UNITED STATES COURT OF APPEALS
FOR DISTRICT OF COLUMBIA CIRCUIT

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UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT

NATURAL RESOURCES DEFENSE COUNCIL, INC. and POWDER RIVER BASIN RESOURCES COUNCIL,	)	
Petitioners,	)	No. 16-1298
v.	)	
UNITED STATES NUCLEAR REGULATORY COMMISSION and the UNITED STATES OF AMERICA,	)	
Respondents.	)	

ORIGINAL

PETITION FOR REVIEW

Pursuant to 42 U.S.C. § 2239, the Hobbs Act, 28 U.S.C. §§ 2341-2351, and Federal and D.C. Circuit Rule 15, notice is hereby given this 24th day of August, 2016, that Petitioners Natural Resources Defense Council, Inc. and Powder River Basin Resources Council, through undersigned council, hereby Petition the United States Court of Appeals for the District of Columbia Circuit for review of:

1. The United States Nuclear Regulatory Commission's ("Commission") February, 2014 Final Environmental Impact Statement ("EIS") for the Ross Uranium In-Situ Recovery Project in Cook County, Wyoming, as amended by subsequent Errata (Attachment A) (Excerpt));

2. The Commission's April 24, 2014 Record of Decision ("ROD") for the Ross Uranium In-Situ Recovery Project (Attachment B);

3. The Commission's April 24, 2014 Materials License No. SUA-1601 , Docket No. 040-09091, to Strata Energy, Inc. (Apr. 24, 2014) (Attachment C); and

4. The Commission's June 29, 2016 Memorandum and Order in *In the Matter of Strata Energy, Inc.* (Ross In Situ Uranium Recovery Project), Docket No. 40-9091, CLI-16-13 (June 29, 2016) (Attachment D).

The Final EIS, ROD, Memorandum and Order, and Materials License violate the Administrative Procedure Act, 5 U.S.C. § 706, the National Environmental Policy Act, 42 U.S.C. § 4321, *et seq.*, the Atomic Energy Act, 42 U.S.C. § 2011 *et seq.*, and implementing regulations.

Respectfully submitted,

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Filed this August 24, 2016

CERTIFICATE OF SERVICE

I, Howard M. Crystal, hereby certify that I caused a true and correct copy of Petitioners' Petition for Review to be served by U.S. mail on the following this August 24, 2016:

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U.S.NRC
United States Nuclear Regulatory Commission
Protecting People and the Environment

NUREG-1910
Supplement 5

Environmental Impact Statement for the Ross ISR Project in Crook County, Wyoming

Supplement to the Generic Environmental Impact Statement for *In-Situ* Leach Uranium Milling Facilities

Final Report

Office of Federal and State Materials and
Environmental Management Programs

On March 11, 2014, the U.S. Nuclear Regulatory Commission's (NRC) notice of availability of NUREG-1910, Supplement 5, *Final Environmental Impact Statement for the Ross ISR Project in Crook County, Wyoming, Supplement to the Generic Environmental Impact Statement for In-Situ Leach Uranium Milling Facilities* (FSEIS) was published in the Federal Register (79 FR 13683). Following publication of NUREG-1910, Supplement 5, the NRC staff was informed of and identified certain errors in the FSEIS.

In a motion filed on March 31, 2014, the Joint Intervenors for the hearing on the licensing action that is the subject of the FSEIS identified an error in Section 4.5.1.3 of the FSEIS related to the ground-water restoration concentrations of Wellfield 1 at the Crow Butte facility near Crawford, Nebraska. Section 4.5.1.3 of the FSEIS includes a discussion of historic approvals of aquifer restoration activities by the NRC. The FSEIS describes three facilities that received NRC's approval for aquifer restoration activities and the ground-water-quality parameters in those wellfields for which the NRC approved restoration. In the FSEIS's description of one of those facilities, Crow Butte Wellfield 1, the NRC states that "[t]he NRC determined that the radium-226 and uranium concentrations at 31 percent and 18 percent above post-licensing, pre- operational concentrations were protective of human health and the environment (Crow Butte Resources, 2001)." Based upon the information in the source document, the relevant portion of that statement should instead describe the concentration for uranium as 18 *times* the post-licensing, pre-operational uranium concentration. The use in error of the term "18 percent" in the FSEIS was a drafting mistake that does not affect the NRC staff's analysis of the potential impacts of the proposed action on restored ground-water quality of the ore-zone and surrounding aquifers, or the staff's conclusion that such potential impacts would be SMALL.

In reviewing the statements in the FSEIS regarding restoration of Crow Butte Wellfield 1, the NRC staff identified additional errors regarding the number of parameters sampled. These errors in the description of ground-water quality in Crow Butte Resource's Wellfield 1 at the time of restoration approval do not affect the FSEIS's characterization of NRC-approved historic restoration values or its conclusion that the potential impacts of aquifer restoration to ground-water quality of the ore-zone and surrounding aquifers would be SMALL. It remains the case that most of the ground-water-quality parameters in wellfields for which the NRC has approved restoration, as described in the FSEIS, were either returned to post-licensing, pre-operational concentrations or Class I Domestic Use standards. For the few parameters that exceeded these standards, the concentrations in the ground water did not change the class of use and did not represent a potential impact to the ground water outside the aquifer-exemption boundary.

Additionally, by letter dated April 4, 2014, the U.S. Environmental Protection Agency (EPA) requested that the NRC clarify information provided in Table 1.2 of the FSEIS regarding the role of the EPA for the Underground Injection Control Program.

To address these matters, the NRC staff has prepared this errata to the FSEIS.

ERRATA

FSEIS SECTION	Page	Correction
1.6.2 Status of Permitting With Other Federal, State, Local, and Tribal Agencies	1-10	Table 1.2 - Environmental Approvals for the Proposed Ross Project, Row 3 (Issuing Agency - U.S. Environmental Protection Agency), Column 2 (Description): • Insert "for Class III injection wells" after "(USDW)"
1.6.2 Status of Permitting With Other Federal, State, Local, and Tribal Agencies	1-11	Table 1.2 - Environmental Approvals for the Proposed Ross Project (*Continued*), Row 5 (Issuing Agency - U.S. Environmental Protection Agency), Column 2 (Description): • Change "Aquifer Exemption Permit for Class I Injection Wells" to "Aquifer exemption approval required for Class I injection wells if receiving aquifer is a USDW" • Delete entire cell with "Aquifer Reclassification for Class III Injection Wells (WDEQ, Title 35-11)"
1.6.2 Status of Permitting With Other Federal, State, Local, and Tribal Agencies	1-11	Table 1.2 - Environmental Approvals for the Proposed Ross Project (*Continued*), Row 5 (Issuing Agency - U.S. Environmental Protection Agency), Column 3 (Status): • Insert a cell next to "Aquifer Exemption Permit for Class I Injection Wells (40 CFR Parts 144 & 146)" with the following text: "Pending water quality data acquisition during well installations and EPA review"
4.5.1.3 Ross Project Aquifer Restoration	4-46	Second full paragraph, replace first and second sentence with the following: "Crow Butte's NRC license initially required the analysis of 35 ground-water constituents to determine pre-operational ground-water quality (Crow Butte Resources, 2000). The NRC amended Crow Butte's license in 2001 to modify the constituent list in License Condition 10.3B to duplicate the constituents contained in the Restoration Table in Crow Butte's Class III UIC permit issued by the Nebraska Department of Environmental Quality. Because of this amendment, several constituents that were originally discussed in Crow Butte's first restoration report were no longer considered restoration parameters by the NRC. The 27 constituents listed in Tables 2 and 3 in Crow

		Butte Resources (2001) are those in the modified parameter list contained in that license amendment (NRC, 2001). The average concentrations of 34 constituents (the initially required 35 constituents minus temperature) at the end of restoration compared to baseline concentrations are reported by the NRC in Table 5 of NUREG/CR-6870, which discusses the geochemical issues in ground -water restoration at ISR facilities (NRC, 2007). Of the 34 constituents, 23 were returned to post-licensing, pre-operational concentrations. The average concentrations of two constituents, arsenic and iron, were returned to levels lower than Wyoming's Class I Domestic Use standards, which, for these two constituents, are identical to the EPA's Drinking Water MCLs and Standards in the UIC Permit from the Nebraska Department of Environmental Quality held by Crow Butte (Crow Butte Resources, 2001). The average concentration of one constituent, vanadium, was returned to the Wyoming Class II standard for agricultural use, which is lower than the UIC Permit Standard. Concentrations of six constituents – alkalinity, bicarbonate, calcium, potassium, magnesium, and molybdenum – for which there are no EPA MCLs or Wyoming Class I, II, or III standards, exceeded post-licensing, pre-operational concentrations by 6 – 65 percent."
4.5.1.3 Ross Project Aquifer Restoration	4-46	Second full paragraph, line 7, replace "18 percent" with "18 times"
4.5.1.3 Ross Project Aquifer Restoration	4-46	Last paragraph, line 7, delete "average"
4.15 References	4-122	Insert the following new reference (NRC, 2001) before the second-to-last reference entry on this page (NRC, 2003a): (US)NRC. "License Amendment 11/Crow Butte Resources In Situ Leach Facility/License No. SUA-1534." Washington, DC: USNRC. 2001. ADAMS Accession No. ML011830343.
4.15 References	4-123	Insert the following new reference (NRC, 2007) after the fourth reference entry on this page (NRC, 2006): (US)NRC. "Consideration of Geochemical Issues in Groundwater Restoration at Uranium In-Situ Leach Mining Facilities." NUREG/CR-6870. Washington, DC: USNRC. 2007. ADAMS Accession No. ML070600405.

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

August 14, 2014
Errata No. 2

Report Number:	**NUREG-1910, Supplement 5**
Report Title:	Final Environmental Impact Statement for the Ross ISR Project in Crook County, Wyoming, Supplement to the Generic Environmental Impact Statement for *In-Situ* Leach Uranium Milling Facilities
Prepared by:	Office of Federal and State Materials and Environmental Management Programs U.S. Nuclear Regulatory Commission Washington, D.C. 20555-0001
Date Published:	February 2014
Instructions:	Please append the enclosed table of corrections to the text of NUREG-1910, Supplement 5.

On March 11, 2014, the U.S. Nuclear Regulatory Commission's (NRC) notice of availability of NUREG-1910, Supplement 5, *Final Environmental Impact Statement for the Ross ISR Project in Crook County, Wyoming, Supplement to the Generic Environmental Impact Statement for In-Situ Leach Uranium Milling Facilities* (FSEIS) was published in the Federal Register (79 FR 13683). Following publication of NUREG-1910, Supplement 5, the NRC staff was informed of and identified certain errors in the FSEIS regarding figures in Section 3.5.3.3 and Appendix B and regarding a reference to NUREG-1910 in Section 4.5.1.2. To address these matters, the NRC staff has prepared this second errata to the FSEIS.

SECOND ERRATA

FSEIS SECTION	Page	Correction
3.5.3.3 Ground-Water Quality	3-38	Third full paragraph, lines 9 and 11, replace "Figure 3.14" with "Figure 3.15."
3.5.3.3 Ground-Water Quality	3-43	Figure 3.16, "Locations of 29 Water-Supply Wells within a 3-Kilometer [2-Mile] Radius of Ross Project Area," is the incorrect graphic. The graphic should be Environmental Report (ER) Figure 3.4-33, "Sampled Water Supply Wells," which can be found on ER Page 3-231 (ADAMS Accession No. ML110130342).
4.5.1.2 Ross Project Operation	4-37	Last paragraph, line 5, replace "GEIS Section 2.11.3" with "GEIS Section 2.11.4."
B.5.9.5 Monitoring	B-44	NRC response to "Comments: RP032-071; RP032-077; RP035-035," last line of the response, replace "*Figure 3.15*" with "*Figure 3.16.*"
B.5.15.1 Concerns about ISR and Ground-Water Contamination	B-82	NRC response to "Comment: RP035-034," line 6 of the response, replace "*Other maps indicating the locations*" with "*The locations.*"

ABSTRACT

The United States (U.S.) Nuclear Regulatory Commission (NRC) issues licenses for the possession and use of source and byproduct materials provided that facilities meet NRC regulatory requirements and will be operated in a manner that is protective of public health and safety and the environment. Under the NRC environmental-protection regulations in Title 10 *Code of Federal Regulations* (CFR) Part 51, which implement the *National Environmental Policy Act of 1969* (NEPA), issuance of a license to possess and use source and byproduct materials during uranium recovery and milling requires an environmental impact statement (EIS) or a supplement to an EIS (SEIS).

In May 2009, the NRC issued NUREG–1910, *Generic Environmental Impact Statement* (GEIS) *for In-Situ Leach Uranium Milling Facilities*. In the GEIS, the NRC assessed the potential environmental impacts from the construction, operation, aquifer restoration, and decommissioning of in situ recovery (ISR) facilities located in four specific geographic regions of the western U.S. As part of this assessment, the NRC determined which potential impacts would be essentially the same for all ISR facilities and which would result in varying levels of impacts for different facilities and would therefore require further site-specific information to determine potential impacts. The GEIS provides a starting point for the NRC's NEPA analyses for site-specific license applications for new ISR facilities as well as for applications to amend or to renew existing ISR licenses.

By a letter dated January 4, 2011, Strata Energy Inc. (referred to herein as Strata or the "Applicant") submitted a license application to the NRC for a new Source and Byproduct Materials License for the proposed Ross Project. The Ross Project would be located in Crook County, Wyoming, which is in the Nebraska-South Dakota-Wyoming Uranium Milling Region identified in the GEIS. The NRC staff prepared this SEIS to evaluate the potential environmental impacts of the Applicant's proposal to construct, operate, conduct aquifer restoration, and decommission an ISR facility at the Ross Project. This SEIS describes the environment that could be affected by the proposed Ross Project activities, estimates the potential environmental impacts resulting from the Proposed Action and two Alternatives, discusses the corresponding proposed mitigation measures, and describes the Applicant's environmental-monitoring program. In conducting its analysis for this SEIS, the NRC staff evaluated site-specific data and information to determine whether the site characteristics and the Applicant's proposed activities were consistent with those evaluated in the GEIS. The NRC staff then determined relevant sections, findings, and conclusions in the GEIS that could be incorporated by reference, and identified the areas that needed additional analysis. Based upon its environmental review, the final NRC staff recommendation is that, unless emerging safety issues mandate otherwise, a Source and Byproduct Materials License be issued to the Applicant as requested.

Paperwork Reduction Act Statement

This NUREG contains and references information collection requirements that are subject to the Paperwork Reduction Act of 1995 (44 U.S.C. 3501 et seq.). These information collections were approved by the Office of Management and Budget (OMB), approval numbers 3150-0014, 3150-0020, 3150-0021, and 3150-0008.

Public Protection Notification

The NRC may not conduct or sponsor, and a person is not required to respond to, a request for information or an information collection requirement unless the requesting document displays a current valid OMB control number.

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References

10 CFR Part 51. Title 10, *Energy*, *Code of Federal Regulations*, Part 51, "Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions." Washington, DC: U.S. Government Printing Office.

NRC. "Generic Environmental Impact Statement for In-Situ Leach Uranium Milling Facilities" NUREG–1910. Washington, DC: USNRC. May 2009. Agencywide Documents Access and Management System (ADAMS) Accession Nos. ML091480244 and ML091480188.

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U.S. NUCLEAR REGULATORY COMMISSION
RECORD OF DECISION
FOR THE ROSS URANIUM IN-SITU RECOVERY PROJECT
IN CROOK COUNTY, WYOMING

Introduction:

The U.S. Nuclear Regulatory Commission (NRC) staff prepared this record of decision (ROD) for the proposed Ross Uranium In-Situ Recovery (ISR) Project in Crook County, Wyoming (Ross Project). This ROD satisfies Section 51.102(a) of Title 10 of the *Code of Federal Regulations* (10 CFR), which states that "a Commission decision on any action for which a final environmental impact statement has been prepared shall be accompanied by or include a concise public record of decision."

In February 2014, the NRC staff issued a Final Supplemental Environmental Impact Statement (Final SEIS) (NRC, 2014a) in support of the NRC's review of the Strata Energy, Inc. (Strata or "Applicant") license application. Strata's application, which was submitted in 2011, is for a new source and byproduct materials license for the Ross Project (Strata, 2011a-b). The Ross Project Final SEIS is Supplement 5 to the NRC staff's *Generic Environmental Impact Statement for In-Situ Leach Uranium Milling Facilities* (NUREG-1910) (known as the GEIS) (NRC, 2009).

This ROD has been prepared pursuant to NRC regulations at 10 CFR § 51.102(b) and § 51.103(a)(1)-(4). Additionally, pursuant to 10 CFR § 51.103(c), this ROD incorporates by reference materials contained in the Final SEIS.

On July 13, 2011, the NRC staff notified the public of the NRC's acceptance of Strata's application for a materials license for a detailed technical and environmental review. By *Federal Register* notice, the NRC staff also informed members of the public that they could request a hearing in connection with Strata's application. *Strata Energy, Inc. Ross In Situ Recovery Uranium Project, Crook County, WY; Notice of Materials License Application, Opportunity to Request a Hearing and To Petition for Leave To Intervene*, 76 Fed. Reg. 41308. The NRC's Atomic Safety and Licensing Board (ASLB), an independent, trial-level adjudicatory body, granted a hearing request from joint intervenors, the National Resources Defense Council and the Powder River Basin Resource Council (ASLB, 2012). The ASLB has scheduled a hearing for late September/early October 2014, and the hearing may involve environmental issues. This ROD may be revised in accordance with any ASLB decision on those issues.

The Decision:

This ROD documents the NRC staff's decision to issue a materials license to Strata for its proposed Ross Project in Crook County, Wyoming (Materials License SUA-1601; NRC, 2014b). The license will authorize Strata to possess uranium source and byproduct materials at the Ross Project facility. Under its license, Strata will be able to construct and operate its facility as proposed in its license application and under the conditions in its NRC license.

The proposed Ross Project will occupy 696 hectares (1,721 acres) in the north half of the approximately 90-square-kilometer (56-square-mile) Lance District. The Lance District is located on the western edge in the northwest corner of the Nebraska-South Dakota-Wyoming Uranium Milling Region identified in the GEIS (NRC, 2009). It is situated between the Black Hills uplift to the east and the Powder River Basin to the west.

Strata intends to recover uranium and produce yellowcake at the Ross Project site. The proposed Ross Project includes a Central Processing Plant (CPP), injection and recovery wells

(in wellfields), surface impoundments, deep disposal wells for liquid effluents, monitoring wells throughout the Ross Project area, and other various infrastructure (e.g., additional buildings, pipelines, roads, and lighting). Strata's proposed activities include construction, operation, aquifer restoration, and decommissioning of its Ross Project. Together, these actions represent the "Proposed Action" evaluated in the Final SEIS. In addition, the Proposed Action includes the option of the Applicant to operate the Ross Project facility beyond the life of the Project's wellfields. The facility could be used to process uranium-loaded resin from potential satellite areas within the Lance District operated by the Applicant, or from other offsite uranium recovery projects not operated by the Applicant (i.e., "toll milling"), or from offsite water treatment operations.

During the ISR process, an oxidant-charged solution, called a lixiviant, will be injected into the ore-zone aquifer (or uranium "ore body") through injection wells. The lixiviant will use native groundwater (from the ore-zone aquifer), carbon dioxide, sodium carbonate and/or sodium bicarbonate, with a hydrogen peroxide or oxygen oxidant. As this solution circulates though the ore zone, the lixiviant oxidizes and dissolves the mineralized uranium, which is present in a reduced chemical state. The resulting uranium-rich solution, the "pregnant" lixiviant, will be drawn to recovery wells by pumping, and then transferred to the CPP via a network of underground pipes. At the CPP, the uranium will be extracted from the solution using an ion exchange process. The resulting "barren" (i.e., uranium-depleted) solution will then be recharged with the oxidant and re-injected to recover additional uranium. The uranium collected in the ion exchange process is subject to another circuit within the CPP to produce yellowcake. The yellowcake is packaged and shipped off-site to a uranium conversion facility, the next step in the fuel cycle process for developing fuel for commercial nuclear power plants.

Alternatives Considered in Reaching the Decision:
The NRC staff analyzed three alternatives in detail before deciding to issue Strata a license. These alternatives included: (i) the Proposed Action in the license application (described above), (ii) the No-Action Alternative, and (iii) the North Ross Project. Under the No-Action Alternative, the NRC staff would not approve Strata's license application, which would result in Strata not constructing or operating the proposed Ross Project. The No-Action Alternative was included to provide a benchmark for the NRC staff to compare and evaluate the potential impacts of the other two alternatives. In the North Ross Project alternative, the proposed Ross Project facility (i.e., the CPP, surface impoundments, and auxiliary structures) would be constructed at a site north of where it is proposed to be located in the Proposed Action, but the wellfields would remain in the same locations as in the Proposed Action. In the Final SEIS (NRC, 2014a), the NRC staff describes the three alternatives (Section 2.1) and compares their potential environmental impacts (Section 2.3 and Table ExS.1 in the Executive Summary).

The NRC staff considered a number of other alternatives when evaluating the Proposed Action. The staff eliminated these alternatives from detailed analysis, however, for reasons discussed in Section 2.2 of the Final SEIS (NRC, 2014a). These alternatives included recovery of uranium by conventional uranium mining and milling (Section 2.2.1), the use of a lixiviant with different chemistry (Section 2.2.2), and alternative methods of waste management (Section 2.2.3).

Preferences Among Alternatives Based on Relevant Factors:
In Chapter 4 of the Final SEIS (NRC, 2014a), the NRC staff assessed the potential environmental impacts from the construction, operation, aquifer restoration, and decommissioning of the proposed Ross Project. The staff also assessed the potential impacts of the No-Action Alternative and the North Ross Project alternative. The NRC staff assessed the impacts of these three alternatives on the following resource areas: land use,

transportation, geology and soils, water resources, ecology, air quality, noise, historical, cultural and paleontological resources, visual and scenic resources, socioeconomics, environmental justice, public and occupational health and safety, and waste management. The staff compared the potential environmental impacts of the three alternatives in Section 2.3 and Table ExS.1 in the Executive Summary of the Final SEIS (NRC, 2014a). In Chapter 5 of the Final SEIS, the NRC staff evaluated the potential for cumulative impacts associated with the Proposed Action and other past, present, or reasonably foreseeable future actions. Additionally, in Chapter 7 of the Final SEIS, the staff summarized the costs and benefits associated with the Proposed Action and the two alternatives. In preparing the Final SEIS, the NRC staff also considered, evaluated, and addressed the public comments received on the Draft SEIS published on March 29, 2013 (78 Fed. Reg. 19330).

After weighing the impacts of the Proposed Action and comparing the alternatives, and evaluating safety issues associated with the Proposed Action, the NRC staff determined that the NRC should issue a source materials license for the proposed Ross Project. The NRC staff based its decision on: (i) the license application, including the Applicant's environmental report (Strata, 2011a-b), and the Applicant's supplemental submissions and responses to the NRC staff requests for additional information (Strata 2011c; Strata and Crook County, 2011d; Strata, 2012a-b); (ii) the NRC staff's consultations with Federal, State, and local agencies and with Native American Tribes; (iii) independent NRC staff review; (iv) the NRC staff's consideration of comments received on the Draft SEIS (see Appendix B in the Final SEIS (NRC, 2014a)); (v) the assessments in the NRC staff's Final SEIS (NRC, 2014a) and in the GEIS (NRC, 2009); and (vi) the assessments in the NRC staff's Safety Evaluation Report (NRC, 2014c-d) for the Ross Project.

Measures to Avoid or Minimize Environmental Harm from the Alternative Selected:
As described below, the NRC has taken all practicable measures within its jurisdiction to avoid or minimize environmental harm from the alternative selected. In its license application (Strata, 2011a-b) and in its supplemental submissions and responses to NRC staff requests for additional information (Strata 2011c; Strata and Crook County, 2011d; Strata, 2012a-b), the Applicant identified mitigation measures that are intended to either minimize or avoid potential adverse environmental impacts from construction, operation, aquifer restoration, and decommissioning of the Ross Project. The Applicant also identified environmental measurements and monitoring programs to verify compliance with the applicable standards and requirements for the protection of worker health and safety in active uranium recovery areas (i.e., both the facility and the wellfields) and for the protection of the public and the environment beyond the licensed facility's boundary. As discussed below, the Applicant's mitigation measures and monitoring programs are conditions in the materials license.

The mitigation measures identified by the Applicant are described for each resource area in Chapter 4 of the Final SEIS (NRC, 2014a). The Applicant's environmental measurements and monitoring programs for the Ross Project are described in detail in Chapter 6 of the Final SEIS (NRC, 2014a), organized as follows: Radiological Monitoring (Section 6.2), Physicochemical Monitoring (Section 6.3), Meteorological Monitoring (Section 6.4), and Ecological Monitoring (Section 6.5). These monitoring programs will provide data on operating and environmental conditions so that prompt corrective actions can be implemented when adverse conditions are detected.

Administrative Condition 9.2 of Materials License SUA-1601 (NRC, 2014b) requires Strata to conduct operations in accordance with the commitments, representations, and statements contained in the license application and supplementary submissions. License Condition 9.2

incorporates by reference Strata's approved application and the supplements to its application. Strata's commitments, representations, and statements include the mitigation measures and monitoring programs described above. An additional license condition relevant to mitigation measures is Administrative Condition 9.8, which requires mitigation of impacts to cultural resources and adherence to the April 24, 2014 Programmatic Agreement (NRC, 2014e). Additional license conditions relevant to monitoring include License Conditions 9.10, 10.9, 10.15, 10.16,10.20, 11.1A, 11.1D, 11.2, 11.3, 11.5, 12.6, 12.7, 12.8, 12.9, , 12.10, 12.11A, 12.11C, and 12.12.

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Strata and Crook County. Memorandum of Understanding for Improvement and Maintenance of Crook County Roads Providing Access to the Ross ISR Project. Sundance, WY: Crook County. April 6, 2011d. ADAMS Accession No. ML111170303.

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Docket No.: 040-09091
License No.: SUA-1601

FOR THE NUCLEAR REGULATORY COMMISSION

Date: 4/24/14

/RA/

Andrew Persinko, Deputy Director
Decommissioning and Uranium Recovery
Licensing Directorate
Division of Waste Management
and Environmental Protection
Office of Federal and State Materials
and Environmental Management Programs

NRC FORM 374

U.S. NUCLEAR REGULATORY COMMISSION

MATERIALS LICENSE

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 license 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	
1. Strata Energy, Inc.	3. License Number SUA-1601
2. 1900 W. Warlow Dr., Bldg A, P.O. Box 2318 Gillette, WY 82716	4. Expiration Date:
	5. Docket No. 040-09091 Reference No.

6. Byproduct Source, and/or Special Nuclear Material	7. Chemical and/or Physical Form	8. Maximum amount that Licensee May Possess at Any One Time Under This License
a. Natural Uranium b. Byproduct material as defined in 10 CFR 40.4	a. Any b. Unspecified	a. Unlimited b. Quantity generated under operations authorized by this license

SECTION 9: Administrative Conditions

9.1 The authorized place of use shall be the licensee's Ross Project in Crook County, Wyoming. The licensee shall conduct operations within the license area boundaries shown in Figure 1.4-2 of the approved license application.

9.2 The licensee shall conduct operations in accordance with the commitments, representations, and statements contained in the license application dated January 4, 2011 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML110120063), which is supplemented by submittals dated February 28, 2011 (ML110800187), March 30, 2012 (ML121030404), April 6, 2012 (ML121020343), August 10, 2012 (ML12227A369), January 18, 2013 (ML130370654), October 14, 2013 (ML13295A230), October 17, 2013 (ML13296A026) and February 28, 2014 (ML14091A036). The approved application and supplements, hereby, are incorporated by reference, except where superseded by specific conditions in this license. The licensee must maintain the approved, updated, license application on site.

Whenever the word "will" or "shall" is used in the above referenced documents, it shall denote a requirement. The use of "the Wellfield" in this license is synonymous with the use of mine unit as defined in the approved license application. The use of "verification" in this license with respect to a document submitted for NRC staff review means a written acknowledgement by U.S. Nuclear Regulatory Commission (NRC) staff that the specified submitted material is consistent with commitments in the approved license application, or requirements in a license condition or regulation. A verification will not require a license amendment.

9.3 All written notices and reports sent to the NRC as required under this license and by regulation shall be addressed as follows: ATTN: Document Control Desk, Director, Office of Federal and State Materials and Environmental Management Programs, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001. An additional copy shall be submitted to: Deputy Director, Decommissioning and Uranium Recovery Licensing Directorate, Division of Waste Management and Environmental Protection, Office of Federal and State Materials and Environmental Management Programs, U.S. Nuclear Regulatory Commission, Mail Stop T-8F5, 11545 Rockville Pike, Rockville, MD 20852-2738. Incidents and events that require telephone notification shall be made to the NRC Operations Center at (301) 816-5100 (collect calls accepted).

9.4 Change, Test, and Experiment License Condition

A) The licensee may, without obtaining a license amendment pursuant to 10 CFR 40.44, and subject to conditions specified in (B) of this condition:

i Make changes in the facility as described in the license application (as updated);

ii Make changes in the procedures as described in the license application (as updated); and

iii Conduct tests or experiments not described in the license application (as updated).

B) The licensee shall obtain a license amendment pursuant to 10 CFR 40.44 prior to implementing a proposed change, test, or experiment if the change, test, or experiment would:

i Result in more than a minimal increase in the frequency of occurrence of an accident previously evaluated in the license application (as updated);

ii Result in more than a minimal increase in the likelihood of occurrence of a malfunction of a facility structure, equipment, or monitoring system (SEMS) important to safety previously evaluated in the license application (as updated);

iii Result in more than a minimal increase in the consequences of an accident previously evaluated in the license application (as updated);

iv Result in more than a minimal increase in the consequences of a malfunction of an SEMS important to safety previously evaluated in the license application (as updated);

v Create a possibility for an accident of a different type than any previously evaluated in the license application (as updated);

vi Create a possibility for a malfunction of an SEMS important to safety with a different result than previously evaluated in the license application (as updated); or

vii Result in a departure from the method of evaluation described in the license application (as updated) used by the NRC in establishing the final safety evaluation report (FSER), environmental impact statement (EIS), environmental assessment (EA), technical evaluation reports (TERs), or other analyses and evaluations for license amendments.

For purposes of this paragraph as applied to this license, SEMS important to safety means any SEMS that has been referenced in a staff SER, TER, EA, or EIS, and supplements and

amendments thereof.

C) Additionally, the licensee must obtain a license amendment unless the change, test, or experiment is consistent with NRC's previous conclusions, or the basis of, or analysis leading to, the conclusions of actions, designs, or design configurations analyzed and selected in the site or facility SER, TER, and EIS or EA. This would include all supplements and amendments, and SERs, TERs, EAs, and EISs issued with amendments to this license.

D) The licensee's determinations concerning (B) and (C) of this condition, shall be made by a Safety and Environmental Review Panel (SERP). The SERP shall consist of a minimum of three individuals. One member of the SERP shall have expertise in management (e.g., Plant Manager) and shall be responsible for financial approval for changes; one member shall have expertise in operations and/or construction and shall have responsibility for implementing any operational changes; and one member shall be the radiation safety officer (RSO) or equivalent meeting recommendations in paragraph 2.4 of regulatory Guide 8.31 with the responsibility of assuring changes conform to radiation safety and environmental requirements. Additional members may be included in the SERP, as appropriate, to address technical aspects such as ground water or surface water hydrology, specific earth sciences, and other technical disciplines. Temporary members or permanent members, other than the three above-specified individuals, may be consultants.

E) The licensee shall maintain records of any changes made pursuant to this condition until license termination. These records shall include written safety and environmental evaluations made by the SERP that provide the basis for determining changes are in compliance with (B) of this condition. The licensee shall furnish, in an annual report to the NRC, a description of such changes, tests, or experiments, including a summary of the safety and environmental evaluation of each. In addition, the licensee shall annually submit to the NRC page changes, which shall include both a change indicator for the area changed, e.g., a bold line vertically drawn in the margin adjacent to the portion actually changed, and a page change identification (date of change or change number or both), to the operations plan and reclamation plan of the approved license application (as updated) to reflect changes made under this condition.

9.5 Financial Assurance. The licensee shall maintain an NRC-approved financial surety arrangement, consistent with 10 CFR 40, Appendix A, Criterion 9, adequate to cover the estimated costs, if accomplished by a third party, for decommissioning and decontamination, which includes offsite disposal of radioactive solid process or evaporation pond residues, and ground water restoration. The surety shall also include the costs associated with all soil and water sampling analyses necessary to confirm the completion of decontamination.

Proposed annual updates to the financial assurance amount, consistent with 10 CFR Part 40, Appendix A, Criterion 9, shall be provided to the NRC 90 days prior to the anniversary date (e.g. renewal date of the financial assurance instrument/vehicle). The financial assurance update renewal date for the Ross Project will be determined following consultation with the licensee and the State of Wyoming. If the NRC has not approved a proposed revision 30 days prior to the expiration date of the existing financial assurance arrangement, the licensee shall extend the existing arrangement, prior to expiration, for one year. Along with each proposed revision or annual update of the financial assurance estimate, the licensee shall submit supporting documentation, showing a breakdown of the costs and the basis for the cost estimates with adjustments for inflation,

maintenance of a minimum 15-percent contingency, changes in engineering plans, activities performed, and any other conditions affecting the estimated costs for site closure. Within 90 days of NRC approval of a revised closure (decommissioning) plan and its cost estimate, the licensee shall submit, for NRC staff review and approval, a proposed revision to the financial assurance arrangement if estimated costs exceed the amount covered in the existing arrangement. The revised financial assurance instrument shall then be in effect within 30 days of written NRC approval of the documents.

At least 90 days prior to beginning construction associated with any approved, planned expansion or operational change that was not included in the annual financial assurance update, the licensee shall provide, for NRC approval, an updated estimate to cover the expansion or change. The licensee shall also provide the NRC with copies of financial assurance-related correspondence submitted to the State of Wyoming, a copy of the State's financial assurance review, and the final approved financial assurance arrangement. The licensee also must ensure that the financial assurance instrument, where authorized to be held by the State, identifies the NRC-related portion of the instrument and covers the aboveground decommissioning and decontamination, the cost of offsite disposal of solid byproduct material, soil, and water sample analyses, and ground water restoration associated with the site. The basis for the cost estimate is the NRC-approved site closure plan or the NRC-approved revisions to the plan. Reclamation or decommissioning plan cost estimates and annual updates should follow the outline in Appendix C to NUREG-1569 entitled "Recommended Outline for Site-Specific In Situ Leach Facility Reclamation and Stabilization Cost Estimates."

The licensee shall continuously maintain an approved surety instrument for the Ross Project, in favor of the State of Wyoming. The initial surety estimate shall be submitted for NRC review and approval within 90 days of license issuance, and the surety instrument shall be submitted for NRC staff review and approval 90 days prior to commencing operations.

9.6 Release of surficially contaminated equipment, materials, or packages for unrestricted use shall be in accordance with the NRC guidance document "Guidelines for Decontamination of Facilities and Equipment Prior to Release for Unrestricted Use or Termination of Licenses for Byproduct, Source, or Special Nuclear Material," (the Guidelines) dated April 1993 (ADAMS Accession No. ML003745526) or suitable alternative procedures approved by NRC prior to any such release.

Where surface contamination by both alpha- and beta-gamma-emitting nuclides exists, the limits established for alpha- and beta-gamma-emitting nuclides shall apply independently.

Personnel performing contamination surveys for items released for unrestricted use shall meet the qualifications as health physics technician or radiation safety officer as defined in Regulatory Guide 8.31 (as revised). Personal effects (e.g., notebooks and flash lights) which are hand carried need not be subjected to the qualified individual survey or evaluation, but these items should be subjected to the same survey requirements as the individual possessing the items.

Regulatory Guide 8.30 (as revised), Table 2 shall apply to the removal to unrestricted areas, of equipment, materials, or packages that have potential accessible surface contamination levels above background radiation levels. The contamination control program shall provide sufficient detail to demonstrate how the licensee will maintain radiological controls over the equipment,

materials, or packages that have the potential for accessible surface contamination levels above background, until they have been released for unrestricted use as specified in the Guidelines, and what methods will be used to limit the spread of contamination to unrestricted areas. The contamination control program shall demonstrate how the licensee will limit the spread of contamination when moving or transporting potentially contaminated equipment, materials, or packages (i.e. pumps, valves, piping, filters, etc.) from restricted areas through unrestricted areas. Prior to its implementation, the licensee shall receive written NRC verification of the licensee's contamination control program if recommendations in RG 8.30 are not followed.

The licensee may identify a qualified designee(s) to perform surveys, as needed, associated with the licensee's contamination control program when moving or transporting potentially contaminated equipment, materials, or packages from restricted or controlled areas through uncontrolled areas and back into controlled or restricted areas. The qualified designee(s) shall have completed education, training, and experience, in addition to general radiation worker training, as specified by the licensee. The education, training, and experience required by the licensee for qualified designees shall be submitted to the NRC for review and written verification. The licensee shall receive written verification of the licensee's qualified designee(s) training program prior to its implementation.

9.7 The licensee shall follow the guidance set forth in NRC Regulatory Guides 8.22, "Bioassay at Uranium Recovery Facilities" (as revised), 8.30, "Health Physics Surveys in Uranium Recovery Facilities" (as revised) and 8.31, "Information Relevant to Ensuring that Occupational Radiation Exposure at Uranium Recovery Facilities will be As Low As Is Reasonably Achievable (ALARA)," (as revised) or NRC-approved equivalent with the following exception:

The licensee may identify qualified designee(s) to perform daily inspections in the occasional absence of the RSO and radiation safety technician(s) (RST). The qualified designee(s) will have health physics training, and the licensee will specify the training program to qualify a designee and submit it to the NRC staff for review and written verification. A qualified designee may perform daily inspections on weekends, holidays, or times when both the RSO and RST(s) must both be absent (e.g., illness or offsite training). A designee shall not perform daily inspections for more than two consecutive days except in the event of a Federal or company holiday, whereby the designee will not exceed more than three consecutive days. Reports generated by the designee will be reviewed by the RSO or RST as soon as practical, but no later than 3 hours from the beginning of the next work day following an absence, weekend, or holiday. The licensee will also have the RSO or RST available by telephone while the qualified designee is performing the daily inspections.

Notwithstanding the License Condition (LC) 9.4 change process, no additional exceptions to the guidance will be implemented without written NRC verification that the criteria in LC 9.4 do not require a license amendment.

9.8 Cultural Resources. 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 Part 800), and the Archaeological Resources Protection Act (as amended) and its implementing regulations (43 CFR Part 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 to proceed from the NRC, Wyoming State Historic Preservation Officer or the Bureau of Land Management, as appropriate.

The licensee shall comply with the terms and conditions included in the Programmatic Agreement (PA) executed on April 24, 2014 (ADAMS Accession No. ML14111A346) that was developed to protect cultural resources within the Ross ISR project boundary. If the PA is terminated, the licensee shall comply with Stipulation L of the PA. Therefore, in the event the PA is terminated, the licensee is required to follow the terms and conditions provided in the PA for on-going ground-disturbing activities, and is not permitted to begin ground-disturbing activities in new areas, until the NRC completes consultation and a new PA or Memorandum of Agreement (MOA), as appropriate, is executed, or the NRC has requested, taken into account, and responded to the comments of the ACHP under 36 CFR § 800.7(c)(4).

9.9 The licensee shall dispose of solid byproduct material from the Ross Project at a site that is authorized by NRC or an NRC-Agreement State to receive such byproduct material. The licensee's approved solid byproduct material disposal agreement shall be maintained on site during any time the facility is in operation. In the event that the agreement expires or is terminated, the licensee shall notify the NRC within seven working days after the date of expiration or termination. A new agreement shall be submitted for NRC review within 90 days after expiration or termination, or the licensee will be prohibited from further lixiviant injection.

9.10 The results of the following activities, operations, or actions shall be documented: sampling; analyses; surveys or monitoring; survey/ monitoring equipment calibrations; audits and inspections; all meetings and training courses; and any subsequent reviews, investigations, or corrective actions required by NRC regulation or this license. Unless otherwise specified in a license condition or applicable NRC regulation, all documentation required by this license shall be maintained until license termination, and is subject to NRC review and inspection.

9.11 The licensee is hereby exempted from the requirements of 10 CFR 20.1902(e) for areas within the facility, provided that all entrances to the facility are conspicuously posted with the words, "CAUTION: ANY AREA WITHIN THIS FACILITY MAY CONTAIN RADIOACTIVE MATERIAL."

SECTION 10: Operations, Controls, Limits, and Restrictions

Standard Conditions

10.1 The licensee shall use a lixiviant composed of native ground water; carbon dioxide, sodium carbonate and/or sodium bicarbonate; and hydrogen peroxide and/or oxygen, as specified in Section 3.1.3.1 of the licensee's approved license application.

10.2 Facility Throughput. The Ross Project processing facility throughput shall not exceed a maximum instantaneous flow rate of 7,500 gallons per minute, excluding restoration flow. The annual production of dried yellowcake shall not exceed 3 million pounds.

10.3 At least 12 months prior to initiation of any planned final site decommissioning, the licensee shall submit a detailed decommissioning plan for NRC staff review and approval. The plan shall represent as-built conditions at the Ross Project.

10.4 The licensee shall develop and implement written standard operating procedures (SOPs) prior to operation for:

A) All routine operational activities involving radioactive and non-radioactive materials associated with licensed activities that are handled, processed, stored, or transported by employees;

B) All routine non-operational activities involving radioactive materials including in-plant radiation protection and environmental monitoring; and

C) Emergency procedures for potential accident/unusual occurrences including significant equipment or facility damage, pipe breaks and spills, loss or theft of yellowcake or sealed sources, significant fires, and other natural disasters.

The SOPs shall include appropriate radiation safety practices to be followed in accordance with 10 CFR Part 20. SOPs for operational activities shall enumerate pertinent radiation safety practices to be followed. A copy of the current written procedures shall be kept in the area(s) of the production facility where they are utilized. Should an activity be deemed 'non-routine', its procedures will be documented in a specific Radiation Work Permit for that non-routine activity.

10.5 Mechanical Integrity Tests. The licensee shall construct all wells in accordance with methods described in Section 3.1.2 of the approved license application. Mechanical integrity tests shall be performed on all wells (injection, extraction, and monitoring wells) before the well is utilized and on wells that have been serviced with equipment or procedures that could damage the well casing. Each well shall be retested at least once every five (5) years it is in use. Integrity tests shall be performed in accordance with Section 3.1.2.3 of the licensee's approved license application. Any failed well casing that cannot be repaired to pass the integrity test shall be appropriately plugged and abandoned in accordance with Addendum 2.6-E of the approved license application.

10.6 Ground water Restoration. The licensee shall conduct ground water restoration activities in accordance with Section 6.1.5 of the approved license application. Permanent cessation of lixiviant injection in a production area would signify the licensee's intent to shift from the principal activity of uranium recovery to the initiation of ground water restoration and decommissioning for any particular production area. If the licensee determines that these activities are expected to exceed 24 months for any particular production area, then the licensee shall submit for approval an alternate schedule request to the NRC that meets the requirements of 10 CFR 40.42.

Restoration Standards. Hazardous constituents in the ground water shall be restored to the numerical ground water protection standards as required by 10 CFR Part 40, Appendix A, Criterion 5B(5). In submitting any license amendment application requesting review and approval of proposed alternate concentration limits (ACLs) pursuant to Criterion 5B(6), the licensee must also show that it has first made practicable effort to restore the specified hazardous constituents to the background or maximum contaminant levels (whichever is greater).

Restoration Stability Monitoring. The licensee shall conduct sampling of the parameters included in the baseline sampling under LC 11.3 during the restoration stability period in accordance with Section 6.1.2.5 of the approved application. The sampling consists of eight samples during a 12 month period. The sampling shall include the specified production zone aquifer wells used to define the baseline levels. The applicant shall continue the stability monitoring until the data show, for all parameters monitored, no statistically significant increasing trend, which would lead to an exceedence of the relevant standard in 10 CFR Part 40, Appendix A, Criterion 5B(5).

10.7 The licensee shall maintain a net inward hydraulic gradient at a wellfield as measured from the surrounding perimeter monitoring well ring starting when lixiviant is first injected into the production zone and continuing until initiation of the stabilization period.

10.8 The licensee is permitted to construct and operate lined retention pond(s) as described in Section 4.2.2 and Addendum 3.1-A of the approved license application subject to requirements of LC 10.11. The ponds will be used for retention of liquid byproduct material prior to disposal in a deep disposal well as described in Section 4.2.3 of the approved license application. Routine pond inspections will be conducted in accordance with procedures defined in Section 5.3.2 of the approved license application. The inspections include:

A) Daily Inspection. The licensee will perform daily inspections in accordance with Section 5.3.2.1 of the approved license application. The inspections will include visual inspections of the piping, berms, diversion ditches, freeboard and leak detection systems. The minimum freeboard is 3 feet. If during the daily inspections a fluid height in any of the standpipes for the pond leak detection system is found to be in excess of six (6) vertical inches, then the licensee will collect a sample of the fluid for analysis of specific conductance. If the specific conductance of the fluid in the leak detection system is in excess of 50 percent of the specific conductance of fluids in the pond, then it is concluded that a leak has occurred in the pond primary liner and the licensee will perform mitigative and corrective actions. The corrective actions include notifying the NRC Project Manager by telephone or email within 48 hours and lowering the water level in the pond sufficiently to eliminate the leak. If corrective actions are not completed within 60 days, the pond will not be used to store any byproduct material until the liner is inspected by qualified personnel as required by Subsection E (Annual Technical Inspection). The licensee will submit a report to NRC upon completion of the corrective actions including documentation of all pond repairs. Routine daily inspections reports will be maintained on-site for NRC staff to review during routine inspections.

B) Weekly Inspection. The licensee will conduct weekly inspections in accordance with Section 5.3.1.2 of the approved license application. The inspections will include visual inspection of the entire area including perimeter fencing. The inspection report will be reviewed by the RSO, Manager of Health, Safety and Environmental Affairs, and the Facility Manager. The weekly inspection reports will be maintained on-site for NRC staff to review during inspections.

C) Monthly Inspection. The licensee will conduct inspections monthly in accordance with Section 5.3.2.2 of the approved license application or following a major storm event (precipitation greater than 1-inch of water during a 24-hour period) of the condition of structures associated with the diversion of the stream around the Central Processing Plant area in accordance with

Section 5.3.4 of the approved license application. The reports will be maintained on-site for NRC staff to review during inspections.

D) Quarterly Inspection. The licensee will conduct quarterly inspections in accordance with Section 5.3.2.3 of the approved license application. Results of the quarterly inspections will be included in the semi-annual report submitted to NRC as required by LC 11.2. If ground-water quality in the monitoring wells indicates a release of fluids from the pond, then the licensee will immediately perform corrective actions to eliminate the leak and any appropriate remedial actions including characterization of impacts to shallow soils and water in the uppermost aquifer. Results of the quarterly inspections will be submitted to NRC for review.

E) Annual Technical Inspection. The licensee will conduct annual inspections in accordance with Section 5.3.2.4 of the approved license application. The annual inspection will include a review of the previous year's daily, weekly, and quarterly inspections, assessment of the hydraulic and hydrologic capacities, and a survey of the embankment by qualified personnel. A copy of the report will be submitted to NRC for review.

10.9 The licensee shall establish and conduct an effluent and environmental monitoring program in accordance with programs described in Section 5.7.8.2 (Operational Monitoring-Surface Water and Operational Monitoring-Private Wells) and Section 5.7.7.1 (radon, air particulate, direct radiation, and soil) of the approved license application. The licensee will conduct a monitoring program in accordance with Section 5.7.8.2 (Operational Monitoring-CPP Area) unless those elements are included in the ground water detection monitoring program required by LC 10.20.

Facility Specific Conditions

10.10 The licensee shall submit to NRC staff for review and approval, plans for equipment and procedures prior to the use, storage, handling and transport of biological or chemical materials for reductant injections during restoration.

10.11 The licensee is prohibited from using Pond 2 for the retention of byproduct material until NRC review and verification that the field operations of the CPP dewatering system is consistent with its design as described in Technical Report Addendum 3.1-A of the approved license application and the October 14, 2013 supplemental data.

10.12 Prior to conducting tests for a wellfield data package, the licensee will attempt to locate and abandon all historic drill holes located within the perimeter well ring for the Wellfield. The licensee will document such efforts to identify and properly abandon all drill holes in the wellfield data package.

10.13 Wellfield Package. Prior to conducting principal activities in a new wellfield, the licensee shall submit a hydrologic test data package (wellfield package) to the NRC. The initial wellfield package will be submitted for NRC staff review and verification. Each wellfield package shall be submitted at least 60 days prior to the planned start date of lixiviant injection. In each wellfield data package, the licensee will document that: (1) all perimeter monitoring wells are screened in the appropriate horizon in order to provide timely detection of an excursion; and (2), the baseline values to establish ground water protection standards and Upper Control Limits (UCLs) for the Wellfield in accordance with LC 11.3. The wellfield package will adequately define heterogeneities that may affect the

chemical signature and ground-water flow paths within the ore zone as described in Sections 2.7.3.2.3, 3.1.1 and 5.7.8.1 of the approved license application.

10.14 Facility and Wellfield Inspection. Injection manifold pressures and flow rates shall be measured and recorded daily by the in-line computer system and/or Wellfield Operator. During wellfield operations, injection pressures shall not exceed the maximum operating pressure as specified in Section 3.1.4 of the approved license application. To the extent possible, the weekly inspections shall include visual inspections and document leaks or other abnormalities in the wellfield piping, wellheads, or module buildings in accordance with Section 5.3.3 of the approved license application. The licensee shall conduct the weekly in-plant inspection and audit programs described in Section 5.3.1 of the approved license application. In addition, as described in Section 5.7 of the approved license application and supplements, the RSO shall document that radiation control practices are being implemented appropriately. Requirements for inspections of the on-site retention ponds are listed in LC 10.8.

10.15 The licensee will use calibrated radiation instruments that can measure the full range of radiation exposure rates or dose rates for radiological parameters that are reasonably expected at an ISR facility to ensure the magnitude and extent of radiation levels are measured in accordance with 10 CFR 20.1501(a)(2)(i). The instruments used to measure airborne concentrations of radioactive materials will allow for a lower limit of detection (LLD), as described in Regulatory Guide 8.30 (as revised), to provide a 95 percent confidence that measurements are in conformance with 10 CFR 20.1201, 20.1204, 20.1301, 20.1501, and 20.1502.

10.16 The licensee shall conduct radiological characterization of airborne samples for natural U, Th-230, Ra-226, Po-210, and Pb-210 for each restricted area air particulate sampling location at a frequency of once every 6 months for the first two years, and annually thereafter to ensure compliance with 10 CFR 20.1204(g). The licensee shall also evaluate changes to plant operations to determine if more frequent radionuclide analyses are required for compliance with 10 CFR 20.1204(g).

10.17 Any area with exposure rates that exceed 2 millirem in any one hour must be immediately treated as a restricted area in accordance with 10 CFR 20.1301(a)(2).

10.18 The licensee shall ensure radiation safety training is consistent with Regulatory Guides 8.13, "Instruction Concerning Prenatal Radiation Exposure," (as revised) and 8.29, "Instruction Concerning Risks from Occupational Radiation Exposure," (as revised) in addition to the requirements in Section 2.5 of Regulatory Guide 8.31 (as revised), and as described in Section 5.5 of the approved application, or NRC-approved equivalent.

10.19 The licensee shall confine its operations to wellfields located north of Little Missouri River within the area delineated as "Mine Unit 1" on Figure 3.1-1 of the approved license application until use of the three industrial wells, designated as "19XX18", "22x-19" and "789V" in the approved license application, as water supply sources for the oil field flooding operations have ceased or diminished to an acceptable level, which has been reviewed and verified by NRC staff. For wellfields south of the Little Missouri River, the licensee must demonstrate in the wellfield package that the proposed operations are outside of the area of influence of the industrial wells. The location of a wellfield or a portion of a wellfield shall not include any of the industrial wells if the well has not been properly abandoned. If the licensee's principal activities are being conducted at a wellfield on the Ross

Project and operations of the onsite industrial water supply wells have not been discontinued, the effluent monitoring program will include monthly sampling of water pumped from the industrial wells.

10.20 The licensee shall conduct a ground water detection monitoring program for the retention ponds that meets requirements of Criteria 5 and 7A of 10 CFR Part 40, Appendix A. The elements in this program will be documented in the licensee's SOPs.

10.21 Emission Controls (Dryer). The licensee shall maintain effluent control systems as specified in Sections 3.3.1, 4.1, and 5.7.1 of the approved license application, with the following exception:

If any of the yellowcake emission control equipment fails to operate within specifications set forth in the SOPs, the drying and packaging room shall immediately be closed-in as an airborne radiation area and heating operations shall be switched to cooldown, or packaging operations shall be temporarily suspended. Packaging operations shall not be resumed until the vacuum system is operational to draw air into the system.

All these cessations, corrective actions, and restarts must be reported to NRC Region IV Office, as indicated in Criterion 8A, in writing, within ten days of the subsequent restart.

SECTION 11: Monitoring, Recording, and Bookkeeping Requirements

Standard Conditions

11.1 In addition to reports required to be submitted to NRC staff or maintained on-site by the applicable parts of Title 10 of the Code of Federal Regulations, the licensee shall prepare the following reports related to operations at the facility:

A) A quarterly report that includes a summary of the excursion indicator parameter concentrations, corrective actions taken, and the results obtained for all wells that were on excursion status during that quarter. This report shall be submitted to NRC within 60 days following completion of the reporting period.

B) A quarterly report summarizing daily flow rates and pressures for each injection manifold within the operating system. This report shall be made available for inspection upon request.

C) A semi-annual report that discusses: status of wellfields (or wellfield modules if appropriate) in operation (including last date of lixiviant injection), progress of wellfields (wellfield modules) in restoration, status of any long term excursions and a summary of the mechanical integrity tests (MITs) during the reporting period. This report shall be submitted to NRC within 60 days following completion of the reporting period.

D) Consistent with Regulatory Position 2 of Regulatory Guide 4.14 (as revised), a semiannual report that summarizes the results of the operational effluent and environmental monitoring program. For this program, the nearby water supply wells are those within 2 km of the perimeter ring monitoring wells for all wellfields undergoing recovery operations or restoration. This report shall be submitted to NRC within 60 days following completion of the reporting period.

E) An annual report pursuant to LC 9.4(E).

F) An annual report that summarizes modifications to the inventory of nearby water supply wells and land-use survey within 2 km of any production area. This report shall be submitted to NRC within 90 days following completion of the reporting period.

11.2 The licensee shall submit the results of at least an annual review of the radiation protection program performed in accordance with 10 CFR 20.1101(c). This review shall include the content and implementation of the radiation protection program. Results shall include an analysis of dose to individual members of the public consistent with 10 CFR 20.1301 and 10 CFR 20.1302. This report shall be submitted to NRC within 90 days following completion of the reporting period.

11.3 Establishment of Background Water Quality. Prior to injection of lixiviant in a wellfield, the licensee shall establish background water quality data for the ore zone, overlying and underlying aquifers. The background water quality sampling shall provide representative baseline data and establish ground water protection standards and excursion monitoring upper control limits, as described in Section 5.7.8 of the approved license application and this license condition.

The data for each mine unit shall consist, at a minimum, of the following sampling and analyses:

A) Ore Zone. To establish a Commission-approved background concentration pursuant to Criterion 5B(5)(a) of 10 CFR Part 40 Appendix A, samples shall be collected from production and injection wells at a minimum density of one production or injection well per two acres of wellfield production area, or, if a wellfield production area is sufficiently isolated from the other wellfield production areas in the Wellfield, a minimum of two wells. Wells selected for the baseline data will be the same ones used to measure restoration success and stabilization.

B) Perimeter Monitoring Wells. Samples shall be collected from all perimeter monitoring wells that will be used for the excursion monitoring program. The perimeter wells will be installed for a wellfield in accordance with information presented in Section 3.1.6 of the approved license application. In no case will the perimeter monitoring wells be installed outside of the exempted aquifer as defined by the Class III UIC permit issued by the Wyoming Department of Environmental Quality.

C) Overlying and Underlying Aquifers. Samples shall be collected from all monitoring wells in the first overlying and first underlying aquifer at a minimum density of one well per 4 acres of wellfield.

D) Sampling and Analyses. Four samples shall be collected from each well to establish background levels. The sampling events shall be at least 14 days apart. The samples shall be analyzed for parameters listed in Table 5.7-2 of the approved license application. The third and fourth sample events can be analyzed for a reduced list of parameters; the parameters that can be deleted from analysis are those below the minimum analytical detection limits (MDL) during the first and second sampling events provided the MDLs meet the data quality objectives for the sampling.

E) Background Water Quality. For the perimeter ring monitoring wells (Section B) and monitoring

wells in the overlying and underlying aquifers (Section C), the background levels shall be the mean values on a parameter-by-parameter, well-by-well, wellfield or sub-set of the wellfield basis, as deemed appropriate, in accordance with Section 5.7.8.1 of the approved license application. The UCLs for monitoring wells in the perimeter ring and overlying and underlying aquifers are established per LC 11.4. For the ore zone monitoring wells, the background levels shall be established on a parameter-by-parameter basis using either the wellfield, sub-set of the wellfield or well-specific mean value. The established background value for each parameter shall be based on the mean value plus a statistically valid factor to account for spatial variability in the data, in accordance with Section 6.1.1.1 of the approved license application.

11.4 Establishment of UCLs. Prior to injection of lixiviant into a wellfield, the licensee shall establish excursion control parameters and their respective upper control limits (UCLs) in the designated overlying aquifer, underlying aquifer and perimeter monitoring wells in accordance with Section 5.7.8.2 of the approved license application. The default excursion parameters for wells in the ore zone and overlying aquifer are chloride, conductivity, and total alkalinity. The default excursion parameters for wells in the underlying aquifer are sulfate, conductivity, and total alkalinity. The UCLs shall be established for each excursion control parameter and for each well, wellfield or subset of the wellfield, as appropriate, based on the mean plus five standard deviations of data collected for LC 11.3. The UCL for chloride can be set at the background mean concentration plus either five standard deviations or 15 mg/l, whichever is higher.

11.5 Excursion Monitoring. Monitoring for the excursion monitoring program shall be conducted twice monthly (semi-monthly) and at least 10 days apart for wells installed under LC 11.3 (B and C). If, at any well during a semi-monthly sampling event, the concentrations of any two excursion indicator parameters exceed their respective UCL or any one excursion indicator parameter exceeds its UCL by 20 percent, then the excursion criterion is exceeded and a verification sample shall be taken from that well within 48 hours after results of the first analysis are received. If the verification sample confirms that the excursion criterion is exceeded, then the well is placed on excursion status. If the verification sample does not confirm that the excursion criterion is exceeded, a third sample shall be taken within 48 hours after results of the first verification sampling are received. If the third sample shows that the excursion criterion is exceeded, the well shall be placed on excursion status. If the third sample does not show that the excursion criterion is exceeded, the first sample shall be considered to be an error and routine excursion monitoring is resumed (the well is not placed on excursion status).

Upon confirmation of an excursion, the licensee shall notify NRC as stated below, implement corrective action, and increase the sampling frequency for the excursion indicator parameters at the well on excursion status to at least once every seven days. Corrective actions for confirmed excursions may be, but are not limited to, those described in Section 5.7.8.2 of the approved license application. An excursion is considered corrected when concentrations of all indicator parameters defining the excursion status are at or below the UCLs defined in LC 11.4 for three consecutive weekly samples.

For wellfields located in an area in which the uppermost aquifer, the "SA Aquifer", is comprised of saturated unconsolidated alluvium, the licensee will include monitoring wells in the SA Aquifer in that area of the wellfield as part of the excursion monitoring program as described above. The wellfield data package must include sufficient justification on the locations, baseline sampling if the frequency

is less than quarterly and operational sampling if the frequency is less than semi-monthly for wells in the uppermost aquifer. The justification must demonstrate that the wells provide early detection of a release (including a surficial release).

If a vertical excursion is detected during operations, then injection of lixiviant into the production area surrounding the monitoring well will cease until the licensee demonstrates to the satisfaction of NRC that the vertical excursion is not attributed to leakage through any abandoned drill hole.

If an excursion is not corrected within 60 days of the initial confirmation, the licensee shall either: (a) terminate injection of lixiviant within the wellfield, or a portion of the wellfield provided the licensee demonstrates to NRC that only a portion of the wellfield is within the area of influence for the excursion) until the excursion is corrected; or (b) increase the financial surety in an amount to cover the full third-party cost for correcting and cleaning up impacts that may be attributed to the excursion. The surety increase shall remain in force until the NRC has verified that the excursion has been corrected and appropriate remedial actions have been undertaken. The written 60-day excursion report shall identify which course of action the licensee is taking if the excursion has not been corrected. Under no circumstances does this condition eliminate the requirement that the licensee remediate the excursion to meet ground water protection standards as required by LC 11.3.

The licensee shall notify the NRC Project Manager (PM) by telephone or email within 24 hours of confirming a lixiviant excursion, and by letter within 7 days from the time the excursion is confirmed, pursuant to this license condition and LC 9.3. A written report describing the excursion event, corrective actions taken, and the corrective action results shall be submitted to the NRC within 60 days of the excursion confirmation. For all wells that remain on excursion status after 60 days, the licensee shall submit a report as discussed in LC 11.1(A).

11.6 Until license termination, the licensee shall maintain documentation on spills of source or byproduct materials (including process solutions) and process chemicals. Documented information shall include, but not be limited to: date, spill volume, total activity of each radionuclide released, radiological survey results, soil sample results (if taken), corrective actions, results of post remediation surveys (if taken), a map showing the spill location and the impacted area, and an evaluation of NRC reporting criteria.

The licensee shall have procedures used to evaluate the consequences of the spill or incident/event against 10 CFR Part 20 Subpart M and 10 CFR 40.60 reporting criteria. If the criteria are met, then the licensee will report the spill or incident/event to the NRC Operations Center, as required.

If the licensee is required to report to a State or other Federal agency incidents/events that may have an impact on the environment, including wellfield excursions or spills of source, byproduct material, and/or process chemicals, the licensee shall submit a report to the NRC Headquarters PM by telephone or electronic mail (e-mail) within 24 hours. This notification shall be followed, within 30 days of the notification, by submittal of a written report to NRC Headquarters in accordance with LC 9.3, detailing conditions leading to the spill or incident/event, corrective actions taken, and results achieved.

SECTION 12.0: Preoperational Conditions

Standard Conditions

12.1 Prior to commencement of operations, the licensee shall obtain all necessary permits, licenses and approvals from the appropriate regulatory authorities. The licensee shall submit a copy of the permits it has obtained from other regulatory agencies for any effluent or waste disposal that includes treated or non-treated byproduct material, as well as documents clearly delineating the approved aquifer exemption areas and boundaries for the Class III UIC wells to the NRC.

12.2 Prior to commencement of operations, the licensee shall coordinate critical emergency response requirements with local authorities, fire department, medical facilities, and other emergency services. The licensee shall document these coordination activities and maintain such documentation on-site.

12.3 Prior to commencement of operations, the licensee shall identify the location, screen depth, and estimated pumping rate of any new water supply well or new use for an existing well within 2 km of a proposed wellfield area, as measured from the perimeter monitoring well ring, since the application was submitted to the NRC. The licensee shall evaluate the impact of ISR operations and recommend any additional monitoring or other measures to protect ground-water users. The evaluation shall be submitted to the NRC staff for review and verification at least 30 days prior to the expected commencement of operations.

12.4 Prior to commencement of operations, the licensee shall submit the qualifications of radiation safety staff members, including the qualifications and responsibilities of a designee, and the policy on the work situations for a declared pregnant worker, for NRC review and verification.

12.5 Prior to commencement of operations, the licensee shall submit a copy of the solid byproduct material disposal agreement to the NRC.

12.6 The licensee shall not commence operations until the NRC performs a preoperational inspection to confirm, in part, that operating procedures and approved radiation safety and environmental monitoring programs are in place, and that preoperational testing is complete.

The licensee should inform the NRC, at least 90 days prior to the expected commencement of operations, to allow for sufficient time for NRC to plan and perform the preoperational inspection.

Facility Specific Conditions

12.7 No later than 30 days before the preoperational inspection, the licensee shall provide to the NRC staff, for review and written verification, written procedures for its airborne effluent and environmental monitoring program that:

A) Discuss how, in accordance with 10 CFR 40.65, the quantity of the principal radionuclides from all point and diffuse sources will be accounted for, and verified by, surveys and/or monitoring.

B) Discuss and identify how radon (radon-222) progeny will be factored into analyzing potential public dose from operations consistent with 10 CFR Part 20, Appendix B, Table 2.

C) Discuss how, in accordance with 10 CFR 20.1501, the occupational dose (gaseous and particulate) received throughout the entire License Area from licensed operations will be accounted for, and verified by, surveys and/or monitoring.

12.8 Prior to the preoperational inspection, the licensee shall develop a survey program that will meet the requirements of 10 CFR Part 20, Subpart F to detect beta-gamma contamination on personnel exiting restricted areas and to detect beta-gamma contamination in unrestricted and restricted areas. The licensee shall provide, for NRC staff review and approval, the surface contamination detection capability (scan MDC) of the radiation survey meters used in surveys for releasing equipment and materials to unrestricted use or personnel contamination. In the scanning mode, the detection capability for any expected alpha and beta radiation shall be provided in terms of dpm per 100 cm^2.

12.9 Prior to the preoperational inspection, the licensee shall submit to the NRC staff, for review and verification, procedures by which it will ensure that unmonitored employees will not exceed 10 percent of the dose limits in 10 CFR Part 20, Subpart C.

12.10 At least 60 days prior to the preoperational inspection, the licensee will submit a completed Quality Assurance Plan (QAP) for NRC staff review and verification. The QAP will include the requirements in 10 CFR 20.1703(c)(4)(vii), and be consistent with guidance for a Quality Assurance Project Plan in Regulatory Guide 4.15 (as revised). The portion of the QAP fulfilling requirements of 10 CFR 20.1703(c)(4)(vii) may be included as a section or attachment in the applicable SOP(s).

12.11 Prior to the preoperational inspection, the licensee will provide to the NRC written SOPs required for LC 10.4, which will include information to meet the following specific-site conditions:

A) Development and sampling of low-yielding monitoring wells.

B) Inspection procedures for the CPP dewatering system.

C) A CPP effluent and environmental monitoring program (if not incorporated into the ground water detection monitoring program required by LC 10.20).

D) An emergency response program that includes hazard assessment of all chemicals used at the facility including an accident analysis for those chemicals.

E) Transportation of licensed material outside of the License area.

12.12 Prior to construction of the retention ponds, the licensee shall submit, for NRC review and verification, a ground water detection monitoring program plan for the retention ponds that meets requirements of Criteria 5 and 7A of 10 CFR Part 40, Appendix A. The plan will include specificity of elements discussed in Section 5.7.8.2 (Operational Monitoring-CPP Area) of the approved license application (e.g., monitoring dewatering effluent quality and water level, and water quality monitoring of monitoring wells along the containment barrier wall).

12.13 At least 90 days prior to the preoperational inspection, the licensee shall submit its analysis of the meteorological data collected to demonstrate long-term meteorological conditions at the Ross ISR Project. The licensee shall continue to collect meteorological data on a continuous basis at a data

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recovery rate of at least 90 percent and may not commence operations until the data collected are verified in writing by NRC headquarters staff to be representative of long-term meteorological conditions at the Ross ISR Project. The data collected on-site shall include, at a minimum, wind speed, wind direction, an annual wind rose and a summary of the stability classification.

To support the verification by NRC headquarters staff, the licensee must submit to the NRC a written justification of the similarity or validity of the data. This justification must include an analysis of the statistical data presented to illustrate confidence in the representativeness of the data.

FOR THE NUCLEAR REGULATORY COMMISSION

Dated: April 24, 2014

/RA/
Andrew Persinko, Deputy Director
Decommissioning and Uranium Recovery
Licensing Directorate
Division of Waste Management
and Environmental Protection
Office of Federal and State Materials
and Environmental Management Programs

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

COMMISSIONERS:

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Jeff Baran

In the Matter of STRATA ENERGY, INC. (Ross *In Situ* Uranium Recovery Project)	Docket No. 40-9091

CLI-16-13

MEMORANDUM AND ORDER

This decision addresses a petition for review relating to a materials license application for an *in situ* uranium recovery facility in Crook County, Wyoming filed by Strata Energy, Inc.[1] Natural Resources Defense Council and Powder River Basin Resource Council (together, "Joint Intervenors") have petitioned for review of the Atomic Safety and Licensing Board's Initial

[1] *Natural Resources Defense Council's & Powder River Basin Resource Council's Petition for Review of Atomic Safety and Licensing Board's January 23, 2015 Initial Decision Denying Environmental Contentions 1 Through 3, and Interlocutory Decisions Denying Environmental Contentions 4/5A and 6/7* (Feb. 17, 2015) (Petition); *see also* Exs. SEI014A to SEI014P, Ross ISR Project USNRC License Application, Crook County, Wyoming, Technical Report (Dec. 2010) (Technical Report); Exs. SEI016A to SEI016E, Ross ISR Project USNRC License Application, Crook County, Wyoming, Environmental Report (Dec. 2010) (Environmental Report).

Decision on their admitted contentions.[2] Joint Intervenors also challenge three earlier interlocutory Board decisions that found several contentions inadmissible.[3] For the reasons stated below, we deny review.

I. BACKGROUND

Strata proposes to build and operate an *in situ* recovery and processing facility for uranium known as the Ross Project.[4] As described in its application, the proposed operation will consist of two steps: recovering mineralized uranium from the ore body and processing the uranium-rich solution into yellowcake.[5] Uranium recovery will be accomplished by injecting an oxidizing solution, or "lixiviant," into the ore-bearing sandstone through a series of injection wells.[6] The lixiviant oxidizes and mobilizes the uranium as it moves through the ore body, after which it is removed from the ore body by recovery wells.[7] The "pregnant," or mineral-rich,

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[2] LBP-15-3, 81 NRC 65 (2015).

[3] LBP-13-10, 78 NRC 117 (2013); Memorandum and Order (Denying Motion for Reconsideration of LBP-13-10 Ruling Regarding Environmental Contention 4/5A or, Alternatively, to Admit Amended Contention) (Aug. 27, 2013) (unpublished) (Reconsideration Order); Memorandum and Order (Ruling on Motion to Migrate/Amend Existing Contentions and Admit New Contentions Regarding Final Supplement to Generic Environmental Impact Statement) (May 23, 2014) (unpublished) (FSEIS Order).

[4] Letter from Andrew Simpson, Strata Energy, Inc. to Keith McConnell, NRC (Jan. 4, 2011) (submitting application consisting of Environment Report (Exs. SEI016A to SEI016E) and Technical Report (Exs. SEI014A to SEI014P)) (ADAMS accession no. ML110120055); *see also* Strata Energy, Inc., Ross In Situ Recovery Uranium Project, Crook County, WY; Notice of Materials License Application, Opportunity to Request a Hearing and to Petition for Leave to Intervene, and Commission Order Imposing Procedures for Document Access to Sensitive Unclassified Non-Safeguards Information for Contention Preparation, 76 Fed. Reg. 41,308 (Jul. 13, 2011).

[5] *See* Ex. SEI014A, Technical Report, § 1.7, at 1-6.

[6] *Id.*

[7] *Id.*

lixiviant is then transferred to a central processing plant to be processed into uranium yellowcake.[8]

The *in situ* uranium recovery process is used throughout Wyoming, South Dakota, Nebraska, and New Mexico. Recognizing the widespread use of this technology in this region of the country, the Staff prepared a generic environmental impact statement (GEIS) to address aspects of the environmental analysis for these facilities that are similar across sites.[9]

This licensing proceeding began in January 2011, when Strata filed an application for the Ross Project. As proposed by Strata, the Ross Project would occupy 1,721 acres (696 hectares) in the northern half of a larger area within the Nebraska–South Dakota–Wyoming Uranium Milling Region known as the Lance District.[10] The project would consist of a central processing facility and 15–25 wellfield modules comprising a total of 1,400–2,200 recovery and injection wells.[11] Strata is also "actively exploring" the entire Lance District for potential satellite uranium recovery facilities, but had not yet submitted a license application for any of these facilities at the time of the Board's decision.[12] A license application, whether for a separate license or for a license amendment to expand the Ross facility, is subject to a separate safety

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[8] *Id.* at 1-6 to 1-7.

[9] *See* Exs. NRC007 to NRC008, "Generic Environmental Impact Statement for In-Situ Leach Uranium Milling Facilities, Final Report," NUREG-1910, Vols. 1-2 (May 2009) (GEIS).

[10] *See* Exs. SEI009A to SEI009B, "Environmental Impact Statement for the Ross ISR Project in Crook County, Wyoming, Supplement to the Generic Environmental Impact Statement for In-Situ Leach Uranium Milling Facilities Final Report," NUREG-1910, Supp. 5 (Feb. 2014), § 2.1.1 at 2-3 (FSEIS). The FSEIS describes the Lance District as an area "90-km^2 [56 mi^2]"—which is an incorrect conversion (90 square kilometers is 35 square miles). The exact size of the district is not relevant to this appeal.

[11] *Id.* at 2-9.

[12] *Id.* at 2-3 to 2-4.

and environmental review, and Joint Intervenors or other members of the public would have an opportunity to request a hearing with respect to any such application.[13]

At the outset of the proceeding Joint Intervenors sought and were granted a hearing on four contentions—all initially challenging Strata's environmental report.[14] The admitted contentions were:

> Contention 1: The application fails to adequately characterize baseline groundwater quality.
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> Contention 2: The application fails to analyze the environmental impacts that will occur if Strata cannot restore groundwater to primary or secondary limits.
>
> Contention 3: The application fails to include adequate hydrological information to demonstrate Strata's ability to prevent mining fluids from migrating into adjacent groundwater.
>
> Contention 4/5A: The application fails to adequately assess cumulative impacts of the proposed action and the planned Lance District expansion projects.[15]

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[13] In the time since the Board's initial decision approving the license, Strata has requested a license amendment to expand into the Kendrick expansion area. *See* Strata Energy Inc., Kendrick Expansion Area Amendment to SUA-1601 (Mar. 20, 2015) (ML15096A141 (package)) (Kendrick Expansion Amendment). That license amendment request is under review, and a notice of opportunity to request a hearing was published in the *Federal Register*. *See* Strata Energy Inc., Ross *In Situ* Recovery Project; License amendment request and notice of opportunity to request a hearing, 81 Fed. Reg. 10,285 (Feb. 29, 2016) (Kendrick Hearing Notice). Joint Intervenors did not submit a petition to intervene in the Kendrick proceeding. Further, the Staff has started the environmental scoping process for the Kendrick request. *See* Strata Energy, Inc. Kendrick Expansion Area *In Situ* Uranium Recovery Project; Scoping notice, 81 Fed. Reg. 12,143 (Mar. 8, 2016) (Kendrick Scoping Notice). Joint Intervenors have submitted scoping comments on the environmental review for the Kendrick expansion area. *See* E-mail from Shannon Anderson, Powder River Basin Resource Council, to NRC (Apr. 22, 2016) (ML16117A369) (transmitting Letter from Howard Crystal, representing Natural Resources Defense Council, to Cindy Bladey, NRC (Apr. 22, 2016) (Kendrick Project Scoping Comments)).

[14] LBP-12-3, 75 NRC 164, 210 (2012). On appeal we affirmed the Board's standing determination and did not address contention admissibility. CLI-12-12, 75 NRC 603 (2012).

[15] *See* LBP-12-3, 75 NRC at 212.

Following the issuance of the Staff's Draft Supplemental Environmental Impact Statement (DSEIS), Joint Intervenors filed a "motion to resubmit" their original contentions and to add a new contention (Contention 6).[16] In LBP-13-10, the Board "migrated" Contentions 1-3 as challenges to the Staff's DSEIS because the DSEIS discussion of the subject matter of each contention was substantially the same as in Strata's environmental report.[17] With respect to Contention 4/5A, however, the Board found that the information in the DSEIS differed significantly from the information in the environmental report.[18] The Board ruled that the migration tenet did not apply and Joint Intervenors should have submitted a new or amended contention, addressing all the admissibility factors.[19] Therefore, it held that Contention 4/5A would continue as a challenge to Strata's environmental report.[20] The Board later denied a motion for reconsideration of its ruling with respect to Contention 4/5A, stating that Joint Intervenors had made no showing on either the good cause or admissibility factors.[21]

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[16] *Natural Resources Defense Council's & Powder River Basin Resource Council's Joint Motion to Resubmit Contentions & Admit One New Contention in Response to Staff's Supplemental Draft Environmental Impact Statement* (May 6, 2013) (Motion to Resubmit Contentions); *see also* Exs. NRC006A to NRC006B, "Environmental Impact Statement for the Ross ISR Project in Crook County, Wyoming Supplement to the Generic Environmental Impact Statement for *In-Situ* Leach Uranium Milling Facilities," NUREG-1910, Supp. 5 (Draft Report for Comment) (Mar. 2013).

[17] LBP-13-10, 78 NRC at 151. Under the "migration tenet," where the information in the Staff's environmental review document is "sufficiently similar" to the material in the applicant's environmental report, an existing contention based on the application can be "migrated," or deemed to apply to the Staff's review document as it did to the application. *Id.* at 132-33 (citations omitted). As the Board explained, this case management practice obviates the need for intervenors to file an essentially identical contention challenging the Staff's document followed by a motion to dismiss the existing contention as moot. *Id.* at 133 n.8.

[18] *Id.* at 141-44.

[19] *Id.* at 143.

[20] *Id.*

[21] Reconsideration Order at 4-6.

The Board also declined to admit Joint Intervenors' proposed Contention 6, which argued that the Staff's NEPA analysis should consider the development of the entire Lance District as the federal action.[22] The Board found that Contention 6 was inadmissible because Joint Intervenors had not shown that plans to develop additional *in situ* recovery facilities in the region were sufficiently advanced or interconnected with the proposed action so as to trigger NEPA's requirement that they be submitted in a single environmental impact statement with the proposed license.[23] The Board further reasoned that the contention should have been filed with Joint Intervenors' initial petition to intervene because the environmental report identified the potential for Strata to develop the entire Lance District.[24]

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[22] LBP-13-10, 78 NRC at 150.

[23] *Id.* at 144-50. As noted above, Strata has now filed an application to expand its operations into the Kendrick area, contiguous to the Ross site, and the Joint Intervenors have filed scoping comments in that proceeding. *See supra* note 13. Joint Intervenors also submitted a "Notice of Filing" asking that we consider their scoping comments as part of the record in this proceeding. *See Natural Resources Defense Council and Powder River Basin Resource Council's Notice of Filing* (Apr. 27, 2016). The record for this proceeding, however, is closed and Joint Intervenors have not addressed the criteria for reopening the record in 10 C.F.R. § 2.326. Further, had Joint Intervenors filed a motion to reopen the record based on their scoping comments, it does not appear that they would have been able to meet the standards. Motions to reopen must, among other things, "demonstrate that a materially different result would be or would have been likely had the newly proffered evidence been considered initially." 10 C.F.R. § 2.326(a)(3). In their scoping comments Joint Intervenors reiterate the claim (among other things) that the Staff's analysis of the environmental impacts in this proceeding is defective because "the entire project should be considered in a single EIS." Kendrick Project Scoping Comments at 2. But, as discussed in more detail below, the Staff's EIS for the Ross project considered the cumulative impacts of the construction of possible satellite facilities, such as Kendrick, including impacts to geology and soils (*see* Ex. SEI009A, FSEIS, ch. 5 at 5-18 to 5-19), and surface and groundwater impacts (Ex. SEI009A, FSEIS ch. 5 at 5-20 to 5-29). Moreover, much of the Joint Intervenors' scoping commentary either does not address cumulative impacts or simply raises concerns with respect to the Kendrick area that were fully litigated with respect to the Ross facility—such as containment of mining fluids, baseline water quality characterization, and restoration impacts (*see* Kendrick Project Scoping Comments, at 6-7). We decline to make Joint Intervenors' scoping comments part of the record here.

[24] LBP-13-10, 78 NRC at 149-50.

The Staff completed its Final Supplemental Environmental Impact Statement (FSEIS) in February 2014 and issued the license in April 2014.[25] Shortly after the Staff completed the FSEIS, Joint Intervenors again sought to migrate or amend their contentions and offered a proposed Contention 7, which reiterated the claims of Contention 6.[26] In May 2014, the Board "migrated" Contentions 1 and 3, admitted an amended Contention 2, and again declined to migrate or amend Contention 4/5A.[27] The Board also found Contention 7 inadmissible because it was not based on new information.[28] Soon thereafter, the Board granted the Staff's and Strata's motions for summary disposition of Contention 4/5A.[29]

The Board held a hearing in the fall of 2014 on Contentions 1, 2, and 3.[30] In its Initial Decision following the hearing, the Board modified one license condition to require Strata to

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[25] *See* Exs. SEI009A to SEI009B, FSEIS; Ex. SEI015, Materials License SUA-1601 (Apr. 24, 2014) (License).

[26] *Natural Resources Defense Council's & Powder River Basin Resource Council's Joint Motion to Migrate or Amend* Contentions, *and to Admit New Contentions in Response to Staff's Final Supplemental Draft Environmental Impact Statement* (Mar. 31, 2014) (Motion to Migrate Contentions to FSEIS); *see also Second Declaration of Christopher E. Paine in Support of the Natural Resources Defense Council & Powder River Basin Resource Council's Joint Motion to Migrate or Amend Contentions, and to Admit New Contentions in Response to the Final Supplemental Environmental Impact Statement* (Mar. 31, 2014) (Second Paine Declaration). Joint Intervenors referred to their proposed contention as "Contention 5" because they had only four contentions pending in the proceeding. *See* Motion to Migrate Contentions to FSEIS, at 33 n.13. The Board, however, designated the contention "Contention 7" to maintain a consistent numbering system.

[27] *See* FSEIS Order at 19.

[28] *Id.* at 14-16, 20.

[29] Memorandum and Order (Ruling on Summary Disposition Motion Regarding Environmental Contention 4/5A) (July 25, 2014) (unpublished) (Summary Disposition Order).

[30] Notice of Hearing (Notice of Evidentiary Hearing and Opportunity To Provide Oral and Written Limited Appearance Statements), 79 Fed. Reg. 44,471 (July 31, 2014).

properly abandon certain historic drill holes outside the wellfield perimeter.[31] In all other respects, the Board ruled in favor of Strata and the NRC Staff on all three contentions.[32]

Joint Intervenors have petitioned for review of the Board's Initial Decision with respect to all three contentions.[33] They also seek review of the Board's interlocutory decisions refusing to migrate or amend Contention 4/5A and refusing to admit Contentions 6 and 7.[34] As detailed below, we find that Joint Intervenors have not raised a substantial question of law or identified a clear factual error and we deny their petition.

II. DISCUSSION

A. Standard of Review

We will grant a petition for review at our discretion, upon a showing that the petitioner has raised a substantial question as to whether:

> (i) a finding of material fact is clearly erroneous or in conflict with a finding as to the same fact in a different proceeding;
>
> (ii) a necessary legal conclusion is without governing precedent or is a departure from or contrary to established law;

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[31] *See* LBP-15-3, 81 NRC at 143-44. Strata did not appeal the Board's imposition of this license condition. In December 2015, Strata requested a license amendment to further modify the affected license condition, License Condition 10.12. *See* Letter from Michael Griffin, Strata Energy, to NRC Document Control Desk (Dec. 23, 2015) (regarding request to amend License Condition 10.12) (ML16020A370). *See also Natural Resources Defense Council and Powder River Basin Resource Council's Notice of Filing* (Feb. 19, 2016), attachment B, Letter from Howard Crystal, Meyer Glitzenstein & Eubanks, LLP, to NRC Document Control Desk (Feb. 17, 2016) (opposing license amendment request). The Staff published a notice of the license amendment request on the NRC public website, along with the opportunity to request a hearing on the amendment. *See* http://www.nrc.gov/about-nrc/regulatory/adjudicatory/hearing-license-applications.html#acc_docketing. Because this license amendment request has a separate opportunity to request a hearing and is not part of this proceeding, we do not need to further consider this issue here.

[32] LBP-15-3, 81 NRC at 153-54.

[33] *See* Petition at 1.

[34] *See id.*

> (iii) a substantial and important question of law, policy, or discretion has been raised;
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> (iv) the conduct of the proceeding involved a prejudicial procedural error; or
>
> (v) any other consideration that we may deem to be in the public interest.[35]

We review questions of law *de novo*; and we defer to the Board's findings with respect to the underlying facts unless the findings are "clearly erroneous."[36] The standard for showing "clear error" is a difficult one to meet: to do so, a petitioner must demonstrate that the Board's determination is "not even plausible" in light of the record as a whole.[37] For this reason, where a petition for review relies primarily on claims that the Board erred in weighing the evidence in a merits decision, we seldom grant review.[38] We defer to the Board on issues of contention admissibility unless there is an error of law or abuse of discretion.[39] Moreover, we generally leave to the Board's judgment whether a proposed contention has a sufficient factual basis to be admitted for hearing.[40]

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[35] 10 C.F.R. § 2.341(b)(4).

[36] *Honeywell International, Inc.* (Metropolis Works Uranium Conversion Facility), CLI-13-1, 77 NRC 1, 18-19 (2013) (citing *David Geisen*, CLI-10-23, 72 NRC 210, 224-25 & n.61 (2010) and *Private Fuel Storage, LLC* (Independent Spent Fuel Storage Installation), CLI-03-8, 58 NRC 11, 26 (2003)).

[37] *See, e.g.*, *Shaw Areva MOX Services, LLC* (Mixed Oxide Fuel Fabrication Facility), CLI-15-9, 81 NRC 512, 519 (2015) (citations omitted).

[38] *See, e.g.*, *DTE Electric Co.* (Fermi Nuclear Power Plant, Unit 3), CLI-14-10, 80 NRC 157, 162-63 (2014); *Entergy Nuclear Generation Co. and Entergy Nuclear Operations, Inc.* (Pilgrim Nuclear Power Station), CLI-12-1, 75 NRC 39, 45-46 (2012).

[39] *Southern Nuclear Operating Co.* (Vogtle Electric Generating Plant, Units 3 and 4), CLI-09-16, 70 NRC 33, 35 (2009); *Calvert Cliffs 3 Nuclear Project, LLC and Unistar Nuclear Operating Services, LLC* (Calvert Cliffs Nuclear Power Plant, Unit 3), CLI-09-20, 70 NRC 911, 914 (2009).

[40] *Entergy Nuclear Operations, Inc.* (Indian Point, Units 2 and 3), CLI-15-6, 81 NRC 340, 354-55 (2015); *Crow Butte Resources Inc.* (Marsland Expansion Area), CLI-14-2, 79 NRC 11, 26 (2014).

B. Contentions Rejected Prior to Hearing

Joint Intervenors seek review of the interlocutory Board decisions relating to three contentions dispositioned prior to hearing: Contention 4/5A, which the Board declined to update as a challenge to the DSEIS and FSEIS; and Contentions 6 and 7, which were never admitted in the proceeding.[41] We find that Joint Intervenors have not raised a substantial question with respect to these decisions.

1. Proposed Contentions 6 and 7

a. Joint Intervenors' Proposed Contentions

Joint Intervenors first challenge the Board's decisions rejecting proposed Environmental Contention 6 (challenging the DSEIS) and Environmental Contention 7 (the same contention, challenging the FSEIS).[42] As discussed above, Joint Intervenors argued in these contentions that the Staff's NEPA analyses should have considered Strata's development plans for the entire Lance District in a single EIS.[43] Joint Intervenors claimed that Strata had "segmented" the Lance District development to mask the actual environmental consequences of its long-term plans and to expedite the licensing process.[44] To support their contentions, Joint Intervenors cited Council on Environmental Quality (CEQ) regulations providing that proposals that "are related to each other closely enough to be, in effect, a single course of action shall be evaluated

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[41] *See* Petition at 4, 7-10 (challenging LBP-13-10, Reconsideration Order, and FSEIS Order). A petitioner who has been granted intervention and has other contentions pending in the proceeding may not seek immediate review of the Board's contention admissibility rulings. *See, e.g.*, *NextEra Energy Seabrook, LLC* (Seabrook Station, Unit 1), CLI-13-3, 77 NRC 51, 54 (2013).

[42] Petition at 7-10.

[43] *See* Motion to Resubmit Contentions at 19-23; Motion to Migrate Contentions to FSEIS at 33-39.

[44] Motion to Resubmit Contentions, at 19-23; *Declaration of Christopher E. Paine on Behalf of the Natural Resources Defense Council & Powder River Basin Resource Council in Support of Contentions 4/5A and 6*, (May 6, 2013) (Paine Declaration).

in a single impact statement" and that proposals should be considered a single course of action where they have "similarities that provide a basis for evaluating their environmental consequences together."[45] Joint Intervenors also argued that the Supreme Court has ruled in *Kleppe v. Sierra Club* that "when several proposals for ... actions that will have a cumulative or synergistic environmental impact upon a region are pending concurrently before an agency, their environmental consequences must be considered together."[46] In support of their contentions, Joint Intervenors cited various public statements and press releases from Strata's corporate parent indicating that Strata intends to file consecutive applications to develop the entire Lance District.[47]

b. The Board's Rulings on Contentions 6 and 7

In LBP-13-10, when the Board considered this claim with respect to Contention 6, it concluded that Strata's expansion plans were not sufficiently well-developed to constitute a "proposal" that the NRC must consider in its review of the Ross Project.[48] The Board found that the lack of additional "proposals"—actual applications for other facilities—undermined Joint Intervenors' reliance on both *Kleppe* and the CEQ regulations they cited.[49] It observed that the Supreme Court held in *Kleppe* that NEPA "does not require an agency to consider the possible environmental impacts of less imminent actions when preparing the [environmental] impact

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[45] Motion to Resubmit Contentions at 19 (quoting 40 C.F.R. §§ 1502.4(a) and 1508.25(a)).

[46] *Id.* (citing *Kleppe v. Sierra Club*, 427 U.S. 390, 410 (1976)).

[47] *See id.* at 20-21; Paine Declaration at 14-31 (unnumbered). The press releases referred to in the Paine Declaration are dated between October 2010 and March 2013. *See id.* at 14 (unnumbered).

[48] LBP-13-10, 78 NRC at 144-50.

[49] *Id.* at 145-46.

statement on proposed actions."[50] In addition, the Board cited Commission precedent that holds "to bring NEPA into play, a possible future action must at least constitute a 'proposal' pending before the agency (i.e., ripeness), and must be in some way interrelated with the action that the agency is actively considering (i.e., nexus)."[51]

The Board next analyzed Joint Intervenors' claim against the three types of actions described in the relevant CEQ regulation: connected, cumulative, and similar.[52] In the "connected action" portion of its analysis, the Board applied the "independent utility" test devised by the U.S. Court of Appeals for the Ninth Circuit in *Thomas v. Peterson*.[53] This test holds that related actions should be discussed together when each would have no independent utility without the other.[54] The Board found that this was not the case here—the Ross Project has "independent utility" without the possible expansion sites.[55] While the Board noted that it would be economically and operationally efficient if the processing facility built for the Ross Project were used for satellite facilities, it found that this efficiency fell short of showing that the proposed facility would have no independent utility if the satellite facilities were never built.[56]

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[50] *Id.* at 145 (quoting *Kleppe,* 427 U.S. at 410 & n.20).

[51] LBP-13-10, 78 NRC at 146 (quoting *Duke Energy Corp.* (McGuire Nuclear Station, Units 1 and 2; Catawba Nuclear Station, Units 1 and 2), CLI-02-14, 55 NRC 278, 295 (2002)).

[52] *Id.* at 147 (citing 40 C.F.R. § 1508.25(a)).

[53] *Id.* (discussing *Thomas v. Peterson*, 753 F.2d 754, 758-59 (9th Cir. 1985)).

[54] *Thomas,* 753 F.2d at 758-59. In *Thomas v. Peterson*, the Ninth Circuit held that in assessing the environmental impacts of a timber road, the U.S. Forest Service must consider the impacts of the timber sales that the road was designed to facilitate. But in that case, the timber sales could not take place without the road and the road had no independent utility apart from the timber sales. *Id.* Other federal courts continue to apply this test. *See, e.g.*, *Webster v. United States Dep't of Agriculture*, 685 F.3d 411, 426 (4th Cir. 2012).

[55] LBP-13-10, 78 NRC at 148.

[56] *Id.* The Board also noted that both the DSEIS and the Environmental Report acknowledged that the processing facility for the Ross Project will be designed to have a processing capacity four times greater than would be needed for the expected production of the Ross Project alone.

The Board concluded that Joint Intervenors had not shown a genuine dispute with respect to the "connected action" aspect of the CEQ's regulation.[57] The Board further declined to consider whether the expansion sites might fit the CEQ regulations' categories of "cumulative" and "similar" projects, because Joint Intervenors nevertheless had failed to show that the information on which their claims were based had not been "previously available."[58] Therefore the Board determined that the proposed contention could not satisfy the good cause factors in 10 C.F.R. § 2.309(c).[59]

In Contention 7, Joint Intervenors reasserted the same claims with respect to the FSEIS as Contention 6 had made with respect to the DSEIS.[60] In support of their motion, Joint Intervenors argued that Strata's parent company had continued to publicly disclose Strata's plans to develop satellite facilities within the Lance District, including in a May 2013 statement that exploratory drilling had commenced in the areas surrounding the Ross Project area.[61]

The Board found that Contention 7 failed to meet the good cause criteria because it was not based on new information.[62] The Board noted that the public documents Joint Intervenors

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Id. (citing Ex. NRC006A, DSEIS, § 2.1.1.1, at 2-13 and Ex. SEI016A, Environmental Report, § 1.1, at 1-4).

[57] *Id.* at 149 (citing 10 C.F.R. § 2.309(f)(1)(vi)).

[58] *Id.* at 149-50.

[59] *Id.* Petitioners who file a new or amended contention filed after the deadline for filing a petition for intervention must demonstrate good cause by showing that their contention is based on information that was not previously available, materially different from the information that was previously available, and filed in a timely fashion after the information becomes available. 10 C.F.R. § 2.309(c)(i), (ii), (iii).

[60] Motion to Migrate Contentions to FSEIS, at 33-40.

[61] *Id.* at 35-36.

[62] FSEIS Order at 14-16.

cited to support the contention were dated from March 2013 through March 2014.[63] And only the last of these, a March 2014 presentation from Strata's parent company, was dated within thirty days of Joint Intervenors' motion.[64] The Board concluded that the presentation was not materially different from previously available information and that Joint Intervenors had not satisfied the good cause factors under 10 C.F.R. § 2.309(c).[65]

c. *Review Denied With Respect to Proposed Contentions 6 and 7*

On appeal, Joint Intervenors argue that the Board's rulings erroneously conflated the merits of the contention with its admissibility and that the Board erred in not finding good cause for filing Contentions 6 and 7 after the deadline for filing the initial intervention petition.[66] Joint Intervenors argue that the Board required them to prove that the Lance District's development is a single project, when the contention admissibility factors only require "a concise statement of the alleged facts."[67]

With respect to whether Contention 7 was based on new information, we observe that Strata disclosed the potential for future satellite facilities in its application.[68] Moreover, it is apparent that Joint Intervenors were aware of these facilities from the fact that they raised the

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[63] *Id.* at 15-16.

[64] *Id.* at 16. *See* Second Paine Declaration at 16-18 (discussing http://www.pel.net.au/images/peninsul---aingoequei.pdf).

[65] FSEIS Order at 16.

[66] Petition at 8.

[67] *Id.*; *see also* 10 C.F.R. § 2.309(f)(1)(v).

[68] Ex. SEI016A, Environment Report, at 1-20 to 1-21. "The proposed Ross ISR Project is intended to be just the first of several ISR project sites to be developed in the area. If these other sites are developed, it is likely that they will serve as ancillary or satellite facilities to the proposed Ross project site, with all satellite facilities using the same [central processing plant]." *Id.* at 2-8.

question of cumulative impacts from these facilities in their initial Contention 4/5A.[69] The Board's conclusion that Joint Intervenors already knew enough to formulate their contentions, and should have done so at the time that the application was filed, was reasonable.

Nor do we discern any error of law in the Board's ruling that the expansion plans would have to be in a sufficiently advanced stage to be considered a "proposal" for action that "bring[s] NEPA into play."[70] The Board's ruling with respect to the scope of the federal action rested on Supreme Court authority in *Kleppe* as well as our own agency case law, as discussed above.[71] While the Ross Project FSEIS appropriately discussed the cumulative impacts of potential satellite facilities, a single environmental impact statement on the development of the entire Lance District would be speculative at this time.[72]

Finally, contrary to Joint Intervenors' arguments on appeal, we do not find that the Board strayed into "weighing the merits" in considering the admissibility of these proposed contentions.[73] Joint Intervenors had the burden to demonstrate the admissibility of their

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[69] *See Petition to Intervene and Request for Hearing by the Natural Resources Defense Council & Powder River Basin Resource Council*, at 28-29 (Oct. 27, 2011).

[70] *Id.* at 146 (quoting *McGuire & Catawba*, CLI-02-14 at 295); *see also Webster*, 685 F.3d at 426-27 (agency of the U.S. Department of Agriculture was not required to consider the possible development of a water treatment facility in deciding whether to approve construction of a dam, when no such facility had been proposed).

[71] *Kleppe*, 427 U.S. at 410; *McGuire & Catawba*, CLI-02-14, 55 NRC at 295.

[72] *See* Ex. SEI009A, FSEIS, § 5.2.1.1, at 5-5 to 5-8 (discussion of potential satellite facilities and other past or future in situ recovery facilities within 50 miles (80 kilometers) of the proposed project). And the filing of a license amendment request to expand the current Strata Facility, which occurred after the issuance of the Board's decision, does not alter the fact that the Board's ruling was appropriate at the time. *See* Kendrick Expansion Amendment. The FSEIS considered the cumulative impacts of future satellite facilities, such as the proposed Kendrick expansion. *See generally* Ex. SEI009A, FSEIS § 5.2. Joint Intervenors have not provided any basis for us to question this analysis as it applies to this proceeding.

[73] *See* Petition at 8.

contention, including establishing a factual predicate for its claims.[74] Here, the Board had to determine whether there was a sufficient factual basis for the contention in the face of the contrary evidence that no concrete proposals to develop additional sites were pending before the agency at that time. Its discussion relates to the "genuine dispute" element of the contention admissibility factors—not the merits of the underlying claim.[75] We usually defer to a Board's judgment as to whether a contention's proponent has provided adequate support to raise a genuine dispute of material fact.[76] We see no reason to change this practice here; we find that Joint Intervenors have not raised a substantial question with respect to Contentions 6 and 7.[77]

2. Contention 4/5A

Joint Intervenors seek review of the Board's decisions declining to admit their "resubmitted" Contention 4/5A as a challenge to the DSEIS, and later, as a challenge to the FSEIS.[78] As admitted, Contention 4/5A argued that the application failed to consider cumulative impacts on groundwater quantity and quality from satellite facilities that Strata eventually intends

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[74] *See Luminant Generation Co., LLC* (Comanche Peak Nuclear Power Plant, Units 3 and 4), CLI-11-9, 74 NRC 233, 243-44 (2011) (in rejecting a contention that failed to identify inadequacies in the applicant's Mitigative Strategies Report, the board did not impermissibly weigh the merits to find that the Mitigative Strategies Report was sufficient).

[75] *See* 10 C.F.R § 2.309(f)(vi); *see also AmerGen Energy Company, LLC* (Oyster Creek Nuclear Generating Station), CLI-09-7, 69 NRC 235, 276-77 (2009) (the board did not impermissibly weigh the merits in finding that petitioners had provided no factual support for their proposed safety contention).

[76] *Indian Point*, CLI-15-6, 81 NRC at 354-55.

[77] We note that the Staff intends to prepare a supplemental EIS, rather than an environmental assessment, for the Kendrick expansion, which will consider potential impacts of construction, operation, and restoration of the site. *See* Kendrick Scoping Notice, 81 Fed. Reg. at 12.144. Joint Intervenors—along with any other interested groups or members of the public—may participate in the separate proceeding regarding the license amendment request for the Kendrick expansion. *See* Kendrick Expansion Amendment and Kendrick Hearing Notice, 81 Fed. Reg. at 10,285.

[78] Petition at 4, 9-10.

to develop surrounding the Ross site.[79] The Board's refusal to migrate or amend Contention 4/5A led to its eventual summary disposition because a challenge to the environmental report was no longer material once the Staff had completed its FSEIS.[80]

Joint Intervenors' challenge with respect to Contention 4/5A, however, only addresses the Board's ruling in LBP-13-10 with respect to good cause.[81] They argue that because the Board itself found that the DSEIS information "differed significantly" from the material in the environmental report, this should be enough to show "good cause" for filing under 10 C.F.R. § 2.309(c), because the information was not "previously available."[82] Joint Intervenors argue that even if their "Motion to Resubmit" their contentions lacked a "formalistic invocation of the 2.309(c) factors," the Board erred in denying their motion for reconsideration of LBP-13-10, which included such a recitation.[83] But good cause was only one basis on which the Board refused to admit Joint Intervenors' "resubmitted" contentions on the DSEIS—the Board also noted that, in addition to demonstrating good cause, Joint Intervenors needed to satisfy "the section 2.309(f)(1) admissibility factors … to provide the foundation for a new or amended contention."[84]

Even if Joint Intervenors were correct with respect to their argument on appeal related to good cause, they do not argue that the Board erred with respect to the admissibility factors. Because the DSEIS provided new information on cumulative impacts to address the

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[79] LBP-12-3, 75 NRC at 212.

[80] *See* Summary Disposition Order at 14-15.

[81] Petition at 9; *see* 10 C.F.R. § 2.309(c).

[82] Petition at 9.

[83] *Id.*

[84] *See* LBP-13-10, 78 NRC at 143.

deficiencies identified in Contention 4/5A, Joint Intervenors needed to challenge that analysis specifically to show that a genuine dispute remained concerning cumulative impacts. And as "the Board is the appropriate arbiter of such fact-specific questions of contention admissibility, we will not second-guess the Board's evaluation of factual support for [a] contention, absent an error of law or abuse of discretion," which Joint Intervenors have not shown here.[85] We therefore decline to take review of the Board's decisions in LBP-13-10, the Reconsideration Order, and the FSEIS Order with respect to Contention 4/5A.

C. Contentions Decided on the Merits

1. Contention 1

a. Background of Contention 1

In Contention 1, Joint Intervenors claimed that Strata's groundwater quality monitoring program was inadequate to describe the baseline—or existing—water quality of the various aquifers underlying the Ross site:

> The FSEIS fails to comply with 10 C.F.R. §§ 51.90-94, 10 C.F.R. Part 40, Appendix A, and NEPA because it lacks an adequate description of the present baseline (i.e., original or pre-mining) groundwater quality and fails to demonstrate that groundwater samples were collected in a scientifically defensible manner, using proper sampling methodologies. The FSEIS's departure from NRC guidance serves as additional evidence of these regulatory violations.[86]

Joint Intervenors argued that if the site is not adequately characterized, the potential impacts of the proposed facility cannot adequately be measured.[87] We agree that the baseline

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[85] *NextEra Energy Seabrook, LLC* (Seabrook Station, Unit 1), CLI-12-5, 75 NRC 301, 326-27 (2012).

[86] FSEIS Order, app. A (citing Ex. SEI007, Standard Review Plan for *In Situ* Leach Uranium Extraction License Applications, NUREG-1569, §§ 2.7.1, 2.7.3, 2.7.4 (2003) (NUREG-1569)).

[87] *See, e.g.*, Ex. JTI001-R, Pre-filed Direct Testimony of Dr. Richard Abitz Supporting Joint Intervenors' Contentions 1 and 3, at 7 (Abitz Direct Testimony).

environmental conditions at a site like Strata must be considered as part of the Staff's NEPA analysis.[88] As we discuss in more detail below, the Board found Strata's and the NRC Staff's description of the environmental baseline to be sufficient to support the NEPA analysis in the FSEIS.[89] Joint Intervenors' appeal does not raise an issue that causes us to disturb the Board's determination here.

An applicant for an *in situ* uranium recovery license must describe the hydrology of the proposed site to predict the potential effect such a facility would have on adjacent groundwater and surface waters as required by NEPA.[90] To do this, the applicant must establish a pre-licensing groundwater monitoring program to provide baseline data sufficient to describe the overall quality of the groundwater.[91] This requirement is also codified in Criterion 7 of Part 40, Appendix A, which requires that "at least one full year prior to any major site construction, a preoperational monitoring program must be conducted to provide complete baseline data."[92]

Accordingly, Strata conducted a groundwater monitoring program over a two-year period, the results of which were incorporated into the FSEIS.[93] Strata's pre-licensing groundwater monitoring activities consisted of six monitoring well clusters, with at least four

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[88] The Board explained that there was some "uncertainty" concerning the terms "baseline" and "background" and whether these terms are interchangeable. *See* LBP-15-3, 81 NRC at 75-76 n.2. The Board used "baseline" to refer to the prelicensing site characterization and "background" for the values that will be established post licensing. *Id.* We use the Board's terminology.

[89] *See* LBP-15-3, 81 NRC at 111.

[90] *See* 10 C.F.R. pt. 40, app. A, Criterion 7; *see also*, Ex. SEI007, NUREG-1569, § 2.7.1.

[91] *See* Ex. NRC001, NRC Staff's Initial Testimony, at 3-4 (Staff Testimony); *see also* Ex. SEI007, NUREG-1569, § 2.7.1, at 2-23 to 2-26.

[92] 10 C.F.R. pt. 40, app. A; *see also* LBP-15-3, 81 NRC at 89-90.

[93] *See generally* Ex. SEI009A, FSEIS, § 3.5.3.3; Ex. SEI009B, FSEIS, app. C (complete sampling data).

wells in each cluster to collect samples from the ore zone, the aquifers immediately overlying and underlying the ore zone, and the surficial aquifer.[94] In addition to the samples collected through its own monitoring, Strata used samples from existing water-supply wells located within or adjacent to the Ross site and data from a former research and development operation during the 1970s to characterize the baseline groundwater quality. Staff incorporated all this information into the FSEIS.[95]

Joint Intervenors' expert Dr. Richard Abitz testified that the distribution of the wells used for groundwater sampling did not collect data "representative of overall site conditions," which led to the flawed characterization of the site.[96] Moreover, Dr. Abitz said that Strata's wells concentrated on the mineralized areas within the aquifer instead of sampling water through the entire thickness of the aquifer, resulting in data that indicated more contamination in the groundwater than is actually there.[97] Dr. Abitz argued that higher baseline contaminate levels would "allow[] for a substantially more degraded aquifer after restoration" that would preclude the use of the mined aquifer in the future for domestic, livestock, or agricultural needs.[98] To address this concern, Joint Intervenors urged that the baseline water quality be established through more rigorous protocols—such as those set forth in NRC regulations for post-licensing, preoperational background monitoring or such as the Environmental Protection Agency's

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[94] Ex. SEI009A, FSEIS, § 3.5.3.3, at 3-37 to 3-38. The Board explained that the monitored aquifers, or horizons, were the ore zone, the aquifer underlying the ore zone (referred to as the deep monitoring unit), the aquifer overlaying the ore zone (referred to as the shallow monitoring unit) and the surficial aquifer. *See* LBP-15-3, 81 NRC at 89.

[95] Ex. SEI009A, FSEIS, § 3.5.3.3, at 3-38. The research and development operation, known as Nubeth Joint Venture, operated from August 1978 through April 1979 and was decommissioned in 1983. *Id.* § 2.1.1, at 2-11.

[96] *See* Ex. JTI001-R, Abitz Direct Testimony, at 10, 16-17.

[97] *Id.* at 10, 21-22.

[98] *Id.* at 11, 24.

"Statistical Analysis of Groundwater Monitoring Data at [Resource Conservation and Recovery Act (RCRA)] Facilities."[99]

b. The Board's Ruling on Contention 1

The Board rejected as a matter of law Joint Intervenors' argument that the FSEIS site characterization must conform to the more rigorous criteria that specifically apply to post-licensing, preoperational monitoring.[100] In reviewing this contention, the Board explained the difference between pre-licensing site characterization for NEPA purposes and the post-licensing activities used to set restoration values and to detect excursions during operations.[101] After receiving a license, a licensee collects groundwater samples from the production and injection wells to establish post-licensing, preoperational background levels for various chemical constituents, which are then used to set restoration goals.[102] At that time, the licensee also installs monitoring wells at the perimeter of each wellfield, which are used to detect leaks during operations.[103] The Board cited the Standard Review Plan for *In Situ* Leach Uranium Recovery Facilities and Regulatory Guide 4.14 to distinguish between the groundwater monitoring necessary for pre-license site characterization (baseline), and the post-licensing, pre-operation monitoring that will be used for monitoring and site restoration.[104] Further, the Board relied on

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[99] *See id.* at 7-10, 35-40; Tr. at 428 (Abitz); *see also* Ex. JTI006, EPA, Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities Unified Guidance (Mar. 2009).

[100] LBP-15-3, 81 NRC at 91-92. That is, the criterion of 10 C.F.R. pt. 40, app. A, Criterion 5 and Criterion 7A do not specifically apply to site characterization under NEPA.

[101] *Id.* at 89-90; *see also* Ex. SEI009A, FSEIS, § 2.1.1.1, at 2-25.

[102] LBP-15-3, 81 NRC at 76, 90; *see also* 10 C.F.R. pt. 40, app. A, Criterion 5B(5).

[103] LBP-15-3, 81 NRC at 76, 90-91; *see also* 10 C.F.R. pt. 40, app. A, Criterion 7A.

[104] LBP-15-3, 81 NRC at 90-91 (citing Ex. SEI007, NUREG-1569, § 2.7; Ex. SEI008, Regulatory Guide 4.14 (Rev. 1), Radiological Effluent and Environmental Monitoring at Uranium Mills (Apr. 25, 1980)). Staff Guidance documents such as standard review plans are entitled to "'special weight.'" *Yankee Atomic Electric Co.* (Yankee Nuclear Power Station), CLI-05-15, 61 NRC 365,

our decision in *Hydro Resources*, where we stated that conducting the more detailed post-licensing analysis "to establish definitively the groundwater quality baselines and upper control limits" is "consistent with industry practice and NRC methodology"; and, in fact, this analysis cannot be completed until after licensing, when an *in situ* leach well field has been installed.[105] The Board held that the fact that Strata's groundwater monitoring (on which the FSEIS relied) did not conform to post-licensing monitoring or other, more rigorous, procedures did not undermine the sufficiency of the site characterization *per se*.[106]

This conclusion, however, did not end the Board's inquiry into Contention 1—the Staff was still required to show that the FSEIS sufficiently described the site. The Board next considered Joint Intervenors' specific arguments that the FSEIS's description of the groundwater at the Ross Project site was inaccurate or incomplete for the purposes of NEPA.[107] After a detailed discussion of each purported defect, the Board ruled in favor of the Staff and Strata on each point.[108]

c. Petition for Review of Contention 1

(1) NO SUBSTANTIAL QUESTION OF LEGAL ERROR IN CONTENTION 1

Joint Intervenors argue that the Board erroneously held that it is permissible to defer "meaningful" or "accurate" baseline characterization until after the license is issued.[109] Joint

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375 n.26 (2005) (quoting *Long Island Lighting Co.* (Shoreham Nuclear Power Station, Unit 1), ALAB-900, 28 NRC 275, 290 (1988)).

[105] LBP-15-3, 81 NRC at 91 (citing *Hydro Resources, Inc.* (P.O. Box 777, Crownpoint, New Mexico 87313), CLI-06-1, 63 NRC 1, 6 (2006)).

[106] *Id.* at 91-92.

[107] *Id.* at 93-110.

[108] *Id.* We do not provide a discussion of the technical arguments resolved in Staff's favor that are not the subject of Joint Intervenors' petition.

[109] Petition at 10-11.

Intervenors have not raised a "substantial question" of law with respect to the applicable standards for site characterization—their claim mischaracterizes the Board's ruling. The Board did not rule that "meaningful" baseline characterization may be deferred until the post-licensing period. Rather, it held that the groundwater monitoring used to describe the environmental conditions at the site for NEPA purposes need not conform to the groundwater monitoring requirements applicable to an operating facility.[110] The two standards serve different purposes.

Joint Intervenors argue generally that NEPA requires the collection of accurate information prior to making a decision.[111] While we agree that the information in the FSEIS must be accurate, in this instance Joint Intervenors equate accuracy with the volume of data collected. Joint Intervenors provide no justification for challenging the validity of the Staff's NEPA analysis beyond a call for the collection of additional data.[112] But our regulations do not require licensees or the Staff to conduct the additional sampling that Joint Intervenors request before the issuance of a license. Joint Intervenors have not shown that additional groundwater sampling is necessary to characterize the existing site conditions or the expected environmental impacts of the proposed operation. While it is always possible to gather more data, at some point the Staff must "move forward with decisionmaking."[113] And, as explained below, Joint Intervenors do not raise a substantial question relating to the Board's fact finding with respect to Strata's site characterization. Given that the Board based its legal ruling on precedent and

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[110] LBP-15-3, 81 NRC at 91-92.

[111] Petition at 11.

[112] *Id.* at 12-14.

[113] *Entergy Nuclear Generation Co. and Entergy Nuclear Operations, Inc.* (Pilgrim Nuclear Power Station), CLI-10-11, 71 NRC 287, 315 (2010) (quoting *Town of Winthrop v. Federal Aviation Administration*, 535 F.3d 1, 11 (1st Cir. 2008)).

applicable Staff guidance, we see no substantial question of law relating to NEPA's site characterization requirements.

Joint Intervenors additionally argue that the Board improperly shifted the burden of proof to Joint Intervenors.[114] We disagree. The Board acknowledged that the Staff has the burden to prove the sufficiency of the FSEIS.[115] When considering challenges to how the Board weighed the evidence, we "defer to the Board's expertise as the fact finder and decline to substitute the judgment [of an Intervenor's expert] for that of the Board."[116]

(2) NO SUBSTANTIAL QUESTION OF FACTUAL ERROR IN CONTENTION 1

We also decline to take review of Joint Intervenors' factual challenges with respect to Contention 1. Although Joint Intervenors raised many challenges to Strata's site characterization before the Board, their petition (and thus our decision today) focuses on only two.[117]

Joint Intervenors first claim that the monitoring wells were not "located and distributed in a manner designed to collect data representative of overall site conditions."[118] Joint Intervenors aver that "no one disputed" that Strata's approach "was neither designed to, nor did, collect representative baseline water quality data."[119]

We see no "clear error" in the Board's fact finding relating to this complex issue. Contrary to Joint Intervenors' assertion, the Staff and Strata vigorously disputed Joint

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[114] Petition at 11-12.

[115] LBP-15-3, 81 NRC at 84-85.

[116] *See, e.g., Oyster Creek*, CLI-09-7, 69 NRC at 266.

[117] Petition for Review at 11-14.

[118] *Id.* at 12 (citing Ex. JTI001-R, Abitz Direct Testimony, at 16).

[119] *Id.* at 13.

Intervenors' claim that the site characterization was insufficient.[120] Moreover, the Board cited ample record support for its conclusions. It observed that Strata's collection methods had generated "362 groundwater samples (with 16,000 chemical and radiological parameters)."[121] The Board also noted that "the number and location of wells was based on factors such as [Wyoming Department of Environmental Quality] guidelines, … having consistent/continuous water-bearing intervals above and below mineralization, satisfactory confining layer thickness, proximity to existing drilling data, sufficient spatial distribution for development of potentiometric data, and landowner considerations."[122] The Board also discussed Joint Intervenors' evidence, specifically the testimony of their expert Dr. Abitz.[123] In considering the record here, the Board found that there was no evidence of "actual bias (or an attempt to induce a biased result)" in the number and location of wells.[124] Given that the Board considered and weighed the evidence from all parties, and based on our review of Joint Intervenors' petition, we will not second guess the Board's conclusion that the number of samples and location of wells were sufficient to support the Staff's FSEIS.

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[120] *See* Ex. NRC001, Staff Testimony at 12-14 ("Because the location and placement of Strata's wells and the sampling and analytical methods used were consistent with those described in Section 2.7 [of the Standard Review Plan], the Staff found that the quality of the baseline groundwater data presenting in the FSEIS was adequate for use in assessing the Ross Project's potential environmental impacts."); Ex. SEI005, Initial Written Testimony of Ben Schiffer, at 9 ("In my experience and opinion, 16,000 results from more than 362 groundwater samples provides a representative, quantitative description of the baseline groundwater quality within and adjacent to the project boundary. As importantly in my opinion, these data more than meet the intent of NEPA ….").

[121] LBP-15-3, 81 NRC at 93-94. The Board cited *Pilgrim*, wherein we held that NEPA does not require that unlimited resources be devoted to information-gathering so long as the result is reasonable. *Pilgrim,* CLI-10-11, 71 NRC at 315.

[122] LBP-15-3, 81 NRC at 94 n.19 (citing Ex. SEI016A, Environmental Report, at 3-101 and Ex. SEI045, Rebuttal Testimony of Ben Schiffer, at 15).

[123] *Id.* at 93-95.

[124] *Id.* at 94.

Joint Intervenors next dispute the Board's finding that Strata's well screening intervals were "appropriate" for site characterization.[125] That is, they claim that Strata's sampling wells were designed to draw water only through the parts of the ore zone aquifer that contain "stacked ore horizons" (uranium deposits), thereby biasing the results toward higher concentrations of uranium and radium-226.[126] Joint Intervenors generally assert that the wells should be screened through the entire thickness of the aquifer.[127]

The Board found that Strata's well screening intervals did not inappropriately bias the results of its site characterization activities.[128] The Board acknowledged that the wells did not draw water from the entire thickness of the ore zone aquifer.[129] Nevertheless, it found the results were not biased because some of the wells were located in the nonmineralized parts of the aquifer, and, for those wells located in the mineralized zones, the screened intervals were "long enough to collect groundwater from nonmineralized layers between ore horizons."[130] It concluded that the well screening protocol used by Strata was sufficient for site characterization.[131]

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[125] Petition for Review at 13-14.

[126] *Id.*; *see also* JTI001-R, Abitz Direct Testimony, at 21-22. The Board explained that "'well screening' denotes the use, at the intake portion of a well, of a porous filter that allows groundwater to be sampled from a targeted aquifer or a specific horizon within an aquifer." *See* LBP-15-3, 81 NRC at 97 n.23.

[127] Petition for Review at 13-14.

[128] LBP-15-3, 81 NRC at 98-99.

[129] *Id.* at 98.

[130] *Id.* at 99.

[131] *Id.* at 98-100. Joint Intervenors also claimed before the Board that the Standard Review Plan requires that wells be "fully screened" through the "entire thickness of the aquifer," but, as the Board pointed out, the Standard Review Plan section in question only applies to the perimeter monitoring wells that are to be installed to detect excursions, not for site characterization. *See Id.* at 98-99 (citing Ex. SEI007, NUREG-1569, § 5.7.8.3, at 5-42 to 5-43).

Joint Intervenors do not show clear error in the Board's finding of fact with respect to well screening intervals. The Board provided a plausible explanation why the well screening protocols would not unduly bias the groundwater sampling results, and well screening was just one sub-issue of many the Board considered with respect to this contention. It is apparent that the Board considered evidence and arguments from both sides of each of Joint Intervenors' specific technical complaints, including the two they discuss in their petition for review.

We decline to review a board's "plausible decision that rests on carefully rendered findings of fact," even where the record includes evidence that supports a different view.[132] We therefore find that Joint Intervenors have not raised a substantial question with respect to the Board's findings of fact on Contention 1.

2. Contention 2

a. Background of Contention 2

In Contention 2, Joint Intervenors argued that the FSEIS did not consider the extent to which groundwater will be degraded due to the establishment of alternate concentration limits for hazardous constituents after site restoration:

> The FSEIS fails to meet the requirements of 10 C.F.R. §§ 51.90-94 and NEPA because it fails to evaluate the virtual certainty that the applicant will be unable to restore groundwater to primary or secondary limits in that the FSEIS does not provide and evaluate information regarding the reasonable range of hazardous constituent concentration values that are likely to be applicable if the applicant is required to implement an [alternate concentration limit] in accordance with 10 C.F.R. Part 40, App. A, Criterion 5B(5)(c).[133]

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[132] *Private Fuel Storage*, CLI-03-8, 58 NRC at 25-26.

[133] FSEIS Order, app. A.

Joint Intervenors maintained that alternate concentration limits are inevitable at the Ross Project site because no decommissioned *in situ* uranium recovery facility has ever met primary or secondary standards for all contaminants.[134]

As explained with respect to Contention 1, *in situ* recovery facility licensees must establish restoration goals for hazardous constituents in groundwater through post-licensing, pre-operational testing.[135] Under the terms of its license, Strata must restore the groundwater in each wellfield to regulatory limits.[136] The first option for any given constituent is background (the level present prior to operations), which the Board termed the "primary" standard.[137] The "secondary" standard to which the contention refers is a maximum contaminant level provided for certain constituents in Part 40, Appendix A, Table 5C.[138] If the licensee cannot meet primary or secondary standards for a particular constituent after restoration efforts, it may file a license amendment request for a site-specific alternate concentration limit for that constituent.[139] To receive the license amendment, the licensee must demonstrate both that the concentration of the particular hazardous constituent is as low as reasonably achievable and that the alternate concentration limit presents no significant hazard to human health or the environment, in accordance with factors listed in Criterion 5B(6). These factors include potential adverse effects to groundwater and to hydraulically connected surface water, current and future uses of the

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[134] *See* Motion to Migrate Contentions to FSEIS, at 23-25.

[135] *See generally*, 10 C.F.R. pt. 40, app. A, Criterion 7A.

[136] *See* Ex. SEI015, License, at 7 (License Condition 10.6).

[137] *See* LBP-15-3, 81 NRC at 114 (citing 10 C.F.R. pt. 40, app. A, Criterion 5B(5)(a)).

[138] 10 C.F.R. pt. 40, app. A, Criterion 5B(5)(b), Table 5C; *see also* LBP-15-3, 81 NRC at 114. The values provided in Table 5C are the Maximum Constituent Levels set by the Environmental Protection Agency in 40 C.F.R. pt. 192, Health and Environmental Protection Standards for Uranium and Thorium Mill Tailings.

[139] 10 C.F.R. pt. 40, app. A, Criterion 5B(5)(c).

ground and surface waters, and possible cumulative effects with other sources of contamination.[140] The license amendment application would also be subject to an opportunity for interested persons to request a hearing.

In admitting the contention at the outset of the proceeding, the Board rejected the Staff's argument that the environmental effects of possible alternate concentration limits are too uncertain for consideration in the FSEIS.[141] The Board acknowledged that the Staff "likely" could not determine prior to licensing the facility what alternate concentration limits would be approved for a particular wellfield after restoration.[142] But the Board reasoned that the Staff could perform a bounding analysis to consider the range of alternate concentration limits that have been approved historically.[143]

The Staff accordingly included a discussion of three approved aquifer restorations in the FSEIS.[144] These three restorations could give only a general idea of the range of possible future alternate concentration limits for the Ross Project because they had all been approved at a time when the Staff used a different interpretation of "secondary" standard than it now uses.[145]

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[140] *Id.*, Criterion 5B(6).

[141] LBP-12-3, 75 NRC at 197.

[142] *Id.*

[143] *Id.*

[144] Ex. SEI009A, FSEIS, § 4.5.1.3, at 4-45 to 4-46.

[145] Crow Butte Wellfield 1 restoration was approved in 2003 (*see* Ex. NRC026, Letter from Daniel M. Gillen, NRC, to Michael L. Griffen, Crow Butte Resources, Inc., License Amendment 15, Crow Butte Resources *In Situ* Leach Facility, License No. SUA-1534, Wellfield #1 Restoration Acceptance (Feb. 12, 2003) (Crow Butte Wellfield 1 Approval)). Smith Ranch-Highland Wellfield A was approved in 2004 (*see* Ex. NRC027, Letter from Gary S. Janosko, NRC to W. F. Kearney, Power Resources, Inc., License Amendment 15, Crow Butte Resources *In Situ* Leach Facility, License No. SUA-1534, Wellfield #1 Restoration Acceptance (June 29, 2004)). Irigaray Mine Units 1-9 restoration was approved in 2006 (*see* Ex. NRC034, Letter from Gary S Janosko, NRC, to Donna L. Wichers, COGEMA Mining, Inc., Review of Cogema Mining,

Prior to 2009, the Staff considered the "secondary standard" to be coextensive with the "pre-operational class of use" established by the state, which—as the Board's decision acknowledges—is not accurate.[146] Alternate concentration limits were not considered necessary at the three sites discussed in the FSEIS bounding analysis because they all met the "pre-operational class of use" standard following restoration.[147] Therefore, those licensees did not have to meet the more stringent criteria—set forth at Part 40, Appendix A, Criterion 5B(6)—that apply at the Ross site.[148] In contrast, before any alternate concentration limit could be approved for any constituent at the Ross Project site, Strata would have to show that its concentration is as low as reasonably achievable and meets the other criteria set forth in Criterion 5B(6). For this reason, the FSEIS bounding analysis provides a conservative basis for predicting the likely range of alternate concentration limits that might be approved following restoration of the Ross Project site.

The FSEIS states that for the three sites discussed in the bounding analysis, most of the groundwater quality constituents were either restored to post-licensing, preoperational background levels or to "class I (domestic use)" standards.[149] In addition, where elevated levels

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Inc., Irigaray Mine Restoration Report, Production Units 1 Through 9, Source Materials License SUA-1341 (Sept. 20, 2006)).

[146] *See* LBP-15-3, 78 NRC at 116 n.46; *see also* Ex. SEI009A, FSEIS, § 4.5.1.3, at 4-45.

[147] After a 2009 Regulatory Issue Summary found this interpretation to be in error, the Staff has used the concentrations set forth in 10 C.F.R. pt. 40, app. A, Table 5C as the secondary standard. Ex. NRC038, NRC Regulatory Issue Summary 2009-05, Uranium Recovery Policy Regarding: (1) the Process for Scheduling Licensing Reviews of Applications for New Uranium Recovery Facilities and (2) the Restoration of Groundwater at Licensed Uranium *In Situ* Recovery Facilities, at 3 (Apr. 29, 2009).

[148] Ex. SEI009A, FSEIS, § 4.5.1.3, at 4-45.

[149] *Id.* at 4-48. The state department of environmental quality determines the water quality standards. The Wyoming Department of Environmental Quality has standards for Class I (domestic use), Class II (agricultural use), or Class III (livestock use).

of certain hazardous constituents persisted after restoration, this did not change the class of use.[150] The FSEIS concludes that, given the relative success of past restorations, the impacts to groundwater quality in the exempted portion of the aquifer and the confined aquifers surrounding the exempted aquifer would be small following restoration at the Ross Project site.[151]

The Board found that the Staff's approach in the FSEIS, as supplemented by the record in this proceeding, "adequately identifies the potential impacts" of an alternate concentration limit, should one be necessary for the Ross project.[152] The Board found that the Staff's determination that impacts would be small was supported by the fact that the mined portion of the aquifer has been permanently exempted as a source of drinking water and "there have been no reported instances of an excursion from an [*in situ* uranium recovery] facility negatively impacting drinking water."[153] The Board concluded that the record supported the Staff's ultimate conclusion that the likely impact due to alternate concentration limits is small:

> [T]he FSEIS, as supplemented by the uranium bounding analysis discussed in this decision, adequately identified the potential environmental impacts of an [alternate concentration limit] should an [alternate concentration limit] be necessary for the Ross Project site. Furthermore, the preponderance of the evidence before the Board supports the FSEIS determination that the

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[150] *Id.*

[151] *Id.* The FSEIS explains that operations will be conducted within an area defined by an aquifer exemption permit granted by the Wyoming Department of Environmental Quality and approved by the Environmental Protection Agency. *See id.*, § 2.1.1.1, at 2-27; *see also* Ex. SEI0034, Letter from Derrith R. Watchman-Moore, U.S. Environmental Protection Agency, Region 8, to Kevin Frederick, Wyoming Department of Environmental Quality, aquifer exemption approval: Strata Energy (May 15, 2013). The area covered by the exemption permit is referred to as the exempted aquifer but is actually a portion of the mined (ore zone) aquifer.

[152] LBP-15-3, 81 NRC at 133. The FSEIS omitted the uranium concentration approved for two of the three sites discussed (Smith Ranch-Highland facility and Irigaray Mine Units 1-9). *See* Ex. SEI009A, FSEIS, § 4.5.1.3, at 4-46. But this information was provided in the Staff's testimony. *See* Ex. NRC001, Staff Initial Testimony, at 33; *see also* LBP-15-3, 81 NRC at 117.

[153] LBP-15-3, 81 NRC at 132.

> restoration-associated impacts on groundwater quality within the Ross Projects site [ore zone] aquifer and surrounding aquifers will be SMALL.[154]

b. Claims of Factual Error in Resolution of Contention 2

On appeal, Joint Intervenors argue that the Board made several errors in affirming the Staff's conclusion that the potential environmental impacts from alternate concentration limits would be small.[155] At bottom, these arguments amount to disagreements with how the Board weighed the evidence.

(1) CLAIM THAT BOARD RELIED ON EVIDENCE NOT IN THE RECORD

Joint Intervenors argue that the Board erred in relying on evidence that was not in the record—specifically, a "transport model" relating to the restoration approval for the Crow Butte Resources wellfield 1 in Nebraska (one of the examples used in the Staff's "bounding analysis" for the Ross Project).[156] As explained below, Joint Intervenors show no clear error in the Board's decision, nor do they raise a substantial question of prejudicial procedural error in the Board's decision not to require documentary evidence related to transport modeling at the Crow Butte site.

In Contention 2, Joint Intervenors claimed that the Staff will approve any number as an alternate concentration limit, provided the licensee first reasonably attempts to meet primary or secondary limits.[157]

At the hearing, the Staff denied that its practice is to set alternate concentration limits based on how much effort the licensee has expended. The Staff's witness, Dr. Johnson, stated

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[154] *Id.* at 133.

[155] Petition at 16-21.

[156] *Id.* at 16-17.

[157] *See e.g.*, Ex. JTI003-R, Pre-Filed Testimony of Dr. Lance Larson on Contentions 2 and 3, at 22 (Aug. 25, 2014) (Larson Direct Testimony).

that the Staff generally evaluates the "transport that would go on from the location within the [exempted] area out to that exempted boundary, the boundary of the exempted aquifer."[158] In other words, the Staff evaluates whether the contaminants would naturally attenuate to primary or secondary levels by the time the groundwater reaches the boundary of the exempted portion of the aquifer.[159] Joint Intervenors' expert requested to see the "transport model" used by the Staff for the Crow Butte site.[160] In response, Dr. Johnson replied that the documents supporting the Crow Butte license amendment approval had been included in the Staff's exhibits.[161] On appeal, Joint Intervenors argue that the Board erred because its conclusion rested in part on "a non-existent transport model."[162]

We find no Board error here; the Board appropriately relied on the Staff's and Strata's testimony in reaching its decision.[163] Contrary to Joint Intervenors' assertions, the Staff provided extensive documentation to support its use of the Crow Butte analysis to support its NEPA review here.[164] The Staff never claimed to have a document called a "transport model"

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[158] Tr. at 617 (Johnson); *see* LBP-15-3 at 121.

[159] *See* Tr. at 559-60, 617 (Johnson).

[160] *Id.* at 618 (Larson and Johnson).

[161] *Id.* at 618-19 (Larson and Johnson).

[162] Petition at 16-17 (citing LBP-15-3, 81 NRC at 121).

[163] *See* LBP-15-3, 81 NRC at 121 (citing Tr. at 617 (Johnson)). It is not error for a board to rely on witness testimony. *See, e.g., Oyster Creek*, CLI-09-7, 69 NRC at 268.

[164] Staff provided several documents supporting its approval of the Crow Butte restoration. *See, e.g.,* Ex. NRC022, Letter from Stephen P. Collings, Crow Butte Resources, Inc., to John Surmeier, NRC, Mine Unit 1 Restoration Report Submittal and Request for License Amendment (Jan. 14, 2000); Ex. NRC023, Letter from Stephen P. Collings, Crow Butte Resources, Inc., to Melvyn Leach, NRC, Mine Unit 1 Restoration; Response to Request For Additional Information (Aug. 24, 2001); Ex. NRC024, Letter from Michael L. Griffin, Crow Butte Resources, Inc. to Daniel M. Gillen, NRC, Mine Unit I Groundwater Stability Data (Oct. 11, 2002); Ex. NRC026, Crow Butte Wellfield 1 Approval.

on the record—the Board's discussion of the Staff's testimony, as cited by Joint Intervenors, refers to "transport modeling," not a "transport model."[165] While the Board certainly could have asked the parties to produce additional documentary evidence, it was not required to do so. The Staff's testimony regarding its practice when approving previous restorations provided a reasonable basis for determining how the Staff would address a request for an alternate concentration limit at the Ross Project site, and Joint Intervenors have not raised a substantial question regarding the Board's reliance on the Staff's practice here.

(2) CLAIM THAT BOARD MISINTERPRETED THE DATA CONCERNING RESTORATION APPROVAL OF SMITH RANCH-HIGHLAND SITE

Joint Intervenors next argue that the Board misinterpreted the evidence concerning the Smith Ranch-Highland facility, Wellfield A, the restoration of which the Staff approved in 2004.[166] Specifically, they argue that the Board mistakenly interpreted testimony of their expert Dr. Larson to refer to groundwater samples taken during the period when groundwater was still undergoing active restoration, when the data actually was gathered during the "stability" period (that is, after active restoration when the licensee was attempting to ascertain whether hazardous constituent concentrations had stabilized).[167]

Joint Intervenors' argument points to no material error. The Board found that Dr. Larson's data was not relevant because it reflected site conditions prior to the time the Staff approved the restoration.[168] The focus of Contention 2 was the reasonable range of alternate

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[165] Petition at 16 (quoting LBP-15-3, 81 NRC at 121). Moreover, the term "transport modeling" was not used by the Staff expert in discussing the Staff's work with the Board—the Board introduced the term to refer to the Staff's work as part of the discussion in LBP-15-3. *See* LBP-15-3, 81 NRC at 121.

[166] Petition at 17-18.

[167] *Id.* (citing Ex. JTI005A-R2, NRC ISL Database Spreadsheets, at 227-32).

[168] LBP-15-3, 81 NRC at 123-24.

concentration limits that might be approved at the Ross Project site *after* its restoration is approved. Regardless of whether Dr. Larson's data came from the restoration period or the stability period, its relevance to Contention 2 is minimal because only the concentrations that the Staff actually approved for restoration matter to the bounding analysis.[169]

(3) CLAIM THAT BOARD IGNORED EVIDENCE OF EXCURSIONS

Joint Intervenors next argue that the Board "dismissed evidence of mining fluid excursions impacting water in vertically or horizontally adjacent aquifers outside the exempted areas."[170] Joint Intervenors cite four paragraphs of the Board's decision to support their claims, and they are correct that the Board does not discuss vertical or horizontal excursions in those four paragraphs.[171]

The evidence that Joint Intervenors cite, however, relates to excursions at sites for which restoration had not been approved.[172] Joint Intervenors do not explain how vertical or horizontal excursions at these sites are relevant to Contention 2, which concerns elevated hazardous constituent levels that may linger on the site after restoration has been approved.

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[169] Joint Intervenors also argue that the Board confused Staff testimony concerning a different site with the evidence concerning Smith Ranch-Highland Wellfield A. Petition at 18. This is incorrect. The Board simply pointed to the Staff's discussion of the other site to show that it is inappropriate to average the results of samples taken during restoration because only the concentrations at the end of the restoration process (at the point of Staff approval) are relevant to the question of what concentrations the Staff might approve at the Ross Project site. *See* LBP-15-3, 81 NRC at 123-24.

[170] *See* Petition at 18-19.

[171] *Id.* at 18 (citing ¶¶ 4.98-4.101, LBP-15-3, 81 NRC at 126-28).

[172] *See* Ex. JTI036, 2012 Status Update Casing Leak Investigation C, E, and F Wellfields Smith Ranch-Highland Operations, at 59-85 (Feb. 20, 1013). Joint Intervenors' Petition also refers to pages 61-62 of Ex. JTI005B-R2, which is only 35 pages long. *See* Petition at 19 n.21. We observe that most of the pages of this exhibit discuss a project (Willow Creek/Christensen Ranch) that the Board found not to be relevant to Contention 2 because site restoration has not been approved. *See* LBP-15-3, 81 NRC at 126-27. The exhibit also discusses shallow aquifer contamination at Smith Highland Ranch due to excursions during operations, but that issue is likewise not relevant to Contention 2.

On appeal, Joint Intervenors do not cite any testimony or pleading to support their claim that excursions during operations or restoration relate to Contention 2. We do not consider cursory, unexplained legal arguments, and we will not speculate about what a pleading is supposed to mean.[173] Therefore, Joint Intervenors have not identified a Board error that would warrant granting their petition for review.

(4) CLAIM THAT BOARD UNJUSTIFIABLY RELIED ON EXEMPTION AND ON FUTURE PROCESSES TO PROTECT THE AQUIFER

Joint Intervenors also argue that the Board erred in relying on the aquifer exemption granted by Wyoming and the license amendment process as additional support for upholding the Staff's conclusion that impacts from alternate concentration limits will be small.[174]

We find that Joint Intervenors have not raised a substantial question with respect to the Board's findings. As an initial matter, the fact that the mined portion of the aquifer is permanently exempted as a source of drinking water and the possibility of a future hearing on an alternate concentration limit were only two factors the Board discussed in concluding that the FSEIS discussion of post restoration impacts was reasonable. Moreover, contrary to Joint Intervenors' suggestion, these factors support the FSEIS's conclusion that any elevated hazardous constituent levels left at the Ross Site following restoration would have a small overall environmental impact.

Our regulations and license amendment process require that no alternate concentration limit be approved without meeting safety criteria, regardless of whether any intervenor has

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[173] *See, e.g.*, *Entergy Nuclear Vermont Yankee, LLC and Entergy Nuclear Operations, Inc.* (Vermont Yankee Nuclear Power Plant), CLI-10-17, 72 NRC 1, 30 (2010); *Commonwealth Edison Co.* (Zion Nuclear Power Station, Units 1 and 2), CLI-99-4, 49 NRC 185, 194 (1999) (quoting *Kansas Gas and Electric Co.* (ALAB-279, 1 NRC 559, 576 (1975)).

[174] Petition at 19-20.

contested the matter.[175] If a licensee fails to show that a proposed alternate concentration limit meets the standards of Criterion 5B(6), then it will have to restore to primary or secondary limits.[176] Moreover, Joint Intervenors and any other interested party will have the opportunity to submit contentions and request a hearing on any future license amendment related to alternate concentration limits, should such an amendment become necessary for this site.

Joint Intervenors' argue that because the future concentration limits are unknown, the Staff cannot show that it meets NEPA now and that the Staff did not provide sufficient information to support its finding that the environmental impacts will be small.[177] However, Joint Intervenors have not pointed to any specific matter where the Board refused to consider their arguments and supporting evidence. It was appropriate for the Board to rely on the testimony from the Staff's experts describing how the Staff reviews secondary concentration limits in license amendment applications. And the Board also modified a license condition in response to Joint Intervenors' concerns that unplugged exploratory wells (or boreholes) existing on the site could cause vertical excursions during operations.[178] The Board's narrowly tailored relief appropriately addresses the concerns raised by Joint Intervenors.

In sum, Joint Intervenors have not identified clear error in the Board's factual findings relating to post-restoration contamination levels in the mined aquifers. None of their arguments call into question the Board's judgment that the FSEIS, as supplemented by the hearing record,

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[175] *See generally*, 10 C.F.R. pt. 40, app. A, Criterion 5B(5).

[176] *See* Ex. SEI015, License, at 7-8 (License Condition 10.6).

[177] *See* Petition at 19-20.

[178] *See* LBP-15-3, 81 NRC at 143-44. The Board modified License Condition 10.2, which requires the licensee to locate and properly abandon historic exploratory wells or boreholes that may exist on the site. The Board expanded the reach of the License Condition to include wells outside the perimeter monitoring ring and downgradient of the wellfield. *Id.*

reasonably concluded that the impact of hazardous constituents persisting in the aquifer after restoration would be small.

c. Claims of Legal Error in Resolution of Contention 2

Joint Intervenors raise one legal argument with respect to Contention 2: that the Staff's issuance of the license prior to the hearing and Board decision violates NEPA.[179] They argue that if the hearing record and Board decision are necessary to complete, or even correct, the environmental record, then the license must be vacated and remanded to the Staff so that it may consider the complete NEPA analysis prior to deciding whether to issue the license.[180] To support their claim, Joint Intervenors point to the Board's agreement with their concern that Staff's analysis was flawed in some respects.[181] Joint Intervenors argue that the Board simply "declar[ed] these violations cured" by its decision, violating the "fundamental NEPA precepts that data may not be utilized simply to 'justify[ ] decisions already made.'"[182]

Joint Intervenors fail to raise a substantial question for our review because the Board found the Staff's environmental impact determinations to be well-founded. Our adjudicatory proceedings, as we recently discussed in *Crow Butte Resources, Inc.*, contemplate that a Board or the Commission may appropriately modify, condition, or revoke a license, if required by the circumstances of a particular proceeding.[183] Here, the Board evaluated the Staff's analysis and determined that, with the additional information considered at the hearing and in the Staff's pre-filed testimony, the environmental impacts of the proposed licensing action were appropriately

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[179] Petition at 14-16.

[180] *Id.* at 14-15.

[181] *Id.* at 14 (citing LBP-15-3, 81 NRC at 122, 124-26).

[182] *Id.* at 15 (citing 40 C.F.R. § 1502.2(g)).

[183] *Crow Butte Resources, Inc.* (*In Situ* Leach Facility, Crawford, Nebraska), CLI-15-17, 82 NRC 33, 40 (2015).

identified.[184] And, after identifying several gaps in the Staff's analysis, the Board determined that modifying a license condition was the appropriate approach to address Joint Intervenors' concerns about groundwater protection.[185] While we agree with Joint Intervenors that remanding, or staying, the license would have been appropriate had the Board determined that the Staff's analysis did not adequately consider the environmental consequences of this licensing action, there is no need for such action here. Here the Board's modification of the environmental record of decision did not change, in any material aspect, the Staff's ultimate determination that impacts to groundwater in the OZ aquifer and surrounding aquifers would be SMALL. Instead, the Board merely modified the record of decision to include a revised license condition and additional analyses that were placed on the record before the Board by various parties.[186] We have previously held that a Board's hearing, hearing record, and subsequent decision on a contested environmental matter augment the environmental record of decision developed by the Staff with respect to this issue[187] and Joint Intervenors have not persuaded us to abandon this practice. Not only have Joint Intervenors failed to demonstrate Board error in reaching this decision, but we find that the environmental record of decision, as modified by the Board supports the issuance of a license to Strata.[188]

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[184] *See* LBP-15-3, 81 NRC at 133.

[185] *Id.* at 143-44.

[186] *Indian Point*, CLI-15-6, 81 NRC at 387-88 ("When a hearing is held on a proposed action, 'the initial decision of the presiding officer or the final decision of the Commissioners acting as a collegial body will constitute the record of decision.' ...We have consistently interpreted our regulations to provide that environmental impact statements are modified by any subsequent Board or Commission decision."); *see Hydro Resources, Inc.* (P.O. Box 15910, Rio Rancho, NM 87174), CLI-01-4, 53 NRC 31, 53 (2001).

[187] *Indian Point*, CLI-15-6, 81 NRC at 388.

[188] It is well settled that parties challenging an agency's NEPA process are not entitled to relief unless they demonstrate harm or prejudice. Joint Intervenors have not done so here because the Board concluded that the Staff's analysis of the reasonably foreseeable impacts from

Therefore, we decline to take review of the Board's legal and factual rulings with respect to Contention 2.

3. Contention 3

In Contention 3, Joint Intervenors argued that Strata and the Staff failed to demonstrate that the mined aquifer is isolated and that Strata can prevent fluid migration outside the production zone during operations:

> CONTENTION: The FSEIS fails to assess [adequately] the likelihood and impacts of fluid migration to the adjacent groundwater, as required by 10 C.F.R. §§ 51.90-94 and NEPA, and as discussed in NUREG-1569 § 2.7, in that:
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> 1. The FSEIS fails to analyze sufficiently the potential for and impacts associated with fluid migration associated with unplugged exploratory boreholes, including the adequacy of applicant's plans to mitigate possible borehole-related migration impacts by monitoring wellfields surrounding the boreholes and/or plugging the boreholes.
>
> 2. There was insufficient information for the NRC staff to make an informed fluid migration impact assessment given that the applicant's six monitor-well clusters and the 24-hour pump tests at four of these clusters provided insufficient hydrological information to demonstrate satisfactory groundwater control during planned high-yield industrial well operations.[189]

All of Joint Intervenors' challenges to the Board's decision on Contention 3 relate to how the Board weighed the evidence. Based upon our review of the record, we find that none of Joint Intervenors' arguments raise a substantial question with respect to the Board's factual findings.

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alternate concentration limits was fundamentally correct. *Nw. Coal. for Alts. to Pesticides (NCAP)* v. *Lyng.* 844 F.2d 588, 594 (9th Cir. 1988).

[189] *See* FSEIS Order, app. A, at 1; *see also* Ex. JTI003-R, Larson Direct Testimony, at 49-51, 54-61; Ex. JTI001-R, Abitz Direct Testimony, at 45-49.

a. Historic Boreholes

There are nearly 1500 historic exploratory boreholes on the site, most of which have not been properly abandoned (plugged) and over 100 of which have not yet been located.[190] As the Board observed, the FSEIS acknowledges that boreholes that have not been properly abandoned could cause vertical excursions—leaks to overlying or underlying aquifers—and that vertical excursions are more difficult to recover than horizontal excursions.[191]

On appeal, Joint Intervenors argue that the Board relied too heavily on a license condition requiring the licensee to "attempt to locate and abandon" the boreholes within the perimeter of each wellfield, a provision they argue is essentially unenforceable.[192] Joint Intervenors argue that Strata's witness acknowledged at hearing that it may not be able to fill all the boreholes, and that the Staff witness stated that the Staff would be "powerless to act" unless it can show that Strata's violation was "willful."[193]

As an initial matter, Joint Intervenors' petition mischaracterizes the hearing testimony. Contrary to Joint Intervenors' arguments, Strata's witness stated that Strata might not be able to locate every borehole prior to performing the pre-operational pump test, but that the boreholes "should show up in that pump test."[194] In addition, our enforcement process does not require

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[190] LBP-15-3, 81 NRC at 137 (citing Tr. at 679-80 (Knode)).

[191] *Id.* (citing FSEIS, § 4.5.1.2, at 4-37).

[192] Petition at 22. Joint Intervenors refer to License Condition 10.12, which the Board modified to include boreholes outside the perimeter well ring if the wells extend into the first underlying aquifer and are downgradient of the Wellfield. The modified condition requires the licensee to fill boreholes from the perimeter monitoring ring to the closer of the Ross Project license area boundary or the outer boundary of the exempted aquifer. *See* LBP-15-3, 81 NRC at 143-44. The licensee has requested an amendment to this condition, which is subject to a separate opportunity to request a hearing. *See supra*, note 31.

[193] Petition at 22.

[194] Tr. at 766 (Griffin); *see also* Ex. NRC001, Staff Initial Testimony, at 49 ("The Staff determined that after performing hydrologic tests to demonstrate confinement of the ore aquifer and routine

that a violation be "willful" for the Staff to take enforcement action.[195] The NRC has a well-developed enforcement process that considers both willful and non-willful violations by NRC licensees and applicants.[196] A licensee's failure to correct a violation once identified could result in a notice of violation.[197]

We find that the Board appropriately considered Joint Intervenors' evidence and arguments with respect to boreholes. The Board found that the license condition requiring Strata to "attempt" to locate the boreholes was sufficient because the NRC does not assume that a licensee will ignore its obligations and other license conditions will help to assure Strata's compliance.[198] In its decision, the Board discussed License Condition 10.13, which requires Strata to conduct additional pumping tests to ensure isolation of the aquifers prior to beginning production of a wellfield; and License Condition 11.5, which requires Strata to immediately cease operations if a vertical excursion is detected.[199] The Board found that these license conditions provide additional incentive for Strata to locate and abandon the boreholes.[200] Moreover, License Condition 10.12 requires Strata to "document its efforts" to find and fill the

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excursion monitoring, a drill hole not abandoned would be detected and proper corrective actions would be undertaken.")

[195] At the hearing, both Staff's witness and Staff's counsel acknowledged that the witness was not qualified to testify regarding the specifics of the NRC's enforcement process. *See* Tr. at 765 (Mr. Saxton) ("I don't know the exact procedure"); *id.* at 766 (Ms. Monteith) ("I don't believe that our witnesses are qualified to testify to the enforcement process.").

[196] *See, e.g.*, "Nuclear Regulatory Commission Enforcement Manual," Rev. 9, (Dec. 2015) (ML102630150).

[197] *See* Nuclear Regulatory Commission Enforcement Manual, Rev. 9 (2013) (updated Sept. 8, 2015), § 2.2.3, at 100-01.

[198] LBP-15-3, 81 NRC 140-41 (citing *GPU Nuclear, Inc.* (Oyster Creek Nuclear Generating Station), CLI-00-6, 51 NRC 193, 207 (2000)).

[199] LBP-15-3, 81 NRC at 141 (citing Ex. SEI015, License, at 9, 13).

[200] *Id.* at 140 (citing Ex. SEI015, License, at 13-14).

boreholes, enabling Staff to assess whether Strata's efforts were in good faith.[201] Given that the Board considered the contrary evidence and explained its reasoning, the Board's conclusion that these factors, taken together, will ensure the licensee's compliance with the requirement to find and plug historic boreholes was reasonable.

b. Pumping Tests

Next, Joint Intervenors argue that the Board disregarded evidence that chemical analyses of the groundwater following Strata's prelicensing pumping tests indicate that the aquifer is not confined.[202] As the Board explained, Strata performed an aquifer test—or pumping test—in each monitoring well cluster to confirm that the ore zone aquifer was confined. According to the prefiled testimony of Strata's witness, Ray Moores, this test involves pumping the well installed in the ore zone aquifer at a constant rate.[203] Pressure transducers installed in the wells in the ore zone, the overlying aquifer, and the underlying aquifer measure and record the water level in each well on one minute intervals.[204] According to Mr. Moores, "by evaluating responses, or lack thereof, recorded in the [overlying and underlying aquifer] wells it was also possible to measure the integrity of the confining intervals above and below the [ore zone] aquifer."[205] Mr. Moores stated that the transducers were sufficiently sensitive to detect "a leaky aquifer even over short pumping durations."[206] He acknowledged that the pumping tests can

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[201] *See* Ex. SEI015, License, at 9.

[202] Petition at 23.

[203] Ex. SEI042, Initial Written Testimony of Ray Moores, at 5 (Aug. 25, 2014) (Moores Testimony); *see also* LBP-15-3, 81 NRC at 144-46.

[204] Ex. SEI042, Moores Testimony at 5. The tests were used to evaluate a variety of ore zone characteristics as well as confirming confinement. *Id.*

[205] *Id.*

[206] *Id.* at 6.

only demonstrate confinement over the immediate area, not the entire Ross Project area.[207] For this reason, License Condition 10.13 requires additional tests prior to opening each wellfield.[208]

According to the prefiled testimony of Joint Intervenors' expert Dr. Abitz, changes in the levels of sodium and sulfate in the water from the ore zone aquifer following the tests indicate that water from the ore zone aquifer had been diluted with water from the overlaying aquifer, which has naturally lower levels of these chemicals.[209] The Board, however, found that Dr. Abitz's interpretation was "mere speculation," and it concluded that the "better explanation" for the variable levels of these constituents was the natural differences in the minerals within the ore zone.[210]

In challenging the Board's decision, Joint Intervenors claim that the Board's conclusion inherently contradicts its conclusion with respect to Contention 1, wherein the Board found that the site had been adequately characterized through its prelicensing monitoring program.[211] Joint Intervenors argue that "if the results of groundwater tests in the [ore zone] will 'vary considerably' depending on the mineral content where they are located then [Strata] and Staff failed to demonstrate that the limited groundwater data collected meaningfully characterized the baseline."[212]

We do not see any inherent contradiction between the Board's findings on Contentions 1 and 3. The FSEIS does not state that water quality is consistent throughout each aquifer—the

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[207] *Id.*

[208] *See* Ex. SEI015, License, at 9.

[209] Ex. JTI001-R, Abitz Direct Testimony, at 49-50.

[210] LBP-15-3, 81 NRC at 147.

[211] Petition at 23.

[212] *Id.*

groundwater monitoring data in Appendix C shows that the concentrations of the constituents tested vary between the wells.[213] At most, the pumping test results show that the picture of the Ross Project site groundwater could be painted with a finer brush—it does not show that more data is necessary to characterize the site and evaluate the environmental impacts of the proposed project. The Board's factual finding resolved two competing technical opinions, which is a matter where the Commission ordinarily defers to the Board's judgment.[214] Based upon our review of the record, we conclude that the Board's interpretation of the pumping test results is reasonable and that Joint Intervenors have failed to identify a clear factual error on the Board's part.

c. Selection of Excursion Indicators (Excursion Monitoring Parameters)

Joint Intervenors also argue that the Board erred in declining to require Strata to use uranium as an excursion indicator—one of the characteristics specifically monitored at the perimeter of a wellfield to ensure that mining fluids have not escaped the area of operation.[215] Specifically, Joint Intervenors argue that the Board recognized that there is "uncertainty" about the movement of uranium in groundwater, and that it was therefore "error for the Board to conclude that the Staff had appropriately found the impacts from excursions will be small based on excursion parameters that will *not include monitoring for uranium*."[216] Further, Joint Intervenors argue that the Board erroneously shifted the burden to Joint Intervenors to show

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[213] *See* Ex. SEI09B, FSEIS, app. C.

[214] *See, e.g.*, *Oyster Creek*, CLI-09-7, 69 NRC at 264; *Louisiana Energy Services, L.P.* (National Enrichment Facility), CLI-05-28, 62 NRC 721, 723 (2005).

[215] Petition at 24.

[216] *Id.*

that uranium should be used, rather than requiring the Staff and Strata to show why it should not.[217]

Joint Intervenors miss the Board's point with respect to the excursion indicators. As the Board noted, the FSEIS explains that most *in situ* uranium recovery facilities will use chloride, conductivity, and total alkalinity because "[t]hese constituents move through the aquifer faster than other water-quality parameters."[218] In other words, the excursion indicators are selected because they will provide the earliest warning of a problem, not because they are the chemicals of most concern in groundwater protection. The Board agreed with Staff that the "uncertainly" surrounding the behavior of uranium in various chemical environments (that is, whether it will be adsorbed or remain in solution) is a reason not to use uranium as an excursion indicator.[219] The Board, after weighing the parties' evidence, concluded that

> the case for using uranium as an excursion indicator for the Ross Project [was] not compelling, particularly given Joint Intervenors' failure to present any convincing site-specific evidence to counter the Staff['s] and [Strata's] showings that chloride and the other

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[217] *Id.*

[218] *See* LBP-15-3, 81 NRC 148 n.73. At least three excursion indicators must be used at each wellfield, and the FSEIS explains why chloride, conductivity, and alkalinity are usually selected:

> [C]hloride is selected because it does not interact strongly with the minerals in the ore zone; it is easily measured; and chloride concentrations are significantly increased during ISR operations. Conductivity, which is correlated to total dissolved solids (TDS), is also considered a good excursion indicator because of the high concentrations of dissolved constituents in the lixiviant as compared to the surrounding aquifers. . . . Total alkalinity (carbonate plus bicarbonate plus hydroxide) is used as an indicator in wellfields where sodium bicarbonate or carbon dioxide is used in the lixiviant.

Ex. SEI009A, FSEIS, § 2.1.1.2, at 2-31; *see also* Ex. NRC001, Staff Testimony, at 72-73. Strata's license provides that sulfate will be used as the default excursion indicator in lieu of chloride only in the aquifer underlying the ore zone aquifer, because of the naturally high chloride in that aquifer. *See* Ex. SEI015, License, at 13 (License Condition 11.4).

[219] LBP-15-3, 81 NRC at 149-50.

> indicators proposed for use by [Strata] and accepted by the Staff would be effective excursion indicators at Ross.[220]

Joint Intervenors' petition does not point to any evidence that demonstrates factual error in the Board's finding that "uranium is not as effective a tool for providing a timely alert regarding a lixiviant excursion."[221] Although Joint Intervenors claim generally that Drs. Abitz and Larson demonstrated that "uranium may move through the aquifer more quickly than chloride and the other excursion indicator constituents," they cite nothing for that proposition.[222] In fact, Dr. Abitz's testimony, which the Board discussed, argues that uranium would be a good indicator because the "levels of uranium in the lixiviant are generally three to four orders of magnitude greater than true baseline; and increases in chloride, alkalinity and [total dissolved solids] in the aquifer will be less than one or two orders of magnitude."[223] But, at most, this testimony would show that if uranium is present, it might be easier to detect than the selected excursion indicators—not that it would be detected earlier than the indicators Strata plans to monitor.

In addition, we do not find that the Board improperly shifted the burden of proof. The Board discussed the parties' prefiled and hearing testimony with respect to this issue, and it appropriately considered the various parties' positions—it simply found the Staff's and Strata's positions more persuasive.[224] Joint Intervenors have not provided any basis for us to review the Board's factual findings with respect to the excursion indicators.

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[220] *Id.* at 150.

[221] *Id.*

[222] Petition at 7, 24.

[223] LBP-15-3, 81 NRC at 149 n.76 (quoting Ex. JTI001-R, Abitz Direct Testimony, at 43).

[224] *See id.* at 148-50.

d. Evidence of Excursions at Other Sites

Finally, Joint Intervenors argue that the Board "discounted" evidence of excursions at other *in situ* uranium recovery sites because of the aquifer exemption.[225] They argue that regardless of the exemption, the aquifer is still part of the "affected environment, impacts to which must be disclosed and considered in the FSEIS."[226]

We do not find that the Board disregarded the evidence. The Board's conclusion relied on the licensee's ability to detect and recover excursions (in addition to the fact that the aquifer is exempted from human consumption) to conclude that the potential environmental impacts from operations is small.[227] In addition, the FSEIS discusses the possibility of excursions and describes recovery measures that are imposed by License Condition 11.5.[228] Joint Intervenors have not shown either that the Board erred in its findings of fact or that the FSEIS failed to consider all potential environmental impacts from the proposed facility.

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[225] Petition at 24-25 (citing LBP-15-3, 81 NRC at 150-52).

[226] *Id.* at 25.

[227] LBP-15-3, 81 NRC at 151.

[228] *See* Ex. SEI009A, FSEIS, § 4.5.1.2, at 4-41 to 4-43.

III. CONCLUSION

For the foregoing reasons, we *deny* the petition for review.

IT IS SO ORDERED.

For the Commission

NRC SEAL

/RA/

Annette L. Vietti-Cook
Secretary of the Commission

Dated at Rockville, Maryland,
this 29th day of June, 2016

Commissioner Baran, Concurring in Part and Dissenting in Part

I concur in part with and dissent in part from the Commission's decision.

I join the majority in the decision except for the subsection that denies review of the Joint Intervenors' claim that the Board erred in resolving Contention 2 by allowing its Initial Decision to supplement the Final Supplemental Environmental Impact Statement (FSEIS) after issuance of the license. I respectfully dissent from this portion of the decision. I would grant review of this claim and order the Staff to cure the deficiency in its environmental analysis.

With respect to Contention 2, Joint Intervenors contend that the Staff's issuance of the license prior to the hearing and Board decision violates NEPA.[1] They argue that if the hearing record and Board decision are necessary to complete or correct the environmental record, then the license must be vacated and remanded to the Staff so that it may consider the complete NEPA analysis prior to deciding whether to issue the license.[2] In response to the Joint Intervenors' claims regarding the need to suspend the license, the Board found that there was not yet a final agency action because the "agency's NEPA record of decision remains open, and is subject to adjudicatory supplementation relative to matters associated with any pending admitted NEPA contention, at least until the hearing record is closed and the final agency adjudicatory decision is issued."[3] To support their claim on appeal, Joint Intervenors point to the Board's agreement with their concern that Staff's environmental analysis was flawed in some respects.[4] Joint Intervenors argue that the Board simply "declar[ed] these violations cured" by

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[1] *Natural Resources Defense Council's & Powder River Basin Resource Council's Petition for Review of Atomic Safety and Licensing Board's January 23, 2015 Initial Decision Denying Environmental Contentions 1 Through 3, and Interlocutory Decisions Denying Environmental Contentions 4/5A and 6/7* (Feb. 17, 2015), at 14-16 (Petition).

[2] *Id.* at 14-15.

[3] LBP-15-3, 81 NRC 65, 122 n.49 (2015).

[4] Petition at 14 (citing LBP-15-3, 81 NRC at 122, 124-26).

its decision, "violat[ing] the fundamental NEPA precepts that data may not be utilized simply to 'justify[ ] decisions already made.'"[5] I believe that the Joint Intervenors raise a substantial question for our review.

The Staff's practice in materials cases is to issue a license before the completion of contested hearings on environmental matters. Section 2.1202(a) provides:

> During the pendency of any hearing under this subpart, consistent with the NRC staff's findings in its review of the application or matter which is the subject of the hearing and as authorized by law, the NRC Staff is expected to promptly issue its approval or denial of the application....[6]

It appears that the Staff reads this regulatory provision to require it to issue a license when it completes its safety review and issues the Final Environmental Impact Statement. However, in the adjudicatory context, the Commission has held that its decisions and Licensing Board decisions can supplement[7] the NEPA analysis to correct deficiencies in such an analysis.[8] Allowing adjudicatory decisions to supplement the NEPA analysis means that, where there are contested environmental matters, the NEPA process is not complete until any admitted environmental contentions are resolved. Thus, the Staff's current practice, in some instances, conflicts with a core requirement of NEPA—that the decisionmaker consider all environmental impacts of an action *before* making a decision.[9]

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[5] *Id.* at 15 (emphasis omitted) (quoting 40 C.F.R. § 1502.2(g)).

[6] 10 C.F.R. § 2.1202(a).

[7] Here, I am using the term "supplement" as it is used in the Commission case law, not as it is used in 10 C.F.R. § 51.92.

[8] *See, e.g.*, *Entergy Nuclear Operations, Inc.* (Indian Point, Units 2 and 3), CLI-15-6, 81 NRC 340, 387-88 (2015).

[9] Petition at 15 (citing *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 349 (1989)).

In my view, this conflict requires the Commission to clarify its supplementation doctrine to account for situations like this one. Several options are available to avoid this conflict. For example, the Staff could wait until the end of the hearing process on contested environmental contentions prior to issuing a license. In this circumstance, a Board or Commission decision could revise the NEPA analysis prior to the issuance of the license, which would ensure that the decisionmaker considers the complete NEPA analysis prior to the completion of the federal action. Alternatively, if the Staff issues a license upon completion of its environmental review but before the completion of any hearing challenging that review, then a subsequent Board or Commission decision finding a flaw in the NEPA analysis or process may require the suspension or vacatur of the license pending Staff action to cure the NEPA deficiency. In these circumstances, the adjudicatory decision or proceedings cannot supplement the NEPA environmental document or Record of Decision after the fact because the licensing action has already been taken in reliance on the NEPA analysis.

Here, the license has already been issued and the Board found aspects of the FSEIS to be deficient. The Board evaluated the Staff's environmental analysis and determined that, only with the additional information considered at the hearing, were the environmental impacts of the proposed licensing action appropriately identified.[10] Because the Board found a deficiency in the NEPA analysis, the agency did not have an adequate environmental analysis at the time it decided whether to issue the license. Thus, the Staff's decision to issue the license was not informed by an adequate NEPA analysis.

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[10] *See* LBP-15-3, 81 NRC at 133.

In federal court, a violation of NEPA, by itself, is not always sufficient to justify suspending or revoking the license.[11] However, the Commission has a responsibility to ensure that the Staff complies with NEPA. The agency should not undermine NEPA's core requirement of fully informed decisionmaking by failing to grapple with the problem of pairing a regulation that allows a materials license to be issued prior to adjudicatory hearings with an adjudicatory doctrine that permits the NEPA environmental review to be supplemented by adjudications completed after issuance of the license. We should not endorse a practice that would likely result in future after-the-fact supplementation of the NEPA analysis. Therefore, I would order the Staff to revise the Record of Decision in this case to include all relevant information, including the change to the license condition made by the Board and the additional information the Board found necessary to supplement the FSEIS in response to Contention 2, so that the Director of the Office of Nuclear Materials Safety and Safeguards could make a fully informed decision on whether to reaffirm, modify, condition, or revoke the license. If the Staff did not revise the Record of Decision and make a decision on whether to reaffirm, modify, condition, or revoke the license within 30 days, then I would order the Staff to suspend the license until such steps are taken.

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[11] *See Monsanto Co. v. Geertson Seed Farms*, 561 U.S. 139, 157-58 (2010) (injunction not automatic or default remedy to cure NEPA violation); *Nw. Coal. for Alts. to Pesticides v. Lyng*, 844 F.2d 588, 595 (9th Cir. 1988); *Cty. of Del Norte v. United States*, 732 F.2d 1462, 1467 (9th Cir. 1984); *Cent. Delta Water Agency v. U.S. Fish & Wildlife Serv.*, 653 F. Supp. 2d 1066, 1086-87 (E.D. Cal. 2009); *Muhly v. Espy*, 877 F. Supp. 294, 300 (W.D. Va. 1995).