

Reclamation Manual

Directives and Standards

Subject:	Safety and Occupational Health – Exposure Assessment
Purpose:	To establish Safety and Occupational Health Program (Program) requirements for exposure assessment for chemical, physical, and biological hazards, and to establish a consistent Bureau of Reclamation-wide exposure reporting protocol for all Reclamation facilities and worksites. By standardizing Reclamation’s exposure assessment and reporting process, we can better protect the health of our employees and help prevent contamination of our facilities and the environment. Consistent and shared exposure assessment and reporting procedures will facilitate more effective use of Reclamation’s safety and health resources.
Authority:	Occupational Safety and Health Act of 1970 (Pub. L. 91-596; 29 U.S.C. 651 et. seq.) as amended; Occupational Safety and Health Standards (29 CFR 1910); Basic Program Elements for Federal Employee Occupational Safety and Health Programs and Related Matters (29 CFR 1960); Executive Order 12196; OMB Circular A-123; Department Manual (DM), Part 485, Safety and Occupational Health Program, 485 DM 1; 485 DM 17
Approving Official:	Director, Security, Safety, and Law Enforcement
Contact:	Safety and Occupational Health Office, 84-43000

1. Introduction.

- A. The safety and health of Reclamation employees and the visiting public is critical to achieving Reclamation’s mission. To achieve success of the mission, a process of regular assessment to discover and address safety and occupational health hazards and potential exposures is needed. 29 CFR 1910 and 485 DM 1, are the minimum requirements for assessing the safety and health of employees.
- B. This D&S establishes Reclamation’s processes for assessing, monitoring, and reporting exposure in compliance with the above mandates, and for ensuring safety and occupational health hazards are appropriately addressed. This D&S will also serve as the basis for determining the need for other components of a comprehensive Program for exposure assessment such as training requirements and medical surveillance. In addition, *A Strategy for Assessing and Managing Occupational Exposures*, a publication of the American Industrial Hygiene Association, may be used as a reference for ensuring the requirements established in this D&S are met.

2. **Applicability.** This D&S applies to all Reclamation employees, supervisors, and managers.

Reclamation Manual

Directives and Standards

3. Definitions.

- A. **American Conference of Governmental Industrial Hygienists or ACGIH.** The organization responsible for setting consensus standards for exposure limits. The ACGIH term for the occupational exposure limit (OEL) is threshold limit value (TLV).
- B. **Basic Characterization.** Assessment(s) (i.e., quantitative and/or qualitative) in which information is collected and organized through science-based strategies and professional judgment to describe and comprehend exposures of the workplace, work force, and environmental agents.
- C. **Basic Information.** The qualitative assessment portion of the basic characterization that applies to the job hazard analysis (JHA). Basic information includes: location, date, task, similar exposure group (SEG), operation, frequency, duration, job title, engineering controls; type of ventilation system (e.g., dilution ventilation, local exhaust ventilation); is the ventilation system adequate for the task (yes or no); chemical(s) used and their health rating (i.e., 4, 3, 2, 1, 0); personal protective equipment (PPE) (e.g., goggles, gloves, boots, respirators, ear plugs/muffs); physical hazards (e.g., heat, light, ionizing radiation, non-ionizing radiation, falls, confined space, fire, etc.); individual conducting the assessment, and the exposure assessment data.
- D. **Control Strategies.** The combination of elimination, substitution, engineering controls, warnings, administrative controls, and PPE to reduce or control workplace agent concentrations and exposures.
- E. **Controls.** Elimination, substitution, engineering, warnings, administrative, or PPE used to control exposure to personnel and prevent contamination of the facility and to the environment.¹
- F. **Designated Agency Safety and Health Official or DASHO.** A designated official with sufficient authority and responsibility to represent effectively the interest and support of the agency head in the management and administration of the agency Program.
- G. **Environmental Agent.** A chemical, radiological, thermal, physical, or biological entity that may cause harmful effects in an exposed individual.

¹Elimination is the most desired and often least practical control method. Substitution involves replacing the item of concern with a less hazardous process, equipment, or material. Engineering controls include process modification, shielding, local exhaust ventilation, etc. Warnings include signage, barricades, and labels. Administrative controls include safe work procedures, limiting work time, worker rotation, training, etc. PPE controls are used only when other controls are not effective.

Reclamation Manual

Directives and Standards

- H. **Exposure.** An individual's contact with an environmental agent by any route of exposure (i.e., inhalation, ingestion, skin contact, skin absorption). The term could mean more than one exposure.
- I. **Exposure Assessment.** The process (science-based and professional judgment) of researching, measuring and defining chemical, physical, and biological exposure profiles and judging the acceptability of workplace exposures to environmental agents. The term could mean more than one exposure assessment.
- J. **Exposure History.** A combination of qualitative and/or quantitative exposure data for the extent of an employee's career which represents various processes, jobs, and work tasks that describe the exposures for an employee or SEG.
- K. **Job Hazard Analysis or JHA.** A study of a job or activity that identifies hazards or analyzes potential accidents/incidents associated with each step or task, and develops solutions that will eliminate, mitigate, or prevent such hazards.
- L. **National Institute for Occupational Safety and Health or NIOSH.** The government-funded entity which publishes non-regulatory, research-based OELs known as recommended exposure limits (RELs).
- M. **Occupational Exposure Limit or OEL.** A generic term that represents a measured science-based exposure level to a hazardous substance that prevents adverse health effects in most individuals. The term OEL can refer to exposure limits set by Occupational Safety and Health Administration (OSHA), NIOSH, ACGIH, or all three.
- N. **Occupational Safety and Health Administration or OSHA.** Governmental agency that establishes regulatory exposure levels and they are termed permissible exposure limits (PELs).
- O. **Permissible Exposure Limits or PELs.** An OEL established by OSHA that is the legal limit for exposure and typically the least restrictive exposure level. PELs are based upon an 8-hour workday during a 40-hour work week.
- P. **Qualitative Assessment.** A process of collecting and evaluating non-quantitative exposure information such as basic information using accepted industrial hygiene practice and professional judgment to make decisions on exposures.²

²Qualitative assessments are used alone or in conjunction with quantitative assessments. Findings are kept and maintained as part of exposure history and data. Collecting basic information is part of the qualitative assessment.

Reclamation Manual

Directives and Standards

- Q. **Quantitative Assessment.** A process of quantitatively measuring exposures using industrial hygiene techniques and evaluating the available data to make decisions on the exposures by comparing measurements to existing OELs.³
- R. **Recommended Exposure Limit or REL.** Research standards exposure limits and health effects data assembled by the NIOSH. According to NIOSH, the REL is a level that would be protective of worker safety and health over a working lifetime if used in combination with engineering and work practice controls, exposure and medical monitoring, posting and labeling of hazards, worker training, and PPE.
- S. **Reclamation's Safety and Health Staff or Safety and Health Staff.** Industrial hygienists, safety managers, safety supervisors, safety specialists, and safety technicians.⁴
- T. **Similar Exposure Group or SEG.** Group of employees having the same general exposure profile for the agent(s) being studied because of the similarity and frequency of the tasks they perform, the materials and processes with which they work, and the similarity of the ways they perform the tasks.
- U. **Threshold Limit Value or TLV.** A time-weighted average (TWA) concentration which most individuals may be repeatedly exposed 8 hours a day, day after day, for a working lifetime, without adverse health effects. This refers to the science-based TLV for exposure to chemical, physical, and biological agents that are revised and published annually by the ACGIH.
- V. **Unacceptable Exposure.** Exposure to an occupational safety and health hazard that exceeds an OEL or there is evidence of adverse health effects associated with exposure to an environmental agent.⁵
4. **Responsibilities.**
- A. **Designated Agency Safety and Health Official.** The DASHO is responsible for:

³Quantitative assessments are used in conjunction with qualitative assessments. Measurement results such as from the accredited laboratory are kept and maintained as part of the exposure history and data.

⁴The term also includes Collateral Duty Safety Representatives as listed in "other duties" and assigned by their supervisor.

⁵When using quantitative assessment methods, the TLV will be used as the primary OEL; otherwise the most stringent OEL will be used. When there is no OEL, the industrial hygiene workgroup will determine the OEL. Unacceptable exposure is determined by the industrial hygienist and/or the safety and health personnel based on the qualitative and quantitative assessments, professional judgment, and scientific research and data.

Reclamation Manual

Directives and Standards

- (1) Providing the Secretary of the Department of the Interior with an annual report addressing any unacceptable exposure assessment data, recommended control strategies, and corrected actions which were implemented in order to protect employee health. The report will be included in Reclamation's input to the Department's annual report to OSHA.
 - (2) Providing personnel, administrative, and financial resources to the Program based on control strategies and/or based on prioritized exposure assessment, as needed and if feasible, to address unacceptable exposure.
- B. Regional Directors.** Regional directors are responsible for:
- (1) providing the DASHO with consolidated unacceptable exposure assessment data in accordance with the provisions of this D&S, and possible solutions and control strategies to prevent unacceptable exposure; and
 - (2) providing financial resources to the Program to conduct exposure assessment and to control any unacceptable exposure.
- C. Reclamation Safety and Occupational Health Program Manager.** The Reclamation Program Manager is responsible for:
- (1) providing Reclamation exposure assessment oversight of all workplace and environmental agents within Reclamation to ensure that an effective process is in place for the identification, evaluation, and control of occupational health hazards and exposures;
 - (2) providing technical support to assist regional safety managers with the exposure assessment process;
 - (3) developing strategies to address Reclamation-wide health hazard issues related to harmful or potentially harmful exposures; and
 - (4) providing an annual summary report of Reclamation exposure data and control strategies, as appropriate.
- D. Regional Safety Managers.** Regional safety managers are responsible for:
- (1) providing oversight for the maintenance of regional exposure assessment to protect employee health and assist with prioritizing and managing control strategies;

Reclamation Manual

Directives and Standards

- (2) supporting region-wide exposure assessment of all workplace and environmental agents within their region to ensure that an effective process is in place for the identification, evaluation, and control of occupational health hazards and exposures;
- (3) reviewing region-wide exposure assessment reports and communicating information to respective regional management;
- (4) providing the Reclamation Program Manager with an annual summary report of region-wide exposure assessment data and control strategies for unacceptable exposure in order of priority; however all region-wide exposure assessment data will be available for reporting or informational purposes;
- (5) providing guidance and assistance to regional/area office employees to comply with exposure assessment requirements;
- (6) supporting and providing the Reclamation safety and health staff, with the knowledge, training, and ability to conduct exposure assessment; and
- (7) providing support and guidance on submittal reviews of contractor programs for occupational health related to exposure assessment.

E. Area Office Managers. Area office managers are responsible for:

- (1) providing support and ensuring that exposure assessment are conducted and coordinated with the regional safety and health offices and control strategies are implemented to prevent unacceptable exposure; and
- (2) providing personnel, administrative, and financial resources to the Program to support exposure assessment, as needed.

F. Area Office Safety and Health Managers/Specialists. The area office safety and health managers/specialists are responsible for:

- (1) coordinating with field locations and supporting exposure assessment;
- (2) identifying and prioritizing SEGs or work tasks based on monitoring reports, unacceptable exposure to employees, occupational hazards, Program history, personnel turnover or illness, amount of time since last formal assessment and monitoring, etc.; and
- (3) coordinating the documentation of local field-level exposure assessment and associated control strategies as appropriate.

Reclamation Manual

Directives and Standards

- G. **Industrial Hygienists.** Industrial hygienists are responsible for providing technical assistance and for:
- (1) Conducting exposure assessment for individual work task/agent exposures. In this process the industrial hygienist will determine the appropriate OEL for the agent. The TLV will be used when available; otherwise, the most protective OEL will be used.
 - (2) Working with Reclamation's industrial hygienist to establish a system of recordkeeping for maintaining data from the assessments.
 - (3) Using the data from the assessments and to determine which exposures are acceptable, unacceptable, or uncertain, and prioritize those that need controls or further information.
 - (4) Using the exposure assessment as a basis for industrial hygiene programs including training requirements, control strategies, and medical surveillance.
 - (5) Researching and providing guidance to employees on the design, selection, implementation, and testing of engineering controls to limit exposure during work tasks and operations.
 - (6) Working with and providing training to the Reclamation safety and health staff to collect basic information needed for exposure assessment and prioritize the exposure assessment, control strategies, and further information gathering.
 - (7) Providing input, language, and guidance for occupational health provisions in contracts.
 - (8) Networking with a licensed healthcare provider and reviewing medical findings and risk-based assessment forms completed by employees and supervisors.
- H. **Supervisors.** Supervisors are responsible for:
- (1) Ensuring that a JHA is developed or updated as required by the Reclamation Safety and Health Standards (RSHS).
 - (2) Notifying and coordinating with the industrial hygienist and/or safety manager to conduct exposure assessment as needed or as identified.

Reclamation Manual

Directives and Standards

- (3) Ensuring the exposure assessment findings and data are incorporated into JHAs. A qualitative exposure assessment such as collecting basic information for the basic characterization will be incorporated into each JHA.
- (4) Ensuring controls of unacceptable exposure have been identified and implemented.
- (5) Ensuring employees are notified and trained on exposure assessment findings.
- (6) Halting unsafe work tasks and/or operations, which includes possible unacceptable exposure, at any time and/or when an employee reports a possible unsafe work task and/or operation.

I. Employees. All Reclamation employees, including those identified in Paragraphs 4.A. – H., are responsible for:

- (1) reporting unsafe work tasks and/or operations, exposure concerns, and any other concerns related to safety and health to their supervisor and/or to the safety and health manager or to the industrial hygienist within their respective geographical boundaries;
- (2) actively participating and cooperating in the exposure assessment process by wearing exposure monitoring equipment and providing input on work tasks, operations, and areas where a perceived exposure exists; and
- (3) performing all work tasks safely and complying with controls as identified during the exposure assessment and the JHA.

5. Requirements.

- A. Reclamation will actively pursue and document exposure assessment of employees, work tasks, operations, areas, practices, SEGs, workplaces, and environmental agents under its control for safety and health compliance. Industrial hygienists will prioritize exposure assessment and safety managers will manage exposure assessment using sound principles of industrial hygiene, and professional knowledge and judgment.
- B. Implementation of engineering controls, work practices, the use of PPE, medical monitoring and further exposure assessment will be based on the protection of the employee, work conditions, exposure levels, and exposure assessment.

Reclamation Manual

Directives and Standards

- C. Exposure assessment will:
- (1) Be based on outcomes from the basic characterization and incorporated into the JHA for operations that:
 - (a) use hazardous materials or physical agents including, but not limited to, toxic, reactive, biohazard, corrosive, flammable or those that have radiological properties;
 - (b) use PPE (e.g., respirators, chemical-resistant clothing, and chemical resistant gloves);
 - (c) require grinding, crushing, cutting, blasting, or other abrasive processes;
 - (d) involve tasks or operations that release metals (e.g. welding, grinding, soldering, brazing, cutting, burning, gouging, plasma cutting, laser cutting);
 - (e) involve mixing, handling, storage, removal or application of thinners, catalysts, solvents, adhesives, epoxies, sealants, base coats, middle coats, top coats, fillers or resins;
 - (f) involve mixing, handling, storage, and application of pesticides/herbicides;
 - (g) involve work tasks, operations, or equipment that generate noise levels which equal or exceed 85 decibel A-weighted (dBA) as an 8-hour TWA;
 - (h) involve entry into a confined space;
 - (i) involve a work-related medical surveillance program, or medical monitoring associated with work tasks, operations, regulatory task requirements, or unacceptable exposure;
 - (j) involve handling, or working with or on equipment that handle, bodily fluids or biological hazards;
 - (k) involve batching, mixing, cutting, chipping, crushing, coring, or drilling concrete; and
 - (l) involve entry into an area, or conducting a work task or working on equipment, contaminated with rodent feces, dander, or nests.

Reclamation Manual

Directives and Standards

- (2) Be designed and conducted by the regional safety manager and/or an industrial hygienist. Reclamation's safety and health staff must have experience and/or up-to-date training in safety and health hazard recognition to conduct exposure assessment and must be under the guidance of a regional safety manager and/or an industrial hygienist.
 - (3) Be reviewed and interpreted by an industrial hygienist or by qualified safety and health staff. Results of the interpretation will be provided to the affected employee(s) by the industrial hygienist or by the qualified safety and health staff.
- D. Work tasks that result in unacceptable exposure will:
- (1) Be stopped by the supervisor until controls are implemented at a level to prevent unacceptable exposure. Depending on the work task and if it continues to result in unacceptable exposure, the employee(s) will be provided PPE and considered for inclusion into the medical surveillance program.
 - (2) Not go back into operation until reviewed and/or monitored by the safety and health staff to verify that the controls implemented are adequate to prevent unacceptable exposure before work proceeds.
- E. Work tasks, operations, and areas that require controls to prevent unacceptable exposure will be posted (e.g., signage, facility maps, etc) in such a manner as to make all approaching personnel aware of the hazards as directed in the RSHS. Examples include; noise attaining 85 dBA as an 8-hour TWA, asbestos abatement, lead abatement, welding operations, coating operations, confined space entry, cavitation repair, and waste system maintenance.
- F. Work tasks, operations, areas, and employees with exposure assessment data that verify unacceptable exposure levels will be documented. Work tasks, operations, and area exposure data that do not contain information covered by the Privacy Act of 1974 (5 U.S.C. 552a) will be made available to employees, union representatives, and other safety and health professionals, upon request.
- (1) All exposure assessment data will contain the following minimum information:
 - (a) date and location, including region, area office, facility, and specific work location;
 - (b) employee exposure data, SEG, work tasks, operations, or area exposures;

Reclamation Manual

Directives and Standards

- (c) names of contaminant, nature, extent, and exposure standard;
 - (d) a reasonable time for abatement of the exposure;
 - (e) name of technician performing the assessment, method and equipment used, calibration information, and collection media;
 - (f) names of other personnel included in the data; and
 - (g) engineering controls, work practices, and PPE in use.
- (2) All exposure history will be maintained via electronic database consistent with the provisions of the Privacy Act of 1974 (5 U.S.C. 552a) and will be available upon appropriate request.
- G. The regional safety manager/specialist and/or industrial hygienist will review exposures, verify that controls are implemented to prevent unacceptable exposure, and notify management and any effected employee.
- H. Reclamation holds the responsibility for employee occupational safety and health. Where exposure is generated by a non-Reclamation entity, management will take steps necessary to protect Reclamation personnel including:
- (1) identifying, informing, and protecting potentially affected employees;
 - (2) removing employees from unacceptable exposure risk and informing the non-Reclamation entity generating the hazard; and
 - (3) coordinating with the Federal tenant agency, if applicable; (e.g., General Services Administration, to secure abatement as specified in 29 CFR Part 1960, Subpart E, and 41 CFR Parts 101-21.
- I. **Reporting.** All exposure assessment data will be collected and maintained electronically. The data will be communicated to the employees and to management in writing (electronic or hard copy). The regional safety manager will submit to the Reclamation Program Manager a report of unacceptable exposure assessment annually by October 15. The reported elements will be:
- (1) duty station;
 - (2) official job title or job code;
 - (3) SEG;
 - (4) work tasks;

Reclamation Manual

Directives and Standards

- (5) location;
- (6) existing controls in place;
- (7) chemicals and their associated hazard rating;
- (8) hazard and date sampled;
- (9) exposure results;
- (10) applicable OEL;
- (11) controls that were implemented;
- (12) exposure after controls implemented;
- (13) exposure history;
- (14) exposure decision/judgment;
- (15) prioritization information; and
- (16) recommendations for additional controls.