CIMARRON CORPORATION

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VICE PRESIDENT

February 20, 2001

Mr. Ken Kalman, Project Manager
Decommissioning Projects Branch
Division of Waste Management
Office of Nuclear Material Safety and Safeguards
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-001

Re: Docket No. 70-925; License No. SNM-928 – Cimarron Corporation Response to USNRC Comments on Final Status Survey Report for Phase III, Subarea K

Dear Mr. Kalman:

The purpose of this letter is to respond to the January 29, 2001 Nuclear Regulatory Commission (NRC) questions pertaining to Cimarron's Final Status Survey Report on Phase III Subarea K. The NRC's two comments are reproduced followed by Cimarron's responses.

NRC Comment #1:

> It appears that Cimarron used methods for averaging measurements in elevated areas that differed from those described in Section 8.6 (Building/Surface Surveys) of the Final Status Survey Plan for Phase III, dated July 1997, or in Section 8.5.2 of NUREG/CR-5849, "Manual for Conducting Radiological Surveys in Support of License Termination", dated June 1992, which described how to calculate the weighted mean including elevated areas. For example, see the elevated-area averaging methods used in FSSR Section 5.2.3.3, Roof Support I-Beams (data in Appendix 9); or in FSSR Section 5.2.3.5, Ceiling Z bar supports (data in Appendix 11). Although your averaging methods appear to be valid, you should provide a brief written justification for the methods you used.

Cimarron Response:

Cimarron believes that the methods used for averaging measurements in elevated areas were consistent with both the Phase III Final Status Survey Plan and NUREG/CR-5849. By letter dated December 5, 1997, Cimarron responded to several NRC questions on the June 1997 Phase III Final Status Survey Plan. (We believe the reference in the NRC Question to a July 1997

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Phase III Plan should be June 1997.) These responses were incorporated into the June 1997 FSSP upon NRC approval of the submitted responses. Per this December response, Section 8.6.1(g) was added to specify that hot spot averaging was to follow NUREG/CR-5849, Section 8.5.2 as follows:

"g) Hot Spot Averaging

Residual activity exceeding 15,000 dpm/100 cm^2 shall be remediated and follow-up surveys performed. Areas of elevated activity between 5,000 and 15,000 dpm/100 cm^2 will be tested in accordance with NUREG/CR-5849, Section 8.5.2, to assure that the average surface activity level within a contiguous 1 m^2 area containing the elevated area is less than 5,000 dpm/100 cm^2."

In specifying the survey coverage for both I-beams and Z-bar supports, Cimarron implemented a procedure that was far more conservative than would be expected for flat surfaces under Section 8.5.2 of NUREG/CR-5849. Because the I-beams and Z-bars presented a more complicated surface than a flat wall or floor, the specific survey approach had to be tailored to the beam configuration. For each 1 meter length of I-beam and Z-bar, Cimarron performed fixed surveys at eight and four locations respectively. The 1 meter length of I-beam represented 1.35 m^2 of beam surface area and included eight fixed survey locations. The 1 meter length of Z-bar represented 0.6 m^2 of surface area and included four fixed survey locations. The I-beam area was slightly larger than the 1 m^2 referenced in the NUREG, but it included eight fixed survey locations as opposed to a single fixed location for a 1 m^2 area as recommended in NUREG/CR-5849.

The eight fixed locations were collected around the circumference of the I-beam supports on each distinct flat surface. The eight locations around the circumference of the I-beam were assigned an area equivalent to the width of the specific area (i.e., the web, flange, etc.) times the 1 meter survey interval along the beam. The largest I-beam area represented was the web of the beam that included one fixed location reading for 0.4 m^2 of beam area. Since the webs were situated in a vertical orientation, their potential for being contaminated was far less than the horizontal surface of the beam, which was represented by smaller surface areas.

In evaluating the systematic survey data, Cimarron initially compared each direct alpha and direct beta/gamma survey result against the guideline values. Any location found to exceed three times the guideline value was remediated and resurveyed. For beam surface areas with a survey results between one and three times the guidelines values, hot spot averaging of the eight locations around the circumference of the I-beam was performed to verify that any contiguous 1 meter interval containing the elevated activity was less than the guideline value.

The hot spot calculation used a weighted average method similar to Section 8.5.2 of NUREG/CR-5849 for determining if the 1 meter interval containing an elevated reading averaged below the guideline values. If the average exceeded the guideline value, then additional survey readings would have been collected. Since the weighted averages for the I-beam (i.e., hot spot averages) met the guideline values, no additional surveys were required to

reduce the assumed areal extent of the elevated activity. This procedure is consistent with both the Phase III FSSP and Section 8.5.2 of NUREG/CR-5849.

As stated, a 1 meter length of Z-bar represented a 0.6 m^2 surface area and included four fixed locations. The data evaluations and hot spot averaging were performed in a similar fashion to the I-beams. These areas were smaller than the 1 m^2 referenced in NUREG/CR-5849 and also included four fixed survey locations. Any location found to exceed three times the guideline value were remediated and resurveyed. For Z-bar surface areas with survey results between one and three times the guideline values, hot spot averaging of the four locations around the circumferences of the Z-bar was performed to verify that any contiguous 0.6 m^2 internal containing the elevated activity was less than the guideline value. Similar to the I-beams, once the initial hot spot averages were determined, no additional surveys were required to reduce the assumed areal extent of the elevated activity.

The ceiling panels, wall panels, and floor survey averages incorporated evenly spaced 1 meter x 1 meter spacing intervals for each of the different survey units. If the survey data exceeded the guideline value, then additional surveys were performed to facilitate the required weighted average calculations. This method also was consistent with both the Phase III FSSP and Section 8.5.2 of NUREG/CR-5849.

Cimarron believes that, in general, the methods for averaging measurements were consistent with the Phase III FSSP and more conservative than the procedures presented in Section 8.5.2 of NUREG/CR-5849. Because several of the survey units were I-beams and Z-bars, the survey locations and assigned areas were somewhat different from that of a flat plane. However, overall evaluations and weighted average calculations were similar.

NRC Comment # 2:

> Most of the instruments used for Cimarron's measurements of alpha and beta/gamma contamination in buildings are clearly identified in Table 4.1 of the FSSR or in its Appendices. However, for some measurements, the measuring detector used with the scaler/rate meter (Ludlum 2220, 2221 or 2224) has been omitted (see for example, Appendix 5 or 6). You should expand Table 4.1 to include all instruments used for radiation monitoring.

Cimarron Response:

Cimarron has reviewed both Table 4.1 and the Appendices to determine which instruments used for radiation monitoring were not listed in Table 4.1. Only one instrument and detector were identified as being inadvertently omitted from Table 4.1. They are:

- Scintillation (43-89)
- Scaler/Ratemeter (Ludlum 2224)

The instrument and detector listed above have been added to Table 4.1 to correct this omission and this revised Table has been included as an attachment for replacement of Table 4.1 contained in the Subarea K FSSR.

Please feel free to contact me if there are any additional questions or concerns.

Sincerely,

Jess Larsen

Jess Larsen
Vice President
Attachment

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TABLE 4.1

RADIATION MONITORING INSTRUMENTS

INSTRUMENT TYPE	NUMBER AVAILABLE	RADIATION DETECTED	SCALE RANGE	BKG	TYPICAL EFFICIENCY	TYPICAL MDA 95% CONFIDENCE LEVEL
Scintillation (43-89) Scaler/Ratemeter (Ludlum 2224)	2	Alpha Beta	0-500,000 cpm	< 10 cpm < 300 cpm	20% 19%	100 dpm/100 cm^2 500 dpm/100cm^2
Micro-R Meter (Ludlum 12 & 19) 1" x 1" NaI Detector	3	Gamma	0 – 5,000 μR/h	7 μR/h- 9 μR/h	N/A	2 μR/h
Ion Chamber (Victoreen)	1	Gamma	0.1 - 300 mR/h	<.0 1 mR/h	N/A	< 0.2 mR/h
3" x 1/2" NaI Scintillation (43-82) Digital Scaler (Ludlum 2220/2221)	3	Gamma	0 - 500,000 cpm	3,000 cpm avg shielded 9,000 cpm avg unshielded	N/A	250 cpm (Shielded) 500 cpm (Unshielded)
100 cm^2 gas flow (43-68) Digital Scaler (Ludlum 2220/2221)	2	Alpha	0 - 500,000 cpm	<10 cpm	20%	100 dpm/100 cm^2
60 cm^2 gas flow (43-4) Digital Scaler	1	Alpha	0 - 500,000 cpm	<10 cpm	25%	200 dpm/100 cm^2
60 cm^2 Count Rate Meter (PRM-6)	7	Alpha	0 - 500,000 cpm	<100 cpm	50%	350 dpm/100 cm^2
50 cm^2 Personnel Room Monitor (Ludlum 177)	2	Alpha	0 - 500,000 cpm	<100 cpm	50%	500 dpm/100 cm^2
Tennelec LB5100 Computer Based Auto Sample Counter	1	Alpha Beta	0 - 99,999,999 cpm	<0.3 cpm 1.5 cpm	38% 42%	0.4 dpm 1.5 dpm
Soil Counter - Computer Linked 4" x 4" x16" NaI (Tl) Detector	1	Gamma	---	4 pCi/g Total U 1.5 pCi/g Th (Nat)	4% 15%	5 pCi/g U (5min. count) 0.6 pCi/g Th (Nat) (5min. count) 3 pCi/g U (15min. count) 0.3 pCi/g Th (Nat) (15min. count)
100 cm^2 gas flow (43-68) Digital Scaler (Ludlum 2220/2221)	2	Beta, Gamma	0 - 10,000 cpm	<300 cpm	20%	600 dpm/100 cm^2
*Reuter-Stokes PIC Model RSS-112	1	Gamma	0 - 100 mR/h	9 – 10 μR/h	N/A	0.5 μR/h (10min. count)

*(Cushing Instrument available for Cimarron Use)