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Ref: 8EPR-N

Michael Lesar
Chief, Rulemaking and Directives Branch
U.S. Nuclear Regulatory Commission
Mail Stop TWB-05-B01
Washington, D.C. 20555-0001

Re: NUREG – 1910, Supplements 1, 2, and 3
Draft SEIS for three Wyoming Uranium ISR Projects
Lost Creek ISR Project CEQ# 20090425
Moore Ranch ISR Project CEQ # 20090421
Nichols Ranch ISR Project CEQ# 20090423

Dear Mr. Lesar:

The United States Environmental Protection Agency Region 8 (EPA) has reviewed the Draft Supplemental Environmental Impact Statements (SEISs), prepared by the U.S. Nuclear Regulatory Commission (NRC), for each of three new source material licenses proposed for the following in-situ uranium recovery (ISR) facilities: (1) Lost Creek ISR, LLC in Sweetwater County, (2) Energy Metals Corporation for Moore Ranch in Campbell County, and (3) Uranerz Energy Corporation for Nichols Ranch in Campbell-Johnson Counties, Wyoming (Projects). NRC determined that some impacts would be generic or essentially the same for all in-situ uranium recovery (ISR) facilities, while other impacts would be facility-specific, thus requiring further site-specific analysis. The 2009 Generic Environmental Impact Statement (GEIS) provided a starting point for these SEISs. EPA's review and comments are provided in accordance with our responsibilities under the National Environmental Policy Act (NEPA), 42 U.S.C. § 4321, et.seq., and Section 309 of the Clean Air Act (CAA), 42 U.S.C. § 7609.

During 2009, EPA participated in multiple teleconferences with NRC regarding the draft SEISs. Throughout EPA's review of these projects, we have emphasized the critical need for the SEISs to adequately assess an appropriate range of reasonable alternatives for disposal of contaminated wastewater. EPA also stressed the need for site specific information in the analysis of all potential environmental impacts associated with these projects. We remain concerned that, individually, the draft SEIS for each project does not provide adequate information to effectively address these key issues.

The primary concerns EPA has with the draft SEISs are the following: (1) the narrow range of the wastewater disposal alternatives analysis along with the limited discussion regarding waste management impacts; and (2) the lack of information regarding air pollutants and the impacts of those emissions. These concerns are the basis for the EPA rating at the conclusion of

this letter. Additional concerns include the potential establishment of alternative concentration limits (ACLs) as groundwater restoration targets prior to completion of adequate restoration efforts, and the information concerning climate change and greenhouse gas emissions.

Wastewater Disposal Analysis

Generally, liquid waste from these projects will be composed of process water, production bleed water, and restoration water. These wastewaters are classified as "byproduct material" under the Atomic Energy Act. Most of these wastes will be contaminated with metals and radionuclides. Under the Underground Injection Control (UIC) program, byproduct material falls under the definition of "radioactive waste," but not under the definition of "hazardous waste," even though it can contain constituents in quantities ordinarily qualifying as hazardous waste. See 40 C.F.R. § 144.3. Consequently, disposal of wastewater from these projects has the potential for significant environmental impacts.

For each of these projects, deep Class I injection well disposal is the only wastewater disposal method analyzed. For example, the draft SEIS for the Lost Creek project states that impacts from Class I wells are small because of the depth of the geologic formation receiving the injected wastewater and proposes that four Class I injection wells be constructed to inject the wastewater at a depth of approximately 8,400 feet. The Safe Drinking Water Act's UIC regulations require that Class I wastes be injected below the lowermost underground source of drinking water (USDW). 40 C.F.R. § 144.6(a). This may be difficult for these types of projects located in Region 8.

In many areas of Wyoming, USDWs are known to occur at great depths, which can significantly limit the areas where injection below the lowermost USDW is feasible. In the area of the Lost Creek Project the Great Divide Basin contains up to 20,000 feet of sedimentary rocks, including two major aquifers which occur below 8,400 feet (the proposed Class I injection depth), the Tensleep Formation and the deeper Madison Formation. Both are known to be USDWs in parts of Wyoming and are currently used as public water supply sources in some areas of the state. Formations below the Madison generally have very low hydraulic conductivity and, therefore, are not likely to be suitable for injection of the volumes of fluids associated with the proposed facility. In order to inject into a Class I well, the injection zone cannot be a USDW, and all underlying formations cannot be USDWs. This situation is very similar for the Moore Ranch and Nichols Ranch project areas. Moore Ranch proposes injection in the area of the Teapot-Teckla-Parkman formation at a depth of 7,916 to 9,610 feet. Waste is also expected to be injected into the Lance formation at depths ranging from 3,700 to 7,500 feet. Nichols Ranch also proposes to inject into the Lance formation several thousand feet below the production zones occurring between 300-700 feet below ground surface.

Determination of USDW/non-USDW status can be difficult and proposed aquifer exemptions are subject to public comment, with final approval by the EPA. Based on these factors, there is significant uncertainty whether Class I injection well disposal will be available at these sites. Consequently, the fact that these draft SEISs evaluate only Class I UIC injection wells as the waste disposal method is inadequate.

Wastewater disposal alternatives that EPA believes need to be analyzed include the following: (1) treatment and disposal via a Class V injection well[1]; (2) treatment and discharge to surface waters under an NPDES permit; and (3) other potential methods such as land disposal and evaporation ponds.

In a related matter, the Lost Creek draft SEIS does not accurately estimate the amount of wastewater that will be generated by the project. A better estimate of the total volume of liquid waste that will require disposal is needed. The GEIS states that ISR facilities operate at a flow rate of 4,000 to 9,000 gpm and that approximately 2 to 3% (80 to 270 gpm) (7 to 138 million gallons per year) of this flow rate will be disposed of as bleed water. The draft SEIS states that only bleed water and elution circuit bleed would be disposed of via Class I wells. There is no information regarding how the other liquid wastes will be disposed of, nor is there an estimated annual volume for the other liquid wastes. This is also an issue with each of the other draft SEISs.

Potential impacts from disposal of non-radioactive contaminants (barium, cadmium, mercury, selenium) in liquid wastes are not adequately addressed given the anticipated volumes and available methods. An analysis should be presented that includes discussion of the following: (1) treatment of the waste stream to applicable Wyoming Groundwater Class of Use standards (i.e. quality) prior to injection or discharge, (2) evaluation of radioactive contaminant removal, (3) arrangements for off-site commercial, licensed land disposal of the treatment residual, (4) use of evaporation ponds with double-liners and leak detection systems, and (5) costs to remove other potentially harmful constituents such as metals, oxides, and chlorides before injection to mitigate or prevent subsurface environmental degradation of any nearby USDWs or cause surface water impacts.

Air Quality Impacts

The SEIS analysis of air quality impacts associated with these projects is not adequate to allow the assessment of the environmental impacts of the projects. These projects will likely result in deterioration of air quality due to emissions from drill rig engines, fugitive emissions and emissions from processing operations, yet these emissions are not presented in the draft SEISs. They lack emission inventories for construction and operational sources and fail to analyze the potential sources of air emissions associated with these projects. Additionally, without a detailed emission inventory we cannot evaluate the proposed CAA determinations made in the NEPA documents, including the emissions sources included in these projects, and whether they comply with applicable CAA permit requirements. Projects similar in scope to these facilities require hundreds of injection/production wells and multiple deep injection wells. Without a complete air quality analysis, EPA's experience from the review of similar projects has shown that these projects are likely to have significant adverse local air quality impacts and also may adversely impact nearby Federal Class I areas, which require special protection of air quality and air quality related values (AQRVs), such as visibility. Of particular concern are the

[1] Class V disposal wells are those not included in Classes I, II, III, and IV. Most relevant for ISR disposal purposes, Class V disposal may include disposal into shallower formations than those below the lowermost USDW if the waste meets certain criteria.

air emissions that will result from the truck-mounted diesel drilling rigs and the drilling of hundreds of wells in each project area. This level of development may have cumulative emission rates in excess of several hundred tons per year of NO_x, PM_{10} and other priority air pollutants. These levels of emissions could adversely affect the AQRVs in Class I and sensitive Class II areas and increase nearby ambient concentrations of ozone, PM_{10}, NO_2, and other pollutants. Detailed emission inventories for the proposed projects need to be included in revised SEISs. We also request that a near field air analysis be conducted to determine direct air impacts. A screening analysis should also be conducted on emissions from the projects to identify far field impacts including visibility parameters for Class I and sensitive Class II air sheds. Prior to any modeling, a draft air quality modeling protocol should be circulated among the interested air quality stakeholders for comment. Finally, with respect to the potential use of evaporation ponds for uranium by-product material, the NEPA analysis needs to estimate radon emissions, and analyze compliance with applicable CAA requirements for such emissions, which could be significant.

Additional Issues

Groundwater Restoration Targets

The draft SEISs do not fully assess the operational requirements and constraints associated with the restoration activities that are critical for achieving groundwater restoration goals. Although they appropriately state that the water quality goal in the portion of the aquifer where extraction occurs is pre-ISR baseline conditions, the same paragraphs conclude with a statement that there will be a demonstration of restoration that complies with the requirements of 10 C.F.R. Part 40, Appendix A. Appendix A allows for restoration target values which can fall short of the pre-ISR baseline. Data from the ISR Christensen Ranch Mine Unit 2, for example, indicate that NRC has approved target restoration values for groundwater constituents as alternative concentration limits (ACLs). Although EPA standards for uranium extraction facilities in 40 C.F.R. Part 192 do allow NRC to utilize this practice, ACLs are above baseline or MCL values.

Without further elaboration in the final GEIS and these SEISs on how often NRC, or its Agreement States, approve ACLs, or the ACL concentrations which have been approved previously by NRC or its Agreement States, this raises an issue of whether the draft SEISs' characterization of the potential permanent degradation of groundwater quality as "small" is accurate. As such, the draft SEISs do not evaluate the potential effects that non-attainment of baseline groundwater restoration would have on surrounding USDWs.

Studies cited in the GEIS[2] concluded that, for sites that were reviewed, aquifer restoration took longer and required more aquifer pore volume flushing than originally planned. The draft SEISs should evaluate the alternative methods that could be used to meet restoration goals of baseline conditions for all constituents mobilized during ISR recovery operations; and whether

[2] (USGS Open File Report 2009-1143 Groundwater Restoration at Uranium In-Situ Recovery Mines, South Texas Coastal Plain, and Report on Findings Related to the Restoration of Groundwater at In-Situ Uranium Mines in South Texas)

the six month post-restoration 'stability period' proposed for these projects is sufficient to achieve baseline values or MCLs and prevent any long-term remobilization of contaminants. There should also be an explanation concerning at what point in the process NRC would make the decision to set ACLs, as well as a discussion of whether there will be a further public process associated with any decision by NRC to approve ACLs.

The Lost Creek draft SEIS section 4.5.2.1.2.2 only briefly describes the excursions of lixiviant or chemical tracers that have occurred at NRC-licensed ISR facilities. It does not provide adequate detail about the cause of these excursions and how they affected the SDWA-protected aquifers outside the exempted uranium recovery zones. The uranium ore body at Lost Creek occurs within the Battle Springs/Wasatch Formation, which is an important aquifer /USDW. Each of the SEISs have similar discussions and therefore should provide a thorough analysis of the potential environmental impacts that an excursion may present, including effects on groundwater restoration estimates.

Climate Change and Greenhouse Gas Emissions

EPA suggests that the SEISs include an expanded discussion of greenhouse gas (GHG) emissions and climate change, including the following:

1. Discuss projected regional climate change impacts relevant to the action area, consider any future needs and capacity of the proposed action to adapt to projected climate change effects, and if appropriate, identify effects from the action that may be exacerbated by projected climate change.
2. Characterize and quantify the expected annual and total project lifetime cumulative GHGs.
3. Briefly discuss the link between GHGs and climate change and the potential impact of climate change.
4. Discuss potential means to mitigate project-related emissions.

EPA's Rating

Based on our review of the draft SEISs and consistent with our responsibilities under NEPA and section 309 of the Clean Air Act, EPA is rating each of the draft SEISs as "Inadequate" (Category 3). This rating indicates EPA's belief that these draft SEISs do not meet the purposes of NEPA and should be formally revised and made available for public comment in a supplemental or revised SEIS. If we are unable to resolve our concerns, this matter would be a candidate for referral to the Council on Environmental Quality for resolution.

We will be contacting you to resolve these significant concerns. EPA will also be providing you with detailed comments regarding each of the SEISs. If you have any questions

before that time, please contact Larry Svoboda, Director of the EPA Region 8 NEPA Compliance and Review Program. Mr. Svoboda can be reached at (303) 312-6004.

Sincerely,

Carol L. Campbell for

Carol Rushin
Acting Regional Administrator

Enclosure: Summary of EPA Rating System

cc: Patrice Bubar (NRC)
Andrea Koch (NRC)

SUMMARY OF EPA RATING SYSTEM

Rating the Environmental Impact of the Action

- LO (Lack of Objections) The review has not identified any potential environmental impacts requiring substantive changes to the preferred alternative. The review may have disclosed opportunities for application of mitigation measures that could be accomplished with no more than minor changes to the proposed action.

- EC (Environmental Concerns) The review has identified environmental impacts that should be avoided in order to fully protect the environment. Corrective measures may require changes to the preferred alternative or application of mitigation measures that can reduce the environmental impact.

- EO (Environmental Objections) The review has identified significant environmental impacts that should be avoided in order to adequately protect the environment. Corrective measures may require substantial changes to the preferred alternative or consideration of some other project alternative (including the no action alternative or a new alternative). The basis for environmental objections can include situations:

    1. Where an action might violate or be inconsistent with achievement or maintenance of a national environmental standard;
    2. Where the Federal agency violates its own substantive environmental requirements that relate to EPA's areas of jurisdiction or expertise;
    3. Where there is a violation of an EPA policy declaration;
    4. Where there are no applicable standards or where applicable standards will not be violated but there is potential for significant environmental degradation that could be corrected by project modification or other feasible alternatives; or
    5. Where proceeding with the proposed action would set a precedent for future actions that collectively could result in significant environmental impacts.

- EU (Environmentally Unsatisfactory) The review has identified adverse environmental impacts that are of sufficient magnitude that EPA believes the proposed action must not proceed as proposed. The basis for an environmentally unsatisfactory determination consists of identification of environmentally objectionable impacts as defined above and one or more of the following conditions:

    1. The potential violation of or inconsistency with a national environmental standard is substantive and/or will occur on a long-term basis;
    2. There are no applicable standards but the severity, duration, or geographical scope of the impacts associated with the proposed action warrant special attention; or
    3. The potential environmental impacts resulting from the proposed action are of national importance because of the threat to national environmental resources or to environmental policies.