environmental
properties management, LLC

July 20, 2020

Mr. James Smith
U.S. Nuclear Regulatory Commission
11555 Rockville Pike
Rockville, MD 20852-2738

Mr. Paul Davis
Oklahoma Department of Environmental Quality
707 North Robinson
Oklahoma City, OK 73101

Mr. Robert Evans
U.S. Nuclear Regulatory Commission
1600 East Lamar Blvd; Suite 400
Arlington, TX 76011-4511

Re: Docket No. 70-925; License No. SNM-928
Cimarron Environmental Response Trust
Report of Changes, Tests, or Experiments Made Under License Condition 27(e)

Dear Sirs:

License Condition 27(e) of license SNM-928 authorizes Environmental Properties Management LLC (EPM) to make certain changes to the NRC-approved Decommissioning Plan (DP) and Radiation Protection Plan (RPP) without NRC's approval, if these changes are consistent with the ALARA principle and the decommissioning process. License Condition 27(e) provides the criteria for making those changes and specifies that the ALARA Committee is responsible to review those changes and verify that they comply with those criteria. Finally, License Condition 27(e) requires that EPM provide an annual report of all changes, tests, and experiments made or conducted pursuant to this license condition.

EPM included Revision 4 of the RPP as an appendix to the November 2 *Facility Decommissioning Plan – Rev 1*. Although the members of the ALARA Committee did review and approve of the revised RPP and the revised DP, no 27(e) evaluations were performed, because NRC approval of both documents was requested, and NRC approval obviates the need for a 27(e) evaluation of the changes.

However, in the process of revising the RPP, several changes were identified that were deemed appropriate for implementation prior to approval of RPP – Rev 4 and *Facility Decommissioning Plan – Rev 1*. Those changes were incorporated into Revision 3 of the RPP and the resulting revision was designated Revision 3.2 of the RPP. A 27(e) evaluation was performed for RPP – Rev 3.2 so it could be implemented prior to approval of RPP – Rev 4.

Attached to this letter is a copy of the 27(e) evaluation, as well as a copy of Revision 3.2 of the RPP, showing the changes that were made to the RPP. Additions are identified by a revision bar

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in the left margin and underlined text in red font. Deletions are identified by red "strikeout" text. Comments are included in the right margin explaining the basis for changes.

License Condition 27(e) also provides for the conduct of tests or experiments that are not contained in an approved decommissioning plan without NRC approval, provided the test or experiment complies with the same evaluation criteria. Jay Maisler, our Radiation Safety Officer, recommended that a 27(e) evaluation be conducted to authorize routine "testing", such as groundwater and soil sampling, without NRC approval.

Attached to this letter is a copy of the 27(e) evaluation that was conducted to authorize those activities which present negligible potential for personnel to receive measurable dose from radiation or radioactive materials.

This report is being submitted only in electronic format. Hard copies will be provided upon request. If you have any questions or desire clarification, please call me at (405) 641-5152.

Sincerely,

Jeff Lux, P.E.
Project Manager

Attachments

Attachment 1 – 27(e) Evaluation for Radiation Protection Plan Rev 3.2
Attachment 2 – 27(e) Evaluation for Low-Risk Activities

cc: Martha Poston-Brown, NRC Region IV
Michael Broderick, Oklahoma Department of Environmental Quality
NRC Public Document Room

ATTACHMENT 1
27(e) EVALUATION FOR RADIATION PROTECTION PLAN REV 3.2

1.0 Description of Proposed Revision, Test, and/or Experiment:

Revision 3.2 is an interim revision pending approval of Revision 4 by the NRC. The revision to the RPP incorporates changes identified by ALARA Committee members and Cimarron staff that the ALARA Committee determined can be implemented prior to NRC approval of Decommissioning Plan and Revision 4 of the RPP. This revision incorporates changes discussed during the 2019 NRC inspection at the Site. Specific changes are identified in the attached markup of Revision 3.1.

2.0 Does the proposed revision, test, and/or experiment ("action") represent a change to the NRC-approved Decommissioning Plan or Radiation Protection Plan?

X	Yes	If "Yes", proceed to section 4.0 for evaluation of the action.
	No	If "No", proceed to section 3.0 for evaluation of the action.

3.0 Is the proposed test or experiment not present in the NRC-approved Decommissioning Plan or applicable license conditions?

	Yes	If "Yes", there is no need to conduct an evaluation.
X	No	If "No", proceed to Section 4.0 for evaluation of the action.

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4.0 Evaluation:

	LICENSE REQUIREMENT	YES	NO	N/A
4.1	**Does the action conflict with requirements specifically stated in the license, other than the RPP or DP?**			
	a) Does the action involve material not authorized by the license?		X	
	b) Are either the use or the place of use different from what the license authorizes?		X	
	c) Will the action violate training requirements?		X	
	d) Are there procedures or procedure revisions which have not been approved by the RSO?		X	
	e) Does the action involve work in Restricted Areas or with licensed material not addressed in RP Procedures?		X	
	f) Doe the action conflict with requirements in tie-downs stipulated in license conditions 10, 26, 27(a), or 27(c)?		X	
	g) Does the action result in contamination exceeding limits stipulated in license condition 27?		X	
4.2	**Does the action impair Cimarron Environmental Response Trust's ability to meet all applicable NRC regulations?**			
	a) Will the action cause an exceedance of dose limits for workers and members of the public?		X	
	b) Does the action establish limits other than approved decommissioning criteria?		X	
	c) Does the action violate requirements for surveys and monitoring, control of internal and external exposure, and control of licensed material?		X	
	d) Will the action violate precautionary procedures (posting, labeling, etc.)?		X	
	e) Does the action violate waste disposal or record keeping requirements?		X	

	LICENSE REQUIREMENT	YES	NO	N/A
4.3	**Does the action result in degradation of safety or environmental commitments addressed in the NRC-approved RPP and/or DP, or health and safety?**			
	a) Does the action result in greater release of licensed material to air or liquid effluents than planned actions?		X	
	b) Does the action result in the spread of licensed material to uncontaminated areas more than planned actions?		X	
	c) Does the action result in the loss of control over licensed material?		X	
	d) Have data quality objectives been established that achieve the required level of data quality?			X
4.4	**Does the action pose a significant adverse effect on the quality of the work or the remediation objectives?**			
	a) Does the action modify the intent to release the site for unrestricted use?		X	
	b) Does the action result in significant increase in the volume of material contaminated above license criteria?		X	
	c) Does the action contaminate unrestricted areas to the extent they will require decommissioning?		X	

	LICENSE REQUIREMENT	YES	NO	N/A
4.5	**Does the action conflict with the conclusions of actions analyzed in the Environmental Assessment, dated July 29, 1999 and Safety Evaluation Report dated August 20, 1999?**			
	a) Does the action render the environmental monitoring program unable to detect a release of licensed material to the environment?		**X**	
	b) Does the action increase the release of licensed material to groundwater, surface water, or air?		**X**	
	c) Does the action create the potential for an accident worse than that in the dose assessment?		**X**	
	d) Does the action result in an adverse socioeconomic impact to the community?		**X**	
	e) Does the action create other than short duration and minor impacts to air?			**X**
	f) Does the action adversely impact potential future land use?		**X**	
	g) Does the action adversely impact transportation plans for shipments to a licensed disposal site?		**X**	
	h) Does the action adversely impact endangered species?		**X**	
	i) Does the action impact historic or archeological sites?		**X**	

NOTE: If "YES" was answered in ***any*** of the Section 4 evaluation questions, the action cannot be performed without NRC approval. Provide any basis for determination of each answer provided in Section 4 as comments in Section 5.0, as appropriate.

5.0 Comments:

NRC approval is not required for implementing Rev. 3.2 of the RPP.

6.0 Results:

Revision, Test, or Experiment Approved:	Yes	X	No	

7.0 Submitted By (Signature/Date):

Position: Radiation Safety Officer	JMaisler Digitally signed by Jay Maisler, CHP DN: cn=Jay Maisler, CHP, o=ENERCON, ou=Radiation Safety Officer, email=jmaisler@enercon.com, c=US Date: 2019.09.05 14:21:51 -04'00'

8.0 Approved By (Signature/Date):

Trust Administrator: Bill Halliburton	Bill Halliburton 09/12/2019
Project Manager: Jeff Lux	Jeff Lux Jeffrey J Lux 2019.09.09 15:38:10 -05'00'
Radiation Safety Officer: Jay Maisler	JMaisler Digitally signed by Jay Maisler, CHP DN: cn=Jay Maisler, CHP, o=ENERCON, ou=Radiation Safety Officer, email=jmaisler@enercon.com, c=US Date: 2019.09.05 14:22:23 -04'00'
Quality Assurance Coordinator: Charles Beatty	Charles Beatty Jr. Digitally signed by Charles Beatty Jr. Date: 2019.09.05 14:27:19 -04'00'

REVIEW AND APPROVALS	
Reviewed by Quality Assurance Coordinator: Chuck Beatty	
Signature:	Date:
Approved by Radiation Safety Officer: Jay Maisler, CHP	
Signature:	Date:
Approved by Trustee Project Manager: Jeff Lux	
Signature:	Date:
Approved by Administrator, Cimarron Environmental Response Trust: Bill Halliburton	
Signature:	Date:

Summary of Changes

Revisions to this document will be identified, and revisions or addenda will be issued as needed. The Trustee Project Manager maintains the signed original of this document; no controlled copies are issued. The end user is responsible to verify with the Trustee Project Manager that any hard copy being referenced is the current revision. A summary description of each revision or addenda will be noted in the following table.

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Revision Number	Date	Comments
Rev. 0	April 11, 2011	Original
Rev. 1	Feb. 3, 2012	Revision 1 to the Cimarron Radiation Protection Plan contains numerous administrative changes and editorial changes. Specific changes are identified in a separate 27(e) evaluation and attached markup of changes from RPP Rev. 0.
Rev. 2	Feb. 24, 2014	Revision 2 to the RPP includes clarifications addressing groundwater processing and editorial changes. Specific changes are identified in a separate 27(e) evaluation and attached markup of changes from Rev. 1.
Rev. 3	April 15, 2016	Revision 3 provides changes to support the proposed Decommissioning Plan and includes editorial changes. Clarifications were added to address how radiological controls for routine activities are handled when an Activity Plan is not required or used. Specific changes are identified in a separate 27(e) evaluation and attached markup of changes from Rev. 2.
Rev. 3.1	Dec. 31, 2018	Revision 3.1 is an interim revision This is an interim revision pending approval of draft Revision 4 by the NRC. Accordingly, it is labeled Revision 3.1. This revision to the RPP incorporates changes identified during the submittal of the Cimarron Facility Decommissioning Plan, Rev. 1, that the ALARA Committee determined can be implemented prior to NRC approval of the Decommissioning Plan. This revision also addresses and clarifies issues discussed with the NRC staff during the November 2018 inspection at the site.

Revision Number	Date	Comments
Rev. 3.2	Sep. 15, 2019	Includes editorial corrections. Corrected error in section 8.2 that implied personnel access logs were required for entry into areas posted solely as Radioactive Materials Areas. Corrected typographical area regarding Radioactive Materials Area in Table 8.1 and Section 10.2.

TABLE OF CONTENTS

1.0 INTRODUCTION

1.1 Purpose

This Radiation Protection Plan (RPP) establishes radiation protection requirements implemented at the Cimarron Site to achieve compliance with applicable regulatory requirements and License SNM-928.

1.2 Scope

The RPP applies to all radiological operations, routine and emergency, at the Cimarron Site. The RPP applies to the following personnel when present at the Cimarron Site:

- Licensee employees
- Contractors and their employees
- Visitors, when work involves radioactive material, under the supervision of trained personnel as authorized by the Radiation Safety Officer (RSO)

1.3 License Transfer

The U.S. Nuclear Regulatory Commission (NRC) transferred the license (SNM-928) for the Cimarron Site (the Site) to the Cimarron Environmental Response Trust (licensee) on February 14, 2011. The license is administered by the Trustee, Environmental Properties Management, LLC (EPM). EPM's maintenance of the Site and administration of the Site in accordance with License SNM-928 will provide adequate protection of the public health and safety and reasonable assurance of compliance with the NRC's regulations.

2.0 TRAINING REQUIREMENTS AND POLICY

2.1 Section Overview

This section describes radiation safety training requirements for individuals who enter a Restricted Area (RA), handle radioactive material, or work in the vicinity of radioactive material at the Site.

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2.2 Responsibilities

The ~~Radiation Safety Officer (~~RSO~~)~~ is responsible for the radiation safety training program which includes:

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- Approving radiation safety training materials
- Approving personnel conducting radiation safety training
- Performing radiation safety training or approving other individuals to perform the training
- Verifying that those individuals who require radiation safety training receive appropriate training

2.3 Training Requirements

Radiation Safety Training requirements are tiered to provide an appropriate level of training based on the type of radiological work an individual will perform at the Cimarron Site. The Licensee shall not assume that radiation safety training has been adequately covered by prior employment or academic training.

Inspectors and representatives of the ~~Nuclear Regulatory Commission (~~NRC~~)~~ and the Oklahoma Department of Environmental Quality, Land Protection Division, Radiation Management Section are exempt from radiation safety training. Site specific information may be provided to agency personnel if deemed necessary by the RSO.

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Ancillary personnel (e.g., clerical, housekeeping, security, etc.) whose duties may require them to work in the vicinity of radioactive material (escorted or not) shall receive information about radiation hazards and the appropriate precautions.

A prospective evaluation of radiological conditions and potential doses to workers for the groundwater treatment process will be performed. Based on the results of this evaluation, the RSO will determine the need for individual monitoring, and General or Site Specific Training (section 2.3.2) or Radiation Worker Training (section 2.3.3) for workers accessing ~~Restricted Area~~RAs, and the boundaries of any required ~~Restricted Area~~RA(s).

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2.3.1 Radiological Orientation

Radiological Orientation is provided for individuals performing routine activities that do not require access into ~~Restricted Area~~RAs, other than Radioactive Materials Areas, but does not include working with or handling radioactive materials. Activities these individuals undertake include general office work, housekeeping, tours and inspections of the property, annual environmental monitoring campaigns, and installation of new monitoring wells.

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Radiological Orientation is required prior to individuals who are permitted unescorted access to the Cimarron Site. Information required for Radiological Orientation may be presented in a classroom setting or provided as a "read-and-sign" document. Documentation will be maintained for all individuals completing Radiological Orientation. The following topics will be addressed:

- Radioactive materials that are present at the Site
- NRC Form 3, "Notice to Employees"
- Information regarding radiation safety requirements for work to be performed (e.g., groundwater sampling, well installation, groundwater processing, packaging and shipping for disposal, etc.)
- Site access and egress;
- Response to emergency conditions (including weather, fires, personnel injuries);
- Site industrial safety requirements (including personal protective clothing and equipment, etc.)

2.3.2 General or Site Specific Training

In addition to Radiological Orientation, General or Site Specific Training is required for workers who are permitted unescorted access to ~~Restricted Area~~RAs and will include:

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- Information regarding the principles and practices of radiation protection;
- Information regarding the purpose and functions of protective and monitoring devices that will be used, as applicable;
- Information regarding protection available for the embryo/fetus, as applicable.

2.3.3 Radiation Worker Training

Radiation Workers are individuals who in the course of employment are likely to receive an occupational dose to radiation greater than 100 mrem (1 milliSievert) in a year or whose duties require them to routinely work in an ~~Restricted Area~~RA or routinely handle radioactive material. Such workers may include groundwater processing operators and their supervision.

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Radiation Worker training will include:

- General or Site Specific Training described above;
- Radioactivity measurements, monitoring techniques, and usage of monitoring instrumentation;
- Basic calculations involved in using and measuring radioactivity;
- Types of radiation, range and effects;
- Regulatory and site specific dose limits to the general public and occupationally exposed persons;
- Storage, transfer, or use of radiation and/or radioactive material;
- Biological effects of radiation;
- Health protection problems associated with exposure to radiation and/or radioactive material;

- Precautions or procedures to minimize exposure;
- Purposes and functions of protective devices employed;
- Applicable ~~Nuclear Regulatory Commission~~NRC regulations and license requirements for the protection of personnel from exposure to radiation and/or radioactive material including Radiation Workers requirement to observe regulatory and license requirements to the extent within the workers control;
- Workers' responsibility to report promptly to the licensee any condition which may lead to or cause a violation of Commission regulations and licenses or unnecessary exposure to radiation and/or radioactive material;
- Appropriate response to warnings made in the event of any unusual occurrence or malfunction that may involve exposure to radiation and/or radioactive material;
- Radiation exposure reports which workers may request pursuant to 10 CFR 19.13.

Initial Radiation Worker Training will include a test to verify an adequate understanding of the training. Each test shall have a minimum passing grade of 80%. Each test question answered incorrectly shall be reviewed with the test participant and noted on test. If an individual does not pass the test, the test may be administered a second time. If the candidate fails the test a second time, the candidate must repeat the entire Radiation Worker Training course before he/she can take another test.

A candidate who does not achieve a minimum of 80% on the Radiation Worker test will not be permitted to perform work in an ~~Restricted Area~~RA or to handle radioactive material.

2.3.4 Training Delivery

Any of the following techniques, or combination thereof, may be used for radiation safety training:

- Classroom training
- Audiovisual media

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- Reading assignments (Self Study)
- Computer-based or on-Line training (Internet)
- On-the-job training (OJT) under the presence of an individual trained in the specific activity being observed;
  - Using survey instrumentation
  - Sample collection
  - Sample analysis, etc.
- Demonstrations
- Drills and
- Discussions

2.4 Training Frequency

- Initial training shall be conducted before routinely working in an RA ~~Restricted Area~~ or routinely handling radioactive material;
- Whenever there is a significant change in duties, regulations, or terms of the license; and
- Refresher training for Radiological Orientation and Radiation Worker training shall be conducted annually (within 12 months).

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2.5 Training Records

Training records, including a copy of the initial graded test, for all individuals shall be maintained in accordance with the Quality Assurance Program Plan (QAPP).

3.0 ADMINISTRATION AND RESPONSIBILITIES

3.1 Section Overview

This section describes the radiation protection organization and responsibilities of those individuals implementing the ~~Radiation Protection Plan (~~RPP~~)~~.

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Administration of the RPP requires coordination among the following individuals:

- Trust Administrator
- Trustee Project Manager (Trustee PM)
- ~~Radiation Safety Officer (~~RSO~~)~~

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- Quality Assurance Coordinator (QAC)
- Project Managers (PMs)
- Activity Leaders
- Individual Workers
- ALARA Committee

3.2 Radiation Protection Organization

The radiation protection organizational structure for the Cimarron Site is shown in Figure 3-1.

Trust Administrator – The Trust Administrator is a permanent member of the ALARA Committee, having responsibility for management of Trust assets and provides resources needed to complete the decommissioning of the Site.

~~Trustee Project Manager (~~Trustee PM~~)~~ – The Trustee PM is responsible for overseeing the construction and operation of decommissioning systems, the implementation of radiation and safety, health and safety, quality assurance, and environmental compliance programs. The Trustee PM is responsible for ensuring that all personnel performing decommissioning activities, or working in radiation protection, health and safety, quality assurance, or environmental compliance functions receive training and have the skills and experience require to perform those functions. The Trustee PM is a

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permanent member of the ALARA Committee, having expertise in decommissioning and responsibility for implementing decommissioning changes.

~~Radiation Safety Officer (~~RSO~~)~~ – (Jay Maisler) The RSO is responsible for maintenance and implementation of the radiation protection program. The RSO is also responsible for review and revision of the RPP and procedures, radiation exposure monitoring, dose reporting, the radiological instrument program, and all levels of radiation safety training. The RSO is responsible to ensure that all activities comply with license requirements, and manage the health physics staff. The RSO chairs the ALARA Committee and is responsible for bringing radiation protection and safety issues to the attention of the ALARA Committee.

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~~Quality Assurance Coordinator (~~QAC~~)~~ – The QAC is responsible for the maintenance and implementation of the quality assurance program. The QAC performs or schedules periodic and/or ad hoc audits and observations of all decommissioning and program management functions. The QAC reviews the RPP to ensure there are no conflicts with the quality assurance system and the QAPP. The QAC routinely attends ALARA committee meetings.

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~~Project Managers (~~PMs~~)~~ – PMs are responsible for the preparation of plans, procurement of services and materials, and the performance of decommissioning projects. PMs ensure that all personnel working on projects have received all the training needed and are qualified to perform the tasks for which they are responsible to perform. PMs are responsible for monitoring the schedule, cost, and quality of the project work.

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Activity Leader Each Activity Leader is responsible for the preparation for Activity Plans, procurement of services and materials, and the performance of decommissioning operations. Activity Leaders ensure that all personnel working on projects are familiar with the Activity Plan under which the work is being performed, and that they have received all the training needed and are qualified to perform the tasks for which they are responsible to perform.

Individual Worker – Each Worker is responsible for complying with regulatory requirements and applicable radiation protection procedures to the best of his/her ability and knowledge.

ALARA Committee – The ALARA Committee is responsible for ensuring that ALARA policy and regulatory compliance are integrated into Site work activities as appropriate. The Committee reviews and approves ALARA goals for the Cimarron Site and the effectiveness of the ALARA program in meeting these goals. The Committee also reviews plans for new Site activities to ensure that ALARA principles have been considered,

reviews the radiation protection program annually to ensure regulatory compliance and incorporate any necessary changes, and evaluates and approves changes to the Decommissioning Plan (DP) or the RPP in accordance with License Condition 27(e).

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3.3 Policies

Each individual listed in Section 3.2 has the authority to stop work:

- If radiological health and safety of workers is compromised
- If radiological health and safety of the general public is compromised
- If radiological regulatory non-compliance may occur (includes NRC regulations, license conditions, and radiation protection procedures)

Individuals are encouraged to contact the RSO first if they feel there is a potential regulatory or license violation. This is not a requirement.

Individuals who are not satisfied with the response to an expressed concern have the right to contact the ~~Nuclear Regulatory Commission (~~NRC~~)~~ for resolution. See NRC Form 3, "Notice to Employees."

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3.4 Radiation Protection Program Document Hierarchy

The order of precedence in regulating the Cimarron Site is:

1. Federal radiation protection regulations (10 CFR)
2. License SNM-928, including the RPP which is incorporated into the license via a license condition
3. Radiation protection program procedures

3.5 Procedure Development

Radiation protection procedures shall be developed in accordance with the ~~Quality Assurance Program Plan~~QAPP.

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Radiation protection procedures shall comply with regulatory requirements, license conditions, and the RPP.

Radiation protection procedures may incorporate or reference applicable technical guidance documents (e.g., ~~U.S.~~ NRC Regulatory Guides and NUREGs, ~~NCRP (~~National Council on Radiation Protection and Measurements~~)~~ (NCRP) guidance, ~~ICRP (~~International ~~Council~~ Commission on ~~Radiation~~ Radiological Protection~~)~~ ICRP guidance, ~~ANSI (~~American National Standards Institute~~)~~ ANSI documents, etc.).

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3.6 Procedure Review, Approval, and Control

Radiation protection procedures shall undergo technical verification and review to ensure compliance with regulatory requirements, applicable licenses and permits, and the RPP, as well as conformance, to the extent practicable, with applicable standard practice.

- Radiation protection procedure review shall assess compatibility with all other Licensee plans, manuals, and procedures.
- Radiation protection procedure review shall ensure that the procedure can be performed as written.
- All radiation protection procedures shall be reviewed and approved by the RSO.
- All radiation protection procedures shall by reviewed by the QAC or designee for conformance with quality assurance program requirements.

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All radiation protection procedures shall be controlled in accordance with regulatory requirements and the ~~Quality Assurance Program Plan~~QAPP.

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3.7 Desk Instructions

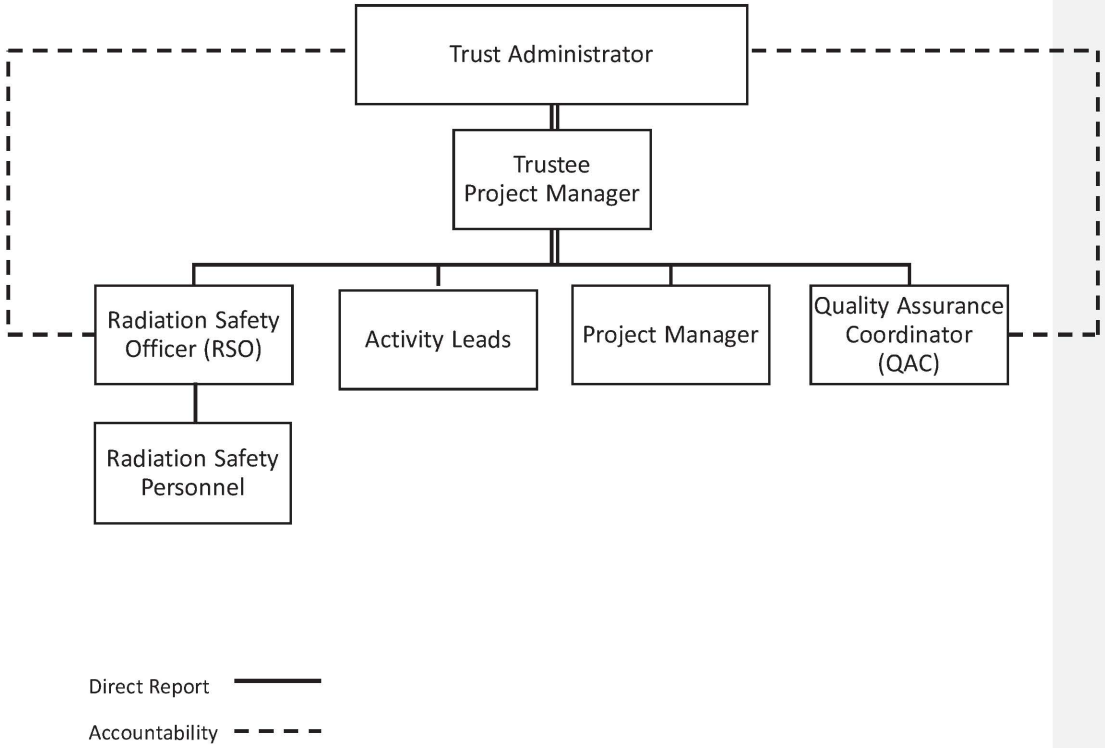
Desk instructions may be developed and implemented to provide a reference guide on specific topics that help the user implement various aspects of the RPP. Desk instructions may be written to address use of specific radiation survey instrumentation or details associated with electronic survey form completion. Desk Instructions are issued by the RSO or designee and expire 12 months after approval. Desk Instructions may be renewed at additional 12 month increments.

3.8 Notifications and Reports

Notifications and reports shall be made in accordance with the requirements of 10 CFR 19, 10 CFR 20 and 10 CFR 70.

Figure 3-1

The Cimarron Environmental Response Trust Organization



4.0 ALARA PROGRAM

4.1 Section Overview

This section describes the philosophy, requirements, and responsibilities of the Cimarron Site As Low As Reasonably Achievable (ALARA) program.

4.2 ALARA Policy

The Cimarron Site radiation protection program uses, to the extent practicable, procedures and engineering controls based upon sound radiation protection principles to achieve occupational doses and dose to members of the public that are ALARA. The licensee is committed to providing resources such as personnel, training programs, engineering controls, monitoring devices, activity planning, etc. to achieve the goals of the ALARA principle.

Radiation Protection Procedure RP-10, "ALARA Program" is the implementing procedure for the ALARA program. In addition, the licensee encourages individuals working at the Site to provide input regarding improvements that would minimize dose and improve the safety and efficiency of activities.

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At a minimum, the ALARA Committee meets once each calendar quarter.

4.3 ALARA Committee Responsibilities

4.3.1 The responsibilities of the ALARA Committee include:

- Ensuring that ALARA policy and regulatory compliance are integrated into all Site work activities as appropriate
- Reviewing and approving ALARA goals for the Cimarron Site (if individual monitoring is required)
- Reviewing the effectiveness of the ALARA Program (if individual monitoring is required)
- Reviewing plans for new activities to ensure that ALARA principles have been considered

- Annual review of the RPP to ensure regulatory compliance and to incorporate any necessary changes
- Evaluate and approve changes to the ~~Decommissioning Plan~~DP or the RPP in accordance with License Condition 27(e)

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4.3.2 The ALARA Committee ensures that a formal annual report is provided to the NRC that includes:

- A description of all changes, tests, and experiments made or conducted pursuant to License Condition 27(e), including a summary of the safety and environmental evaluation of each action.
- Any DP or RPP pages revised pursuant to License Condition 27(e)

A formal report shall also be submitted to the NRC annually if no changes, tests or experiments were approved by the ALARA Committee.

4.4 ALARA Committee Membership

As stipulated in License Condition 27(e), which states:

"The ALARA Committee shall consist of a minimum of three individuals, one of whom shall be designated as the ALARA Committee chairman. Of these three designees, one shall have expertise in management and shall have managerial and financial responsibility for the decommissioning of the Site; one shall have expertise in decommissioning and shall be responsible for Site decommissioning, and one shall be the Site ~~Radiation Safety Officer~~ RSO or equivalent, and shall ensure conformance to radiation safety and environmental requirements. The designee with managerial and financial responsibility shall be employed by the licensee's Trustee. The designee for decommissioning of the Site and the ~~Radiation Safety Officer~~ RSO or equivalent, shall be retained by the Trustee. Except for the representative of management, ALARA Committee members may be consultants."

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In accordance with this License Condition, the ALARA Committee shall consist of a minimum of three individuals:

- The Trust Administrator is a permanent (voting) member who has managerial and financial responsibility for the decommissioning of the Site. The Trustee is stipulated in the Cimarron Environmental Response Trust Agreement dated February 14, 2011.
- The Trustee ~~Project Manager~~PM is a permanent (voting) member who is responsible for Site decommissioning and groundwater remediation.
- The Site RSO chairs the ALARA Committee and ensures conformance to radiation safety and environmental requirements. The RSO is a permanent (voting) member of the ALARA Committee.

The licensee is authorized to make certain changes to the NRC-approved ~~Decommissioning Plan (~~DP~~)~~ and ~~Radiation Protection Plan (~~RPP~~)~~ without NRC's approval, if these changes are consistent with the ALARA principle and the decommissioning process. These changes are discussed in License Condition 27(e) and require ALARA Committee approval. Formal approval of such changes shall require a majority of the voting members and documented in minutes from the ALARA Committee meeting where these changes were approved.

Additional non-voting members may be included, as appropriate, to address technical issues such as quality assurance, decommissioning activities, health physics, hydrogeology, etc. The QAC routinely attends ALARA Committee meetings to monitor Committee activities and report on QAPP issues. Others may periodically be appointed to the Committee including, ~~Project Managers~~PMs and Activity Leaders involved with radiological work activities.

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5.0 ASSESSMENTS

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5.1 Section Overview

Audits and/or surveillances provide a review of decommissioning and radiation protection activities to evaluate compliance with regulatory requirements, license conditions, and the ~~radiation protection plan~~RPP and procedures. Audits and/or surveillances identify unsatisfactory performance and/or weaknesses in procedures, training, or work practices. The results of audits and surveillances are reviewed by the ALARA Committee.

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5.2 Audits

10 CFR 20.1101(c) requires that a licensee shall, at least annually, review the radiation protection program content and implementation. Various NRC guidance documents (e.g. Appendix L, NUREG-1556, Vol. 7) provide sample forms to assist the licensee in meeting this requirement.

Periodic audits (review of documentation and records), the ALARA Committee review of the RPP and an annual audit modeled on NRC's sample audit form are used to meet this requirement. Periodic audits are conducted, as required, under the ~~Quality Assurance Program Plan~~QAPP. Audits shall be documented, as well as program changes resulting from audit findings or observations.

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5.3 Surveillances

Surveillances are observations of activities being performed. Surveillances of Site activities are done by, or under the direction of, the ~~Quality Assurance Coordinator~~ QAC and/or the RSO. The goal of surveillances is to determine whether or not an activity is being performed in accordance with applicable procedures, plans, accepted industry standards, etc. Surveillances shall be documented, as well as program changes resulting from findings or observations made during surveillances.

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5.4 Records

Records of audits and surveillances are maintained in accordance with the QAPP.

6.0 PERSONNEL MONITORING

6.1 Individual Monitoring of Occupational Dose

NRC regulation 10 CFR 20.1502 requires the licensee to monitor occupational exposures from both licensed and unlicensed radiation sources. Monitoring is required of any adult likely to receive, in 1 year from sources external to the body, a dose in excess of 10 percent of the Occupational Dose Limits for Adults and/or who are likely to receive, in 1 year, an intake in excess of 10 percent of the applicable annual limit on intake (ALI) in Table 1, Columns 1 and 2, of Appendix B to 10 CFR 20.1001-20.2402. Monitoring for minors is required when they are likely to receive, in 1 year, from radiation sources external to the body, a deep dose equivalent (DDE) in excess of 0.1 rem, a lens dose equivalent in excess of 0.15 rem, or a shallow dose equivalent to the skin or the extremities in excess of 0.5 rem and/or likely to receive, in 1 year, a committed effective dose equivalent (CEDE) in excess of 0.1 rem. Monitoring of declared pregnant women is required when they are likely to receive during the entire pregnancy, from radiation sources external to the body, a ~~deep dose equivalent~~DDE in excess of 0.1 rem and/or likely to receive during the entire pregnancy, a ~~committed effective dose~~CEDE equivalent in excess of 0.1 rem.

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Personnel monitoring has not been performed at the Site since 2006 because there was no potential to receive a dose that would require monitoring under 10 CFR 20.1502. During the design of groundwater extraction and treatment systems, new work activities, such as groundwater processing, were evaluated to determine if they may result in exposure requiring personnel monitoring. The threshold dose for personnel monitoring will not be approached; accordingly, neither monitoring workers for external or internal occupational dose is required.

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6.2 Occupational Dose Limits

NRC Regulation 10 CFR 20.1201 establishes a total effective dose equivalent (TEDE) limit and a total organ dose equivalent (TODE) limit for occupationally exposed adults. The TEDE is the sum of the ~~deep dose equivalent (~~DDE~~)~~ from external exposures and the ~~committed effective dose equivalent (~~CEDE~~)~~ from internal exposures. The TODE is the sum of the DDE and the committed dose equivalent (CDE) to the organ receiving the highest dose. The following annual dose limits apply to all the licensee employees, contractors, and visitors who receive occupational dose at the Cimarron Site.

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Occupational dose is defined as the radiation dose an individual receives in an RA ~~Restricted Area~~ and other work-related radiation dose the person receives. Occupational dose does not include medical dose, dose due to background radiation, or dose received while a member of the public.

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6.2.1 Occupational Dose Limits for Adults (10 CFR 20.1201) are as follows:

- Whole Body - The more limiting of a TEDE equal to 5 rem or the sum of the ~~deep dose equivalent~~DDE and ~~committed dose equivalent~~CDE to any individual organ or tissue, other than the lens of the eye, equal to 50 rem.
- Skin of the whole body or skin of any extremity - A shallow dose equivalent equal to 50 rem.
- Lens of the Eye - A lens dose equivalent equal to 15 rem.

6.2.2 Occupational Dose Limits to Minors (10 CFR 20.1207) are as follows:

- The dose limits for minors shall be 10 percent of the corresponding limit for adults.

6.2.3 Occupational Dose Limits to Embryo/Fetus (10 CFR 20.1208) are as follows:

- The dose to the embryo/fetus of declared pregnant women shall be limited to 500 mrem during the entire time of pregnancy. Substantial variations in dose rate shall be avoided.

6.3 Dose Limits for Individual Members of the Public (10 CFR 20.1301)

The TEDE received by individual members of the public from licensed operations shall not exceed 100 mrem above background in a year in ~~Restricted Area~~RAs. In addition, the dose in any Unrestricted Area from external sources shall not exceed 2 mrem above background in any one hour. Members of the public are not subject to individual monitoring, record keeping, and reporting requirements of 10 CFR 20.

6.4 Determination of Prior Occupational Exposure

The occupational dose during the current year shall be determined and an attempt shall be made to obtain records of lifetime dose for all personnel who are likely to receive a dose in excess of 10% of the annual dose limit. The prior dose history shall be documented on Form NRC-4, or equivalent. Forms NRC-4 and NRC-5 and records used in their preparation shall be retained by the licensee until the regulating agency terminates each pertinent license requiring this record and in accordance with the ~~Quality Assurance Program Plan (~~QAPP~~)~~.

6.5 Personnel Monitoring for External Radiation

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Individual monitoring devices shall be issued to:

- Any individual who is likely to receive, from radiation sources external to the body, a dose in excess of 10 percent of the occupational dose limits in a year.
- Any minor who is likely to receive, in 1 year, from radiation sources external to the body, a ~~deep dose equivalent~~DDE in excess of 0.1 rem a lens dose equivalent in excess of 0.15 rem, or a shallow dose equivalent to the skin or the extremities that exceeds 0.5 rem.
- Any declared pregnant woman likely to receive during the entire pregnancy, from radiation sources external to the body, a ~~deep dose equivalent~~DDE that exceeds 0.1 rem.

When external exposure is determined by measurement with an external personal monitoring device, the ~~deep dose equivalent~~DDE must be used in place of the effective dose equivalent, unless the effective dose equivalent is determined by a dosimetry method approved by the NRC. Dosimetry devices shall be processed by a laboratory or vendor maintaining accreditation by the National Voluntary Laboratory Accreditation Program (NVLAP).

6.6 Internal Exposure Monitoring

If radiological conditions change or evaluation of the final groundwater processing equipment design indicates that an individual worker could be exposed to 2% of the ~~annual limit on intake (~~ALI~~)~~ in a year, then in-vivo and/or in-vitro bioassay shall be performed. In-vivo and/or in-vitro bioassay sampling shall be performed whenever a calculated intake of 40 Derived Air Concentration (DAC)-hours could have occurred in any one incident based on air sampling data, accident conditions, equipment failure, external contamination, or other conditions. In-vitro and/or in-vivo bioassay sampling shall also be performed whenever it is likely that an individual may have received an intake of 10 milligrams uranium in any one week. In-vivo and/or in-vitro bioassay shall be considered upon termination of all Radiation Workers who may have had intakes of radioactive materials. The need for bioassay sampling shall be determined by the RSO/designee. Determination of internal exposure requirements are listed in 10 CFR 20.1204.

If the need for a bioassay program is identified, RP procedures will be implemented that include requirements for worker intakes are determined:

- Using measurements of quantities of radionuclides excreted from, or retained in the human body.

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- By measurements of the concentrations of airborne radioactive materials in the workplace.
- For an adult, a minor, and a declared pregnant woman using any combination of the measurements above, as may be necessary.

6.7 Declared Pregnant Woman ~~(DPW)~~ Exposure Policy

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Based on recommendations of the ~~National Council on Radiation Protection and Measurements (~~NCRP~~)~~ and on regulatory requirements, controls are established for the protection of the embryo/fetus during a declared female workers pregnancy. These controls shall ensure compliance with regulatory requirements and protect the rights of the female worker.

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Declaration of pregnancy is at the discretion of the woman (medical proof is not required). Any woman who does not declare her pregnancy shall be subject to the normal occupational dose limits and shall not be subject to special controls or treatment with respect to work assignments involving exposure to radiation even if she is pregnant. The Licensee shall ensure the dose to the embryo/fetus of a declared pregnant woman does not exceed regulatory limits due to occupational dose during the entire pregnancy.

6.8 ALARA Dose Goals

As discussed in Section 4.3, ALARA dose goals will be set if individual monitoring is required. Until such time, the annual Administrative Dose Goals for the Site is effectively 100 mrem TEDE. In cases where Administrative Dose Goals are exceeded without prior authorization, the RSO or designee shall investigate to determine the cause and prepare a written report.

6.9 Personnel Exposure Reports

An annual report of the individual radiation dose received shall be sent to each worker who was issued individual dosimetry and/or was subject to the requirements for monitoring as specified in Section 6.1. When requested by an individual, a written exposure report shall be provided to each such individual within 30 days of the request or within 30 days of exposure determination, whichever is later.

Internal and external doses shall be summed whenever positive doses are measured. The dose to the lens of the eye, skin, and extremities are not included in the summation. Intakes through wounds or skin absorption shall be evaluated and, to the

extent practical, accounted for in summation of internal and external doses independent of intakes by ingestion or inhalation.

Records of individual monitoring shall be kept in accordance with 10 CFR 20.2106 and the Trust QAPP. These records shall be updated at least annually for any radiation monitoring data collected. All radiation exposure records shall use the units curie, rem, rad, or multiples thereof and shall clearly and specifically indicate the quantities (e.g., ~~deep dose equivalent~~DDE) and units (e.g., rem or mrem) of all recorded values.

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Records of embryo/fetus dose shall be maintained with those of the mother, including the declaration of pregnancy.

7.0 RADIATION PROTECTION INSTRUMENTATION

7.1 Calibration

Calibration of radiation monitoring, counting, and air sampling instruments shall be performed in accordance with the manufacturers' recommendation unless otherwise approved by the RSO. These calibrations shall be consistent with regulatory requirements.

The calibration frequency for portable radiation monitoring instruments and portable air sampling equipment shall be at least every 12 months. Semi-portable (e.g., continuous air monitors) and fixed (e.g., count room/laboratory instrumentation, portal monitors) instrumentation shall be calibrated at least annually.

As discussed in Section 13.0, instruments used to perform release surveys must be calibrated using National Institute of Science and Technology (NIST) traceable, or equivalent, standards for energies and geometries similar to material being released. The energy dependence of the instruments to alpha, beta, and gamma radiation, as applicable, shall be known and documented.

Commented [JM58]: Captures language in Section 13.2 for completeness.

7.2 Operation and Response Tests

Operation and response tests of radiation monitoring, counting, and air sampling instruments, shall only be performed by personnel trained in the use of the instrument and following approved procedures. Operation and response tests shall be conducted as required by radiation protection procedures. Desk Instructions may be used to provide guidance on certain aspects of operation and response tests.

7.3 Maintenance and Repair

Maintenance and repair of radiation protection instrumentation shall be performed by qualified personnel or an approved vendor. All maintenance and repair shall be documented.

7.4 Quality Control/Quality Assurance

Quality Control (QC) measures for instruments shall be established and maintained to ensure reliability of counting results and sensitivities. Quality Assurance ~~(QA)~~ for laboratory instrumentation shall be proceduralized and consistent, to the extent practicable, with the requirements of ~~USNRC~~ NRC Regulatory Guide 4.15, "Quality

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Assurance for Radiological Monitoring Programs (Normal Operations) - Effluent Streams and the Environment.

QC for instruments shall be consistent with the manufacturer's instructions and be consistent with regulatory requirements.

Review and evaluation of instrumentation operability shall be performed on an on-going basis by the RSO or designee.

8.0 ACCESS CONTROL

8.1 Section Overview

This section provides the access control requirements for entry into and exit from ~~Restricted Areas (~~RAs~~)~~. Access control is designed to ensure that individuals have appropriate qualifications, training, and authorization for entry. Access control requirements are applicable to personnel, contractors and visitors who enter RAs. ~~Restricted Area~~RAs are areas within the Site boundary for which access is controlled for the purpose of protecting individuals against undue risk from exposure to radiation and/or radioactive materials.

~~Restricted Area~~RAs will be established based on the potential for accumulating radioactive material greater than ten times the 10 CFR 20 Appendix C quantities or requiring posting as Radiation Areas, High Radiation Areas, Contaminated Areas, or Airborne Radioactivity Areas.

8.2 Restricted Area Access Controls

Only properly trained or escorted personnel shall be permitted inside any RA. Personnel who enter RAs may be required to wear dosimetry. RAs include Radioactive Materials Areas, Radiation Areas, High Radiation Areas, Contaminated Areas, and Airborne Radioactivity Areas. RAs can be controlled through the use of guards, barriers, fences, signs, gates, or doors.

RA boundaries shall be defined by the use of postings, barriers, walls, tape, ropes, markings, or locked doors. A log of personnel entry and exit to any ~~Restricted Area~~RA, other than Radioactive Materials Areas, at the Site will be maintained by the RSO or designee. A log of personnel entry into areas posted solely as Radioactive Materials Areas is not required.

8.3 Posting and Labeling Requirements

Posting of areas within each RA shall be performed in accordance with 10 CFR 20, Subpart J. Containers of radioactive materials shall be labeled in accordance with 10 CFR 20.1904. Exceptions to posting requirements found in 10 CFR 20.1903 and exceptions to labeling requirements found in 10 CFR 20.1905 shall be approved by the RSO or designee. Signs used for posting radiological areas within an RA shall include the wording provided in Table 8-1 when the associated requirements are expected or are actually encountered.

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Commented [JM63]: Editorial change.

Commented [JM64]: This change clarifies that personnel entry logs are not maintained for Radioactive Materials Areas.

TABLE 8-1
RADIOLOGICAL POSTING REQUIREMENTS

POSTING WORDING	REQUIREMENT
"CAUTION RADIATION AREA"	Accessible area in which radiation levels could result in an individual receiving 5 mrem in one hour 30 cm from the radiation source or surface that the radiation penetrates.
"CAUTION HIGH RADIATION AREA" or "DANGER HIGH RADIATION AREA"	Accessible area in which radiation levels could result in an individual receiving 5 mrem in one hour 30 cm from the radiation source or surface that the radiation penetrates.
"CAUTION AIRBORNE RADIOACTIVITY AREA" or "DANGER AIRBORNE RADIOACITVE MATERIALS AREA"	Licensed airborne radioactive materials in a room, enclosure, or area exists in concentrations exceeding the ~~derived air concentration~~DACs specified in 10 CFR 20 Appendix B, Table I, or when an individual present in the area without respiratory protective equipment could exceed, during the hours an individual is present in a week, an intake of 0.6% of the ~~annual limit on intake~~ALI or 12 DAC–hours.
"CAUTION CONTAMINATED AREA"	Accessible area in which contamination levels exceed 1,000 dpm/100 cm^2 beta/gamma contamination or 1000 dpm/100 cm^2 alpha contamination.
"CAUTION RADIOACTIVE MATERIAL(S) AREA" or "DANGER RADIOACTIVE MATERIAL(S) AREA"	Areas or rooms in which there is used or stored an amount of licensed radioactive material exceeding 10 times the quantity of such material in 10 CFR 20 Appendix C.

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9.0 RADIOLOGICAL WORK CONTROLS

9.1 Section Overview

Radiological work within ~~Restricted Area~~RAs is controlled through two mechanisms; site procedures and Activity Plans. Site procedures include quality assurance procedures, radiation protection procedures, sampling and analysis procedures, operations and maintenance procedures, waste management procedures, etc. Site procedures cover routine work or repetitive tasks that may include radiological work. Any necessary radiological controls are included in Site procedures.

Activity plans cover specific work activities and include information on the conditions that exist in the work area and radiological and non-radiological safety requirements. To ensure compliance with the RPP and regulatory requirements, Activity Plans involving radiological work must include the information identified in Section 9.2.

Work within posted Radiation Areas, High Radiation Areas, Airborne Radioactivity Areas, and Contaminated Areas, or requiring the use of respiratory protection or protective (i.e., anti-contamination) clothing shall be controlled through the use of an Activity Plan unless specifically authorized by the RSO or designee. Workers entering any ~~Restricted Area~~RA, other than Radioactive Materials Areas, shall be sign in daily on the sign-in sheet maintained in the Site Office or at the location of the routine activity.

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Commented [JM70]: This change clarifies applicability of this requirement with respect to Radioactive Materials Areas.

9.2 Activity Plan Requirements

The Activity Plan job description and job location shall be consistent with the activities or task to be performed. The Activity Plan shall identify potential radiological hazards, methods to address radiological hazards, and protective equipment needed for the work. Activity Plans shall, as a minimum, include:

- A description of the work,
- Anticipated radiological conditions,
- Reference to applicable procedures,
- Radiation safety requirements,
- Required personal protective clothing and equipment,
- Radiological survey and/or monitoring requirements,

- Training requirements,
- Special sampling requirements.

9.2.1 Activity Plan Approval/Closeout

Activity Plan approval and closeout is addressed in the ~~Quality Assurance Program Plan~~QAPP and implementing procedures.

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9.2.2 Activity Plan Training

Training and qualifications for individuals working under an Activity Plan are addressed in the ~~Quality Assurance Program Plan~~QAPP. All Radiation Workers operating under an Activity Plan are required to review and comply with the measures required by the Activity Plan.

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9.2.3 Record Keeping

The ~~Quality Assurance Coordinator~~ QAC is responsible for maintaining the Activity Plan and all related documents in accordance with ~~QA~~ quality assurance procedures.

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9.3 Receipt of Potentially Contaminated Tools, Equipment, Parts, and Material

9.3.1 Tools, equipment, parts, and material that has been used at oil and pipeline facilities and sites may be contaminated with naturally occurring radioactive material (NORM) or other radioactive material used as tracers. Qualified individuals shall perform receipt surveys to document the radiological conditions of all tools, equipment, parts and equipment potentially used at oil and pipeline facilities or sites prior to use at the Cimarron Site.

9.3.2 Procurement specifications for tools, equipment, parts, and material previously used at oil and pipeline facilities and sites shall require thorough cleaning of these procured items prior to shipment to the Site.

~~9.3.2~~9.3.3 The Site cannot receive tools, equipment, parts and material that are potentially contaminated with radioisotopes other than NORM or uranium.

Commented [JM75]: Clarification to ensure license compliance.

~~9.3.3~~9.3.4 If the receipt survey detects fixed or removable contamination or if dose rates two times background are detected, these items shall be segregated and the RSO and ~~EPM Project Manager~~Trustee PM notified. The RSO and ~~EPM Project Manager~~Trustee PM will determine disposition of these items.

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10.0 RADIATION PROTECTION SURVEYS

10.1 General Requirements

Survey information is used to:

- assist in the development of Activity Plans ~~(AP)~~,
- inform individuals of the radiological conditions/hazards in the area,
- evaluate the need for area postings,
- identify needed personnel protective equipment,
- ensure personnel exposures to radiation and radioactive materials are maintained ALARA,
- determine the decommissioning status of material, equipment, and/or environmental media, and
- determine compliance with regulatory and/or license criteria.

Radiation and contamination surveys, air sampling, and sample collection will be performed as appropriate to assess radiological conditions and to establish specific radiological controls for work to be performed. Radiation protection surveys that are required by the license shall be conducted in accordance with specified requirements.

Two types of dose rates measurements may be used. Contact dose rates are used to locate and identify radiation levels detected and are measured within 1 cm (0.5 in) from the surface being surveyed. General area dose rates are used to identify radiation levels detected at approximately 30 cm (1 ft) from the surface being surveyed.

Surveys for removable and direct contamination are performed to detect and/or quantify radioactive contaminants. Removable contamination surveys should be performed when necessary to ensure that radioactive contamination has not inadvertently spread.

~~U.S.~~ NRC Regulatory Guide 8.25, "Air Sampling in the Workplace" provides an acceptable method for meeting certain survey and dose assessment requirements of 10 CFR 20. Air samples shall be collected whenever the airborne radioactivity levels are expected to exceed 10 percent of the ~~Derived Air Concentration (~~DAC~~)~~ as listed in Appendix B, Table 1 "Occupational" of 10 CFR 20.

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Breathing zone air sampling shall be performed whenever respiratory protection devices are worn by personnel. If air sample data indicates a measured level greater than 40 DAC-hours in any shift or operation, whichever is shorter in time duration, the ~~Radiation Safety Officer (~~RSO~~)~~ or designee shall conduct an investigation and take corrective actions to reduce airborne contamination levels.

Air sample collection media shall be appropriate to address the radionuclide mixture(s) present. The analysis of air samples (including preliminary field screening) shall be performed in a timely and expeditious manner.

10.2 Routine Surveys

Routine radiological monitoring ~~is~~ shall be performed to ensure that surveys are performed at a frequency that is consistent with the existing and potential hazards and activities planned in the ~~Restricted Area~~RAs. The following radiation dose rate and contamination survey frequencies ensure area hazards are adequately characterized:

- Weekly, in office space located in areas surrounding or adjacent to ~~Restricted Area~~RAs, other than Radioactive Materials Areas, where the potential exists for external radiation exposure or contamination spread.
- Weekly, in routinely occupied ~~Restricted Area~~RAs, other than Radioactive Materials Areas.
- Monthly, or upon entry, if entries are less frequent than monthly, for Radioactive Materials Areas.

10.3 Investigative Surveys

Investigative surveys shall be performed as soon as practicable following the discovery or indication of abnormal radiological conditions.

10.4 Personnel Contamination Monitoring

Personnel shall routinely perform contamination monitoring (frisking) prior to exiting ~~Restricted Area~~RAs that have the potential for spreading contamination or per SWP/AP requirement. At a minimum, hands and feet shall be frisked when exiting these areas.

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Commented [JM84]: Editorial change.

Commented [JM85]: This change clarifies applicability of this requirement with respect to Radioactive Materials Areas.

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Commented [JM87]: This change clarifies applicability of this requirement with respect to Radioactive Materials Areas.

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10.5 Area Radiation Monitoring

The RSO or designee will determine when and where area radiation monitoring is appropriate. Area radiation monitoring may be performed using either passive devices, such as dosimeters (e.g., thermoluminescent or optically stimulated luminescent) or real-time radiation monitors. Dosimeters are posted at the Cimarron Site to confirm that no occupational worker is likely to receive 100 mrem DDE in a year.

10.6 Air Monitoring

Air monitoring is required whenever airborne radioactivity levels are expected to exceed 10 percent of the ~~Derived Air Concentration (~~DAC~~)~~ as listed in Appendix B, Table 1 "Occupational Values" of 10 CFR 20.

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10.7 Survey Training and Documentation

Surveys shall be performed by personnel who have been trained commensurate with the type of surveys to be performed. Training will address the following, as applicable:

- Appropriate instrumentation to be used,
- Operational and response checks for survey instrumentation,
- Survey methods, recording of data,
- Calculations, data evaluation, and
- Action levels.

Radiation and contamination surveys performed for compliance purposes, or to demonstrate that decommissioning criteria have been met, shall be documented and maintained in accordance with 10 CFR 20, Subpart L and the ~~Quality Assurance Program Plan~~QAPP.

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11.0 RADIOACTIVE MATERIALS CONTROL

11.1 Section Overview

This section addresses radioactive material ~~(~~RAM~~)~~ controls employed at the Cimarron Site to control the spread of contamination in ~~Restricted Area~~RAs, prevent inadvertent release of radioactive material to Unrestricted Areas, protect members of the public and workers, and minimize the amount of radioactive waste generated during decommissioning operations.

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This section of the RPP addresses receipt, labeling, storage, shipment, transfer, controls, theft and loss of radioactive materials.

11.2 Material Accountability and Control (Reserved)

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11.3 Receipt, Labeling, and Storage of ~~RAM~~Radioactive Material

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All radioactive materials shall be received in accordance with radioactive material license possession limits and 10 CFR 70.19. The individual responsible for radioactive material receipt shall perform all surveys as required by 10 CFR 20.1906 and review shipment paperwork to ensure compliance with 49 CFR.

Each container of radioactive material shall be labeled as required by 10 CFR 20.1904.

Radioactive material shall be secured against unauthorized access or removal. Radioactive material storage areas shall be posted and controlled using appropriate barriers and radiological postings.

11.4 Shipment and Transfer of Radioactive Material

~~RAM~~ Radioactive material shipments shall comply with NRC (10 CFR) and U.S. Department of Transportation (49 CFR) regulations. Low-level radioactive waste shipments transferred for disposal shall be accompanied by a shipment manifest prepared in accordance with 10 CFR 20.2006. Radioactive material shall only be transferred to authorized individuals in accordance with the appropriate regulations in 10 CFR 20, and 10 CFR 70.

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11.5 Controls for Radioactive Sources

The ~~Radiation Safety Officer (~~RSO~~)~~ shall approve all requisitions for radioactive sources and ensure that source inventories are performed on a quarterly basis. Radioactive

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sources shall be tested for leakage and/or contamination upon receipt and on a quarterly basis, except that any licensed sealed source is exempt from leak tests if the source contains less than 0.1 microcuries of plutonium or uranium, 100 microcuries of beta and/or gamma emitting radioactive material or 10 microcuries of other alpha emitting radioactive material. The RSO shall approve locations for storage of radioactive sources. Radioactive source storage areas shall be secured against unauthorized removal or access of licensed radioactive material and posted per 10 CFR 20.1902.

Leak testing and inventory of Exempt Quantity radioactive sources is not required, however, these sources should be stored in a secure area to prevent unauthorized removal or access.

Electroplated sources are not swipe tested for leakage to prevent removal of radioactive material from the electroplating.

11.6 Theft or Loss of Radioactive Material

Any individual who discovers that radioactive material is lost, stolen, or missing shall immediately notify the RSO. The RSO shall evaluate the physical and radiological characteristics of the missing material and the potential hazards to workers and the general public, initiate an investigation to locate the material, and perform a root cause evaluation of the incident. The RSO shall determine the need for notifications to regulatory authorities and make notifications as necessary per 10 CFR 20.2201

12.0 CONTAMINATION CONTROL

12.1 Section Overview

The purpose of contamination control is to prevent and/or minimize the spread of radioactive contamination to individuals, areas, and equipment. Control of radioactive surface contamination prevents or minimizes possible inhalation or ingestion of radioactive material by personnel, skin dose from small particles of radioactivity, and the spread to or build-up of radioactive material in the facility or environment from decommissioning operations. Controls to prevent the spread of contamination shall be proposed by the Activity Leaders and approved by the RSO or designee prior to implementation.

12.2 General

Radioactive contamination of buildings and equipment located within an RA ~~Restricted Area~~ shall be maintained below the removable contamination limit of 1,000 dpm/100cm^2 alpha. In addition, Contaminated Area controls, including posting, shall be implemented whenever removable contamination in an Unrestricted Area exceeds 1,000 dpm/100cm^2 alpha or 1,000 dpm/100cm^2 beta-gamma. The Site incorporates the ALARA philosophy when selecting decontamination methods and practices.

Commented [JM98]: Editorial change.

As a general rule, decontamination is performed by working from areas of low contamination to areas of high contamination if possible. Decontamination materials should be limited to the minimum required for the task. All decontamination materials shall be collected, monitored, and properly dispositioned.

12.3 Contaminated Personnel

Decontamination of personnel shall be performed under the guidance of health physics personnel and shall incorporate good health physics practices and ALARA principles. An individual whose skin or personal clothing is found contaminated above background shall not exit an ~~Restricted Area~~RA without prior approval of the RSO. Appropriate surveys and monitoring shall be performed to evaluate dose to the individual resulting from contamination.

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12.4 Spill of Radioactive Material

A spill of radioactive material requires immediate actions which include:

- Stop the spill
- Warn other personnel
- Isolate the area
- Minimize radiation exposure

Supplementary actions should include the performance of radiological surveys in immediate and adjacent areas, including downwind.

12.5 Contamination Control During Groundwater Processing (Reserved)

Commented [JM100]: Editorial change to capture the title of the section, which is reserved pending finalization of the DP.

13.0 UNCONDITIONAL RELEASE OF MATERIALS

13.1 Section Overview

Site personnel are authorized to unconditionally release tools, equipment, parts, and materials provided that radiation levels and surface contamination levels do not exceed the limits in condition 27(c) of the license. Such surveys will be performed and documented by qualified individuals.

Tools, equipment, parts and material that do not come into contact with subsurface soil or groundwater containing licensed radioactive material do not require surveys prior to release from the Site.

13.2 Survey Instrumentation

Instruments used to perform release surveys must be calibrated using National Institute of Science and Technology (NIST) traceable, or equivalent, standards for energies and geometries similar to material being released. The energy dependence of the instruments to alpha, beta, and gamma radiation, as applicable, shall be known and documented.

13.3 Release Surveys of Materials

Release surveys will consist of direct (fixed+removable and removable (smears) contamination monitoring. The Site is authorized to release materials provided that the direct and removable levels do not exceed the limits stated in the Trust license and summarized below. Such surveys will be performed and documented by qualified individuals.

13.3.1 Surfaces of buildings and equipment

- Direct – 15,000 dpm/100cm^2 alpha or beta/gamma, maximum over 1 m^2
- Direct – 5,000 dpm/100cm^2 alpha or beta/gamma, averaged over 1 m^2
- Removable – 1,000 dpm/100cm^2 alpha or beta/gamma

13.3.2 Soils

- Natural Uranium - 10 pCi/g total uranium
- Enriched Uranium – 30 pCi/g total uranium

- Depleted Uranium – 35 pCi/g total uranium
- Natural Thorium – 10 pCi/g total thorium

13.3.3 Exposure Rates

a. Surface of buildings and equipment

- 5 µR/hr – above background at 1 meter

b. Soils

- 10 µR/hr – average above background at 1 meter
- 20 µR/hr – maximum above background at 1 meter

14.0 RESPIRATORY PROTECTION

14.1 Section Overview

Respiratory protection measures shall be employed when necessary to protect workers from airborne hazards. Groundwater treatment results in the generation of moist treatment media with little potential to generate airborne radioactivity. However, as future conditions change and the RSO or designee determines, through review of field conditions or anticipated work functions, that respiratory protection is required, procedures and controls will be instituted in accordance with the requirements found in 10 CFR 20, Subpart H, "Respiratory Protection and Controls to Restrict Internal Exposure in Restricted Areas" for radiological hazards and the Code of Federal Regulations Title 29 Part 1910.134 for non-radiological hazards. Section 14.2 provides specific requirements for the respiratory protection program, if needed.

14.2 Respiratory Protection Program

Respiratory protection will be required if work activities could potentially expose workers to 40 or more ~~derived air concentration (~~DAC~~)~~-hours in a week. Respiratory protection will also be required for any areas where airborne radioactive material concentrations are expected to exceed 1 DAC. If either of these trigger levels are encountered, a respiratory protection procedure or procedures will be established to include:

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- Process controls, engineering controls or procedures to control concentrations of radioactive material in air.
- Evaluations performed when it is not practical to apply engineering controls or procedures.
- Considerations used to demonstrate respiratory protection equipment is required.
- Required medical screening and respirator fit testing.
- Use, maintenance, and storage of respiratory protection devices.
- Respiratory protection training program.
- Selection of respiratory protection equipment.

15.0 ENVIRONMENTAL MONITORING

15.1 Section Overview

Environmental monitoring shall be performed at various locations to monitor the migration of licensed material from former (now decommissioned) sources through environmental media. Final surveys have demonstrated that buildings and soils have been decommissioned. Licensed material exceeds decommissioning criteria in groundwater in three areas: Burial Area #1, the Western Upland Area, and the Western Alluvial Area. The Licensee shall maintain an environmental monitoring program in these three areas until superseded by a groundwater remediation work plan.

Effluent from the groundwater treatment process will be monitored to demonstrate that the concentrations of uranium complies with discharge permit limits and underground injection permits. Monitoring will be performed in accordance with permit requirements and the Sampling and Analysis Plan.

15.2 Surface and Groundwater Monitoring

Surface and groundwater samples are collected annually and are analyzed for fluoride, nitrates/nitrites, gross alpha radioactivity, gross beta radioactivity, and uranium isotopes. The locations identified in Table 15-1 shall be sampled on an annual basis.

15.3 Quality Control in Sampling

Sample collection, preservation, shipping, and analysis shall be conducted in accordance with the site-specific Sampling and Analysis Plan and associated procedures. Data review, reporting, and management will be conducted in accordance with Quality Assurance Implementing Procedure, QAIP-17.1, "Data Management Procedure."

15.4 Reporting

Environmental monitoring results shall be reported to NRC within 30 days of the completion of data review.

TABLE 15-1

SURFACE AND GROUNDWATER MONITORING LOCATIONS

BURIAL AREA #1	WESTERN UPLAND AREA
1314	1351
TMW-08	1352
TMW-09	1354
TMW-13	1356
02W06	
02W08	
02W09	**WESTERN ALLUVIAL AREA**
02W16	MWWA03
02W17	MWWA09
02W27	T-62
02W28	T-64
02W32	T-70R
02W35	T-76
02W42	T-77
02W43	T-79
02W44	T-82
SURFACE WATER	
1201 Cimarron River Upstream	
1202 Cimarron River Downstream	

16.0 DEFINITIONS

Absorbed Dose: Energy imparted by ionizing radiation per unit mass of irradiated material. The units of absorbed dose are the rad and the gray (Gy). 1 Gy = 100 rad

Administrative Changes: Administrative changes to documents are defined as editorial corrections (e.g., grammatical, typographical, etc.) or other administrative changes such as personnel title changes, changes in procedure names, or other changes that do not alter the technical or procedural content of a document.

Administrative Dose Limit: A radiation dose limit established by licensee for the purpose of maintaining radiation dose below regulatory limits.

Adult: An individual 18 or more years of age.

Airborne Radioactive Material or Airborne Radioactivity: Radioactive material dispersed in the air in the form of dusts, fumes, particulates, mists, vapors, or gases.

Airborne Radioactivity Area: A room, enclosure, or area in which airborne radioactive materials, composed wholly or partly of licensed material, exists in concentrations:

(1) in excess of the derived air concentrations (DAC) specified in appendix B of 10 CFR 20.1001 – 20.2401, or

(2) to such a degree that an individual present in the area without respiratory protection equipment could exceed, during the hours an individual is present in a week, an intake of 0.6% of the Annual Limit on Intake (ALI) or 12 DAC hours.

ALARA: An acronym for "As Low As is Reasonably Achievable". ALARA means making every reasonable effort to maintain exposures to radiation as far below the dose limits in 10 CFR 20 as is practical consistent with the purpose for which the licensed activity is undertaken, taking into account the state of technology, the economics of improvements in relation to state of technology, the economics of improvements in relation to benefits to the public health and safety, and other societal and socioeconomic considerations, and in relation to utilization of nuclear energy and licensed materials in the public interest.

ALARA Committee: The Cimarron Site ALARA Committee that has responsibility for overall coordination of the ALARA Program. The Committee is composed of members as described in Section 4.0 of this RPP and meets on a regular basis (typically, quarterly) to review the status of the ALARA Program and to approve changes to the ~~Radiation Protection Plan~~RPP and ~~Decommissioning Plan~~DP.

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Alpha Particle: A positively charged particle ejected spontaneously from the nuclei of some radioactive elements. It is identical to a helium nucleus that has a mass number of 4 and an electrostatic charge of +2, i.e. two protons and two neutrons.

Annual Limit on Intake (ALI): The derived limit for the amount of radioactive material taken into the body of an adult worker by inhalation or ingestion in a year. ALI is the smaller value of intake of a given radionuclide in a year by the reference man that would result in a committed effective dose equivalent of 5 rems (0.05 Sv) or a committed dose equivalent of 50 rems (0.5 Sv) to any individual organ or tissue. (ALI values for intake by ingestion and by inhalation of selected radionuclides are given in Table 1, Columns 1 and 2, of appendix B to 10 CFR 20.1001 thru 20.2401).

Audit: An audit is an evidence gathering process. Audit evidence is used to evaluate how well audit criteria (procedures, requirements, policies) are being met. Audit evidence is used to determine how well policies are being implemented, how well procedures are being applied, and how well requirements are being met.

Atomic Number (Symbol Z): The number of protons in the nucleus of an atom.

Background: Ambient signal response recorded by measurement instruments that is independent of radioactivity contributed by the radionuclide being measured in the person or sample.

Background Radiation: Radiation from cosmic sources; naturally occurring radioactive material, including radon (except as a decay product of source or special nuclear material); and global fallout as it exists in the environment from the testing of nuclear explosive devices or from past nuclear accidents such as Chernobyl that

contribute to background radiation and are not under the control of the licensee. "*Background radiation*" does not include radiation from source, byproduct, or special nuclear materials regulated by the NRC.

Becquerel (Bq): The term used to describe one disintegration per second (dps).

Beta Particle: Beta particles are emitted by the nucleus of an atom to attain stability. Beta particles are usually negatively charged, and are emitted from the nucleus of atoms with an excess of neutrons and serve to reduce the number of neutrons in the nucleus. Some beta particles are positively charged. These positively charged beta particles, known as positrons, are emitted from a nucleus and result in an increase in the number of neutrons in the nucleus. Negatively charged beta particles and positively charged positrons have a mass equal to 1/1837 that of a proton. Beta particles are easily stopped by a thin sheet of metal or plastic.

Bioassay (radiobioassay): The determination of kinds, quantities or concentrations and, in some cases, the locations of radioactive material in the human body, whether by direct measurement (in vivo counting) or by analysis and evaluation of materials excreted or removed from the human body.

Breathing Zone: The breathing zone is that region adjacent to a worker's mouth and nostrils from which air is drawn into the lungs while he/she is performing assigned work.

Breathing Zone Air Sample: Air which is drawn through or into the sample media and is a fair representation of the workers "Breathing Zone."

Byproduct material:

(1) Any radioactive material (except special nuclear material) yielded in, or made radioactive by, exposure to the radiation incident to the process of producing or using special nuclear material;

(2) The tailings or wastes produced by the extraction or concentration of uranium or thorium from ore processed primarily for its source material content, including discrete surface wastes resulting from uranium solution extraction processes. Underground ore bodies depleted by these solution extraction operations do not constitute "byproduct material" within this definition;

(3) (i) Any discrete source of radium-226 that is produced, extracted, or converted after extraction, before, on, or after August 8, 2005, for use for a commercial, medical, or research activity; or

(ii) Any material that—

(A) Has been made radioactive by use of a particle accelerator; and

(B) Is produced, extracted, or converted after extraction, before, on, or after August 8, 2005, for use for a commercial, medical, or research activity; and

(4) Any discrete source of naturally occurring radioactive material, other than source material, that—

(i) The ~~Nuclear Regulatory Commission~~NRC, in consultation with the Administrator of the Environmental Protection Agency, the Secretary of Energy, the Secretary of Homeland Security, and the head of any other appropriate Federal agency, determines would pose a threat similar to the threat posed by a discrete source of radium-226 to the public health and safety or the common defense and security; and

(ii) Before, on, or after August 8, 2005, is extracted or converted after extraction for use in a commercial, medical, or research activity.

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Calendar Quarter(s): First quarter - January 1 through March 31

Second quarter - April 1 through June 30

Third quarter - July 1 through September 30

Fourth quarter - October 1 through December 31

Calendar Year: From January 1 through December 31.

Calibrate: To adjust and/or determine:

(1) The response or reading of an instrument relative to a series of conventionally true values; or

(2) The strength of a radiation source relative to a standard or conventionally true value.

Committed Dose Equivalent (CDE) ($H_{T,\,50}$): Means the dose equivalent to organs or tissues of reference (T) that will be received from intake of radioactive material by an individual during the 50 year period following the intake.

Committed Effective Dose Equivalent (CEDE) ($H_{E,50}$): The sum of the products of the weighting factors applicable to each of the body organs or tissues that are irradiated and the committed dose equivalent to these organs or tissues ($H_{E,50} = \Sigma_T W_{T,50}$).

Contact Dose Rate: A radiation dose rate as measured with the detector or instrument case within 1/2 inch of the surface being measured.

Contamination, Radioactive: Deposition of radioactive material in any place where it is not desired. Radioactive contamination may be removable (loose) or fixed.

Contaminated Area: Any area that has radioactive contamination at levels greater than the radioactivity release limits for unrestricted use.

Continuous Air Sampling/Monitoring: A method of sampling used to measure airborne radioactivity levels in routinely occupied areas.

Controlled Area: An area outside of a Restricted Area but inside the site boundary, where access can be limited by the Licensee for any reason.

Corrective Action(s): Action(s) taken to improve areas of performance or to eliminate causes of adverse trends in performance identified during Audits, Surveillances, and as a response to a Non Conformance Report.

Counts Per Minute (cpm): The rate of ionizing event occurrence in one minute recorded by a radiation detection instrument designed to count ionizing events caused by radiation.

Curie (Ci): A measure of the amount of radioactive material present.

One curie equals 37 billion (3.7 E+10 or 3.7×10^{10}) becquerels (dps)or 2.2 trillion (2.2 E+12) radioactive disintegration's per minute (dpm).

A millicurie (mCi) is 2.2 billion (2.2 E+09) dpm

A microcurie (µCi) is 2.2 million (2.2 E+06) dpm

A nanocurie (nCi) is 2.2 thousand (2.2 E+03) dpm

A picocurie (pCi) is 2.2 dpm.

Declared Pregnant Woman ~~(DPW)~~: A woman who has voluntarily informed the licensee, in writing, of her pregnancy and the estimated date of conception. The

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declaration remains in effect until the declared pregnant woman withdraws the declaration in writing or is no longer pregnant.

Decontamination: Means the process of removing or reducing the level of contamination on an item or individual.

Deep Dose Equivalent (H_d): The dose equivalent at a tissue depth of 1 cm (1000 mg/cm^2) Applies to external whole body exposure.

Derived Air Concentration (DAC): The concentration of a given radionuclide in air which, if breathed by the reference man for a working year of 2,000 hours under conditions of light work (inhalation rate 1.2 cubic meters of air per hour), results in an intake of one ALI. DAC values are given in Table 1, Column 3, of appendix B to 10 CFR 20.1001-2401.

Derived Air Concentration-hour (DAC-hour): The product of the concentration of radioactive material in air (expressed as a fraction or multiple of the derived air concentration for each radionuclide) and the time of exposure to that radionuclide, in hours. A licensee may take 2,000 DAC-hours to represent one ALI, equivalent to a committed effective dose equivalent of 5 rems (0.05 Sv).

Detector: That portion of an instrument system sensitive to and used for the quantification of ionizing radiation.

Direct Contamination Survey: This method measures fixed and removable levels of surface contamination. A direct frisk is performed by scanning the survey location using a count rate meter.

Direct Reading Dosimeter (DRD): A monitoring device consisting of a collection chamber coupled with an optical lens and calibrated scale. DRD's can be used as a device to provide individuals with an immediate estimate of their external gamma radiation exposure.

Discrete Source: A radionuclide that has been processed so that its concentration within a material has been purposely increased for use for commercial, medical, or research activities.

Disintegrations Per Minute (dpm): Refers to the number of nuclear transformations occurring per minute.

Disintegrations Per Second (dps): Refers to the number of nuclear transformations occurring per second.

Dose or Radiation Dose: A generic term that means absorbed dose, dose equivalent, effective dose equivalent, committed dose equivalent, committed effective dose equivalent, or total effective dose equivalent, as applicable to context and as defined in 10 CFR 20. The unit for absorbed dose is the rad. 100 rad = 1 Gy

Dose Equivalent (H_T): Means the product of the absorbed dose in tissue, quality factor, and all other necessary modifying factors at the location of interest. The units for dose equivalent rem. 100 rem = 1 Sv

Dose Rate: The quantity of absorbed dose delivered per unit of time.

Dosimeter: Any of several types of devices used to measure radiation dose. Common types include TLD, OSL, film, and direct reading dosimeters.

Effective Dose Equivalent (H_E): The sum of the products of the dose equivalent to the organ or tissue (H_T) and the weighing factors (W_T) applicable to each of the body organs or tissues that are irradiated ($H_E = \Sigma W_T H_T$).

Effluent: Material discharged into the environment from licensed operations.

Embryo/Fetus: The developing human organism from conception until the time of birth.

Exposure: Means being exposed to ionizing radiation or to radioactive material. The unit of exposure is the roentgen.

External Dose: That portion of the dose equivalent received from a source of radiation outside the body.

Extremity: Means hand, elbow, arm below the elbow, foot, knee, or leg below the knee.

Fission: The splitting of a nucleus into at least two other nuclei and the release of a relatively large amount of energy. Two or three neutrons are usually released during this type of transformation.

Frisk: The performance of a direct survey for radioactive contamination.

Gamma Ray (Gamma Radiation): High-energy, short wavelength electromagnetic radiation (a packet of energy) emitted from the nucleus. Gamma radiation frequently accompanies alpha and beta emissions and always accompanies fission. Gamma rays

are very penetrating and are best stopped or shielded against by dense materials, such as lead or uranium. Gamma rays are similar to x-rays, but are usually more energetic.

General Area Dose Rate: A radiation dose rate measured at 30 cm or more from a surface.

Gray (Gy): The SI unit for absorbed dose: 1 Gy = 1 Joule kg^{-1} = 100 rad. .

Groundwater: Water contained in pores or fractures in either the unsaturated or saturated zones below ground level.

Half-Life, Radioactive: The time required for a radioactive substance to lose 50% of its activity by decay. Each radionuclide has a unique half-life.

In-Vitro Bioassay (indirect): The estimation of radioactivity in the human body based upon:

(1) the measurement of radioactivity in excreta or other materials taken from the body, and

(2) a biological model for the radionuclide movement in body tissues and organs.

In-Vivo Bioassay (direct): The measurement of radioactivity in the human body using instrumentation which detects radiation emitted from radionuclides in the body.

Individual Monitoring: The assessment of dose equivalent by use of devices designed to be worn by an individual; the assessment of committed effective dose equivalent by bioassay or by determination of the time-weighted air concentrations to which an individual has been exposed; or the assessment of dose equivalent by the use of survey data..

Individual Monitoring Devices: Devices designed to be worn by a single individual for the assessment of dose equivalent. Examples include thermoluminescence dosimeters (TLD's), optically stimulated luminescent (OSL) dosimeters, direct reading dosimeters, and lapel air samplers.

Instrument: A complete system designed to quantify one or more characteristics of ionizing radiation or radioactive material.

Intake: The amount of radioactive material taken into the body by inhalation, absorption through the skin, injection, ingestion, or through wounds.

Internal Dose: That portion of the dose equivalent received from radioactive material taken into the body.

Isotopes: Nuclides having the same number of protons in their nuclei, but differing in the number of neutrons. Isotopes have the same atomic number and different mass numbers.

Lens Dose Equivalent (LDE): Dose equivalent due to external exposure to the lens of the eye. It is taken as the dose equivalent at a tissue depth of 0.3 cm (300 mg/cm^2).

Licensed Radioactive Material: Source material, special nuclear material, or byproduct material received, possessed, used, transferred or disposed of under a general or specific license issued by the NRC.

License: Means the radioactive materials license issued by the NRC to the Trust to possess and/or use radioactive materials. Other licenses may be issued to the Trust by other state or federal agencies.

Licensee: The holder of the radioactive materials license (the Trust).

Limits (dose limits): The permissible upper bounds of radiation doses.

Low-Level Radioactive Waste (LLRW): Those low-level radioactive wastes containing source, special nuclear, or by-product material that are acceptable for disposal in a land disposal facility. Low-level waste has the same meaning as in the Low-Level Waste Policy Act: that is, radioactive waste not classified as high-level radioactive waste, transuranic waste, spent nuclear fuel, or by-product material as defined in paragraphs (2), (3), and (4) of the definition of *Byproduct material* set forth in 10 CFR 20.1003.

Member of the Public: An individual who is not receiving an occupational dose.

Micro: A prefix meaning "one millionth" (1 E-06), as in microcurie.

Milli: A prefix meaning "one thousandth" (1 E-03), as in millirem, millirad, or millicurie.

Minimum Detectable Activity: The smallest concentration of radioactivity in a sample that can be detected with a 5% probability of erroneously detecting radioactivity, when in fact none may be present (Type I error) and also, a 5% probability of not detecting radioactivity, when in fact it is present (Type II error). Often used interchangeably with Minimum Detectable Concentration, since the difference between the two terms is only one of units conversion.

Minor: An individual less than 18 years of age.

Monitoring (Radiation Monitoring): The measurement of radiation levels, concentrations, surface area concentrations, or quantities of radioactive material, and the use of the results of these measurements to evaluate potential exposures and doses.

Nano: A prefix meaning "one billionth" (1 E-09), as in nanocurie.

NRC: U.S. Nuclear Regulatory Commission or its duly appointed representatives.

Nuclide: Any one of the approximately 1800 isotopes of all the elements, whether radioactive or not. See radionuclide and isotope.

Occupational Dose: The dose received by an individual in the course of employment in which the individual's assigned duties involve exposure to radiation or to radioactive material from licensed and unlicensed sources of radiation, whether in the possession of the licensee or other person. Occupational dose does not include doses received from background radiation, from any medical administration the individual has received from exposure to individuals administered radioactive material and released under 10 CFR 35.75, from voluntary participation in medical research programs, or as a member of the public.

Occupational Dose Limit: The maximum legally allowable dose to individuals during a specific time period, as defined by 10 CFR 20.

Particulate: Sometimes used to describe alpha and beta radiations, but most often used to mean dust or droplets containing radioactive material.

Pico: A prefix meaning "one trillionth" (1 E-12), as in picocurie.

Planned Special Exposure: An infrequent exposure to radiation, separate from and in addition to the annual dose limits.

Posting: A standardized sign or label which bears the standard trefoil radiation symbol in magenta or purple or black on a yellow background and information concerning a specific radiological hazard.

Protective Clothing: Clothing provided to reduce exposure and prevent the spread of contamination to personnel clothing or the body while performing work with radioactive materials.

Qualification: Certification of the fact that an individual possesses the knowledge, capabilities (e.g., physical) characteristics, or abilities gained through experience, training, or on-the-job training that an individual can perform a required task.

Qualified Escort: An individual that meets the Qualified Escort training requirements set forth in Radiation Protection Procedure RP-14, "Training".

Qualified Individual: An individual who has completed the training and or testing requirements set forth by procedures or regulations, which in turn grants that individual permission to operate specific equipment, instrumentation, or work duties.

Rad: The special unit of radiation dose. One rad is equal to an absorbed dose of 100 ergs/gram or 0.01 joule/kilogram (0.01 gray).

Radiation (Ionizing Radiation): Alpha particles, beta particles, gamma rays, x-rays, neutrons, high-speed electrons, high-speed protons, and other particles capable of producing ions. Radiation, as used within the context of the Radiation Protection Program does not include non-ionizing radiation such as radio or microwaves and visible, infrared, or ultraviolet light.

Radiation Area: Defined as any accessible area where the dose equivalent to an individual could exceed 5 millirem (.05 mSv) in any one hour at 30 cm from the radiation source or surface that radiation penetrates.

Radiation Safety Officer (RSO): The individual responsible for development and oversight of radiation protection program policies at the Cimarron Site. This individual shall meet the requirements set forth in NUREG-1757, Section 17.2.3.1.

Radiation Worker: An individual who has access to the Restricted Areas to perform work and has completed the training requirements listed in Radiation Protection Procedure RP-14.

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Radioactive Material (49 CFR 173.403): For purposes of transportation, any material containing radionuclides where both the activity concentration and the total activity in the consignment exceed the values specified in the table in 49 CFR 173.436 or values derived according to the instructions in 49 CFR 173.433.

Radioactive Materials Area: Any area or room which is posted and is used to store or contains for use an amount of licensed material exceeding 10 times the quantity of such material as listed in Appendix C to 10 CFR 20.

Radioactivity: Rate of disintegration (transformation) or decay of radioactive material. The units of activity are the curie (Ci) and the becquerel (Bq). Bq = 1 (dps) disintegration per second; Ci = 3.7×10^{10} dps

Radiologically Controlled Area (RCA): See Restricted Area.

Radiological Occurrence Report (ROR): A report generated to document the facts, record the apparent and/or root cause, track the resolution and aid in trending radiological exposure events.

Radionuclide: Any one of the radioactive nuclides.

Record: A document that provides evidence of the quality of services performed, demonstrates that actions were performed in accordance with radiation protection procedures, or demonstrates conformance of actions to regulatory requirements.

Reference Man: A hypothetical aggregation of human physical and physiological characteristics arrived at by international consensus. These characteristics may be used by researchers and public health workers to standardize results of experiments and to relate biological insult to a common base.

Rem: The special unit for any of the quantities expressed as dose equivalent. The dose equivalent in rems is equal to the absorbed dose in rads multiplied by the quality factor (1 rem = 0.01 sievert).

Removable Contamination Survey: The method used to measure removable contamination. Removable survey techniques are:

(1) Smear Surveys - A smear is obtained by using an absorbent filter disk to wipe with moderate pressure across the area or item to be evaluated. A smear is usually wiped over an area of 100 cm^2.

(2) Wipe Surveys – A wipe is obtained by wiping an absorbent pad or towel over a large area or the entire surface of the item being surveyed.

Respirator: An apparatus used to reduce the individual's intake of airborne radioactive materials

Restricted Area: An area having access controlled by the Licensee for the purpose of protecting individuals against undue risk from exposure to radiation and radioactive materials. Restricted Area does not include areas used as residential quarters, but separate rooms in a residential building may be set apart as a Restricted Area.

Sealed Source: Any by-product material that is encased in a capsule designed to prevent leakage or escape of the by-product material.

Shallow Dose Equivalent (SDE): The dose equivalent at a tissue depth of 0.007cm (7 mg/cm^2), averaged over an area of one square centimeter. It applies to external exposure of the skin of the whole body or of an extremity.

Sievert (Sv): The SI unit of any of the quantities expressed as dose equivalent. The dose equivalent in sieverts is equal to the absorbed dose in grays multiplied by the quality factor. 1 Sv = 100 rem.

Site Boundary: The line beyond which the land or property is not owned, leased, or otherwise controlled by the Licensee.

Skin of the Whole Body: The skin of the whole body, exclusive of skin of the extremities.

Smear: A radiation survey technique which is used to determine levels of removable surface contamination. A medium (typically filter paper) is rubbed over a surface (typically of area 100 cm^2), followed by a quantification of the activity on the medium. Also known as a swipe.

Source Material:

(1) Uranium or thorium or any combination of uranium and thorium in any physical or chemical form; or

(2) Ores that contain, by weight, one-twentieth of 1 percent (0.05 percent), or more, of uranium, thorium, or any combination of uranium and thorium. Source material does not include special nuclear material.

Special Nuclear Material:

(1) Plutonium, uranium-233, uranium enriched in the isotope 233 or in the isotope 235, and any other material that the Commission, pursuant to the provisions of section 51 of the Act, determines to be special nuclear material, but does not include source material; or

(2) Any material artificially enriched by any of the foregoing but does not include source material.

Stochastic Effects: Health effects that occur randomly and for which the probability of the effect occurring, rather than its severity, is assumed to be a linear function of dose without threshold. Hereditary effects and cancer are examples of stochastic effects.

Survey: An evaluation of the radiological conditions and potential hazards incident to the production, use, transfer, release, disposal, or presence of radioactive materials or other sources of radiation. When appropriate, such an evaluation includes a physical survey of the location of a source of radiation and measurements or calculations of levels of radiation or concentrations or quantities of radioactive material present.

Thermoluminescent Dosimeter (TLD): An integrating detector where radiation energy is absorbed (trapped) and can be read out later by thermal excitation of the detector.

Total Effective Dose Equivalent (TEDE): The sum of the deep dose equivalent (for external exposures) and the committed effective dose equivalent (for internal exposures).

Total Organ Dose Equivalent (TODE): The sum of the deep dose equivalent and the committed dose equivalent to the organ receiving the highest dose.

Unrestricted Area: Any area to which access is not limited or controlled for purposes of protection of individuals from exposure to radiation and radioactive materials.

Uptake: Quantity of a radionuclide taken up by the systematic circulation (e.g., by injection into the blood, by absorption from compartments in the respiratory or gastrointestinal tracts, or by absorption through the skin or through wounds in the skin).

Uranium (Natural, Depleted and Enriched):

Natural Uranium: Uranium found in nature. Natural uranium contains 0.71 weight percent U-235, 99.3 weight percent U-238, and a trace of U-234.

Depleted Uranium: Uranium in which the U-235 isotope represents less than 0.71 weight percent of the mass of the material. Depleted uranium is less radioactive than natural uranium.

Enriched Uranium: Uranium in which the U-235 isotope represents greater than 0.71 weight percent of the mass of the material. The alpha emission rate increases from 1.5 E3 dpm per mg at 0.71 weight percent enrichment to 1.4 E5 dpm per mg at 93% enrichment.

Visitor: An individual who is not an employee or contractor of the Licensee.

Week: Seven consecutive days starting on Sunday.

Weighting Factor (W_T): The proportion of risk of stochastic effects resulting from irradiation of the organ or tissue to the total risk of stochastic effects when the whole body is irradiated uniformly.

Whole Body (WB): Means, for purposes of whole body exposure, the head, trunk (including male gonads), arms above the elbow, or legs above the knee.

Year: The period of time beginning on January 1 and ending on December 31 that is used to determine compliance with the NRC.

X-Ray: Penetrating electromagnetic radiation having a wavelength much shorter than that of visible light. X-rays are usually produced by a excitation of the electron field around certain nuclei. In nuclear reactions, it is customary to refer to photons originating in the electron field of the atom as X-rays.

17.0 REFERENCES

1. 10 CFR 19, "Notices, Instructions and Reports to Workers; Inspection and Investigations"
2. 10 CFR 20, "Standards for Protection Against Radiation"
3. 10 CFR 30, "Rules of General Applicability to Domestic Licensing of By-Product Material"
4. 10 CFR 61, "Licensing Requirements for Land Disposal of Radioactive Waste"
5. 10 CFR 70, "Domestic Licensing of Special Nuclear Material"
6. NUREG-1556, Vol. 7, "Consolidated Guidance About Materials Licenses, Program-Specific Guidance About Academic, Research and Development, and Other Licenses of Limited Scope Including Gas Chromatographs and X-Ray Fluorescence Analyzers," Appendix L, "Sample Audit Program"
7. NUREG 1757, "Decommissioning Process for Materials Licensees"
8. NCRP 87-1987, "Use of Bioassay Procedures for Assessment of Internal Radionuclide Deposition"
9. Regulatory Guide 4.15, "Quality Assurance for Radiological Monitoring Programs (Normal Operations) - Effluent Streams and the Environment."
10. Regulatory Guide 8.25, "Air Sampling in the Workplace"
11. The Cimarron Environmental Response Trust Special Nuclear Material License (SNM-928)
12. Order Transferring License No. SNM-928 for the Cimarron Site
13. "Cimarron Facility Decommissioning Plan," Rev. 1 (Reserved)
14. U.S. NRC, "Guidelines for Decontamination of Facilities and Equipment to Release for Unrestricted Use or Termination of License or Byproduct, Source, or Special Nuclear Material," August 1987
15. U.S. NRC, "Disposal or Onsite Storage of Thorium or Uranium Wastes from Past Operations," October 1981

Commented [JM106]: Editorial change to capture the title of the reference, which is reserved pending finalization of the DP.

ATTACHMENT 2
27(e) EVALUATION FOR LOW-RISK ACTIVITIES

1.0 Description of Proposed Revision, Test, and/or Experiment:

This evaluation addresses ongoing low-risk periodic activities conducted at the Cimarron Site. Examples of such activities include:

a) Collecting, packaging, and shipping groundwater and surface water samples for laboratory analysis.
b) Conducting soil borings and collecting, packaging, and shipping soil samples for laboratory analysis.
c) Installing and developing groundwater monitor wells.

This evaluation applies only to activities performed in accordance with Activity Plans or Standard Operating Procedures which have been approved by the Radiation Safety Officer or designee. It excludes activities performed within the confines of the disposal cell designated Burial Area #4.

2.0 Does the proposed revision, test, and/or experiment ("action") represent a change to the NRC-approved Decommissioning Plan or Radiation Protection Plan?

	Yes	If "Yes", proceed to section 4.0 for evaluation of the action.
X	No	If "No", proceed to section 3.0 for evaluation of the action.

3.0 Is the proposed test or experiment present in the NRC-approved Decommissioning Plan or applicable license conditions?

	Yes	If "Yes", there is no need to conduct an evaluation.
X	No	If "No", proceed to Section 4.0 for evaluation of the action.

Note: The rest of this page is intentionally blank.

4.0 Evaluation:

	LICENSE REQUIREMENT	YES	NO	N/A
4.1	**Does the action conflict with requirements specifically stated in the license, other than the RPP or DP?**			
	a) Does the action involve material not authorized by the license?		X	
	b) Are either the use or the place of use different from what the license authorizes?		X	
	c) Will the action violate training requirements?		X	
	d) Are there procedures or procedure revisions which have not been approved by the RSO?		X	
	e) Does the action involve work in Restricted Areas or with licensed material not addressed in RP Procedures?		X	
	f) Doe the action conflict with requirements in tie-downs stipulated in license conditions 10, 26, 27(a), or 27(c)?		X	
	g) Does the action result in contamination exceeding limits stipulated in license condition 27?		X	
4.2	**Does the action impair Cimarron Environmental Response Trust's ability to meet all applicable NRC regulations?**			
	a) Will the action cause an exceedance of dose limits for workers and members of the public?		X	
	b) Does the action establish limits other than approved decommissioning criteria?		X	
	c) Does the action violate requirements for surveys and monitoring, control of internal and external exposure, and control of licensed material?		X	
	d) Will the action violate precautionary procedures (posting, labeling, etc.)?		X	
	e) Does the action violate waste disposal or record keeping requirements?		X	

	LICENSE REQUIREMENT	YES	NO	N/A
4.3	**Does the action result in degradation of safety or environmental commitments addressed in the NRC-approved RPP and/or DP, or health and safety?**			
	a) Does the action result in greater release of licensed material to air or liquid effluents than planned actions?		X	
	b) Does the action result in the spread of licensed material to uncontaminated areas more than planned actions?		X	
	c) Does the action result in the loss of control over licensed material?		X	
	d) Have data quality objectives been established that achieve the required level of data quality?		X	
4.4	**Does the action pose a significant adverse effect on the quality of the work or the remediation objectives?**			
	a) Does the action modify the intent to release the site for unrestricted use?		X	
	b) Does the action result in significant increase in the volume of material contaminated above license criteria?		X	
	c) Does the action contaminate unrestricted areas to the extent they will require decommissioning?		X	

	LICENSE REQUIREMENT	YES	NO	N/A
4.5	**Does the action conflict with the conclusions of actions analyzed in the Environmental Assessment, dated July 29, 1999 and Safety Evaluation Report dated August 20, 1999?**			
	a) Does the action render the environmental monitoring program unable to detect a release of licensed material to the environment?		X	
	b) Does the action increase the release of licensed material to groundwater, surface water, or air?		X	
	c) Does the action create the potential for an accident worse than that in the dose assessment?		X	
	d) Does the action result in an adverse socioeconomic impact to the community?		X	
	e) Does the action create other than short duration and minor impacts to air?		X	
	f) Does the action adversely impact potential future land use?		X	
	g) Does the action adversely impact transportation plans for shipments to a licensed disposal site?		X	
	h) Does the action adversely impact endangered species?		X	
	i) Does the action impact historic or archeological sites?		X	

NOTE: If "YES" was answered in ***any*** of the Section 4 evaluation questions, the action cannot be performed without NRC approval. Provide any basis for determination of each answer provided in Section 4 as comments in Section 5.0, as appropriate.

5.0 Comments:

Routine and low-risk activities may be conducted at the Cimarron Site and are addressed under the approved RPP. Low-risk activities may include routine and special radiological surveys, installation of groundwater monitoring wells, and grounds maintenance (mowing of grass, road or facility maintenance, etc.); typically any activity that does not unearth radioactive material buried ***in the disposal cell designated Burial Area #4*** at the site. Section 15.0 of the RPP specifically addresses annual surface and groundwater sampling in. Quarterly groundwater samples are also collected following the same process used for the annual sampling. Section 15.3 recognizes that "sample collection, preservation, shipping, and analysis is conducted in accordance with the site-specific Sampling and Analysis Plan and associated procedures."

Section 9.2 of the RPP recognizes that for certain work activities "special sampling requirements" must be incorporated into Activity Plans. Although a broad term, these special sampling requirements may include the sampling, packaging, and shipping of groundwater or soil samples for laboratory analysis, which would be conducted in accordance with the Sampling and Analysis Plan and approved procedures.

Planned low-risk activities and routine and special sampling events are discussed in ALARA Committee meetings. The Committee considers if these activities and sampling can be performed under the approved RPP or DP and do not require an evaluation under License Condition 27(e). Activities that are not clearly within the scope of the approved RPP or DP must be fully evaluated in accordance with License Condition 27(e).

6.0 Results:

Revision, Test, or Experiment Approved:	Yes	X	No	

7.0 Submitted By (Signature/Date):

Position: RSO	J Mailer 11/20/2019

8.0 Approved By (Signature/Date):

Trust Administrator: Bill Halliburton	12/09/2019
Project Manager: Jeff Lux	November 22, 2019
Radiation Safety Officer: Jay Maisler	11/20/2019
Quality Assurance Coordinator: Chuck Beatty	