January 10, 2005

Michael L. Griffin
Manager of Environmental and Regulatory Affairs
Crow Butte Resources, Inc.
86 Crow Butte Road
Post Office Box 169
Crawford, NE 69339-0169

SUBJECT: WELLFIELD DECOMMISSIONING PLAN REVIEW (TAC LU0053)

Dear Mr. Griffin:

I am responding to your letter dated July 7, 2004, in which you submitted the Wellfield Decommissioning Plan, and requested an amendment to Source Materials License SUA-1543, Conditions 9.8 and 12.5. After initial review, it was determined that a license amendment was not required and in a letter dated August 10, 2004, you withdrew the amendment request and requested that the NRC review the Wellfield Decommissioning Plan and provide comments to ensure its adequacy for use during reclamation efforts.

We have reviewed the Wellfield Decommissioning Plan and our comments are enclosed. Because there is no need to respond to these comments, we are closing this TAC.

If you have any questions concerning this letter or the enclosure, please contact me at (301) 415-7694 or by e-mail to JHL@nrc.gov.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter will be 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/NRC/ADAMS/index.html (the Public Electronic Reading Room).

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Sincerely,

/RA/

John H. Lusher, Project Manager
Uranium Processing Section
Fuel Cycle Facilities Branch
Division of Fuel Cycle Safety
and Safeguards
Office of Nuclear Material Safety
and Safeguards

Docket No.: 40-8943
License No.: SUA-1534

Enclosure: Review Comments

cc: Stephen P. Collings, CBR, Denver
Dave Miesbach, Nebraska, UIC, DEQ
Dave Carlson, Nebraska, UIC, DEQ

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John H. Lusher
Fuel Cycle Facilities Branch
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(Closes Tac No. LU0053)

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CROW BUTTE DRAFT WELLFIELD DECOMMISSIONING PLAN

By letters dated July 7, 2004, and August 10, 2004, Crow Butte Resources, Inc. (CBR), submitted a Wellfield Decommissioning Plan for review. The plan was evaluated using the guidance in NUREG-1569, "Standard Review Plan for *In Situ* Leach Uranium Extraction License Applications," Sections 6.2, 6.3, and 6.4 and Appendix E, and NUREG-1575, "Multi-Agency Radiation Survey and Site Investigation Manual." The staff did not confirm the dose modeling or the results of other calculations.

I. Soil Characterization and Cleanup

1. Page 8 states that the liquid process waste will go to evaporation ponds or a deep well, and restoration waste will go to the waste disposal system, while the permeate is re-injected into a wellfield or to the waste disposal system. The waste disposal system is not described so the staff could not determine if the regulations would be met.

2. Page 12 describes pre-operational sampling of the upper 5 cm of soil and analysis for background radionuclides. These results may not be comparable to recent sampling.

3. Page 19 quotes a draft guide that was replaced by NUREG-1757, Volume 2, "Consolidated NMSS Decommissioning Guidance - Characterization, Survey, and Determination of Radiological Criteria," in September 2003. Also, page 21 refers to draft NUREG/CR-5849 that has been replaced, in part, by NUREG-1757, Volume 2. Current guidance should be consulted and referenced.

4. Page 21 provides a Ra-226 background value, but not a proposed U-nat value. If grids need to be cleaned because of the Th-230 level, a background value for Th-230 must also be proposed and justified.

5. Page 22 describes the procedure for gamma surveys and soil sampling. CBR should explain how the process of taking one meter readings and 5 soil samples (to be composited) within a 3-foot diameter relates to the requirement to demonstrate compliance with cleanup limits for 100 m^2 (30 by 30 feet) areas. This data was apparently used for the radium-gamma correlation (Figure 6-1) on page 46. The correlation is good for a small area and can be used for small hot spots. The licensee still needs to provide a correlation developed with procedures that will be used for the final status survey (cleanup verification).

6. Page 33 states that only alpha surface measurements will be performed for release surveys. The licensee should be aware of the limitations of alpha instruments and be familiar with NUREG-1575, Sections 6.4.1.2, 6.4.2.2, and 6.7.2.2.

7. Page 36 indicates that the Radium Benchmark Dose (see comment on Appendix A) approach results in a limit of 537 pCi/g U-nat. However, the plan proposes a limit of 230 pCi/g for surface and subsurface soil. Page 38 states that the ALARA

goal for surface soil is 150 pCi/g U-nat. However, ALARA is a requirement so if 150 pCi/g is approved, it would be the maximum value allowed for any 100 m^2 area. The plan should be clarified regarding the use of these values.

8. Page 39 indicates that 230 pCi/g U-nat is the ALARA goal for subsurface soil, but the plan does not demonstrate why this value is ALARA. This demonstration should be added. The plan also states that the ALARA goal would be abandoned when the cost is prohibitively high. The licensee would first need to demonstrate in the plan the cost and benefit ratio before proposing such an action.

9. The size of the area where the subsurface criterion might be applied should be addressed. NUREG-1569, Appendix E,0 states that a subsurface criterion is to be applied to small areas where the cover could reasonably be expected to remain in place for the foreseeable future (low erosion rate).

10. Page 44, Section 6.3, indicates that a percentage of grids with gamma rates below the action level will also be soil-sampled. The plan should specify the percentage of the grids that will be sampled and how the grids will be chosen.

11. Page 45 states that the 17,900 cpm (gamma) count rate corresponds to 5.55 pCi/g Ra-226 (3-ft diameter area) and that this count rate will be the action level for small areas. The action level should be conservative (ALARA) and a corresponding justification should be added to the plan.

12. Section 6 of the Plan should be clarified to address the verification procedures that will be used for U-nat.

13. Page 53 states that a single soil sample will be taken in trenches at 150-ft intervals. The plan should be revised to discuss how this approach will comply with the 10 CFR Part 40, Criterion 6(6) requirement of 100 m^2 areas. Also, if contamination had existed in the sides of the trench, the plan should state how verification would be accomplished by one measurement in the center of the trench floor.

14 Page 53, Section 6.7, discusses laboratory quality assurance. The plan should address quality control measures for all radiological measurements and data management.

15 Page 62, Section 8.3, states that there are no threatened or endangered animals in the remediation area. Information for the Environmental Report should include the date that the latest biological survey was performed at the site.

II. Structure Cleanup

1. Any structure that will remain on site should be evaluated as to the potential for contamination. If contamination is known or likely, the Radium Benchmark Dose Approach should be used to develop cleanup criteria.

III. Radium Benchmark Dose Plan, 10 CFR Part 40, Appendix A

1. The dose modeling is not being done for screening purposes as indicated in several sections of Appendix A. The modeling provides a cleanup criterion for U-nat and site-specific values should be used when possible.

2. The contaminated area of 10,000 m^2 is not realistic; even 5,000 m^2 is not appropriate for this site, based on the characterization survey.

3. The cover and contaminated zone erosion rate should not be the RESRAD screening value if evidence suggests that the site value would be much lower.

4. The plan should use consumption rates of contaminated food (from small areas of contamination) that are realistic (NUREG-1569, Appendix E, Section 2.1.2). Vegetables, grains, fruit, and cattle would not all be grown on a contaminated area of about 1 acre (4050 m^2).

5. The default drinking water value was used but there is no indication that the groundwater is of the appropriate quality or contamination level to justify use of this pathway. This justification should be added.

6. The plant root depth value should reflect the crops mostly likely to be grown on the site and not the most conservative value.