitoring (§1910.1027(n)(1))

The Agency assigned the burden hours and costs of this recordkeeping requirement to paragraph (d)(5) (see "Employee Notification of Monitoring Results (§1910.1027(d)(5)" above)).

Objective Data for Exemption from Requirement for Initial Monitoring (§1910.1027(n)(2))

The Agency assumes that the burden is minimal for employers to maintain objective data once the data has been developed. Burden for employers to develop such data is accounted for under "Objective Data (§1910.1027(d)(2)(iii)."

Medical Surveillance (§1910.1027(n)(3))

The Agency assigned the burden hours and cost of this recordkeeping requirement to paragraphs (l)(9) and (l)(10). (See "Information Provided to Physician (§1910.1027 (l)(9))" and "Physician's Written Opinion (§ 1910.1027(l)(10)" above.)

Availability (§1910.1027(n)(4))

The Agency assumes that 10% (31,473 of the 314,728 workers potentially exposed to Cd request to see their records each year.[16] OSHA estimates that a secretary requires five minutes (0.08 hour) to make these records available to each worker, for a total of 2,518 hours. Therefore, the estimated annual burden hours and cost for this requirement are:

16This figure includes parties acting on an employee's behalf (i.e., their designated representatives, parties with the employee's written consent, and family members).

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Burden hours: 31,473 workers x .08 hour = 2,518 hours
Cost: 2,518 hours × $25.01 = $62,975

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Table 3 – Summary of Requested Annual Burden Hour and Cost Estimates

Collection of Information	Responses	Time	Burden Hours	Wage Rate	Estimated Cost
Exposure Monitoring					
Initial Monitoring					
Objective Data	16	1 hour	16	$41.57	$665
Monitoring Frequency (Periodic Monitoring)	10,335	0.5 hour	5,168	$35.65	$184,291
Additional Monitoring	103	0.5 hour	52	$35.65	$1,854
Employee Notification of Monitoring Results	99,571	0.08 hour	7,966	$25.01	$199,230
Compliance Program	4,887	1.5 hours	7,331	$41.57	$304,750
	8,969	1 hour	8,969	$41.57	$372,841
Emergency Situations	0	0	0	0	0
Notification of Laundry Personnel	0	0	0	0	0
Medical Surveillance					
Initial Examination; Actions Triggered by Initial Biological Monitoring;	25,839	1.5 hours	38,758	$24.98	$968,175
Periodic Medical Surveillance; Actions Triggered by Medical Examinations	208	1.5 hours	312	$24.98	$7,794
Additional Examinations; Emergency Examinations (biological-monitoring collection)	814	0.75 hour	610	$24.98	$15,238

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Collection of Information	Responses	Time	Burden Hours	Wage Rate	Estimated Cost
Information Provided to the Physician	26,861	0.08 hour	2,149	$25.01	$53,746
Physician's Written Medical Opinion	26,861	0.08 hour	2,149	$25.01	$53,746
Communication of Cd Hazards to Employees					
Warning Signs and Warning Labels	0	0	0	0	0
Employee Information and Training	0	0	0	0	0
Recordkeeping					
Exposure Monitoring	0	0	0	0	0
Medical Surveillance	0	0	0	0	0
Availability	31,473[17]	0.08 hour	2,518	25.01	$62,975
Totals	**235,937**[18]		**75,998**		**$2,225,305**

17 This value was incorrect in Table 3 of the 2015 ICR, where it was reported as 32,169. A correction has been made here, to report the correct value of 31,473 responses. Neither burden hours nor estimated cost was affected by this error in the previous ICR.

18 This value was incorrect in Table 3 of the 2015 ICR, where it was reported as 236,630. A correction has been made here, to report the correct value of 235,937. Neither burden hours nor estimated cost was affected by these errors in the previous ICR.

13. Provide an estimate of the total annual cost burden to respondents or recordkeepers resulting from the collection of information. (Do not include the cost of any hour burden shown in Items 12 and 14).

- The cost estimate should be split into two components: (a) a total capital and start-up cost component (annualized over its expected useful life); and (b) a total operation and maintenance and purchase of service component. The estimates should take into account costs associated with generating, maintaining, and disclosing or providing the information. Include descriptions of methods used to estimate major cost factors including system and technology acquisition, expected useful life of capital equipment, the discount rate(s), and the time period over which costs will be incurred. Capital and start-up costs include, among other items, preparations for collecting information such as purchasing computers and software; monitoring, sampling, drilling and testing equipment; and record storage facilities.

- If cost estimates are expected to vary widely, agencies should present ranges of cost burdens and explain the reasons for the variance. The cost of purchasing or contracting out information collection services should be a part of this cost burden estimate. In developing cost burden estimates, agencies may consult with a sample of respondent (fewer than 10), utilize the 60-day pre-OMB submission public comment process and use existing economic or regulatory impact analysis associated with the rulemaking containing the information collection, as appropriate.

- Generally, estimates should not include purchases of equipment or services, or portions thereof, made: (1) prior to October 1, 1995, (2) to achieve regulatory compliance with requirements not associated with the information collection, (3) for reasons other than to provide information or keep records for the government, or (4) as part of customary and usual business or private practices.

Capital Cost Determinations

In determining the capital cost of these paperwork requirements, OSHA used the information and data from Item 12 above. From these determinations, the Agency estimates that the total capital cost of these requirements is $5,407,985.

(A) Exposure Monitoring

Based on information from a laboratory in New York, the cost for a laboratory to analyze air-monitoring samples for Cd is approximately $37 per sample[19]. According to the information provided under "Exposure Monitoring (§1910.1027(d))" above, employers collect 5,168 representative exposure-monitoring samples twice a year, for a total of 10,336 samples, as well as an additional 103 exposure-monitoring samples annually. The capital cost each year associated with obtaining these exposure-monitoring samples is:

Cost: (10,336 samples + 103 samples) × $37 = $386,243

19Galson Laboratories, 2015. Sampling & Analysis Guide. Available at http://www.galsonlabs.com/samplinganalysis/sampling-analysis-guide/ (Accessed March 13, 2015).

(B) Medical Surveillance

The cost for the medical exam required by the Standard is estimated to be $190 per exam.[20] For biological testing, costs are as follows: β_2-MU - $32; CdU - $53; and CdB - $53.[21] According to "Medical Surveillance (§1910.1027(l))" above, employers provide 25,839 annual medical examinations, 208 additional medical examinations, and analyze 2,442 biological-monitoring samples for CdU, CdB, and β_2-MU.[22] The yearly capital cost of the medical-surveillance requirements is:

Cost: (25,839 medical examinations × $190) + 814 CdU samples × $53) + (814 CdB samples × $53) + 814 β_2-MU samples × $32) = $5,021,742

14. Provide estimates of annualized cost to the Federal government. Also, provide a description of the method used to estimate cost, which should include quantification of hours, operational expenses (such as equipment, overhead, printing, and support staff), and any other expense that would not have been incurred without this collection of information. Agencies also may aggregate cost estimates from Items 12, 13, and 14 in a single table.

There is no cost to the Federal Government.

15. Explain the reasons for any program changes or adjustments.

As part of the SIP-IV rulemaking, OSHA removed the requirement that employers document employees' social security numbers (SSN) in their exposure and medical records. Time to

20Out-of-pocket costs by CPT Code were obtained from FAIR Health webpage. The cost for a medical examination was estimated to be $190, including $131 for Medical History and Physical (average of out-of-pocket cost for CPT Code 99385, 99386 and 99387), $13 for Chest X-Ray (out-of-pocket cost for CPT Code 71020), and $46 for Pulmonary Function Testing (average of out-of-pocket costs for CPT Code 94010 and 94060). FAIR Health, 2015. Consumer Cost Lookup. Available at http://fairhealthconsumer.org/medical_cost.php (Accessed March 5, 2015).

21Out-of-pocket costs by CPT Code were obtained from FAIR Health webpage. The cost of biological testing were estimated as follows: β_2-MU - $32 (out-of-pocket cost for CPT Code 82232); CdU - $53 (out-of-pocket cost for CPT Code 82300); and CdB - $53 (out-of-pocket cost for CPT Code 82300).
FAIR Health, 2015. Consumer Cost Lookup. Available at http://fairhealthconsumer.org/medical_cost.php (Accessed March 5, 2015).

22While the information under "Medical Surveillance (§1910.1027(l))" indicates that employers perform 814 urine collections and blood collections annually, laboratories divide the urine collections into two parts for analyzing CdU and β_2-MU separately; the resulting 1,627 urine samples, when added to 814 blood samples, result in a total of 2,441 biological-monitoring samples (the number noted in the above paragraph is 2,442 as it is a rounded number).

document SSN in records is negligible and, therefore, the Agency is not requesting any changes in the burden hour or cost estimates as a result. OSHA is also not taking burden hours for the update to the chest x-ray requirements, which adds the option of digital radiography, or the change to the question about birth defects in Appendix D, because those changes do not impact the time required for medical examinations.

Upon further review, the Agency is requesting an adjustment in the number of responses from 263,630 to 235,937, a difference of 27,693 responses. This decrease is due to an error in the number of responses reported in the previous ICR for this standard.

Table 4 – Summary of Annual Current and Requested Burden Hours

Collection of Information	Current Burden Hours	Requested Burden Hours	Change
Exposure Monitoring			
Initial Monitoring			
Objective Data	16	16	0
Monitoring Frequency (Periodic Monitoring)	5,168	5,168	0
Additional Monitoring	52	52	0
Employee Notification of Monitoring Results	7,966	7,966	0
Compliance Program	7,331	7,331	0
	8,969	8,969	0
Emergency Situations	0	0	0
Notification of Laundry Personnel	0	0	0
Medical Surveillance			
Initial Examination; Actions Triggered by Initial Biological Monitoring	38,758	38,758	0
Periodic Medical Surveillance; Actions Triggered by Medical Examinations	312	312	0
Additional Examinations; Emergency Examinations (biological-monitoring collection)	610	610	0
Information Provided to the Physician	2,149	2,149	0

Collection of Information	Current Burden Hours	Requested Burden Hours	Change
Physician's Written Medical Opinion	2,149	2,149	0
Communication of Cd Hazards to Employees			
Warning Signs and Warning Labels	0	0	0
Employee Information and Training	0	0	0
Recordkeeping			
Exposure Monitoring	0	0	0
Medical Surveillance	0	0	0
Availability	2,518	2,518	0
Totals	**75,998**	**75,998**	**0**

16. For collections of information whose results will be published, outline plans for tabulation, and publication. Address any complex analytical techniques that will be used. Provide the time schedule for the entire project, including beginning and ending dates of the collection information, completion of report, publication dates, and other actions.

OSHA will not publish the information collected under the Standard.

17. If seeking approval to not display the expiration date for OMB approval of the information collection, explain the reasons that display would be appropriate.

OSHA lists current valid control numbers in §§1910.8, 1915.8, 1917.4, 1918.4, and 1926.5 and publishes the expiration date in the Federal Register notice announcing OMB approval of the information-collection requirement (*see* 5 CFR 1320.3(f)(3)). OSHA believes that this is the most appropriate and accurate mechanism to inform interested parties of these expiration dates.

18. Explain each exception to the certification statement.

OSHA is not requesting an exception to the certification statement.

B. COLLECTION OF INFORMATION EMPLOYING STATISTICAL METHODS.

This Supporting Statement does not contain any collection of information requirements that employ statistical methods.