



**UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
611 RYAN PLAZA DRIVE, SUITE 400
ARLINGTON, TEXAS 76011-8064**

September 18, 2002

Douglas M. Finch, Program Manager
Cimarron Corporation
Kerr-McGee Center
P.O. Box 25861
Oklahoma City, Oklahoma 73125

SUBJECT: NRC INSPECTION REPORT 70-925/02-01

Dear Mr. Finch:

An NRC inspection was conducted on June 24 through 27, 2002, at your Cimarron site near Crescent, Oklahoma, of activities authorized by NRC Special Nuclear Materials License SNM-928. The lead inspector conducted a telephonic exit briefing with you at the conclusion of the inspection on September 10, 2002, following our receipt of confirmatory sample results from the NRC's contractor laboratory. The enclosed report presents the scope and results of that inspection.

This inspection was an examination of activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your license. Within these areas, the inspection consisted of a review of your organization and management, radiation protection, solid radioactive waste management, transportation of radioactive materials, environmental protection, and corrective actions on a previously identified violation. In addition, groundwater and surface water samples were collected for analysis, and independent confirmatory surveys in Sub-Areas N were conducted by the inspectors.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response, if you provide one, will be made available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Should you have any questions concerning this inspection, please contact D. Blair Spitzberg, Ph.D. at (817) 860-8191 or Emilio M. Garcia at (530) 756-3910.

Sincerely,

/RA/

Dwight D. Chamberlain, Director
Division of Nuclear Materials Safety

Docket No.: 70-925
License No.: SNM-928
Enclosure:

Cimarron Corporation

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NRC Inspection Report
070-925/02-01

cc w/enclosures:
Kerr-McGee Corporation
Kerr-McGee Center
P.O. Box 25861
Oklahoma City, Oklahoma 73125

Karen Morgan, RSO
Cimarron Corporation
P. O. Box 315
Crescent, Oklahoma 73028

Mr. Earl Hatley
Oklahoma Toxics Campaign
3000 United Founders Blvd. #125
Oklahoma City, Oklahoma 73112

P. L. Bishop, Senior Environmental Specialist
Radiation Management Section
Waste Management Division
Department of Environmental Quality
State of Oklahoma
707 North Robinson Avenue
Oklahoma City, Oklahoma 73102-6087

Mike Broderick
Radiation Management Section
Waste Management Division
Department of Environmental Quality
State of Oklahoma
707 North Robinson Avenue
Oklahoma City, Oklahoma 73102-6087

bcc w/enclosure (via ADAMS distrib):

EW Merscoff

DD Chamberlain

JE Whitten

DB Spitzberg

EM Garcia

RR Muñoz

MIS System

Materials Docket File (5th Floor)

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EMGarcia via e-mail	RRMuñoz	DBSpitzberg	DDChamberlain
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ENCLOSURE 2

U. S. NUCLEAR REGULATORY COMMISSION

REGION IV

Docket No.: 70-925

License No.: SNM-928

Report No.: 70-925/02-01

Licensee: Cimarron Corporation
Kerr-McGee Center
Oklahoma City, Oklahoma 73125

Facility: Cimarron Site

Location: Crescent, Oklahoma

Dates: June 24 - September 10, 2002

Inspectors: Emilio M. Garcia, Health Physicist
Rick R. Muñoz, Health Physicist

Accompanied By: Kenneth M. Kalman, Project Manager, DWM NMSS
Jon M. Peckenpaugh, Groundwater Hydrologist, DWM NMSS
Gary W. Purdy, Health Physicist, DWM NMSS

Approved By: D. Blair Spitzberg, Ph.D., Chief
Fuel Cycle & Decommissioning Branch

Attachment: Supplemental Information

EXECUTIVE SUMMARY

Cimarron Corporation NRC Inspection Report 70-925/02-01

The Cimarron Corporation has been conducting site remediation activities in preparation for the termination of Special Nuclear Materials License SNM-928. Decommissioning inspections and radiological surveys had been conducted by the NRC at the Cimarron Site as part of the overall confirmatory survey process. This inspection was a continuation of that process. This inspection included reviewing organization and management, radiation protection, solid radioactive waste management, transportation of radioactive materials, and environmental protection. It also involved performing exposure-rate and direct alpha and beta contamination measurements and collecting soil samples from Sub-Area N, and water samples from groundwater wells and from two seeps.

Management Organization and Controls

- The licensee's organization was consistent with the license requirements.
- The licensee had conducted periodic audits of its licensed programs.

Radiation Protection

- Radiation survey instruments were operable and within their calibration interval.
- No occupational exposure was received in 2001 or the first quarter of 2002. Radioactive sources were stored in a locked and properly labeled cabinet.
- The ALARA Committee had met quarterly in 2001, and the first quarter of 2002 with one additional Special ALARA Committee meeting on June 26, 2002.

Radioactive Waste Management, Waste Generator Requirements, and Transportation Activities

- The onsite waste disposal cell was properly posted.
- There had been no offsite, nor onsite disposal of decommissioning wastes, nor shipments of radioactive waste since the last inspection.

Environmental Protection

- The licensee had procedures and practices in place to implement the environmental protection program at the site.
- The Radiation Protection Plan needed to be updated to reflect the change from monitoring Well 1317 to TMW-13.
- The licensee planned on revising and resubmitting their work plan for defining and evaluating the groundwater plume associated with Burial Area 1.

- All environmental samples were taken as required by the license.

Closeout Inspection and Survey

- The results of confirmatory measurements made in Sub-Area N of the Cimarron Site by the inspectors were all below the applicable NRC release criteria. These confirmatory measurements were consistent with the licensee's determination that Sub-Area N of the Cimarron Site meets the criteria established in NRC License SNM-928, License Condition 27 for unrestricted use.
- The groundwater analytical result from well TMW-13 exceeded the applicable release criteria of 180 pCi/l for total uranium. This sample was collected from a well located on a known groundwater plume.
- All measurement results for Tc-99 were below the release criteria as determined by NRC. However, for two samples the analytical results between the NRC contract laboratory and the licensee's contract laboratory were statistically not in agreement. This lack of agreement in analysis results was also observed during the previous inspection and will continue to be tracked as an Inspection Follow-up Item.

Follow-up

- The inspectors confirmed that corrective actions for a violation previously identified related to a change in the Radiation Protection Plan without prior ALARA Committee approval had been completed and this followup item is considered closed.
- The inspectors and licensee discussed a followup item related to lack agreement between the licensee's and NRC's contract laboratories on the analysis of technetium-99. However this item remains open.

Report Details

1. Management Organization and Controls (88005, 88104)

1.1 Inspection Scope

The inspectors interviewed cognizant licensee staff regarding the licensee organization, management, and audits. The inspectors reviewed a number of documents related to these activities.

1.2 Observations and Findings

a. Organization

By letter dated December 20, 2001, Kerr-McGee notified NRC of a reorganization of their Safety and Environmental Affairs Division. This reorganization resulted in changes in personnel and positions. The Cimarron Corporation is a subsidiary of the Kerr-McGee Corporation. The senior person directly responsible for the site is titled Vice President Cimarron Corporation. The Program Manager reports to this position and the Manager, Planning and Regulatory Compliance reports to the Program Manager. Three individuals report directly to the Manager, Planning and Regulatory Compliance. These are the Quality Assurance Coordinator; the Decontamination Supervisor; and the Cimarron Radiation Safety Officer. Contractors from Kelly Services report to the quality assurance coordinator. Contractors from NEXTEP Environmental and Chase Environmental provide support to the decontamination supervisor and the health physics and safety coordinator.

The individual working as the radiation safety officer was as noted in the license.

b. Audits

The inspectors selected for review the records of semi-annual corporate audits for calendar year 2000 and the first half of 2001. Semi-annual corporate audits cover the Kerr-McGee Cimarron and Technical Center sites.

The audit for the first half of calendar year 2000 was conducted on May 17 and 18, 2000. The audit was conducted by an auditor from the corporate organization and a contractor from NEXTEP Environmental. The response to the audit findings was submitted on January 15, 2001. The audit identified internal program requirements that were not being performed. The licensee revised their radiation protection plan; many of the radiation protection procedures; and the site health and safety plan to reflect the change in site conditions and decrease in risks that resulted from the removal of most of the radioactive materials onsite. In addition, the 2000 audit covered the review of activities performed by Cimarron to support decommissioning efforts at the KMCLLC (Kerr-McGee Cimarron Limited Liability Corporation) and Technical Center auditing a number of areas slated for decommissioning.

The audit for the first half of calendar year 2001, was conducted on June 4-5, 2001. The audit was conducted by two auditors from the corporate organization and a contractor from NEXTEP Environmental. The issues identified in the audit were addressed in the site manager's response to the audit dated July 11, 2001.

At this site, the radiation safety committee is called the ALARA Committee. The ALARA Committee has license authorization to evaluate and approve changes to the Decommissioning Plan or Radiation Protection Plan in accordance with License Condition 27(e). Section 2 below discusses the ALARA Committee.

1.3 Conclusions

The licensee's organization was consistent with the license requirements. The licensee had conducted periodic audits.

2 Radiation Protection (83822, 88104)

2.1 Inspection Scope

The inspectors interviewed cognizant individuals regarding the implementation of their health physics program, reviewed applicable records, and observed the storage of radioactive materials.

2.2 Observations and Findings

The licensee had submitted their revised radiation protection plan to the NRC for review and approval. The NRC accepted the revised plan on April 17, 2000.

a. Survey Instruments

The inspectors selected two portable radiation survey instruments used by the licensee to determine if they were operable and within their calibration frequency. The instruments were operable, had charged batteries, responded to radiation and were within the calibration interval. The licensee has their instruments on a 6-month calibration interval.

b. Personnel Monitoring

The inspectors reviewed the exposure reports for 2001 through April 2002 submitted by the external dosimetry supplier; selected licensee reports; and internal memorandums related to external dosimetry.

The external dosimetry supplier was accredited by the National Voluntary Laboratory Accreditation Program (NVLAP). The licensee used thermo luminescence dosimeters (TLD) as the primary means of determining the dose of record. No occupational dose was reported as having been received for any of the quarters reviewed. A review of NRC Forms 4 and 5 for all monitored individuals indicated the forms were completed accurately. These forms were

reviewed through March 4, 2002. A total of 24 visitor badges were reviewed for the period covered. Administrative limits were set at 100 millirem for individuals and 200 mRem for collective dose. Doses for the year were 0 millirem for individual and collective dose. The licensee's ALARA goals were met.

c. Radiation Work Permits

The licensee issues Radiation Work Permits (RWP) for work where the potential for significant exposure to radioactive materials exists and for which no standard operating procedure (SOP) exists. RWPs used by the licensee contain the details of the job to be performed; any precautions necessary to reduce exposure; and radiological monitoring and sampling necessary before, during, and following completion of the job. The RSO indicates, by signature, the review of each RWP prior to the initiation of the work. The work appears to be carried out in adherence to the conditions of the RWPs. A total of three RWPs have been issued since September 6, 2002. Two RWPs were general work permits for the characterization of buildings and sampling of soils. The other RWP was issued for the test pit excavation/FSS/backfill operations. Each work permit included a signed and dated sheet by all parties involved and initialed by the Health Physics (HP) Technician. The RWP program and RWPs issued appeared adequate.

d. Radiation Protection Program

The inspectors reviewed selected records of the April 23, 2001, revised radiation protection plan. The ALARA committee maintains procedure control over its Radiation Protection Plan (RPP) and SOPs by holding meetings to discuss changes to the SOP through License Condition 27(e) authorization. KM-CI RP-38 and RP-39 were modified on Revision 4. RP-38 revised radiological surveys, routine wipes and follow-up surveys and RP-39 addressed analysis procedures. No apparent problems were noted. The records appeared to be maintained in accordance with the requirements of 10 CFR 20.2102.

e. Security

The licensee maintained all radioactive sources in a secured cabinet. The cabinet was observed to be locked and the appropriate posting was in place. The last quarterly inventory was performed by the RSO on February 12, 2002, with all sources accounted for.

f. ALARA Committee

The minutes of the quarterly ALARA committee were reviewed for calendar year 2001 and the first quarter of 2002. Records indicate, and the RSO confirmed, that all subsequent ALARA committee meetings have occurred each calendar quarter. A special ALARA Committee meeting was held on June 26, 2002, specifically to discuss the NRC Notice of Violation dated November 26, 2001, Cimarron's response to the NRC Notice of Violation dated December 19, 2001, and any additional actions that the ALARA Committee deemed warranted.

to assure that full compliance with license conditions are achieved at all times. The minutes of this ALARA Committee meeting appeared to adequately address measures to prevent recurrence.

g. Wipe Surveys

Surveys (wipes) are conducted weekly at 15 locations for alpha contamination. Building U, which has been released by NRC, is wiped at the driveway where trucks enter and exit the facility building. The men's and women's change rooms, offices, count and instrument rooms, soil count room, guard station and laundry room are included in the 15 wipe locations.

2.3 Conclusions

Radiation survey instruments were operable and within their calibration interval. No occupational exposure was received in 2001 or the first quarter of 2002. Radioactive sources were stored in a locked and properly labeled cabinet. The ALARA Committee had met quarterly in 2001 and the first quarter of 2002, with one additional Special ALARA Committee meeting on June 26, 2002.

3 Transportation Activities (86740)
Radioactive Waste Management and Waste Generator Requirements (84850)

3.1 Inspection Scope

The inspectors interviewed the cognizant licensee representatives; toured the site; and reviewed applicable records related to radioactive waste management to determine if the licensee had established and maintained an effective program, and to determine whether transportation of licensed materials was in compliance with the applicable NRC and US Department of Transportation regulations.

3.2 Observations and Findings

There were no temporary storage/staging areas for radioactive wastes from building demolition, equipment dismantlement, or soil excavation. The onsite waste disposal cell was properly posted. The licensee had placed cairns on each corner of the disposal cell that indicate the cell's location. The onsite disposal cell was adequately protected by fencing around the entire site, onsite security, and a 4-foot cap of clean soil.

There has been no offsite nor onsite disposal of decommissioning wastes since the last inspection.

There were no radioactive waste shipments made since the last inspection. The last shipment of radioactive waste was on October of 2000 involving one shipment of radioactive waste to an offsite facility.

3.3 Conclusions

The onsite waste disposal cell was properly posted. There had been no offsite nor onsite disposal of decommissioning wastes, nor shipments of radioactive waste since the last inspection.

4 **Environmental Protection (88045, 88104)**

4.1 Inspection Scope

The environmental protection program was reviewed to assess the effectiveness of the licensee's programs and to evaluate the impact, if any, of site activities on the local environment.

4.2 Observations and Findings

a. Environmental Monitoring

Section 15 of the Cimarron Radiation Protection Plan requires the licensee to implement an environmental monitoring program. The licensee's environmental monitoring program includes monitoring surface water and groundwater well sites. The licensee's program no longer requires the licensee to submit an annual environmental report to the NRC; however, the analytical data is retained on site.

b. Surface Water Monitoring

Surface water samples were collected annually at seven locations and were analyzed for gross alpha, and beta concentrations. Additional analysis for isotopic uranium was performed if the gross alpha action level of 15 picocuries per liter (pCi/l) or gross beta action level of 20 pCi/l was exceeded. The inspectors reviewed analytical results for 2001 for gross alpha and beta. Additional analysis for isotopic uranium was performed when necessary. All results for total uranium analysis were below the applicable effluent concentration limit specified in 10 CFR Part 20, Appendix B, Table 2.

c. Groundwater Monitoring

Water samples were collected annually from 24 monitoring wells and analyzed for the same constituents as surface water. The inspectors reviewed the 2001 analytical groundwater data used to compile the annual environmental report. Temporary monitoring Well 13 (TMW-13) had the highest sample measured 1722.1 pCi/l total uranium.

On June 19, 2000, monitoring Well 1317 was replaced by TMW-13 because monitoring Well 1317 was not producing adequate water. TMW-13 was installed to provide more representative water volumes and samples than monitoring Well 1317 had in the past. The licensee indicated their plans to update the Radiation Protection Plan and associated procedures to reflect this change.

The licensee continued to monitor the contaminated groundwater within and adjacent to Burial Area 1. Monitoring wells in this area have reported total uranium concentrations in the groundwater greater than the 180 pCi/l total uranium release criteria specified in the license for groundwater. The licensee is continuing to monitor these wells on a quarterly basis as required. The licensee's investigation consists of monitoring the groundwater quality, hydrology and soil activity in the area of Burial Area 1. On April 17, 2002, the licensee submitted a work plan to delineate and evaluate the groundwater plume within and adjacent to Burial Area 1. During this inspection, the NRC Project Manager and NRC Hydrologist discussed the work plan with cognizant licensee representatives. The licensee's management stated their intent to revise the work plan and resubmit it to the NRC.

4.3 Conclusions

The licensee had procedures and practices in place to implement the environmental protection program at the site. The Radiation Protection Plan needed to be updated to reflect the change from monitoring Well 1317 to TMW-13. The licensee planned on revising and resubmitting their work plan for defining and evaluating the groundwater plume associated with Burial Area 1. All environmental samples were taken as required by the license.

5 **Closeout Inspection and Survey (83890)**

5.1 Inspection Scope

The site status and decommissioning activities were reviewed to determine if activities were being conducted in accordance with the license, regulatory requirements, and the Cimarron decommissioning plan. The Cimarron decommissioning plan committed to the recommendations in NUREG/CR-5849, "Manual for Conducting Radiological Surveys in Support of License Termination." Confirmatory measurements were conducted during this inspection and included exposure-rate measurements, direct measurements of total alpha and beta contamination, soil sample locations in Sub-Area N and the disposal cell.

NRC License SNM-928 issued to Cimarron Corporation lists the release criteria in License Condition 27. The applicable values are:

a. Groundwater

6.7 Bq/l (180 pCi/l) total uranium

The attachment to a letter from the NRC Project Manager to the licensee's Jess Larsen dated March 13, 1997, states that the technetium-99 concentration in groundwater should not exceed the US Environmental Protection Agency's Interim Primary Drinking Water Regulations (40 CFR 141.16). This regulation requires that the average annual concentration in drinking water shall not produce an annual dose equivalent to the total body or any internal organ greater than 4 mrem/yr. The NRC derived concentration limit for Tc-99 is 3,790 pCi/l.

b. Surface of buildings and equipment

5,000 dpm alpha/100 cm², average over 1 m²
5,000 dpm beta-gamma/100 cm², average over 1 m²
15,000 dpm alpha/100 cm², maximum over 1 m²
15,000 dpm beta-gamma/100 cm², maximum over 1 m²

c. Soils

Enriched uranium	1.1 Bq/g (30 pCi/g) total uranium
Natural Thorium	0.37 Bq/g (10 pCi/g) total uranium

d. Exposure Rates

Surface of buildings and equipment
5 microRoentgen/hour (μR/hr) above background at 1 meter (3.3 feet)

Soils

10 μR/hr average above background at 1 meter (3.3 feet).
20 μR/hr maximum above background at 1 meter (3.3 feet).

e. Instruments

The inspectors used a Ludlum Model 19, Micro-R Meter, NaI(Tl) Gamma Scintillator, Serial Number 32888, to measure exposure rates at the locations where soil samples were collected. This instrument was last calibrated on November 30, 2001, and is due for recalibration on November 30, 2002.

The inspectors also used an Eberline Model 660E, Serial Number 790, NRC Number 063473, with a dual phosphor scintillator detector. This instrument was calibrated with this detector on December 8, 2001, and is due for recalibration on December 8, 2002. The detector used was an Eberline SHP 380 AB, Serial Number 00907, NRC Number 072358.

f. Results Comparisons

The criteria in NRC Inspection Procedure 84525, "Quality Assurance and Confirmatory Measurements," was used for comparison of licensee and NRC results. The table that follows lists the criteria.

TABLE 1
Acceptance Criteria¹

Resolution ²	Ratio ³
<4	0.4 - 2.5
4 - 7	0.5 - 2.0
8 - 15	0.6 - 1.66
16 - 50	0.75 - 1.33
51 - 200	0.80 - 1.25
>200	0.85 - 1.18

¹ Criteria from Inspection Procedure 84525, Quality Assurance and Confirmatory Measurements for In-Plant Radiochemical Analysis

² Resolution is the NRC result divided by its associated 1 σ uncertainty.

³ Ratio is the licensee result divided by NRC result.

5.2 Observation and Findings

a. Background Measurements

To determine applicable background values for the surface of buildings and equipment, the inspectors obtained alpha and beta contact measurements from the Crescent Electric Substation. This Substation is located 5 miles from the licensed Cimarron site. Selected locations on the concrete pads, supports, berms, electrical boxes, angle iron and metal supports within the Substation were surveyed. Table 2 summarizes the background measurements.

Table 2
Kerr-McGee Cimarron Site
Concrete and Metal Backgrounds

Media	Concrete		Metal	
No. of Samples	4		4	
Measurement	Alpha dpm/100cm ²	Beta dpm/100cm ²	Alpha dpm/100cm ²	Beta dpm/100cm ²
Average	68.3	739.5	14.7	392.2
Median	67.7	725.6	13.5	389.0
Lowest	52.6	709.3	11.2	376.3
Highest	85.1	797.7	20.5	414.4
Standard Deviation	13.7	36.1	3.5	15.4

b. Sub-Area N

On June 25-27, 2002, the inspectors conducted confirmatory surveys of Sub-Area N of the Cimarron Site. The inspectors selected 40 sample locations. The inspectors used the same grid system that had been established by the licensee for site remediation. The sample points were located using the licensee's global positioning system. The inspectors measured the exposure rate at 1 meter above the surface of each soil sampling location, and specified where the licensee staff was to collect the soil samples.

The 39 soil and 1 sediment samples collected were split between the licensee and the NRC. The NRC splits were sent to the NRC's contractor laboratory operated by Environmental Survey and Site Assessment Program (ESSAP) of the Oak Ridge Institute for Science Education. The samples were analyzed for uranium and thorium. The NRC splits were analyzed by the ORISE laboratory using a traditional peak identification gamma spectroscopy program. The licensee's contractor NEXTEP analyzed the samples at their Kerr-McGee Technical Center laboratory using their least-square resolution method. Table 3A summarizes the exposure rates and gamma spectroscopy analysis sample results. Samples where the total uranium as determined by gamma spectroscopy exceeded 10 picocuries per gram were selected for further analysis by alpha spectroscopy. Table 3B provides the results of these analysis.

As noted on Table 3A all sample results and the average value were below the release criteria. The criteria in NRC Inspection Procedure 84525, "Quality Assurance and Confirmatory Measurements," was used for comparison of licensee and NRC results. All but two of the results were in agreement between the laboratories. With respect to the one uranium and one thorium result that were not in agreement, the respective values were well below the acceptance criteria. Therefore, in these cases the lack of analysis agreement between the laboratories is not considered significant. Alpha spectroscopy results confirmed that the release criteria was not exceeded.

TABLE 3A
Kerr-McGee Cimarron Site
Sub-Area N Soil Samples Exposure Rates and Gamma Analysis
Samples Collected on June 25-27, 2002

Licensee Sample No.	Location ^a	Depth	Exposure Rate at 1 m (μ R/hr) ^b	Total Uranium (pCi/g)			Total Thorium (pCi/g)		
			8 Bckgnd	NRC (ESSAP) Results	K-M Results	Agreement	NRC (ESSAP) Results	K-M Results	Agreement
NA-4283	125N 240E	0-6"	9	12.1 \pm 2.3	10.08	Yes	1.73 \pm 0.19	1.69	Yes
NA-4284	105N 310E	0-1'	8	14.9 \pm 2.9	9.12	Yes	1.67 \pm 0.22	1.69	Yes
NA-4285	105N 235E	2'-3'	8	1.23 \pm 0.53	1.51	Yes	0.87 \pm 0.10	0.83	Yes
NA-4286	090N 341E	2'-3'	9	3.16 \pm 0.89	2.90	Yes	1.70 \pm 0.17	1.62	Yes
NA-4287	235N 365E	2'-3'	8	1.91 \pm 0.76	2.78	Yes	1.65 \pm 0.16	1.27	Yes
NA-4288	235N 365E	3'-4'	8	1.95 \pm 0.84	2.20	Yes	1.99 \pm 0.19	2.05	Yes
NA-4289	185N 130E	0-1'	8	14.5 \pm 2.5	13.70	Yes	1.52 \pm 0.17	1.45	Yes
NA-4290	155N 200E	0-6"	9	8.7 \pm 1.5	7.39	Yes	0.83 \pm 0.10	0.80	Yes
NA-4291	155N 200E	1'-2'	9	2.48 \pm 0.67	3.73	Yes	0.77 \pm 0.11	0.61	Yes
NA-4292	120N 240E	0-6"	8	2.17 \pm 0.80	4.43	Yes	1.58 \pm 0.17	1.47	Yes
NA-4293	110N 260E	0-6"	8	7.2 \pm 1.8	6.84	Yes	1.76 \pm 0.16	1.50	Yes
NA-4294	110N 260E	1'-2'	8	6.7 \pm 2.7	6.49	Yes	1.60 \pm 0.18	1.42	Yes
NA-4295	157N 344E	0-1'	8	1.95 \pm 0.88	2.45	Yes	1.61 \pm 0.17	1.32	Yes
NA-4296	300N 350E	0-6"	10	3.49 \pm 0.80	3.58	Yes	2.39 \pm 0.22	1.97	Yes
NA-4297	350N 360E	0-6"	11	23.2 \pm 3.1	13.60	Yes	1.98 \pm 0.23	1.88	Yes
NA-4298	350N 360E	1'-2'	11	2.8 \pm 1.0	3.86	Yes	2.35 \pm 0.21	1.66	No
NA-4299	101N 283E	2'-3'	9	1.36 \pm 0.79	1.95	Yes	0.66 \pm 0.10	0.52	Yes
NA-4300	145N 360E	2'-3'	8	1.64 \pm 0.68	2.92	Yes	1.65 \pm 0.15	1.38	Yes
NA-4301	145N 360E	3'-4'	8	2.3 \pm 1.1	2.56	Yes	1.72 \pm 0.22	1.33	Yes
NA-4302	140N 210E	0-6"	10	16.2 \pm 2.7	17.20	Yes	1.77 \pm 0.17	1.53	Yes
NA-4303	140N 210E	2'-3'	10	1.10 \pm 0.65	2.52	Yes	0.99 \pm 0.11	0.98	Yes
NA-4304	430N 412E	0'-1'	9	1.80 \pm 0.46	2.85	Yes	0.70 \pm 0.08	0.72	Yes
NA-4305	427N 411E	0'-1'	8	0.82 \pm 0.49	1.61	Yes	0.67 \pm 0.11	0.68	Yes
NA-4306	410N 420E	2'-3'	9	2.12 \pm 0.60	3.06	Yes	2.13 \pm 0.18	1.68	Yes
NA-4307	405N 490E	1'-2'	9	2.31 \pm 0.66	2.45	Yes	1.92 \pm 0.17	1.80	Yes
NA-4308	405N 490E	2'-3'	9	2.6 \pm 1.0	4.10	Yes	2.06 \pm 0.20	1.97	Yes

NA-4309	350N 495E	1'-2'	10	1.94 ± 0.85	2.28	Yes	2.04 ± 0.20	1.92	Yes
NA-4310	270N 540E	1'-2'	10	2.91 ± 0.90	2.41	Yes	1.73 ± 0.18	1.47	Yes
NA-4311	330N 595E	1'-2'	9	1.75 ± 0.67	2.26	Yes	1.30 ± 0.15	1.38	Yes
NA-4312	330N 595E	2'-3'	9	0.95 ± 0.56	1.94	Yes	1.31 ± 0.13	1.05	Yes
NA-4313	410N 610E	1'-2'	10	1.08 ± 0.74	1.67	Yes	2.05 ± 0.21	1.75	Yes
NA-4314	410N 610E	2'-3'	10	1.71 ± 0.86	2.00	Yes	1.72 ± 0.17	1.57	Yes
NA-4315	115N 215E	0"-1'	8	10.4 ± 1.8	12.80	Yes	2.25 ± 0.19	1.84	Yes
NA-4316	300N 345E	0-1'	8	2.71 ± 0.94	4.15	Yes	1.80 ± 0.22	1.62	Yes
NA-4317	134N 338E	0-1'	8	2.77 ± 0.63	3.70	Yes	1.78 ± 0.15	1.78	Yes
NA-4318	134N 338E	1'-2'	8	8.7 ± 2.5	6.09	Yes	1.80 ± 0.19	1.52	Yes
NA-4319	110N 236E	0-1'	9	12.1 ± 2.3	10.96	Yes	1.45 ± 0.18	1.35	Yes
NA-4320	105N 207E	0-1'	7	1.05 ± 0.76	3.65	No	1.79 ± 0.20	1.52	Yes
NA-4321	^d	^d	^d	2.43 ± 0.82	3.36	Yes	1.05 ± 0.14	0.99	Yes
NA-4322	^e	^e	^e	9.1 ± 2.0	7.49	Yes	2.23 ± 0.19	1.92	Yes
Average			8.8	5.01	5.02		1.61	1.44	
Median			9	2.46	3.47		1.72	1.51	
Lowest			7	0.82	1.51		0.66	0.52	
Highest			11	23.2	17.2		2.39	2.05	
Standard Deviation			0.94	5.22	3.90		0.47	0.40	
NRC release criteria ^c			10	30			10		

^a These are the designated locations on the licensee's global positioning system grid.

^b Background was not subtracted from these values.

^c The NRC release criteria values noted are above background. Background was not subtracted from the analysis results.

^d NA-4321 was a sediment sample collected below seep 1206, thus no location or depth was appropriate and no exposure rate was noted.

^e NA-4322 was a sample collected from a pile of soil removed from another location, thus no location nor depth was appropriate and no exposure rate was noted.

TABLE 3B
Kerr-McGee Cimarron Site
Sub-Area N Uranium Isotopes in Soil Samples
by Alpha Spectroscopy
Samples Collected on June 25-27, 2002

Licensee Sample No.	Location	Depth	Radionuclide Concentration (pCi/g)			
			U-234	U-235	U-238	Total U
NA-4283	125N 240E	0-6"	8.4 ± 1.1	0.41 ± 0.09	2.24 ± 0.31	11.1 ± 1.1
NA-4284	105N 310E	0-1'	6.92 ± 0.87	0.28 ± 0.07	2.40 ± 0.32	9.60 ± 0.93
NA-4289	185N 130E	0-1'	10.3 ± 1.3	0.49 ± 0.10	2.82 ± 0.38	13.6 ± 1.4
NA-4297	350N 360E	0-6"	19.5 ± 2.4	0.86 ± 0.14	5.85 ± 0.74	26.2 ± 2.5
NA-4302	140N 210E	0-6"	13.8 ± 1.7	0.69 ± 0.12	5.54 ± 0.71	20.0 ± 1.9
NA-4315	115N 215E	0"-1'	10.2 ± 1.3	0.48 ± 0.10	2.23 ± 0.31	12.9 ± 1.3
NA-4319	110N 236E	0-1'	9.6 ± 1.2	0.41 ± 0.09	2.56 ± 0.35	12.6 ± 1.3
NA-4322	^a	^a	5.43 ± 0.69	0.27 ± 0.06	2.13 ± 0.29	7.83 ± 0.75
NRC release criteria^b						30

^a NA-4322 was a sample collected from a pile of soil removed from another location, thus no location or depth was appropriate.

^b The NRC release criteria values noted are above background. Background was not subtracted from the analysis results.

c. Cimarron Electric Substation

The inspectors selected locations on the concrete pads, supports, berms, electrical boxes, angle iron and metal supports within the Substation to take alpha and beta contact measurements. Although some survey points were higher than background for both alpha (15 cpm) and beta (190 cpm), none of the measurements taken by the inspectors exceeded the criteria in License Condition 27. Tables 4A and 4B summarize the results.

Table 4A
Kerr-McGee Cimarron Site
Summary of the Alpha Survey of the Surface of the Electrical Substation
June 26, 2002

Media	# of Measurements	Average dpm/100 cm ²	Median dpm/100 cm ²	Lowest dpm/100 cm ²	Highest dpm/100 cm ²	Standard Deviation
Concrete	5	-4.5	-29.6	-38.7	72.4	41.4
Metals	10	87.0	63.8	-14.7	242.5	85.7
NRC Release Criteria		5,000			15,000	

Table 4B
Kerr-McGee Cimarron Site
Summary of the Beta Survey of the Surface of the Electrical Substation
June 26, 2002

Media	# of Measurements	Average dpm/100 cm ²	Medium dpm/100 cm ²	Lowest dpm/100 cm ²	Highest dpm/100 cm ²	Standard Deviation
Concrete	5	214.8	230.6	-90.0	455.6	175.3
Metals	10	366.5	179.3	82.8	1003.2	378.2
NRC Release Criteria		5,000			15,000	

d. Ground Water Samples

On June 25-26, 2002, NRC staff observed the collection of 16 groundwater samples from wells and two seeps. The samples were split between the licensee and NRC. The NRC hydrologist preserved the NRC splits by acidification on collection. The NRC samples were sent to ESSAP. The NRC splits were analyzed for gross alpha and gross beta, by alpha spectroscopy for uranium, and by chemical separation and radiological analysis for technetium-99. The licensee used their local laboratory to conduct the gross alpha and gross beta analysis. Splits were sent to two licensee contract laboratories for alpha spectroscopy and technetium-99 analysis. There is no NRC groundwater release criteria for gross alpha or gross beta.

Table 5 summarizes the ESSAP and licensee's gross alpha and gross beta sample results. Table 6 summarizes the uranium alpha spectrum analysis results. With one exception (TMW-13), all analytical results for total uranium, were below the applicable release criteria of 180 pCi/l. Well TMW-13 was located within a known plume within and adjacent to Burial Area 1. This plume is believed to be the result of radiological material that had been previously buried hydrologically up gradient from this well. The licensee was developing characterization and remediation plans to address the plume.

Table 7 summarizes the technetium 99 analytical results. All measurement results for Tc-99 were below the release criteria as determined by NRC. When the analytical results between the NRC contractor laboratory and the licensee contract laboratory are compared using the criteria in NRC Inspection Procedure 84525, "Quality Assurance and Confirmatory Measurements," 6 of the 12 analyses were not in agreement. For four of these analyses both laboratories provided results that were near their minimum detectable concentration (MDC) and the lack of agreement is not considered significant. However, the NRC contract laboratory had statistically significant results for the samples from Seep 1206 and well TMW-13, while the Kerr-McGee contract laboratory had values near their MDC. This lack of agreement in analysis results was also observed during the previous inspection and will continue to be tracked as an Inspection Follow-up Item.

TABLE 5
Kerr-McGee Cimarron Site
Groundwater Samples Gross Alpha and Gross Beta Analysis Results
Samples Collected on June 26-27, 2002

Sample ID	ALPHA ACTIVITY pCi/L			BETA ACTIVITY pCi/L			Beta/Alpha Ratio	
	NRC (ESSAP) Results	K-M Results	Agree	NRC (ESSAP) Results	K-M Results	Agree	NRC	K-M
1432 Seep 1206	159 ± 15	102.0	N	75.8 ± 8.3	36.9	N	0.48	0.36
1429 Seep 1208	232 ± 28	13.7	N	2320 ± 240	717	N	10.04	52.34
1411 Well 1312	101 ± 12	24.3	N	575 ± 53	216	N	5.69	8.89
1414 Well 1313	24.1 ± 3.7	14.7	Y	151 ± 15	66	N	6.27	4.49
1417 Well 1320	3.9 ± 2.3	6.8	Y	5.5 ± 2.6	7.33	Y	1.41	1.07
1399 Well 1321	14.5 ± 8.0	18.8	Y	14.8 ± 7.6	10	Y	1.02	0.53
1426 Well 1324	50 ± 13	82.1	Y	43.5 ± 8.9	59.8	Y	0.87	0.73
1423 Well 1325	0.7 ± 1.7	1.15	Y	2.2 ± 2.4	2.30	Y	3.14	2.00
1444 Well 1326	56 ± 12	101	N	75 ± 12	102	Y	1.36	1.01
1441 Well 1331	85.8 ± 6.7	127.0	N	26.3 ± 2.8	19.8	Y	0.31	0.16
1402 Well 1332	27 ± 16	21.4	Y	12 ± 10	11.1	Y	0.44	0.52
1405 Well 1333	34.3 ± 6.5	30.9	Y	41.4 ± 5.7	26.4	Y	1.21	0.85
1408 Well 1334	21.9 ± 3.5	20.7	Y	17.4 ± 2.4	12.2	Y	0.79	0.59
1420 Well 1335a	7.5 ± 2.1	11.5	Y	8.2 ± 1.6	7.14	Y	1.09	0.62
1438 Well 1336a	80.6 ± 7.4	25.8	N	475 ± 40	291	N	5.89	11.28
1396 Well 1339	20 ± 31	20.5	Y	36 ± 26	20.2	Y	1.80	0.98
1435 TWM-13	360 ± 23	411.0	Y	85.2 ± 7.8	87	Y	0.24	0.21
Duplicate-1331	113.9 ± 9.3	127.0	Y	30 ± 3.4	19.8	N	0.26	0.16

TABLE 6
Kerr-McGee Cimarron Site
Groundwater Samples Uranium Alpha Spectroscopy Analysis Results
Samples Collected on June 26-27, 2002

Sample ID	Radionuclide Concentration pCi/l								
	U-234		U-235		U-238		Total U		
	NRC	KM	NRC	KM	NRC	KM	NRC	KM	Agreement
1432 Seep 1206	109 ± 14	111	6.8 ± 1.2	3.88	30 ± 4	29.6	146 ± 14	144.48	Yes
1429 Seep 1208	8.2 ± 1.3	10.5	0.83 ± 0.32	0.351	2.52 ± 0.58	3.86	11.6 ± 1.5	14.71	Yes
1411 Well 1312	34.7 ± 4.7	35.1	3.04 ± 0.74	1.56	10.5 ± 1.7	10.4	48.3 ± 5.0	47.06	Yes
1414 Well 1313	11.2 ± 1.7	10.1	0.96 ± 0.36	0.374	3.46 ± 0.71	2.78	15.6 ± 1.9	13.25	Yes
1417 Well 1320	1.33 ± 0.42	1.39	0.11 ± 0.14	0.105	0.48 ± 0.24	1.16	1.92 ± 0.50	2.66	Yes
1399 Well 1321	10.1 ± 1.6	9.65	0.32 ± 0.21	0.206	4.93 ± 0.9	4.32	15.3 ± 1.8	14.18	Yes
1426 Well 1324	0.61 ± 0.44	1.02	0.06 ± 0.2	0.111	0.55 ± 0.34	0.76	1.22 ± 0.59	1.89	Yes
1423 Well 1325	0.81 ± 0.31	0.96	0.13 ± 0.15	0.15	0.19 ± 0.18	0.392	1.12 ± 0.39	1.51	Yes
1444 Well 1326	4.05 ± 0.77	4.86	0.21 ± 0.17	0.399	1.21 ± 0.36	2.04	5.47 ± 0.86	7.30	Yes
1441 Well 1331	92 ± 11	89.3	5.08 ± 0.95	3.13	17.6 ± 2.4	17.4	115 ± 12	109.83	Yes
1402 Well 1332	21.4 ± 2.9	22.1	0.62 ± 0.26	0.258	10.9 ± 1.6	11.6	32.9 ± 3.3	33.96	Yes
1405 Well 1333	8.2 ± 1.2	12.6	0.36 ± 0.27	0.123	3.1 ± 0.61	3.78	11.7 ± 1.4	16.50	No
1408 Well 1334	9 ± 1.3	7.82	0.6 ± 0.24	0.472	4.44 ± 0.77	3.69	14.1 ± 1.6	11.98	Yes
1420 Well 1335a	1.05 ± 0.31	3.26	0.07 ± 0.1	0.6	0.67 ± 0.24	0.878	1.79 ± 0.41	4.74	No
1438 Well 1336a	17.6 ± 2.4	16.2	0.79 ± 0.32	0.881	5.8 ± 1	5.79	24.2 ± 2.7	22.87	Yes
1396 Well 1339	14.5 ± 2.1	16.3	0.48 ± 0.23	2.32	4.57 ± 0.83	4.09	19.6 ± 2.2	22.71	Yes
1435 TWM-13	302 ± 37	293	15.3 ± 2.2	13.9	185 ± 23	187	503 ± 43	493.90	Yes
Duplicate-1331	98 ± 12	89.3	4.49 ± 0.85	3.13	19.6 ± 2.6	17.4	122 ± 12	109.83	Yes
NRC Release criteria							180 pCi/l		

^a Uncertainties are total propagated uncertainties at the 95% confidence level.

TABLE 7
Kerr-McGee Cimarron Site
Groundwater Samples Technetium-99 Analysis Results
Samples Collected on June 26-27, 2002

Sample ID	NRC (ESSAP) Results pCi/l	Kerr-McGee (STL) Results pCi/l	Beta/Alpha Ratio		Agreement Status ¹
			NRC	Kerr- McGee	
1432 Seep 1206	74 +/- 14	19.9	0.48	0.36	N
1429 Seep 1208	2846 +/- 335	2640	10.04	52.34	Y
1411 Well 1312	867 +/- 104	824	5.69	8.89	Y
1414 Well 1313	192 +/- 26	154	6.27	4.49	Y
1417 Well 1320	9 +/- 9	1.59	1.41	1.07	N
1399 Well 1321	3 +/- 9	-0.156	1.02	0.53	N
1441 Well 1331	19 +/- 10	10.1	0.31	0.16	Y
1402 Well 1332	13 +/- 9	-0.052	0.44	0.52	N
1405 Well 1333	18 +/- 9	14.6	1.21	0.85	Y
1408 Well 1334	17 +/- 9	4.18	0.79	0.59	N
1438 Well 1336a	970 +/- 116	788	5.89	11.28	Y
1435 TWM-13	89 +/- 15	-0.189	0.24	0.21	N
Duplicate-1331	30 +/- 10	10.1	0.26	0.16	N
Equivalent to drinking water standard of 4 mREM/year criterion as determined by NRC	3,790 pCi/L				

¹ Agreement status determined from Table 1 Acceptance Criteria above.

² 1206 and 1208 are seeps. Therefore the 60,000 pCi/l Part 20 Appendix B effluent release criteria applies.

5.3 Conclusions

The confirmatory exposure-rate measurements, soil sample analysis results, and alpha and beta building measurements were all below the applicable NRC release criteria. These confirmatory measurements were consistent with the licensee's determination that Sub-Area N of the Cimarron Site meets the criteria established in NRC License SNM-928, License Condition 27 for unrestricted use. The groundwater analytical result from well TMW-13 exceeded the applicable release criteria of 180 pCi/l for total uranium. This sample was collected from a well located on a known groundwater plume. All measurement results for Tc-99 were below the release criteria as determined by NRC. However, for two samples the analytical results between the NRC contract laboratory and the licensee's contract laboratory were statistically not in agreement. This lack of agreement in analysis results was also observed during the previous inspection and will continue to be tracked as an Inspection Follow-up Item.

6 Follow-up (92701)

6.1 (Closed) Violation 070-00925/0101-01: Change to Radiation Protection Plan without prior ALARA Committee Approval. License Condition 27(e).

During the previous inspection, a violation of License Condition 27(e) was identified. The violation related to a change in the Radiation Protection Plan without prior ALARA Committee approval. In a letter dated December 19, 2001, to NRC in response to the Notice of Violation (NOV), the licensee stated that the NOV would be placed in the next agenda of ALARA Committee to discuss what additional action the ALARA Committee deem warranted to assure that full compliance with license conditions were achieved at all times. During this inspection the inspectors noted that there had been two ALARA Committee meetings since the December 19, 2001, letter, and that the NOV had not been included in the agendas nor discussed. This matter was brought to licensee's management attention and the licensee decided to conduct a Special ALARA Committee meeting on June 26, 2002. The minutes of this meeting indicate that the ALARA Committee identified causes and took two actions to prevent recurrence:

1. ALARA Committee agendas were generated "from scratch" at least 2 months after the preceding meeting and it was easy for the chair, the individual preparing the agenda, to forget to include or accidentally omit potentially important issues. To prevent recurrence, a preliminary agenda would be drafted at the same time as the meeting minutes were distributed. To this baseline agenda, members would remind the chair to add items as they are identified. Also, all NRC correspondence sent or received between ALARA Committee meetings would be added to the agenda.
2. To prevent implementing changes prior to documenting ALARA Committee approval, the Committee decided to modify the change procedure by adding a signature line to the change evaluation form. The signature line would require the signature of the HP manager, showing the date of implementation. This signature would hold the HP manager accountable for when changes are implemented, and should ensure that changes are not implemented before they are approved by the ALARA committee and documented.

These corrective actions address the concerns identified by the NOV and this item is considered closed.

6.2 (Discussed) Inspection Followup Item 070-00925/0101-02: Lack of Agreement between NRC and Licensee analysis for Tc-99.

During the previous inspection, the inspector noted that when the analysis results between the NRC contractor laboratory and the licensee contract laboratory were compared using the criteria in NRC Inspection Procedure 84525, "Quality Assurance and Confirmatory Measurements," four of the five analyses were not in agreement. During this inspection, 12 samples were analyzed for Tc-99. All results were below the NRC criteria but 2 of the 12 results were significantly not in agreement between the laboratories. This item was discussed during this inspection but not resolved.

7 Exit Meeting Summary

The inspectors presented the preliminary results of the inspection to licensee representatives at the conclusion of the site visit. After receipt and analysis of the last set of sample results, a telephonic exit meeting was conducted on September 10, 2002, between the lead inspector and the Manager, Planning and Regulatory Compliance. The licensee representatives acknowledged the findings as presented. The licensee did not identify as proprietary any information provided to, or reviewed by, the inspectors.

ATTACHMENT

PARTIAL LIST OF PERSONS CONTACTED

Licensee Cimarron Corporation

D. Finch, Program Manager
J. Lux, Manager, Planning and Regulatory Compliance
K. Morgan, Radiation Safety Officer
L. Smith, Quality Assurance Coordinator
H. Gay, Decommissioning Supervisor
J. Crawford, Hydrologist
R. Jones, Project Manager

NEXTEP Environmental (contractor)

S. Marshall, Principal
R. Callahan, Technician
W. Rogers, Technical Consultant

INSPECTION PROCEDURES USED

IP 88104 Decommissioning Inspection Procedure for Fuel Cycle Facilities
IP 88045 Environmental Protection
IP 83890 Closeout Inspection and Survey
IP 86740 Transportation Activities

ITEMS OPENED, CLOSED AND DISCUSSED

Closed

070-00925/0101-01 VIO Change to Radiation Protection Plan without prior ALARA Committee Approval. License Condition 27(e).

Opened

None

Discussed

070-00925/0101-02 IFI Lack of Agreement between NRC and Licensee analysis for Tc-99.

LIST OF ACRONYMS

ALARA	As Low As is Reasonably Achievable
CFR	Code of Federal Regulations
cpm	counts per minute
dpm/100 cm ²	disintegrations per minute per 100 squared centimeters
ESSAP	Environmental Survey and Site Assessment Program
HP	Health Physics
IFI	Inspection Followup Item
KMCLLC	Kerr-McGee Cimarron Limited Liability Corporation
MDC	minium detectable concentration
μR/hr	microRoentgen/hour
NVLAP	National Voluntary Laboratory Accreditation Program
pCi/g	picocuries/gram
QA	quality assurance
RSO	Radiation Safety Officer
RWP	radiation work permit
SNM	special nuclear material
SOP	standard operating procedure
TLD	thermo luminescence dosimeters
TMW	temporary monitoring well
VIO	Violation