



March 20, 2008

Douglas Manderville  
U.S. Nuclear Regulatory Commission  
Two White Flint North  
11545 Rockville Pike, T7E18  
Rockville, MD 20852-2738

RE: Minor License Amendment  
Source Material License SUA-1548, Docket No. 40-8964  
Permit to Mine No. 633

Dear Mr. Manderville:

Please find attached a revised Chapter 9, "Management Organization and Administrative Procedures" of the license application for Source Material License SUA-1548. This minor revision is in response to Cameco's letter dated December 28, 2007, "Reply To A Notice Of Violation". Corrective action number 8 of said document commits to revising Chapter 9 for submittal and approval by the NRC.

If you have any questions concerning this submittal please contact me at (307) 358-6541 ext. 46.

Regards,

A handwritten signature in black ink, appearing to read 'John McCarthy', with a long horizontal flourish extending to the right.

John McCarthy  
Manager, Safety, Health and Environment, RSO

cc: S. Magnuson  
File SR 4.3.3.1

C. Foldenauer  
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**CHAPTER 9**  
**MANAGEMENT ORGANIZATION AND ADMINISTRATIVE PROCEDURES**

**9.1 ENVIRONMENT, HEALTH, AND SAFETY MANAGEMENT**

Cameco Resources (CR) will maintain a performance-based approach to the management of the environment, health and safety program, including radiation safety. The Environment, Health and Safety Management Program encompasses licensing, compliance, environmental monitoring, industrial hygiene, and health physics programs under one umbrella, and it includes involvement from the individual worker to the senior management of CR. This program will allow CR to operate efficiently and maintain an effective Environment, Health and Safety Program (EHS Program).

**9.2 ENVIRONMENT, HEALTH AND SAFETY MANAGEMENT ORGANIZATION**

Figure 9-1 is a partial organization chart for CR with respect to the operation of the Smith Ranch–Highland Operation and associated operations, and represents the management levels that play a key part in the Environment, Health and Safety Management Program and may serve a functional part of the Safety and Environmental Review Panel (SERP) described under Section 9.5.2.1. The dashed line of reporting signifies a dual reporting function. This organization allows environmental, health, industrial safety, and radiation safety matters to be considered at any management level.

**9.2.1 Board of Directors**

The Board of Directors has the ultimate responsibility and authority for radiation safety and environmental compliance for CR, including the Smith Ranch–Highland Operation and associated operations. The Board of Directors sets corporate policy and provides procedural guidance in these areas. The Board of Directors directly provides operational direction to the President of CR.

**9.2.2 President**

The President is responsible for interpreting and acting upon the Board of Directors policy and procedural decisions. The President directly supervises the Vice President of Operations and Director, Compliance and Licensing. The President is empowered by the Board of Directors to have the responsibility and authority for the radiation safety and environmental compliance programs. He/she is responsible for ensuring that Operations staff are complying with all applicable regulations and permit/license conditions through direct supervision of the Vice President of Operations and Director, Compliance and Licensing.

### 9.2.3 Vice President of Operations

The Vice President of Operations reports to the President and is directly responsible for ensuring that Corporate Operations personnel (including the Smith Ranch–Highland Operation) comply with Industrial Safety, Radiation Safety, and Environmental Protection Programs as stated in the EHS Management System. The Vice President of Operations is also responsible for company compliance with all regulatory license conditions/stipulations, regulations and reporting requirements. The Vice President of Operations has the responsibility and authority to terminate immediately any activity that is determined to be a threat to employees, public health, the environment, or potentially a violation of state or federal regulations as indicated in reports from the Manager-Environmental, Health and Safety or the RSO.

The Vice President of Operations directly supervises the General Manager of Operations.

### 9.2.4 General Manager of Operations

The General Manager of Operations is responsible for managing the day-to-day operations at the Smith Ranch–Highland Operation, and reports directly to the Vice President of Operations. The General Manager of Operations is responsible for ensuring that Smith Ranch–Highland Operation personnel comply with Industrial Safety, Radiation Safety, Environmental Protection Programs, and all relevant state and federal regulations.

The General Manager of Operations has the responsibility and the authority to suspend, postpone or modify, immediately if necessary, any activity that is determined to be a threat to employees, public health, the environment, or potentially a violation of state or federal regulations. The General Manager of Operations cannot unilaterally override a decision for suspension, postponement or modification if that decision is made by the Vice President of Operations, the Manager-Environmental, Health and Safety, or the RSO.

### 9.2.5 Director, Compliance and Licensing

The Director, Compliance and Licensing reports directly to the President and is responsible for ensuring that Corporate Operations personnel (including the Smith Ranch–Highland Operation) comply with Industrial Safety, Radiation Safety, and Environmental Protection Programs as stated in the EHS Management System. The Director, Compliance and Licensing is also responsible for company compliance with all regulatory license conditions/stipulations, regulations and reporting requirements. The Director, Compliance and Licensing has the responsibility and authority to terminate

immediately any activity that is determined to be a threat to employees or public health, the environment, or potentially a violation of state or federal regulations as indicated in reports from the Manager-Environmental, Health and Safety or the RSO. The Director, Compliance and Licensing may also serve as Corporate Radiation Safety Officer (CRSO) and if doing so, shall meet the RSO qualifications described in Section 9.3.1.

#### 9.2.6 Manager-Environmental, Health and Safety

Reporting directly to the General Manager of Operations, the Manager-Environmental, Health and Safety oversees all Radiation Protection, Health, and Environmental Programs as stated in the EHS Management System, at the Smith Ranch-Highland Operation. This position assists in the development and review of radiological and environmental sampling and analysis procedures and is responsible for routine auditing of the programs. The Manager-Environmental, Health and Safety has the responsibility and authority to suspend, postpone, or modify any activity that is determined to be a threat to employees, public health, the environment or potentially a violation of state or federal regulations. As such, the Manager-Environmental, Health and Safety has a secondary reporting requirement to the Director, Compliance and Licensing. This position could fulfill the duties of RSO on an interim basis and if doing so, shall meet the RSO qualifications described in Section 9.3.1.

#### 9.2.7 Environmental Coordinator

The Environmental Coordinator is primarily responsible for assisting in the implementation of the environmental compliance programs and the compilation of required reports. This position also assists with the industrial and radiation safety programs. This position reports directly to the Manager-Environmental, Health and Safety.

#### 9.2.8 Environmental Specialist

The Environmental Specialist assists with the implementation of the environmental compliance programs including maintaining ground water monitoring, collects air, water, soil and vegetation samples, maintains data bases and waste management programs. This position also assists with the industrial and radiation safety programs as needed. The position reports to the Manager, Environmental, Health and Safety, but will report radiation safety items directly to the RSO.

#### 9.2.9 Radiation Safety Officer (RSO)

Reporting directly to the Manager-Environmental, Health and Safety, the Radiation Safety Officer (RSO) is responsible for the daily supervision of the

radiation safety programs at company operations. Responsibilities include the development and implementation of all radiation safety programs, ensuring that all records are correctly maintained, and assisting the Manager-Environmental, Health and Safety in ensuring compliance with NRC regulations and license conditions applicable to public and worker health.

The RSO conducts and/or oversees training programs for the supervisors and employees with regard to the proper application of radiation protection procedures. The RSO or a designee inspects facilities to verify compliance with all applicable radiological health and safety requirements. The RSO has the responsibility and the authority, through appropriate line management, to suspend, postpone, or modify any work activity that is unsafe or potentially a violation of NRC regulations or license conditions, including the ALARA program. The position of RSO may be fulfilled on an interim basis by the Manager – Environmental, Health, and Safety. Depending on the level of activity at the site, the RSO may also fulfill the responsibilities of the RST.

#### 9.2.10 Radiation Safety Technician (RST)

The Radiation Safety Technician (RST) conducts radiological surveys, collects air, water, soil and vegetation samples, performs analyses and collects data for the radiation safety program, performs calculations of employee radiation exposures, keeps records, and conducts various other activities associated with implementation of the environmental and radiation protection programs. The RST reports directly to the RSO.

#### 9.2.11 Safety Supervisor/Trainer

The Safety Supervisor/Trainer is responsible for the non-radiation related health and safety programs. Responsibilities include the development and implementation of health and safety programs in compliance with the regulatory agency. Responsibilities include administration or presentation of all training programs, and the maintenance of appropriate records to document compliance with regulations. The Safety Supervisor/Trainer reports directly to the Manager-Environmental, Health and Safety.

### **9.3 HEALTH PHYSICS QUALIFICATIONS**

#### 9.3.1 Radiation Safety Officer

The position of RSO shall meet the requirements of NRC Regulatory Guide 8.31.

#### 9.3.2 Radiation Safety Technician

The position of RST shall meet the requirements of NRC Regulatory Guide 8.31.

## 9.4 ALARA POLICY

The purpose of the ALARA (As Low As Reasonably Achievable) Policy is to keep exposures to all radioactive nuclides and other hazardous material as low as possible and to as few personnel as possible, taking into account the state of technology and the economics of improvements in relation to benefits to the public health and safety, and other societal and socioeconomic considerations, and in relation to the utilization of atomic energy in the public interest.

In order for an ALARA Policy to correctly function, all individuals including management, supervisors, health physics staff, and workers, must take part and each share in the responsibility to keep all exposures as low as reasonably achievable. This policy addresses this need and describes the responsibilities of each.

### 9.4.1 Management Responsibilities

Consistent with Regulatory Guide 8.31, the licensee Management is responsible for the development, implementation, and enforcing the applicable rules, policies, and procedures as directed by regulatory agencies and company policies. These shall include the following:

1. The development of a strong commitment to and continuing support of the implementation and operations of the ALARA program;
2. An Annual Audit Program which reviews radiation monitoring results, procedural, and operational methods;
3. A continuing evaluation of the Health Physics Program including adequate staffing and support;
4. Proper training and discussions which address the ALARA program and its function to all facility employees and, when appropriate, to contractors and visitors.

### 9.4.2 Radiation Safety Officer Responsibility

The RSO shall be charged with ensuring technical adequacy, proper radiation protection, and the overall surveillance and maintenance of the ALARA program. The RSO shall be assigned the following:

1. The responsibility for the development and administration of the ALARA program;

2. Sufficient authority to enforce regulations and administrative policies that affect any aspect of the Health Physics Program;
3. Assist with the review and approval of new equipment, process changes or operating procedures to ensure that the plans do not adversely affect the Health Physics Program;
4. Maintain equipment and surveillance programs to assure continued implementation of the ALARA program;
5. Assist with conducting an Annual ALARA Audit with Management to determine the effectiveness of the program and make any appropriate recommendations or changes as may be dictated by the ALARA philosophy;
6. Review annually all existing operating procedures involving or potentially involving any handling, processing, or storing of radioactive materials to ensure the procedures are ALARA and do not violate any newly established or instituted radiation protection practices;
7. Conduct or designate daily inspections of pertinent facility areas to observe that general radiation control practices, hygiene, and housekeeping practices are in line with the ALARA principle.

#### 9.4.3 Supervisor Responsibility

Supervisors shall be the front line for implementing the ALARA program. Each shall be trained and instructed in the general radiation safety practices and procedures. Their responsibilities include:

1. Adequate training to implement the general philosophy behind the ALARA program;
2. Provide direction and guidance to subordinates in ways to adhere to the ALARA program;
3. Enforcement of rules and policies as directed by regulatory agencies and company management;
4. Seek additional help from management and the RSO should radiological problems be deemed by the supervisor to be outside their sphere of training.

#### 9.4.4 Worker Responsibility

Because success of both the radiation protection and ALARA programs are contingent upon the cooperation and adherence to those policies by the workers themselves, the facility employees must be responsible for certain aspects of the program in order for the program to accomplish its goal of keeping exposures as low as possible. Worker responsibilities include:

1. Adherence to all rules, notices, and operating procedures as established by management and the RSO;
2. Making valid suggestions which might improve the ALARA program;
3. Reporting promptly, to immediate supervisor, any malfunction of equipment or violation of procedures which could result in an unacceptable increased radiological hazard;
4. Proper use and fit testing of any respirator;
5. Proper use and returning of any bioassay sample kit at its required time.

## **9.5 MANAGEMENT CONTROL PROGRAM**

### **9.5.1 CR Environment, Health and Safety Management System**

CR's Environment, Health and Safety (EHS) Management System formalizes the Company's approach to EHS management to ensure a consistency across its operations. The management system is a key element assuring that the management demonstrates "due diligence" in addressing EHS issues and describes how the operations of the facility will comply with the requirements of the CR EHS Policy and Regulatory requirements.

The EHS Management System:

- Assures that sound management practices and processes are in place to ensure that strong EHS performance is sustainable.
- Clearly sets out and formalizes the expectations of EHS management.
- Provides a systematic approach to the identification of EHS issues and ensures that a system of risk identification and management is in place.
- Provides a framework for personal, site and corporate EHS responsibility and leadership.

- Provides a systematic approach for the attainment of CR's EHS objectives.
- Ensures continued improvement of EHS programs and performance.

The EHS Management System has the following characteristics:

- The system is compatible with the ISO 14001 Environment Management System.
- The system is straightforward in design and is intended as an effective management tool for all types of activities and operations, and is capable of implementation at all levels of the organization.
- The system is supported by standards that clearly spell out CR's expectations, while leaving the means by which these are attained as a responsibility of line management.
- The system is readily auditable.
- The system is designed to provide a practical tool to assist the operations in identifying and achieving their EHS objectives while satisfying CR's governance requirements.

The EHS Management System uses a series of standards that aligns with specific management processes and sets out the minimum expectations for EHS performance. The standards management processes consist of assessment, planning, implementation (including training, corrective actions, safe work programs, and emergency response), checking (including auditing, incident investigation, compliance management, and reporting), and management review. CR has developed procedures consistent with these standards and regulatory requirements to implement these management controls.

#### 9.5.1.1 Historical Management Program Activities

Commercial operations at the Highland Facility were authorized by the NRC in July 1987. Both the Smith Ranch and Highland operations are located at past surface or underground uranium mining operations and substantially use buildings and other facilities remaining from those historic operations. Both operations utilized numerous Standard Operating Procedures (SOPs) to assist with implementation of radiation safety, environmental monitoring, and management procedures.

In July 2000, Rio Algom Mining Corp. (RAMC) finalized the EHS Management Procedures for the Smith Ranch Facility. The procedures are contained in the following 8 volumes:

- Volume 1 – Management System Manual
- Volume 2 – Management Procedures
- Volume 3 – Operating Procedures (SOPs)
- Volume 4 – Health Physics Manual
- Volume 5 – Health and Safety Manual
- Volume 6 – Environmental Manual
- Volume 7 – Training and Awareness Manual
- Volume 8 – Emergency Procedure Manual

In July 2002 CR acquired the Smith Ranch Facility and combined operations with the Highland Operation into the Smith Ranch – Highland Operation (Smith Ranch-Highland Operation). Soon after the workforces of both operations were combined and EHS Department personnel were consolidated at the Smith Ranch Main Office complex, activities began to modify the EHS Management System Procedures in order that they could be utilized by CR Management and the newly combined Smith Ranch-Highland Operation workforce. The initial focus of these efforts included revising procedures detailing emergency procedures and the processing of resin from the Highland Satellites at the Smith Ranch CPP. As of December 2004, revisions to the EHS Management System were approximately 80% complete.

As committed to the NRC during the license transfer process as well as during the September 9-11, 2002 NRC Inspection for the combined Smith Ranch-Highland Operation facilities, CR is committed to revising the EHS Management System Procedures accordingly and utilizing the system to augment the operation of the combined operations.

#### 9.5.2 Performance Based License Condition

This license application is the basis of the Performance Based License, and under that license CR may, without prior U.S. Nuclear Regulatory Commission approval or the need to obtain a License Amendment:

- 1) Make changes to the facility or process, as presented in the license application (as updated);
- 2) Make changes in the procedures presented in the license application (as updated);
- 3) Conduct tests or experiments not presented in the license application (as updated).

A License Amendment and/or NRC approval will be necessary prior to implementing a proposed change, test or experiment if the change, test or experiment would:

1. Result in any appreciable increase in the frequency of occurrence of an accident previously evaluated in the license application (as updated);
2. Result in any appreciable increase in the likelihood of occurrence of a malfunction of a structure, system, or component (SSC) important to safety previously evaluated in the license application (as updated);
3. Result in any appreciable increase in the consequences of an accident previously evaluated in the license application (as updated);
4. Result in any appreciable increase in the consequences of a malfunction of an SSC previously evaluated in the license application (as updated);
5. Create a possibility for an accident of a different type than any previously evaluated in the license application (as updated);
6. Create a possibility for a malfunction of an SSC with a different result than previously evaluated in the license application (as updated);
7. Result in a departure from the method of evaluation described in the license application (as updated) used in establishing the final safety evaluation report (FSER) or the environmental assessment (EA) or technical evaluation reports (TERs) or other analysis and evaluations for license amendments.
8. For purposes of this paragraph as applied to this license, SSC means any SSC which has been referenced in a staff SER, TER, EA, or environmental impact statement (EIS) and supplements and amendments thereof.

Additionally, the licensee must obtain a license amendment unless the change, test, or experiment is consistent with the NRC conclusions, or the basis of, or analysis leading to, the conclusions of actions, designs, or design configurations analyzed and selected in the site or facility Safety Evaluation Report, TER, and EIS or EA. This would include all supplements and amendments, and TERs, EAs, EISs issued with amendments to this license.

Determination of compliance concerning the above listed conditions will be made by a "Safety and Environmental Review Panel (SERP)." The SERP will consist of a minimum of three individuals. One member of the SERP will have

expertise in management and will be responsible for managerial and financial approval for changes; one member will have expertise in operations and/or construction and will have expertise in implementation of any changes; and one member will be the Radiation Safety Officer (RSO), or equivalent. Other members of the SERP may be utilized as appropriate, to address technical aspects of the change, experiment or test, in several areas, such as health physics, ground water hydrology, surface water hydrology, specific earth sciences, and others. Temporary members, or permanent members other than the three identified above, may be consultants.

#### 9.5.2.1 Organization of the Safety and Environmental Review Panel

The composition of the SERP shall be as follows:

Number of Participants: No less than 3 persons. It may consist of more participants.

Required Participants:

Radiation Safety Officer or equivalent (such as the CRSO)

A member of Facility Management  
(e.g. Facility General Manager of Operations)

A member of Operations Management  
(e.g. Plant Manager, Wellfield Manager, etc.)

Other members of the SERP may be utilized as appropriate to address technical aspects described in Section 9.5.2 shown above in several areas of expertise such as health physics, ground water hydrology, surface water hydrology, specific earth sciences, and other areas. Temporary or permanent members other than the three above may be consultants

#### 9.5.3 Safety and Environmental Review Panel Responsibilities

This procedure will be used for the evaluation of all major changes to the facility operations as described in Section 9.5.2 of this chapter. The changes may be derived from operational and/or economic considerations, and can include changes dictated by regulatory requirements including Federal and State agencies outside of the NRC organization. The following reviews shall be carried out by the SERP. The SERP may delegate any portion of these responsibilities to a committee of two or more members of the SERP. This committee will report their findings to the full SERP for a determination of compliance with Section 9.5.2 of this chapter.

## 1. Operations / Technical Review

- a. Review operating criteria and critical equipment and determine the following:
  - i. Does the proposed change impact the operations as described in the license application?
  - ii. Does the proposed change significantly change the processes used at the facility as described in the license application?
- b. Review the Standard Operating Procedures, (SOP), for the proposed change and determine the impact on current SOP's. Make the necessary updates to the current SOP's or develop new ones.
- c. If applicable, review the Emergency Response Plan and determine compatibility with it.

## 2. Environmental / Health Physics / Safety Review

- a. Review the proposed change to determine if any changes in monitoring and record keeping are required to ensure compliance with existing programs.
- b. Review the proposed changes and determine the need for additional training.
- c. Review key personnel training records and determine training needs as required by the proposed change.

## 3. Compliance Review

- a. Review the proposed change and determine whether it will conflict with Corporate or facility policies regarding training, safety, and responsibility concerns.
- b. Review the proposed change and determine compliance with the facility NRC Source Material License.
- c. Review the proposed change and determine compliance with NRC regulations and other Federal and State regulations.

Upon completion of this review, the SERP will determine if the proposed change meets the criteria listed in Section 9.5.2. If the proposed change does meet those criteria, then the SERP may implement the change and provide a record of that change as described in Section 9.5.4 of this chapter. If the proposed change does not meet those criteria, then the change will not be implemented until approval of a License Amendment is received from the U.S. Nuclear Regulatory Commission.

#### 9.5.4 Record Keeping and Reporting

Records will be kept of all changes made following the Performance Based License requirements. These records shall include written safety and environmental evaluations, performed by the SERP, that provide the basis for the determination that the change is in compliance with the requirements referred to in Section 9.5.2. These records shall be maintained by the RSO and a copy provided to the facility General Manager of Operations and members of the SERP.

An Annual Report will be submitted to the U.S. NRC that provides a description of changes, tests, or experiments made pursuant to the SERP approval process including a summary of the safety and environmental evaluation of each review. Additionally, all pages that reflect a change made to the license application under the Performance Based License Condition will be submitted with this report. Each replacement page shall include both a change indicator for the area of change, (e.g., Bold marking vertically in the margin adjacent to the portion actually change), and a page change identification, (date of change or change number, or both).

### 9.6 **EMPLOYEE TRAINING**

All newly hired permanent facility employees will attend a training program conducted by the RSO or another qualified individual on the basic principles of radiation safety, health hazards of exposure to uranium, personal hygiene practices for uranium facilities, radiation safety procedures, and responses to emergencies or accidents involving radioactive materials. A written examination will be given at the completion of the training and the instructor will review all questions with incorrect answers with the employees. Each worker must achieve a predetermined passing score before being allowed to work in a controlled or restricted area of the facility. The written examination for these employees shall be maintained on file.

All permanent facility workers will also receive an Annual Refresher Training course that includes a review of any new radiation safety regulations, site safety experience and radiation exposure trends. Radiation safety problems or subjects will also be offered for discussion at least four times per year in the Quarterly Safety Meetings. Safety Meeting subjects and attendance records will be maintained on file at the site. Specialized instruction on the radiation health and safety aspects of jobs involving higher than normal exposure risks will be provided by the RSO, RST and/or Supervisor.

Each worker who may be required to use respiratory protective equipment will receive training in the use of the specific equipment to be used. No person shall

use respiratory equipment until they are specifically trained in the use of the equipment.

## **9.7 STANDARD OPERATING PROCEDURES**

Written Standard Operating Procedures (SOPs) will be established for all operational activities involving radioactive materials that are handled, processed, stored, or transported by employees. The procedures will enumerate pertinent radiation safety procedures to be followed. Written procedures shall also be established for in-plant and environmental monitoring, bioassay analysis, and instrument calibration for activities involving radiation safety. A copy of the written procedure will be kept in the area where it is used. All procedures involving radiation safety will be reviewed and approved in writing by the RSO or another individual with similar qualifications prior to being implemented. The RSO and/or his designee(s) will review the operating procedures annually.

In the case that employees are required to conduct activities of a non-routine nature where there is the potential for significant exposure to radioactive materials, and no SOPs exist for the activity, a Radiation Work Permit (RWP) will be required. The RWP will describe the scope of the work, precautions necessary to maintain radiation exposures to ALARA, and any supplemental radiological monitoring and sampling to be conducted during the work. The RWP shall be reviewed and approved in writing by the RSO, RST, or a designated supervisor in the absence of the RSO or RST, prior to initiation of the work.

## **9.8 EXTERNAL RADIATION EXPOSURE MONITORING PROGRAM**

External radiation exposure was monitored at the Highland Uranium Project during the period 1988 through 1993 by the use of personal radiation dosimeters, such as Thermoluminescent Dosimeter badges (TLDs) or Optically Stimulated Luminescent dosimeter badges (OSLs). All employees, except several office personnel that did not enter areas where potential exposures existed, utilized dosimeters. During the period 1988 through 1993 the monitoring data collected from the dosimeters shows that the annual dose to all workers was less than 10 percent of the 5000 mrem annual limit contained in 10 CFR 20.1201(a). Therefore, consistent with 10 CFR 20.1502, beginning on January 1, 1994, individual monitoring devices, such as TLDs, were only used to monitor occupational exposures to Central Plant Operators because they could potentially exceed 10 percent of the annual limit contained in 10 CFR 20.1201(a) due to the potential exposure to airborne uranium. Accordingly, it is not required that occupational exposures to external radiation be determined or recorded for other workers, although CR has continued to monitor some additional workers.

To ensure that potential exposures to gamma radiation remain less than 10 percent of the annual limit (or less than 500 mrem), the two work groups with the greatest potential for exposure (Central Plant Operators and Satellite/Restoration Operators) will utilize NRC approved dosimeters. Quarterly monitoring data collected from these badges will be recorded and reviewed annually to ensure that exposures do not exceed 500 mrem.

Additionally, quarterly gamma surveys are performed at specified locations throughout the Satellite buildings and Central Processing Facilities (CPFs) to assure that areas requiring posting as "Radiation Areas" are identified, posted, and monitored to assess external radiation conditions. "Radiation Areas" are those areas exhibiting 5 to 100 mrem per hour at a distance of 30 cm from the source. Radiation Areas are posted at various locations in the yellowcake processing areas of the CPFs and Satellites, and consist of IX columns and various tanks and filter apparatuses. Both Yellowcake Warehouses, located at each CPF, are posted as Radiation Areas.

## **9.9 BIOASSAY PROGRAM**

A Bioassay (urinalysis) Program consistent with the program outlined in Revision 1 of NRC Regulatory Guide 8.22 "Bioassay at Uranium Mills" has been implemented and will be maintained at the Smith Ranch-Highland Operation. All permanent employees that will handle yellowcake submit a baseline urinalysis prior to their initial assignment at the facility. A urinalysis is also requested from all permanent employees at the time of termination of employment if they were recently involved in yellowcake processing activities. Central Plant and Dryer Operators, who are the only workers to routinely work in the yellowcake precipitation, drying and packaging areas, are required to submit monthly urine specimens for uranium analysis. Specimens are collected 2 to 4 days after the employee has left the work area (i.e., after a weekend and prior to entering the work area). Consistent with Regulatory Guide 8.22, quality control of the monthly urinalyses is assured by including one blank and two spiked samples with each month's batch of specimens. The blank and spiked samples are labeled with non-employee names in order that the contract laboratory is not aware of the particular specimens content. Laboratory results for these specimens are compared with known values to ensure that laboratory results are accurate.

Workers potentially exposed to concentrations of uranium above regulatory limits are also required to submit urine specimens for uranium analysis 2 to 4 days following the potential exposures. Workers meeting this requirement are typically working under the direction of a Radiation Work Permit (RWP). This is done even if respiratory protection has been utilized to ensure that the respiratory protection equipment has been worn properly and to ensure that respirators are functioning as designed.

CR also randomly obtains, on a monthly basis, urine specimens from other workers at the facility to confirm that workers are not subject to an unknown uptake of uranium.

The contract laboratory provides immediate notification (via telephone or fax) of all urinalyses exceeding 15 µg/L uranium. Table 9-1 lists the actions taken for individual urinalysis results.

## **9.10 AIRBORNE RADIATION MONITORING PROGRAM**

### **9.10.1 Airborne Uranium Particulate Monitoring**

There is no potential for exposure to ore dust at the Smith Ranch-Highland Operation since the facility is an ISL uranium mine. However, there is the potential for exposure of workers to yellowcake dust in certain areas of the Smith Ranch-Highland Operation. In the drying and packaging areas at Highland the potential exists for exposure to yellowcake dust that is classified as "insoluble" since the operating temperature of the Dryer is in excess of 400°C (752°F). The Highland Dryer typically operated at about 600°C (1100°F). The Highland dryer has not operated since 2003.

In the drying and packaging areas at Smith Ranch the potential exists for exposure to yellowcake dust that is classified as "soluble" since the operating temperature of the Vacuum Dryer is low (about 77°C or 170°F). In the slurry unloading area the potential for exposure to airborne uranium is considerably less than in the drying and packaging areas. The yellowcake dust is classified as soluble in the slurry unloading area. Slurry unloading is performed on a very infrequent basis.

#### **9.10.1.1 Airborne Uranium Monitoring at the Highland Central Plant**

When the Highland Central Plant is operating, there is continuous monitoring of airborne uranium particulates at the drying and packaging areas. During periods of drying and packaging activity, the filters of the continuous air monitors are changed and analyzed daily. During periods that drying and packaging activities are not occurring, the filters are changed and analyzed on a weekly basis.

Exposures to workers are determined from the conservatively estimated uranium particulate concentration data, occupancy time studies, and the application of the Applied Protection Factor (APF) of 100 for the routine use of fullface air purifying respirators. Consistent with the Respiratory Protection Program, all Highland Central Plant Operators utilizing negative pressure respirators are required to pass the quantitative fit test.

When the Highland Central Plant is operating, the Precipitation Area of the plant is monitored on a quarterly basis for airborne uranium. A review of the historic data shows that maximum airborne uranium concentrations were less than 1% of the DAC for soluble uranium ( $5E-10 \mu\text{Ci/ml}$ ).

#### 9.10.1.2 Airborne Uranium Monitoring at the Smith Ranch Central Processing Plant (CPP)

Airborne uranium particulate monitoring at the Smith Ranch CPP and Pilot Building was historically performed on a monthly basis. Given the extensive data base that exists for the Pilot Building that shows the virtual lack of airborne uranium in this area, and the fact that IX equipment and tanks have been removed, it is not necessary to further monitor this area for airborne uranium.

Airborne uranium particulates at the Smith Ranch CPP are monitored to assess any unanticipated occurrence of uranium in the air and provide uranium airborne concentration data used in the exposure determinations for the CPP Operators and the Dryer Operators. The monitoring locations and frequency are as follows:

<u>Location</u>	<u>Frequency</u>
Precipitation Area	Monthly
Yellowcake Storage Area	Monthly
Dryer Room	Monthly

To estimate the routine exposure of Dryer Operators to uranium, a high volume sampler is set up in the yellowcake packaging area or representative samples are collected with a Breathing Zone (BZ) sampler. Dryer Operators are required to wear respiratory protection during yellowcake packaging operations because of the potential release of airborne uranium during this procedure.

#### 9.10.1.3 Airborne Uranium Monitoring at Satellites

Due to the fact that the uranium bearing fluids at the Satellite facilities are fully contained within pipes, tanks, and IX vessels the likelihood of any significant quantities of uranium in the air is very remote. This is supported by many years of data collected at both Smith Ranch and Highland Satellites that show virtually no occurrence of airborne uranium at these facilities. Therefore, uranium particulates are not routinely monitored at these facilities.

#### 9.10.1.4 Radon Daughter Monitoring

Radon daughters are routinely monitored on a monthly basis at the Highland CPF (when operating), the Smith Ranch CPP, and Satellite facilities. Routine exposures to radon daughters are only determined for Central Plant Operators. The method of analysis is the modified Kusnetz method or other commonly

accepted method of measurement. In the case that radon monitoring determines concentrations above 0.08 WL, the monitoring frequency will be increased to weekly until the following four samples return to less than 0.08 WL.

During the period 1988 through 1993, weekly and monthly monitoring results at numerous sites throughout the project showed that radon daughter concentrations were routinely less than 10% of the regulatory limit of 0.33 working level. Therefore, it was determined that the routine exposure of workers to radon daughters only needed to be determined for Central Plant Workers (Central Plant and Dryer Operators).

#### 9.10.1.5 Airborne Radioactive Areas

Any area, room, or enclosure will be designated an "Airborne Radioactivity Area" as defined in 10 CFR 20.1003, if at any time the uranium concentration exceeds  $5E-10$   $\mu\text{Ci/ml}$  for soluble uranium or  $2E-11$   $\mu\text{Ci/ml}$  for insoluble uranium.

When operating, both the Yellowcake Dryer Room and Yellowcake Packaging Room at Highland are posted as Airborne Radioactivity Areas as concentrations of insoluble uranium may at times exceed  $2E-11$   $\mu\text{Ci/ml}$ . Because the predominant form of airborne uranium in these areas is comprised of high-fired (above  $400^{\circ}\text{C}$ ) dried yellowcake, the insoluble uranium DAC ( $2E-11$   $\mu\text{Ci/ml}$ ) is used.

Additionally, areas will be posted as "Airborne Radioactivity Areas" in the case that an individual present in the area without respiratory protection could exceed, during the hours an individual is present in a week, an intake of 0.6 percent of the Allowable Limit on Intake (ALI) or 12 Derived Air Concentration (DAC)-hours. Airborne Radioactivity Areas are posted in accordance with 10 CFR 20.1902. CR will avoid posting radiation hazard signs in areas that do not require them.

### 9.11 EXPOSURE CALCULATION

Employee exposures at the Smith Ranch-Highland Operation are monitored in accordance with USNRC Regulatory Guide 8.34, "Monitoring Criteria and Methods to Calculate Occupational Radiation Doses." A bioassay program consistent with USNRC Regulatory Guide 8.22, Rev. 1 "Bioassay at Uranium Mills" is utilized as a means of ensuring the adequacy of the monitoring and respiratory protection programs for protection from airborne uranium dust.

Employee exposure to airborne uranium is estimated for routine and non-routine activities. The exposure to dried yellowcake at Highland is considered "insoluble" (Y-Class) and the exposure to dried yellowcake at Smith Ranch is

considered "soluble" (D-Class). Exposure to any uranium that has not been through any drying process is considered "soluble" (D-Class).

The exposure estimates are based on exposure times and the concentrations of airborne uranium as determined from routine air monitoring or non-routine air monitoring (i.e. breathing zone monitoring or specific area air monitoring). Routine exposures to uranium and radon daughters are only determined for the Central Plant Workers (Central Plant Operators, Dryer Operators) as, in accordance with 10 CFR 20.1502(b)(1), they are the only workers routinely exposed to airborne radionuclides in concentrations which are likely to result in annual exposures in excess of 10% of the ALI, without respiratory protection. These potential exposures result from the need to work in the yellowcake dryer and yellowcake packaging facilities. Routine exposures are estimated using exposure times generated from Annual Time Studies or actual occupancy times. Time Studies are updated after any significant change in equipment procedures, or job functions.

Non-routine exposures to uranium result from performing non-routine operational or maintenance tasks that have the potential for creating a significant exposure to airborne uranium. These types of exposures are monitored utilizing a Radiation Work Permit (RWP). The RWP specifies the types of radiological monitoring required for the task (soluble or insoluble uranium) and the protective equipment and clothing employees must wear while performing the task. The sampling results are evaluated and documented. This data, together with the employee's time in the area, is used to estimate the non-routine exposure. Each Central Plant Worker's routine and non-routine exposure to soluble and insoluble uranium is recorded at least monthly and summarized annually.

Routine employee exposure to radon daughters is determined for only the Central Plant Workers. Similar to non-routine uranium exposures, non-routine radon daughter exposures are monitored utilizing an RWP. Routine exposure times are determined by annual time studies or actual occupancy times. Time studies are also updated after any significant change in equipment, procedures, or job functions. Each Central Plant Worker's routine and non-routine exposure to radon daughters is recorded monthly and summarized annually.

#### 9.11.1 Airborne Uranium Exposure Calculation

The intake of soluble or insoluble yellowcake during the weekly or annual period being evaluated is estimated using the following equation:

$$I_U = \sum_{i=1}^n \frac{(x_i)(t_i)}{(DAC)(PF)}$$

Where:

$I_u$	=	uranium intake, DAC-hours
$t_i$	=	time that the worker is exposed to concentration $x_i$ , hr
$x_i$	=	average concentration of uranium in the air, $\mu\text{Ci/ml}$
DAC	=	the derived air concentration value for uranium ( $5\text{E-}10 \mu\text{Ci/ml}$ for soluble, $2\text{E-}11 \mu\text{Ci/ml}$ for insoluble) from Appendix B Table 1 of 10 CFR Part 20
PF	=	respirator protection factor from Appendix A of 10 CFR Part 20
$n$	=	number of exposures during the period of evaluation

### 9.11.2 Radon Daughter Exposure Calculation

The modified Kusnetz or equivalent method for determining exposure to radon daughters is utilized at the Smith Ranch-Highland Operation. From the monitoring data collected, the employees' intake of radon daughters is calculated using the following equation:

$$I_r = \sum_{i=1}^n \frac{(w_i)(t_i)}{(DAC)(PF)}$$

Where:

$I_r$	=	radon daughter intake, DAC-hours
$t_i$	=	time of exposure to concentration $W_i$ , hr
$w_i$	=	average number of working levels in the air during time $t_i$
DAC	=	the derived air concentration value for radon daughters, ( $3\text{E-}8 \mu\text{Ci/ml}$ or 0.33 WL) from Appendix B of 10 CFR Part 20
PF	=	respirator protection factor
$n$	=	number of exposure periods during the year

Section 20.2203 of 10 CFR requires that overexposure reports be made to the appropriate NRC Regional Office if the intake of uranium and/or radon exceeds the quantities specified in 10 CFR 20.1201. The following exposure limits require NRC notification:

1. Soluble Uranium - if an employee has an intake of more than 10 mg of soluble uranium in one week. This intake is in consideration of chemical toxicity.
2. Total Effective Dose Equivalent (TEDE) - if an employee exceeds the TEDE annual limit of 5 rem. The annual TEDE is determined by summing annual doses from soluble uranium, insoluble uranium and radon.

### 9.11.3 Calculation of Total Effective Dose Equivalent (TEDE)

In accordance with 10 CFR 20.1201, the Total Effective Dose Equivalent (TEDE) is determined on an annual basis for each Central Plant Worker by adding the deep dose external gamma exposures for the year to the internal exposures to radon daughters and uranium. The annual limit for the TEDE is 5 rem.

## **9.12 ADMINISTRATIVE ACTION LEVELS**

An administrative action level is set at 2.5 mg of soluble uranium for any calendar week. An administrative action level is set at 125 DAC-hours for exposure to insoluble uranium and/or radon daughters for any calendar quarter. If the action level is exceeded, the RSO will initiate an investigation into the cause of the occurrence, determine any corrective actions that may reduce future exposures and document the corrective actions taken. Results of the investigation will be reported to management within one month of the action level being exceeded.

The results of the personal gamma radiation monitoring from the dosimeters are evaluated on a quarterly basis and an administrative action level is set at 312 mrem per quarter. If an employee's exposure exceeds this level, the RSO will investigate the reason for the exposure and initiate corrective measures to prevent a recurrence.

The results of the bioassay program are also used to evaluate the adequacy of the respiratory protection program at the facility. An abnormally high urinalysis will be investigated both to determine the cause of the high result and determine if the exposure records adequately reflected that such an exposure may have actually occurred.

## **9.13 CONTAMINATION CONTROL PROGRAM**

### **9.13.1 General**

The primary sources of potential surface contamination at the Smith Ranch-Highland Operation are associated with yellowcake precipitation, drying, and packaging activities. The recovery and elution portions of the process do not present a significant surface contamination problem except for dried spills or when special equipment maintenance is required. The primary method for control of surface contamination is instruction in, and enforcement of, good housekeeping and personal hygiene practices. Any visible yellowcake or production fluid spills will be cleaned up as soon as possible to prevent drying and possible suspension into the air which could pose an inhalation hazard. Plant Operators are instructed in the proper use of equipment and the prevention of spills and solution leaks at various stages of the process. Inadvertent contamination of designated Clean Areas is controlled by instructing

employees not to enter such areas with clothing or equipment contaminated with radioactive materials.

### 9.13.2 Surface Contamination Control

To ensure these administrative controls are effective in controlling surface contamination, alpha contamination surveys are performed monthly in Process Areas and weekly in designated Clean Areas. Routine surveys in the Process Areas of the Central Processing Plants and Satellite facilities consist of both a visual inspection for obvious signs of contamination and instrument surveys to determine total alpha contamination. Visible yellowcake, outside the drying and packaging facilities, will require prompt cleanup to minimize the potential for the material to become airborne. If the total alpha survey indicates contamination greater than 200,000 dpm/100 cm<sup>2</sup>, the area will be cleaned and resurveyed.

In designated Clean Areas, such as Lunch Rooms and offices, the target level of contamination is "nothing detectable". If the total uranium alpha survey in these areas indicates contamination in excess of 250 dpm/100 cm<sup>2</sup> (25% of the Table 9-2 Removable Contamination Limits) a smear test will be performed to assess the level of removable alpha activity. If smear test results indicate removable contamination greater than 250 dpm/100 cm<sup>2</sup>, the area will be cleaned promptly and resurveyed. The RSO will investigate the cause of the contamination and implement corrective action to minimize the potential for a recurrence. Total alpha surface contamination levels exceeding the Table 9-2 limits will also require cleanup and investigation.

Before yellowcake drums leave the packaging area, they are washed to remove all visible yellowcake. Prior to shipment, the drums are surveyed for total alpha contamination. Although the limit for removable contamination on drums shipped in sole use vehicles is 2200 dpm/100 cm<sup>2</sup>, a target level of 1500 dpm/100 cm<sup>2</sup> is used at the Smith Ranch-Highland Operation. If the total alpha survey results reveal contamination in excess of 1500 dpm/100 cm<sup>2</sup>, a smear survey is performed. If this survey indicates contamination in excess of 1500 dpm/100 cm<sup>2</sup>, the drums will be rewashed and resurveyed.

Yellowcake processing equipment that must be removed for maintenance or repair is thoroughly decontaminated prior to its removal from the area to prevent the possibility of contamination in the Maintenance Shop or other areas.

### 9.13.3 Personnel Contamination Control

Change rooms, showers and lockers for clean clothing are provided for employee use. An operable and appropriately calibrated alpha survey meter is made available for employee use at the exit of the Central Processing facilities and at the entrance to the Lunch Room at these facilities.

Employees are instructed in the use of the survey meter, techniques for minimizing contamination, for maintaining good personal hygiene, and in basic decontamination methods. Employees are also instructed on methods and procedures for good housekeeping practices within process areas to minimize the potential for contamination of personnel and equipment. The RSO or designee performs unannounced spot check surveys for alpha contamination on workers leaving the yellowcake production facilities. These unannounced spot check surveys are conducted on at least a quarterly basis.

Employees working in the precipitation, drying and packaging areas, as well as those involved in process equipment maintenance or repair are provided with appropriate protective clothing and equipment. Protective clothing is laundered on site or, if a disposable type, is disposed of in a facility licensed to accept such wastes.

All employees with potential exposure to yellowcake dust can shower and change clothes each day prior to leaving the site. An employee who showers and changes clothes is considered to be free of significant contamination. In lieu of showering, employees are required to survey their clothing, shoes, hands, face and hair with an alpha survey instrument prior to leaving the site. These surveys and/or showers are documented and maintained on site.

#### 9.13.4 Surveys for Release of Potentially Contaminated Materials and Equipment

Materials and equipment which have been used or stored in an area where contamination by uranium or uranium daughters could have occurred are surveyed for contamination prior to release from the site. The survey is conducted in accordance with the limits specified in Table 9-2. If the equipment or material does not meet the limits, it will be decontaminated and resurveyed. The survey results are documented and maintained on site.

### 9.14 PROTECTIVE EQUIPMENT & PROCEDURES

All process and maintenance workers who work in yellowcake areas or work on equipment contaminated with yellowcake will be provided and required to wear protective clothing including coveralls, boots or shoe covers. Workers who package yellowcake for transport will also be provided gloves. Before leaving the yellowcake processing area, all workers involved in the precipitation or packaging for transport of yellowcake, will, at a minimum, monitor their hands and feet using a calibrated alpha survey instrument. In addition, spot surveys will be performed for alpha contamination at least quarterly on all workers leaving the recovery plant area. The monitoring results are documented and maintained on file.

At the Central Processing Plants, eating is only allowed in designated Lunch Room areas that are separated from the process areas. Eating or smoking in the plant controlled areas is prohibited and violators are subject to disciplinary action.

### **9.15 MANAGEMENT AUDIT AND INSPECTION PROGRAMS**

Routine inspections of yellowcake processing areas at the CPP and Satellite facilities are conducted daily by the RST, or trained designee, to ensure that all radiation protection, monitoring, and safety requirements are being followed and/or are properly functioning. The EHS staff performs a Weekly Safety and Environmental Inspection that covers all major facilities at the Smith Ranch-Highland Operation, including the CPP areas, Satellites, and Wellfields.

In accordance with NRC requirements, an "Annual ALARA Audit" is performed to review the radiation safety program and associated monitoring data and survey results to ensure that the program is acting consistent with the ALARA philosophy. An important part of this audit includes recommendations to further improve the radiation safety and environmental programs.

In accordance with the EHS Management System, audits of the environmental, radiation safety, and industrial safety programs are periodically conducted by CR's parent company, or outside consultants specializing in these types of operations.

### **9.16 RECORD KEEPING AND RETENTION**

CR, as part of its EHS Management System, maintains a record keeping and retention program that is consistent with requirements of 10 CFR 20 Subpart L, 10 CFR 40.61 (d) and (e). Records of surveys, calibrations, personnel monitoring, bioassays, transfers or disposal of source or byproduct material, and transportation accidents will be maintained on site until license termination. Records containing information pertinent to decommissioning and reclamation such as description of spills, excursions, contamination events, etc. as well as information related to site and aquifer characterization and background radiation levels will be maintained on site until license termination. Duplicates of all significant records will be maintained in the corporate office or other offsite locations.

### **9.17 SECURITY**

Measures to secure licensed material from unauthorized removal and access are in place at the Smith Ranch-Highland Operation. The operating facilities are manned 24 hours per day, 7 days per week, and in controlled and/or unrestricted

areas, surveillance is maintained through the presence of the operators and workers on site. Licensed Material in the form of dry and slurry yellowcake is stored at the Smith Ranch Central Processing Plant. Access to both the Smith Ranch and Highland Central Processing Plants by the public is limited by the use of a locked or automatic gate. All visitors are required to check and sign in at the office before being allowed to enter the controlled access areas of the facility. Also, CR has further increased security at the Smith Ranch CPP/Main Office Complex by installing continuous video surveillance of outside areas.

## **9.18 QUALITY ASSURANCE**

CR has established the following Quality Assurance Program for all radiological, non-radiological effluent and environmental (including ground water) monitoring programs at the Smith Ranch-Highland Operation. This Quality Assurance Program addresses elements discussed in USNRC Regulatory Guide 4.15, "Quality Assurance for Radiological Monitoring Programs (Normal Operations) – Effluent Streams and the Environment."

Quality assurance comprises those planned and systematic actions which are necessary to provide adequate confidence in the results of a monitoring program. Quality control includes those quality assurance actions that provide a means to control and measure the characteristics of measurement equipment and processes to established requirements. Therefore, quality assurance includes quality control.

The overall objectives of the Quality Assurance program are:

1. To identify deficiencies in the sampling and measurement processes to those responsible for these operations so that corrective action can be taken.
2. To obtain a measure of confidence in the results of the monitoring programs to assure regulatory agencies and the public that the results are valid.

The first step of any reliable Quality Assurance Program is a formal delineation of the organization structure, management responsibilities, and training requirements for management personnel. These items have been covered in the previous section. Other components of the program are described below.

### **9.18.1 Radiological and Environmental Monitoring Procedures**

A critical step to ensure quality assurance objectives includes written procedures for various aspects of the radiological and environmental monitoring programs. Procedures for radiological and environmental monitoring programs are

contained in EMS Manual IV-Health Physics Manual (radiological monitoring program procedures), and EMS Manual VI- Environmental Manual (environmental monitoring program procedures). These manuals describe the procedures used to collect samples, complete laboratory analyses and survey, calibrate equipment, evaluate data, etc. for the radiological and environmental monitoring programs.

Procedures contained in EMS Manual IV-Health Physics Manual include the following programs:

- Airborne Radioactivity Monitoring
- External Radiation Monitoring
- Contamination Control
- Respiratory Protection
- Exposure Monitoring
- Transportation of Radioactive Materials
- Radiological Laboratory Programs

Procedures contained in EMS Manual VI-Environmental Manual include the following programs:

- Liquid Effluent Monitoring
- Air Monitoring
- Soil and Sediment Monitoring
- Vegetation Monitoring
- Wellfield Development and Monitoring
- Waste Management
- Topsoil Management
- Other Management Programs

#### 9.18.2 Duplicative Sampling and Inter and Intra Laboratory Analyses

A good Quality Assurance Program provides provisions to ensure that contract and in-house laboratories are accurately analyzing and reporting radiologic and chemical analyses. CR utilizes an EPA certified laboratory for all off site radiologic and chemical samples.

For every 20 excursion monitor well samples, a duplicate sample and a spiked sample are analyzed by CR's in-house laboratory. The duplication begins with original sample aliquots and allows the analyst to determine the precision of the analytical result. Standard addition spikes consist of the addition of a known amount of analyte to a duplicate sample aliquot. These spiked samples are useful in estimating the accuracy of an analytical result as well as identifying potential interferences.

In accordance with the applicable SOP's, baseline water quality samples for new wellfield areas are submitted within the required holding time to an EPA approved laboratory for filtration and preservation prior to analysis. Additionally, protocols have been established for the storage and shipment of samples, including standard Chain of Custody procedures.

#### 9.18.3 Instrument Calibrations

Electronic instruments used to conduct radiologic surveys or determine the concentrations of radiologic material are calibrated by a qualified contractor on a routine basis to ensure that they are operating within specified ranges for the radionuclides being measured. In accordance with SOP's certain instruments, such as alpha and GM probes, are functionally checked with a known radiologic source on a more frequent basis (daily or weekly). Additionally, air pumps used to collect environmental or breathing air samples are routinely calibrated. CR only utilizes EPA approved laboratories which adhere to strict protocols to ensure that their electronic instruments are properly calibrated to ensure valid results.

#### 9.18.4 Records

Records of radiologic surveys, instrument calibrations, radiological and chemical analyses, and employee exposures are retained on site under the direction of the RSO. To maintain the integrity of the program, the RSO and others, through the audit program, periodically review records to ensure that they are complete and accurate, and calculations have been done properly. These types of records are maintained on site until license termination. Critical records are periodically duplicated and stored in a second location in the case of fire or a similar type disaster. Computer programs used to determine employee exposures or other components of the program are verified with hand calculations to ensure that they are accurate.

#### 9.18.5 Audits

CR management periodically conduct audits of the radiation safety and environmental monitoring programs to verify compliance with applicable rules, regulations, license requirements and to ensure that exposures of employees, the public, and the environment are ALARA. Audit teams are comprised of knowledgeable individuals from within the project or from other CR operations, the parent company, or outside contractors specializing in such audits. The Annual ALARA Audit is conducted on an annual basis to assist with achieving the above objectives.

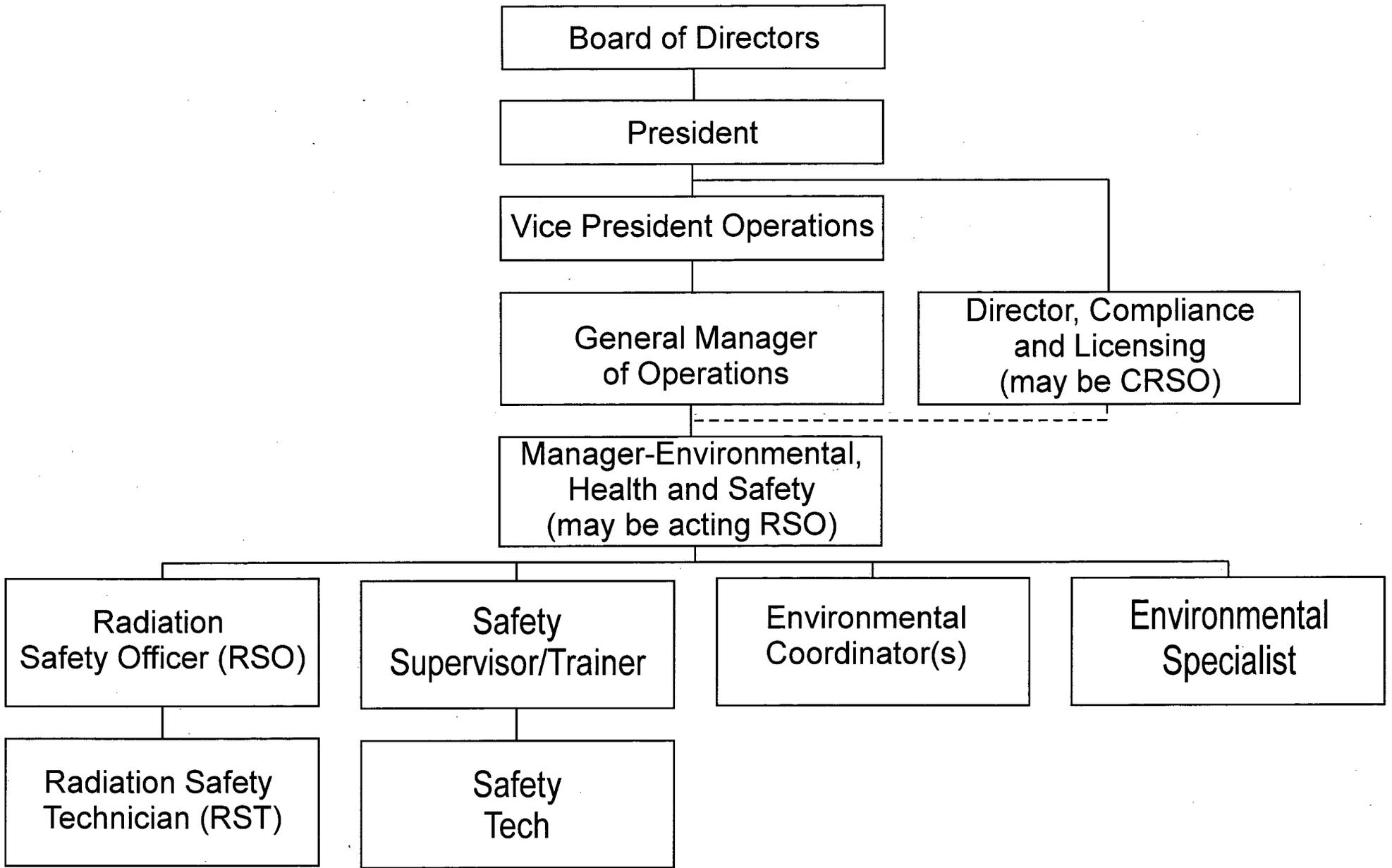


Figure 9-1: PRI Environmental, Health, and Safety Reporting Structure