

Envirocare of Utah, Inc.

Program for Maintaining Radiation Exposures
As Low As Reasonably Achievable

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1.0 Objective

The objective of the ALARA Program is to ensure that all reasonable actions are taken to reduce radiation exposures and effluent concentrations to levels that are considered as low as reasonably achievable (ALARA).

Envirocare of Utah, Inc. is committed to applying the ALARA philosophy, and thus this ALARA Program, to all aspects of its operations including the initial planning and sales of waste disposal services, engineering, waste disposal operations, and site decommissioning.

2.0 Definitions

- a. ALARA - As low as reasonably achievable
- b. Investigative Level-that level of radiation dose, exposure, or release to the environment that requires a formal investigation and report

3.0 References

- a. Code of Federal Regulations, Title 10, Part 20
- b. U. S. Nuclear Regulatory Commission Regulatory Guide 8.31, "Information Relevant to Ensuring that Occupational Radiation Exposures at Uranium Mills Will be As Low As Reasonably Achievable."
- c. U. S. Nuclear Regulatory Commission Regulatory Guide 8.37, "ALARA Levels for Effluent from Materials Facilities."
- d. U. S. Nuclear Regulatory Commission Regulatory Guide 8.10, "Operating Philosophy for Maintaining Occupational Radiation Exposures As Low As Reasonably Achievable."

4.0 Responsibilities

4.1 Vice President of Operations

The Vice President of Operations is ultimately responsible for establishing and maintaining the ALARA program. Some of the elements of this responsibility are:

- a. Ensuring that the Corporate management ALARA philosophy is consistent with the current regulatory requirements and that the ALARA Program is updated as required.
- b. Ensuring that the Corporate ALARA philosophy and Program requirements are considered in all

radiation work planning activities.

- c. Ensuring that the authority and responsibilities for developing and implementing the ALARA procedures are delegated to the appropriate management staff.
- d. Ensuring that adequate resources are available to implement the ALARA Program. This includes staff, training programs, equipment, and facilities.
- e. Ensuring that adequate resources are available for performance measurement systems to demonstrate compliance with the goals and objectives of the ALARA program.

4.2 Site Manager

The Site Manager's responsibilities include:

- a. Ensuring that the ALARA Program is actively supported at the Site. This is accomplished by demonstrating a commitment through written policy statements and activities to enhance the employee's awareness of the Corporate ALARA philosophy and goals.
- b. Assisting in the preparation of ALARA goals and objectives. This is normally accomplished by providing input to the Radiation Safety Committee who develops the goals and objectives.
- c. Supporting the Field Radiation Safety Officer (FRSO) in his/her efforts to implement the ALARA Program at the site.

4.3 Corporate Radiation Safety Officer

The Corporate Radiation Safety Officer (CRSO) has been delegated the responsibility for developing and maintaining the ALARA Program. Some associated responsibilities are:

- a. As a member of the Radiation Safety Committee, assisting in the preparation of ALARA goals for the site.
- b. Assisting the FRSO and Site Manager in implementing new requirements and procedures.
- c. Providing technical assistance to the FRSO.
- d. Conducting formal reviews of the site radiation protection program to assess the effectiveness of

the ALARA procedures in meeting the ALARA goals and objectives. This will be done annually.

- e. Conducting reviews when investigative levels have been exceeded.
- f. Reviewing and approving plans for new equipment, process changes, or changes in operating procedures to ensure that they are consistent with the ALARA program.

4.4 Field Radiation Safety Officer (FRSO)

The FRSO has the responsibility for implementing the ALARA Program at the disposal site. These duties include:

- a. Serving on the Radiation Safety Committee and assisting in developing the ALARA Goals and Objectives for the site.
- b. Developing plans, procedures, and methods for maintaining personnel radiation exposures and effluent concentrations ALARA. This is accomplished in part as a team effort with the Site Manager and the site engineering staff.
- c. Conducting employee training programs in which the Corporate ALARA philosophy is presented and understood by all employees.
- d. Establishing and maintaining personnel and environmental monitoring programs appropriate for assessing compliance with regulatory requirements and for determining whether ALARA goals and objectives were met.
- e. Performing an analysis of site operations, environmental, work area, and personnel monitoring data to determine whether ALARA goals were met and to identify areas of further improvement.
- f. Approving all Standard Operating Procedures (SOPs) prior to their being used and reviewing, at least annually, all SOPs. These activities will be documented.
- g. Conducting documented radiation surveys and work area inspections at least once per week while work is being performed.

4.5 Health Physics Technicians and Radiation Monitors

Health physics technicians and radiation monitors assist

the FRSO in implementing the ALARA Program. A very important responsibility of the technician is to evaluate work practices in the field as to whether they are consistent with regulatory requirements and the Corporate ALARA Program. Recommendations for work stoppages or changes in work practices are typically the responsibility of the health physics technicians and radiation monitors.

4.6 Individual Workers

Every radiation worker assumes some responsibility for maintaining his radiation exposure ALARA. He/she has been trained in the ALARA philosophy and job-related safety practices. Worker responsibilities include:

- a. Understanding Corporate ALARA philosophy and how it applies to the particular job.
- b. Complying with all standard operating procedures, warning signs, and barriers.
- c. Understanding the particular radiation hazards associated with his/her particular job.
- d. Providing suggestions to the FRSO or other management on how exposures or releases might be further reduced.
- e. Applying existing radiation exposure reduction methods, such as time-distance-shielding, to the job site.
- f. Promptly reporting to line management or the FRSO conditions or practices at the site that may not be consistent with ALARA Corporate policy.

4.7 Radiation Safety Committee

The Radiation Safety Committee considers the ALARA Program an integral part of the Radiation Protection Program. As such, the committee is responsible for:

- a. Developing the ALARA Goals and Objectives for each year (or Project).
- b. Assuring that ALARA Goals and Objectives are effectively integrated into management plans and operating procedures.
- c. Reviewing all ALARA audit reports and reporting information to the Vice President of Operations.

5. ALARA Program Description

5.1 ALARA Policy Statement

Envirocare of Utah, Inc. believes that it is prudent to maintain radiation exposures to workers and the environment as low as reasonably achievable (ALARA). In order to implement this policy, Envirocare management endorses this ALARA program and agrees to provide the necessary resources to implement it.

The Vice President of Operations is ultimately responsible for establishing and implementing this ALARA Program. Under his direction, Envirocare personnel will develop and implement various facets of the ALARA program. On-site workers will conduct their work in such a manner that considerations for reducing radiation exposure will be of paramount importance. Failure to do so may result in disciplinary action.

The Corporate Radiation Safety Officer will have the primary responsibility for monitoring the ALARA Program and reporting to the Vice President of Operations. He will ensure that:

- a. Draft Waste Disposal Contracts and facility designs are reviewed and that changes necessary to minimize worker exposure or releases to the environment are incorporated.
- b. Training programs incorporate the ALARA concept and that all personnel understand their responsibilities.
- c. ALARA goals are established for each calendar year.
- d. Evaluations are done at least annually to assess whether the ALARA goals and objectives have been achieved.

The Field Radiation Safety Officer (FRSO) has the delegated responsibility for the day-to-day implementation of the ALARA Program. He will carry out his responsibilities as defined in Section 4.5.

The CRSO and the FRSO have the organizational freedom to stop work and raise any ALARA concern to upper levels of management, including the owner of Envirocare, should a satisfactory resolution not be possible at lower levels of management.

While the ultimate responsibility lies with the Vice President of Operations, all Envirocare personnel are expected to carry out their responsibility in the full implementation of this ALARA program.

Vice President of Operations

5.2 ALARA Goals

ALARA goals will be developed by the Radiation Safety Committee and concurred in by line managers having the day-to-day responsibility for operations. Guidance provided in Regulatory Guide 8.37 will form the basis for establishing goals. Several types of goals may be established as discussed below. Where practical, initial goals are proposed below and will be used until they are revised and approved by the Radiation Safety Committee.

Annual occupational and environmental goals will be established based on historical operational records, release models, and regulatory limits. Goals will be set close to what has been achieved in the past or near predictions based on models. It is recognized that if goals are adequately established, they frequently will not be met and may have to be adjusted upward.

Envirocare will use the following goals until revised by the Radiation Safety Committee.

- a. Occupational Radiation Exposure-The annual goal for each employee is to limit radiation exposures for each employee to 10 percent of the total effective dose equivalent (TEDE) limits.
- b. The annual ALARA goal for releases of radioactive material off site is to limit the concentrations to levels that would not result in a calculated TEDE to the maximally exposed individual of more than 10 percent of the limits as specified in 10 CFR Part 20.
- c. For large projects where dosimetry records are expected to reflect the associated exposures, project ALARA goals may be developed when practical.

5.3 Investigation Levels

Until revised and approved by the Radiation Safety Committee, Envirocare will use the following investigative levels:

- a. Investigate all monthly personnel radiation exposures that exceed a TEDE of 50 mrem.
- b. Investigate site conditions where measured airborne radionuclide concentrations in the work area or at the site perimeter exceed 25 percent of the respective derived air concentration (DAC) for the measurement period.

- c. Investigate site conditions where trend analyses indicate that the two conditions above (a and b) may be exceeded.

5.4 ALARA Program Elements

The ALARA philosophy is an integral part of many of Envirocare's operating and administrative procedures as discussed below.

5.4.1 Standard Operating Procedures and Radiation Work Permits

Envirocare uses standard operating procedures (SOPs) and Radiation Work Permits (RWP) for all major tasks including radiation safety, work area and environmental monitoring, waste testing, waste handling, and waste disposal. SOPs are used for routine tasks whereby RWPs are used for nonroutine jobs, normally of short duration. These SOPs and RWPs specify methods to be used to assure safe operations, including personnel protective equipment, general area radiological conditions, and other special safety instructions.

5.4.2 Facility and Equipment Design

All facility designs and specifications for new equipment will be reviewed prior to construction or purchase to assure that they are consistent with Envirocare's ALARA program.

5.4.3 Engineering and Administrative Controls

5.4.3.1 Preoperational Reviews

Preoperational reviews are performed prior to finalizing a waste disposal contract to determine whether the waste and waste-handling methods are consistent with Envirocare's license requirements and that Envirocare's SOPs are appropriate for maintaining radiation exposures ALARA.

Preoperational reviews are also conducted prior to using new waste-handling equipment on site as well as prior to using new facilities, where radiation exposure is a consideration.

5.4.3.2 Modification of designs and SOPs

Whenever preoperational reviews indicate that ALARA considerations are inadequate, Envirocare will make the necessary changes or modifications to assure that radiation exposures are ALARA. All new modifications or designs will be subjected to a

preoperational review until all unresolved issues are adequately addressed.

5.4.4 Radiation Safety Training

All personnel visiting or working at the site will be trained in Envirocare's ALARA philosophy and given the basic information on how to minimize radiation exposure and releases to the environment. The requirements for training, including specific initial and refresher training for ALARA, are contained in Envirocare's Procedures Manual, Section TRAIN-1. The FRSO is responsible for training individual workers on task specific methods for minimizing radiation exposure and releases.

5.4.5 Control of Airborne Radioactivity

Envirocare considers the control of airborne radioactivity essential to the ALARA program. Operational procedures and license conditions establish specific measures for controlling dust and airborne releases of radionuclides including the application of water and chemical surfactant to dusty areas, prompt placement of radon cover on wastes, suspension of work under adverse meteorological conditions, establishing vehicle speed limits, and containerization of more highly concentrated radioactive wastes prior to receipt.

Vigilant enforcement of these rules and procedures is a duty of the Site Manager and all site personnel. While respirators will be worn for certain work tasks, Envirocare's primary controls are considered to be engineering and operational controls.

5.4.6 Control of Liquid Effluent

The current design of the waste disposal site is to prevent surface water from entering and leaving the site. No process liquids are generated and thus no liquid effluent exists. As part of the ALARA audit, the site will be inspected to ensure that the design objectives are being met.

5.4.7 ALARA Audits and Inspections

The Corporate Radiation Safety Officer has the responsibility for monitoring the implementation of this ALARA program and assessing its effectiveness. Auditors must be chosen who do not have day-to-day responsibilities in implementing the radiation safety program. Audits will be done at least annually.

The ALARA Audit may be done in conjunction with a health

physics program audit. However the ALARA audit will be broader in scope in that fulfilling the commitments and responsibilities of line management including operations will be evaluated.

ALARA audit and inspection tasks include:

- a. Determining whether ALARA goals are being met
- b. Evaluating radiation exposure and release trends to identify potential problems
- c. Reviewing records of ALARA-related activities to assure that design and operational reviews are being conducted.
- d. Assessing the understanding by site employees of the Envirocare ALARA policy
- e. Reviewing the Radiation Protection Program content
- f. Reviewing emergency plans and procedures including fire protection to assure that they are consistent with ALARA.

6.0 Radiation Protection Program

6.1 Technical Qualifications of Health Physics Staff

The Corporate Radiation Safety Officer (CRSO) is responsible for assuring that the environmental health and safety requirements at the site are being met and, in particular, the operations at the site are in compliance with Nuclear Regulatory Commission License Requirements. All health and safety related procedural changes are approved by the CRSO.

The Field Radiation Safety Officer (FRSO) has the day-to-day radiation safety responsibilities and reports to the CRSO while working very closely with the Site Manager. Assisting the FRSO are Radiation Technicians, Radiation Monitors, and an Environmental Safety Technician. The Environmental Safety Technician is responsible for conducting the routine environmental monitoring program and performing certain laboratory analyses.

6.1.1 Corporate and Field Radiation Safety Officers

The CRSO and FRSO must have a minimum of a bachelor's degree in the physical sciences, industrial hygiene, or engineering from an accredited college or university or an equivalent combination of training and relevant experience. Two years of relevant experience are generally considered equivalent to 1 year of academic study. A minimum of 4 weeks of formal training in health

physics is required.

The CRSO and FRSO shall have at least one year of experience related to measuring radioactivity and radiation exposures in the work place and the environment. The CRSO and the FRSO shall maintain a current understanding of measurement methods and regulatory requirements by self study, and if necessary, attendance at appropriate workshops and seminars.

6.1.2 Radiation Monitors and Radiation Technicians

Envirocare certifies all personnel classified as either a Radiation Monitor or a Radiation Technician. This certification includes training and testing beyond that given in the restricted-area training program. Specific training and experience requirements for the positions, entrance training, on-the-job training, and examinations are listed in the Procedures Manual. The following is a summary of requirements for certification in those areas:

6.1.2.1 Radiation Monitor

- a. Twenty (20) classroom hours of training in areas of chemistry, physics, radiation safety, construction safety, operation of equipment and site operations.
- b. Pass a written exam designed specifically for Radiation Monitors.
- c. Pass, to the satisfaction of the FRSO, a practical test designed to assure that a candidate possesses knowledge of the monitoring equipment and that all duties can be performed effectively.

6.1.2.2 Health Physics Technician

- a. Two years of post high school training (or equivalent experience) in the sciences, mathematics, or engineering.
- b. Forty (40) classroom hours of training in areas of chemistry, physics, radiation safety, construction safety, operation of equipment and site operations.
- c. Pass a written exam designed specifically for Radiation Technicians.
- d. Pass a laboratory test designed to assure that all equipment is being handled properly and all duties can be performed effectively.

In addition to the certification, each Radiation Monitor and Health Physics Technician must maintain certification by completing the annual site training refresher and the 20 hours of additional training required of all site personnel.

6.2 ALARA Technical Reviews

6.2.1 Work Area and Environmental Radiation Monitoring

The CRSO and FRSO will periodically evaluate existing radiation safety and environmental monitoring methods and procedures to determine if they are providing the performance data on which achievement of ALARA goals can be evaluated.

Changes in methods and procedures may be required to provide a better understanding on such subjects as the principal sources of airborne releases, the effect of wind speed and other meteorological conditions on airborne concentrations and releases to the environment, and sources of external radiation exposure.

6.2.2 Emergency Response and Contingency Plans

The CRSO and FRSO will periodically evaluate the site Emergency Response and Contingency Plans to assure that the prescribed actions are consistent with Envirocare's ALARA policy.

6.2.3 Fire Control

Fire control at the disposal site is not considered to be a major problem. However the CRSO and FRSO will evaluate the fire control procedures, practices, and engineered features to assure that they are consistent with Envirocare's ALARA policy.