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By Electronic Mail

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Re: Sur-reply Comments on the Proposed Renewal and Amendment of Energy Fuels Resources (USA), Inc.'s Radioactive Materials License and Groundwater Discharge Permit for the White Mesa Mill

Dear Mr. Anderson:

Thank you for the opportunity to submit a reply to Energy Fuels' response to some of our comments on the Division of Waste Management and Radiation Control's proposal to renew the company's radioactive materials license for the White Mesa Mill.

We're pleased that Energy Fuels revised Reclamation Plan Revision 5.1 in response to the subject matters on which the Division sought a response to our comments, and we thank the company for making those revisions. We also thank the Division for soliciting Energy Fuels' views on some of our comments. We believe the back-and-forth on these comments and the additional scrutiny given to the legal requirements at issue have led to some positive changes in Plan Revision 5.1.

We continue to have differing views from Energy Fuels on some points, however, and we address those issues below. To avoid quibbling over relatively immaterial matters, we haven't responded to some of Energy Fuels' assertions even though we don't mean to concede those points or retract our initial comments on those subjects. We've organized our replies numerically by topic in the order that each issue is presented in Energy Fuels' October 23, 2017, response to our comments.

1. Milestones for Non-Conventional Impoundments

Energy Fuels' Response:

Criterion 6A applies only to tailings impoundments, which are permanent disposal facilities for byproduct material, and for which a final radon barrier will be constructed. Evaporation ponds are not permanent disposal facilities and will be removed and the liners etc. disposed of in a tailings impoundment for permanent disposal as 11e.(2) byproduct material. Evaporation ponds at the Mill do not have radon barriers. If an evaporation pond contains tailings that will require permanent disposal and a radon barrier, then they are not evaporation ponds; they are tailings impoundments and would be subject to the requirements set out in Criterion 6A. As stated below, in the Nuclear Regulatory Commission's ("NRC's") preamble (see Appendix 1) to its rulemaking under which Criterion 6A was added to 10 CFR Part 40 Appendix A, Federal Register Volume 59, Number 104, Wednesday June 1, 1994, (the "NRC Preamble"), page 28224, NRC states:

Note, as discussed in EPA's statements of consideration for its amendment of 40 CFR part 192 (at FR 32183, June 8, 1993 and reiterated at 58 FR 60354; November 15, 1993), the reclamation of evaporation ponds may be dealt with separately from meeting the expeditious radon cover requirements if deemed appropriate by the Commission or the regulating Agreement State. This may be the case whether or not the evaporation pond area is being used for continued disposal of byproduct material.

None of the Mill's evaporation ponds will have a final radon barrier, so milestones are not required to be set under Criterion 6A for the decommissioning of the evaporation ponds at the site.

It should be noted, however, that 40 CFR 61.251(o) of EPA's revised Subpart W regulations defines "Reclamation Plan" to mean a plan detailing activities and milestones to accomplish reclamation of tailings impoundments as well as the "removal and disposal of non-conventional impoundments," which includes evaporation ponds. It should also be noted that Subpart W provides that an approved "reclamation plan prepared and approved in accordance with 10 CFR part 40, Appendix A is considered a reclamation plan" for purposes of Subpart W.

EFRI is of the view that since an approved reclamation plan that meets the requirements of Appendix A satisfies the definition of "Reclamation Plan" in Subpart W, and Appendix A does not require any milestones under Criterion 6A that do not relate to the placement of a final radon barrier on a tailings impoundment, any closure requirements in the Reclamation Plan relating to removal and disposal of non-conventional impoundments need not be milestones.

Nevertheless, although not required, we have added milestones for the removal and disposal of non-conventional impoundments to revised Section 6 of the Reclamation Plan. Although these milestones are not milestones required under Criterion 6A(1), EFRI has committed in revised Section 6 that for purposes of the Reclamation Plan they will be treated as milestones as required by Criterion 6A(1), and as a result EFRI has committed that they will be subject to the provisions of Criterion 6A(2) (see Appendix 2)[.]

The Trust's Reply:

We appreciate Energy Fuels' decision in response to our comments to include milestones in Revised Section 6 of Reclamation Plan Revision 5.1 for closing non-conventional impoundments at the mill.

The only remaining issue on this subject that we dispute is Energy Fuels' argument that milestones are not *required* for evaporation ponds under Criterion 6A of Appendix A to the Nuclear Regulatory Commission's source-material licensing rules.¹ So that this issue is not debated again in the future if Energy Fuels' reclamation plan is revised, we believe the Division should direct Energy Fuels to revise Section 6 of Plan Revision 5.1 to clarify that the milestones set out for non-conventional impoundments are not voluntary additions to the plan, but are required by Appendix A.

Energy Fuels argues that milestones are not required for closing the mill's non-conventional impoundments because Appendix A demands milestones only for building a "final radon barrier," and

¹ See 10 C.F.R. Part 40, App. A.

the company doesn't plan to build a radon barrier over the mill's non-conventional impoundments.² We don't believe this argument is sound.

We agree that Appendix A requires reclamation plans to include only those milestones that are "key" to completing the "final radon barrier."³ We also acknowledge that Energy Fuels is not required to build a "final radon barrier" over evaporation ponds if they are dug up and buried in another impoundment in a way that reduces the radium-226 concentration in the evaporation pond's former footprint to the numeric thresholds set out in Criterion 6(6).⁴ And Energy Fuels' reclamation plan does indeed call for evaporation ponds to be reclaimed in this manner.⁵ But there are two reasons that milestones nonetheless must be established for closing evaporation ponds.

First, Energy Fuels may forgo building a final radon barrier over evaporation ponds at the mill only if the company demonstrates that the residual radium-226 concentration in the land beneath closed evaporation ponds is below the numeric thresholds in Criterion 6(6). That is, Appendix A provides that "licensees *shall* place an earthen cover (or approved alternative) over tailings or wastes at the end of milling operations..."⁶ The only exemption from this requirement is for areas at the mill that are cleaned up so that radium-226 concentrations are below specified numeric limits.⁷ Thus, once "final closure" of an evaporation pond begins, milestones must be triggered for building a final radon barrier over the residual byproduct material in the pond, and the only basis for not completing the final radon barrier according to those milestones is to clean up the pond to meet the radium-226 concentration limits. To avoid violating the final-radon-barrier milestone requirements, that cleanup must be completed in a timeframe that is consistent with milestones for building a final radon barrier.

Second, as Energy Fuels acknowledges,⁸ because the company plans to bury non-conventional impoundments in the mill's conventional impoundments, and milestones must be established for building a final radon barrier over conventional impoundments, excavating non-conventional impoundments and discarding them in a conventional impoundment is a "key" step in building the final radon barrier for conventional impoundments—at least for the last impoundment that's closed. Although as Energy Fuels observes, reclamation of non-conventional impoundments sometimes could be accomplished independently from closure of conventional impoundments, that's true only while at least one conventional impoundment remains in operation. Because initiating final closure of at least the last conventional impoundment at the mill thus could require closure and removal of all remaining non-conventional impoundments, the reclamation plan must have a deadline for properly removing all non-conventional impoundments before the mill's last conventional impoundment is covered.

Added to those two reasons for requiring milestones for closing non-conventional impoundments, as Energy Fuels points out, the U.S. Environmental Protection Agency's definition of the term "reclamation plan" in its recent revisions to Subpart W recognizes that milestones must be established

² Energy Fuels Resources (USA) Inc., "Response to Public Comments on the White Mesa Mill Groundwater Discharge Permit and Radioactive Materials License" 21–22, 30–31 (Oct. 23, 2017) ("Energy Fuels' Resp.").

³ 10 C.F.R. Part 40, App. A at "Reclamation Plan."

⁴ See 10 C.F.R. Part 40, App. A, Criterion 6(6).

⁵ See Ex. 1 to the Grand Canyon Trust's Comments on the Proposed Renewal and Amendment of Energy Fuels Resources (USA), Inc.'s Radioactive Materials License and Groundwater Discharge Permit for the White Mesa Mill (July 31, 2017) ("Trust's Comments") at 3-5, I-2.

⁶ 10 C.F.R. Part 40, App. A, Criterion 6(1).

⁷ *Id.* at Criterion 6(6).

⁸ Energy Fuels' Resp. at 30.

for closing non-conventional impoundments. The “[a]ctivities and milestones to be addressed” in a reclamation plan, the definition provides, “include ... removal and disposal of non-conventional impoundments.”⁹

To support its argument that milestones need not be established for evaporation ponds, Energy Fuels quotes the preamble to two rulemakings that led to the addition of milestone requirements in Appendix A: (1) EPA's 1993 amendments to 40 C.F.R. Part 192 (58 Fed. Reg. 32,174, 32,183–84 (June 8, 1993)); and (2) NRC's conforming changes to Appendix A made in 1994 (59 Fed. Reg. 28,220, 28,224 (June 1, 1994)). We believe these quotations are inapt. Indeed, they demonstrate that the agencies expected a final radon barrier to be built over evaporation ponds, subject to Appendix A's milestone requirements.

In the material that Energy Fuels quotes from EPA's rulemaking, EPA was rejecting “comments noting that evaporation ponds should be excluded from the expeditious cover requirement...”¹⁰ The agency observed that the “expeditious radon cover requirement” would not apply “to the extent that [an] evaporation pond is deemed by the implementing agency ... *to be an appropriate aspect to the overall remedial program for the particular site.*”¹¹ That isn't a blanket exemption from the milestone requirements for all evaporation ponds, but an exemption only for ponds deemed “appropriate” for overall site remediation. There's nothing in the rulemaking to suggest that evaporation ponds would not be subject to Appendix A's milestone requirements if keeping them open isn't “appropriate” for overall site remediation. And no such finding has been made for the mill's evaporation ponds.

The section of NRC's rulemaking preamble that Energy Fuels quotes similarly reiterates this point by citing “EPA's statements” on this issue before observing that “the reclamation of evaporation ponds may be dealt with separately from meeting the expeditious radon cover requirements *if deemed appropriate by the Commission or the regulating Agreement State.*” Again, that isn't an automatic exemption from Appendix A's milestone requirements, and given the reference to EPA's statements in its rulemaking preamble, indicates that the only “appropriate” basis for dealing with evaporation ponds separately is if they are necessary for overall site remediation.

Appendix A's milestone requirements apply broadly to all impoundments in which byproduct material is discarded, including non-conventional impoundments.¹² We accordingly urge the Division to insist that Energy Fuels remove from revised Section 6 of Plan Revision 5.1 any suggestion that the milestones the company has included for non-conventional impoundments are being voluntarily adopted.

2. Definition of Final Closure

Energy Fuels' Response:

See revised Section 6 of the Reclamation Plan, which includes the pertinent parts of the definition of “final closure” from the new 40 CFR Part 61 Subpart W regulations. The definition of “final closure” in

⁹ 40 C.F.R. § 61.251(o).

¹⁰ Health and Environmental Standards for Uranium and Thorium Mill Tailings, 58 Fed. Reg. 32,174, 32,183 (June 8, 1993).

¹¹ *Id.* (emphasis added).

¹² 10 C.F.R. Part 40, App. A (“For impoundments containing uranium byproduct materials, the final radon barrier must be completed as expeditiously as practicable considering technological feasibility after the pile or impoundment ceases operation....”).

revised Section 6 excludes the paragraph relating to heap leach piles because that paragraph is inapplicable to the Mill (the Mill is not licensed to have any heap leach piles).

The Trust's Reply:

We agree with how Energy Fuels has modified Section 6 of the reclamation plan in response to our request and appreciate the company's willingness to make those modifications.

3. Minimum Milestone Requirements

Energy Fuels' Response:

In developing [revised] milestones and schedule commitments, the following factors were taken into consideration:

a) Three Milestones Required.

10 CFR Part 40 Appendix A, Criterion 6A(1) requires that deadlines must be established for only the following three items:

- *Completion of the final radon barrier;*
- *Windblown tailings retrieval and placement on the pile; and*
- *Interim stabilization (including dewatering or the removal of freestanding liquids and re-contouring).*

In the NRC Preamble, page 28226, NRC states that: "The final rule has been changed to specifically require the establishment of deadlines for only three milestones: windblown tailings retrieval and placement on the pile, interim stabilization (including dewatering or the removal of freestanding liquids and re-contouring) and final radon barrier construction. The Commission, however, retains the authority to require the establishment of additional milestones determined to be "key" to the completion of the final radon barrier in an individual case (note the words "but not limited to" in the definition of reclamation plan)."

The Trust's Reply:

We do not dispute the preceding assertion about which milestones must be established by default under Appendix A, but we emphasize, as Energy Fuels acknowledges, that Appendix A requires reclamation plans to contain all milestones that are "key" to completion of the final radon barrier, not just the three milestones listed as examples in Appendix A.

4. Schedule Commitments Generally

Energy Fuels' Response:

b) Additional Schedule Commitments may be Set, but they are not Subject to Paragraph 2 of Criterion 6A

In describing Criterion 6A in the NRC Preamble, page 28225, NRC states that: "no deadlines are required to be established in the licenses beyond completing the final radon barrier as a result of this rulemaking and that any other schedules established in a license do not come under the specific provisions of paragraph (2) of Criterion 6A".

In revised Section 6 of the Reclamation Plan we have set out a comprehensive schedule for reclamation of impoundments, which goes beyond completing the final radon barrier for conventional impoundments. In revised Section 6 of the Plan and in these comments, we refer to deadlines that are not milestones (because they go beyond or are not related to completing the final radon barrier) as "schedule commitments." As those schedule commitments are not milestones they do not come under the specific provisions of paragraph (2) of Criterion 6A. However, a general timeliness standard for completing those activities is retained. The licensee must complete those activities in a timely way, and the Director has the authority to take action if necessary in this regard.

The Trust's Reply:

We do not dispute the assertion that Appendix A requires a schedule of milestones only for "key" tasks in completing the final radon barrier and that a separate timeliness requirement may apply to other reclamation tasks. We also agree that the procedural requirements in Criterion 6A(2) apply only to extensions of milestones and not to extensions of other deadlines.

However, as explained in more detail under Item No. 6 below, we believe some of the schedule commitments that Energy Fuels has set out in Revised Section 6 of the reclamation plan should be milestones.

5. Definition of Final Radon Barrier

Energy Fuels' Response:

c) Radon Barrier is Not the Entire Tailings Cover.

The radon barrier is not the entire tailings impoundment cover, but only the radon barrier layer of the cover. The erosion protection barriers or other features necessary for long-term control of the tailings are placed on top of the final radon barrier and are not part of the final radon barrier. In the Subpart W Preamble, on page 36285, EPA notes that: "Milestones which are not reasonably determined to advance timely compliance with the radon air emissions standard, e.g., installation of erosion protection and groundwater corrective actions, are not relevant to the tailings closure plans (radon)." In the NRC Preamble, page 28222, NRC states that: "A definition of final radon barrier was also included in the Commission's proposed rule. . . . This definition excludes the erosion protection features which were not a subject to EPA's amendment to 40 CFR part 192."

The Trust's Reply:

We agree, as a general matter, that the NRC intended for the term "final radon barrier" to mean the cover features necessary to achieve a radon flux of 20 pCi/(m²-sec) and to exclude erosion-protection features or other features built solely for achieving Appendix A's "longevity" requirements. As we explain in response to Item No. 6 below, we disagree with how Energy Fuels has applied these standards to the proposed cover designs for the mill.

6. Schedule Commitments for Erosion Protection and Other Long-Term Tailings Control Features

Energy Fuels' Response:

d) The Required Milestones do not include the Erosion Protection Barrier or other Features Necessary for Long-Term Control of the Tailings.

The milestones required under Criterion 6A(1) do not include erosion protection barriers or other features necessary for long-term control of the tailings. In the NRC Preamble, page 28226, NRC states that: "The final rule has been modified so that the terminology 'as expeditiously as practicable considering technological feasibility' is used only for emplacement of the final radon barrier. A general timeliness standard for completing erosion protection features is retained. Thus, it is clear that the licensee must complete these actions in a timely way and that the NRC has the authority to take action if necessary in this regard. However, the restrictive cost considerations specified for the completion of the final radon barrier do not apply to decisions concerning the timeliness of completion of erosion protection features. Instead, the more flexible, general cost considerations of the AEA (Section 84a(1)) apply."(NRC 2015b)

In the case of Reclamation Plan 5.1, the final radon barrier is Layer 2 (3.0- 4.0 ft. (91 to 122 cm) thick Primary Radon Attenuation Layer (highly compacted loam to sandy clay)), and the erosion protection barriers or other features necessary for long-term control of the tailings are Layer 3 (3.5 ft. (107 cm) thick Water Storage/Biointrusion/Frost Protection/Secondary Radon Attenuation Layer (loam to sandy clay)) and Layer 4 (0.5 ft. (15 cm) thick Erosion Protection Layer (topsoil-gravel admixture or topsoil)). For Reclamation Plan 3.2, the final radon barrier is Layer 2 (1 ft. (30.5cm) Radon Barrier (compacted clay)), and the erosion protection barriers or other features necessary for long-term control of the tailings are Layer 3 (2ft. (61 cm) Frost Barrier Layer (random fill)) and Layer 4 (3 in. (7.6 cm) Rock Armor).

Accordingly, the milestones required under Criterion 6A(1) are for the completion of Layers 1 and 2 under each Reclamation Plan option (the Proposed Cover Design and the Existing Cover Design, respectively, using the terminology in revised Section 6 of the Reclamation Plan). Schedule commitments, not milestones, are set for the remaining Layers under each cover design option. As those schedule commitments are not milestones they do not come under the specific provisions of paragraph (2) of Criterion 6A. However, a general timeliness standard for completing those activities is retained. The licensee must complete those activities in a timely way, and the Director has the authority to take action if necessary in this regard.

The Trust's Reply:

We disagree, with Energy Fuels' assertions that the "final radon barrier" in the evapotranspirative cover ("ET Cover") and 1996 conventional cover comprises only Layer 2 in those covers and that Layers 3 and 4 in the ET Cover and Layer 3 in the 1996 conventional cover design are simply "erosion protection barriers or other features necessary for long-term control of the tailings."¹³ Energy Fuels has described Layer 3 in both covers as a radon-attenuation layer.¹⁴ True enough, Layer 3 in the ET Cover is meant to serve other functions, such as deterring biointrusion and frost-degradation. But according to Energy Fuels' modelling, Layer 3 is essential for achieving a radon flux below 20 pCi/(m²-sec).¹⁵ In fact, Energy Fuels' radon-flux model predicts that Layer 4—the erosion-protection layer—is also necessary to reduce radon-flux to 20 pCi/(m²-sec), at least for Cell 2.¹⁶ Because both Layer 3 and Layer 4 in the ET Cover serve the purpose of reducing radon-flux to 20 pCi/(m²-sec), they are both part of the "final radon barrier" as that term is defined in Appendix A. As a result, milestones must be established for their completion.

¹³ See Energy Fuels' Resp. at 29.

¹⁴ See Ex. 16 to the Trust's Comments at 2.

¹⁵ See Ex. 16 to The Trust's Comments at App. C, p. 2 (showing an exit flux of 20.18 pCi/(m²-sec) through Layer 3, which is identified in the radon-flux model as "Layer 4," i.e. the 107-cm thick "ET Cover").

¹⁶ *Id.* (predicting the exit flux to fall to 20 pCi/(m²-sec) only after accounting for all of the ET Cover's layers, including the erosion-protection layer named "Layer 5" in the model).

The same is true of Layer 3 in the 1996 conventional cover. In modelling radon-attenuation from that cover design, Energy Fuels included Layer 3—the 2-foot random fill layer—in addition to the 1-foot compacted clay layer.¹⁷ Because that layer also serves the purpose of reducing radon flux below 20 pCi/(m²-sec), it is also part of the “final radon barrier” under Appendix A and is subject to Criterion 6A's milestone requirements.

We accordingly request that the Division require Energy Fuels to amend Revised Section 6 of Plan Revision 5.1 to convert the “schedule commitments” into milestones for placing Layers 3 and 4 of the ET Cover and Layer 3 of the 1996 conventional cover. We also request, as explained under Item No. 11 below, that the milestones for completing these items be no later than seven years after final closure of an impoundment begins.

7. Milestones for Non-Conventional Impoundments

Energy Fuels' Response:

e) Milestones not Required for Evaporation Ponds

The milestones required under Criterion 6A(1) do not generally extend to evaporation ponds, because they generally do not have a final radon barrier. In the NRC Preamble, page 28224, NRC states:

Note, as discussed in EPA's statements of consideration for its amendment of 40 CFR part 192 (at FR 32183, June 8, 1993 and reiterated at 58 FR 60354; November 15, 1993), the reclamation of evaporation ponds may be dealt with separately from meeting the expeditious radon cover requirements if deemed appropriate by the Commission or the regulating Agreement State. This may be the case whether or not the evaporation pond area is being used for continued disposal of byproduct material.

In our view, milestones need not be set for reclamation of evaporation ponds unless such reclamation is a required step that needs to be done after a conventional impoundment (which would require a radon barrier) begins final closure and prior to placement of the final radon barrier. In most cases, reclamation of evaporation ponds could be accomplished independently of conventional impoundments, so milestones for evaporation ponds would not be required.

Further, in EPA's preamble to its amendment of 40 CFR Part 192 (FR, Vol 58, No. 108, June 8, 1993) (the "Subpart D Preamble") (see Appendix 4), EPA states on pages 32183-32184 that:

EPA does not intend that the expeditious radon cover requirement extend to areas where evaporation ponds are located, even if on the pile itself, to the extent that such evaporation pond is deemed by the implementing agency (NRC or an affected Agreement State) to be an appropriate aspect to the overall remedial program for the particular site. Rather, the evaporation pond area may be covered to control radon after it is no longer in use and ready for covering. EPA believes the overall public health interest in comprehensively resolving the problems associated with each site is best served by requiring that the radon cover be expeditiously installed in a manner that does not require interruption of this aspect of remediation. Moreover, the ponds themselves serve as an effective radon barrier. Thus, this decision is bolstered by the absence of any evidence that there is a significant public health risk presented by the radon emissions

¹⁷ Ex. 30 to the Trust's Comments at 4 and App. B, p. 1.

from these evaporation ponds during the period they are employed as part of the overall remediation of the site. EPA believes that provided all other parts of the pile are covered with the radon barrier, compliance with the 20 pCi/m²-s standard will result, and this will be maintained by covering the evaporation pond area when it is no longer in use.

It should be noted, however, that 40 CFR 61.251(o) of EPA's revised Subpart W regulations defines "Reclamation Plan" to mean a plan detailing activities and milestones to accomplish reclamation of tailings impoundments as well as the "removal and disposal of nonconventional impoundments," which includes evaporation ponds. It should also be noted that Subpart W provides that an approved reclamation plan prepared and approved in accordance with 10 CFR Part 40, Appendix A is considered a reclamation plan for purposes of Subpart W. EFRI is of the view that since an approved reclamation plan that meets the requirements of Appendix A, satisfies the definition of "Reclamation Plan" in Subpart W, and Appendix A does not require any milestones under Criterion 6A that do not relate to the placement of a final radon barrier on a tailings impoundment, any closure requirements in the Reclamation Plan relating to removal and disposal of non-conventional impoundments need not be milestones.

Nevertheless, although not required, we have added milestones for the removal and disposal of non-conventional impoundments to revised Section 6 of the Reclamation Plan. Although these milestones are not milestones required under Criterion 6A(1), EFRI has committed in revised Section 6 that for purposes of the Reclamation Plan they will be treated as milestones as required by Criterion 6A(1), and as a result EFRI has committed that they will be subject to the provisions of Criterion 6A(2).

The Trust's Reply:

See our response to Item No. 1 above.

8. Seven-Year Closure Goal

Energy Fuels' Response:

f) The Guiding Objective is to Complete the Final Radon Barrier Within Seven Years of a Tailings Impoundment Ceasing Operations

The Memorandum of Understanding (the "MOU") (see Appendix 5) Between EPA, NRC and The State of Colorado, Texas, and Washington Concerning Clean Air Act Standards for Radon Releases from Uranium Mill Tailings, Subparts T and W, 40 CFR Part 61, dated October 1991, which was entered into in connection with the rescission of 40 CFR Part 61 Subpart T, states that:

EPA, NRC and affected Agreement States are entering into this MOU to ensure that owners and operators of existing uranium mill tailings disposal sites licensed by the NRC, or the affected Agreement States, who have ceased operation, effect emplacement of a final earthen cover to limit radon emissions to a flux of no more than 20 pCi/m²/s, as expeditiously as practicable considering technological feasibility. A guiding objective is that this occur to all current disposal sites (see attachment A) by the end of 1997, and within seven years of when the existing operating and standby sites cease operation. The final closure requirement shall be enforceable by NRC or the affected Agreement States." (Emphasis added).

The MOU also states that: NRC or the affected Agreement States will ensure that the schedules and conditions for effecting final closure are flexible enough to contemplate technological feasibility and that

cover emplacement of the tailings impoundments occurs as expeditiously as practicable considering both short-term reductions in radon releases and long-term stability of the uranium tailings.

On November 15, 1993, EPA amended 40 CFR part 192 subpart D to provide for site closure to occur as expeditiously as practicable considering technological feasibility (including factors beyond the control of the licensee). In the Subpart D Preamble, EPA noted on page 36285 that:

The goal of the amendments to subpart D is for existing sites, or those that become non-operational in the future, to achieve compliance as expeditiously as practicable considering technological feasibility (including factors beyond the control of licensees) within the time periods set forth in the MOU, including Attachment A thereto, and for new sites to achieve compliance no later than seven years after becoming non-operational.

In the Subpart D Preamble, page 36288, EPA notes that:

EPA has modified its UMTRCA regulations (40 CFR part 192 subpart D) to require compliance with the 20 pCi/m² -s flux standard as expeditiously as practicable considering technological feasibility (and factors beyond the control of the licensee), and to require appropriate monitoring to verify the efficacy of the design of the permanent radon barrier. By definition, no more rapid compliance can occur, as a practical matter, because this schedule represents the earliest that the sites could be closed when all factors are considered. EPA expects that these compliance schedules were developed and will be modified consistent with the targets set forth in the MOU as reasonably applied to the specific circumstances of each site. When EPA promulgated subpart T it recognized that many sources might not be able to comply with the two year compliance date then required pursuant to section 112. Based on this, subpart T includes a provision that in such a case EPA would 'establish a compliance agreement which will assure that disposal will be completed as quickly as possible.' 40 CFR 61.222(b). The time period required for closure under subpart D embodies the same approach. In practice, therefore, both subpart T and subpart D establish the same basic timeframes for achievement of the flux standard. Assuming NRC and the Agreement States faithfully implement subpart D and the license amendments required under subpart D, EPA would not expect there to be any significant difference between these two programs in the amount of time required for sites to comply with the radon flux standard. Further, on page 36286, EPA states that: "although NRC's conforming regulations are not identical to subpart D, the differences are minor in nature, and properly reflect application of the subpart D requirements to NRC's separate regulatory program." The milestones set out in revised Section 6 of the Reclamation Plan are consistent with the targets set forth in the MOU as reasonably applied to the specific circumstances of the Mill site. The milestones require that the final radon barrier be placed as expeditiously as practicable considering technological feasibility (including factors beyond the control of licensees), as reasonably applied to the specific circumstances of the Mill site, and require that the final radon cover be completed within the seven-year guiding objective set forth in the MOU.

The milestones set out in revised Section 6 of the Reclamation Plan are consistent with the targets set forth in the MOU as reasonably applied to the specific circumstances of the Mill site. The milestones require that the final radon barrier be placed as expeditiously as practicable considering technological feasibility (including factors beyond the control of licensees), as reasonably applied to the specific circumstances of the Mill site, and require that the final radon cover be completed within the seven-year guiding objective set forth in the MOU.

The Trust's Reply:

We don't dispute that a goal in amending Appendix A to include milestones was to ensure that the final radon barrier was complete no later than seven years after final closure of an impoundment begins. As Energy Fuels appears to acknowledge, EPA and NRC, however, plainly meant for the final radon barrier to be built as quickly as possible considering technological feasibility, with the seven-year benchmark functioning as a maximum time limit, rather than a default for setting milestones.

EPA's preamble to its rulemaking rescinding 40 C.F.R. Part 61, Subpart T emphasizes this point:

The goal of the amendments to subpart D is for existing sites, or those that become non-operational in the future, to achieve compliance as expeditiously as practicable considering technological feasibility (including factors beyond the control of licensees) within the time periods set forth in the MOU, including Attachment A thereto, and for new sites to achieve compliance no later than seven years after becoming non-operational.¹⁸

Milestones should be set to impose deadlines that inspire expeditious closure of impoundments. Because seven years reflects the maximum amount of time that EPA and NRC believed would be necessary to close uranium-mill impoundments, we are skeptical that Energy Fuels' selection of a seven-year timeframe for milestones in Revised Section 6 creates a schedule that ensures that impoundments will be closed "as quickly as possible" considering technological feasibility.¹⁹ We accordingly urge the Division to independently scrutinize Energy Fuels' proposed milestones and require that they be accelerated where, in the Division's judgment, tasks can be performed more quickly than the milestones that Energy Fuels has proposed.

9. Reclamation-Schedule Flexibility

Energy Fuels' Response:

g) Schedules and Conditions for Effecting Final Closure must be Flexible.

The MOU states that:

NRC or the affected Agreement States will ensure that the schedules and conditions for effecting final closure are flexible enough to contemplate technological feasibility and that cover emplacement of the tailings impoundments occurs as expeditiously as practicable considering both short-term reductions in radon releases and long-term stability of the uranium tailings.

In revised Section 6 of the Reclamation Plan, we have set the milestones and schedule commitments for impoundments to be as firm as possible, while maintaining enough flexibility to contemplate technological feasibility, with an outside date of seven years from commencement of final closure for placement of the final radon barrier, in the case of conventional impoundments, as well as for removal and disposal, in the case of nonconventional impoundments. In the case of conventional impoundments, we have retained some flexibility to place Layer 2 (the final radon barrier) before or after completion of dewatering because

¹⁸ National Emissions Standards for Hazardous Air Pollutants, 59 Fed. Reg. 36,280, 36,285 (July 15, 1994).

¹⁹ See 10 C.F.R. Part 40, App. A (definition of "[a]s expeditiously as practicable considering technological feasibility").

the weight of Layer 2 may help to speed up the dewatering in some circumstances, which would help to expedite closure. In any event, Layer 2 (the final radon barrier) would be required to be placed within seven years from commencement of final closure of the impoundment. We have also added flexibility to add Layer 3 before or after completion of dewatering for the same reasons. We have added flexibility to complete dewatering up to two years after the final radon barrier is placed on the impoundment to allow some time for any resulting settlement, and we have added flexibility to place Layer 4 on the impoundment up to two years after placement of Layer 3, also to allow some time for any resulting settlement. None of this flexibility changes the seven-year milestone for completion of placement of the final radon barrier. We believe this flexibility is necessary to allow for proper dewatering and settlement.

We have added some flexibility to the milestones for removal and disposal of each nonconventional impoundment. We have set five years as the milestone to remove all freestanding liquids from the impoundment. Net evaporation at the site is about 30 inches per year, not counting additional inflows from area drainage into the cells that would occur during storm events. The depth of solutions in evaporation ponds could exceed fifteen feet, which would require more than five years to evaporate the solutions if no other evaporative capacity is available at the site. We believe we should be able to manage this five-year milestone by using any additional evaporative capacity that may be available at the site, or by timing commencement of final closure of the impoundment such that evaporation within a five-year period after final closure begins is reasonable to expect. It should be noted that the primary protection of Subpart W (requiring that all sediments in the pond be covered by solution) will apply prior to the impoundment commencing final closure, and for a good portion of the time it takes to evaporate the fluids (because solutions will continue to cover sediments during the evaporation process). We expect that the liners, sediments and any contaminated soils can be removed within three years thereafter, but in any event within a total elapsed time of seven years from the date final closure begins, and the milestone has been set accordingly.

These schedules are tight and fall within the seven-year goal. We do not believe it is reasonable to attempt to apply any further restrictions on the timing of any of the various steps. Although in some cases it may be possible to complete a step in less than the allocated time period, if commenced during the beginning of a construction season, it may take the full time period if commenced at a different time of the year. We have taken these seasonal matters into account in setting all of the milestones and schedule commitments.

The Trust's Reply:

The 1991 memorandum of understanding among EPA, NRC, and several agreement states that led to the addition of Appendix A's expeditious-closure requirements does observe, as Energy Fuels notes, that reclamation schedules must have enough flexibility to accommodate technological feasibility and take account of short-term radon reductions and long-term stability.²⁰

But this statement in the MOU does not supply standards for reclamation schedules that are independent of the ensuing standards adopted in Appendix A. Rather, Appendix A establishes how much flexibility is afforded for technological feasibility by carefully defining the phrases "[a]s expeditiously as practicable considering technological feasibility," "[a]vailable technology," and "[f]actors beyond the control of the licensee."²¹ It is plain from those standards that EPA and the NRC's goal was to afford very little flexibility in the schedule for completing the final radon barrier. Under Appendix A, the final radon barrier must be built "as quickly as possible" with little flexibility for the limits of available technology or factors beyond the licensee's control.

²⁰ Energy Fuels' Resp. at 33; App. 5 to Energy Fuels' Resp. at 2.

²¹ See 10 C.F.R. Part 40, App. A.

So long as Appendix A's expeditious-closure requirements are being met, the Trust doesn't object in theory to Energy Fuels' plan to retain some flexibility as to the timing for placing certain cover layers. Whether Energy Fuels' proposed milestones in Revised Section 6 of Plan Revision 5.1 are "as firm as possible," however, is a matter of engineering judgment that the Trust urges the Division to independently scrutinize.

10. Mill-Site Closure

Energy Fuels' Response:

h) Neither Subpart W, nor Appendix A, sets any timeframe or limit as to when an impoundment (whether conventional or non-conventional) must cease operation and begin final closure.

As discussed above, 40 CFR Part 61 Subpart W provides protection against radon flux while an impoundment is in operation. When the impoundment ceases operation and final closure begins, Subpart W no longer applies, but Appendix A takes over. Because Criterion 6(1) of Appendix A requires that the final radon barrier for a tailings impoundment must satisfy EPA's 20 pCi/m²/s standard, adequate protections against radon flux are ensured once the final radon barrier is constructed. The problem that 40 CFR Part 61 Subpart T was intended to address was the gap between the time an impoundment ceases operations, and Subpart W ceases to apply, and the time that the final radon barrier is completed under Appendix A. The requirement in Criterion 6A(l) for milestones therefore applies only to ensure the timely placement of the final radon barrier and for no other purpose, so as to make sure this gap is as short as practicable considering technological feasibility. Neither Subpart W, nor Appendix A, sets any timeframe or limit as to when an impoundment (whether conventional or nonconventional) must cease operation and begin final closure. This is because the protections in Subpart W continue so long as an impoundment is in operation, so there is no need to limit the period of operations. The milestones and targets only apply after an impoundment ceases operations and Subpart W no longer applies.

Subpart T applied to mill tailings "piles" that were no longer operational. The definition of "operational" in Subpart T stated that "A pile cannot be considered operational if it is filled to capacity or the mill it accepts tailings from has been dismantled or otherwise decommissioned". Subpart T was challenged by a number of parties, including the American Mining Congress and NRC on the basis that Subpart T was unnecessarily burdensome and duplicative with NRC regulations, and because it was physically impossible to come into compliance with Subpart T in the time required. Subpart T was rescinded by EPA in 1994 and the definition of "operational" was replaced with a definition of "operation," and the concept that an impoundment cannot be considered operational or in operation if it is filled to capacity or the mill it accepts tailings from has been dismantled or otherwise decommissioned was eliminated. As a result, after the rescission of Subpart T, there was no requirement for an impoundment to be deemed to be in final closure just because the mill site may be in closure or decommissioned.

This has been confirmed by the NRC in the NRC Preamble, page 28228, where NRC stated that:

If Subpart T is rescinded, there will be no regulatory requirement for the tailings impoundment to change from operational to non-operational status within any specified time after the mill ceases operation. The definition of "operational" in subpart T would have restricted the continued use of the impoundment for extended periods after the associated mill was decommissioned.

The Trust's Reply:

We agree that Subpart W continues to apply to all impoundments that are in "operation," and that the expeditious-closure requirements in Appendix A apply when impoundments cease to be in operation. We disagree, however, with Energy Fuels' argument that impoundments at the mill may remain in "operation" indefinitely after the mill closes.

In setting general standards under the Uranium Mill Tailings Radiation Control Act (UMTRCA) for managing and disposing of uranium tailings, EPA has long "intended and expected expeditious progress toward radon control once an active site *ceased milling operations*."²² When EPA adopted the milestone requirements that NRC incorporated into Appendix A, EPA observed that: "The crux of today's proposal is additional regulatory means to ensure expeditious and permanent control of radon emissions from uranium mill tailings piles *after active milling operations have ceased*."²³

This expectation is set out in Criterion 6 of Appendix A, which provides that "in disposing of waste byproduct material, licensees shall place an earthen cover (or approved alternative) over tailings or wastes *at the end of milling operations*..."²⁴ It is also consistent with EPA's definition of "phased disposal" in Subpart W—the method of tailings disposal that Energy Fuels uses—which contemplates using "lined impoundments which are filled and then *immediately* dried and covered to meet all applicable Federal standards."²⁵ Allowing impoundments at an otherwise decommissioned uranium mill to stay open indefinitely to accept uranium byproduct material from sources other than the mill is inconsistent with these regulatory provisions.

Added to that, EPA's rules in Subpart D and NRC's rules in Appendix A allow operators to seek, though a license amendment, to discard byproduct material from other sources *while an impoundment is being closed*, so long as doing so doesn't delay placement of the final radon barrier over the rest of the impoundment.²⁶ It would be anomalous to allow Energy Fuels to effectively bypass these requirements by keeping impoundments in "operation" indefinitely.

We acknowledge, as Energy Fuels points out, that NRC in responding to comments on its 1993 amendments to Appendix A observed that rescinding Subpart T would eliminate any regulatory requirement for taking impoundments out of operation when milling ceases.²⁷ Yet even if that is true, it doesn't follow that the agencies intended to allow a decommissioned uranium mill to keep impoundments in operation indefinitely, effectively turning the mill into a perpetual byproduct-material disposal site. Put differently, even if there is no regulatory requirement specifying a firm deadline for commencing "final closure" of impoundments, one purpose of Appendix A is nevertheless to ensure expeditious closure of impoundments "at the end of milling operations."²⁸ The Division should use its licensing authority to carry out that purpose.

We therefore believe that, even if Appendix A and Subpart W do not require impoundments to enter final closure at the time the mill is decommissioned, the Division should impose that requirement in

²² Health and Environmental Standards for Uranium and Thorium Mill Tailings, 58 Fed. Reg. 32,174. 32,178 (June 8, 1993).

²³ *Id.* at 32,176–77.

²⁴ 10 C.F.R. § Pt. 40, App. A, Criterion 6.

²⁵ 40 C.F.R. § 61.251.

²⁶ 10 C.F.R. Part 40, App. A, Criterion 6A(3).

²⁷ Energy Fuels' Resp. at 35.

²⁸ 10 C.F.R. § Pt. 40, App. A, Criterion 6.

the mill's license to carry out the expeditious-closure purpose reflected in Appendix A and Subpart D. We see two pathways for imposing that requirement. First, the Division could require final closure of all operating impoundments to commence at the time that mill-site closure begins (as we requested in our comments) and then authorize Energy Fuels to discard decommissioning materials in one or more impoundments during the closure process under Criterion 6A(3). Second, the Division could allow one impoundment to remain in operation until all mill facilities are demolished and buried in that impoundment, at which point final closure of the final impoundment would commence.²⁹

Nevertheless, if the Division declines to do that, we request at a minimum that the Division add a condition to Energy Fuels' radioactive materials license prohibiting the company from keeping impoundments in operation after mill closure begins unless Energy Fuels receives approval to do so from the Division through a license amendment, subject to public comment.

11. Milestone Revisions [pp. 35–39 of Energy Fuels' Response]

Beginning in the middle of page 35 and ending at the bottom of page 39 of its response, Energy Fuels addresses numerous comments that the Trust raised about reclamation deadlines. Rather than repeat each of Energy Fuels' responses on these items and reply to them individually, we address them collectively here.

We are grateful that Energy Fuels revised Section 6 of the reclamation plan in response to our comments on the matters addressed. We have only the following additional comments on these issues:

- Revised Section 6 of the Reclamation Plan calls for dewatering to commence when re-contouring is complete. It's our understanding that impoundment dewatering is initiated by turning on a pump connected to each impoundment's slimes-drain network. Although we can see an argument for delaying commencement of dewatering until after freestanding liquids evaporate from the impoundment (to minimize recharge into the slimes drain), we're puzzled by the plan to delay the dewatering process until after re-contouring is complete. Absent a compelling justification for that delay, we ask that the plan be revised to require dewatering to begin, at the latest, as soon as freestanding liquids are removed from the impoundment.
- As noted above, we believe milestones rather than schedule commitments must be established for placing Layers 3 and 4 of the ET Cover and Layer 3 of the 1996 conventional cover if that cover is built (although we re-iterate our comment that reverting to the 1996 conventional cover design without updating that design should not occur). And we believe those milestones should require placement of these additional layers, at the latest, within seven years after final closure begins. As the Revised Section 6 now reads, placement of Layer 3 on the ET cover could occur 9 years after final closure begins if Layer 2 isn't placed until 7 years after final closure begins. Placement of Layer 4 on the ET Cover could occur anywhere from 8 to 11 years after final closure begins.
- In our comments, we urged the Division to structure the schedule of milestones so that "the first deadline starts running the moment that 'final closure' begins, and the time limit for each subsequent reclamation step is automatically triggered when the prior step is completed or the deadline for the prior step passes, whichever occurs first."³⁰ Put differently, as is reflected in the table we included on page 19 of our comments, we sought milestones that imposed a deadline

²⁹ As noted above, if an evaporation pond is necessary for overall site remediation—such as for groundwater remediation—the Division could also license one to remain in operation for that purpose.

³⁰ Trust's Comments at 18.

triggered by the prior reclamation step and a maximum deadline that applied under any circumstance. In response, Energy Fuels has established only maximum deadlines in Revised Section 6 of Plan Revision 5.1.

We recognize that Appendix A does not explicitly address this issue. But we continue to believe that, for Energy Fuels to comply with Criterion 6A's requirement to build the final radon barrier "as expeditiously as practicable considering technological feasibility," milestones should have deadlines that set both a maximum time limit for each reclamation task and a time limit that runs from the completion of the prior task. If Energy Fuels completes a reclamation step early, the schedule of milestones should require the company to promptly begin the next reclamation task to ensure that construction of the final radon barrier proceeds "as quickly as possible"³¹ as required by Appendix A.

- Again, we urge the Division to independently scrutinize Energy Fuels' proposed reclamation milestones and schedule commitments to determine whether the deadlines are as tight as possible consistent with Appendix A's requirements.

12. Schedule Commitments for Vegetative Cover

Energy Fuels' Response:

As stated above, the milestones required under Criterion 6A do not include erosion protection barriers or other features necessary for long-term control of the tailings. In the NRC Preamble, page 28227, NRC states that:

The final rule has been modified so that the terminology 'as expeditiously as practicable considering technological feasibility' is used only for emplacement of the final radon barrier. A general timeliness standard for completing erosion protection features is retained. Thus, it is clear that the licensee must complete these actions in a timely way and that the NRC has the authority to take action if necessary in this regard. However, the restrictive cost considerations specified for the completion of the final radon barrier do not apply to decisions concerning the timeliness of completion of erosion protection features. Instead, the more flexible, general cost considerations of the AEA (Section 84a(1)) apply. (NRC 2015b)

Accordingly, revised Section 6 of the Reclamation Plan does not set milestones relating to vegetative cover. Instead it sets schedule commitments for completion of those activities. As those schedule commitments are not milestones required by Criterion 6A(1), the provisions of Criterion 6A(2) do not apply to those schedule commitments. Rather, EFRI is required to complete those activities in a timely way, and the Director has the authority to take action if necessary in this regard.

The Trust's Reply:

We agree that establishing vegetation on the ET Cover is not proposed for the purpose of reducing radon emissions to less than 20 pCi/(m²-sec) and that Appendix A therefore does not mandate that a milestone be established for that task (even though Energy Fuels initially proposed treating the vegetative-cover deadline as a milestone).

³¹ See 10 C.F.R. Part 40, App. A (definition of "[a]s expeditiously as practicable considering technological feasibility").

However, we again ask that a deadline be established not only for seeding but for establishing vegetative coverage and vegetative diversity in a way that meets the design criteria for the ET Cover (as described in Appendix D to the Updated Tailings Cover Design Report).³² Simply seeding the ET Cover should not end Energy Fuels' reclamation obligations, for establishing vegetation on the ET Cover is essential to its long-term sustainability.

13. Mill-Closure Schedule and Sequential Impoundment Closure

Energy Fuels' Response:

See revised Section 6 of the Reclamation Plan, which addresses this concern.

As stated above, nothing in Appendix A or Subpart W sets a time limit for when an impoundment (whether conventional or non-conventional) must cease operation and go into final closure, because Subpart W continues to apply so long as the impoundment is in operation. The milestones required under Criterion 6A only apply after the impoundment begins final closure, which is when Subpart W no longer applies to the impoundment. They do not dictate when final closure begins.

Revised Section 6 of the Reclamation Plan sets out milestones relating to closure of each conventional impoundment and each non-conventional impoundment. Those milestones commence when the impoundment begins final closure, regardless of whether that is prior to, during or after final closure of the mill facility itself. It is expected that one or more impoundments will continue in operation during the final mill closure process in order to receive decommissioning byproduct material.

The Trust's Reply:

We appreciate Energy Fuels' revisions to Section 6 to eliminate the requirement for submitting a separate mill-closure schedule and to eliminate the possibility that impoundments could be closed one-by-one. In regard to the question of whether impoundments may remain in operation after final closure of the mill facility begins, see our response under Item No. 10 above.

14. Mill-Closure Milestones

Energy Fuels' Response:

See revised Section 6 of the Reclamation Plan, which addresses this concern.

It is incorrect to state that "when Mill closure begins, it's necessarily true that 'final closure' of all operating impoundments will begin." As stated above, Criterion 6A(1) applies to each nonoperating impoundment. Neither Criterion 6A nor Subpart W dictates when an impoundment must begin final closure. Again, that is because the protections of Subpart W continue while an impoundment is in operation, so the rules are not concerned about when operations cease. They are only concerned about setting milestones that commence when each impoundment begins final closure, because the protections of Subpart W no longer apply to each such impoundment.

In revised Section 6, appropriate milestones are set for completing the final radon barriers for all tailings impoundments, which are tied to when each such impoundment ceases operation. It should be noted that,

³² See Ex. 16 to the Trust's Comments at App. D, particularly pp. D-30 to D-31.

as the Grand Canyon Trust has pointed out above, a tailings impoundment is in operation so long as it is receiving byproduct material for disposal. As all of the site decommissioning materials, windblown materials, evaporation pond liners etc., must be disposed of into the Mill's remaining tailings impoundments, and such materials are 11e.(2) byproduct material, one or both of the remaining tailings impoundments continue in operation until all such materials are disposed of in the tailings impoundments. The milestone for placing the final radon barrier on each remaining tailings impoundment must therefore be tied to the day that each such impoundment ceases operations. In accordance with Subpart W, a maximum of only two conventional impoundments will remain in operation at any one time. The milestones and targets in revised Section 6 of the Reclamation Plan set milestones and targets that address these matters.

It is not uncommon for a licensed uranium mill to maintain an impoundment in operation indefinitely after the rest of the Mill is decommissioned, to perform licensed operations, such as to receive 11e.(2) byproduct material from In Situ Recovery operations for direct disposal. In those cases, Subpart W continues to apply (which limits the number of impoundments that are in operation at any one time to two or fewer), so long as the impoundment continues in operation. There is no reason to assume that all impoundments cease operation upon commencement of Mill closure, and as discussed above, they are considered to remain in operation as long as they receive Mill decommissioning byproduct material.

Further, as discussed above, in the NRC Preamble, page 28228, NRC states that:

If subpart T is rescinded, there will be no regulatory requirement for the tailings impoundment to change from operational to non-operational status within any specified time after the mill ceases operation. The definition of "operational" in subpart T would have restricted the continued use of the impoundment for extended periods after the associated mill was decommissioned.

...

See previous comment. Revised Section 6 sets out all milestones required under Criterion 6A(1) and satisfies all requirements contemplated by Subpart W with respect to conventional and nonconventional impoundments that have ceased operation. As Subpart W applies while an impoundment is in operation, there is no requirement to dictate when an impoundment must cease operation and commence final closure.

...

See the previous response. Nothing in Criterion 6A(1) or Subpart W dictates when an impoundment must cease operations and go into final closure. Subpart W applies to each impoundment when it is in operation, and the milestones required under Criterion 6A(1) commence when final closure of the impoundment begins and Subpart W no longer applies. The purpose of this regulatory program is to ensure that there is no unregulated gap in radon protection, not to shut down uranium mills or their impoundments.

...

See the responses above. Milestones must be set for all non-operating tailings impoundments. A tailings impoundment is in operation so long as it is receiving byproduct material, which for some or all of the impoundments will continue throughout the Mill decommissioning process. Appropriate milestones have been set in revised Section 6 of the Reclamation Plan, which commence when each impoundment ceases operation, as required by Criterion 6A(1).

In the preamble to the Subpart W rulemaking (FR Vol. 82, No. 10 January 17, 2017) (the "Subpart W Preamble"), EPA states at page 5168 that:

In 10 CFR Part 40, Appendix A, NRC identifies a reclamation plan as applicable to individual impoundments, while the closure plan is a more comprehensive document that addresses all aspects of facility closure and decommissioning, including any necessary site remediation. A reclamation plan prepared and approved in accordance with NRC requirements in 10 CFR Part 40, Appendix A, is considered a reclamation plan for purposes of Subpart W. The reclamation plan may be incorporated into the larger facility closure plan (Emphasis added).

On page 5171 of the Subpart W Preamble EPA states that:

Both 40 CFR 192.32(a)(3) and 10 CFR Part 40 Appendix A, Criterion 6(a) provide for the use of impoundments while they are undergoing closure. However, impoundments that are used to manage uranium byproduct material or tailings generated during closure or remediation activities, while remaining open to manage operational wastes, would continue to fall under Subpart W until they formally enter the closure process and implement the approved reclamation plan for that impoundment. (Emphasis added).

Further, at page 5168 of the Subpart W Preamble, EPA stated: "[a]n impoundment remains "operating" until it enters closure, even if it is not receiving newly-generated uranium byproduct material or tailings from facility processing (79 FR 25404)."

Finally, at page 5166 of the Subpart W Preamble, EPA states that " ... [n]on-conventional impoundments remain subject to the requirements of Subpart W until they enter final closure pursuant to an approved reclamation plan for that impoundment, even if at some point in their operational life they are used for the purpose of managing liquids from closure or remediation activities." (Emphasis added).

It is clear from the foregoing that initiating Mill final closure does not initiate final closure of individual impoundments. There is nothing in the regulatory regime that requires this, nor should there be, since Subpart W continues until final closure of the impoundment begins, so there is no gap.

...

These matters are addressed in revised Section 6 to the Reclamation Plan.

Milestones are only applicable to placement of the final radon barrier on tailings impoundments after they have ceased to be in operation. As stated above, in describing Criterion 6A in the NRC Preamble, page 28225, NRC states that: "no deadlines are required to be established in the licenses beyond completing the final radon barrier as a result of this rulemaking and that any other schedules established in a license do not come under the specific provisions of paragraph (2) of Criterion 6A." In the NRC Preamble, page 28228, NRC further states that:

If subpart T is rescinded, there will be no regulatory requirement for the tailings impoundment to change from operational to non-operational status within any specified time after the mill ceases operation. The definition of "operational" in subpart T would have restricted the continued use of the impoundment for extended periods after the associated mill was decommissioned.

Further, as Grand Canyon Trust has pointed out, a tailings impoundment is in operation so long as it is receiving byproduct material, which will of necessity require that all or some of the impoundments must continue in operation during the entire Mill decommissioning process. As Criterion 6A only requires milestones to be applied after an impoundment ceases operation, the milestones required under Criterion 6A only apply once the impoundment ceases operations; they are not intended to set dates by which an impoundment must cease operations.

The Trust's Reply:

See our reply under Item No. 10 above.

15. Establishing Deadlines in the Radioactive Materials License

Energy Fuels' Response:

The Mill's Reclamation Plan is incorporated by reference into the Mill's license, and is enforceable as if it were stated in the License. There is no need to include the milestones in the License per se.

The Trust's Reply:

We don't dispute that incorporating the reclamation plan into the mill's radioactive materials license allows mandatory provisions of the plan, including milestones, to be enforced as if they were license conditions. As a practical matter, however, incorporating the plan by reference obscures its requirements by burying them in long documents that aren't necessarily easily accessible to the public. Many of the 27 documents currently incorporated by reference in License Condition 13.1 are not available to the public, and over time, the requirements of Reclamation Plan 5.1 may not be easily accessible either.

Because Appendix A requires milestones to "be established as a condition of the individual license,"³³ we again request that the Plan Revision 5.1's milestones be stated explicitly as a condition of the mill's individual license. That said, we suggest for sake of space that the license need not repeat Revised Section 6 of Revision 5.1 in its entirety, but rather should: (1) include a condition requiring compliance with the milestones and schedule commitments set out in Revised Section 6; and (2) include the Summary Table of Milestones that Energy Fuels included in Revised Section 6.

16. Liner Design for the Cell 1 Disposal Area

Energy Fuels' Response:

The so-called "Cell 1 Disposal Area" is not something new that EFRI added to the Reclamation Plan arbitrarily or to "flout" applicable regulations. The Cell 1 Disposal Area is part of the Mill's existing license. It was reviewed and approved by the NRC and was the subject of a specific license amendment (Amendment 15) in July 2000, which was supported by a Technical Evaluation Report the "Technical Evaluation Report" dated July 13, 2000. (

NRC's interpretation and implementation of its regulations in Appendix A are determinative. The Mill is not directly regulated by EPA's standards at 10 CFR Part 192. Those regulations merely set the standards to be adopted by NRC in its regulatory program, and do not form a parallel regulatory regime applicable

³³ 10 C.F.R. Part 40, App. A, Criterion 6A.

to uranium mill licensees. The AEA grants the EPA authority only to promulgate “standards of general application ... from radiological and non-radiological hazards associated with the processing and with the possession, transfer, and disposal of byproduct material, as defined in section 11e.(2) of this Act (NRC 2015a), at sites at which ores are processed primarily for their source material content or which are used for the disposal of such byproduct material” (AEA §275(b)(1)) (NRC 2015c) (Emphasis added). In contrast, Section 84(a) (NRC 2015b), grants exclusive management authority to the Atomic Energy Commission, now the NRC over 11e.(2) byproduct material “in such manner as the Commission deems appropriate” (§84(a)(1)) (NRC 2015b) while conforming “with applicable general standards promulgated by the Administrator of the Environmental Protection Agency under section 275” (§84(a)(2)) by establishing its own requirements “which are, to the maximum extent practicable, at least comparable to requirements ... regulated by the Administrator under the Solid Waste Disposal Act...” (§84(a)(3)) (NRC 2015b).

EPA’s standards were thus not intended to apply directly to uranium-milling operators. The purpose of this is clear from the legislative history to avoid dual regulation by federal agencies (or their Agreement States) by allocating specific and distinct, exclusive roles to each, and providing license applicants with clear guidelines on which to rely. EPA confirmed this interpretation in the Subpart D Preamble (page 32184) by stating that:

EPA is constrained by Congress in the scope of the UMTRCA amendments which the Agency may promulgate. EPA does not have the authority to provide for a legally enforceable means of compelling compliance with the UMTRCA requirements that are implemented by NRC ... EPA’s role in amending UMTRCA encompasses promulgating generally applicable standards without specifying any particular method of control. ... UMTRCA gives NRC and the Agreement States the responsibility to implement and enforce UMTRCA.

Nevertheless, even though the Cell 1 Disposal Area and its current design are an approved part of the Mill’s existing license, EFRI is prepared to agree to revising the wording in the Reclamation Plan to state that the liner system for the Cell 1 Disposal Area will have the same basic design as the liner system for Cell 4B, including the same basic leak detection system design, with the specific details of the design to be submitted to the Director for approval prior to construction of the Cell 1 Disposal Area.

The Trust’s Reply:

We are pleased that Energy Fuels has agreed to install a liner system for the Cell 1 Disposal Area that is the same as that used for Cell 4B, which we understand conforms to the requirements of 40 C.F.R. § 264.221. We thank Energy Fuels for making that offer and urge the Division to require the company to make this change to its reclamation plan. We also stand by all of our arguments that the liner for the Cell 1 Disposal Area must comply with 40 C.F.R. § 192.32(a)(1). On that point, we note that, although Energy Fuels disputed our argument that 40 C.F.R. Part 192, Subpart D applies directly to the mill’s operations (a point we don’t concede), the company did not dispute our arguments that Appendix A, Utah state law, and Subpart W all require installation of double liners with interstitial leak detection.³⁴

* * *

³⁴ See Energy Fuels’ Resp. at 47–48; see Trust’s Comments at 34–36.

November 17, 2017

Thank you again for the opportunity to reply to Energy Fuels' comments on these subjects. If you have any questions or would like additional information, please let me know.

Sincerely,

A handwritten signature in blue ink, appearing to read "A.M. Paul". The signature is fluid and cursive, with the first letters of the first and last names being capitalized and prominent.

Aaron M. Paul
Staff Attorney
Grand Canyon Trust

cc: Bret Randall, Assistant Attorney General, Utah Attorney General's Office



Ryan Johnson <rmjohnson@utah.gov>

Opportunity to provide Sur-Reply Comments to the State of Utah in Regards to your Previously Submitted Comments

4 messages

Ryan Johnson <rmjohnson@utah.gov>
To: kerrmp9@gmail.com
Cc: Bret Randall <bfrandall@agutah.gov>

Fri, Nov 3, 2017 at 11:17 AM

Mr.Kerr,

Please see attached a Notice informing you of the opportunity to provide Sur-Reply Comments as they relate to the comments that you submitted to the Utah Division of Waste Management and Radiation Control for the White Mesa Uranium Mill's Radioactive Waste License renewal.

--

Ryan Johnson, P.G.
Environmental Scientist/Health Physicist
Utah Division of Waste Management and Radiation Control

Disclaimer:

Statements made in this e-mail do not constitute the official position of the Director of the Division of Waste Management and Radiation Control. If you desire a statement of the Director's position, please submit a written request to this office, on paper, including documents relevant to your request

 **DRC-2017-008542.pdf**
1243K

Mark Kerr <kerrmp9@gmail.com>

Sun, Nov 5, 2017 at 3:16 PM

To: Ryan Johnson <rmjohnson@utah.gov>, "Lopas, Sarah" <Sarah.Lopas@nrc.gov>, jknudsen@fbi.gov

Mr. Johnson,

I have reviewed the EFRI comments in regard to my comments, and provide for your review the following:

EFRI response Pg 61

The major changes in technical specifications are not in the CQA report. I submitted a GRAMA request in regard to those major changes. If the engineer that performed the review also had knowledge of the changes, then answers to my GRAMA would be available, and by DWMRC requirements should be in the CQA report.

Also, if the engineer knew of, and observed the changes, then the engineer approved conflicting technical specifications. This is well documented. I have provided the details to DWMRC, and the NRC, and have followed up several times. As stated previously, nearly all the documents are DWMRC, URS, Geosyntec Consultants, and Denison Mines documents. DWMRC has copies. Surely DWMRC, given their review and observation, can answer a simple GRAMA request with more than stating I have been given all the information there is to give. What were the approved modifications? What were the changes in technical specifications? There were changes that DWMRC & URS considered critical components to the technical specifications. Surely those changes qualify as Major. They are not in the CQA report.

EFRI response Pg 62

The KGL blasting plan was approved prior to construction activities, by Denison Mines & Geosyntec Consultants, and was in compliance with the specifications. There was 'Sub-Drill', not over blasting. Denison & Geosyntec were aware of the sub-drill plan well ahead of blasting activities. Geosyntec reviewed the sub-drill months into construction activities, the adjustment to the sub-drill, and the adjustments were in compliance with the specifications.

Denison & Geosyntec were aware, by blast report, as soon as blasting began in December 2009 of the sub-drill. Geosyntec reviewed the sub-drill in March 2010. Then in May 2010, sub-drill, according to the Geosyntec, suddenly became 'overblasting'!

DWMRC & URS considered the Blast Plan to be a critical component of the technical specifications, and Geosyntec approved the blast plan with conditions in regard to soil cover. Then in March 2010, Geosyntec directs KGL to change the blast plan, contrary to their own approval and their own requirements for approval.

I did not claim that 'in his opinion' that the loose rock was acceptable for the Cell 4B foundation. We were excavating in accordance with the drawings and specifications, and blasting in accordance with the blast plan and specifications. Denison & Geosyntec specified the excavation to a level 6 inches below the design grade for engineered fill. In a letter to the Utah Radiation Control Board, Harold Roberts, Executive Vice President of Denison Mines, U.S. Operations indicates that the blasted rock will be removed. Then the design states that only 6 inches will be removed, in direct conflict with Roberts assurances. Furthermore, during the approximated 3 weeks of conflict and turmoil, while Roberts is attempting to convince me that this is not a change in the scope of work, and that KGL should remove the blasted rock without additional compensation, Roberts stated to me, on May 12, 2010, that there would be caves and caverns in the blasted rock, these would collapse and the liner would tear.

Roberts also stated to me "it's about time we quit jerking you around and delaying you", ('we' meant Denison & Geosyntec). At that time I had a one sided conversation with Roberts questioning him why he wouldn't step in and correct the conduct, and I commented to him to remember his statement. Roberts would not comment further.

I was concerned about all this conflict regarding the specification changes so I inquired by document to Geosyntec as to the details of the 'in-lieu

of shot rock removal' specification, as to if the UT DEQ regulators knew of the changes, and as to where the changes would be in the 'As Built' (CQA) report.

Geosyntec, by letter from Paul Sanner, Vice President and General Council, advised that this subject is not appropriate subject matter for agreed on request process, that the modification to compaction methodology (in-lieu of shot rock removal) was based on Geosyntec experience and that they assume engineering responsibility for the decision. He indicated that it was not their experience to be cross-examined on the grounds of an engineering determination by means of the approved request process, and for us to please revise or rescind the request. He didn't answer any of the questions in my request. Sanner referred to an earlier letter where he wrongfully describes sub-drill as over blasting, wrongfully interprets the specifications and bid documents, wrongfully describes the history of operations, wrongfully describes scheduling, and ignores delays caused by Denison & Geosyntec. Sanner validates Roberts comments in Roberts letter to URCB, that blasted rock may settle differentially or significantly if not removed and replaced with competent fill or re-compacted. The blasted rock was not removed or re-compacted, and the 'in-lieu of shot rock removal' process was not applied to the entire cell floor. The 'in-lieu of shot rock removal' specification was never explained, described by Specification, Precedent, ASTM, Generally Accepted Practice, or Prior Experience.

On May 19, 2010, Geosyntec came up with a plan, 'in-lieu of shot rock removal'. But this plan did not solve the deformation, discontinuous fractures & joints, caves & caverns that lead to 3 weeks of conflict. Geosyntec states this will provide for a firm and unyielding sub-grade surface, but Roberts' assurance letter to the URCB and his comments to me are about sub-surface, not sub-grade surface.

We did not abandon the job. We were forced off the project due to non-payment by Denison. For months, Denison & Geosyntec advised us that change notices for changes including blasting, delays, and obstruction by Indian ruins operations were in processing. These changes were result of direction by Denison/Geosyntec long before we were forced to take legal action. Roberts stated to the arbitrator that Denison denied the changes even though they were Denison & Geosyntec directed changes. These changes are well documented.

EFRI Response Pg 64:

The blasted (loose) rock was, in fact, NOT removed further than 6 inches below top of engineered fill, and the 'in-lieu of shot rock removal' plan was not applied to areas that Roberts and Geosyntec claimed were unacceptable. There was approximately 4 acres of cell floor with engineered fill in place, blasted with the same sub-drill depth, that was never reworked. This area was stated by S. Irwin of Geosyntec to be acceptable. At the time of his acceptance of one area, but not another, he was in direct conflict with the judgements of two professional engineers, Roberts & Corcoran of Geosyntec, the specifications and the construction plans & drawings. Then Irwin's judgement was overridden by the 'in-lieu of shot rock removal' plan, but the 4 acre area, that is now NOT (according to the the over ride) acceptable was never reworked. And according to EFRI, the DWMRC reviewed AND observed all of this and determined all was acceptable. This would mean that in several areas the acceptable construction directly conflicts with DWMRC, Denison Mines, Geosyntec, and URS documents. Geosyntec states that all these areas, (rock is ok, rock is not ok, 'in-lieu of' process applied in one area, no need to apply 'in-lieu of' process in another area) is all documented and observed by their personnel. These are Major changes and that documentation should be in the CQA report. The report states there were

'minor' changes, and concludes cell constructed in accordance with all drawing, specs, approved modifications. If so, answers to a GRAMA request should be simple.....all the information is there to forward.

Also, these are all Major changes and should be in the CQA report and answered by the reviewing/observing engineer. I was told the the engineer was not available for questions/comments.

EFRI General Response:

EFRI response to most of my comments is 'See general response above, or lacks sufficient detail to allow for a meaningful response'. There is plenty of detail as evidenced by DWMRC, URS, Denison, and Geosyntec documents, all of which DWMRC has copies.

EFCI's David Frydenlund, Senior Vice president, General Council and Corporate Secretary, who held a similar position with Denison Mines during Cell 4B construction, confirms that notice was given on the changes in Blasting, Rock Excavation, and rock material processing and compaction. Frydenlund also confirms the DRC engineer observation, review and approval, as stated by DRC to the NRC. Frydenlund confirms documentation of notice, review and approval between Corcoran/Geosyntec and the DRC engineer exists. In accordance with bid documents, permits, and licenses, this documentation is required. Notice of the changes, and approval by DRC was required prior to implementation, and these documents were required in the CQA report. However, the NRC and I have been advised that we have been given all information available. Obviously this is not the case. DRC provided information does not contain the documents. Answers to my GRAMA request do not contain this information. The CQA report does not have this information. Frydenlund, as Vice President of Regulatory Affairs with Denison Mines, would have, no doubt, been very familiar with these notices, changes in specs, observations, and DRC conclusions, as he has stated occurred, and as General Council would assure documentation was thorough and in accordance with regulatory compliance.

So, contrary to several permit, license, assurances, statements, directives and requirements, together with confirmation that the documents exist, the documents are not available and the DRC reviewing/observing engineer is also not available.

The reality is: Deception by Roberts and Denison Mines for personal and monetary gain. False certification by Corcoran and Geosyntec Consultants. DWMRC complicity in the entire affair.

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Mark Kerr <kerrmp9@gmail.com>

Sun, Nov 5, 2017 at 6:18 PM

To: Ryan Johnson <rmjohnson@utah.gov>, "Lopas, Sarah" <Sarah.Lopas@nrc.gov>, jknudsen@fbi.gov

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Mark Kerr

On Fri, Nov 3, 2017 at 10:17 AM, Ryan Johnson <rmjohnson@utah.gov> wrote:
Mr.Kerr,

Please see attached a Notice informing you of the opportunity to provide Sur-Reply Comments as they relate to the comments that you submitted to the Utah Division of Waste Management and Radiation Control for the White Mesa Uranium Mill's Radioactive Waste License renewal.

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Ryan Johnson, P.G.
Environmental Scientist/Health Physicist
Utah Division of Waste Management and Radiation Control

Disclaimer:

Statements made in this e-mail do not constitute the official position of the Director of the Division of Waste Management and Radiation Control. If you desire a statement of the Director's position, please submit a written request to this office, on paper, including documents relevant to your request

Ryan Johnson <rmjohnson@utah.gov>

Mon, Nov 6, 2017 at 7:08 AM

To: "Goble, Phillip" <pgoble@utah.gov>, Bret Randall <bfrandall@agutah.gov>

FYI

----- Forwarded message -----

From: **Mark Kerr** <kerrmp9@gmail.com>

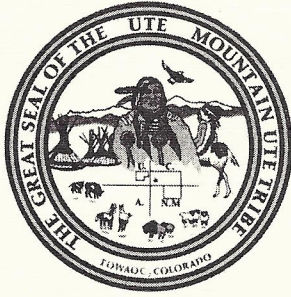
Date: Sun, Nov 5, 2017 at 3:16 PM

Subject: Re: Opportunity to provide Sur-Reply Comments to the State of Utah in Regards to your Previously Submitted Comments

To: Ryan Johnson <rmjohnson@utah.gov>, "Lopas, Sarah" <Sarah.Lopas@nrc.gov>, jknudsen@fbi.gov

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Ute Mountain Ute Tribe

Environmental Programs Department

P.O. Box 448

Towaoc, Colorado 81334-0448

(970) 564-5430

December 4, 2017

Scott Anderson
Director
Utah Division of Waste Management and Radiation Control
P.O. Box 144880
Salt Lake City, Utah 84114-4850
dwmrcpublic@utah.gov

Dear Mr. Anderson:

Thank you for allowing the Ute Mountain Ute Tribe (Tribe) to review and submit responses to the comments provided by Energy Fuels Resources (USA), Inc. (EFRI) on October 23, 2017 regarding the relicensing and ground water permitting at their White Mesa Mill facility that the State is now considering. As an opening statement, the Tribe does expect that the State's scientists and regulators will provide ***your own responses*** to comments in the public process and not rely solely on the responses of the regulated entity.

UMUT Reply to EFRI responses to the Tribe's Requested Actions to address groundwater contamination

As clearly stated in our original comments regarding the proposed license and GWDP, the Ute Mountain Ute Tribe (Tribe) is the closest neighboring community to the White Mesa Uranium Mill and has depended on and will continue to depend on water resources in the vicinity of the nearby community of White Mesa forever. Contamination of the shallow or deep aquifer systems by toxic metals and radioactive elements by the White Mesa Uranium Mill (the Mill) is a serious concern and threat to the health and welfare of the tribal community and the ecosystem that sustains the community and its members.

EFRI and DWMRC are proposing to increase compliance limits which serve as indicator parameters of Mill contamination in groundwater monitoring wells at the facility. There is recognized groundwater contamination caused by facility operations which is indicated by increasing concentrations of chloroform, nitrate, chloride, cadmium, selenium, thallium and uranium and declining pH. Concentrations of these indicator parameters are increasing (decreasing in the case of pH) significantly. The source identification work conducted to date has not been definitive and relies on old misrepresentative data and unproven theories and explanations.



For the reasons detailed in the Tribe's prior comments, the Tribe's Requested Actions are necessary and appropriate to evaluate the technical sufficiency of EFRI's unproven theories on the degrading condition of the shallow aquifer and the sources and causes of contamination. EFRI rejects all of the Tribes Requested Actions. These actions are necessary to ensure that impacts to groundwater are being fully and accurately evaluated in a technically sound manner based on current hydrologic conditions and data and to positively identify sources of pollution at the earliest possible point in time and to halt the degradation of the Burro Canyon aquifer.

The Tribe requests that DWMRC:

1. Require updated SARs for monitoring wells MW-24, -28, -5 and -31 at a more rigorous scientific level considering all 38 monitored GWDP parameters. The prior SARs rely on an outdated report (Hurst & Solomon, 2008), which has never been updated with further investigation as expressly recommended by that report and the pH (Intera Geosciences and Engineering, October 10, 2012) and pyrite (Hydro Geo Chem, Inc., 2012) reports which rely on preliminary calculations and modeling and unproven assumptions.

The 2008 report by Hurst and Solomon is based on isotopic and other data collected in 2007- over 10 years ago. Since that time the chemical and physical conditions of the shallow aquifer have changed significantly. It is technically unsound to rely on a report based on groundwater data and conditions which have changed so significantly without updating the report based on current data and conditions.

The USGS report (Naftz, Ranalli, Rowland, & Marston, 2011) recommended that isotopic analyses be integrated into monitoring requirements for the facility which has not been done.

The "pyrite report" (Hydro Geo Chem, Inc., 2012) relies on the outdated Hurst and Solomon report and advances unlikely and unproven theories regarding the chemical nature of the shallow aquifer based on a narrow evaluation of limited selection of analytes. This approach has prevented identification for sources of pollution continuing to degrade the quality of the shallow aquifer at the site.

EFRI has not properly or consistently applied its selected intra-well compliance monitoring well design for the facility. The intra-well approach necessarily requires that all 38 parameters in the Groundwater Discharge Permit (GWDP) be evaluated on a well by well, parameter by parameter basis. This is not being done.

Because of the fact compliance limits were developed on a well by well, parameter by parameter basis due to variability in the Burro Canyon aquifer, and then the analysis of facility impacts to groundwater must follow the same arrangement. Key indicators of facility impact to groundwater are expected to be different well by well depending on the spatial location of the discharge source and the exact flow path through the vadose zone and aquifer to the well. EFRI recognizes this concept when responding to the Tribe's comments regarding soil partitioning factors (Kd) when EFRI states, "the Kds for each constituent may change from location to location and may vary by depth as different soil conditions are encountered" (page 5, EFRI Comments). Changing Kd values will cause changes to adsorption/retardation behavior of contaminants and require an individual well by well parameter and parameter by parameter evaluation.



EFRI's suggestion that the frequency of chemical parameter detection in monitoring wells and tailings solution is somehow evidence that constituents in groundwater "have a ubiquitous presence across the Mill site" is technically wrong and directly contradicts EFRI's use of an intra-well compliance design based on EFRI's asserted premise that each monitoring well must be considered on its own (for GWCL development and compliance monitoring) due to the heterogeneous nature of the Burro Canyon formation and varying concentrations of constituents across the site.

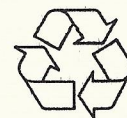
Page 4 of EFRI's response to selected public comments regarding the need for evaluation of the 38 indicator parameters with GWCLs states, "each constituent is evaluated, but most of these constituents are not considered to be nearly as good first indicators of potential impacts as chloride, fluoride, sulfate and uranium." EFRI's response highlights the problem with its approach to indicator parameters analysis for the site. EFRI limits the definition of potential facility impact to groundwater to four parameters (chloride, fluoride, sulfate and uranium) and only if those four parameters are all present and significantly rising. This approach means that EFRI really only considers one potential signature (well must have all of these four parameters present and rising in tandem) and is not evaluating each of the 38 parameters in the GWDP on a well by well, parameter by parameter basis as required by its selected intra-well compliance monitoring design for the facility.

The possible retardation of uranium and chloride based on site-specific data and peer-reviewed scientific literature has not been evaluated.

EFRI's suggestion that the mineral apatite is potentially acting as a solubility control for fluoride transport is not based on any data or other evidence showing this mineral to actually be present or a significant factor in the Burro Canyon formation at the site.

As set forth in the narrative in the section directly below Figure 11 in the Geo-Logic report submitted by the Tribe with its prior comments: "Section 3.2.1 Major Ions and General Water Quality Parameters", brings analyte concentrations into the discussion revealing that wells MW-30 and MW-31 exhibit the closest chemical compositions to fluids in Tailings Cell 2 LDS, that groundwater mounding near the northwest corner of the mill site has unique water chemistry not associated with the wildlife ponds and is impacting water chemistry downgradient of the tailings cells, and that a chloride source remains active (and uninvestigated) in the subsurface near the southeastern corner of Tailings Cell 1." See Geo-Logic page 42, "Average Chloride Concentrations" (Geo-Logic Associates, 2017).

2. For the foregoing reasons and reasons set forth in the Tribe's prior comments, require use of all 38 monitored GWDP parameters in developing modified GWCLs.
3. As recommended by EPA Guidance and for the reasons set forth in the Tribe's prior comments, require development and assessment of site-specific, rather than generic, Kd (soil partitioning values) for each of the 38 monitored GWDP parameters (or at least for the 4 indicator parameters and pH). Site-specific values could be readily obtained and used and would provide sounder technical support for conclusions about groundwater monitoring data.
4. For the foregoing reasons and reasons set forth in the Tribe's prior comments, require an updated isotopic groundwater and surface water investigation report. The 2008 Hurst & Solomon isotopic report has never been updated with further investigation as expressly recommended by that report. The report is based on isotopic and other data collected in 2007-



over 10 years ago. Since that time the chemical and physical conditions of the shallow aquifer have changed significantly. It is technically unsound to rely on a report based on groundwater data and conditions which have changed so significantly without updating the report based on current data and conditions. While an isotopic investigation report may not be required expressly under EPA guidance, EPA guidance does expressly state that it is unacceptable to raise a GWCL for a point of compliance (POC) well if there is a possibility that a facility may be the cause of the exceedance (Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities. Unified Guidance. EPA/530/R-09/007, 2009). There has been no showing by EFRI or DWMRC that the purported changing background concentrations detected in the Mill monitoring wells “[have] not been affected by that facility, activity or practice” as required by Utah regulations and the Unified Guidance. An updated comprehensive isotopic study is a requirement to provide proof of current EFRI and DWMRC theories regarding groundwater degradation at the site (Section 3 of our comments).

5. For the foregoing reasons and reasons set forth in the Tribe’s prior comments, require measurement and reporting of dissolved oxygen as part of the field parameter set. This is a routinely collected field parameter for evaluating groundwater quality and fate and transport of contaminants. EFRI’s claims about oxygen content to support its theories should be verified by collecting and reporting this routine parameter.
6. For the foregoing reasons and reasons set forth in the Tribe’s prior comments, rescind approval of modified GWCLs based on pH/pyrite investigation reports and require that any reliance on the pH/pyrite theory be supported by an updated isotopic study and results of humidity cell testing. The 2012 Hydro Geo Chem report (the pyrite report) relies on unlikely and unproven theories regarding the chemical nature of the shallow aquifer (Hydro Geo Chem, Inc., 2012) and a narrow evaluation of selected analytes for each well which has prevented identification for sources of pollution continuing to degrade the quality of the shallow aquifer at the site. The claim that the pyrite report and the pH report ((Intera Geosciences and Engineering, October 10, 2012) are based on site specific geochemistry is misleading, the calculations presented in the pyrite report are identified as “screening level” and the modeling as “preliminary”. The November 22, 2017 response to the Tribe’s GRAMA request for the computer modeling input files used in the Pyrite Report (Hydro Geo Chem, Inc., 2012) stated that DWMRC did not have the files. The DWMRC should not consider the Pyrite Report unless and until it has reviewed the computer modeling input files for that report and made those files available to the public prior to any final action on the renewal of the GWDP. Site specific data to prove the conclusions and theories in the pH and pyrite reports does not exist. The Geologic Report (Geo-Logic Associates, 2017) and the Tribes’ original comments (See Section 4, (Ute Mountain Ute Tribe, 2017)) detail the unacceptable shortfalls associated with both of these reports.
7. For the foregoing reasons and the reasons set forth in the Tribes’ prior comments, require direct testing of liner integrity and leak location surveys and direct testing of subsurface leakage to the vadose zone for the three legacy cells – 1, 2 and 3 - which lack double synthetic liners and leak detection systems. This is a conclusive way to determine the integrity of the liners of the legacy cells.
8. For the foregoing reasons and the reasons set forth in the Tribes’ prior comments, require a source assessment report and contaminant investigation for the chloride plume prior to approving modified GWCLs for wells associated with the chloride plume. Chloride has been



consistently cited by EFRI and DWMRC as the primary and most useful indicator of facility impact to groundwater.

9. For the foregoing reasons and the reasons set forth in the Tribes' prior comments, require southeast hydrologic investigation and report to determine the local groundwater flow directions and any preferential groundwater pathways between the cells and MW-22. This is absolutely necessary to ensure that the Tribe's lands and waters are being protected.
10. For the foregoing reasons and the reasons set forth in the Tribe's prior comments, require installation and monitoring of three new groundwater monitoring wells between tailings cell 4A and groundwater monitoring well MW-22. MW-22, which is nearest to the Tribal community, shows alarming chemical trends consistent with impacts from the mill and needs to be thoroughly investigated.
11. For the foregoing reasons and the reasons set forth in the Tribe's prior comments, designate groundwater monitoring well MW-22 a POC and require a SAR for OOC parameters.
12. For the foregoing reasons and the reasons set forth in the Tribe's prior comments, require periodic sampling of deep water supply wells and reporting of results in 4th quarter groundwater reports. The Tribal community depends on the deep aquifer as its source of drinking water; ongoing confirmation of the aquifer's protection is absolutely warranted.
13. For the foregoing reasons and the reasons set forth in the Tribe's prior comments, require analysis and reporting of uranium isotopes and calculation and reporting of the activity ratio for the isotopes in all of the groundwater monitoring wells. This was recommended by the USGS Report (2012) and concurred with by DWMRC, but never required. The DWMRC requires Energy Solutions to perform isotopic analysis and reporting under its GWDP.
14. For the foregoing reasons and the reasons set forth in the Tribe's prior comments, require calculation and reporting of annual water balance for the mill showing annual water use, consumption and loss. This is a routine practice at mining and milling and similar facilities to track inflows and outflows of systems being permitted for potential discharge to groundwater. A water balance is required on Utah's GWDP Application form.
15. For the foregoing reasons and the reasons set forth in the Tribe's prior comments, require assaying and reporting of thorium isotopes TH-230 and TH-232 in the conventional compound effluent.
16. On page 12 of EFRI's comments, they describe their offer to install additional monitoring wells and "the Tribe's apparent disinterest in such additional wells." The Tribe is certainly interested in the wells, as confirmed by our comments herein. Unfortunately the offer by EFRI included the provision that the Tribe cease requesting additional investigation of the groundwater mound on the northwest part of the facility and that the Tribe cease requesting more a robust suite of sampling parameters in certain other groundwater wells. The Tribe cannot compromise two of its concerns to achieve one another.



There is a compelling need for additional data collection to positively identify sources of pollution at the earliest possible point in time and halt the degradation of the aquifer. Our requests and reasons for asking for the addition of dissolved oxygen measurements as a field parameter for all groundwater monitoring at the Mill, direct liner testing and leak surveys for tailings cells 1,2 and 3, a new SAR for chloride, and a detailed hydrologic investigation to the south of the Mill along with the installation and testing of new POC wells in that area, all endure. The Tribe believes that the requests outlined on our comments (Ute Mountain Ute Tribe, 2017) are based in sound science and desire to protect human health and the environment as required by federal and UDWRC regulatory requirements. The Tribe requests that UDWRC comprehensively consider our original comments in their entirety and compel EFRI to take the necessary steps to ensure public health and the environment are protected.

Works Cited

- Geo-Logic Associates. (2017). *Updated Data Review and Evaluation of Groundwater Monitoring*. Tucson, AZ: Geo-Logic Associates.
- Hurst, G. T., & Solomon, K. D. (2008). *Summary of work completed, data results, interpretations and recommendations for the July 2008 Sampling Event at the Denison Mines, USA, White Mesa Uranium Mill Near Blanding, Utah*. Salt Lake City: University of Utah.
- Hydro Geo Chem, Inc. (2012). *Investigation of Pyrite in the Perched Zone White Mesa Uranium Mill Site, Blanding, Utah*. Tucson, Arizona: Hydro Geo Chem, Inc.
- Intera Geosciences and Engineering. (October 10, 2012). *Source Assessment Report White Mesa Uranium Mill. Blanding, Utah*. Albuquerque, New Mexico: Intera.
- Naftz, D. L., Ranalli, A. J., Rowland, R. C., & Marston, T. M. (2011). *Assessment of Potential Migration of Radionuclides and Trace Elements from the White Mesa Uranium Mill to the Ute Mountain Ute Reservation and Surrounding Areas, Southeastern Utah*. Reston, Virginia: U.S. Geological Survey Science Investigations Report.
- U.S. Environmental Protection Agency. (2009). *Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities. Unified Guidance. EPA/530/R-09/007*. Washington, DC: USEPA.
- Ute Mountain Ute Tribe. (2017, June 31). Ute Mountain Ute Tribe White Mesa Mill Groundwater Discharge Permit UGW370004 Comments and Statement of Basis Part III. Towaoc, CO.

Response to p. 17 -- *The thorium isotopes, Th-230 and Th-232 should also be individually monitored in the conventional compound effluent. Using gross alpha as a surrogate does not allow quantification of these isotopes individually, or any other additional alpha emitter in the tailing cell effluent "soup".*

The NRC Regulatory Guide 4.14 Rev. 1 *Radiological Effluent and Environmental Monitoring at Uranium Mills* is guidance for air, sediments, surface water, and groundwater sampling. It is also stated in section 2.1, "Any unusual release (such as surface seepages) that is not a part of normal operations should be



sampled.” (This language infers tailings leak detection systems). In section 2.2, the analyses are addressed: “Water samples should be analyzed for natural uranium, thorium-230, radium-226, polonium-210, and lead-210.” This guide strongly suggested that the radionuclide individual analysis is important and had been measured in the operational years 1980-2003 when the NRC had regulatory authority over mill operations. The NRC results have been added to the EFRI Annual Tailings Systems Wastewater Sampling Report each year in Tab E.

EFRI’s response to this question stated (p18) that Thorium-230 and Thorium-232 are minimally soluble at a pH greater than 4 and would not serve well as indicator parameters of potential tailing cell leakage into groundwater where it is presumed the groundwater would have a pH greater than 4. However at lower pH’s they are soluble, and as a consequence, the thorium’s would stay in solution in the tailings cells. Therefore thorium-230 and thorium-232 are not groundwater monitoring constituents under the GWDP.

From the 2016 Annual Tailings Systems Wastewater Sampling Report, the pH in the leak detection reports for the mill are in the table below.

Sample Description, pH, and Thorium Isotope Results 2016

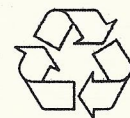
| Waste water stream | pH | Thorium-230 | Thorium-232 | Thorium-228 |
|--------------------|-------|-------------|-------------|-------------|
| Cell 1 | <1.00 | 677000 | 4480 | |
| Cell 3 | <1.00 | 72500 | 1670 | 983 |
| Cell 4A | 1.59 | 466000 | 2870 | |
| Cell 4B | 1.26 | 595000 | 3510 | 122 |
| Cell2 Slimes Drain | 2.99 | 5050 | | |
| Cell 4A LDS | 2.04 | 134000 | 1130 | |
| Cell 4B LDS | 1.88 | 368000 | 1010 | |

From these samples, it appears that the thoriums are in solution at low pH’s. Other studies including a DOI study, *Isolation of Uranium Mill Tailings and their Component Radionuclides From the Biosphere—Some Earth Science Perspectives*, have also backed up the fact that at lower pH the Th-230 as well as other metals have a higher probability of being in solution. “Acid –leach milling may dissolve from 30 to 90 per cent of the thorium in the ore.” (USGSp17)

The pH at the monitoring wells has been declining over the years; pH has been recorded at levels of 4.96 at MW24 Q1 2017 and of 4.51 at MW22 (Nov 16, 2016).

With this downward trend in pH, the thorium may or may not tend to precipitate out into the substrate material under the cells but travel in the aqueous component. The speciation of thorium isotopes, should prove to be a useful practice with this downward trend in the pH and the potential variations in pH which exist at and surrounding the mill site.

The DOI Report which consolidated mill thorium studies, stated that because the tailing cells are a mixture of all the mill liquid effluents, with organic and carbonaceous components and complexing agents, the thorium isotopes had low distribution coefficients on subsoil materials, i.e., not leaving the solution as expected.



The mill has been processing alternative fuels with radionuclide fractions not typical of the milling process or processing ore not from the area, i.e., possible higher quantities of the thorium isotopes other than thorium-230. The DEQ DWMRC specifically required air effluent environmental monitoring to include speciation of the thorium-230 and thorium-232. And all but the thorium-232 radionuclide analyses are also performed with the surface water samples. A similar assessment for the liquid wastewater from the tailings cells would provide a more uniform assessment if it did include Ra-226, Th-230, Th-232, and Pu-214 on a consistent basis.

The EFRI response also states that thorium-230 does not generate radon. The following table states the activity for decay products of thorium-230 for 1,000,000 decays per second, or Becquerels (Bq) of thorium-230, after 40 years, the time the mill has been in operation. As you can see, for each million atoms of thorium-230, there are over 17,000 Bq of radium-226, and over 17,000 Bq of radon-222 generated, and this many atoms of each of its decay products. This unit radioactivity can be multiplied by the isotopic concentration (activity per amount of liquid in a sample) with the amount of liquid in each of the impoundments and leak detection systems, to result in the amount of radioactivity of radium-226, and radon-222 and its decay products, which is certainly not a trivial amount.

Decay Calculations for 1,000,000 Bq of Th-230 over 40 years

| Nuclide | Activity |
|---------|----------|
| Th-230 | 999600 |
| Ra-226 | 17180 |
| Rn-222 | 17170 |
| Po-218 | 17170 |
| Pb-214 | 17170 |
| At-218 | 3.434 |
| Bi-214 | 17170 |
| Rn-218 | 0.003434 |
| Po-214 | 17170 |
| Tl-210 | 3.606 |
| Pb-210 | 7381 |
| Bi-210 | 7375 |
| Hg-206 | 0.00014 |
| Po-210 | 7209 |
| Tl-206 | 0.009875 |

Also should a problem arise and dose assessment is required, this can only be done accurately when an individual radionuclide or radioisotope concentration is assayed. The alternative to using individual radionuclides is a surrogate, which in the case of any alpha-emitter the choice is to use gross alpha data, the only option available. And as EFRI has noted, when the Tribe used the gross alpha as a proxy in the past, this was determined to be “an incorrect assumption”. (This leads the Tribe to question whether the gross alpha results would be useful as assumption of activity for any radionuclide.)

For dose assessment, due to different energies of the particulate or gamma radiation, thorium isotopes impart the energies to a biological system differently resulting in different doses for each isotope. This



difference is exhibited in the dose conversion factors for the isotopes. For example, the thorium-232 dose conversion factor for ingestion is 2.73E+06 rem/Ci, while for thorium-230, it is 5.48E+05 rem/Ci.

EFRI has been analyzing the wastewater samples for radium-226, thorium-228, thorium-230 and thorium-232 since 2015, and the resulting data has been useful for with respect to radionuclide fate and transport, especially with respect to the thorium isotopes.

References

Landa, E., *Isolation of Uranium Mill Tailings and their Component Radionuclides From the Biosphere—Some Earth Science Perspectives*, Department of Interior, 1980.

USNRC, NRC Regulatory Guide 4.14 Rev. 1 *Radiological Effluent and Environmental Monitoring at Uranium Mills*, 1980.

USNRC, *Radiological Toolbox Code*, Version 3.0.

Response to Emergency Response Plan (ERP) involving Ammonium Hydroxide (EFRI to S. Anderson, Director, DWMRC, October 23, 2018, p52 and p57)

The Tribe requested the ERP from DWMRC. The response via email from R. Johnston cited the 2009 ERP which specifically gives the scenario of the release of the 140,000 pound content of one of the tanks over a 10 minute period (pE-14) extending 12 miles from the point of origin.

If there is indeed an updated ERP, the DWMRC should have provided it to the Tribe so that the Tribe could have used the correct distance. Could the correct and updated ERP be sent to the Tribe in either email or regular mail format with the formal letters of correspondence (EFRI to DWMRC)?

The Tribe noted that the zone of exposure for the release involving the updated ERP was 6.9 miles, which is well within the range of the White Mesa community.

The remainder of the response seems to infer that an excessive release could only occur from catastrophic events or sabotage derived accidents. However we live in an age of terrorist behavior, and statistically, the only operational uranium mill in the country *is* a target. Aside from that, accidents do occur. The previous comment from the Tribe cited a website with a list of accidents due to ammonia to verify how often they have happened in the United States. EFRI's comment was that none of the more severe accidents on that listing so far happened in the *State of Utah or at the mill*.

Once again the Tribe will make the point that accidents due to anhydrous ammonia occur. The US Department of Labor OSHA website listed 63 accidents from anhydrous ammonia from 1985-2017 being caused in many situations due to human error and lack of proper maintenance. In addition, the EPA's *Hazards of Ammonia Releases at Ammonia Refrigeration Facilities* stated the following concerning anhydrous ammonia accidents. "Releases result from a number of situations that include plant upsets leading to over pressure conditions and lifting of pressure relief valves; seal leaks from rotating shafts and valve stems; refrigerant piping failures due to loss of mechanical integrity from corrosion; physical damage of system components from equipment collisions; hydraulic shock; and hose failures that occur



during ammonia deliveries. Some of these incidents have led to injury and fatalities on-site as well as causing adverse off-site consequences.” Although the mill is not a refrigeration facility, similarities exist with using the large quantities of ammonia for industrial settings.

In the discussion for a release of the 140,000 pound tank in its entirety, the EFRI response identified several safety features built into the system which would prevent such an accident from occurring. These safeguards are certainly an asset for maintaining safety for the workers at the plant, the community at White Mesa, and the general public.

References

Email correspondence from R. Johnson, DWMRC, to J. Archuleta, UMUT Environmental Programs, June 20, 2017.

US Department of Labor, Office of Safety and Health Administration,
https://www.osha.gov/pls/imis/accidentsearch.search?sic=&sicgroup=&naics=&acc_description=&acc_abstract=&acc_keyword=%22Anhydrous%20Ammonia%22&inspr=&fatal=&officetype=&office=&startmonth=&startday=&startyear=&endmonth=&endday=&endyear=&keyword_list=on&p_start=&p_finish=20&p_sort=&p_desc=DESC&p_direction=Next&p_show=20

US EPA, Environmental Protection and Emergency Response Agency EPA 550-F-01-009, August 2001.
<https://www.epa.gov/sites/production/files/2013-11/documents/ammonia.pdf>

Response pages 52-59 concerning lack of notification to Tribe and procedures.

The Tribe is aware that there are several tiered approaches to emergencies, spills, and transportation accidents. The Tribe did not have access to the Alternate Feedstock Material Procedures that EFRI submitted to the state in 2017, which EFRI stated contains the SOP’s for the leaking containers, and request a copy.

The tribe is aware that the state is to be notified within a given timeframe of an emergency. The DWMRC also through the Agreement State status, has the authority to direct the mill to undertake actions to ensure safety to the public and environment, as well as workers, other than what is listed under the license agreement.

The Tribe appreciates being considered for listing for notifications by EFRI for Emergency situations and an additional letter is forthcoming with respect to this.

Although EFRI responded that none of the leaking shipments at this time crossed the Tribal lands, the Tribe has a travel center that is frequented by trucks and future shipments are planned to cross the Tribal lands.

In addition in the explanation of the leaking trucks, EFRI’s response infers that there was no release of the material in the 2016 shipment when indeed there was material released. The NRC report (p4) of the March 29, 2016 Shipment stated, “The contamination levels for the March 2016 Shipment, as reported by the State of Utah, for radiological material along the roadway to the White Mesa site ranged between 9360 dpm per 100 cm² to 5850/ 100 cm² for total direct alpha survey and 0.04 to 0.08 millirem per hour beta/gamma surveys. Removable alpha contamination for the asphalt roadways used



by the carrier for the March 2016 shipment was reported as 383 to 493 dpm/100cm².” In addition to this the amount of spilled material on the truck was fixed and removable which infers it could fall off of the truck while the truck travelled at typical highway speeds of 65 miles per hour.

Material was spilled along the roadway, and roads are public access. Road rights-of-way are considered from fence to fence on either side of the road. *The members of the tribe are members of the public* and since they reside there are more likely to be exposed to any contamination and uncontrolled releases relating to the mill whether originating at the mill or as a result of transportation of radioactive materials en route to or coming from the mill.

Reference:

USNRC Correspondence to Brent Berg , President Cameco Resources Power Resources, *NRC Inspection Report 040-08964/2016-003*, April 3, 2017.

Page 59 Response to Question 2 regarding the exceedance of the mill’s Air Approval Order.

The limits stipulated in an operating order are designated to be complied with at all times and it does not matter whether the annual emissions for the entire year have been met.

[Air Quality Approval Order DAQE-AN0112050018-11](#) states:

“II.B.2. a. Emissions to the atmosphere at all times from the indicated emission points shall not exceed the following ratings and concentrations:...”

Page 60 Response to Question 3 involving the photo of the brown cloud that was emitted by the mill.

The response here and in the past from EFRI or the DAQ did not present any data to back up the gaseous release. Please provide verification of these statements presented concerning the ‘discrete samples’ to monitor the inorganic and acid gas parameters of chlorine, hydrogen fluoride and acid gases with data from the monitoring devices.

Effective approximations for pollutants and radioactive materials can be easily performed by using codes. There is a meteorological station at the mill which can be accessed for the real conditions during this time and air dispersion codes using the Gaussian dispersion model exist.

Comments on Reclamation and 10 CFR Part 40

Section B.2.a pp.21, last ¶, In EFRI’s response they state “evaporation ponds at the Mill do not have radon barriers:” This statement misleads a reader to believe that all of the “tailings impoundments” have radon barriers, when in fact only Cell 2, in closure, has a radon barrier. Cells 3 and 4A do not have radon barriers and neither does Cell 4B which is constructed to be a “tailings impoundment,” but



currently does not meet EFRI's narrow definition of a tailings impoundment. Cell 3 violated the Clean Air Act NESHAPS radon emissions criteria shortly after Cell 2 violated the Clean Air Act, 5 years ago.

Section B.2.a pp.22, first ¶, quotation from 10 CFR Part 40, Appendix A regarding regulatory discretion on evaporation ponds: The Tribe requests that the DWMRC performing as an Agreement State, uses its broad regulatory discretion in protecting the environment and implementing 10 CFR Part 40, to regulate evaporation ponds in the same manner as "tailings impoundments." This would vastly improve the ability to come to common ground among all concerned parties in the implications of both NRC and EPA rules at the Mill.

Section B.2.a pp.22, second ¶, The statement that "none of the Mill's evaporation ponds will have a radon barrier...:" This is relative to the previous point, and quite misleading. Cell 4B is constructed to receive tailings sands and will eventually receive those 11e.(2) by-product materials as well as the hazardous materials currently being disposed of in that cell- including dissolved radioactive wastes that will eventually crystallize or adsorb onto solids and be permanently stored in that cell. It is only a delay in defining the cells as tailings cells to defer adequate bonding when the intention is to store hazardous waste in there forever, regardless of whether currently it is mostly dissolved liquid waste. It is still a waste stream from the Mill. In "Appendix 2, Revised Section 6 to the White Mesa Mill Reclamation Plan, 6.2.1 (c), the fine line that EFRI describes in defining Cell 4B- constructed in a similar manner to Cell 4A- to meet the requirements of 40 CFR Part 61, Subpart W- as not being a "tailings impoundment" does not accurately describe the intention of its construction. It was constructed as a tailings impoundment and that is what it is. Similarly, EFRI redefined Cell 1 as an evaporation cell, after decades of just calling it what it is, during the EPA's revision of the 40 CFR Part 61, Subpart W rule.

Section C.1.h pp.41, second ¶, "It is expected that one or more impoundments will continue in operation during the final mill closure process in order to receive decommissioning byproduct material:" This is an understandable part of the reclamation process but it conflicts with statements in the next pages of EFRI's response, see below.

Section C.1.h pp.41, last ¶, pp. 42, first ¶, "impoundments continue in operation until all such materials are disposed of in the tailings impoundments:" As stated above, it is reasonable that an impoundment remain open during mill decommissioning, but it conflicts with statements made in the next paragraph.

Section C.1.h pp.41, last ¶, pp. 42, second ¶, "It is not uncommon for a licensed uranium mill to maintain an impoundment in operation indefinitely after the rest of the Mill is decommissioned, to perform licensed operations, such as to receive 11e.(2) byproduct material from In Situ Recovery operations for direct disposal... they are considered to remain in operation as long as they receive Mill decommissioning byproduct material:" The Tribe strongly objects to this line of reasoning. If the Mill is decommissioned, then it is no longer a Mill and when the decommissioning is completed and all of those materials are disposed of, then the impoundments need to be closed. The position that "it is not uncommon" to simply transition into being an outright disposal facility receiving 11.e(2) wastes within the purview of the Mill license is not fully supported by the statute that EFRI is citing. The intention is clearly, as stated twice by EFRI to keep an impoundment or two open to accommodate the decommissioning of a mill. When the mill is taken apart and the materials from that mill are stowed away forever in impoundments, those impoundments should enter into final closure.



10 CFR Part 40 Appendix A Criterion 6A (3):

“The Commission may authorize by license amendment, upon licensee request, a portion of the impoundment to accept uranium byproduct material or such materials that are similar in physical, chemical, and radiological characteristics to the uranium mill tailings and associated wastes already in the pile or impoundment, from other sources, during the closure process. No such authorization will be made if it results in a delay or impediment to emplacement of the final radon barrier over the remainder of the impoundment in a manner that will achieve levels of radon-222 releases not exceeding 20 pCi/m²s averaged over the entire impoundment. The verification required in paragraph (2) of Criterion 6 may be completed with a portion of the impoundment being used for further disposal if the Commission makes a final finding that the impoundment will continue to achieve a level of radon-222 releases not exceeding 20 pCi/m²s averaged over the entire impoundment. In this case, after the final radon barrier is complete except for the continuing disposal area, (a) only byproduct material will be authorized for disposal, (b) the disposal will be limited to the specified existing disposal area, and **(c) this authorization will only be made after providing opportunity for public participation.** Reclamation of the disposal area, as appropriate, must be completed in a timely manner after disposal operations cease in accordance with paragraph (1) of Criterion 6; however, these actions are not required to be complete as part of meeting the deadline for final radon barrier construction. **[Emphasis added].**”

If EFRI wants to run it as a radioactive waste dump in perpetuity, without even the parallel operation of a mill, then EFRI should apply for a license for radioactive waste dump and not retain a mill license. It is clearly implied by NRC that this requires a separate and discrete public process, not simple inclusion in the public process currently being undertaken by DWMRC for the purpose of the mill license. Further, the Tribe does not understand how this could be considered “common” when the White Mesa Mill is the only privately owned uranium mill facility in the United States in operation. Nothing is common here, especially not in 2017 under the laws of the United States of America.

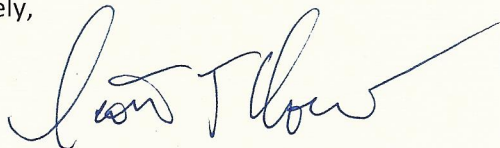
Section G, pp. 48, fourth ¶, “EFRI is prepared to agree to revising the wording in the Reclamation Plan to state that the liner system for the Cell 1 Disposal Area will have the same basic design as the liner system for Cell 4B, including the same basic leak detection system design, with the specific details of the design to be submitted to the Director for approval prior to construction of the Cell 1 Disposal Area:” There are two unexplained details in this statement. First, the reclamation plan currently under consideration includes the Cell 1 Disposal Area, as did previous plans. So, it needs to be clear to the public, and to the regulators that this more protective design is being proposed again now, in this license application process. To wait until some indeterminate time in the distant future to propose the design cannot be supported by a license issued in the near future. The primary reason for this need for an actual proposal immediately is because it needs to be considered in the annual surety assessment for the facility and the license compliance. Construction of a synthetically lined cell is far more expensive than the construction of a clay-lined cell, and installation of a dual-lined system with leak detection instead of something similar to the supplemental monitoring well network installed in lieu of a leak detection system is vastly more expensive. These designs need to be supported by the adequate surety to ensure that when the facility is no longer profitable, EFRI or some future licensee does not leave that



bill for the American taxpayers to pay. The revised design needs to be incorporated into the current application and the 2018 surety needs to reflect it adequately, if the license is issued.

We appreciate the opportunity to clarify our positions on these issues.

Sincerely,

A handwritten signature in blue ink, appearing to read "Scott Clow", with a long horizontal flourish extending to the right.

Scott Clow

Environmental Programs Director

Ute Mountain Ute Tribe



Uranium Watch

P.O. Box 344
Moab, Utah 84532
435-260-8384

November 16, 2017

via electronic mail

Scott Anderson
Director
Utah Division of Waste Management and Radiation Control
P.O. Box 144880
Salt Lake City, Utah 84114-4850
dwmrcpublic@utah.gov

RE: Energy Fuels Resources (USA) Inc., White Mesa Mill, License No. UT1900479.
License Renewal. Response to November 2, 2017, DWMRC Notice Regarding
Submission of Sur-Reply Comments.

Dear Mr. Anderson:

Below please find comments in response to the Division of Waste Management and Radiation Control's (DWMRC's) November 2, 2017, Notice Regarding Submission of Sur-Reply Comments regarding the White Mesa Uranium Mill, San Juan County, Utah. These Sur-Reply Comments address the Energy Fuels Resources (USA) Inc. (Energy Fuels, or Licensee) "Response to Public Comments on the White Mesa Mill Groundwater Discharge Permit and Radioactive Materials License," dated October 23, 2017. The Energy Fuels' October 23 comments were responsive to an October 3, 2017, DWMRC letter requesting Licensee response to certain comments submitted Uranium Watch et al. and other commenters. The Sur-Reply Comments are submitted by Uranium Watch, Living Rivers, and the Utah Chapter of the Sierra Club.

1. URANIUM WATCH ET AL. COMMENTS

Below are comments on Energy Fuels comments on Uranium Watch (UW) comments submitted to the DWMRC August 2017, pages 48 to 51.

1.1. UW Comment 4.10.1.

UW asked that the DWMRC establish a License Condition specifically for the Reclamation Plan(s), rather than just include the Reclamation submittals in a long list of other, unrelated Licensee submittals. Energy Fuels feels that this is not necessary. However, since the Reclamation Plan submittals are significant and will likely include additional submittals over time, it is not unreasonable to ask that all of the Reclamation

Plan documents that have been, or will be, incorporated into the license via the license amendment process be referenced in one place, under a specific license condition devoted to reclamation and radon closure plans. This would also include including any orders or consent decrees. Additionally, the DWMRC must establish license conditions that incorporate the reclamation milestones and schedules as specific license conditions. The Nuclear Regulatory Commission (NRC) consistently incorporated reclamation milestones as specific license conditions in uranium mill licenses. The reclamation schedules were not hidden within reclamation plans that could be hundreds of pages long or consent decrees. Attached is the most recent NRC license for the Homestake Mill (New Mexico) with reclamation milestones in License Condition 36. *See Exhibit A.*

1.2. UW Comment 4.10.3.

UW discusses the need for specific license conditions and specific license amendment requests related to the final radon barrier reclamation milestones for Cell 2. The Licensee and DWMRC negotiated a Consent Agreement establishing Cell 2 reclamation milestones and other reclamation actions. The DWMRC did not amend the license to incorporate the reclamation schedule and milestones into the license as specific license conditions. Nor, did the DWMRC provide an opportunity for public comment on the various stipulations, including milestones. This was contrary to requirements for the establishment of enforceable reclamation milestones.

The October 1991 Memorandum of Understanding (MOU) between the NRC, Environmental Protection Agency (EPA), and the NRC Agreement States of Colorado, Texas, and Washington provides specific instructions regarding public notice and comment for the incorporation of reclamation schedules and milestones into uranium mill licenses. *See Exhibit B.* Utah, as an NRC Agreement State is also subject to this MOU. The *Memorandum of Understanding Between EPA, NRC and of State of Colorado, Texas, and Washington Concerning Clean Air Act Standards for Radon Releases from Uranium Mill Tailings, Subparts T and W, 40 CFR Part 61*¹ states, with respect the need for public notice and comment to incorporate reclamation plans or other schedules for effecting final closure into licenses:

2. NRC agrees to provide for public notice and comment by publishing in the *Federal Register* receipt of requests, intent to issue amendments, or intent to issue orders which (1) incorporate reclamation plans or other schedules for effecting final closure into licenses, and (2) amend reclamation schedules as necessary for reasons of technological feasibility (including inclement weather, litigation which compels delays to emplacement, or other factors beyond control of the licensee) after the reclamation plans have been incorporated into the licenses. The affected Agreement States agree to provide comparable public notice and

¹ 56 Fed. Reg 67568; December 31, 1991. Exhibit B.

comment.

It appears that there are additional closure milestones for Cell 2 that have yet to be met. It is unclear if Energy Fuels will continue to dewater Cell 2. Completion of Cell 2 dewatering would be an appropriate milestone, as would the placement of erosion protection. The NRC regulatory program includes the placement of erosion protection cover to ensure required longevity of the covered tailings and incorporates milestones for placement of erosion protection as part of reclamation to comply with Criterion 6 of Appendix A of 10 CFR Part 40. *See* Exhibit A, License Condition 36.B.1.

The MOU makes it clear that the DWMRC (as an NRC Agreement State) must provide public notice and comment on 1) receipt of requests, 2) intent to issue amendments, or 3) intent to issue orders which (1) incorporate reclamation plans or other schedules for effecting final closure into licenses—prior to agency action. The DWMRC failed to provide public notice of its intent to issue the *Stipulated Consent Agreement* (essentially an order) establishing milestones for Cell 2. The milestones were not incorporated into the draft license issued for public comment in May 2017 as specific license conditions. Nor were there any license conditions that informed the Licensee of the steps to take to amend reclamation schedules as necessary for reasons of technological feasibility (including inclement weather, litigation which compels delays to emplacement, or other factors beyond control of the licensee). Such license conditions are found in the Homestake License, License Condition 36.C. and D. *See* Exhibit A.

1.3. Reclamation Plan Section 6.

The October 23 Energy Fuels response to commenters includes a revised Section 6 of the Reclamation Plan and proposed reclamation schedules for reclamation actions, excluding Cell 2. According to the MOU, the DWMRC **MUST** provide for public notice of 1) the receipt of the October 23 Energy Fuels reclamation schedule in the revised Section 6 and 2) the DWMRC intent to issue amendments to incorporate the proposed reclamation milestone schedules in the White Mesa Mill License, after review of initial public comments. The DWMRC has yet to notice the receipt of the amended Section 6 of the Reclamation Plan and the proposed reclamation schedules for public comment. After review of those comments, the DWMRC must notice their intent to incorporate the proposed (or revised) schedules into the White Mesa Mill License.

2. GRAND CANYON TRUST COMMENTS

Below are comments on Energy Fuels discussion of the Grand Canyon Trust comments submitted to the DWMRC August 2017 (pages 26 to 48).

2.1. Milestone Requirements:

Energy Fuels discusses milestone requirements for the final radon barrier and asserts that only three milestones are required: completion of windblown tailings retrieval and placement on the pile, and interim stabilization (pages 26 to 29). Energy Fuels cites 10 C.F.R. Part 40 Appendix A, Criterion 6A.

However, it is clear that the EPA intended that the radon closure milestone activities not be limited to the three milestones referenced by Energy Fuels. The EPA, in rescinding Subpart T, states with respect “*E. Actions by NRC and EPA Pursuant to the MOU and Settlement Agreement, EPA Regulatory Actions*”:

In addition, subpart D requires that licensees ensure that radon closure milestone activities, **such as** wind blown tailings retrieval and placement on the pile, interim stabilization (including dewatering or the removal of freestanding liquids and recontouring), and radon barrier construction, are undertaken to achieve compliance with, including attainment of, the 20 pCi/m² - s flux standard as expeditiously as practicable considering technological feasibility.² [Emphasis added.]

Further, EPA standards at 40 C.F.R. Part 192, Subpart D—Standards for Management of Uranium Byproduct Materials Pursuant to Section 84 of the Atomic Energy Act of 1954, as Amended, states (in part) at Section 192.31(n):

Tailings Closure Plan (Radon) means the Nuclear Regulatory Commission or Agreement State approved plan detailing activities to accomplish timely emplacement of a permanent radon barrier. A tailings closure plan shall include a schedule for key radon closure milestone activities **such as** wind blown tailings retrieval and placement on the pile, interim stabilization (including dewatering or the removal of freestanding liquids and recontouring), and emplacement of a permanent radon barrier constructed to achieve compliance with the 20 pCi/ m²-s flux standard as expeditiously as practicable considering technological feasibility (including factors beyond the control of the licensee). [Emphasis added.]

As discussed above at 1.2., the NRC regulatory program includes the placement of erosion protection cover to ensure required longevity of the covered tailings and incorporates milestones for placement of erosion protection as part of reclamation to comply with Criterion 6 of Appendix A of 10 C.F.R. Part 40. *See* Exhibit A, License Condition 36.B.1. Without timely placement of the erosion protection cover(s), erosion could compromise the effectiveness of the final radon barrier. The erosion protection barrier layer, or layers, is an integral part of the final closure of a tailings impoundment and is necessary to maintain compliance with the radon emission standard.

The DWMRC has the authority to require any enforceable reclamation milestone, whether or not it is associated with the placement of the final radon barrier. Therefore, it is entirely appropriate and advisable for the DWMRC to include the schedule for the placement of additional layers, such as the proposed Water Storage/Biointrusion/Frost

² 59 Fed. Reg. 36280, 36284, Col. 2; July 15, 1994.

Protection/Secondary Radon Attenuation Layer and Erosion Protection Layer as enforceable reclamation milestones.

2.2. Evaporation Pond Milestones.

Energy Fuels (pages 30 to 31) argues that milestones are not required for evaporation ponds and quotes from EPA and NRC statements. However, it is apparent that the evaporation ponds that the EPA and NRC were referring to in 1993 were the evaporation ponds that were being used as part of over all site reclamation plans and requirements. Evaporation ponds at sites undergoing site closure were, and still are, being used as part as groundwater restoration actions. All of the tailings impoundments that were subject of the 1991 MOU were unlined impoundments, so that groundwater cleanup and restoration was, and still is, an important element of site closure and reclamation of those mill sites. There is yet no indication that Energy Fuels will need evaporation ponds, such as Cell 1, or evaporation ponds on top of tailings impoundments to store and evaporate contaminated groundwater from groundwater restoration actions. Since the final closure of the White Mesa Mill will involve the dismantling of Cell 1, a reclamation milestone for a lined pond used solely for storage and evaporation of mill-processing liquid effluents is appropriate.

2.3. Cessation of Operation.

Energy Fuels asserts (page 34 at h) that, “Neither Subpart W, nor Appendix A, sets any timeframe or limit as to when an impoundment (whether conventional or non-conventional) must cease operation and begin final closure.” Energy Fuels looks to Subpart T and the Subpart Rescission to support their claim that “after the rescission of Subpart T, there was no requirement for an impoundment to be deemed to be in final closure just because the mill site may be in closure or decommissioned.”

Energy Fuels assertion is not supported by EPA definitions of “closure,” “operation,” and “final closure.”

The EPA has defined “closure” of a tailings impoundment in Standards for Management of Uranium Byproduct Materials Pursuant to Section 84 of the Atomic Energy Act of 1954 since they were promulgated in 1983:

(h) Closure period means the period of time beginning with the cessation, with respect to a waste impoundment, of uranium ore processing operations and ending with completion of requirements specified under a closure plan.³

Here, the EPA definition of “closure” states that closure begins when uranium ore processing operations (associated with that tailings impoundment) cease.

³ 40 C.F.R. Part 192, Subpart D—Standards for Management of Uranium Byproduct Materials Pursuant to Section 84 of the Atomic Energy Act of 1954, as Amended, Section 192.31(h). 48 Fed. Reg. 45926, 45946, Col. 3; October 7, 1983.

The EPA in the newly promulgated Subpart W, defines “operation”:

(e) *Operation*. Operation means that an impoundment is being used for the continued placement of uranium byproduct material or tailings or is in standby status for such placement. An impoundment is in operation from the day that uranium byproduct material or tailings are first placed in the impoundment until the day that final closure begins.⁴

The Final Subpart W Rule also defines “final closure”:

(n) *Final closure* means the period during which an impoundment or heap leach pile is being managed in accordance with the milestones and requirements in an approved reclamation plan. Final closure for the impoundment or heap leach pile begins when the owner or operator provides written notice to the Administrator and to the Nuclear Regulatory Commission or applicable NRC Agreement State that:

(1) A conventional impoundment is no longer receiving uranium byproduct material or tailings, is no longer on standby for such receipt and is being managed under an approved reclamation plan for that impoundment or facility closure plan; or

(2) A non-conventional impoundment is no longer required for evaporation or holding purposes, is no longer on standby for such purposes and is being managed under an approved reclamation plan for that impoundment or facility closure plan;

NRC regulations also define “closure”:

Closure means the activities following operations to decontaminate and decommission the buildings and site used to produce byproduct materials and reclaim the tailings and/or waste disposal area.⁵

These definitions give no indication that the closure of a tailings impoundment that is not in operation (that is, not receiving tailings or uranium byproduct material, or not on standby) can be delayed. These definitions do not support the claim that applicable regulation do not establish any time frame or limit as to when an impoundment (whether

⁴ Revisions to National Emission Standards for Radon Emissions From Operating Mill Tailings; 82 Fed. Reg. 5142, 5179; January 17, 2017.

⁵ 10 C.F.R. Part 40, Appendix A to Part 40—Criteria Relating to the Operation of Uranium Mills and the Disposition of Tailings or Wastes Produced by the Extraction or Concentration of Source Material From Ores Processed Primarily for Their Source Material Content.

conventional or non-conventional) must cease operation and begin final closure. Operation ends and closure should begin when a tailings impoundment no longer is receiving tailings or uranium byproduct material or is on standby or when the mill site itself has commenced closure and decommissioning. These definitions do not support the claim that after the rescission of Subpart T, there was no requirement for an impoundment to be deemed to be in final closure just because the mill site may be in closure or decommissioned.

The EPA did not contemplate a situation where an impoundment was in operation, but the mill site (as a whole) was in closure or decommissioned. It is hard to know where Energy Fuels is going with this argument. If a uranium mill site (not just specific tailings impoundments) were in closure or decommissioned, there would be none of the support facilities necessary to maintain an impoundment that is still in operation. A mill site is the sum of its tailings impoundments, evaporation ponds, office buildings, ore processing operations, decommissioning rock piles, equipment, and other support facilities. One segment cannot be considered operational indefinitely to receive materials that have nothing to do with site decommissioning, if the mill site as a whole is in closure or decommissioned. If an impoundment is receiving site reclamation materials (such as evaporation pond liners, equipment, contaminated soils and equipment, etc), the impoundment would still be in closure and the site reclamation materials would be placed in the impoundment pursuant to the site reclamation and closure plans.

The NRC definition of “closure” contemplates the final closure after the cessation of site operations following operations to decontaminate and decommission the buildings and site and reclaim the tailings and/or waste disposal area. It does not contemplate the continued operation of one or more impoundment to receive wastes from other uranium recovery operations (such as ISL wastes) during the closure or post closure time frames.

The DWMRC must clarify the status of a tailings impoundment that is no longer receiving tailings and wastes from the processing of ore at the mill (that is, it is no longer in operation), but is being held open (in part or in whole) to receive materials from the decommissioning of the mill site itself, as contemplated in the site reclamation, or closure, plan.

UW believes that a tailing impoundment that is no longer receiving waste from the processing of ore has entered the closure period, which is guided by the approved impoundment or mill site closure plan and reclamation milestones. Therefore, under the closure plan, decommissioning wastes can be placed in the impoundment in an expeditious manner, in compliance with site reclamation schedules, and the impoundment is not considered to be operational (or, in operation).

2.4. Schedule Commitments.

Energy Fuels (page 40, ¶ 1) argues that schedule commitments are not enforceable reclamation milestones. That is not supported by the MOU and EPA and NRC regulations and statements related to the promulgation of the regulations implementing

the MOU. The EPA and NRC have referred to reclamation milestones as schedules. Any reclamation schedule proposed by Energy Fuels should be considered to be an enforceable reclamation milestone and incorporated into the White Mesa Mill License under specific license conditions. When a specific tailings impoundment or mill as a whole enters closure, then the schedules in the license should be revised to reflect dates-certain. The EPA and NRC contemplated the possibility that reclamation schedules might need to be extended, after an application by the licensee and public notice and comment. This should be acknowledged in the Mill license conditions.

2.5. Operations After Site Closure and Decommissioning.

Energy Fuels (page 42) asserts:

It is not uncommon for a licensed uranium mill to maintain an impoundment in operation indefinitely after the rest of the Mill is decommissioned, to perform licensed operations, such as to receive 11e.(2) byproduct material from In Situ Recovery operations for direct disposal. In those cases, Subpart W continues to apply (which limits the number of impoundments that are in operation at any one time to two or fewer), so long as the impoundment continues in operation. There is no reason to assume that all impoundments cease operation upon commencement of Mill closure, and as discussed above, they are considered to remain in operation as long receive Mill decommissioning byproduct material.

First of all, the EPA, as contemplated by the MOU, took final action on December 31, 1991, to stay and propose rescission of subpart T under section 112(d)(9) and issued an advance notice of proposed rulemaking under the Uranium Mill Tailings Radiation Control Act of 1978 (UMTRCA).⁶ The White Mesa Mill licensee did not apply to the NRC for authorization to dispose of 11e.(2) byproduct material from the cleanup of in situ leach (ISL) uranium recovery operations until until May 20, 1993.⁷ There is no indication that the EPA, in rescinding Subpart T, contemplated the indefinite operation of a mill tailings impoundment to receive ISL materials during closure and after decommissioning of the mill itself. The ISL waste is not waste from the White Mesa Mill decommissioning, but is limited amounts of material (5,000 cubic yards from any one origin) from other sites in other states undergoing decommissioning or other site cleanup.

Energy Fuels fails to identify any mill site that maintains an impoundment in operation indefinitely after the rest of the mill is decommissioned—in order to receive 11e.(2) byproduct material from ISL operations for direct disposal. Therefore, it is not

⁶ 55 Fed Reg. 67537, 67561, and 67569. December 31, 1991.

⁷ Utah Department of Environmental Quality, Division of Radiation Control, Radioactive Materials License, License No. UT1900479, License Condition 10.5.

possible to determine the veracity of that statement. It appears that Energy Fuels in contemplating, over the long-term, a plan to keep at least one tailings impoundment “operational” in order to receive ISL waste—after the mill and most of the tailings impoundments have entered closure and are being, or have been, decommissioned. It is hard to see how Energy Fuels could maintain the onsite operations (which go beyond the tailings impoundment itself) required to receive and dispose of ISL waste if the Mill itself were in closure or decommissioned. Currently, there is only one White Mesa Mill tailings impoundment that is authorized to receive ISL waste—Cell 3.

Energy Fuels fails to reference EPA standards at 40 C.F.R. Part 192, Subpart D, Section 192.32(a)(3)(iv) - (v):

- (iv) The Nuclear Regulatory Commission or Agreement State may, in response to a request from a licensee, authorize by license or license amendment a portion of the site to remain accessible during the closure process to accept uranium byproduct material as defined in section 11(e)(2) of the Atomic Energy Act, 42 U.S.C. 2014(e)(2), or to accept materials similar to the physical, chemical and radiological characteristics of the in situ uranium mill tailings and associated wastes, from other sources. No such authorization may be used as a means for delaying or otherwise impeding emplacement of the permanent radon barrier over the remainder of the pile or impoundment in a manner that will achieve compliance with the 20 pCi/m²-s flux standard, averaged over the entire pile or impoundment.
- (v) The Nuclear Regulatory Commission or Agreement State may, in response to a request from a licensee, authorize by license or license amendment a portion of a pile or impoundment to remain accessible after emplacement of a permanent radon barrier to accept uranium byproduct material as defined in section 11(e)(2) of the Atomic Energy Act, 42 U.S.C. 2014(e)(2), if compliance with the 20 pCi/m²-s flux standard of § 192.32(b)(1)(ii) is demonstrated by the licensee’s monitoring conducted in a manner consistent with § 192.32(a)(4)(i). Such authorization may be provided only if the Nuclear Regulatory Commission or Agreement State makes a finding, constituting final agency action and after providing an opportunity for public participation, that the site will continue to achieve the 20 pCi/m²-s flux standard when averaged over the entire impoundment.

The NRC regulations contain similar wording at 10 C.F.R. Part 40 Appendix A, Criterion 6A(3):

The Commission may authorize by license amendment, upon licensee request, a portion of the impoundment to accept uranium byproduct

material or such materials that are similar in physical, chemical, and radiological characteristics to the uranium mill tailings and associated wastes already in the pile or impoundment, from other sources, during the closure process. No such authorization will be made if it results in a delay or impediment to emplacement of the final radon barrier over the remainder of the impoundment in a manner that will achieve levels of radon-222 releases not exceeding 20 pCi/m²-s averaged over the entire impoundment. The verification required in paragraph (2) of Criterion 6 may be completed with a portion of the impoundment being used for further disposal if the Commission makes a final finding that the impoundment will continue to achieve a level of radon- 222 releases not exceeding 20 pCi/m² -s averaged over the entire impoundment. In this case, after the final radon barrier is complete except for the continuing disposal area, (a) only byproduct material will be authorized for disposal, (b) the disposal will be limited to the specified existing disposal area, and (c) this authorization will only be made after providing opportunity for public participation. Reclamation of the disposal area, as appropriate, must be completed in a timely manner after disposal operations cease in accordance with paragraph (1) of Criterion 6; however, these actions are not required to be complete as part of meeting the deadline for final radon barrier construction.

These EPA and NRC regulations contemplate the disposal of ISL waste in an impoundment during site closure or after placement of the permanent radon barrier— after certain conditions are met and after public notice and comment. There are no allowance for the disposal of ISL waste in an operational impoundment if the mill site, itself, were undergoing closure or was decommissioned.

It appears the Energy Fuels is trying to grab hold of something that is not there. There is no legal basis for Energy Fuels' assumption that they will be able to continue to operate a tailings impoundment at the White Mesa Mill to receive and dispose of ISL waste from other states during Mill site closure or after Mill decommissioning is complete.

2.6. Adequacy of Cell 1 Disposal Area Liner Design.

Energy Fuels (pages 45 to 48) argues that the final Cell 1 Disposal containment area for disposal of 11e.(2) byproduct material from site decommissioning need not be constructed with a double-liner system. Energy Fuels uses convoluted arguments as to why a double-liner system is not required, then comes to the conclusion that, in fact, “EFRI is prepared to agree to revising the wording in the Reclamation Plan to state that the liner system for the Cell 1 Disposal Area will have the same basic design as the liner system for Cell 4B, including the same basic leak detection system design, with the specific details of the design to be submitted to the Director for approval prior to construction of the Cell 1 Disposal Area.”

The only point we would make is that Energy Fuels fails to mention the requirements in

40 C.F.R. Part 61 Subpart W, Section 61.252(a)(2) for the construction of new impoundments for the disposal of 11e.(2) byproduct material.⁸ The new Cell 1 Disposal Area impoundment would be subject to this regulation, which states:

(2) After December 15, 1989, no new conventional impoundment may be built unless it is designed, constructed and operated to meet one of the two following management practices:

(i) Phased disposal in lined impoundments that are no more than 40 acres in area and comply with the requirements of 40 CFR 192.32(a)(1). The owner or operator shall have no more than two conventional impoundments, including existing conventional impoundments, in operation at any one time.

Therefore, the DWRC must make clear to Energy Fuels, whether or not Energy Fuels is prepared to agree to revising the wording in the Reclamation Plan regarding Cell 1 construction, that the requirements set forth in 40 C.F.R. Part 61 Subpart W, Section 61.252(a)(2) and 40 C.F.R. 192.32(a)(1) are applicable to the construction of the Cell 1 Disposal Area impoundment.

2.7. Waste Water Sampling Report.

Energy Fuels (pages 17 to 18) discusses the Waste Water Sampling Report, in response to comments about the need to measure the thorium-230 and thorium-232 concentrations. In that discussion, Energy Fuels discusses two Calculation Briefs.⁹ Those briefs relate to the radon emissions from liquid effluents, based on a formula that had been developed by an EPA contractor as part of the EPA Revision of Subpart W.¹⁰ The formula was used by the Ute Mt. Ute Tribe to calculate the radon emissions from White Mesa Mill liquid effluents, based on the data submitted to the DWMRC regarding the radionuclide emissions from the effluents. Energy Fuels, using a few sampling events and measurements of the radium content of the effluents, determined that there were, in fact, radon emissions from the liquid effluents, but those emissions were below the EPA regulatory standard for radon emissions from existing operating tailings impoundments in

⁸ Revisions to National Emission Standards for Radon Emissions From Operating Mill Tailings, 82 Fed. Reg. 5142, 5179; January 17, 2017.

⁹ Calculation Brief, Radon Emissions from Evaporative Ponds White Mesa Uranium Mill dated July 07, 2014, prepared by Mike King, and submitted to EPA on July 9, 2014; and Supplement to Calculation Brief (July 7, 2014), dated February 10, 2015, prepared by the Ute Mountain Ute Tribe.

¹⁰ Risk Assessment Revision for 40 C.F.R. Part 61 Subpart W — Radon Emissions from Operating Mill Tailings; Task 5 — Radon Emission from Evaporation Ponds. Environmental Protection Agency, Office of Radiation and Indoor Air. November 9, 2010.
<https://www.epa.gov/sites/production/files/2015-05/documents/riskassessmentrevision.pdf>

40 C.F.R. Part 61 Subpart W. However, Energy Fuels' results demonstrated that the radon emissions were more than "zero." The EPA has long assumed that the radon emissions from liquid effluent ponds (ponds on top of more solid tailings and separate evaporation ponds) were "zero." Now it is clear that that is not the case. Radon emissions from liquid effluent ponds would create additional radon emissions, that are contributing to the cumulative radon emissions from the Mill, but are not being calculated and reported to the DWMRC and the public.

Energy Fuels used only a few sampling events to determine radon emissions from the radium-bearing effluents. The radium content of these effluents fluctuates greatly, depending on the Mill operations and evaporation rates. Therefore, the DWMRC should require that Energy Fuels conduct a comprehensive sampling program to determine the variations in concentration of radium 226 (uranium decay chain) and radium 228 and radium-224 (thorium-232 decay chain) in Cells 1, 4A, and 4B. This data can then be used to determine fluctuations in the radon emissions from these effluents. With the White Mesa Mill being the only operating conventional uranium mill in the United States, the DWMRC and Energy Fuels have the opportunity and responsibility to take a hard look at the radon emissions from liquid effluents that contain high levels of radium that vary over time.

3. UTE MOUNTAIN UTE TRIBE COMMENTS

3.1. Cultural Resource Protection.

Energy Fuels (page 51) responded to the Ute Mountain Ute Tribe request. The Tribe request states: "Regarding Sec. 9. 7 Cultural Resources Protections, the Tribe requests that procedures be implemented by the State of Utah at the White Mesa Mill for repatriation of human remains and related artifacts in the same manner as the Native American Graves Repatriation Act (NAGPRA)." In response, Energy Fuels asserts that NAGPRA does not apply to the White Mesa Mill, because the Mill is not on federal or tribal lands.

License Condition 9.7 applies to a list of cultural sites that were submitted to the NRC by the White Mesa Mill Licensee (Umetco Minerals Corporation) on July 28, 1988.¹¹ *See* Exhibit C. This list includes a few of the cultural resources that are in areas that are also subject to a Cultural Resource Easement with the federal government—Department of Interior, Bureau of Land Management.¹² *See* Exhibit D. The Easement applies to 2,591.42 acres of land transferred from the BLM to the White Mesa Mill Licensee:

¹¹ License Amendment Application submitted by Umetco Minerals Corporation to the NRC Uranium Recovery Field Office, July 28, 1988.

¹² Energy Fuels - BLM Land Exchange, Cultural Resource Easement, August 26, 1985. Patent No. 43-85-0028.

Township 37 South, Range 22 East, SLBM

Section 29: SE 1/4 SE 1/4

Section 33: SW 1/4

Township 38 South, Range 22 East, SLBM

Section 4: N 1/2, SW1/4, W1/2 SE 1/4, W 1/2 E 1/2 SE 1/4

Section 5: All

Section 6: E 1/2

Section 8: NE 1/4

Section 9: All

The 1985 BLM Easement states (in part):

Should the sites be within the proposed impact zone (defined as the area of any facility plus the surrounding land to 100 feet distance from the facility's perimeter, or alternative facility location areas), the patentee shall submit to the Moab District of the Bureau of Land Management a proposed cultural resources mitigation plan. The sites, if unavoidable, shall be recovered through an acceptable data recovery program which will specify procedures for study and final disposition of any human burials found. In either case, Bureau of Land Management's approval of the proposed cultural resources mitigation plan shall be made in consultation with the Utah State Historic Preservation officer, the Advisory Council on Historic Preservation, and, regarding human remains, the appropriate native American interests.

The Easement pertains to cultural sites listed in an Attachment "A" to the Easement. According to the BLM, they have identified and mapped 132 sites with that area of the 1985 land transfer.¹³

The original White Mesa Mill license, issued by the NRC on August 7, 1979, to Energy Fuels Nuclear listed various archeological sites related to the Mill. Subsequently, Umetco Minerals Corporation (Umetco) became the Mill's owner and licensee. Umetco submitted an amended list of "Archaeological Site Related to the White Mesa Project" under cover of a letter dated July 28, 1988. *See* Exhibit C. That list is referenced in License Condition 9.7 of the current Mill License.

¹³ White Mesa Mill Cultural Resources Monitoring Plan 2016; by Don Simonis, BLM-Monticello Field Office Archeologist, October 24, 2016.

There are two lists of archaeological sites related to the Mill under consideration here. The two lists are almost mutually exclusive.¹⁴ There are the sites listed in Attachment A of the Easement (within the boundaries of the land transferred from the BLM), which are subject to the requirements set forth in the Easement. And, there are the sites in the 1988 archeological site list submitted to the NRC, which are subject to License Condition 9.7.

The mineral (subsurface rights) to the land transferred to the Mill owner by the BLM were not included in the land transfer. Therefore, it is probable that the 132 sites archaeological sites, including burial sites, on the lands transferred to the White Mesa Mill licensee are, in fact, on federal lands. The BLM Easement, which still has force and effect, clearly states the intention that final disposition of any human burials found in the areas transferred to the Mill licensee by the BLM will be in accordance with “appropriate native American interests.”

3.2. Emergency Preparedness.

Energy Fuels (page 51) addresses the Ute Mountain Ute Tribe’s request: “The Ute Mountain Ute Tribe requests that the Emergency Preparedness Plan be amended to include notification procedures to the White Mesa Community and Ute Mountain Ute Tribal officials. In addition, there are no specific procedures in the Emergency Response or the Environmental Monitoring Handbook for trucks specifically delivering ISL Material; these need to be developed.”

As part of their response, Energy Fuels states that certain materials delivered to the Mill do not travel between the Mill and White Mesa. However, White Mesa Ute tribal members do travel between White Mesa and Blanding regularly and pass by the Mill. These community members include school children attending school in Blanding throughout the school year. Further, hazardous processing materials are shipped to the Mill, passing through the community on Hwy. 191, and even off of the Hwy. 191 onto tribal roads and parking lots. Mill emissions are blown onto tribal lands, depending on the local wind directions. Therefore, there are several means by which the operation of the White Mesa Mill affects the White Mesa Ute community, whether during normal operations or unexpected events that may result in radioactive or hazardous material releases.

Energy Fuels must take every possible step to keep the White Mesa community and the Ute Mt. Ute Tribe informed in a timely manner of any spills, expected and unexpected emissions, accidents, or any activities that could possibly result in exposure of White Mesa and nearby communities to radiological and non-radiological contamination.

¹⁴ It appears that only 3 archaeological sites within the area transferred to Energy Fuels Nuclear by the BLM are also on the 1988 list of archaeological sites submitted to the NRC: 42SA6400, 42SA6401, and 42SA6402. These were Undetermined Sites in 1988 that were located within 100 feet of tailings or liquid effluent cells or related construction.

Thank you for the opportunity to submit these Sur-Reply Comments.

Sincerely,

Sarah Fields
Program Director
Uranium Watch
sarah@uraniumwatch.org

and

John Weisheit
Conservation Director
Living Rivers
P.O. Box 466
Moab, Utah 84532

and

Marc Thomas, Chair
Sierra Club - Utah Chapter
423 West 800 South, Suite A103
Salt Lake City, Utah 84101

Attachments: Exhibits A, B, C, and D

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Pursuant to the Atomic Energy Act of 1954, as amended, the Energy Reorganization Act of 1974 (Public Law 93-438), and the applicable parts of Title 10, Code of Federal Regulations, Chapter I, Parts 19, 20, 30, 31, 32, 33, 34, 35, 36, 39, 40, 51, 70, and 71, and in reliance on statements and representations heretofore made by the licensee, a licensee is hereby issued authorizing the licensee to receive, acquire, possess, and transfer byproduct, source, and special nuclear material designated below; to use such material for the purpose(s) and at the place(s) designated below; to deliver or transfer such material to persons authorized to receive it in accordance with the regulations of the applicable Part(s). This license shall be deemed to contain the conditions specified in Section 183 of the Atomic Energy Act of 1954, as amended, and is subject to all applicable rules, regulations, and orders of the Nuclear Regulatory Commission now or hereafter in effect and to any conditions specified below.

| | | | |
|-----------------|---|---|--|
| Licensee | | 3. License Number: | SUA-1471 |
| 1. | Homestake Mining Company of California | | |
| 2. | P.O. Box 98 Grants, New Mexico 87020 | 4. Expiration Date: | Until terminated |
| | | 5. Docket No.: | 40-8903 |
| 6. | Byproduct, Source, and/or Special Nuclear Material: Uranium | 7. Chemical and/or Physical Form: Any | 8. Maximum Amount that Licensee May Possess at Any One Time Under This License: Unlimited |

9. Authorized Place of Use: The licensee's uranium mill located in Cibola County, New Mexico.

[Applicable Amendments: 12, 29]

10. This license authorizes only the possession of residual uranium and byproduct material in the form of uranium waste tailings and other byproduct waste generated by the licensee's past milling operations in accordance with Tables 1 and 3 and the procedures submitted by letter dated September 2, 1993, as modified by letter dated March 7, 1996.

Anywhere the word "will" is used, it shall denote a requirement.

[Applicable Amendments: 2, 6, 12, 16, 24]

11. DELETED by Amendment No. 21.

12. Periodic embankment inspections of the large and small tailings embankment shall be conducted by knowledgeable individuals who are familiar with the site and the embankment design. An annual embankment status report shall be included in the Annual Report (see LC 42).

[Applicable Amendments: 2, 12, 14, 24, 34]

13. DELETED by Amendment No. 27.

14. Release of equipment or packages from the restricted area shall be in accordance with the attachment to SUA-1471 entitled, "Guidelines for Decontamination of Facilities and Equipment Prior to Release for Unrestricted Use or Termination of Licenses for Byproduct or Source Materials," dated September 1984.

[Applicable Amendments: 21, 31]

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15. The results of all effluent and environmental monitoring required by this license shall be reported to the NRC. For purposes of reporting requirements, only groundwater radionuclide data from the point of compliance wells and backgrounds well P shall be reported.

[Applicable Amendments: 5, 31, 34]

16. Before engaging in any activity not previously assessed by the NRC, the licensee shall prepare and record an environmental evaluation of such activity. When the evaluation indicates that such activity may result in a significant adverse environmental impact that was not previously assessed or that is greater than that previously assessed, the licensee shall provide a written evaluation of such activities and obtain prior approval of the NRC in the form of a license amendment.

17. Prior to termination of this license, the licensee shall provide for transfer of title to byproduct material and land, including any interests therein (other than land owned by the United States or the State of New Mexico), which is used for the disposal of such byproduct material or is essential to ensure the long-term stability of such disposal site, to the United States or the State of New Mexico, at the State's option.

18. DELETED by Amendment No. 27.

19. DELETED by Amendment No. 17.

20. DELETED by Amendment No. 21.

21. The site Radiation Protection Administrator (RPA), who is responsible for conducting the site radiation safety program, shall possess the minimum qualifications as specified in Section 2.4.1 of Regulatory Guide 8.31, "Information Relevant to Ensuring that Occupational Radiation Exposures at Uranium Mills will be As Low As is Reasonably Achievable."

[Applicable Amendment: 27]

22. The results of sampling, analyses, surveys and monitoring; the results of calibration of equipment, reports on audits and inspections; all meetings and training courses required by this license and any subsequent reviews, investigations, and corrective actions, shall be documented. Unless otherwise specified in the NRC regulations, all such documentation shall be maintained for a period of at least 5 years.

23. Standard procedures shall be established for all activities involving radioactive materials that are handled, processed, or stored. Procedures shall enumerate pertinent radiation safety practices to be followed. Additionally, written procedures shall be established for environmental monitoring, bioassay analyses, and instrument calibrations. An up-to-date copy of each written procedure shall be kept in the area to which it applies.

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24. The licensee shall be required to use a Radiation Work Permit (RWP) for all work or nonroutine maintenance jobs where the potential for significant exposure to radioactive material exists and for which no standard written procedure already exists. The RWP shall be approved by the RPA or his designee, qualified by way of specialized radiation protection training, and shall at least describe the following:
- A. The scope of work to be performed.
 - B. Any precautions necessary to reduce exposure to uranium and its daughters.
 - C. The supplemental radiological monitoring and sampling necessary prior to, during, and following completion of the work.
25. DELETED by Amendment No. 21.
26. Mill tailings, other than small samples for purposes such as research or analysis, shall not be transferred from the site without specific prior approval of the NRC in the form of a license amendment. The licensee shall maintain a permanent record of all transfers made under the provisions of this condition.
27. DELETED by Amendment No. 21.
28. The licensee shall maintain an NRC-approved financial surety arrangement consistent with 10 CFR 40, Appendix A, Criteria 9 and 10, adequate to cover the estimated costs, if accomplished by a third party, for decommissioning and decontamination of the mill and mill site, reclamation of tailings or waste disposal areas, ground-water restoration, and the long-term surveillance fee. Within 3 months of NRC approval of a revised reclamation plan and its cost estimate, the licensee shall submit for NRC review and approval a proposed revision to the financial surety arrangement if estimated costs for the newly approved plan exceed the amount covered in the existing financial surety. The revised surety arrangement shall then be in effect within 30 days of written NRC approval of the surety documents.

Annual updates to the surety amount required by 10 CFR Part 40, Appendix A, Criteria 9, shall be submitted to the NRC at least 3 months prior to the anniversary date, which is designated as June 30 of each year. Along with each proposed revision or annual update, the licensee shall submit supporting documentation showing a breakdown of costs and the basis for the cost estimate, adjustments for inflation, maintenance of a minimum 15 percent contingency, and reflecting any changes in engineering plans or any other conditions affecting estimated costs for site closure. Appendix C of NUREG-1620, Rev.1, outlines the minimum considerations used by the NRC in the review of site closure cost estimates.

The licensee's currently approved surety, a Parent Company Guarantee issued by Barrick Gold Corporation, shall be continuously maintained in an amount no less than \$62,490,490 for the purpose of complying with 10 CFR 40, Criteria 9 and 10, until a replacement is authorized by the NRC. The use of a parent company guarantee necessitates an evaluation of the corporate parent as part of the annual surety

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update. In addition to the cost information required above, the annual submittal must include updated documentation of the (1) letter from the chief financial officer of the parent company; (2) auditor's special report confirmation of chief financial officer's letter; (3) schedule reconciling amounts in chief financial officer's letter to amounts in financial statements; and (4) parent company guarantee if any changes are appropriate.

[Applicable Amendments: 9, 12, 23, 24, 26, 34, 35, 37, 38, 40, 41, 42, 43, 44, 46, 48]

- 29. DELETED by Amendment No. 32.
- 30. DELETED by Amendment No. 21.
- 31. DELETED by Amendment No. 27.
- 32. The licensee shall follow the guidance set forth in U.S. Nuclear Regulatory Commission, Regulatory Guides 8.22, "Bioassay at Uranium Recovery Facilities," 8.30, "Health Physics Surveys in Uranium Recovery Facilities," and 8.31, "Information Relevant to Ensuring that Occupational Radiation Exposure at Uranium Recovery Facilities will be As Low As is Reasonably Achievable (ALARA)," or NRC-approved equivalent.
 - A. DELETED by Amendment 27.
 - B. Any time uranium in a worker's urine specimen exceeds 15 micrograms per liter (ug/l), the annual ALARA audit will indicate what corrective actions were considered or performed.
 - C. DELETED by Amendment 34.

[Applicable Amendments: 2, 34]

- 33. DELETED by Amendment No. 21.
- 34. DELETED by Amendment No. 4.
- 35. The licensee shall implement a groundwater compliance monitoring program to assess the performance of the groundwater restoration program. This program is separate from the requirements in License Condition 15. The Licensee shall:
 - A. Implement the groundwater monitoring shown in Table 2 (8-99) submitted September 29, 1999, except that under "Reversal Wells," delete Well KF and replace with Well DZ, and except that well CW2 will remain in the sampling program monitoring annually for G list of parameters, and Cr is to be deleted from the D and F lists of parameters.

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Well DD and one additional monitoring well to the middle of the southeast side of EP3 (to be named later) is to be added to the Table list and will be monitored semi-annually for the B and F list of parameters. The additional well is to be installed and monitored quarterly for at least two quarters prior to EP3 becoming operational to determine background water quality for the well.

- B. The following ground water protection standards are established for each designated aquifer/zone as described in Ground-Water Hydrology for Support of Background Concentration at the Grants Reclamation Site (Hydro-Engineering, December 2001) and Background Water Quality Evaluation of the Chinle Aquifers (Homestake Mining Company and Hydro-Engineering, October 2003):

| Constituents | Alluvial Aquifer | Chinle Mixing Zone | Upper Chinle Non-Mixing Zone | Middle Chinle Non-Mixing Zone | Lower Chinle Non-Mixing Zone |
|---------------------|------------------|--------------------|------------------------------|-------------------------------|------------------------------|
| Selenium (mg/L) | 0.32 | 0.14 | 0.06 | 0.07 | 0.32 |
| Uranium (mg/L) | 0.16 | 0.18 | 0.09 | 0.07 | 0.03 |
| Molybdenum (mg/L) | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 |
| Sulfate (mg/L) | 1500 | 1750 | 914 | 857 | 2000 |
| Chloride (mg/L) | 250 | 250 | 412 | 250 | 634 |
| TDS (mg/L) | 2734 | 3140 | 2010 | 1560 | 4140 |
| Nitrate (mg/L) | 12 | 15 | * | * | * |
| Vanadium (mg/L) | 0.02 | 0.01 | 0.01 | * | * |
| Thorium-230 (pCi/L) | 0.3 | * | * | * | * |
| Ra-226 + Ra-228 | 5 | * | * | * | * |

* - ground-water protection standards not necessary for the constituents in the indicated zones

The constituents listed above for the alluvial aquifer must not exceed the specified concentration limit at compliance monitoring wells (former point of compliance wells) D1, X, and S4. At present, no compliance monitoring wells have been designated for the Chinle Mixing Zone or the Upper, Middle or Lower Chinle Non-Mixing Zones for the purpose of implementing the ground water protection standards listed above for these zones. The licensee shall propose compliance monitoring wells for the Chinle Mixing Zone and the Upper, Middle and Lower Chinle Non-Mixing Zones in a revised Corrective Action Plan to be submitted to the NRC no later than December 31, 2006. NRC will evaluate the proposed compliance monitoring wells and, if acceptable, will incorporate them into the license as compliance locations for the ground water protection standards listed above. NRC will notify the licensee and request new proposed compliance monitoring well locations from the licensee, if any of the well locations are determined to be unacceptable.

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- C. Implement the corrective action program described in the September 15, 1989 submittal, as modified by the reverse osmosis system described in the January 15, 1998 submittal with the objective of returning the concentrations of molybdenum, selenium, thorium-230, uranium, and vanadium to the site standards as listed in LC 35B. In addition, the reverse osmosis system will include the addition of Sample Point 2 downstream of the Mixing Tank. Composite samples from Sample Point 2 will be taken monthly and analyzed for U and Mo.
- D. Operate evaporation ponds, EP1, EP2 and EP3, and enhanced evaporation systems located in each pond as described in the June 8 and 28, 1990; July 26, August 16, August 19, September 2 and 15, 1994; October 25, 2006, February 7, 2007, July 18, 2007, and March 17, 2008, submittals. Monitoring and mitigation measures for EP3 contained in the HMC Environmental Report dated January 30, 2007, are incorporated into this LC by reference.
- E. Submit by March 31 of each year, a performance review of the corrective action program that details the progress towards attaining groundwater protection standards.

[Applicable Amendments: 3, 4, 5, 7, 8, 10, 11, 16, 21, 28, 30, 31, 33, 34, 39, 41]

36. The licensee shall complete site reclamation in accordance with an approved reclamation plan. The ground-water corrective action plan shall be conducted as authorized by License Condition No. 35. All activities shall be completed in accordance with the following schedules.

A. To ensure timely compliance with target completion dates established in the Memorandum of Understanding with the Environmental Protection Agency (56 FR 55432, October 25, 1991), the licensee shall complete reclamation to control radon emissions as expeditiously as practicable, considering technological feasibility, in accordance with the following schedule:

(1) Windblown tailings retrieval and placement on the pile:

For the Large Impoundment - December 31, 1996.

For the Small Impoundment - May 31, 1997.

(2) Placement of the interim cover to decrease the potential for tailings dispersal and erosion:

For the Large Impoundment - December 31, 1996.

For the Small Impoundment - May 31, 1997.

(3) Placement of final radon barrier designed and constructed to limit radon emissions to an average flux of no more than 20 pCi/m²/s.

MATERIALS LICENSE

**MATERIALS LICENSE
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License Number
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For the Large Impoundment which has no evaporation ponds – December 31, 2012.

For the Small Impoundment, tailings pile surface areas are essentially covered by evaporation ponds constructed as part of the ground-water corrective action program. Prior to December 31, 2013, the areas not covered by the evaporation ponds shall have interim cover in place. Final radon barrier placement over the entire pile shall be completed within 2 years of completion of ground-water corrective actions.

[Applicable Amendments: 25, 36, 41, 45]

B. Reclamation, to ensure required longevity of the covered tailings and ground-water protection, shall be completed as expeditiously as is reasonably achievable, in accordance with the following target dates for completion:

(1) Placement of erosion protection as part of reclamation to comply with Criterion 6 of Appendix A of 10 CFR Part 40:

For the Large Impoundment – September 30, 2013.

For the Small Impoundment - December 31, 2013.

[Applicable Amendments: 25, 36, 41, 45]

(2) Projected completion of ground-water corrective actions to meet performance objectives specified in the ground-water corrective action plan - December 31, 2011.

C. Any license amendment request to revise the completion dates specified in Section A must demonstrate that compliance was not technologically feasible (including inclement weather, litigation which compels delay to reclamation, or other factors beyond the control of the licensee).

D. Any license amendment request to change the target dates in Section B above, must address added risk to the public health and safety and the environment, with due consideration to the economic costs involved and other factors justifying the request such as delays caused by inclement weather, regulatory delays, litigation, and other factors beyond the control of the licensee.

E. As detailed in the licensee's October 28, 2003 submittal, the licensee is to verify compliance with the radon flux standard of 20 pCi/m²s by performing a radon flux survey for the large and small tailings piles on an annual basis during the milestone extension period specified above. An annual report detailing results of this survey shall be submitted with the annual groundwater CAP report as specified in condition 35E no later than March 31 each year.

[Applicable Amendments: 13, 22, 36]

MATERIALS LICENSE

| | |
|--|---------------------------------------|
| MATERIALS LICENSE SUPPLEMENTARY SHEET | License Number SUA-1471 |
| | Docket or Reference Number 40-8903 |
| | Amendment No. 48 |

37. The licensee shall reclaim the large and small tailings impoundments as stated in its October 29, 1993, submittal, including the following requirements.
- A. The radon barrier for the large tailings pile shall be in accordance with material types, thicknesses and placement criteria described in Homestake Mining Company's *Final Radon Barrier Design for the Large Tailings Pile*, submitted June 16, 1995.
- [Applicable Amendment: 22]
- B. The final reclamation of the area that includes the small tailings pile and the three evaporation ponds will include the disposal of the contaminated groundwater restoration materials and precipitated solids from the evaporation pond. The small tailings pile and evaporation ponds will be reconstructed and covered with radon barrier material. The placement of the barrier on the small tailings pile shall be done in accordance with the material types, thicknesses, and placement criteria described in Homestake Mining Company's *Final Radon Barrier Design for the Small Tailings Pile*, transmitted to the NRC in August 1996.
- [Applicable Amendments: 27, 32, 41]
- C. The licensee shall submit a construction quality control program for NRC review and approval prior to placing any portion of the radon barrier that will ensure that the specification which limits the activity of the radon barrier material to 5 pCi/g above background, is not exceeded.
 - D. The construction quality assurance and control program shall be as defined in the Staff Technical Position On Testing and Inspection (NRC, 1989). The acceptable correlation between ASTM D 2922 and ASTM D 1556 shall be as defined in the licensee's April 30, 1992, submittal.
 - E. OMITTED in Amendment No. 14.
 - F. The radon barrier shall not be placed on the top surface of the large tailings impoundment until the settlement has been demonstrated to be at least 90 percent of expected settlement, and the results of this determination have been reviewed and accepted by the NRC. The radon barrier may be placed on the large impoundment side slopes following final grading of the impoundment. Care shall be taken to preclude the possibility of ponding. Before the erosion protection is placed, it shall be verified that the radon barrier material meets the specifications.
 - G. The adequacy of the erosion protection proposed for the side slopes of both the large and small impoundments shall be reevaluated considering any increases in impoundment heights due to the revised radon attenuation cover design.
 - H. DELETED by Amendment No. 21.

MATERIALS LICENSE

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- I. A completion report shall be provided within 6 months of the completion of construction. This report, including as-built drawings, shall verify that reclamation of the site has been performed according to the approved plan. The report shall also include summaries of results of the quality assurance and control testing to demonstrate that approved specifications were met.
- J. The soil cleanup program associated with the decommissioning of the groundwater restoration facilities and small tailings pile reclamation shall be done as specified in the submittal of September 15, 1994, and as modified by the submittal of December 13, 1995.

[Applicable Amendment: 32]

- K. The licensee shall implement a quality control (QC) program for the soil cleanup verification program to include sending at least 10 percent of the samples (randomly selected) to a vendor laboratory for Ra-226 analysis. If the vendor laboratory uses gamma spectroscopy, at least 30 percent of these QC samples shall also be chemically analyzed.

[Applicable Amendments: 14, 32]

- 38. The licensee is authorized to use water collected as part of the site ground-water corrective action program for conditioning soils during placement of the interim cover or the radon barrier on the tailings impoundments. The licensee shall also analyze samples of the collection water being used for this purpose for radium-226 and 228 content semiannually. If sample results exceed 30 pCi/l combined radium, the licensee shall perform an evaluation of the potential impacts of using this water on the required design of the radon barrier and submit the evaluation for NRC review within 30 days of receipt of sample results.

[Applicable Amendment: 18]

- 39. DELETED by Amendment No. 31.

- 40. All written notices and reports to NRC required under this license shall be addressed: Attn: Document Control Desk, c/o Deputy Director, Division of Decommissioning, Uranium Recovery, and Waste Programs (Mailstop T8-F5), Office of Nuclear Materials Safety and Safeguards, U. S. Nuclear Regulatory Commission, 11545 Rockville Pike, Two White Flint North, Rockville, MD 20852-2738.

Required telephone notification shall be made to the NRC Operations Center at (301) 816-5100, unless otherwise specified in license conditions.

[Applicable Amendments: 34, 41, 48]

MATERIALS LICENSE

**MATERIALS LICENSE
SUPPLEMENTARY SHEET**

License Number
SUA-1471

Docket or Reference Number
40-8903

Amendment No. 48

41. Spills, Leaks, Excursions, and Incident/Event Reporting

Until license termination, the licensee shall maintain documentation on unplanned release of source or 11e.(2) byproduct materials and process chemicals. Documented information shall include, but not be limited to: date, volume, total activity of each radionuclide released, radiological survey results, soil sample results (if taken), corrective actions, results of post remediation surveys (if taken), and a map showing the spill location and the impacted area. The licensee shall have procedures which will evaluate the consequences of the spill or incident/event against 10 CFR 20, Subpart "M," and 10 CFR 40.60 reporting criteria. If the criteria are met, then report to the NRC Operations Center as required.

If the licensee is required to report any spills, leaks, or excursions of source, 11e.(2) byproduct material and process chemicals that may have an impact on the environment, or any other incidents/events to State or Federal Agencies, a report shall be made to the NRC Region IV Nuclear Materials Licensing Branch Chief and NRC Headquarters Project Manager (PM) by telephone or electronic mail (e-mail) within 48 hours of the event. This notification shall be followed, within thirty (30) days of the notification, by submittal of a written report to NRC Region IV and NRC Headquarters, detailing the conditions leading to the spill or incident/event, corrective actions taken, and results achieved.

[Applicable Amendment: 34]

42. An annual report will be submitted to the NRC that includes the ALARA audit report, land use survey, monitoring data, corrective action program report, and the effluent and environmental monitoring reports.

[Applicable Amendment: 34]

43. Before engaging in any developmental activity not previously assessed by the NRC, the licensee shall administer a cultural resource inventory. All disturbances associated with the proposed development will be completed in compliance with the National Historic Preservation Act (as amended) and its implementing regulations (36 CFR 800), and the Archaeological Resources Protection Act (as amended) and its implementing regulations (43 CFR 7).

In order to ensure that no unapproved disturbance of cultural resources occurs, any work resulting in the discovery of previously unknown cultural artifacts shall cease. The artifacts shall be inventoried and evaluated in accordance with 36 CFR Part 800, and no disturbance of the area shall occur until the licensee has received authorization from the NRC to proceed.

MATERIALS LICENSE

**MATERIALS LICENSE
SUPPLEMENTARY SHEET**

License Number
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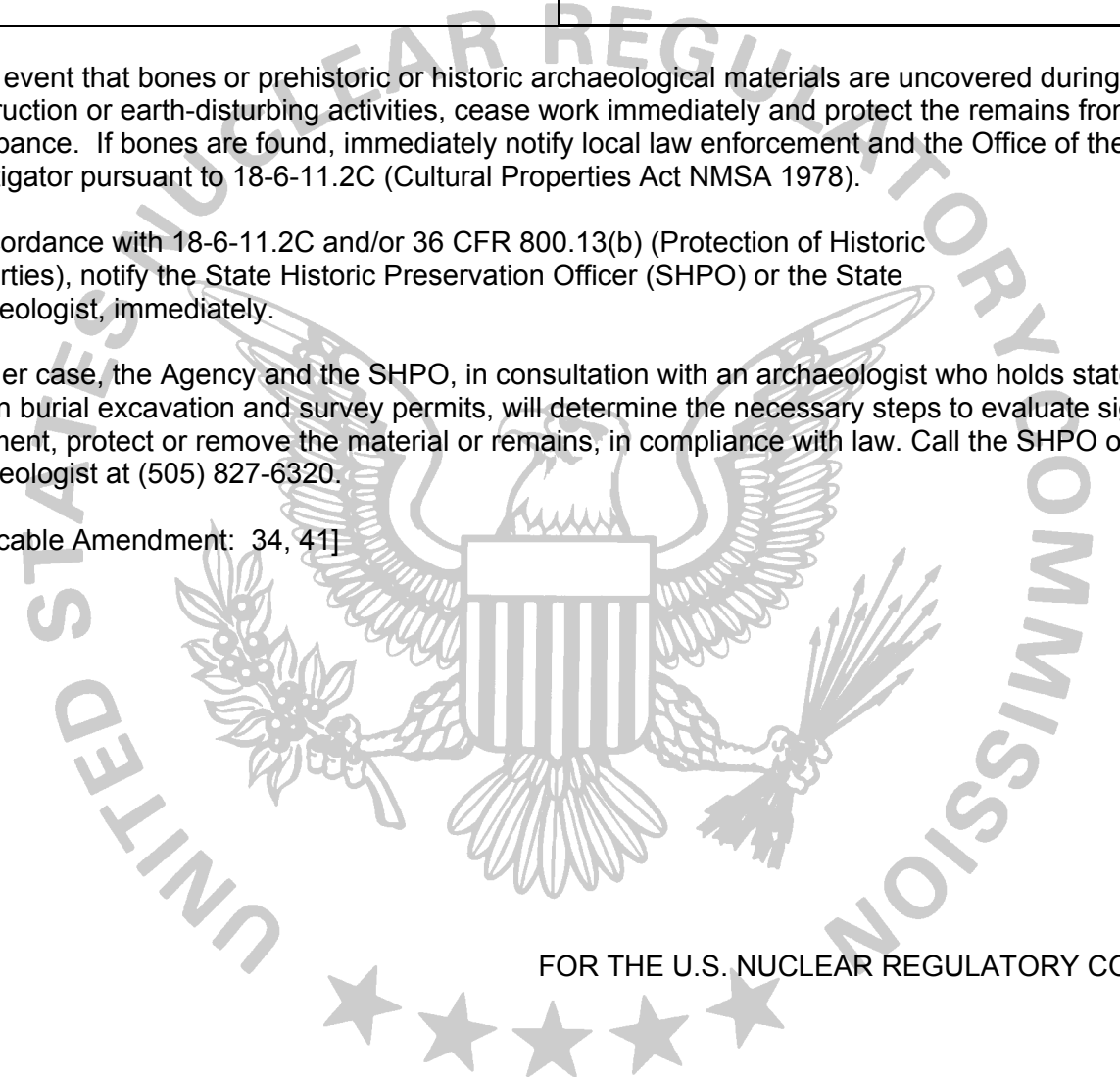
Amendment No. 48

In the event that bones or prehistoric or historic archaeological materials are uncovered during construction or earth-disturbing activities, cease work immediately and protect the remains from further disturbance. If bones are found, immediately notify local law enforcement and the Office of the Medical Investigator pursuant to 18-6-11.2C (Cultural Properties Act NMSA 1978).

In accordance with 18-6-11.2C and/or 36 CFR 800.13(b) (Protection of Historic Properties), notify the State Historic Preservation Officer (SHPO) or the State Archaeologist, immediately.

In either case, the Agency and the SHPO, in consultation with an archaeologist who holds state unmarked human burial excavation and survey permits, will determine the necessary steps to evaluate significance, document, protect or remove the material or remains, in compliance with law. Call the SHPO or State Archaeologist at (505) 827-6320.

[Applicable Amendment: 34, 41]



FOR THE U.S. NUCLEAR REGULATORY COMMISSION

Dated: 10/04/2016

/RA/

Andrea L. Kock, Deputy Director
Division of Decommissioning, Uranium Recovery,
and Waste Programs
Office of Nuclear Material Safety
and Safeguards

**Memorandum of Understanding Between EPA, NRC and
The State of Colorado, Texas, and Washington
Concerning Clean Air Act Standards
for Radon Releases from Uranium Mill Tailings,
Subparts T and W, 40 CFR Part 61**

In accordance with Sections 112 (d)(9) and 122 (c)(2) of the Clean Air Act, as amended in 1990, and in order to minimize regulatory duplication and conserve resources in the control of radionuclide emissions to air from uranium mill tailings sites licensed by the Nuclear Regulatory Commission (NRC) or its Agreement States under the Atomic Energy Act of 1954, as amended, NRC, the Environmental Protection Agency (EPA), and the States of Colorado, Texas, and Washington (the affected Agreement States) agree as follows:

General Goal of Agreement

EPA, NRC and affected Agreement States are entering into this MOU to ensure that owners and operators of existing uranium mill tailings disposal sites licensed by the NRC, or the affected Agreement States, who have ceased operations and those owners and operators that will in the future cease operation, effect emplacement of a final earthen cover to limit radon emissions to a flux of no more than 20 pCi/m²/s, as expeditiously as practicable considering technological feasibility. A guiding objective is that this occur to all current disposal sites (see Attachment A) by the end of 1997, and within seven years of when the existing operating and standby sites cease operation. The final closure requirement shall be enforceable by NRC or the affected Agreement States.

NRC and Affected Agreement State Lead Actions

1. NRC or the affected Agreement States will complete review and approval of detailed reclamation (i.e., final closure) plans, including schedules for emplacement of earthen covers on non-operational tailing impoundments such that radon emissions will not exceed a flux of 20 pCi/m²/s, as soon as practicable but in any event not later than September of 1993. NRC or the affected Agreement States will immediately solicit voluntary requests by uranium mill tailings disposal site licensees to amend their licenses to set forth, or incorporate by reference, the schedule for reclamation. Once approved by NRC or the Agreement States, these reclamation schedules will be enforceable. If any licensee fails to voluntarily have a firm reclamation schedule (consistent with this MOU) incorporated into its license, NRC or the Agreement States will impose the appropriate license amendments by order (in accordance with applicable regulatory procedures).

NRC or the affected Agreement States will ensure that the schedules and conditions for effecting final closure are flexible enough to contemplate technological feasibility and that cover emplacement on the tailings impoundments occurs as expeditiously as practicable considering both short-term reductions in radon releases and long-term stability of the uranium tailings.

2. NRC agrees to provide for public notice and comment by publishing in the *Federal Register* receipt of requests, intent to issue amendments, or intent to issue orders which (1) incorporate reclamation plans or other schedules for effecting final closure into licenses, and (2) amend reclamation schedules as necessary for reasons of technological feasibility (including inclement weather, litigation which compels delays to emplacement, or other factors beyond control of the licensee) after the reclamation plans have been incorporated into the licenses. The affected Agreement States agree to provide comparable public notice and comment.

3. NRC will conduct enforcement actions in accordance with 10 CFR Part 2, Appendix C, to compel licensee adherence to reclamation schedules, except when the licensee both demonstrates that compliance was not technologically feasible and has made written application to NRC for a license amendment to reflect that concern. The affected Agreement States shall act pursuant to their authority to similarly enforce. NRC and the affected Agreement States will consider and act within a reasonable time period upon requests from EPA or other interested parties to institute a proceeding to modify, suspend, or revoke a license or other enforcement action as may be proper. NRC will consider such requests in accordance with the procedures in 10 CFR 2.206; the affected Agreement States will consider such requests in accordance with State law and existing State procedures.

EPA Lead Actions

4. In or about October 1991, EPA will develop and publish in the *Federal Register* a Notice of Proposed Rulemaking to stay existing 40 CFR Part 61, Subpart T pending implementation of this agreement, including the rulemaking initiatives described in paragraphs 5 and 6, below, and the license amendments described in paragraphs 1 and 2, above. Final action will be taken on or about December 15, 1991.

5. ~~On or~~ about December 15, 1991, EPA will develop and publish in the *Federal Register* a Notice of Proposed Rulemaking or an Advance Notice of Proposed Rulemaking, pursuant to its authority under Atomic Energy Act Section 275, to make specific amendments to 40 CFR Part 192 that would require emplacement of a final earthen cover on non-operational tailing impoundments such that radon emissions will not exceed a flux of 20 pCi/m²/s, as expeditiously as practicable, but with a goal that such occur no later than December 31, 1997 or seven years after the date on which the impoundment ceased operations, whichever is later. This proposal will include generic performance obligations towards closure. NRC and the affected Agreement States will assist EPA in developing the technical basis to support this rulemaking. Final action will be taken as soon as practicable.

6. On or about December 15, 1991, EPA will develop and publish in the *Federal Register* a Notice of Proposed Rulemaking, pursuant to its authority under Clean Air Act Section 112(d)(9), to rescind its existing uranium mill tailings disposal regulations at 40 CFR Part 61, Subpart T. This proposal, which will occur only if the purposes and provisions of this MOU are proceeding expeditiously, requires that the Administrator find that the regulatory program implemented by NRC and the affected Agreement States will protect public health with an ample margin of safety. It is expected, subject to public notice and comment, that the basis for this finding will ultimately be provided through compliance by NRC, the affected Agreement States, and EPA with all aspects of this agreement, including finalized, enforceable reclamation plans and expeditious closure schedules for all affected facilities. Final action will be taken as soon as practicable after completion of the rulemaking described in paragraph 5 and the licensing described in paragraphs 1 and 2.

7. During or after performance of the actions described in paragraphs 1, 4, 5 and 6, EPA, NRC and the affected Agreement States will cooperate in addressing pursuant to CAA Section 112 (d)(9) duplication of regulation presented by 40 CFR Part 61, Subpart W, which relates to radionuclide emissions from uranium mill tailings piles that are operational or in standby status.

Effective Date, Revision, and Termination

This memorandum shall be effective immediately and shall continue in effect until revised by mutual agreement, unless terminated by any party after 120 days notice in writing.

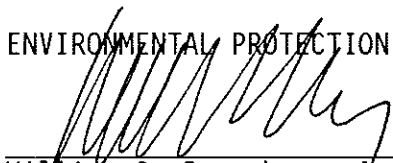
NUCLEAR REGULATORY COMMISSION,



Robert M. Bernero, Director
Office of Nuclear Material Safety and Safeguards

October 17, 1991

ENVIRONMENTAL PROTECTION AGENCY,



William G. Rosenberg, Assistant Administrator
For Air and Radiation

October 18, 1991



ATTACHMENT A

Non-Operational Tailings Impoundments

| <u>FACILITY</u> | <u>TARGET DATE¹</u> |
|--|--------------------------------|
| ANC, Gas Hills, WY -1 impoundment operational for - in-situ waste disposal -1 non-operational impoundment | 1995 |
| ARCO Coal, Bluewater, NM | 1995 |
| Atlas, Moab, UT | 1996 |
| Conoco, Conquista, TX | 1996 |
| Ford-Dawn Mining, Ford, WA -1 operational impoundment -3 non-operational impoundments | 2010 |
| Hecla Mining, Durita, CO | 1997 |
| Homestake, Milan, NM (large impoundment) (small impoundment) | 1996 2001 |
| Pathfinder-Lucky Mc, Gas Hills, WY | 1998 |
| Petrotomics, Shirley Basin, WY | 1995 |
| Quivira, Ambrosia Lake, NM -2 operational impoundments -1 non-operational impoundment | 1997 |
| Rio Algom, Lisbon, UT | 1996 |
| Sohio-L-Bar, Cebolleta, NM | 1992 |
| UMETCO, Gas Hills, WY -1 operational impoundment -1 non-operational impoundment | 1995 |

¹ For completing emplacement of final earthen cover to limit radon emissions to a flux of no more than 20 pCi/m²/s.

| <u>FACILITY</u> | <u>TARGET DATE</u> ¹ |
|-------------------------------|---------------------------------|
| UMETCO, Maybell, CO | 1997 |
| UMETCO, Uravan, CO | 2002 ² |
| UNC, Church Rock, NM | 1997 |
| Union Pacific, Bear Creek, WY | 1996 |
| WNI, Sherwood, WA | 1996 |
| WNI, Split Rock, WY | 1995 |

¹ For completing emplacement of final earthen cover to limit radon emissions to a flux of no more than 20 pCi/m²/s.

² CERCLA Consent Decree requires final cover over tailings by 1997 but allows small portion (roughly 1% of the impoundment) to remain open to receive residues from groundwater restoration activities.

6. On or about December 15, 1991, EPA will develop and publish in the *Federal Register* a Notice of Proposed Rulemaking, pursuant to its authority under Clean Air Action Section 112(d)(9), to rescind its existing uranium mill tailings disposal regulations at 40 CFR Part 61, Subpart T. This proposal, which will occur only if the purposes and provisions of this MOU are proceeding expeditiously, requires that the Administrator find that the regulatory program implemented by NRC and the affected Agreement States will protect public health with an ample margin of safety. It is expected, subject to public notice and comment, that the basis for this finding will ultimately be provided through compliance by NRC, the affected Agreement States, and EPA with all aspects of this agreement, including finalized, enforceable reclamation plans and expeditious closure schedules for all affected facilities. Final action will be taken as soon as practicable after completion of the rulemaking described in paragraph 5 and the licensing described in paragraphs 1 and 2.

7. During or after performance of the actions described in paragraphs 1, 4, 5 and 6, EPA, NRC and the affected Agreement States will cooperate in addressing pursuant to CAA Section 112 (d)(9) duplication of regulation presented by 40 CFR Part 61, Subpart W, which relates to radionuclide emissions from uranium mill tailings piles that are operational or in standby status.

Effective Date, Revision, and Termination

This memorandum shall be effective immediately and shall continue in effect until revised by mutual agreement, unless terminated by any party after 120 days notice in writing.

NUCLEAR REGULATORY COMMISSION,



Robert M. Bernero, Director
Office of Nuclear Material Safety and Safeguards

October 17, 1991


ENVIRONMENTAL PROTECTION AGENCY,



William G. Rosenberg, Assistant Administrator
For Air and Radiation

October 18, 1991

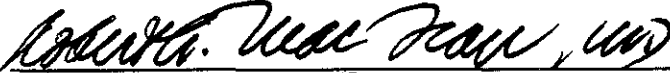
STATE OF COLORADO,



Joel Kohn, Interim Executive Director
Department of Health

October 23, 1991


STATE OF TEXAS,



Robert A. MacLean, MD
Acting Commissioner of Health

October 23, 1991

STATE OF WASHINGTON,



Kristine Gebbie, Secretary
Department of Health

October 23, 1991

#

Umetco Minerals Corporation

40-8681



WHITE MESA MILL P.O. BOX 669 • BLANDING, UTAH 84511
(801) 678-2221

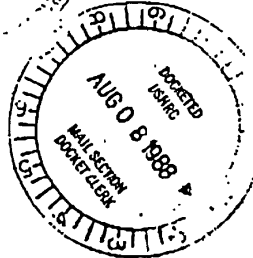
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PUBLIC DOCUMENT CENTER

RETURN ORIGINAL TO PDR, HQ.

July 28, 1988



Mr. Harry J. Pettengill
U. S. Nuclear Regulatory Commission
Region IV
Uranium Recovery Field Office
Box 25325
Denver, CO 80225

Re: Umetco Minerals Corporation
SUA-1358: Docket No. 40-8681
White Mesa Mill; Utah

Dear Mr. Pettengill:

The purpose of this letter is to request License Amendments to White Mesa's Source Materials License. Enclosed is a check for \$150.00.

If you need any information do not hesitate to contact me or my staff.

Very truly yours,

J S Hamrick

J. S. Hamrick
Site Environmental Coordinator

| | |
|-----|-----------------|
| 123 | Aug 28-3 |
| 124 | White Mesa Mill |
| 125 | 2986 |
| 126 | \$150 |
| 127 | 2A |
| 128 | Amendment |
| 129 | 8/29/88 |
| 130 | 1/1/88 |

Jackson

D.K. Sparling
D. K. Sparling
Superintendent
Umetco Minerals Corporation
White Mesa Mill
P. O. Box 669
Blanding, UT 84511
(801) 678-2221

DESIGNATED ORIGINAL

Certified By *Mary C. Hood*

8809120156 880728
PDR ADOCK 04008681
PDC

DFO

88-10

License Condition 15

License Condition (LC) 15 sets forth guidelines for archeological sites that may be affected by mill operations or construction. Attachment No. 2 referenced in LC 15 should reflect the archeological work that has been accomplished at the White Mesa Mill. Accordingly, Umetco proposes that the following attachment be substituted for Attachment No. 2 of the license.

Diversioin Ditches

Conceptual construction plans called for the construction of 3 diversion ditches. It was envisioned that these ditches would be needed for the Probable Maximum Flood Series (PMFS) event of over 15 inches. The design work that has gone into White Mesa's reclamation plan has shown a PMF of 7.76 inches. Designing to this precipitation event has shown that no diversion ditches are needed for flood protection.

Attached is a site map showing drainage boundaries and areas. Note that the Mill and Facilities Area Sedimentation Pond has a 14 acre-foot capacity. A PMF of 7.76 inches produces 140 acre-feet of liquid. The freeboard limit on Cell 1-I is 3.5 feet and its surface area is 54 acres, providing PMF storage capacity of 189 acre-feet.

The PMF would then leave:

$$189 + 14 - 140 = 63 \text{ acre-feet}$$

of solution capacity in Cell 1-I, or a 45% safety margin beyond PMF requirements. Therefore no diversion ditches are needed for flood design purposes.

Umetco proposes that monitoring and maintenance standards for Diversion Ditch 1 be abandoned and that requirements for the construction of Diversion Ditches 2 and 3 be dropped.

Restricted Area Boundaries

Umetco wishes to enlarge the restricted area to the north and south of the Tailings Management Area. The boundary enlargement to the south is necessary for Cell 4 construction. Expanding the boundary to the north will allow greater flexibility in maintenance of spray systems in Cell 1-I. Attached is a map of the current and proposed boundaries. Note that the now fencing is on land owned by Umetco.

The new boundary would consist of steel posts and barbed wire fencing. This would replace the existing cedar post and barbed wire fence which would be removed as needed after the new fence had been completely constructed. This will insure that there are

no breaches in the perimeter fence during construction.

Westwater Creek, License Condition 24-C

This surface water in this creek is monitored according to specifications in the License and supporting documents. The creek has been dry for 15 of the last 25 quarters. Umetco proposes that this creek be dropped from monitoring requirements.

Rupture Detection, License Condition 47

Umetco proposes that rupture detection for Cell 3 and successive tailings cells follow the system outlined in the letter to the NRC dated December 31, 1986.

Attachment No. 2
 Archeological Sites Related to the White Mesa Project

| Excavated Sites | Contributing Sites To Be Excavated | Undetermined Sites | Non-Contributing Sites |
|-----------------|------------------------------------|--------------------|------------------------|
| 6380 | 6379 | 3766 | 7663 |
| 6381 | 6382 | 6398 | 7664 |
| 6384 | 6405* | 6390 | 7669 |
| 6385 | 6408* | 6389 | 7670 |
| 6386 | 6421* | 6399 | 7671 |
| 6387 | 6427 | 6400* | 7672 |
| 6388 | 6430* | 6401* | 7673 |
| 6391 | 6431* | 6402* | 7674 |
| 6392 | 6432* | 6406* | 7675 |
| 6393 | 6439* | 6407* | 7679 |
| 6394 | 6441* | 6419* | 7680 |
| 6395 | 6443 | 6422 | 7681 |
| 6396 | 6444 | 6423 | 7682 |
| 6397 | 6445 | 6424 | 7683 |
| 6403 | 6739* | 6425 | 7685 |
| 6404 | 6740 | 6426 | 7686 |
| 6420 | 7653 | 6428 | 7688 |
| 6429 | 7655 | 6433 | 7692 |
| 6435 | 7656 | 6434 | 7694 |
| 6436 | 7657 | 6438 | 7695 |
| 6437 | 7658 | 6440 | 7699 |
| 6684 | 7659 | 6442 | 7750 |
| 6685 | 7660 | 6452 | 7751 |
| 6686 | 7661 | 6453 | 7875 |
| 6697 | 7665 | 6462 | |
| 6698 | 7668 | | |
| 6699 | 7675 | | |
| 6754 | 7684 | | |
| 6757 | 7687 | | |
| 7754 | 7689 | | |
| | 7690 | | |
| | 7691 | | |
| | 7693 | | |
| | 7696 | | |
| | 7700 | | |
| | 7752* | | |
| | 7876 | | |
| | 8014 | | |

Totals: 30 38 25 24 7
 * Sites located within 100 feet of Cell 1-E, Cell 5, and related construction areas.

Energy Fuels - BLM Land Exchange
Cultural Resource Easement Agreement

At such time as a surface disturbing activity is proposed on the subject land described as:

- T. 37 S., R. 22 E., SLBM, Section 29: SE 1/4 SE 1/4
Section 33: SW 1/4
- T. 38 S., R. 22 E., SLBM, Section 4: N 1/2, SW 1/4, W 1/2 SE
1/4, W 1/2 E 1/2 SE 1/4
Section 5: All
Section 6: E 1/2
Section 8: NE 1/4
Section 9: All

The patentee (Energy Fuels, Ltd.) or its heirs, successors-in-interest or assigns shall determine the potential adverse effect of proposed land disturbing activities on the cultural sites, as shown on Attachment "A" which have been identified as potentially eligible for inclusion on the National Register of Historic Places, and complete the following steps:

- a. Should the sites be within the proposed impact zone (defined as the area of any facility plus the surrounding land to 100 feet distance from the facility's perimeter, or alternative facility location areas), the patentee shall submit to the Moab District of the Bureau of Land Management a proposed cultural resources mitigation plan. The sites, if unavoidable, shall be recovered through an acceptable data recovery program which will specify procedures for study and final disposition of any human burials found. In either case, Bureau of Land Management's approval of the proposed cultural resources mitigation plan shall be made in consultation with the Utah State Historic Preservation officer, the Advisory Council on Historic Preservation, and, regarding human remains, the appropriate native American interests.
- b. Periodic inspections of sites shall be performed by Bureau of Land Management personnel by prior arrangement with the patentee to assure compliance with these provisions at intervals not greater than three (3) years. Should surface disturbing activity be noted at any time, a joint inspection shall be requested of the patentee immediately to

assess cultural damage, if any, and determine needed mitigation required.


- c. Energy Fuels, Ltd., or its heirs, successors-in-interest or assigns will be responsible for the costs of any mitigation including excavations or testing necessary as a result of damage or development impacts. Professional archaeologists employed and salvage techniques are subject to approval by the Utah State Historic Preservation Office, the Advisory Council on Historic Preservation and the Bureau of Land Management.
- d. After study, the recovered artifacts will be curated at an institution acceptable to the Utah State Historic Preservation Office.

Any obligation imposed hereunder shall run with the subject land and shall be binding upon Energy Fuels, Ltd. for so long as, and only so long as, it owns, controls or has the right to possess that portion of the subject land to which any such obligation relates.

IN WITNESS WHEREOF, the parties have executed this Cultural Resources Easement Agreement this 26th day of August, 1985.

ENERGY FUELS, LTD.,
a Colorado limited
partnership
By E.F. Uranium Group, Inc.
a Colorado corporation
Its General Partner


Moab District Manager
Bureau of Land Management

By: 
Brad L. Doores
Vice President -
Legal & Regulatory Affairs