ANNEX A

CIMARRON CORPORATION

RADIATION PROTECTION

PLAN

for
Cimarron Corporation former Nuclear Fuels Fabrication Facility
near Crescent, OK

SNM-928 Amendment #19
Approved by NRC October 3, 2005

CIMARRON CORPORATION

RADIATION PROTECTION PLAN

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DATE: 12/5/07

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DATE: 12/6/07

APPROVED BY: _____
VICE PRESIDENT/CIMARRON

DATE: 12/5/07

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1.0 INTRODUCTION

1.1 Section Overview

This introductory section to the Cimarron Radiation Protection Plan (RPP) is intended as an orientation to the overall purpose and scope of the Plan.

1.2 Purpose

The purpose of the Plan is to establish Cimarron radiation protection policies to comply with applicable regulatory requirements and the conditions of License SNM-928. Radiation protection procedures are developed and implemented to ensure compliance with these requirements and to maintain exposure to levels As Low As Reasonably Achievable (ALARA). Cimarron Corporation shall comply with all applicable state and federal regulations, licenses, and permits during the decommissioning process.

The policies stated in this Plan are not intended to restrict Cimarron operations more than required by regulations. Wherever a policy is more restrictive than the regulations, the policy is intended only as a practical means of achieving regulatory compliance. Any variation from these policies or subordinate procedures must be approved by the RSO and documented.

This RPP shall be reviewed at least annually by the ALARA Committee. The review will assess the effectiveness of the Plan in providing appropriate regulatory and radiation protection policy. The review will be documented and changes to the Plan will be made based upon the recommendations of the ALARA Committee.

1.3 Scope

The policies in this Plan apply to all routine and emergency radiological operations. All employees, contractors, and visitors are included within the scope of the policies in this Plan.

2.0 GENERAL INFORMATION

2.1 Section Overview

This section provides requirements for the responsibilities of those involved in Cimarron Corporation radiological operations, and discusses radiation safety training requirements.

2.2 Responsibilities

Each individual at Cimarron shares responsibility for their own radiation protection as well as for their co-workers and individual members of the public. Key responsibilities under the Radiation Protection Program are outlined in Section 3. Specific responsibilities under the Radiation Protection Program shall be outlined in the Radiation Protection Program Procedures.

2.3 Training Requirements and Policy

All persons who are permitted to enter any restricted area/radiologically controlled area (RCA) shall receive information and training in radiation safety. Training will be commensurate with the potential for exposure to radiation and or radioactive materials and will comply with 10 CFR 19 and 10 CFR 20. Training will ensure that individuals are:

- Aware of radioactive materials are present in the RCA's;
- Informed regarding risks that may result in exposure of the individual;
- Informed regarding precautions or procedures to minimize exposure to radioactive materials or radiation;
- Informed of the purpose and functions of protective devices and monitoring devices that will be used; and
- Informed regarding additional protection available for the embryo/fetus, as applicable.

Training for radiation workers will also include:

- Applicable provisions of the regulations and license for the protection of personnel from exposure to radiation or radioactive material;
- Responsibility of the worker to report promptly to the site manager any conditions that may lead to or cause a violation of regulations, license, or unnecessary exposure to radioactive material or radiation.
- Appropriate responses to warnings made in the event of any unusual occurrence or malfunction involving exposure to radiation or radioactive material; and
- Radiation exposure reports that may be requested by the worker pursuant to the regulations.

The Radiation Safety Officer is responsible for the oversight of the training program of onsite workers and visitors. Training requirements are approved by the RSO, but training may be performed by radiation workers approved by the RSO.

The radiation training program may meet these requirements by using any of the following techniques: Classroom training, videotapes, reading assignments, on-the-job training, demonstrations, drills, and discussions. Radiation workers attend an appropriate classroom training session upon employment and receive periodic review training at least annually. Training records for all individuals shall be maintained in accordance with the Quality Assurance Plan.

3.0 ADMINISTRATION

3.1 Section Overview

This section describes the administration of Cimarron Corporation's Radiation Protection Program. Administration of the Radiation Protection Program requires coordination between the Radiation Safety Officer, Project Manager, Site Manager, Quality Assurance Coordinator, Activity Supervisors, the ALARA Committee, and workers. Organization and staffing requirements of the Radiation Protection organization are presented, as well as the requirements of the ALARA Committee.

Compliance with the Radiation Protection Program policies is achieved through the implementation of procedures. Requirements for the development, review, approval, and control of procedures are presented in this section.

Regulations and/or the Radiation Protection Program require the generation of documents, notifications, reports, and other records This section specifies documents containing the requirements for proper generation, storage, and turnover of documents and notifications for regulatory compliance.

3.2 Radiation Protection Organization

The current organizational structure for Cimarron Corporation is presented in Figure 3-1. Radiation Protection staffing levels shall be appropriate for activities being performed.

The Vice President, Cimarron Corporation, provides corporate oversight of site activities of the Cimarron facility. The Vice President, Cimarron Corporation has ultimate responsibility for assuring that the RPP at Cimarron Corporation is developed and implemented in a manner consistent with regulatory requirements and company policies. This responsibility is delegated to the Radiation Safety Officer.

The Project Manager is responsible to provide sufficient resources to implement the Radiation Safety Program and to perform site activities. The Project Manager oversees site staffing, monitors regulatory requirements, site activities, scheduling and budget status.

The Radiation Safety Officer (RSO) is responsible for development, implementation, and oversight of the Radiation Protection Program. The RSO chairs the ALARA Committee and is responsible for bringing pertinent radiation protection and safety issues to the attention of the ALARA Committee.

The Quality Assurance Coordinator is responsible for the implementation, review, and revision of the Quality Assurance Plan.

Each Activity Supervisor is responsible for the effective implementation of radiation protection procedures as required for their scope of activities and that each individual under their supervision has been properly training for the work requirements needed before beginning work.

Each worker is responsible for complying with regulatory requirements and Cimarron Corporation radiation protection procedures to the best of his/her ability and knowledge. These responsibilities include proper use of protective and personnel monitoring equipment, notifying management of any potential or real radiation hazards or improper practices, and maintaining his/her individual radiation exposure and that of others ALARA. All workers should be aware of and heed the instructions on the "Notice to Employees" (NRC Form 3).

Each worker has the authority to stop work in the event that the health and safety of workers or members of the public may be compromised or if regulatory non-compliance may occur. Workers are requested to contact site management regarding potential regulatory or license violations before contacting regulatory agencies. However, any worker who is not satisfied with the management response regarding the potential violation is encouraged to contact the regulatory agency for resolution of the concern.

3.3 Radiation Protection Program Document Hierarchy

Hierarchy of the Radiation Protection Program documents shall be as follows:

Federal and State Regulations (e.g., 10 CFR)

Radioactive Materials Licenses and Permits issued by the Nuclear Regulatory Commission, other Federal offices, and the State of Oklahoma, including all documents incorporated by reference, such as the Cimarron Corporation RPP.

Radiation Protection Program Procedures. These procedures shall administer and implement the RPP.

3.4 Procedure Development

Radiation Protection Procedures shall be developed in accordance with the Quality Assurance Plan. Procedures shall comply with regulatory requirements and the RPP and should incorporate or reference applicable technical guidance documents (e.g., ICRP, NCRP, U.S. NRC Regulatory Guides, ANSI Standards, ASME Standards, etc.).

3.5 Procedure Review, Approval, and Control

Procedures shall undergo technical verification and review to ensure compliance with regulatory requirements, all applicable licenses and permits, the RPP, and conformance, to the extent practicable, with applicable technical guidance documents. Procedure review shall also assess compatibility with all other Cimarron Corporation procedure manuals and documents. Reviews shall ensure that the procedure can be performed as written. All Radiation Protection Program procedures shall be reviewed and approved by the Radiation Safety Officer. Procedures shall be controlled in accordance with the Quality Assurance Plan.

3.6 Radiation Protection Program Documentation

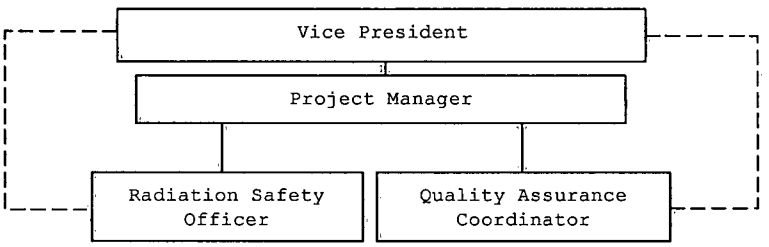
Implementation of the Radiation Protection Program results in generation of documents demonstrating the quality of services performed and compliance with federal and state regulations. Radiation Protection documents shall be controlled in accordance with regulatory requirements and the requirements of the Quality Assurance Plan.

3.7 Notifications and Reports

Notifications and reports shall be made in accordance with the requirements of 10 CFR 19, 10 CFR 20, 10 CFR 21, and 10 CFR 70.

Figure 3-1

Cimarron Corporation Organization



4.0 ALARA PROGRAM

4.1 Section Overview

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

4.2 ALARA Policy

The basic philosophy of radiation protection is to maintain radiation exposures As Low As Reasonably Achievable (ALARA) below the regulatory requirements. In addition, Cimarron operations shall be performed in a manner such that doses are maintained ALARA. "Reasonable" means that the costs, benefits, and risks are considered in trying to minimize dose.

Cimarron Corporation has developed, documented, and implemented a radiation protection program commensurate with the scope and extent of licensed activities. The Cimarron Radiation Protection Program embraces the ALARA philosophy through its use, to the extent practicable, of procedures and engineering controls based upon sound radiation protection principles to achieve occupational doses and doses to members of the public that are ALARA. Cimarron is committed to providing all necessary resources, in the form of personnel, training, engineering controls, preparation and planning, design, equipment, monitoring devices, and controls to achieve ALARA doses at its facility.

Each worker is expected to be knowledgeable of work activities, and to abide by all ALARA requirements such as those found on Special Work Permits. In addition to the responsibility for their own dose minimization, each worker is responsible for minimizing dose to other workers and members of the public. Cimarron Corporation has an ALARA Suggestion Program for workers to provide comments and suggestions for dose minimization and improving the safety and efficiency of operations. Cimarron Corporation encourages worker participation in the ALARA Suggestion Program.

4.3 ALARA Committee

Cimarron shall have an ALARA Committee whose purpose is to ensure that ALARA policy, philosophy, commitments and regulatory requirements are integrated into all appropriate work activities.
The responsibilities of the ALARA Committee are:

- Ensuring that ALARA policy, philosophy, commitments, and regulatory requirements are integrated into all appropriate work activities.

- Reviewing and approving ALARA Program goals for Cimarron Corporation.

- Reviewing the effectiveness of the ALARA Program.

- Discussion of plans for new activities to ensure that ALARA considerations are met.

- Annual review of the Radiation Protection Program to ensure compliance and to incorporate any necessary changes.

- Evaluate and approve changes to the Decommissioning Plan or RPP in accordance with License Condition 27(e).

The ALARA committee shall be chaired by the RSO. The Vice-Chair shall be the Cimarron Project Manager and the third member shall be the Cimarron Vice President. Other individuals with appropriate authority and technical expertise shall serve on the committee as deemed necessary by the Chair or Vice-Chair.

5.0 ASSESSMENTS

5.1 Section Overview

Assessments are audits and/or surveillances which provide a systematic review of key activities and the overall quality of radiation protection activities. These assessments help to ensure that:

- Activities comply with license and regulatory requirements,
- Activities are performed in accordance with established policies, procedures and recognized good practices,
- Unsatisfactory performance is identified and corrected, and
- Programmatic weaknesses are targeted and corrected

5.2 Audits

Periodic audits shall evaluate the effectiveness of selected aspects of the Radiation Protection Program and determine the adequacy of and adherence to established procedures, instructions, specifications, regulations and standards, and other applicable permitting and licensing requirements

5.3 Surveillances

Surveillances are job specific observations performed under the guidance or direction of the Quality Assurance Coordinator to evaluate the implementation of the radiation protection program with respect to accepted practices (e.g., procedures, management directives, etc.), industry standards, and regulatory requirements.

5.4 Nonconformance Reports

A Nonconformance Report (NCR) is generated to document the facts, record the apparent and/or root cause, track the resolution and aid in trending radiological events. CARs are issued, responded to, corrected, and documented in accordance with the Quality Assurance Plan.

6.0 PERSONNEL MONITORING

6.1 Occupational Dose Limits

NRC regulations establish 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 any individual organ and tissue. The following annual dose limits apply to all Cimarron employees, contractors, and visitors who receive occupational dose at Cimarron facilities. Occupational dose is defined as the radiation dose an individual receives in a restricted area and other work-related radiation dose the person receives, but does not include medical dose, dose due to background radiation, or dose received while a member of the public.

6.1.1 Occupational Dose Limits for Adults are as follows:

Whole Body - The more limiting of a total effective dose equivalent (TEDE) equal to 5 rem or the sum of the deep dose equivalent and committed dose equivalent to any individual organ or tissue, other than the lens of the eye, equal to 50 rem.

Skin - A shallow dose equivalent equal to 50 rem.

Lens of the Eye - An eye dose equivalent equal to 15 rem.

Extremities - A shallow dose equivalent equal to 50 rem.

6.1.2 Occupational Dose Limits to Minors are as follows:

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

6.1.3 Occupational Dose Limits to Embryo/Fetus 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.

6.2 Dose Limits for Individual Members of the Public

The TEDE received by individual members of the public from licensed operations shall not exceed 100 mrem above background in a year in restricted areas. 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.

6.3 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 Cimarron until the Department terminates each pertinent license requiring this record and in accordance with the Cimarron Quality Assurance Plan.

6.4 Personnel Monitoring for External Radiation

Cimarron shall issue individual monitoring devices to any individual who is likely to receive a dose in excess of 10 percent of the occupational limits. Monitoring shall also be performed to measure the dose to the embryo/fetus when declaration of pregnancy is made. Dosimetry devices shall be processed by a laboratory or vendor maintaining accreditation by the National Voluntary Laboratory Accreditation Program (NVLAP).

6.5 Internal Exposure Monitoring

Baseline in-vivo and/or in-vitro monitoring shall be performed for all individuals prior to performing radiation work involving respiratory protection equipment or work that could involve an intake of radioactive materials. Additional bioassay sampling shall be performed at the direction of the RSO.

Intakes shall normally be calculated based upon the results of the air monitoring program, unless the time of intake is well defined, the lung Class is known, or bioassay results are significantly higher than detection limits.

In-vivo and/or in-vitro bioassay sampling shall be performed whenever a calculated intake of 40 DAC-hours may 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 should 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 should also 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.

6.6 Declared Pregnant Woman (DPW) Exposure Policy

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.

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. Cimarron shall ensure the dose to the embryo/fetus of a declared pregnant woman does not exceed regulatory limits due to occupational dose during the pregnancy.

6.7 ALARA Dose Goals

The ALARA Committee establishes ALARA dose goals for the site. In cases where ALARA dose goals are exceeded without prior authorization, the RSO shall investigate to determine the cause and prepare a written report.

6.8 Personnel Exposure Reports

An annual summary report of the individual radiation dose received shall be sent to each worker who was issued primary dosimetry. When requested by an individual in writing, 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 20.1203 and the Cimarron Quality Assurance Plan. These records shall be updated at least annually. 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) and units (e.g., rem or mrem) of all recorded values.

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, should be performed in accordance with ANSI N323-1978, "Radiation Protection Instrumentation Test and Calibration."

The calibration frequency for portable radiation monitoring instruments and portable air sampling equipment shall be at least every 6 months. Semi-portable (e.g., continuous air monitors, personnel contamination monitors) and fixed (e.g., count room/laboratory instrumentation, portal monitors) instrumentation shall be calibrated at least annually.

7.2 Operation and Response Tests

Operation of radiation monitoring, counting, and air sampling instruments, shall only be performed by personnel qualified in the use of the instrument. Additionally, operation shall be performed in accordance with the operational procedure for each type of instrument in use. Operation shall be performed in accordance with regulatory requirements and should conform to industry standards and guidance.

Operation procedures shall include response test requirements and should be consistent with ANSI N323-1978, "Radiation Protection Instrumentation Test and Calibration."

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

A Quality Control (QC) Program for counting instruments shall be established and maintained to ensure reliability of counting results and sensitivities. The Quality Assurance (QA) Program for laboratory instrumentation should be consistent, to the extent practicable, with the requirements of USNRC Regulatory Guide 4.15, "Quality Assurance for Radiological Monitoring Programs (Normal Operations) - Effluent Streams and the Environment."

QC for counting instruments should be proceduralized or based on manufacturer's instructions and be consistent with ANSI N323-1978, "Radiation Protection Instrumentation Test and Calibration" and 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

The Access Control program provides the access control requirements for entry into and exit from Restricted Areas and Radiologically Controlled Areas (RCAs). The Access Control Program 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 Restricted or Radiologically Controlled Areas. Restricted Areas are areas within the Cimarron Facility boundary for which access can be limited for any reason.

8.2 Radiologically Controlled Area (RCA) Access Controls

RCAs are those areas within the fenced area of the Cimarron Facility that require the completion of specific training prior to entry. Only properly trained or escorted personnel shall be permitted inside any Radiologically Controlled Area. RCAs include Radioactive Materials Areas, Radiation Areas, and Airborne Radioactivity Areas. RCAs may be controlled through the use of guards, barriers, fences, signs, gates, or doors.

RCA boundaries shall be defined by the use of postings, barriers, walls, tape, ropes, markings, or locked doors. Each RCA shall be posted.

8.3 Posting Requirements

Each RCA shall be posted in accordance with 10 CFR 20.1902 unless excepted from posting under the provisions of 10 CFR 20.1903.

9.0 SPECIAL WORK PERMITS

9.1 Section Overview

A Special Work Permit (SWP) is a document or series of documents prepared by the Activity Supervisor or Designee, with input and approval from appropriate personnel, to inform individuals of the conditions that exist in the work area and radiological and non-radiological job safety requirements. SWPs are required only when hazardous or radioactive materials are present in quantities that could result in health or safety hazards due to the work to be performed and activities not covered by a Standard Operating Procedure (SOP) or Work Plan.

9.2 SWP Preparation

SWP documentation shall consider all safety and radiological hazards and protective equipment needed for the work. SWPs should include information on the nature of the work, equipment needed to perform the job, work procedures, work plans, Health & Safety requirements, personal protective equipment, radiological requirements and conditions, necessary surveys, and training requirements. Evaluations are performed based upon the above documentation, and the SWP requirements shall be written to incorporate all health and safety considerations.

9.3 SWP Requirements

The SWP job description and job location shall be consistent with the activities or task to be performed. Personnel monitoring requirements, radiological survey requirements, special sampling requirements, and health physics oversight requirements shall be written into the SWP.

9.4 SWP Approval

SWPs must be approved by the Activity Supervisor or designee. SWPs addressing radiological hazards must be approved by the Radiation Safety Officer. SWPs addressing non-radioactive hazardous materials must be approved by the Health and Safety Officer.

9.5 SWP Training

Each individual who performs work governed by a SWP shall receive training regarding the SWP by the Activity Supervisor or Designee prior to starting work. SWP training shall be documented by having the worker sign a form acknowledging that training was received.

10.0 RADIATION PROTECTION SURVEYS

10.1 General Requirements

Survey information is used to assist in the development of Special Work Permits, to inform individuals of the radiological conditions/hazards in the area, to determine area postings (if required), to determine the type(s) of personnel protective equipment necessary, and to ensure personnel exposures to radiation and radioactive materials are maintained ALARA. Cimarron shall conduct radiation and contamination surveys, perform air sampling, and take samples when required to assess radiological conditions and to establish specific radiological controls for work to be performed. Decommissioning surveys shall be performed in accordance with the NRC-approved Site Decommissioning Plan and subsequent revisions.

Contact dose rates are used to locate and identify radiation levels to which personnel are exposed.

Indirect (smears) and direct (fixed) contamination surveys are performed to detect and quantify radioactive contaminants. Loose-surface 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" shall be an acceptable method for meeting certain survey and dose assessment requirements of 10 CFR 20. Air samples shall be collected whenever the airborne activity levels are expected to exceed 10 percent of the Derived Air Concentration (DAC).

Breathing zone (BZ) 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 RSO 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. In addition, the analysis of air samples (including preliminary field screening) shall be performed in a timely and expeditious manner.

10.2 Routine Surveys

Surveys shall be conducted at a frequency commensurate with the hazards present and the personnel occupancies in a given area.

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 Radiologically Controlled Areas that have the potential for spreading contamination or per SWP requirement. A hand and foot frisk shall be performed at a minimum, when exiting these areas.

10.5 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 appropriate instrumentation to be used, operational and response checks for survey instrumentation, survey methods, recording of data, calculations, data evaluation, and action levels, as applicable. 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.

11.0 RADIOACTIVE MATERIALS CONTROL

11.1 Section Overview

Radioactive material (RAM) controls are established to provide positive control of radioactive material, prevent inadvertent release of radioactive material to unrestricted areas, ensure protection of members of the public and workers, and to minimize the amount of radioactive waste generated during operations. This section of the Plan addresses receipt, labeling, storage, shipment, transfer, controls, theft and loss of radioactive materials.

11.2 Receipt, Labeling, and Storage of RAM

All radioactive materials shall be received in accordance with radioactive material license possession limits. The individual responsible for radioactive material receipt shall perform all surveys and paperwork review for the shipment to ensure compliance with 49 CFR. Each container of radioactive material shall be labeled as required by 10 CFR 20.

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.

11.3 Shipment and Transfer of Radioactive Material

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

11.4 Controls for Radioactive Sources

The Radiation Safety Officer shall approve all requisitions for sealed radioactive sources and ensure that source inventories are performed on a quarterly basis. Sealed sources (except exempt quantities) shall be tested for leakage and/or contamination upon receipt and on a quarterly basis. The RSO shall approve locations for storage of sealed radioactive sources. Source storage areas shall be locked and posted per 10 CFR 20.

11.5 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 if necessary.

12.0 CONTAMINATION CONTROL

12.1 Section Overview

The purpose of contamination control is to prevent and/or minimize the spread of contamination to individuals, areas, and equipment. Control of radioactive surface contamination minimizes possible inhalation or ingestion of radioactivity by personnel, skin dose from small particles of radioactivity, and the spread to or build-up of radioactivity in the facility or environment from decommissioning operations.

12.2 General

Cimarron shall maintain buildings and equipment located within a restricted or radiological controlled area below the smearable contamination limit of 5,000 dpm/100cm^2 gross alpha. In addition, Cimarron shall establish Contaminated Area controls, including posting, whenever smearable contamination in an unrestricted area exceeds 1,000 dpm/100cm^2 alpha or beta-gamma. Cimarron shall incorporate the ALARA philosophy when selecting decontamination methods and practices.

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

12.3 Control and Use of Radiological Containments

The Health Physics Department, along with Activity Supervisors, shall determine the need for containment to control the spread of contamination.

12.4 Contaminated Personnel

Decontamination of personnel shall be performed under the guidance of health physics personnel and shall incorporate good health physics practices and ALARA. Cimarron shall not allow an individual whose skin or personal clothing is found contaminated above background to exit a controlled area without prior approval of the Project Manager or RSO. Appropriate surveys and monitoring shall be performed to evaluate dose to the individual resulting from contamination.

12.5 Spill of Radioactive Material

A spill of radioactive material requires immediate actions which include stopping the spill, warning other personnel, isolating the area, and minimizing radiation exposure. Supplementary actions should include the performance of radiological surveys in immediate and adjacent areas, including downwind.

13.0 UNCONDITIONAL RELEASE OF MATERIALS

13.1 Section Overview

Cimarron is authorized to unconditionally release tools, equipment, parts, and materials provided that radiation levels and surface contamination levels do not exceed the limits as stated in the Cimarron license:

- Smearable (removable) - 1000 dpm/100cm^2 alpha or beta/gamma
- Exposure rate – 5 µR/hr (1.3 pCi/kg) above background at 1 meter (3.3 ft)

13.2 Survey Instrumentation

Instruments used to perform release surveys must be calibrated using 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 must be known and documented.

13.3 Release Surveys of Materials

Release surveys will consist of direct (fixed) and removable (smearable) monitoring. Cimarron is authorized to release materials provided that the direct and removable levels do not exceed the limits stated in the Cimarron license. Such surveys will be performed and documented by qualified individuals.

- Direct – 15,000 dpm/100cm^2 alpha or beta/gamma, maximum over 1m^2
- Direct – 5,000 dpm/100cm^2 alpha or beta/gamma, averaged over 1m^2
- Removable – 1000 dpm/100cm^2 alpha or beta/gamma

14.0 RESPIRATORY PROTECTION

14.1 Section Overview

Respiratory protection measures shall be employed when necessary to protect workers from airborne hazards. At this time, it has been determined that respiratory protection requirements to support the activities at the Cimarron facility are no longer needed. If the 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.

15.0 ENVIRONMENTAL MONITORING

15.1 Section Overview

Environmental monitoring shall be performed at the controlled area boundary and at various locations outside of the restricted areas to ensure that the conditions of Cimarron's radioactive materials license and all applicable regulations are complied with. Cimarron shall monitor all potential environmental pathways through appropriate measurements. This program will be modified as decommissioning activities reduce the potential for exposure to the general public. The following sections describe the environmental monitoring program that is currently in place.

15.2 Surface Water Monitoring

Surface water samples are collected annually and are analyzed for Fluoride, NO_3 (as N), gross alpha, and gross beta. Additional analysis for isotopic uranium is performed if the gross alpha action level of 15 pCi/L or gross beta action level of 20 pCi/l is exceeded. Analysis for Tc-99 shall be performed if the gross beta to gross alpha ratio exceeds 3:1 and gross beta exceeds 30 pCi/L. Sampling locations and analyses are summarized in Table 15-1. Figure 15-1 shows the sampling locations. The RSO notification action level (see Section 15.4) for surface water is 50 percent of the effluent concentration limit found in Appendix B to 10 CFR 20.

15.3 Ground Water Well Monitoring

Ground water well samples are collected annually and are analyzed for the same constituents as given above for surface water. Additional analysis for isotopic uranium is performed if the gross alpha action level of 15 pCi/L or gross beta action level of 20 pCi/l is exceeded. Analysis for Tc-99 shall be performed if the gross beta to gross alpha ratio exceeds 3:1 and gross beta exceeds 30 pCi/L. Sampling locations and analyses are summarized in Table 15-1. Figure 15-1 shows the ground water sampling locations. The RSO notification action level for ground water is 50 percent of the effluent concentration limit found in Appendix B to 10 CFR 20.

15.4 Samples Exceeding Action Levels

Immediate notification shall be made to the RSO of any samples or doses exceeding action levels. In the event that sample analytical results exceed action levels, the RSO shall perform an investigation consisting of one or more of the following actions, as appropriate.

- Verification of laboratory data and calculations;
- Analyze and review probable causes;

- Evaluate the need for sample re-analysis or additional analysis;
- Evaluate the need for re-sampling;
- Evaluate the need for sampling of other environmental pathways;
- Evaluate the need for notifications to regulatory agencies;
- Evaluate the need to perform dose assessment.

Notifications and reports shall be made to the NRC in accordance with 10 CFR §20.2202 and §20.2203 when necessary based upon the above evaluation.

15.5 Laboratory and Environmental Monitoring Program Quality Control Requirements

Laboratory counting performed for purposes of environmental or effluent stream monitoring should comply with the requirements of U.S. NRC Regulatory Guide 4.15. Laboratory minimum detectable limits shall be less than or equal to 50 percent of the action levels for all environmental media.

15.6 Records

Records of environmental monitoring data shall be kept indefinitely after license termination until they are determined to be of no further use by management. The minimum time period for record retention shall be ten years after termination of the licenses.

15.7 Quality Control in Sampling

Steps should be taken to ensure that samples collected are representative of the material sampled. Sample integrity should be maintained from the time of collection to time of analysis. Cimarron shall utilize sample chain of custody documentation to track environmental samples sent to off-site laboratories for analysis.

Quality control records for laboratory counting systems shall include the results of measurements of radioactive check sources, calibration sources, backgrounds, and blanks.

15.8 Reference Standards

All standards used for calibration of laboratory equipment shall be NIST traceable when such standards are available.

15.9 Performance Checks of Radiation Measurement Systems

Scheduled checks should be performed on laboratory equipment to determine background counting rate and response to check sources. Corrective actions shall be taken whenever measurement values fall outside of predetermined control values. Background counting should normally be performed daily or before each use. Check source measurements are usually measured daily or with each batch of samples counted on automated equipment.

15.10 Calculations and Computations

Calculations and computations used in determining concentrations of radioactive materials shall be independently checked prior to implementation. The calculations shall be proceduralized and implemented in accordance with quality assurance requirements for procedure development.

15.11 Audits

Periodic audits shall be made of the laboratory and environmental monitoring program to verify implementation of the quality assurance program. Audit results shall be documented and follow-up actions taken when required.

TABLE 15-1
CIMARRON FACILITY ENVIRONMENTAL SAMPLING SCHEDULE

SURFACE WATER

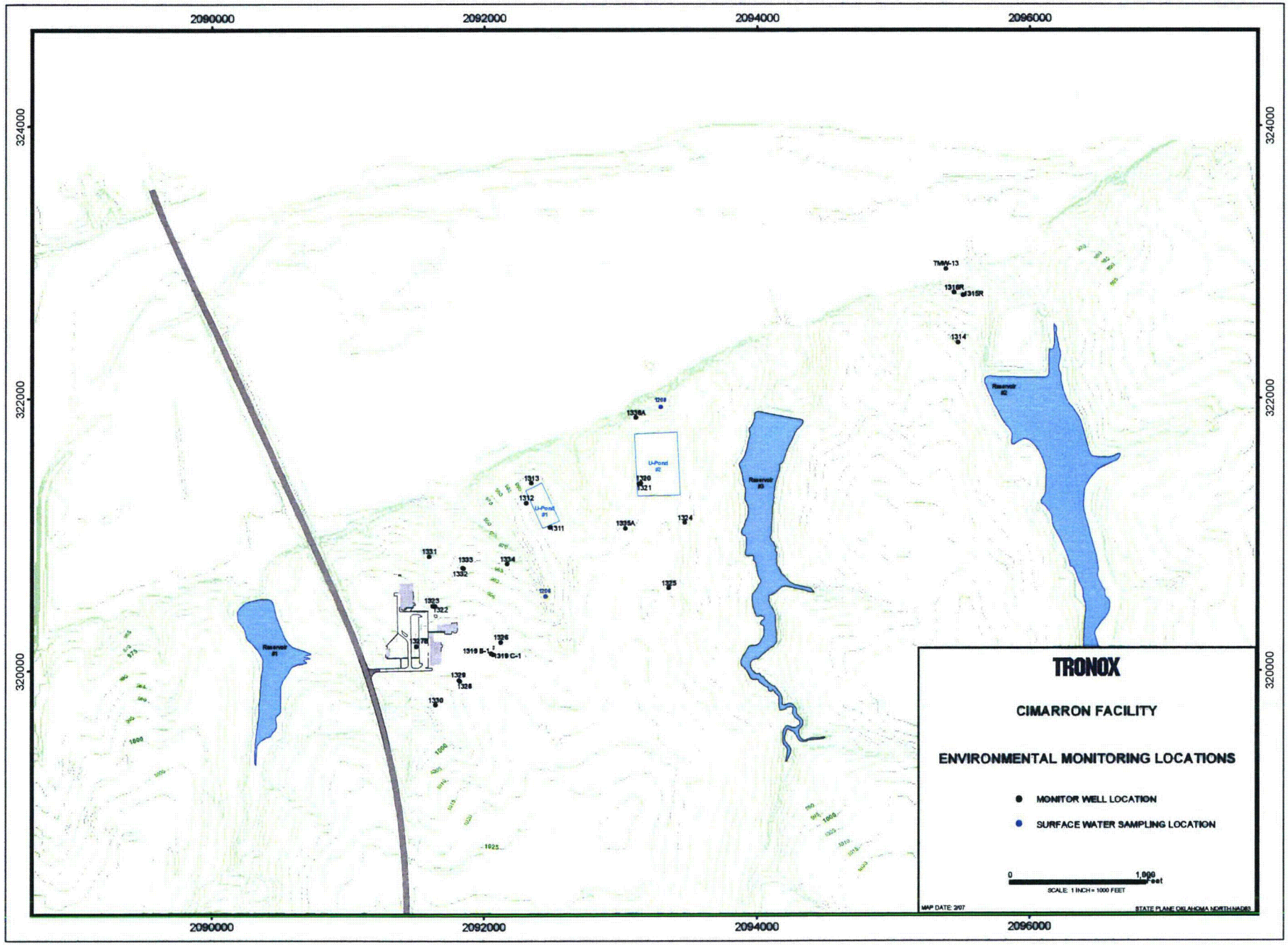
LOCATION	DESCRIPTION	FREQUENCY	ANALYSIS	ACTION LEVEL*
		Annually	Gross Alpha	15 pCi/l
			Gross Beta	20 pCi/l
			Fluorides	None
			Nitrates	None
1206	Stream West of Area M			
1208	Seep – North of U-Pond 2			

GROUNDWATER WELLS

LOCATION	DESCRIPTION	FREQUENCY	ANALYSIS	ACTION LEVEL*
1311	South of former U-Pond 1 (Area O)	Annually	Gross Alpha	15 pCi/l
1312	West of former U-Pond 1 (Area O)		Gross Beta	20 pCi/l
1313	North of former U-Pond 1 (Area O)		Fluorides	None
1314	South of former BG-1 (Area F)		Nitrates	None
1315R	North of former BG-1 (Area F)			
1316R	Northwest of former BG-1 (Area F)			
TMW-13	North of former BG-1 (Area F)			
1319B-1	East U-Yard (Area K)			
1319C-1	East U-Yard (Area K)			
1320	Southwest of former U-Pond 2 (Area O)			
1321	Southwest of former U-Pond 2 (Area O)			
1322	Northwest U-Yard (Area I)			
1323	Northwest U-Yard (Area I)			
1324	East of BG-4 (Area N)			
1325	South of BG-4 (Area N)			
1326	East U-Yard (Area N)			
1327B	West U-Yard (Area I)			
1328	South U-Yard (Area K) Deep Well			
1329	South U-Yard (Area K)			
1330	South of U-Yard (Area K)			
1331	Northeast of MOFF Yard (Area L)			
1332	West of former San Lagoons (Area H) Deep			
1333	West of former Sanitary Lagoons (Area H)			
1334	North of former Sanitary Lagoons (Area H)			
1335A	West of BG-4 (Area N)			
1336A	North of former U-Pond 2 (Area G)			

Tc-99 analysis must be run (wells only) if ß to a ratio exceeds 3:1 AND gross ß is >30pCi/L

* See (Samples Exceeding Action Levels) section of Radiation Protection Plan for specific requirements when action level is exceeded.


2090000
2092000
2094000
2096000
324000
322000
320000
TMW-13
1316R
1315R
1314
Reservoir #2
1316A
1320
1321
U-Pond #2
Reservoir #3
1313
1312
U-Pond #1
1311
1315A
1324
1331
1333
1334
1332
1325
1323
1322
1326
1319 B-1
1319 C-1
1329
1328
1330
Reservoir #1
TRONOX
CIMARRON FACILITY
ENVIRONMENTAL MONITORING LOCATIONS
MONITOR WELL LOCATION
SURFACE WATER SAMPLING LOCATION
0
1,000 Feet
SCALE: 1 INCH = 1000 FEET
MAP DATE: 2/07
STATE PLANE OKLAHOMA NORTH NAD83