

**NUCLEAR REGULATORY COMMISSION  
ISSUANCES**

**OPINIONS AND DECISIONS OF THE  
NUCLEAR REGULATORY COMMISSION  
WITH SELECTED ORDERS**

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July 1, 2016 – December 31, 2016

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## PREFACE

This is the eighty-fourth volume of issuances (1–452) of the Nuclear Regulatory Commission and its Atomic Safety and Licensing Boards, Administrative Law Judges, and Office Directors. It covers the period from July 1, 2016, to December 31, 2016.

Atomic Safety and Licensing Boards are authorized by Section 191 of the Atomic Energy Act of 1954. These Boards, comprised of three members, conduct adjudicatory hearings on applications to construct and operate nuclear power plants and related facilities and issue initial decisions which, subject to internal review and appellate procedures, become the final Commission action with respect to those applications. Boards are drawn from the Atomic Safety and Licensing Board Panel, comprised of lawyers, nuclear physicists and engineers, environmentalists, chemists, and economists. The Atomic Energy Commission (AEC) first established Licensing Boards in 1962 and the Panel in 1967.

Between 1969 and 1990, the AEC authorized Atomic Safety and Licensing Appeal Boards to exercise the authority and perform the review functions which would otherwise have been exercised and performed by the Commission in facility licensing proceedings. In 1972, that Commission created an Appeal Panel, from which were drawn the Appeal Boards assigned to each licensing proceeding. The functions performed by both Appeal Boards and Licensing Boards were transferred from the AEC to the Nuclear Regulatory Commission by the Energy Reorganization Act of 1974. Appeal Boards represented the final level in the administrative adjudicatory process to which parties could appeal. Parties, however, were permitted to seek discretionary Commission review of certain board rulings. The Commission also could decide to review, on its own motion, various decisions or actions of Appeal Boards.

On June 29, 1990, however, the Commission voted to abolish the Atomic Safety and Licensing Appeal Panel, and the Panel ceased to exist as of June 30, 1991. Since then, the Commission itself reviews Licensing Board and other adjudicatory decisions, as a matter of discretion. *See* 56 FR 29403 (1991).

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Issuances are referred to as follows: Commission (CLI), Atomic Safety and Licensing Boards (LBP), Administrative Law Judges (ALJ), Directors' Decisions (DD), and Decisions on Petitions for Rulemaking (DPRM).

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UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

OFFICE OF NUCLEAR REACTOR REGULATION

William M. Dean, Director

In the Matter of

Docket No. 50-389  
(License No. NPF-16)

FLORIDA POWER & LIGHT  
COMPANY  
(St. Lucie Nuclear Power Plant,  
Unit 2)

July 8, 2016

By petition dated March 10, 2014, Southern Alliance for Clean Energy (SACE or the Petitioner) requested a hearing on what the Petitioner characterized as a *de facto* license amendment for the replacement of the steam generators (SGs) in 2007 at the St. Lucie Plant, Unit No. 2 (SL-2), under Title 10 of the *Code of Federal Regulations* (10 C.F.R.), section 50.59, "Changes, tests and experiments." SACE requested that the U.S. Nuclear Regulatory Commission (NRC or the Commission) revoke the *de facto* license amendment and stay the restart of SL-2 from the March 3, 2014 refueling outage pending resolution of the hearing request. As the basis for this request, the Petitioner stated that Florida Power & Light Company (the Licensee) misapplied 10 C.F.R. § 50.59 and that the SG replacement should have required a license amendment.

The Commission denied SACE's hearing request, concluded that the NRC did not issue the Licensee a *de facto* license amendment and referred SACE's safety concerns regarding the replacement SGs at SL-2 to the NRC Staff for disposition under 10 C.F.R. § 2.206, "Requests for action under this subpart." The portion of the petition that the NRC accepted for review under the 10 C.F.R. § 2.206 process addresses the Licensee's application of 10 C.F.R. § 50.59 with respect to the change in a methodology for evaluating SGs, as described in the updated final safety analysis report (UFSAR). The NRC Staff also evaluated whether the Licensee properly applied 10 C.F.R. § 50.59 when it changed the structural analysis codes as described in the UFSAR.

In this Director's Decision, dated July 8, 2016, the Director of the Office of Nuclear Reactor Regulation denied the Petitioner's request. NRC inspectors identified the two issues related to the petition: (1) a failure to verify the adequacy of the SL-2 replacement SGs tube-to-tubesheet weld design, and (2) an inadequate 10 C.F.R. § 50.59 evaluation for the SL-2 SG tube-to-tubesheet welds. The inspectors determined that the first issue was a noncited violation of quality assurance requirements for design control in 10 C.F.R. Part 50, "Domestic Licensing of Production and Utilization Facilities," Appendix B, "Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants," Criterion III, "Design Control," while the second issue was a minor violation of 10 C.F.R. § 50.59. The Licensee has implemented corrective actions to address the violations.

In accordance with the NRC Enforcement Policy, noncited and minor violations are not subject to enforcement action. Therefore, the NRC does not have a basis for expanding its current level of regulatory oversight in accordance with the agency's Reactor Oversight Process and the Enforcement Policy, or otherwise taking the Petitioner's requested enforcement actions against the Licensee.

## **DIRECTOR'S DECISION UNDER 10 C.F.R. § 2.206**

### **I. INTRODUCTION**

By petition dated March 10, 2014 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML14071A431), as supplemented,<sup>1</sup> Southern Alliance for Clean Energy (SACE or the Petitioner) requested a hearing on what the Petitioner characterized as a *de facto* license amendment for the replacement of the steam generators (SGs) in 2007 at the St. Lucie Plant, Unit No. 2 (SL-2), under Title 10 of the *Code of Federal Regulations* (10 C.F.R.), section 50.59, "Changes, tests and experiments." SACE requested that the U.S. Nuclear Regulatory Commission (NRC or the Commission) revoke the *de facto* license amendment and stay the restart of SL-2 from the March 3, 2014 refueling outage pending resolution of the hearing request. As the basis for this request, the Petitioner stated that Florida Power & Light Company (the Licensee) misapplied 10 C.F.R. § 50.59 and that the SG replacement should have required a license amendment.<sup>2</sup> The Petitioner also expressed concerns (1) related to the inspection

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<sup>1</sup>Supplements (ADAMS Accession Nos. ML14071A431, ML14115A457, ML14115A458, ML14125A514, ML14128A557, ML14143A412, ML14147A523, ML14310A811, and ML14337A792).

<sup>2</sup>Regulations in 10 C.F.R. § 50.59 set forth the circumstances under which a Licensee can make changes to a facility as described in its UFSAR, make changes in the procedures described in  
(Continued)

of the replacement SGs, and (2) regarding the effects of the extended power uprate (EPU) on SG tube inservice inspection and flow-induced effects on the SG internals.

The Commission, by a memorandum and order (CLI-14-4, 79 NRC 249) dated April 1, 2014 (ADAMS Accession No. ML14091B118), denied SACE's request to stay the restart of SL-2 from the March 3, 2014, refueling outage. Subsequently, by a memorandum and order (CLI-14-11, 80 NRC 167) dated December 19, 2014 (ADAMS Accession No. ML14353A114), the Commission denied SACE's hearing request, concluded that the NRC did not issue the Licensee a *de facto* license amendment, and referred SACE's safety concerns regarding the replacement SGs at SL-2 to the NRC's Executive Director for Operations for disposition under 10 C.F.R. § 2.206, "Requests for action under this subpart." Therefore, the Staff treated these concerns in SACE's hearing request as a petition for enforcement action pursuant to 10 C.F.R. § 2.206. On February 24, 2015 (ADAMS Accession No. ML15057A221), and August 5, 2015 (ADAMS Accession No. ML15217A443), SACE informed the NRC Staff that it had decided not to request a meeting with the NRC's Petition Review Board with regard to its 10 C.F.R. § 2.206 petition.

By letter dated September 28, 2015 (ADAMS Accession No. ML15205A313), the NRC acknowledged receipt of SACE's 10 C.F.R. § 2.206 petition and notified SACE of the NRC's acceptance of a portion of the petition (i.e., one of SACE's safety concerns) for review in the 10 C.F.R. § 2.206 process. The portion of the petition that the NRC accepted for review under the 10 C.F.R. § 2.206 process addresses the Licensee's application of 10 C.F.R. § 50.59 with respect to the change in a methodology for evaluating SGs, as described in the updated final safety analysis report (UFSAR). The letter also stated that the NRC Staff was evaluating whether the Licensee properly applied 10 C.F.R. § 50.59 when it changed the structural analysis codes as described in the UFSAR.

The Staff's September 28, 2015 letter explained why the NRC did not accept the remaining portion of the petition for review under the 10 C.F.R. § 2.206 process. This portion of the petition raised safety concerns related to (1) inspection of the replacement SGs, and (2) the effects of the EPU on SG tube inservice inspection and flow-induced effects on the SG internals. These concerns met the criteria for rejection in NRC Management Directive 8.11, "Review Process for 10 C.F.R. § 2.206 Petitions," dated October 25, 2000 (ADAMS Accession No. ML041770328), because the concerns had already been reviewed, evaluated, and resolved by the NRC Staff. The following paragraphs describe the NRC Staff's prior resolutions of these concerns.

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the UFSAR, and conduct tests or experiments not otherwise described in the UFSAR without obtaining a license amendment.

Regarding the first concern related to the inspection of replacement SGs, NRC inspectors reviewed several aspects of the replacement SGs at SL-2 under Inspection Procedure 50001, "Steam Generator Replacement Inspection," dated September 6, 2000 (ADAMS Accession No. ML003754462). The inspection scope included the following related to the replacement SGs:

- design and planning;
- removal and replacement;
- preservice and baseline inspections;
- welding and nondestructive examination;
- quality assurance program and corrective actions; and
- post-installation verification and testing.

This inspection also covered a review of the plant change modification packages and Licensee procedures to design and replace the SGs. The NRC inspectors did not identify any findings of significance during their inspection. The inspection is documented in section 4OA5.3 of the NRC's Integrated Inspection Report No. 05000389(335)/2007005, dated February 1, 2008 (ADAMS Accession No. ML080350408).

Regarding the second concern related to the effects of the EPU on SG inservice inspections and flow-induced effects on the SGs, NRC Staff reviewed and approved the SL-2 EPU amendment on September 24, 2012 (ADAMS Accession No. ML12268A167). The Licensee's application for the EPU included evaluations of the replacement SGs, including inservice inspections and flow-induced effects. In its review, the NRC Staff determined that the effects of the proposed EPU at SL-2 did not adversely affect the structural integrity of the replacement SGs and that the Licensee had identified appropriate degradation management inspections.

The Advisory Committee on Reactor Safeguards (ACRS) also reviewed the SL-2-EPU application with respect to SG performance. By letter dated July 23, 2012 (ADAMS Accession No. ML12198A202), ACRS evaluated the Licensee's root cause of SG tube wear indications and the Licensee's action plan to address SG tube integrity. ACRS determined that the Licensee's action plan adequately addressed the concerns about SG tube integrity.

By letters to the Petitioner and Licensee dated May 24, 2016 (ADAMS Accession Nos. ML16055A311 and ML16055A330, respectively), the NRC issued the proposed director's decision (ADAMS Accession No. ML16055A284) for comment. The Petitioner and the Licensee were asked to provide comments within 15 days on any part of the proposed director's decision considered to be erroneous or any issues in the petition that were not addressed. The NRC Staff did not receive any comments on the proposed director's decision.

## **II. DISCUSSION**

Under 10 C.F.R. § 2.206(b), the director of the NRC office with responsibility for the subject matter shall either institute the requested proceeding or advise the person who made the request in writing that no proceeding will be instituted, in whole or in part, with respect to the request, and the reason for the decision. Accordingly, the decision of the Director of the Office of Nuclear Reactor Regulation is provided below.

### **A. Regulatory Background**

Regulations in 10 C.F.R. § 50.59 require licensees to determine if any changes to their facilities or procedures described in the UFSAR, or tests or experiments not described in the UFSAR, will need prior NRC approval through a license amendment. An NRC-approved license amendment is required if the changes, tests, or experiments involve a change to the technical specifications or if they meet any one of the eight criteria in 10 C.F.R. § 50.59(c)(2). A 10 C.F.R. § 50.59 evaluation typically refers to a Licensee's documented evaluation against the eight criteria in 10 C.F.R. § 50.59(c)(2) to determine if a proposed change, test, or experiment requires prior NRC approval through a license amendment under 10 C.F.R. § 50.90, "Application for amendment of license, construction permit, or early site permit."

### **B. Disposition of Previously Unresolved Safety Concerns**

As documented in section 4OA2.4 of the NRC's Integrated Inspection Report No. 05000389(335)/2014005, dated January 30, 2015 (ADAMS Accession No. ML15030A323), the NRC Staff opened an "unresolved item" that discussed the Staff's plans to review the specific design and qualification approach for the SL-2 replacement SG tube-to-tubesheet joint. In December 2015, the NRC Staff finished its inspection activities for the unresolved item. The inspection results are documented in section 4OA2 of the NRC's Integrated Inspection Report No. 05000389(335)/2015004, dated February 5, 2016 (ADAMS Accession No. ML16036A156). In resolving the unresolved item, the NRC inspectors identified the following two issues:

- (1) a failure to verify the adequacy of the SL-2 replacement SGs tube-to-tubesheet weld design, and
- (2) an inadequate 10 C.F.R. § 50.59 evaluation for the SL-2 SG tube-to-tubesheet welds.

As described below, the inspectors determined that the first issue was a violation

of quality assurance requirements for design control in 10 C.F.R. Part 50, “Domestic Licensing of Production and Utilization Facilities,” Appendix B, “Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants,” Criterion III, “Design Control,” while the second issue was a minor violation of 10 C.F.R. § 50.59.

***1. Failure to Verify Adequacy of Replacement SG Tube-to-Tubesheet Weld Design***

In 2007, the Licensee replaced the SGs in SL-2. As described in the January 30, 2015 inspection report, the inspectors identified a potential difference in design approaches between the original and replacement SGs for SL-2. In response, the Licensee entered the issue into its corrective action program and determined that the original SL-2 SGs were designed with a tubesheet joint with tube-to-tubesheet welds, considered as structural welds, to function as the tube-to-tubesheet joint pressure boundary. The replacement SGs were designed with a tubesheet joint that relies on the tube radial expansion against the tubesheet to function as the tube-to-tubesheet joint pressure boundary. However, the tubesheet joint still has a tube-to-tubesheet weld that is classified as a seal weld, not a structural weld, and was not relied on to create the tube-to-tubesheet joint pressure boundary.

Based on the design information made available by the Licensee, the inspectors determined that the Licensee did not perform the necessary American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code) analyses to support the pressure-retaining (or structural) function of the welds, as in the design basis of the original SGs. Specifically, the Licensee did not perform the primary stress analyses of the tube-to-tubesheet welds in the SL-2 replacement SGs to verify that the design-basis loads would not result in stresses beyond the limits established in the ASME Code. The failure to perform the stress analyses for the SL-2 replacement SGs, in accordance with the ASME Code, was attributed to the failure of the Licensee’s design review process to verify that the replacement SG tube-to-tubesheet welds were designed as pressure-retaining welds, with the corresponding analyses, and consistent with the design basis of the original SGs.

As part of its corrective actions, the Licensee performed primary stress analyses for the SL-2 replacement SG tube-to-tubesheet welds, consistent with what was done for the original SGs. The analyses demonstrated that the applicable ASME Code stress limits were satisfied under design-basis conditions. Therefore, structural integrity of the welds was demonstrated, consistent with the design basis for the original SGs, and the tube-to-tubesheet welds could be considered as structural welds.

The Licensee determined that the 10 C.F.R. § 50.59 evaluation performed in support of the replacement SGs did not specifically identify and address the change in the design basis of the tube-to-tubesheet joints because the change to

the joint design basis was not included in the design technical report reviewed by the Licensee. Because the Licensee subsequently demonstrated that the tube-to-tubesheet welds in the replacement SGs met the applicable ASME Code requirements and were consistent with the design basis of the original SGs, the conclusions of the original 10 C.F.R. § 50.59 evaluations for the replacement SGs were not affected.

The inspectors determined that the Licensee's failure to perform the primary stress analyses for the SL-2 replacement SG tube-to-tubesheet welds was a violation of quality assurance requirements for design control in 10 C.F.R. Part 50, Appendix B, Criterion III. In accordance with the NRC's Enforcement Policy (ADAMS Accession No. ML15029A148), the violation was treated as a noncited violation because of its very low safety significance. Because of the very low safety significance of the violation, the NRC does not have a basis for expanding its current level of regulatory oversight in accordance with the agency's Reactor Oversight Process and the Enforcement Policy, or otherwise taking the Petitioner's requested enforcement actions against the Licensee. The NRC published Regulatory Issue Summary 2016-02, "Design Basis Issues Related to Tube-to-Tubesheet Joints in Pressurized-Water Reactor Steam Generators," dated March 23, 2016 (ADAMS Accession No. ML15169A543), to inform licensees of existing requirements for tube-to-tubesheet welds.

## ***2. Inadequate 10 C.F.R. § 50.59 Evaluation for Tube-to-Tubesheet Welds***

The vendor for the SG replacement, AREVA, performed and documented for the Licensee a 10 C.F.R. § 50.59 evaluation of the SG replacement. In support of the SG replacement, the vendor used computer programs for the structural design of the SGs, including for the design of the tube-to-tubesheet joint welds that were different from the programs described in the UFSAR for the design of the original SGs. The inspectors determined that the computer programs described in the UFSAR were methods of evaluation subject to the provisions of 10 C.F.R. § 50.59(c)(2)(viii) and, thus, any changes to these methods would require a written evaluation. However, the inspectors identified that such changes in methods of evaluation were not specifically addressed in the Licensee's 10 C.F.R. § 50.59 evaluation. The inspectors did not identify any concerns with the application of the remaining seven criteria in 10 C.F.R. § 50.59(c)(2)(i)-(vii) within the scope of their review (i.e., the tube-to-tubesheet joint welds).

The Licensee entered the issue regarding the 10 C.F.R. § 50.59 evaluation into its corrective action program. As part of its corrective actions, the Licensee revised its original 10 C.F.R. § 50.59 evaluation to include the evaluation of changes in computer programs used for the structural design of the replacement SGs. The Licensee concluded that no departure from a method of evaluation occurred (i.e., the criterion in 10 C.F.R. § 50.59(c)(2)(viii) was not met) because the UFSAR

only provided a general functional description of the computer programs used to design the original SGs, and the UFSAR did not explicitly define the calculational framework behind the structural analysis performed by the computer programs. Additionally, the vendor for the replacement SGs stated that its computer programs met the applicable quality assurance program requirements and were benchmarked against classical solutions or other industry-acceptable codes.

In accordance with the NRC's Enforcement Policy, the inspectors determined that the failure to maintain a written evaluation (providing the basis for the determination that a license amendment was not required for changes in computer programs described in the UFSAR) was a minor violation of 10 C.F.R. § 50.59. The violation was minor because it involved a change to the UFSAR where there was not a reasonable likelihood that the change would ever require NRC approval per 10 C.F.R. § 50.59. Prior NRC approval was not required since the criterion of 10 C.F.R. § 50.59(c)(2)(viii) was not met, as the Licensee's 10 C.F.R. § 50.59 revised evaluation showed that no departure from a method of evaluation occurred when the Licensee changed the computer codes in the UFSAR. The inspectors found the Licensee's technical justification reasonable and the Licensee's revised 10 C.F.R. § 50.59 evaluation generally consistent with the guidelines of Nuclear Energy Institute 96-07, Revision 1, "Guidelines for 10 C.F.R. § 50.59 Implementation," dated November 2000 (ADAMS Accession No. ML003771157), as endorsed by Regulatory Guide 1.187, "Guidance for Implementation of 10 C.F.R. § 50.59 Changes, Tests, and Experiments," dated November 2000 (ADAMS Accession No. ML003759710).

In summary, the NRC inspectors identified a minor violation of 10 C.F.R. § 50.59. In accordance with the NRC Enforcement Policy, minor violations must be corrected; however, given their low safety significance, they are not subject to enforcement action. The Licensee corrected the minor violation. In addition, the NRC inspectors determined that no license amendment was required because none of the eight criteria in 10 C.F.R. § 50.59(c)(2) was met, and the SG replacement, as related to the tube-to-tubesheet joint welds, did not involve changes to the technical specifications. Therefore, the NRC does not have a basis for expanding its current level of regulatory oversight in accordance with the agency's Reactor Oversight Process and the Enforcement Policy, or otherwise taking the Petitioner's requested enforcement actions against the Licensee.

### **III. CONCLUSION**

Based on the NRC's inspection results, as described above, the NRC does not have a basis for taking the Petitioner's requested enforcement actions against the Licensee. The NRC did not find that the continued operation of the plant would

adversely affect the health and safety of the public. Therefore, the NRC denies the Petitioner's requested enforcement actions against the Licensee.

As provided in 10 C.F.R. § 2.206(c), the NRC will file a copy of this Director's Decision with the Secretary of the Commission for the Commission to review. As provided for by this regulation, the decision will constitute the final action of the Commission 25 days after the date of the decision, unless the Commission, on its own motion, institutes a review of the decision within that time.

For the Nuclear Regulatory  
Commission

William M. Dean, Director  
Office of Nuclear Reactor Regulation

Dated at Rockville, Maryland,  
this 8th day of July 2016.



UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

**COMMISSIONERS:**

**Stephen G. Burns, Chairman**  
**Kristine L. Svinicki**  
**Jeff Baran**

**In the Matter of**

**Docket No. 70-3098-MLA**  
**(Possession and Use License)**

**CB&I AREVA MOX SERVICES, LLC**  
**(Mixed Oxide Fuel Fabrication**  
**Facility)**

**September 9, 2016**

**MEMORANDUM AND ORDER**

Intervenors Blue Ridge Environmental Defense League (BREDL) and Nuclear Watch South request that we amend the Protective Order governing “Controlled Information” in the now-closed proceeding related to the mixed oxide fuel fabrication facility (the MOX Facility).<sup>1</sup> We grant the motion as discussed below.

In 2005, Duke, Cogema, Stone & Webster (later renamed Shaw AREVA MOX Services, LLC, which subsequently became CB&I AREVA MOX Services, LLC (MOX Services))<sup>2</sup> received a construction authorization for the MOX Facility located at the Department of Energy’s (DOE) Savannah River Site.<sup>3</sup> The next year, Shaw AREVA MOX Services filed an application to possess and use

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<sup>1</sup> Intervenors’ Unopposed Motion to Amend Protective Order (May 17, 2016) at 1 (Motion). A third intervenor, Nuclear Information and Resource Service, did not receive Controlled Information under the Protective Order and therefore did not participate in this Motion. *Id.* at 1 n.1.

<sup>2</sup> Letter from Jack Strosnider, NRC, to David Stinson, Shaw AREVA MOX Services (Nov. 30, 2006), at 1 (ADAMS Accession No. ML063200264); In the Matter of CB&I AREVA MOX Services, LLC; Order, 79 Fed. Reg. 69,886, 69,887 (Nov. 24, 2014).

<sup>3</sup> Mixed Oxide Fuel Fabrication Facility Construction Authorization; Construction Authorization No. CAMOX-001 (Mar. 30, 2005) (ADAMS Accession No. ML050660392).

strategic special nuclear material, byproduct material, and source material at the MOX Facility. An adjudicatory proceeding related to the application began in 2007 and ended in 2015.<sup>4</sup> The Atomic Safety and Licensing Board held hearings on three admitted contentions related to material control and accounting (Contentions 9, 10, and 11).<sup>5</sup> The Board ruled on the merits of the three contentions and ultimately found in favor of Shaw AREVA MOX Services.<sup>6</sup> The Intervenor appealed; we denied their petition for review and terminated the proceeding last year in CLI-15-9.<sup>7</sup>

Early in the proceeding, the Board issued a Protective Order governing the Intervenor's access to certain "Controlled Information," i.e., proprietary information and sensitive unclassified nonsafeguards information (SUNSI).<sup>8</sup> After admitting Contentions 9, 10, and 11, the Board amended the Protective Order to allow the Intervenor access to information designated by DOE as unclassified controlled nuclear information (UCNI).<sup>9</sup> As relevant here, the Protective Order required the Intervenor to dispose of any documents containing Controlled Information by delivering them to the Board in accordance with the Nondisclosure Declaration attached to the Protective Order.<sup>10</sup> The Nondisclosure Declaration, in turn, provided that an individual with access to Controlled Information would, among other things, provide the Board with an accounting of all documents with Controlled Information and submit such documents to the Board via U.S. Postal Service registered, certified, or express mail for destruction either at the conclusion of the proceeding or at the conclusion of the individual's participation in the proceeding.<sup>11</sup>

The Nondisclosure Declaration was signed by four individuals: representatives of BREDL and Nuclear Watch South, the Intervenor's counsel, and the

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<sup>4</sup> See CLI-15-9, 81 NRC 512, 513-14 (2015); LBP-14-1, 79 NRC 39, 47-48 (2014).

<sup>5</sup> CLI-15-9, 81 NRC at 514-15.

<sup>6</sup> *Id.* at 515 (citing LBP-14-1, 79 NRC at 46).

<sup>7</sup> *Id.* at 519.

<sup>8</sup> Licensing Board Order (Adopting Protective Order) (Dec. 31, 2008) (unpublished) (attaching Protective Order and Controlled Information Nondisclosure Declaration (Nondisclosure Declaration)).

<sup>9</sup> Licensing Board Memorandum and Order (Summarizing Prehearing Conference Call, Revising Protective Order, and Scheduling Evidentiary Proceeding) (July 26, 2011) at 6-7 (unpublished) (Order Revising Protective Order). The Motion cites to the document destruction requirements in paragraph I of the Protective Order and paragraph 13 of the Nondisclosure Declaration. Motion at 4-5. Following the revision, those paragraphs were retitled paragraph J and paragraph 14, respectively. Order Revising Protective Order at 6-7 (citing Joint Motion for Board Approval of Revised Protective Order and Nondisclosure Declaration (June 29, 2011) (attachments)). For clarity's sake, we cite to the revised paragraph titles.

<sup>10</sup> Protective Order ¶ J.

<sup>11</sup> Nondisclosure Declaration ¶ 14.

Intervenors' expert witness; the Intervenors' counsel possesses the majority of the documents provided to the Intervenors.<sup>12</sup>

BREDL and Nuclear Watch South now seek to amend the Protective Order and Nondisclosure Declaration to dispose of documents in a way not specified by the Protective Order and Nondisclosure Declaration. In particular, they seek to shred paper documents in accordance with the DOE regulation governing destruction of UCNI and mail any compact discs containing Controlled Information to MOX Services.<sup>13</sup> The Intervenors represent that such an amendment would save the time and expense associated with packaging a large volume of documents (approximately five file cabinet drawers) in sealed double envelopes that are specially marked and mailing them by special delivery service.<sup>14</sup> BREDL and Nuclear Watch South represent that they will (1) comply with all requirements of the Protective Order as modified, including making an accounting of the documents to the Secretary of the Commission; (2) shred paper documents pursuant to DOE's specifications for UCNI documents; and (3) confirm by declaration that they have destroyed or mailed the documents to the appropriate person.<sup>15</sup> Neither MOX Services nor the NRC Staff opposes the Motion.<sup>16</sup>

We grant the Motion as follows. We find that the requested amendments to the Protective Order and the associated relief related to the Nondisclosure Declaration would not compromise the security of the Controlled Information because the information will be destroyed in a manner that complies with relevant DOE regulations and NRC guidance. However, the more efficient course is to amend only the Protective Order to avoid a need for the Intervenors to refile amended Nondisclosure Declarations. We therefore modify paragraph J of the Protective Order as follows:<sup>17</sup>

Once granted access to Controlled Information, persons shall keep a record of all documents containing or revealing Controlled Information in their possession, cus-

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<sup>12</sup> Motion at 3.

<sup>13</sup> *Id.* at 4; *see* 10 C.F.R. § 1017.26 (allowing for shredding by using a cross-cut shredder that produces pieces no larger than 1/4 inch wide by 2 inches long). Of the types of Controlled Information addressed by the Protective Order, UCNI has the strictest level of controls. NRC guidance provides that sensitive unclassified information should be destroyed "by a method that will prevent reconstruction of the information in whole or in part" and includes shredding as an option. Management Directive 12.6, "NRC Sensitive Unclassified Information Security Program" (revised Dec. 20, 1999), Handbook 12.6, at 17.

<sup>14</sup> Motion at 3-4.

<sup>15</sup> *Id.* at 4. Under the terms of the Nondisclosure Declaration, "documents" include information on paper or electronic media. Nondisclosure Declaration ¶ 1(g).

<sup>16</sup> Motion at 1; *see Public Citizen v. Liggett Group, Inc.*, 858 F.2d 775, 781-83 (1st Cir. 1988) (noting that courts retain the power to modify protective orders even after the underlying proceeding closes).

<sup>17</sup> Deletions are indicated with a line through the text, and insertions are underlined.

tody, or control and shall account for and ultimately destroy ~~deliver~~ that information ~~for disposal to the Board, in accordance with the nondisclosure declaration attached hereto~~ by shredding paper documents with a cross-cut shredder that produces particles no larger than one-quarter inch wide and two inches long, in conformance with the requirements of 10 C.F.R. § 1017.26. If a person does not possess such a shredder, he or she shall mail the documents to counsel for Intervenors in a manner that conforms to the requirements of the Protective Order and shall request her to destroy them. Any CDs containing Controlled Information shall be delivered to MOX Services c/o Dealis Gwyn under the terms of this Protective Order.

Consistent with this modification, CDs containing Controlled Information shall be mailed to the following address:

CB&I AREVA MOX Services  
Attn: Dealis Gwyn (706-5F)  
P.O. Box 7097  
Aiken, SC 29804-7097

Upon completion of document destruction activities, each individual subject to the Nondisclosure Declaration shall prepare a declaration confirming that the Controlled Information in his or her possession was destroyed, mailed to counsel for the Intervenors, or mailed to MOX Services at the above address.<sup>18</sup> These declarations shall be submitted to the Secretary of the Commission *within 30 days from the date of this Order*.

This decision supersedes the document disposal provisions of paragraph J of the Protective Order and paragraph 14 of the Nondisclosure Declaration. Individuals subject to the Nondisclosure Declaration are not required to execute an amended Nondisclosure Declaration.

IT IS SO ORDERED.<sup>19</sup>

For the Commission

ANDREW L. BATES  
Acting Secretary of the Commission

Dated at Rockville, Maryland,  
this 9th day of September 2016.

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<sup>18</sup> See Protective Order ¶ J; Nondisclosure Declaration ¶ 14.

<sup>19</sup> Chairman Burns has in the past disqualified himself from participating in this proceeding because of his prior service as Deputy General Counsel of the Nuclear Regulatory Commission. He abstains from this matter and is participating solely for the purpose of establishing a quorum for Commission action. See 42 U.S.C. § 5841(a).

UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

**ATOMIC SAFETY AND LICENSING BOARD**

**Before Administrative Judges:**

**Paul S. Ryerson, Chairman**  
**E. Roy Hawkens**  
**Dr. Gary S. Arnold**

**In the Matter of**

**Docket No. 55-71371-SP**  
**(ASLBP No. 16-947-01-SP-BD01)**

**ALEXANDER ABRAHAMS**  
**(Denial of Reactor Operator License)**

**September 7, 2016**

**ORDER**

**(Approving Proposed Settlement Agreement and  
Terminating Proceeding)**

1. On February 5, 2016, and on May 5, 2016, the NRC Staff denied Alexander Abrahams' operator license application because it determined, based on the information in the application, that Mr. Abrahams' general medical condition did not meet the minimum standards under 10 C.F.R. § 55.33(a)(1).
2. On June 7, 2016, Mr. Abrahams served the Staff with a hearing demand challenging the denial of his application.
3. On June 13, 2016, this Atomic Safety and Licensing Board was established to address the matter.
4. On June 16, 2016, the Staff filed an answer opposing Mr. Abrahams' hearing demand.
5. On July 5, 2016, upon the joint request of the parties, the Board requested that the Chief Administrative Judge appoint a Settlement Judge to conduct settlement negotiations.

6. On July 5, 2016, the Chief Administrative Judge appointed Administrative Judge G. Paul Bollwerk, III to serve as the Settlement Judge.

7. On August 30, 2016, the Staff and Mr. Abrahams jointly submitted to this Board a nonpublic Proposed Settlement Agreement that would resolve all of the issues in this proceeding.

8. Also on August 30, 2016, the Staff and Mr. Abrahams jointly submitted to this Board a nonpublic motion requesting that the Board approve the Proposed Settlement Agreement and terminate this proceeding.

9. Upon review of the Proposed Settlement Agreement, the Board is satisfied that its terms reflect a fair and reasonable settlement of all of the issues in this proceeding and that the public interest does not require the adjudication of these issues. Therefore, the Board grants the joint motion of the parties and approves the Proposed Settlement Agreement.

10. Because all of the issues required to be adjudicated as part of this proceeding have been resolved, the proceeding is *terminated*.

It is so ORDERED.

THE ATOMIC SAFETY AND  
LICENSING BOARD

Paul S. Ryerson, Chairman  
ADMINISTRATIVE JUDGE

E. Roy Hawkens  
ADMINISTRATIVE JUDGE

Dr. Gary S. Arnold  
ADMINISTRATIVE JUDGE

Rockville, Maryland  
September 7, 2016

UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

**ATOMIC SAFETY AND LICENSING BOARD**

**Before Administrative Judges:**

**Ronald M. Spritzer**, Chairman  
**Nicholas G. Trikouros**  
**Dr. Gary S. Arnold**

**In the Matter of**

**Docket Nos. 52-025-LA-2**  
**52-026-LA-2**  
**(ASLBP No. 16-946-02-LA-BD01)**

**SOUTHERN NUCLEAR OPERATING**  
**COMPANY, INC.**  
**(Vogtle Electric Generating Plant,**  
**Units 3 and 4)**

**September 15, 2016**

In this Order, the Atomic Safety and Licensing Board (the Board) concluded that the Blue Ridge Environmental Defense League and its chapter Concerned Citizens of Shell Bluff (collectively BREDL) has standing to intervene, but has not pled an admissible contention regarding the license amendment request (LAR) of Southern Nuclear Operating Company, Inc. (Southern Nuclear). In the LAR, Southern Nuclear sought to modify the hydrogen ignition subsystem of Vogtle Electric Generating Plant, Units 3 and 4, through the addition of two new hydrogen igniters within containment. The Board denied BREDL's petition to intervene and request for a hearing.

**RULES OF PRACTICE: STANDING (REPRESENTATIONAL)**

To establish representational standing, an organization must show that (1) the identified members would have standing to intervene in their own right, and (2) they have authorized the organization to request a hearing on their behalf.

**RULES OF PRACTICE: STANDING**

When assessing whether an individual or organization has set forth a sufficient interest, the Commission has generally applied contemporaneous judicial concepts of standing, under which the petitioner must allege a concrete and particularized injury that is fairly traceable to the challenged action and is likely to be redressed by a favorable decision.

**RULES OF PRACTICE: STANDING (PROXIMITY PRESUMPTION)**

In certain circumstances, the Commission has adopted a proximity presumption that allows a petitioner living, having frequent contacts, or having a significant property interest within 50 miles of a nuclear power reactor to establish standing without the need to make an individualized showing of injury, causation, and redressability.

**RULES OF PRACTICE: STANDING (PROXIMITY PRESUMPTION)**

The proximity presumption rests on the Commission's finding, in construction permit and operating license cases, that persons living within the roughly 50-mile radius of the facility face a realistic threat of harm if a release from the facility of radioactive material were to occur.

**RULES OF PRACTICE: STANDING (PROXIMITY PRESUMPTION)**

For the proximity presumption to apply in license amendment proceedings, the proposed amendment must obviously entail an increased potential for off-site consequences. The petitioner has the burden to show that the presumption should apply. The petition must identify some plausible chain of causation, some scenario suggesting how the particular license amendments would result in a distinct new harm or threat to the petitioner or its members.

**RULES OF PRACTICE: STANDING**

Standing is a threshold legal question that does not require an assessment of the petitioner's case on the merits. At the pleading stage, it is generally sufficient if the petitioner provides plausible factual allegations that satisfy each element of standing, and the Board must accept as true all material allegations of the petition.

**RULES OF PRACTICE: STANDING**

Licensing boards follow a longstanding principle that, in the standing analysis, we construe the petition in favor of the petitioner.

**RULES OF PRACTICE: PRO SE PETITIONER**

It is the Commission's longstanding policy that pleadings submitted by *pro se* petitioners are afforded greater leniency than petitions drafted with the assistance of counsel.

**RULES OF PRACTICE: STANDING (QUANTATIVE PROOF OF HARM)**

The low estimate of the probability of a severe accident does not mean that a petitioner lacks standing. Federal courts have not generally imposed a minimum quantitative threshold on the probability of future injury alleged as the basis of standing. An estimate of the likelihood of a severe accident alone, unaccompanied by any consideration of the severity of the consequences, fails to provide a persuasive argument against standing.

**RULES OF PRACTICE: STANDING (PROXIMITY PRESUMPTION)**

There are limits to proximity standing when there are no changes to the physical plant itself, its operating procedures, design basis accident analysis, management, or personnel. The Commission has rejected proximity standing for license transfers, license amendments associated with shutdown and defueled reactors, and certain changes to worker-protection requirements.

**RULES OF PRACTICE: STANDING (CONTENTION MERITS)**

In deciding whether the petitioner established standing, a licensing board does not decide the admissibility or merits of its contentions. The Commission has identified a clear distinction between standing and the ultimate merits of a proposed contention, concluding that a full-blown factual inquiry is not required for the threshold legal question of standing. Standing and contention admissibility are distinct issues, and a licensing board need not rule on contention admissibility to decide standing.

**RULES OF PRACTICE: STANDING (EXPERT AFFIDAVITS)**

In order to satisfy contention admissibility requirements, the petitioner must

identify the facts or expert opinions on which it relies and show that they present a genuine dispute of material fact with the application. But the Commission does not require that a petitioner's standing be supported by expert affidavits regarding a petitioner's "plausible scenario" for injury, much less that such affidavits be sufficient to support an admissible contention.

**RULES OF PRACTICE: STANDING (PROXIMITY PRESUMPTION)**

In ruling on claims of proximity standing, the Board decides the appropriate radius on a case-by-case basis.

**RULES OF PRACTICE: INTERVENTION**

To participate as a party in this proceeding, a petitioner for intervention must not only establish standing, but also proffer at least one admissible contention that meets the requirements of 10 C.F.R. § 2.309(f).

**LICENSE AMENDMENT: SCOPE OF REVIEW**

NRC regulations define the scope of review of a license amendment application broadly: In determining whether an amendment to a license, construction permit, or early site permit will be issued to the applicant, the Commission will be guided by the considerations which govern the issuance of initial licenses, construction permits, or early site permits to the extent applicable and appropriate. The applicant must satisfy the requirements of 10 C.F.R. § 50.90 and demonstrate that the requested amendment meets all applicable regulatory requirements and acceptance criteria and does not otherwise harm the public health and safety or the common defense and security.

**REGULATIONS: GENERAL DESIGN CRITERIA**

An applicant for a design certification must include the principal design criteria identified in the General Design Criteria as set forth in Appendix A of 10 C.F.R. Part 50, including the hydrogen control requirements of Criterion 41. Water-cooled reactors licensed after October 16, 2003, must also satisfy the combustible gas control requirements of 10 C.F.R. § 50.44(c)(1)-(5).

**REGULATIONS: FINALITY OF CERTIFIED DESIGN**

Pursuant to 10 C.F.R. § 52.63, a certified reactor design, including the AP-

1000, is final and the NRC may not impose new requirements absent special circumstances.

**RULES OF PRACTICE: CHALLENGE TO COMMISSION REGULATIONS**

Pursuant to 10 C.F.R. § 2.335, “no rule or regulation of the Commission, or any provision thereof, concerning the licensing of production and utilization facilities . . . is subject to attack by way of discovery, proof, argument, or other means in any adjudicatory proceeding subject to [10 C.F.R. Part 2 procedural rules].”

**TECHNICAL ISSUE(S) DISCUSSED: HYDROGEN IGNITER PLACEMENT**

The AP1000 DCD and UFSAR Table 6.2.4-6 require hydrogen igniters to be placed at IRWST vents and “as close to the [hydrogen] source as feasible.” Absent a regulation requiring additional analyses of the location of hydrogen igniters, additional requirements cannot be imposed through this proceeding.

**TECHNICAL ISSUE(S) DISCUSSED: HYDROGEN SOURCES AND HYDROGEN STRATIFICATION**

Pursuant to 10 C.F.R. § 52.63(a)(1), the AP1000 certified design applicable to Vogtle Units 3 and 4 is not subject to additional hydrogen source requirements — beyond those currently set forth in 10 C.F.R. § 50.44(c). The AP1000 certified design is also not subject to additional hydrogen stratification requirements through this proceeding.

**TECHNICAL ISSUE(S) DISCUSSED: HISTORICAL PRECEDENTS OF HYDROGEN EXPLOSIONS**

The question whether the Fukushima accident requires modification of the hydrogen control system of the AP1000 certified design is currently subject to agency review and potential rulemaking, and is therefore outside the scope of this proceeding.

**TECHNICAL ISSUE(S) DISCUSSED: FLAME “BACKFLOW”**

The Board may not consider arguments regarding flame “backflow” that amount to a challenge to the AP1000 certified design or would be inconsistent

with the Commission's ongoing review of the events at Fukushima to determine whether changes to the certified design are necessary.

## **ORDER**

### **(Ruling on Petition to Intervene and Request for a Hearing)**

Before the Board is a petition to intervene and request for a hearing (Petition) filed by Blue Ridge Environmental Defense League and its chapter Concerned Citizens of Shell Bluff (collectively BREDL or Petitioner).<sup>1</sup> The Petition challenges the License Amendment Request (LAR) of Southern Nuclear Operating Company, Inc. (Southern Nuclear) to amend its combined licenses (COLs) for the construction and operation of Vogtle Electric Generating Plant (Vogtle) Units 3 and 4, located in Burke County, Georgia. We conclude that BREDL has representational standing. But we also conclude that its two proffered contentions are inadmissible, primarily because they amount to challenges to a certified reactor design, the Nuclear Regulatory Commission (NRC) licenses for Vogtle Units 3 and 4, and NRC regulations. We therefore deny the request for a hearing and dismiss the Petition.

### **I. BACKGROUND**

On February 10, 2012, the NRC issued COLs NPF-91 and NPF-92 to Southern Nuclear for the construction and operation of Vogtle Units 3 and 4.<sup>2</sup> Both new units, which are currently under construction, are Westinghouse Advanced Passive 1000 (AP1000) pressurized water reactors. The AP1000 is a certified reactor design.<sup>3</sup>

On February 6, 2015, Southern Nuclear submitted the LAR, based on its determination that the design of the hydrogen ignition subsystem associated with Vogtle Units 3 and 4 required modification.<sup>4</sup> The hydrogen ignition subsystem

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<sup>1</sup> Petition for Leave to Intervene and Request for Hearing by the Blue Ridge Environmental Defense League and its Chapter Concerned Citizens of Shell Bluff Regarding Southern Nuclear Operating Company's Request for a License Amendment and Exemption for Containment Hydrogen Igniter Changes, LAR-15-003 (May 2, 2016) [hereinafter Petition].

<sup>2</sup> Southern Nuclear Operating Company's Answer Opposing Petition to Intervene and Request for Hearing (May 27, 2016) at 2 [hereinafter Southern Nuclear Answer].

<sup>3</sup> 10 C.F.R. Part 52, App. D.

<sup>4</sup> Vogtle Electric Generating Plant Units 3 and 4 Request for License Amendment and Exemption: Containment Hydrogen Igniter Changes (LAR-15-003) (Feb. 6, 2015) (ADAMS Accession No. ML15037A715) [hereinafter LAR].

currently consists of sixty-four hydrogen igniters within containment.<sup>5</sup> Hydrogen igniters are intended to mitigate a severe accident scenario that results in the rapid production of hydrogen exceeding the capacity of the Passive Autocatalytic Recombiners.<sup>6</sup> Igniters are located within containment based on the predicted behavior of hydrogen during a severe accident and promote hydrogen burning at low concentrations to avoid buildup within containment.<sup>7</sup>

Southern Nuclear proposes to modify the AP1000 design with the installation of two additional hydrogen igniters immediately above the In-Containment Refueling Water Storage Tank (IRWST) roof vents.<sup>8</sup> It states that the placement of the two additional hydrogen igniters ensures hydrogen exiting the IRWST roof vents in a severe accident scenario is burned as close to the hydrogen source as possible.<sup>9</sup> Southern Nuclear characterizes the proposed igniters as providing additional conservatism to the hydrogen ignition system.<sup>10</sup> The LAR also states that the igniters are located within containment consistent with criteria in Updated Final Safety Analysis Report (UFSAR) Table 6.2.4-6 and, therefore, “do not alter the design function of the igniters, have no effect on any analysis or analysis method, and do not affect the performance or controls of hydrogen control functions.”<sup>11</sup>

On March 2, 2016, the NRC published a notice of receipt of the LAR in the *Federal Register*.<sup>12</sup> As stated in the notice:

The proposed changes would revise the Combined Licenses (COLs) by changing the [UFSAR] in the form of departures from the incorporated plant specific Design Control Document [(DCD)] Tier 2 information and by making related changes to COL Appendix C information, with corresponding changes to the associated plant-specific Tier 1 information related to hydrogen igniters.<sup>13</sup>

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<sup>5</sup> *Id.*, Encl. 1, at 3.

<sup>6</sup> *See id.* Hydrogen production results from a degraded core or core melt accident with up to 100% of the zirconium fuel cladding reacting with steam to produce hydrogen. *Id.*

<sup>7</sup> *Id.*

<sup>8</sup> *Id.* The LAR identifies additional modifications “to remove control of the hydrogen igniters from the Protection and Safety Monitoring System (PMS), to clarify the controls available for the hydrogen igniters at the Remote Shutdown Workstation (RSW), and to make changes to the design aspects of the hydrogen igniters to maintain consistency within the Update[d] Final Safety Analysis Report (UFSAR).” *Id.* These additional changes have not been challenged by Petitioner.

<sup>9</sup> Southern Nuclear Answer at 2.

<sup>10</sup> LAR, Encl. 1, at 12.

<sup>11</sup> *Id.*

<sup>12</sup> Vogtle Electric Generating Plant, Units 3 and 4, 81 Fed. Reg. 10,920 (Mar. 2, 2016).

<sup>13</sup> *Id.* at 10,921. Because the proposed changes require a departure from Tier 1 information in the Westinghouse AP1000 DCD, Southern Nuclear also requested an exemption from the requirements of the Generic DCD Tier 1. *Id.* BREDL has not challenged Southern Nuclear’s exemption request.

The NRC Staff (Staff) proposed that the LAR involves no significant hazards consideration and sought public comment on that proposed determination.<sup>14</sup> The notice also provided an opportunity to request a hearing.<sup>15</sup>

Acting *pro se*, BREDL filed its Petition to Intervene on May 2, 2016. The Petition includes two contentions. On May 11, 2016, this Atomic Safety and Licensing Board was established to preside over the proceeding.<sup>16</sup> On May 27, 2016, the Staff and Southern Nuclear filed answers opposing the Petition.<sup>17</sup> On June 3, 2016, BREDL filed a reply.<sup>18</sup> On August 3, 2016, the Board heard oral argument on standing and contention admissibility by online video conference at the NRC Headquarters in Rockville, Maryland.<sup>19</sup> The designated representatives of BREDL, Southern Nuclear, and the Staff participated remotely. Interested members of the public were provided listen-only telephone access to the oral argument.

## II. PETITIONER'S STANDING

BREDL asserts that it has standing in this proceeding as the representative of its members who live near the site of Vogtle Units 3 and 4 and are concerned that the LAR may jeopardize their health and safety.<sup>20</sup> For BREDL to establish representational standing, it must show that (1) the identified members would have standing to intervene in their own right, and (2) they have authorized the organization to request a hearing on their behalf.<sup>21</sup> As to the standing of its members, BREDL maintains that the Commission's proximity presumption should apply because they live within 25 miles or less of Vogtle Units 3 and 4, and the license amendment presents an obvious potential for offsite consequences.

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<sup>14</sup> *Id.*

<sup>15</sup> *Id.* at 10,921-22.

<sup>16</sup> Establishment of Atomic Safety and Licensing Board (May 11, 2016); *see also* 81 Fed. Reg. 30,571 (May 17, 2016).

<sup>17</sup> Staff Answer to Petition for Leave to Intervene and Request for Hearing (May 27, 2016) at 1 [hereinafter Staff Answer]; Southern Nuclear Answer at 1.

<sup>18</sup> Reply of the Blue Ridge Environmental Defense League and Its Chapter Concerned Citizens of Shell Bluff to Answers of Nuclear Regulatory Commission and Southern Nuclear Operating Company, LAR-15-003 (June 3, 2016).

<sup>19</sup> Tr. at 1-132. All transcript citations are to the "final" transcript docketed on August 19, 2016.

<sup>20</sup> Petition at 4-5.

<sup>21</sup> *See Sequoyah Fuels Corp. and General Atomics (Gore, Oklahoma Site)*, CLI-94-12, 40 NRC 64, 72 (1994) ("An organization seeking representational standing on behalf of its members may meet the 'injury-in-fact' requirement by demonstrating that at least one of its members, who has authorized the organization to represent his or her interest, will be injured by the possible outcome of the proceeding." (citation omitted)).

The Staff does not contest application of the proximity presumption, stating that “[f]or purposes of assessing standing, the Staff does not dispute that Petitioner alleges that the granting of the proposed LAR entails clear potential for offsite consequences in the form of hydrogen accumulation and potential for breach of containment.”<sup>22</sup> Southern Nuclear, however, argues that the proximity presumption should not apply because BREDL has not demonstrated an obvious potential for offsite consequences.<sup>23</sup>

We agree with the Staff that BREDL’s pleadings and standing declarations adequately allege that the LAR “entails [a] clear potential for offsite consequences in the form of hydrogen accumulation and potential for breach of containment.”<sup>24</sup> BREDL may therefore invoke the proximity presumption to establish the individual standing of its members. And, because the members have authorized BREDL to represent them in this proceeding, BREDL satisfies the requirements for representational standing.

#### **A. The Proximity Presumption**

A petitioner’s participation in a licensing proceeding requires a demonstration of standing. This requirement is derived from section 189a of the Atomic Energy Act of 1954,<sup>25</sup> which instructs the NRC to provide a hearing “upon the request of any person whose interest may be affected by the proceeding.”<sup>26</sup> When assessing whether an individual or organization has set forth a sufficient interest, the Commission has generally applied contemporaneous judicial concepts of standing, under which the petitioner must allege “a concrete and particularized injury that is fairly traceable to the challenged action and is likely to be redressed by a favorable decision.”<sup>27</sup>

In certain circumstances, however, the Commission has adopted a proximity presumption that allows a petitioner living,<sup>28</sup> having frequent contacts,<sup>29</sup> or hav-

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<sup>22</sup> Staff Answer at 14.

<sup>23</sup> Southern Nuclear Answer at 29.

<sup>24</sup> Staff Answer at 14.

<sup>25</sup> 42 U.S.C. § 2011 *et seq.* (1954).

<sup>26</sup> 42 U.S.C. § 2239(a)(1)(A); *see also* 10 C.F.R. § 2.105(a)(4) (providing an opportunity for a hearing for “[a]n amendment to an operating license, combined license, or manufacturing license”).

<sup>27</sup> *Cleveland Electric Illuminating Co.* (Perry Nuclear Power Plant, Unit 1), CLI-93-21, 38 NRC 87, 92 (1993) (citations omitted); *see also Georgia Institute of Technology* (Georgia Tech Research Reactor, Atlanta, Georgia), CLI-95-12, 42 NRC 111, 115 (1995).

<sup>28</sup> *Florida Power & Light Co.* (St. Lucie Nuclear Power Plant, Units 1 and 2), CLI-89-21, 30 NRC 325, 329 (1989) (“[L]iving within a specific distance from the plant is enough to confer standing on an individual or group in proceedings for construction permits, operating licenses, or significant amendments thereto . . .”).

<sup>29</sup> *Sequoyah Fuels Corp.*, CLI-94-12, 40 NRC at 75.

ing a significant property interest<sup>30</sup> within 50 miles of a nuclear power reactor to establish standing without the need to make an individualized showing of injury, causation, and redressability.<sup>31</sup> “The presumption rests on our finding, in construction permit and operating license cases, that persons living within the roughly 50-mile radius of the facility ‘face a realistic threat of harm’ if a release from the facility of radioactive material were to occur.”<sup>32</sup> Although this threat can be assumed in construction permit and operating license proceedings for power reactors,<sup>33</sup> for the proximity presumption to apply in license amendment proceedings, the proposed amendment must “‘obvious[ly]’ entail[] an increased potential for offsite consequences.”<sup>34</sup>

## **B. BREDL’s Standing Under the Proximity Presumption**

The petitioner has the burden to show that the proximity presumption should apply.<sup>35</sup> In a license amendment proceeding such as this, the petition must identify “some ‘plausible chain of causation,’ some scenario suggesting how [the] particular license amendments would result in a distinct new harm or threat” to the petitioner or its members.<sup>36</sup>

Standing is a threshold legal question, however, that does not require an assessment of the petitioner’s case on the merits.<sup>37</sup> At the pleading stage, “it is generally sufficient if the petitioner provides plausible factual allegations that

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<sup>30</sup> *USEC Inc.* (American Centrifuge Plant), CLI-05-11, 61 NRC 309, 314 (2005).

<sup>31</sup> *Exelon Generation Co., LLC* (Peach Bottom Atomic Power Station, Units 2 and 3), CLI-05-26, 62 NRC 577, 581 (2005).

<sup>32</sup> *Calvert Cliffs 3 Nuclear Project, LLC* (Calvert Cliffs Nuclear Power Plant, Unit 3), CLI-09-20, 70 NRC 911, 917 (2009) (quoting *Calvert Cliffs 3 Nuclear Project, LLC* (Calvert Cliffs Nuclear Power Plant, Unit 3), LBP-09-4, 69 NRC 170, 183 (2009)).

<sup>33</sup> *Id.* at 915.

<sup>34</sup> *Florida Power & Light Co.* (Turkey Point Nuclear Generating Plant, Units 3 and 4), LBP-08-18, 68 NRC 533, 539 (2008) (first modification in original) (quoting *Commonwealth Edison Co.* (Zion Nuclear Power Station, Units 1 and 2), CLI-99-4, 49 NRC 185, 191 (1999)); see also *Florida Power & Light Co.* (Turkey Point Nuclear Generating Plant, Units 3 and 4), LBP-01-6, 53 NRC 138, 148 (2001) (“[T]he rule laid down in *St. Lucie* is intended to be applied across the board to all proceedings regardless of type because the rationale underlying the proximity presumption is not based on the type of proceeding per se but on whether ‘the proposed action involves a significant source of radioactivity producing an obvious potential for offsite consequences.’” (quoting *Ga. Tech.*, CLI-95-12, 42 NRC at 116)), *aff’d on other grounds*, CLI-01-17, 54 NRC 3 (2001).

<sup>35</sup> *Peach Bottom*, CLI-05-26, 62 NRC at 581.

<sup>36</sup> *Zion Nuclear Power Station*, CLI-99-4, 49 NRC at 192.

<sup>37</sup> See *Sequoyah Fuels Corp.* (Gore, Oklahoma Site Decommissioning), CLI-01-2, 53 NRC 9, 15 (2001).

satisfy each element of standing,”<sup>38</sup> and the Board must accept as true all material allegations of the Petition.<sup>39</sup> Also, licensing boards “follow a longstanding principle that, in the standing analysis, ‘we construe the petition in favor of the petitioner.’”<sup>40</sup> And, under another longstanding Commission policy, pleadings submitted by a *pro se* petitioner such as BREDL are afforded greater leniency than petitions drafted with the assistance of counsel.<sup>41</sup>

### 1. BREDL’s Allegations

To establish its standing, BREDL submitted a list of thirty members of BREDL and Concerned Citizens of Shell Bluff whose interests it represents in this proceeding. Each of the members alleges that the proposed license amendment “could increase the chance or effects of an accident, create the possibility of a new or different kind of accident and reduce the margin of safety.”<sup>42</sup> The declarants state that “[f]ailure of the hydrogen ignition system could lead to

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<sup>38</sup> *U.S. Army Installation Command* (Schofield Barracks, Oahu, Hawaii, and Pohakuloa Training Area, Island of Hawaii, Hawaii), LBP-10-4, 71 NRC 216, 229-30 (2010) (citing *Lujan v. Defenders of Wildlife*, 504 U.S. 555, 561 (1992)), *aff’d*, CLI-10-20, 72 NRC 185 (2010); *see also Strata Energy, Inc.* (Ross In Situ Recovery Uranium Project), LBP-12-3, 75 NRC 164, 177 (2012) (referencing “plausible factual allegations” standard).

<sup>39</sup> *Georgia Institute of Technology* (Georgia Tech Research Reactor, Atlanta, Georgia), LBP-95-6, 41 NRC 281, 286 (citing *Warth v. Seldin*, 422 U.S. 490, 501 (1975), and *Kelly v. Selin*, 42 F.3d 1501, 1507-08 (6th Cir. 1995)), *aff’d*, CLI-95-12, 42 NRC 111 (1995); *accord Sierra Club v. Environmental Protection Agency*, 292 F.3d 895, 898-99 (D.C. Cir. 2002) (“At the pleading stage, ‘general factual allegations of injury resulting from the defendant’s conduct may suffice,’ and the court ‘presum[es] that general allegations embrace the specific facts that are necessary to support the claim.’” (quoting *Defenders of Wildlife*, 504 U.S. at 561)).

<sup>40</sup> *Crow Butte Resources, Inc.* (Marsland Expansion Area), CLI-14-2, 79 NRC 11, 19 n.45 (2014) (quoting *Ga. Tech*, CLI-95-12, 42 NRC at 115, and citing *Duke Energy Carolinas, LLC* (William States Lee III Nuclear Station, Units 1 and 2), LBP-08-17, 68 NRC 431, 439 (2008); *Progress Energy Carolinas, Inc.* (Shearon Harris Nuclear Power Plant, Units 2 and 3), LBP-08-21, 68 NRC 554, 559 (2008)).

<sup>41</sup> *See Entergy Nuclear Vermont Yankee, LLC* (Vermont Yankee Nuclear Power Station), CLI-10-17, 72 NRC 1, 45 n.246 (2010) (declining to reject argument on procedural grounds given practice of “treating *pro se* litigants more leniently than litigants with counsel”); *Florida Power & Light Co.* (Turkey Point Nuclear Generating Plant, Units 3 and 4), CLI-01-17, 54 NRC 3, 15 (2001) (“Given that Mr. Oncavage is a *pro se* intervenor, however, the Commission has made a special effort to review the contentions he made in his Amended Petition before the Board.”); *Virginia Electric and Power Co.* (North Anna Power Station, Units 1 and 2), ALAB-146, 6 AEC 631, 633 & n.4 (1973) (recognizing that *pro se* petitioner is not held to the same standards of clarity and precision as a lawyer).

<sup>42</sup> BREDL Standing Declarations (May 2, 2016) [hereinafter Standing Declarations].

rupture of the containment structure, releasing radioactive contamination and endangering [the declarant] and other residents of Shell Bluff.”<sup>43</sup>

BREDL’s Petition explains the basis of these claims. BREDL states that 5 years ago Southern Nuclear identified a key safety risk: “[T]he potential for hydrogen generated from an atomic reactor meltdown to seriously damage the containment of the AP1000 atomic reactor at Vogtle Units 3 and 4.”<sup>44</sup> BREDL bases that claim on the statement in the LAR that “[d]esign reviews in 2011 identified a credible scenario in which the applicable plant damage state meets the core damage frequency cutoff to be considered as part of the severe accident analysis.”<sup>45</sup> The identification of this credible scenario resulted in Southern Nuclear “conservatively determining, by engineering judgment, that two additional hydrogen igniters should be installed outside of and at the [IRWST] roof vents to meet the design criteria for the hydrogen igniters.”<sup>46</sup>

BREDL observes that “[t]he purpose of the hydrogen ignition system is to prevent levels of hydrogen created by a reactor accident from reaching concentrations sufficient to cause a breach of containment.”<sup>47</sup> That much appears to be undisputed; NRC regulations recognize that control of hydrogen, oxygen, and other substances in the containment atmosphere is necessary to assure that containment integrity is maintained.<sup>48</sup> The LAR itself states that “[t]he primary objective of the hydrogen ignition subsystem is to promote hydrogen burning at a low concentration and, to the extent possible, to burn hydrogen more or less continuously so that the hydrogen concentration does not build up in the containment.”<sup>49</sup> As the Staff explains, “hydrogen igniters create deliberate ignition sources that allow for small, controlled, volumetric burns to remove hydrogen and oxygen early in an accident before they can accumulate to levels large enough to challenge containment integrity or equipment.”<sup>50</sup> The concern with maintaining containment integrity led Southern Nuclear to propose adding the two new igniters to the IRWST roof vents. Southern Nuclear determined that “igniter coverage can be improved to burn any hydrogen that may potentially exit through the IRWST roof vents. Burning of hydrogen near the vents before it can be combined with the containment atmosphere will prevent [a] potentially detonable mixture from being created.”<sup>51</sup>

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<sup>43</sup> *Id.*

<sup>44</sup> Petition at 6.

<sup>45</sup> *Id.* (quoting LAR, Encl. 1, at 4).

<sup>46</sup> LAR, Encl. 1, at 4.

<sup>47</sup> Petition at 4.

<sup>48</sup> 10 C.F.R. Part 50, App. A, GDC 41.

<sup>49</sup> LAR, Encl. 1, at 3.

<sup>50</sup> Staff Answer at 16 (citing LAR, Encl. 1, at 3).

<sup>51</sup> LAR, Encl. 2, at 3.

The LAR's technical evaluation explains in more detail why Southern Nuclear concluded that igniter coverage of the IRWST roof vents could be improved. It states that "[t]he IRWST roof vents along the steam generator dog-house wall is a likely area, based on engineering judgment, where hydrogen will be released."<sup>52</sup> But while hydrogen igniters are located inside the IRWST and at the hooded vents along the containment wall, "the roof vents do not have igniters located directly at their exit exterior to the IRWST."<sup>53</sup> The LAR indicates that two additional igniters should be added at the roof vents because (1) the existing igniters within the interior roof of the IRWST may not burn hydrogen before it is released from the roof vents because of a lack of oxygen within the IRWST; (2) the hooded vents along the containment wall "rarely, if ever, open for hydrogen releases"; and therefore (3) "hydrogen will be preferentially released from the roof vents located away from the containment shell."<sup>54</sup>

Absent the proposed new igniters, the closest igniters to the IRWST roof vents are located approximately 30 feet above the IRWST.<sup>55</sup> Southern Nuclear concluded that the "mixing in the volume above the IRWST where the plume is released from the IRWST vents is too complex to be accurately modeled to either quantitatively confirm the need for additional igniters or confirm that the current design . . . could control the local hydrogen releases from the roof vents."<sup>56</sup> Therefore, Southern Nuclear concluded that two additional hydrogen igniters should be placed outside the IRWST roof vents so that hydrogen can be burned as it is released from the vents and mixes with oxygen, "preventing localized mixtures that could be susceptible to flame acceleration."<sup>57</sup>

BREDL challenges Southern Nuclear's claim that, with the addition of the two hydrogen igniters as proposed in the LAR, the hydrogen ignition subsystem will be adequate to control hydrogen buildup within containment during a severe accident and prevent a detonation that could damage the containment. BREDL alleges that granting the LAR "could allow conditions leading to unsafe levels of hydrogen," thus creating the potential for breach of containment.<sup>58</sup> BREDL therefore maintains that the "[g]ranteeing of the LAR would present a tangible and particular risk of harm to the health and well-being of our members."<sup>59</sup>

BREDL argues that "[i]nstead of protecting against the threat of a hydrogen buildup and subsequent explosion," the solution proposed in the LAR "intro-

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<sup>52</sup> *Id.*, Encl. 1, at 11.

<sup>53</sup> *Id.*

<sup>54</sup> *Id.*

<sup>55</sup> *Id.*

<sup>56</sup> *Id.* at 4.

<sup>57</sup> *Id.*

<sup>58</sup> Petition at 4.

<sup>59</sup> *Id.* at 5.

duces a new threat to the already vulnerable AP1000 containment by placing Vogtle Units 3 and 4 hydrogen igniters possibly near the location of excess concentrations of hydrogen.”<sup>60</sup> BREDL asserts that “[t]he AP1000 containment is already within [one] pound per square inch of its design limit without considering the additional pressure that would be created by either a detonation or deflagration shock wave if one of the proposed igniters causes backflow into a sub-compartment.”<sup>61</sup>

According to BREDL, granting the LAR would result in “an unanalyzed condition that significantly compromises plant safety” because the proposed location of the new igniters is based only on “engineering judgement [sic] instead of rigorous testing and analysis.”<sup>62</sup> BREDL claims that, “[r]ather than performing a rigorous gaseous diffusion and flame propagation analysis, [Southern Nuclear] chose to place two hydrogen igniters in a ‘likely area’ by relying upon the personal ‘engineering judgment’ of its engineers.”<sup>63</sup> BREDL argues that a much more rigorous analysis should be required.<sup>64</sup>

BREDL cites several specific issues that it maintains the LAR should have considered, but did not. The first is hydrogen stratification. According to BREDL, hydrogen may form in strata, or layers, that “can explode when too much hydrogen has formed in one area near an igniter.”<sup>65</sup> This would cause the explosion that the proposed igniters are intended to prevent. Also, the LAR should address sources of hydrogen other than the reaction between zirconium and water. BREDL maintains that these other sources “can produce hydrogen and oxygen in a stoichiometric ratio, causing an explosion simply from being in proximity to the proposed hydrogen igniters.”<sup>66</sup> BREDL cites as examples of these other sources radiolytic decomposition of water and concrete degradation from contact with corium.<sup>67</sup> Finally, BREDL emphasizes that the LAR should have considered “the possibility that the igniter can create a flame that blows back through the [IRWST] roof vents along the steam generator dog house wall into the sub-compartment causing a serious detonation.”<sup>68</sup>

BREDL further alleges that “[e]xperience in Japan is illustrative of the unanticipated problems that have been created by the LAR placing hydrogen igniters

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<sup>60</sup> *Id.* at 8.

<sup>61</sup> *Id.* at 10 (citing *id.*, Attach. 1, Decl. of Arnold Gundersen (May 2, 2016) [hereinafter Gundersen Decl.]).

<sup>62</sup> *Id.* at 8.

<sup>63</sup> *Id.* at 11.

<sup>64</sup> *Id.*

<sup>65</sup> *Id.*

<sup>66</sup> *Id.* at 12.

<sup>67</sup> *Id.*

<sup>68</sup> *Id.*

near a source of hydrogen based simply on ‘engineering judgment’ and not a root cause analysis determination.”<sup>69</sup> Citing a September 17, 2013 presentation by the Japan Nuclear Energy Safety Organization to the International Atomic Energy Agency, BREDL states that a hydrogen explosion (a “deflagration shockwave”) occurred at Fukushima Daiichi Unit 1 because 400 kilograms of hydrogen leaked from containment, while at Fukushima Daiichi Unit 3 another type of hydrogen explosion (a “detonation shockwave”) resulted from “1000 kilograms of hydrogen that remained in the basement for unknown reasons and did not flow upward to the refueling floor.”<sup>70</sup>

## **2. Obviously Increased Potential for Offsite Consequences**

BREDL has satisfied its obligation to identify in its Petition “some ‘plausible chain of causation,’ some scenario suggesting how [the LAR] would result in a distinct new harm or threat” to its members.<sup>71</sup> BREDL contends, on the basis of the allegations just summarized, that the unanalyzed design modification proposed in the LAR may increase rather than mitigate the risk of a detonation within containment during a severe accident.<sup>72</sup> Given the acknowledged risk of a “potentially detonable mixture” from the accumulation of hydrogen and other gases in the containment atmosphere during a severe accident,<sup>73</sup> BREDL plausibly alleges that placing two new igniters in close proximity to hydrogen sources inside containment without adequate technical analysis would put at risk the allegedly vulnerable AP1000 containment.<sup>74</sup> And it is certainly plausible that a breach of containment during a severe accident would result in the release of radioactive contamination to the surrounding environment, which “would present a tangible and particular risk of harm to the health and well-being” of BREDL’s members who live near Vogtle Units 3 and 4.<sup>75</sup>

We are not persuaded by Southern Nuclear’s argument that BREDL’s chain of causation is too unlikely to support an obvious potential for offsite consequences.<sup>76</sup> Southern Nuclear argues that BREDL’s detonation scenario could only occur in the event of a beyond-design-basis accident with a frequency of  $5.8 \times 10^8$  per reactor year.<sup>77</sup> But the low estimate of the probability of a severe

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<sup>69</sup> *Id.* at 9.

<sup>70</sup> *Id.* at 9-10.

<sup>71</sup> *Zion Nuclear Power Station*, CLI-99-4, 49 NRC at 192.

<sup>72</sup> Petition at 7-12.

<sup>73</sup> LAR, Encl. 2, at 3.

<sup>74</sup> Petition at 8-10.

<sup>75</sup> *Id.* at 5.

<sup>76</sup> See Southern Nuclear Answer at 29-30.

<sup>77</sup> *Id.* at 30.

accident does not mean that BREDL lacks standing to challenge the LAR for the two new hydrogen igniters. In the *Calvert Cliffs* reactor licensing proceeding, the board rejected the applicant's similar argument against standing based on its low estimate of the probability of an accidental release of radioactivity from the proposed new reactor.<sup>78</sup> The licensing board noted that federal courts have not generally imposed a minimum quantitative threshold on the probability of future injury alleged as the basis of standing.<sup>79</sup> And "various contemporaneous standing decisions find the 'injury-in-fact' requirement satisfied without the type of quantitative proof of harm Applicant contends is required."<sup>80</sup>

Moreover, "risk equals the likelihood of an occurrence times the severity of the consequences."<sup>81</sup> Therefore an estimate of the likelihood of a severe accident alone, unaccompanied by any consideration of the severity of the consequences, fails to provide a persuasive argument against standing.

At oral argument, Southern Nuclear acknowledged that it is not aware of any Commission or federal court decision imposing a minimum quantitative risk threshold for standing, and it stated that its position on standing is not based on such a requirement.<sup>82</sup> Rather, its position is that the alleged injury or off-site consequences must be probable and cannot be based on mere speculation.<sup>83</sup> In fact, both the Commission and licensing boards have upheld application of the proximity presumption to risk scenarios that were, if anything, less plausible than BREDL's allegations in this case. For example, in a case involving the relicensing of a research reactor, the Commission determined that the petitioner had standing under the proximity presumption despite the licensee's argument that the hypothetical accident scenarios underlying the standing argument were "incredible" because they would "first require three independent redundant safety

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<sup>78</sup> *Calvert Cliffs*, LBP-09-4, 69 NRC at 183-86. The applicant estimated the large release frequency for internal, at-power events of  $2.6 \times 10^{-8}$  per year. *Id.* at 186 n.48.

<sup>79</sup> *Id.* at 184-85 & n.40 (citations omitted).

<sup>80</sup> *Id.* at 185 & n.44 (citing *Friends of the Earth v. Laidlaw Environmental Services, Inc.*, 528 U.S. 167, 182-84 (2000) ("injury-in-fact was adequately documented by the affidavits and testimony of members of the plaintiff organizations asserting that the defendant's pollutant discharges, and the affiants' reasonable concerns about the effects of those discharges, directly affected those affiants' recreational, aesthetic, and economic interests; plaintiffs did not have to show that the discharges actually harmed the environment"); *Covington v. Jefferson County*, 358 F.3d 626, 638-41 (9th Cir. 2004) (sufficient to allege that defendant's actions "caused 'reasonable concern' of injury to" the plaintiff); *Sierra Club, Lone Star Chapter v. Cedar Point Oil Co. Inc.*, 73 F.3d 546, 556 (5th Cir. 1996) (affiants' "concern" that discharges would impair water quality is sufficient)).

<sup>81</sup> *Limerick Ecology Action, Inc. v. NRC*, 869 F.2d 719, 738 (3d Cir. 1989) (citing *Baltimore Gas & Electric Co. v. Natural Resources Defense Council, Inc.*, 462 U.S. 87, 104-05 (1983) (quoting NUREG-0116 at 2-11)).

<sup>82</sup> Tr. at 102-03.

<sup>83</sup> *Id.*

systems to fail.”<sup>84</sup> In the *Perry* proceeding, the Commission determined that the proximity presumption applied even though the challenged license amendment affected only the petitioner’s right to request a hearing on any changes to the material specimen testing schedule that might be proposed at some future date.<sup>85</sup> Similarly, licensing boards have found standing in cases where the proximity presumption was based on “unlikely” but plausible risk scenarios.<sup>86</sup> Therefore, even though a severe accident is improbable, BREDL has justified the application of the proximity presumption by plausibly alleging that the LAR will increase the likelihood of damage to the containment structures if such an accident occurs, with an obvious potential for offsite consequences affecting its members if the containment structures were breached.

By contrast, when the Commission has found no obvious potential for off-site consequences it was not solely because the petitioner’s risk scenario was uncertain or unlikely, but because there were no changes to “the physical plant itself, its operating procedures, design basis accident analysis, management, or personnel.”<sup>87</sup> Thus, the Commission has rejected proximity standing for license transfers,<sup>88</sup> license amendments associated with shutdown and defueled reactors,<sup>89</sup> and certain changes to worker-protection requirements.<sup>90</sup> Here, however, Southern Nuclear proposes to modify the hydrogen ignition subsystem, which implicates the control of hydrogen gas within containment and the integrity of the primary containment structures if hydrogen gas is not adequately controlled during a severe accident.<sup>91</sup> Thus, the challenged LAR proposes modifications to

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<sup>84</sup> See *Ga. Tech.*, CLI-95-12, 42 NRC at 117. In *Sequoyah Fuels*, CLI-94-12, 40 NRC at 74 n.19, the Commission noted that in *National Wildlife Federation v. Hodel*, 839 F.2d 694, 713 (D.C. Cir. 1988), the court upheld the standing of an organization representing a petitioner claiming injury from soil disturbance caused by mining, despite the industry’s argument that the alleged injury could only occur “upon the chance occurrence of eight events,” one of which only had “a 0.8% chance of occurring.”

<sup>85</sup> *Perry*, CLI-93-21, 38 NRC at 90-96.

<sup>86</sup> See *Shaw AREVA MOX Services* (Mixed Oxide Fuel Fabrication Facility), LBP-07-14, 66 NRC 169, 187-88 (2007) (concluding based on “the Application and the Board’s own technical expertise” that nuclear criticality was a “legitimate concern” in the context of license to operate a mixed oxide fuel fabrication facility); *CFC Logistics, Inc.*, LBP-03-20, 58 NRC 311, 320 (2003) (identifying an “unlikely, yet plausible, scenario in which an accident of some sort could damage the armored pool containing the cobalt-60 at the [food processing irradiator] facility”).

<sup>87</sup> See *Peach Bottom*, CLI-05-26, 62 NRC at 582 (stating that the license transfer did not implicate these concerns).

<sup>88</sup> *Id.* at 581.

<sup>89</sup> *Commonwealth Edison Co.* (Zion Nuclear Power Station, Units 1 and 2), LBP-98-27, 48 NRC 271, 276 (1998), *aff’d*, CLI-99-4, 49 NRC 185, 191 (1999).

<sup>90</sup> *St. Lucie*, CLI-89-21, 30 NRC at 329-30.

<sup>91</sup> LAR, Encl. 1, at 3-4.

the physical plant of the new reactors, and BREDL alleges that those proposed modifications will create a dangerous situation rather than mitigating it.

Southern Nuclear also argues that BREDL's claims are in conflict with the NRC's findings in the AP1000 Safety Evaluation Report and that BREDL has failed to provide "relevant support" for its risk scenario.<sup>92</sup> Our ruling on standing, however, is not the point at which to resolve those disputes. The Commission has drawn a clear distinction between standing and the ultimate merits of a proposed contention, concluding that a "full-blown factual inquiry" is not required for the "threshold legal question" of standing.<sup>93</sup> The Commission has adopted the "often-repeated admonition to avoid the familiar trap of confusing the standing determination with the assessment of petitioner's case on the merits."<sup>94</sup> It follows "the fundamental principle that the ultimate merits of the case have no bearing on the threshold question of standing."<sup>95</sup> The standing determination is not the appropriate juncture at which to make findings on the underlying dispute because doing so "would require us to reach beyond the minimum threshold for standing."<sup>96</sup> Thus, our ruling means only that BREDL has made a sufficient showing on the threshold issue of standing, not that its allegations are correct.

Similarly, arguments concerning contention admissibility, while relevant to whether BREDL's request for a hearing may be granted, fail to provide a reason to deny BREDL standing because our evaluation of the threshold issue of standing does not depend on the admissibility of its contentions. In *Perry*, for example, the Commission held that the Petitioners had standing based on the proximity presumption, while stating that its ruling did "not signify any opinion on the admissibility or the merits of the Petitioners' contention."<sup>97</sup> As this

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<sup>92</sup> Southern Nuclear Answer at 30.

<sup>93</sup> *Sequoyah Fuels*, CLI-01-2, 53 NRC at 15 (quotation omitted); see also *Shaw AREVA*, LBP-07-14, 66 NRC at 188 ("Petitioners are not required to demonstrate their asserted injury with 'certainty,' nor to 'provide extensive technical studies' in support of their standing argument. . . . Resolving standing questions is an entirely different matter than adjudicating the ultimate merits of a contention." (internal quotation omitted)).

<sup>94</sup> *Sequoyah Fuels*, CLI-01-2, 53 NRC at 15 (quoting *Sequoyah Fuels Corp.* (Gore, Oklahoma Site Decontamination and Decommissioning Funding), LBP-94-5, 39 NRC 54, 68 (1994), *aff'd*, CLI-94-12, 40 NRC 64 (1994)).

<sup>95</sup> *Id.* (quoting *Campbell v. Minneapolis Public Housing Authority*, 168 F.3d 1069, 1074 (8th Cir. 1999)); see also *Blackhawk Heating & Plumbing Co. v. Driver*, 433 F.2d 1137, 1140 (D.C. Cir. 1970) ("[T]he question of standing is a preliminary matter which does not go to the merits of the case."); see also *International Uranium (USA) Corp.* (White Mesa Uranium Mill), CLI-02-10, 55 NRC 251, 255-56 (2002) (noting the distinction between the ultimate merits and the threshold issue of standing).

<sup>96</sup> *Gulf States Utilities Co.* (River Bend Station, Unit 1), CLI-94-10, 40 NRC 43, 49 (1994).

<sup>97</sup> *Perry*, CLI-93-21, 38 NRC at 96.

ruling confirms, standing and contention admissibility are distinct issues, and a licensing board need not rule on contention admissibility to decide standing.<sup>98</sup> Thus, licensing boards have ruled that allegations were sufficient to establish standing even though they were insufficient to support a valid contention.<sup>99</sup> This is because the requirements for contention admissibility are “considerably more stringent” than those for standing.<sup>100</sup>

Therefore, we do not need to resolve Southern Nuclear’s argument that BREDL’s contentions are in conflict with the NRC’s findings in the AP1000 Safety Evaluation Report<sup>101</sup> to decide whether BREDL has standing.<sup>102</sup> Instead, we address that issue below in our ruling on contention admissibility. For the same reason, we reject Southern Nuclear’s argument that, in order to make the standing determination, the Board must decide whether BREDL’s expert affidavit and the other sources it cites provide adequate support for its contentions.<sup>103</sup> In order to satisfy contention admissibility requirements, the petitioner must identify the facts or expert opinions on which it relies and show that they present a genuine dispute of material fact with the application.<sup>104</sup> But the Commission does not require that a petitioner’s standing be supported by expert affidavits regarding a petitioner’s “plausible scenario” for injury,<sup>105</sup> much less that such affidavits be sufficient to support an admissible contention. As just noted, petitioner’s support for standing may be adequate even though it may be insufficient to support an admissible contention. Thus, in deciding standing, we may consider Mr. Gundersen’s Declaration and the other supporting information cited by BREDL without deciding whether those sources provide adequate support for BREDL’s contentions.

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<sup>98</sup> *Id.*; see also *Dominion Nuclear Connecticut, Inc.* (Millstone Nuclear Power Station, Unit 2), CLI-03-14, 58 NRC 207, 215-18 (2003).

<sup>99</sup> *Dominion Nuclear Connecticut, Inc.* (Millstone Nuclear Power Station, Unit 2), LBP-03-12, 58 NRC 75, 92-93 (2003) (concluding that the petitioner’s showing of an “obvious potential for offsite consequences,” while sufficient for standing, was insufficient to support an admissible contention), *aff’d*, CLI-03-14, 58 NRC 207 (2003); *Ga. Tech.*, LBP-95-6, 41 NRC at 287; *Consumers Power Co.* (Palisades Nuclear Plant), LBP-79-20, 10 NRC 108, 115 (1979).

<sup>100</sup> *Millstone Nuclear Power Station*, LBP-03-12, 58 NRC at 93.

<sup>101</sup> Southern Nuclear Answer at 30.

<sup>102</sup> See William States Lee, LBP-08-17, 68 NRC at 438-39, 442-43 (concluding petitioner had standing but its contentions related to the AP1000 design were inadmissible).

<sup>103</sup> See Southern Nuclear Answer at 30 (stating that BREDL’s allegations lack “relevant support”).

<sup>104</sup> 10 C.F.R. § 2.309(f)(1)(v)-(vi).

<sup>105</sup> *Crow Butte Resources, Inc.* (North Trend Expansion Project), CLI-09-12, 69 NRC 535, 545-46 (2009) (finding “no basis” for the proposition that a petitioner must provide expert testimony in support of its “plausible scenario” of injury offered to establish standing).

### 3. *Sufficient Proximity to Vogtle Units 3 and 4*

In addition to requiring that the LAR entail an obviously increased potential for offsite consequences, the proximity presumption also requires that BREDL's members live or otherwise regularly utilize areas sufficiently near Vogtle Units 3 and 4 that they likely would be affected by the alleged offsite consequence, the release of radioactive contamination to the environment because of a breach of containment.

On that issue, each of BREDL's members has filed a declaration stating that he or she lives within 25 miles of Vogtle Units 3 and 4.<sup>106</sup> BREDL states that some of its members live within 7 miles of Vogtle.<sup>107</sup> "In ruling on claims of 'proximity standing,' we decide the appropriate radius on a case-by-case basis."<sup>108</sup> The Staff does not dispute BREDL's standing, Southern Nuclear does not argue that BREDL's members live beyond the appropriate radius from Units 3 and 4, and, as BREDL notes, representational standing has been granted to an organization whose members lived within 15 miles of the subject plant.<sup>109</sup> A detonation that damages the containment structure during a severe accident could plausibly put at risk the health and well-being of persons living within 25 miles of the damaged nuclear power plant, and certainly of persons living within 7 miles of the plant. We therefore conclude that BREDL's members live sufficiently near Vogtle Units 3 and 4 to justify application of the proximity presumption.

Because BREDL has satisfied standing requirements, we move on to consider the admissibility of its contentions.

### III. ADMISSABILITY OF PETITIONER'S CONTENTIONS

BREDL sets forth two interrelated contentions asserting that the hydrogen igniter modifications proposed in the LAR should not be permitted. BREDL's first contention is that the LAR creates, rather than mitigates, an extremely dangerous situation because the proposed hydrogen igniter modifications were poorly conceived by relying principally on "engineering judgment."<sup>110</sup> BREDL's second contention is that the basis for the proposed modification fails to account for historical precedents of hydrogen explosions, including events at Fukushima.<sup>111</sup>

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<sup>106</sup> Standing Declarations.

<sup>107</sup> Petition at 5.

<sup>108</sup> *Peach Bottom*, CLI-05-26, 62 NRC at 580.

<sup>109</sup> Petition at 3-4 (citing *Entergy Nuclear Vermont Yankee, LLC* (Vermont Yankee Nuclear Power Station), LBP-04-28, 60 NRC 548, 553-54 (2004)).

<sup>110</sup> *Id.* at 7-10; *see also supra* Section II.B.1.

<sup>111</sup> Petition at 9-12; *see also supra* Section II.B.1.

In support of its second contention, BREDL also alleges that hydrogen sources, stratification, and containment vulnerability due to “flame backflow into a sub-compartment” have not been addressed.<sup>112</sup>

We conclude that BREDL’s two contentions in substance challenge the approved hydrogen control system of the AP1000 certified design, the licenses of Vogtle Units 3 and 4, and NRC regulations. We also decide that, in certain respects explained below, BREDL’s contentions fail to identify a material dispute with the LAR. Accordingly, we may not admit either contention.

#### **A. General Pleading Requirements**

To participate as a party in this proceeding, a petitioner for intervention must not only establish standing, but also proffer at least one admissible contention that meets the requirements of 10 C.F.R. § 2.309(f)(1).<sup>113</sup> An admissible contention must: (1) provide a specific statement of the legal or factual issue; (2) provide a brief explanation of the basis for the contention; (3) demonstrate that the issue is within the scope of the proceeding; (4) demonstrate that the issue is material to the findings the NRC must make to support the action that is involved in the proceeding; (5) provide a concise statement of the alleged facts or expert opinions, including references to specific sources and documents, that support the petitioner’s position and upon which the petitioner intends to rely at the hearing; and (6) provide sufficient information to show a genuine dispute concerning a material issue of law or fact, including references to specific portions of the application that the petitioner disputes, or, in the case where the application is alleged to be deficient, the identification of such deficiencies and supporting reasons for this belief.<sup>114</sup>

#### **B. Scope of Review of License Amendments**

NRC regulations define the Commission’s scope of review of a license amendment application broadly: “In determining whether an amendment to a license, construction permit, or early site permit will be issued to the applicant, the Commission will be guided by the considerations which govern the issuance of initial licenses, construction permits, or early site permits to the extent applicable and appropriate.”<sup>115</sup> The “applicant must satisfy the requirements of 10 C.F.R. § 50.90 and demonstrate that the requested amendment meets all appli-

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<sup>112</sup> Petition at 10-12; *see also supra* Section II.B.1.

<sup>113</sup> *See* 10 C.F.R. § 2.309(a).

<sup>114</sup> *Id.* § 2.309(f)(1)(i)-(vi).

<sup>115</sup> *Id.* § 50.92(a).

cable regulatory requirements and acceptance criteria and does not otherwise harm the public health and safety or the common defense and security.”<sup>116</sup>

## C. Regulatory Framework

### 1. *The Hydrogen Control System for the AP1000 Certified Design*

As previously discussed,<sup>117</sup> the LAR proposes the addition of two hydrogen igniters within the containment of Vogtle Units 3 and 4.<sup>118</sup> Hydrogen igniters are a component of the AP1000 hydrogen control system for the AP1000 certified design associated with Vogtle Units 3 and 4.<sup>119</sup> The hydrogen control system of the AP1000 design, including hydrogen igniters, was subject to the combustible gas control requirements of 10 C.F.R. Part 50 during the design certification process.<sup>120</sup> The regulatory requirements of Part 50 ensure that hydrogen concentrations within containment are monitored and controlled.

An applicant for a design certification must include the principal design criteria identified in the General Design Criteria as set forth in Appendix A of 10 C.F.R. Part 50.<sup>121</sup> Criterion 41 of the General Design Criteria requires that

[s]ystems to control fission products, hydrogen, oxygen, and other substances which may be released into the reactor containment shall be provided as necessary to reduce, consistent with the functioning of other associated systems, the concentration and quality of fission products released to the environment following postulated accidents, and to control the concentration of hydrogen or oxygen and other substances in the containment atmosphere following postulated accidents to assure that containment integrity is maintained.<sup>122</sup>

Pursuant to 10 C.F.R. § 50.44, entitled “Combustible gas control for nuclear power reactors,” water-cooled reactors licensed after October 16, 2003, must (1)

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<sup>116</sup> *Tennessee Valley Authority* (Sequoyah Nuclear Plant, Units 1 and 2; Watts Bar Nuclear Plant, Unit 1), LBP-02-14, 56 NRC 15, 35 (2002); *accord Entergy Nuclear Operations, Inc.* (Palisades Nuclear Plant), CLI-15-22, 82 NRC 310, 316 & n.44 (2015); *Northern States Power Co.* (Prairie Island Nuclear Generating Plant, Units 1 and 2), ALAB-455, 7 NRC 41, 44 (1978).

<sup>117</sup> *See supra* Section I.

<sup>118</sup> LAR, Encl. 1, at 3.

<sup>119</sup> *See id.*

<sup>120</sup> Final Safety Evaluation Report Related to Certification of the AP1000 Standard Design, Vol. 1, Chs. 1-9, NUREG-1793, at 6-71 (Sept. 30, 2004) (ADAMS Accession No. ML043450354) [hereinafter NUREG-1793]; Westinghouse AP1000 Design Control Document, Revision 19, Tier 2, Ch. 6, Sec. 6.2, Containment Systems (June 13, 2011), at 6.2-38 (ADAMS Accession No. ML11171-A458) [hereinafter AP1000 DCD].

<sup>121</sup> *See* 10 C.F.R. § 50.34(a)(3)(i) (setting forth requirements for preliminary safety analysis report).

<sup>122</sup> 10 C.F.R. Part 50, App. A, GDC 41.

have the capability to maintain a mixed atmosphere within containment during a design-basis or significantly beyond-design-basis accident; (2) have an inerted atmosphere or limit hydrogen concentrations in containment to less than 10% by volume during an accident that releases hydrogen from a 100% fuel-clad coolant reaction; (3) have the ability to establish and maintain safe shutdown and containment structural integrity with systems and components exposed to conditions created by the burning of hydrogen; (4) have equipment to monitor hydrogen within containment; and (5) have an analysis that demonstrates containment structural integrity in the event of an accident that releases hydrogen from a 100% fuel-clad coolant reaction with accompanying hydrogen burning.<sup>123</sup> As a component of the AP1000 hydrogen control system, hydrogen igniters address the requirements of 10 C.F.R. Part 50.<sup>124</sup>

The AP1000 DCD, which is incorporated by reference in the design certification rule,<sup>125</sup> sets forth the location criteria, implementation requirements, and in-containment elevations of all sixty-four hydrogen igniters in DCD Tables 6.2.4-6 and 6.2.4-7.<sup>126</sup> During the AP1000 design certification process, the NRC reviewed placement of hydrogen igniters and concluded that adequate coverage existed to satisfy the requirements of 10 C.F.R. § 50.44.<sup>127</sup>

The license application for Vogtle Units 3 and 4 incorporated by reference the AP1000 DCD components related to the hydrogen control system, including DCD Tables 6.2.4-6 and 6.2.4-7, without any departure, exemption, or site-specific information.<sup>128</sup> A significant provision of Table 6.2.4-6, which was incorporated, is the requirement that “[i]n locations where the potential hydrogen release location can be defined, i.e.,] above the IRWST spargers, *at IRWST vents*, etc[.,] igniter coverage is provided as close to the source as feasible.”<sup>129</sup> The placement criteria of Table 6.2.4-6 are not modified by the LAR.<sup>130</sup> The

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<sup>123</sup> See 10 C.F.R. § 50.44(c)(1)-(5).

<sup>124</sup> See NUREG-1793, at 6-71.

<sup>125</sup> See 10 C.F.R. Part 52, App. D, § III.A.

<sup>126</sup> AP1000 DCD at 6.2-113 to -116.

<sup>127</sup> NUREG-1793, at 6-68, 6-71.

<sup>128</sup> See Final Safety Evaluation Report, Related to the Combined Licenses for Vogtle Electric Generating Plant, Units 3 and 4, Vol. 1, NUREG-2124, at 6-14 (Sept. 2012) (ADAMS Accession No. ML12271A045) [hereinafter NUREG-2124]; see also Southern Nuclear Operating Company, Combined Licenses Application for Vogtle Electric Generating Plant, Units 3 & 4, Pt. 2, Final Safety Analysis Report, Rev. 5 (June 24, 2011) at 6.2-1 (ADAMS Accession No. ML11180A100) [hereinafter FSAR].

<sup>129</sup> Vogtle, Units 3 and 4, Updated Final Safety Analysis Report, Rev. 4, Ch. 6, Engineered Safety Features (June 26, 2015), at 6.2-104 (ADAMS Accession No. ML15194A462) (emphasis added) [hereinafter UFSAR].

<sup>130</sup> LAR, Encl. 3, at 11 (identifying minor language revisions to accommodate the addition of two hydrogen igniters).

LAR, however, does modify Table 6.2.4-7 by identifying the placement elevations of the proposed IRWST Roof Vent hydrogen igniters.<sup>131</sup> The locations of the existing sixty-four hydrogen igniters are unchanged.

## 2. *The Legal Effect of Design Certification*

Pursuant to NRC regulations, a certified reactor design, including the AP-1000, is final and the NRC may not impose new requirements absent special circumstances.<sup>132</sup> Specifically, 10 C.F.R. § 52.63 states that “while a standard design certification rule is in effect . . . , the Commission may not modify, rescind, or impose new requirements on the certification information, whether on its own motion, or in response to a petition from any person [absent special circumstances].”<sup>133</sup> Design finality was a primary objective of the Commission in adopting this approach, because “standardization through design certification has the potential for resolving design-specific issues in a rule, which subsequently cannot be challenged through application-specific litigation.”<sup>134</sup>

DCD Revision 19 for the AP1000, which is applicable to Vogtle Units 3 and 4, is a final design approved by regulation and “includes the finding that additional or alternative structures, systems, components, design features, design criteria, testing, analyses, acceptance criteria, or justifications are not necessary for the AP1000 design.”<sup>135</sup> For purposes of this license amendment proceeding, finality applies to all Tier 1 and 2 issues, including the hydrogen control system and hydrogen igniters that were part of the certified design.<sup>136</sup>

Pursuant to 10 C.F.R. § 2.335, “no rule or regulation of the Commission, or any provision thereof, concerning the licensing of production and utilization facilities . . . is subject to attack by way of discovery, proof, argument, or other means in any adjudicatory proceeding subject to [10 C.F.R. Part 2 procedu-

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<sup>131</sup> *Id.* at 12.

<sup>132</sup> 10 C.F.R. § 52.63(a) (setting forth special circumstances for modifications to a certified design or imposition of a plant-specific order).

<sup>133</sup> *Id.* § 52.63(a)(1).

<sup>134</sup> Conduct of New Reactor Licensing Proceedings; Final Policy Statement, 73 Fed. Reg. 20,963, 20,970 (Apr. 17, 2008).

<sup>135</sup> 10 C.F.R. Part 52, App. D, § VI.A.

<sup>136</sup> *See id.* App. D, § VI.B.1 (“The Commission considers the following matters resolved within the meaning of 10 CFR 52.63(a)(5) in subsequent proceedings for issuance of a COL, *amendment of a COL*, or renewal of a COL, proceedings held under 10 CFR 52.103, and enforcement proceedings involving plants referencing this appendix . . . . All nuclear safety issues, except for the generic TS and other operational requirements, associated with the information in the FSER and Supplement Nos. 1 and 2, Tier 1, Tier 2 . . . , and the rulemaking records for initial certification and Amendment 1 of the AP1000 design . . . .” (emphasis added)).

ral rules].”<sup>137</sup> Therefore, a participant in an adjudicatory proceeding may not challenge a standard design such as the AP1000 that has been approved by regulation,<sup>138</sup> unless it petitions the Commission under section 2.335 for permission to do so.<sup>139</sup> In addressing a challenge to an AP1000 design, the Commission stated that “[t]o the extent [Petitioner] challenges the AP1000 design certified in Part 52, Appendix D, it is an impermissible challenge to NRC regulations.”<sup>140</sup> The Commission reached a similar conclusion regarding design finality in an unrelated proceeding regarding Vogtle Units 3 and 4.<sup>141</sup> Prohibiting challenges to certified designs complements the general principle that a contention may not litigate an issue that is the subject of rulemaking.<sup>142</sup>

Therefore, because BREDL has not filed a petition for a waiver or exception under section 2.335, it may only challenge the specific issues raised by the proposed addition of hydrogen igniters at the IRWST roof vents. BREDL may not challenge the AP1000 certified design by arguing, for example, that additional testing or analysis is necessary to support the design.

## D. Analysis of BREDL’s Contentions

### 1. Contention One

In Contention One, BREDL asserts that the LAR creates an extremely dangerous situation because the proposed hydrogen igniter locations at the IRWST roof vents are based on “engineering judgment” rather than technical analysis.<sup>143</sup>

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<sup>137</sup> 10 C.F.R. § 2.335(a).

<sup>138</sup> *Detroit Edison Co.* (Fermi Nuclear Power Plant, Unit 3), LBP-10-9, 71 NRC 493, 525 & n.146 (2010); *see also Shearon Harris*, LBP-08-21, 68 NRC at 571 (“[T]o the extent Contention TC-5 challenges matters addressed in the AP1000 DC Rule, Contention TC-5 is inadmissible because it is an impermissible challenge to the rule, failing to comply with the requirements of section 2.335 and contravening the provisions of section 52.63(a)(1).”).

<sup>139</sup> *Fermi Nuclear Power Plant*, LBP-10-9, 71 NRC at 525.

<sup>140</sup> *Progress Energy Carolinas, Inc.* (Shearon Harris Nuclear Power Plant, Units 2 and 3), CLI-10-9, 71 NRC 245, 260 (2010).

<sup>141</sup> *Southern Nuclear Operating Co.* (Vogtle Electric Generating Plant, Units 3 and 4), CLI-11-8, 74 NRC 214, 228-30 (2011) (rejecting a challenge to the containment design of the AP1000 certified design applicable to Vogtle Units 3 and 4).

<sup>142</sup> *See generally Southern Nuclear Operating Co.* (Early Site Permit for Vogtle ESP Site), LBP-07-3, 65 NRC 237, 252 (2007) (“An adjudication is not the proper forum for challenging applicable statutory requirements or the basic structure of the agency’s regulatory process. . . . Similarly, a contention that attacks a Commission rule, or which seeks to litigate a matter that is, or clearly is about to become, the subject of a rulemaking, is inadmissible. . . . This includes contentions that advocate stricter requirements than agency rules impose or that otherwise seek to litigate a generic determination established by a Commission rulemaking.”).

<sup>143</sup> Petition at 7-10; *see supra* Section II.B.1.

We may not admit Contention One, both because it fails to identify a genuine dispute with the LAR on a material issue of law or fact, as required by 10 C.F.R. § 2.309(f)(1)(vi),<sup>144</sup> and because it seeks to impose requirements that are outside the scope of this proceeding, in violation of 10 C.F.R. § 2.309(f)(1)(iii).<sup>145</sup>

As we have explained,<sup>146</sup> the proposed hydrogen igniters in the LAR mitigate the potential release of hydrogen from the IRWST roof vents during a severe accident.<sup>147</sup> Southern Nuclear relied on UFSAR Table 6.2.4-6 to locate the proposed hydrogen igniters.<sup>148</sup> As previously discussed, DCD and UFSAR Table 6.2.4-6 require hydrogen igniters to be placed at IRWST vents and “as close to the [hydrogen] source as feasible.”<sup>149</sup> Southern Nuclear “conservatively determin[ed], by engineering judgment, that two additional hydrogen igniters should be installed outside of and at the [IRWST] roof vents to meet the design criteria for the hydrogen igniters.”<sup>150</sup> Southern Nuclear states that the proposed hydrogen igniters are located “as close to the [hydrogen] source as feasible so the hydrogen can be burned as it is released from the vent and mixes with oxygen.”<sup>151</sup>

Although BREDL questions the placement of the proposed hydrogen igniters, arguing that Southern Nuclear unduly relied on engineering judgment, BREDL does not assert that the hydrogen igniters could be placed closer to the hydrogen source.<sup>152</sup> In fact, the only apparent way in which the new igniters could have been placed closer to the hydrogen source would be to place them inside the IRWST, but the LAR states — and BREDL has not disputed — that the existing igniters within the interior roof of the IRWST may not burn hydrogen before it is released from the roof vents because of a lack of oxygen within the IRWST.<sup>153</sup> Not surprisingly, therefore, BREDL has not argued that the new igniters should have been placed inside the IRWST. Thus, there is no genuine dispute as to

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<sup>144</sup> See Rules of Practice for Domestic Licensing Proceedings — Procedural Changes in the Hearing Process, 54 Fed. Reg. 33,168, 33,171 (Aug. 11, 1989) (“[A] protestant does not become entitled to an evidentiary hearing merely on request, or on a bald or conclusory allegation that . . . a dispute exists. The protestant must make a minimal showing that material facts are in dispute, thereby demonstrating that an ‘inquiry in depth’ is appropriate.”).

<sup>145</sup> See *Nuclear Management Co., LLC* (Palisades Nuclear Plant), LBP-06-10, 63 NRC 314, 338, *aff’d*, CLI-06-17, 63 NRC 727 (2006).

<sup>146</sup> See *supra* Section II.B.1.

<sup>147</sup> LAR, Encl. 1, at 3-4.

<sup>148</sup> *Id.* at 4.

<sup>149</sup> AP1000 DCD at 6.2-113; UFSAR at 6.2-104.

<sup>150</sup> LAR, Encl. 1, at 4.

<sup>151</sup> *Id.*

<sup>152</sup> See Petition at 7-10.

<sup>153</sup> LAR, Encl. 1, at 11.

whether the igniters could feasibly have been placed closer to the hydrogen source.

BREDL contends, however, that Southern Nuclear has not provided an adequate technical basis for locating the proposed new igniters at the IRWST roof vents. BREDL maintains that a “root cause analysis determination” should be required.<sup>154</sup> It also argues that the placement of the proposed igniters should be subject to “a rigorous gaseous diffusion and flame propagation analysis.”<sup>155</sup> BREDL wants Southern Nuclear to perform “rigorous testing and analysis” to determine whether new igniters should be located at the IRWST roof vents.<sup>156</sup> BREDL, however, does not identify any regulatory basis for requiring these analyses.<sup>157</sup> Pursuant to 10 C.F.R. § 52.63, new requirements may not be imposed on a certified design.<sup>158</sup> Therefore, absent a regulation requiring a gaseous diffusion and flame propagation analysis for the new igniters, the analyses BREDL demands cannot be imposed through this proceeding.<sup>159</sup>

BREDL also alleges, quoting Mr. Gundersen, that “[i]f the NRC allows the proposed poorly designed hydrogen igniter modification to be implemented at Vogtle Units 3 and 4, a gross containment failure from a detonation shock wave in a sub-compartment is likely to occur.”<sup>160</sup> This argument is based on Mr. Gundersen’s “backflow” theory,<sup>161</sup> which BREDL also relies on as support for Contention Two. However, for the reasons we explain below,<sup>162</sup> the “backflow” theory is outside the scope of this adjudication because it challenges the AP1000 certified design and would be inconsistent with the Commission’s ongoing review of the events at Fukushima to determine whether they require modification of the design. Therefore, BREDL may not rely on the “backflow” theory to challenge the LAR.

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<sup>154</sup> Petition at 9.

<sup>155</sup> *Id.* at 11. BREDL raises this issue in Contention Two, but we analyze it as part of Contention One because it appears more relevant to that Contention.

<sup>156</sup> *Id.* at 8.

<sup>157</sup> Southern Nuclear stated during oral argument that flame propagation analysis was performed for the existing hydrogen igniters located near walls within containment. Tr. at 70-71. The proposed hydrogen igniters at issue in this proceeding are not located near walls and do not raise any issue related to the prior flame propagation analysis. Tr. at 71.

<sup>158</sup> 10 C.F.R. § 52.63(a)(1).

<sup>159</sup> BREDL also asserts that a genuine dispute with Southern Nuclear exists, because the evaluations required by COL-ISG-025, Interim Staff Guidance on Changes during Construction under 10 C.F.R. Part 52, have not been undertaken. *See* Petition at 6, 10. However, Southern Nuclear’s pursuit of a license amendment makes these preliminary requirements moot. *See* Staff Answer at 19.

<sup>160</sup> Petition at 10 (quoting Gundersen Decl. at 12).

<sup>161</sup> *See id.* at 9-10.

<sup>162</sup> *See infra* Section III.D.2.b.

Accordingly, BREDL has failed to show a genuine dispute concerning Southern Nuclear's compliance with the requirement of Table 6.2.4-6 that hydrogen igniters be placed "as close to the [hydrogen] source as feasible."<sup>163</sup> And Southern Nuclear's placement of hydrogen igniters as close to the IRWST vents as feasible is not subject to challenge in this proceeding, because the criteria for locating hydrogen igniters in containment have been settled through rulemaking and the licensing of Vogtle Units 3 and 4.<sup>164</sup> BREDL's indirect challenge to the Table 6.2.4-6 igniter placement criteria is outside the scope of this proceeding.<sup>165</sup>

## 2. *Contention Two*

### a. *Hydrogen Sources and Stratification*

BREDL alleges in Contention Two that hydrogen sources and stratification have not been addressed by the LAR.<sup>166</sup> In fact, the specific hydrogen source and stratification issues raised by BREDL were either considered during the AP1000 design certification process or addressed by the hydrogen control design requirements of 10 C.F.R. Part 50. Similar to BREDL's "engineering judgment" argument, the hydrogen sources and stratification issues raised by BREDL constitute an impermissible challenge to regulations and, therefore, are outside of the scope of this proceeding pursuant to 10 C.F.R. § 2.309(f)(1)(iii).

Each of BREDL's alleged hydrogen source deficiencies relate to an alleged failure to consider additional sources of hydrogen beyond that generated by a fuel clad-coolant reaction. Pursuant to 10 C.F.R. § 50.44(c), however, the zirconium and water source of hydrogen is the only hydrogen source new reactor applicants are required to analyze.<sup>167</sup> More specifically, this regulation limits the applicable hydrogen source by requiring a reactor design to address and control a 100% fuel clad-coolant reaction.<sup>168</sup> The design of the hydrogen ignition subsystem of the AP1000 DCD, which was adopted for Vogtle Units 3 and 4,<sup>169</sup> satisfies the 100% fuel clad-coolant reaction requirement of 10 C.F.R. § 50.44.<sup>170</sup> Pursuant to 10 C.F.R. § 52.63(a)(1), the AP1000 certified design applicable to Vogtle Units 3 and 4 is not subject to additional hydrogen source requirements through this proceeding.

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<sup>163</sup> AP1000 DCD at 6.2-113; UFSAR at 6.2-104.

<sup>164</sup> *See supra* Section III.C.

<sup>165</sup> 10 C.F.R. § 2.309(f)(1)(iii).

<sup>166</sup> Petition at 11-12; *see supra* Section II.B.1.

<sup>167</sup> 10 C.F.R. § 50.44(c)(2)-(3), (5).

<sup>168</sup> *Id.*

<sup>169</sup> NUREG-2124, at 6-14; FSAR at 6.2-1.

<sup>170</sup> NUREG-1793, at 6-66.

Prior to being amended by the NRC in 2003, section 50.44 required that reactor designs control hydrogen generation — following a design-basis loss-of-coolant accident — caused by (1) metal-water reactions involving the fuel cladding and reactor coolant, (2) radiolytic decomposition of the reactor coolant, and (3) corrosion of metals.<sup>171</sup> The NRC’s 2003 amendment to section 50.44, however, eliminated hydrogen generation controls associated with a design-basis loss-of-coolant accident.<sup>172</sup> For future water-cooled reactors, the amended regulation applied the beyond-design-basis requirements currently set forth in 10 C.F.R. § 50.44(c)(2), (3), and (5).<sup>173</sup> This regulatory history demonstrates that BREDL’s hydrogen source arguments are, in effect, an impermissible challenge to a regulation that has evolved on the issue of hydrogen sources.<sup>174</sup>

BREDL also asserts that “the LAR assumes concentration of hydrogen is uniform throughout the AP1000 containment, including in sub-compartments.”<sup>175</sup> BREDL contends that hydrogen stratification is possible within containment, creating an explosion risk if excess hydrogen forms in one area near an igniter.<sup>176</sup> But, like the issue of hydrogen sources, hydrogen stratification was addressed during the AP1000 design certification rulemaking.<sup>177</sup> Specifically, the AP1000 certified design is based on an analysis of the mixing of the containment atmosphere and the potential for hydrogen stratification.<sup>178</sup> BREDL has not shown that the addition of the proposed hydrogen igniters changes the prior stratification analysis of the AP1000 DCD. And, without a petition pursuant to 10 C.F.R. § 2.335, the AP1000 certified design is not subject to additional hydrogen stratification requirements.<sup>179</sup>

*b. Historical Precedents and “Backflow”*

In Contention Two, BREDL also asserts that the LAR fails to account for historical precedents of hydrogen explosions, including events at Fukushima.<sup>180</sup>

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<sup>171</sup> 10 C.F.R. § 50.44(a)(1)-(3) (2003).

<sup>172</sup> Combustible Gas Control in Containment, 68 Fed. Reg. 54,123, 54,125, 54,141 (Sept. 16, 2003).

<sup>173</sup> *See id.* at 54,136.

<sup>174</sup> *See* 10 C.F.R. § 2.335.

<sup>175</sup> Petition at 11.

<sup>176</sup> *Id.*

<sup>177</sup> *See* NUREG-1793, at 6-68 (“The staff does not expect significant stratification within the AP1000 containment based on the containment-mixing evaluation . . . and the number and location of igniters provided for the AP1000 containment.”).

<sup>178</sup> *Id.* at 6-68 to -70.

<sup>179</sup> 10 C.F.R. § 52.63(a)(1).

<sup>180</sup> Petition at 9-12; *see supra* Section II.B.1.

In addition, as it did in Contention One, BREDL raises the related issue of containment vulnerability due to a detonation resulting from “backflow.”<sup>181</sup> For the following reasons, these issues are outside the scope of this proceeding and fail to raise a genuine dispute with the LAR.<sup>182</sup>

BREDL provides a general outline of the events that occurred at Fukushima Units 1 and 3, focusing primarily on the pathways of hydrogen out of containment and the development of explosive shockwaves and associated “back-flow.”<sup>183</sup> The apparent implication is that the LAR fails to account for hydrogen migration and the potential for an explosive shockwave that would threaten the integrity of AP1000 containments at Vogtle Units 3 and 4. BREDL’s arguments, however, fail to account for the NRC’s continuing consideration of these issues post-Fukushima.

The NRC has examined Fukushima and concluded that the hydrogen igniter subsystems for AP1000 designs do not require modification. The Fukushima Near-Term Task Force (NTTF), in a July 12, 2011 report (NTTF Report), stated:

[Boiling Water Reactor] facilities with Mark I . . . containment structures are required to operate their containments with inerted atmospheres. . . . [Whereas Pressurized Water Reactor] facilities with large dry containments do not control hydrogen buildup inside the containment structure because the containment volume is sufficient to keep the pressure spike of potential hydrogen deflagrations within the design pressure of the structure.<sup>184</sup>

The NTTF Report recommended additional review of hydrogen control and mitigation inside containment based on further study of Fukushima (NTTF Recommendation 6), without identifying any immediate AP1000 design changes.<sup>185</sup>

On December 30, 2011, the Commission issued the Final Rule for the AP-1000 Design Certification Amendment, which referenced the NTTF Report.<sup>186</sup> The Commission noted the NTTF’s support for completing the AP1000 design certification without delay, because licensing did not present an imminent risk to public health or safety.<sup>187</sup> The Commission identified specific NTTF Recommendations relevant to the AP1000 design, but did not mention NTTF Recom-

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<sup>181</sup> Petition at 9-10, 12.

<sup>182</sup> 10 C.F.R. § 2.309(f)(1)(iii), (vi).

<sup>183</sup> See *Petition* at 9-10; see also Gundersen Decl. at 8-9.

<sup>184</sup> Dr. Charles Miller et al., Recommendations for Enhancing Reactor Safety in the 21st Century, The Near-Term Task Force Review of Insights from the Fukushima Dai-ichi Accident, at 41-42 (July 12, 2011) (ADAMS Accession No. ML111861807) [hereinafter NTTF Report].

<sup>185</sup> *Id.* at 43.

<sup>186</sup> AP1000 Design Certification Amendment, 76 Fed. Reg. 82,079, 82,081 (Dec. 30, 2011).

<sup>187</sup> See *id.*

mentation 6 regarding hydrogen control.<sup>188</sup> The Commission stated, however, that if action were required in the future, the NRC retained the legal authority to modify the AP1000 design certification rule.<sup>189</sup>

Regarding NTTF Recommendation 6, the Staff recently stated that it had “assessed potential enhancements beyond those already included for new plants licensed under 10 CFR Part 52 (e.g., *hydrogen igniters for AP1000 design reactors . . .* ) and found that such measures would not likely be justified under the finality provisions established under 10 CFR Part 52.”<sup>190</sup> The Staff’s NTTF Recommendation 6 statement was a tentative conclusion,<sup>191</sup> subject to further stakeholder interaction prior to finalization.<sup>192</sup> The Staff later affirmed its no-further-action conclusion on March 31, 2016.<sup>193</sup> At this time, however, the Commission has not acted on the Staff’s final conclusion regarding NTTF Recommendation 6.

For purposes of this proceeding, any issues associated with Fukushima and modifications to the hydrogen control system or hydrogen igniters of the AP-1000 certified design are currently subject to agency review and potential rule-making. Thus, the Commission has elected to address these issues generically through the rulemaking process.<sup>194</sup> Therefore, not only is BREDL prohibited by 10 C.F.R. § 52.63(a)(1) from challenging the certified design through this adjudication, but its allegations regarding Fukushima are also outside of the scope of this proceeding because the Commission has decided to handle that issue through the rulemaking process.<sup>195</sup>

Lastly, BREDL asserts that a “detonation or deflagration shock wave [could occur] if one of the proposed igniters causes backflow into a sub-compartment,”

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<sup>188</sup> *Id.*

<sup>189</sup> *Id.*

<sup>190</sup> Policy Issue, Proposed Plans for Resolving Open Fukushima Tier 2 and 3 Recommendations, Encl. 4, Reliable Hardened Vents for Other Containment Designs and Hydrogen Control and Mitigation Inside Containment and Other Buildings, SECY-15-0137, at 15 (Oct. 29, 2015) (ADAMS Accession No. ML15254A016) (emphasis added).

<sup>191</sup> Policy Issue, Proposed Plans for Resolving Open Fukushima Tier 2 and 3 Recommendations, SECY-15-0137, at 5 (Oct. 29, 2015) (ADAMS Accession No. ML15254A008).

<sup>192</sup> Memorandum from Annette L. Vietti-Cook, NRC Secretary, to Victor M. McCree, Executive Director for Operations (Feb. 8, 2016) (ADAMS Accession No. ML16039A175).

<sup>193</sup> Policy Issue, Closure of Fukushima Tier 3 Recommendations Related to Containment Vents, Hydrogen Control, and Enhanced Instrumentation, SECY-16-0041, at 3-4 (Mar. 31, 2016) (ADAMS Accession No. ML16049A088).

<sup>194</sup> *See generally Duke Energy Corp.* (Oconee Nuclear Station, Units 1, 2, and 3), CLI-99-11, 49 NRC 328, 345 (1999) (addressing a challenge to the waste confidence rule and stating that when an issue is resolved generically, a petitioner’s remedy lies in the rulemaking process, not through adjudication).

<sup>195</sup> 10 C.F.R. § 2.309(f)(1)(iii).

citing as support an example of “backflow” that occurred at Fukushima.<sup>196</sup> BREDL’s limited explanation of this argument alleges that the LAR “ignores the possibility that the [hydrogen] igniter can create a flame that blows back through the [IRWST] roof vents along the steam generator dog house wall into the sub-compartment causing a serious detonation.”<sup>197</sup> BREDL includes an expert declaration that quotes a World Association of Nuclear Operators resource referring to a “backflow” event at Fukushima that occurred during attempts to vent primary containment.<sup>198</sup>

BREDL appears to assume that a flame generated by the new hydrogen igniters could blow back from the IRWST roof vents into a subcompartment of the primary containment, where it would cause a “serious detonation,” presumably by igniting an abnormally high concentration of hydrogen and oxygen in that area. But BREDL fails to provide technical analysis sufficient to explain how this phenomenon could occur, or why it is limited to the two new igniters. Nor has BREDL explained the applicability of the Fukushima “backflow” experience to the change proposed in the LAR.

Even had BREDL provided an adequate explanation, we could not consider this argument because it amounts to a challenge to the AP1000 certified design and would be inconsistent with the Commission’s ongoing review of the events at Fukushima to determine whether they require modification of the design. In the AP1000 design certification rulemaking, the NRC concluded that the AP1000’s hydrogen control system is adequate to satisfy the requirements of 10 C.F.R. § 50.44(c).<sup>199</sup> Those requirements include: (1) limiting “hydrogen concentrations in containment during and following an accident that releases an equivalent amount of hydrogen as would be generated from a 100 percent fuel-clad coolant reaction, uniformly distributed, to less than 10 percent by volume”; and (2) ensuring that containment structural integrity will be maintained during such an event that is accompanied by hydrogen burning.<sup>200</sup> BREDL’s argument that “backflow” could cause a “serious detonation” sufficient to damage the primary containment would conflict with the determination that the AP1000 design satisfies those requirements, because the argument presumes a concentration of hydrogen and oxygen within a subcompartment of the primary containment sufficient to cause a detonation that would damage the containment. Furthermore, given that the Commission is reviewing the question whether the Fukushima events merit changes to the AP1000 certified design and considering potential rulemaking on that issue, BREDL may not raise its Fukushima-related

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<sup>196</sup> Petition at 10.

<sup>197</sup> *Id.* at 12.

<sup>198</sup> Gundersen Decl. at 8.

<sup>199</sup> NUREG-1793, at 6-66 to -68.

<sup>200</sup> *See* 10 C.F.R. § 50.44(c)(2), (5).

arguments in this adjudication because they seek modifications to the AP1000 certified design.

For these reasons, BREDL's "backflow" argument is outside the scope of this proceeding and fails to raise a genuine dispute with the LAR.<sup>201</sup>

#### IV. CONCLUSION

Although BREDL has standing to intervene, it has not pled an admissible contention. Therefore, the petition to intervene and request for a hearing is *denied*. Petitioner may appeal this decision to the Commission pursuant to 10 C.F.R. § 2.311(c), within 25 days of service of this Order.

It is so ORDERED.

THE ATOMIC SAFETY AND  
LICENSING BOARD

Ronald M. Spritzer, Chairman  
ADMINISTRATIVE JUDGE

Nicholas G. Trikouros  
ADMINISTRATIVE JUDGE

Dr. Gary S. Arnold  
ADMINISTRATIVE JUDGE

Rockville, Maryland  
September 15, 2016

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<sup>201</sup> 10 C.F.R. § 2.309(f)(1)(iii), (vi).

### **Concurring Opinion of Judge Arnold**

While I agree with my colleagues concerning the standing of BREDL and contention admissibility, I wish to separately address BREDL's presentation of their expert witness. Neither the Petition nor supporting documents state the qualifications of Mr. Gundersen to provide expert testimony in support of their contentions.

At the contention admissibility stage, Boards should not be considering the merits of support provided by the parties. But this does not mean that the Board should not examine such information. The Commission has stated, "[w]e expect our licensing boards to examine cited materials to verify that they do, in fact, support a contention."<sup>1</sup> The totality of support for BREDL's proposed contentions consists of the opinion of Mr. Gundersen. Without an indication that he is indeed an expert, the Petition arguably is incomplete as lacking the requisite support.

Nowhere does the Petition state that Mr. Gundersen has expertise in phenomena related to hydrogen in a containment building. The Petition states, "Petitioner's requests for leave to intervene and a hearing are supported by an affidavit submitted on behalf of the Petitioner by Arnold Gundersen"<sup>2</sup> without even mentioning his field of expertise. Mr. Gundersen's curriculum vitae (CV), provided with BREDL's initial pleadings, appears to have been provided to establish his credentials as an expert witness. Review of this CV indicates that he may well be qualified to provide expert testimony on the general topic of nuclear engineering. However, the evolution, transport, and combustion of hydrogen during a severe reactor accident are topics for which there are limited experts worldwide. The CV provides no indication of any such expertise. The word "hydrogen" does not even occur in the CV. His declaration, which also summarizes his expertise, also provides no indication that he is qualified to provide an expert opinion concerning hydrogen control in containment.

With the Petition, Mr. Gundersen's CV, and his declaration failing to provide an indication of his qualifications to be an expert witness concerning hydrogen combustion, BREDL was provided at oral argument with an opportunity to bolster its presentation of Mr. Gundersen's credentials. We also permitted BREDL to document his hydrogen expertise in a post-oral argument submittal to the Board.

On August 10, 2016, BREDL submitted to the Board a seven-page declaration, which includes the following relevant paragraph:

Mr. Gundersen's Master Thesis in nuclear engineering dealt with the turbulent

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<sup>1</sup> *USEC Inc.* (American Centrifuge Plant), CLI-06-10, 63 NRC 451, 457 (2006).

<sup>2</sup> Petition at 7.

mixing process of air with different masses, and the density and energy that required sophisticated thermodynamic modeling to calculate phase change location and timing. *This modeling analysis is similar to what might now be expected at Vogtle as a buoyant light gas mixes with a heavier media.*<sup>3</sup>

In my view this provides the minimal required support of Mr. Gundersen's expertise required at this stage.

At the contention admissibility stage, in a case where so much is dependent on witness opinion, we do not evaluate the merits of claimed expertise, but simply verify that at least a minimal claim of expertise has been provided. Of course, whether Mr. Gundersen's claim of expertise in this instance would survive at hearing is a question for another time given BREDL's failure to provide an admissible contention.

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<sup>3</sup> Letter from Louis A. Zeller, Executive Director, BREDL, to the Board (Aug. 10, 2016), Attach. 1, Decl. of Margaret Gundersen, Founder and President, Fairewinds Associates, Inc., ¶ 17 (Aug. 10, 2016) (emphasis in original).



UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

**COMMISSIONERS:**

**Stephen G. Burns**, Chairman  
**Kristine L. Svinicki**  
**Jeff Baran**

**In the Matter of**

**Docket No. 11006187**  
**(License No. XSNM3757)**

**U.S. DEPARTMENT OF ENERGY**  
**(Export of 93.20% Enriched Uranium)**

**October 5, 2016**

**NUCLEAR NON-PROLIFERATION ACT: HEARING REQUEST**

To obtain a hearing in a nuclear export proceeding, petitioners must successfully explain why a hearing would be in the public interest and how a hearing would assist the Commission in making the required statutory determinations.

**NUCLEAR NON-PROLIFERATION ACT: HEARING REQUEST**

To obtain a hearing in a nuclear export proceeding, petitioners must show that a hearing would bring new information to light.

**NUCLEAR NON-PROLIFERATION ACT: HEARING REQUEST**

Even if a petitioner does not satisfy the test for obtaining a hearing, the Commission may still consider the petition as written comments under the non-adjudicatory public participation provision set forth in 10 C.F.R. § 110.81.

**ATOMIC ENERGY ACT: HEU EXPORT LICENSE**

Authorizing a multiyear HEU export license does not necessarily violate AEA § 134.

**ATOMIC ENERGY ACT: COMMON DEFENSE AND SECURITY**

Exporting a multiyear supply of HEU in a single shipment does not pose unreasonable diversion risks or otherwise raise inimicality concerns.

**ATOMIC ENERGY ACT: COMMON DEFENSE AND SECURITY**

Exporting a multiyear supply of HEU in a single shipment does not raise stockpiling concerns when the end user can establish a need for the nuclear material.

**MEMORANDUM AND ORDER**

**I. INTRODUCTION**

Dr. Alan J. Kuperman requests leave to intervene and a hearing on an export license application filed by the Department of Energy/National Nuclear Security Administration (DOE/NNSA).<sup>1</sup> DOE/NNSA seeks to export 130 kilograms of highly enriched uranium (HEU) to France — specifically to the Compagnie pour l’Etude et la Réalisation de Combustibles Atomiques (CERCA) facility. Dr. Kuperman does not seek denial of this requested license; rather, he requests a full and open public hearing, and he asks the NRC to limit the amount of uranium DOE/NNSA can export so that DOE/NNSA does not send a multiyear supply of HEU to France. For the reasons discussed below, we deny Dr. Kuperman’s request for a hearing and direct issuance of the requested license.

**II. BACKGROUND**

DOE/NNSA submitted a license application to export up to 130 kilograms of HEU (enriched up to 93.20%) to CERCA, which will fabricate the HEU into fuel and then transfer the fuel to the Institut Laue-Langevin for use in its High-Flux Reactor. This proposed export would take place under the auspices of the U.S.–Euratom Agreement for Cooperation in the Peaceful Uses of Nuclear Energy, and the European Commission has confirmed that the French recipients

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<sup>1</sup>See Petition of Alan J. Kuperman for Leave to Intervene and Request for Hearing (Mar. 18, 2015) (Petition); Application to Export Enriched Uranium to the Institut Laue-Langevin for use as Fuel in the High-Flux Reactor (to France), License No. XSNM3757 (Dec. 18, 2014) (ADAMS Accession No. ML14357A012).

are authorized to receive this type of nuclear material. DOE/NNSA plans to export this HEU using a military transporter.

The ultimate end user — the Institut Laue-Langevin — is a research center that specializes in neutron science. It uses a high-flux reactor to produce neutrons that, in turn, are used in a variety of research settings. This High-Flux Reactor operates continuously during a 50-day cycle, followed by a shutdown after each cycle.<sup>2</sup> Typically there are four cycles per year, and each cycle requires a single fuel element containing approximately 10 kilograms of HEU.<sup>3</sup> The reactor therefore uses about 40 kilograms of HEU per year; this proposed export constitutes a 3- to 5-year supply of HEU.

The operator cannot currently use low-enriched uranium to fuel this reactor and produce the neutrons it needs. Although the operator agreed in 1998 to study the feasibility of converting its reactor to a low-enriched uranium reactor, that work remains ongoing, with conversion to low-enriched uranium now expected in the 2027-28 time frame.

All fuel for the Institut's High-Flux Reactor is first fabricated at the CERCA facility. As noted in the correspondence providing the Executive Branch's views, the Institut's current fuel inventory will last only until September 2019. CERCA requested an extended lead time for this HEU due to uncertainties related to possible post-Fukushima refurbishments at its fabrication facility. Once exported, and after fabrication, this 130 kilograms of HEU would provide enough fuel to allow the High-Flux Reactor to operate until approximately 2023.

In accordance with section 126 of the Atomic Energy Act of 1954, as amended (AEA),<sup>4</sup> and 10 C.F.R. § 110.41, the NRC submitted DOE/NNSA's application to the Executive Branch on January 20, 2015, for review. The State Department provided the NRC with the Executive Branch's views on this export application by letter dated May 4, 2016.<sup>5</sup> The Executive Branch recommended that the NRC make all the required statutory determinations and issue the requested license to DOE/NNSA. The Executive Branch supplemented its views in a letter dated June 3, 2016.<sup>6</sup> The June letter provided additional information and context regarding DOE/NNSA's application and reiterated the Executive Branch's recommendation that the NRC issue the proposed license.

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<sup>2</sup> <https://www.ill.eu/en/reactor-environment-safety/high-flux-reactor> (last visited August 18, 2016).

<sup>3</sup> <https://www.ill.eu/en/reactor-environment-safety/safety/faq-reactor-safety/what-are-the-technical-specifications-of-the-ills-reactor/> (last visited August 18, 2016).

<sup>4</sup> 42 U.S.C. § 2155.

<sup>5</sup> Letter from Richard J.K. Stratford, U.S. Department of State, to Brooke G. Smith, U.S. Nuclear Regulatory Commission (May 4, 2016) (ADAMS Accession No. ML16126A052) (nonpublic).

<sup>6</sup> Letter from Richard J.K. Stratford, U.S. Department of State to Brooke G. Smith, U.S. Nuclear Regulatory Commission (June 3, 2016) (ADAMS Accession No. ML16158A026) (nonpublic).

The NRC also published a notice of opportunity to request a hearing on the application.<sup>7</sup> Dr. Kuperman thereafter filed an intervention petition. Dr. Kuperman seeks, first, a hearing on DOE/NNSA's export application and, second, that the Commission not issue a multiyear export license for HEU to CERCA and the Institut Laue-Langevin in excess of demonstrated need.<sup>8</sup> As discussed below, we deny Dr. Kuperman's request for a hearing. But we respond to his views as we consider the statutory and regulatory determinations we must make before issuing this license, treating his views as written comments pursuant to 10 C.F.R. § 110.81. Finally, we direct the issuance of the license.

### III. DR. KUPERMAN'S HEARING REQUEST

Dr. Kuperman seeks an oral hearing in which (1) all pertinent information and data are made available for public inspection and analysis and (2) the public is afforded a reasonable opportunity to present oral and written testimony to the Commission.<sup>9</sup>

#### A. Statutory and Regulatory Requirements for a Hearing on an Export License Application

Pursuant to section 304(b) of the Nuclear Non-Proliferation Act of 1978, the NRC established procedures that allow for "public participation in nuclear export licensing proceedings when the Commission finds that such participation will be in the public interest and will assist the Commission in making the statutory determinations required by the [AEA], including such public hearings and access to information as the Commission deems appropriate."<sup>10</sup> These procedures, which govern hearing requests and petitions to intervene on an export license application, are contained in 10 C.F.R. Part 110, Subpart H, and they "constitute the exclusive basis for hearings in nuclear export licensing proceedings."<sup>11</sup> Our regulations also require us to review the Executive Branch's views on the export application before reaching a decision on the hearing request or petition to intervene.<sup>12</sup> If we determine that a hearing should be granted, we may order either an oral hearing or a hearing consisting of written comments.<sup>13</sup> In

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<sup>7</sup> Application for a License to Export High-Enriched Uranium, 80 Fed. Reg. 8711 (Feb. 18, 2015).

<sup>8</sup> Petition at 18-21.

<sup>9</sup> *Id.* 20, 22.

<sup>10</sup> 42 U.S.C. § 2155a.

<sup>11</sup> *Id.*; see also 10 C.F.R. § 110.80.

<sup>12</sup> 10 C.F.R. § 110.84(d).

<sup>13</sup> *Id.* § 110.84(g).

addition to these hearing procedures, our regulations also provide for nonadjudicatory public participation. Specifically, our regulations expressly encourage the public to provide written comments on export license applications, which we consider and respond to as appropriate.<sup>14</sup>

Under our regulations — and consistent with section 304(b) of the Nuclear Non-Proliferation Act — hearing requests in export cases must “explain why a hearing or an intervention would be in the public interest and how a hearing or intervention would assist the Commission in making the [statutory] determinations.”<sup>15</sup> Once we receive an intervention petition on an export application, therefore, we must determine whether a hearing is in the public interest and would assist us in making the required determinations.<sup>16</sup>

Our regulations further provide that a hearing request must “specify, *when a person asserts that his interest may be affected*, both the facts pertaining to his interest and how it may be affected.”<sup>17</sup> Section 110.84 further explains:

If a hearing request or intervention petition asserts an interest which may be affected, the Commission will consider:

- (1) The nature of the alleged interest;
- (2) How that issue relates to issuance or denial; and
- (3) The possible effect of any order on that interest, including whether the relief requested is within the Commission’s authority, and, if so, whether granting relief would redress the alleged injury.<sup>18</sup>

We first consider Dr. Kuperman’s assertion of an interest and then address whether Dr. Kuperman has shown that a hearing would be in the public interest and would assist us in making the required statutory and regulatory determinations.

## **B. Analysis**

Dr. Kuperman’s petition includes a section discussing his interests.<sup>19</sup> Dr. Kuperman provides biographical information describing his past and ongoing professional work on nonproliferation issues and his organization’s institutional

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<sup>14</sup> *Id.* § 110.81(a).

<sup>15</sup> *Id.* § 110.82(b)(3).

<sup>16</sup> *Id.* § 110.84(a).

<sup>17</sup> *Id.* § 110.82(b)(4) (emphasis added).

<sup>18</sup> *Id.* § 110.84(b). As we have explained, persons without an affected interest are not as likely as persons with an affected interest to contribute to our decisionmaking and show that a hearing would be in the public interest and assist us in making the statutory determinations. *See U.S. Department of Energy* (Plutonium Export License), CLI-04-17, 59 NRC 357, 367 (2004).

<sup>19</sup> Petition at 3-5.

interests in the topic.<sup>20</sup> Dr. Kuperman asserts that these institutional interests related to public information and education programs concerning arms control, proliferation risks, nuclear terrorism, and the use of HEU “would be significantly and adversely impaired” unless we hold a “full, open, and independent review” of the issues.<sup>21</sup>

Consistent with 10 C.F.R. § 110.84(b), we find that although Dr. Kuperman has articulated the nature of his interests, his interests do not have a sufficient nexus to the proposed export of HEU to France to satisfy the other elements we consider when assessing an asserted interest that may be affected by a proceeding.<sup>22</sup> Specifically, Dr. Kuperman has not shown that issuing this export license will hinder his ability to continue his educational activities and continue his activities related to arms control, nuclear weapons, proliferation, terrorism, and the use of HEU. As a result, we conclude that Dr. Kuperman has not demonstrated that he possesses an interest that may be affected by this proceeding.

Additionally, Dr. Kuperman has not demonstrated that granting the hearing or intervention would be in the public interest and would assist us in making the required statutory and regulatory determinations.<sup>23</sup> We consider both factors when evaluating whether to grant a hearing or intervention.<sup>24</sup> To satisfy these factors, a petitioner must specifically identify how a hearing would bring new information to light.<sup>25</sup>

Here, although Dr. Kuperman “does not necessarily oppose the granting of the license application *for some portion* of the HEU sought, assuming the requisite need can be demonstrated,”<sup>26</sup> he argues that the NRC should not approve

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<sup>20</sup> *Id.* at 3-4. Dr. Kuperman notes that he is the Coordinator of the Nuclear Proliferation Prevention Project, which engages in “research, debate, and public education to ensure that civilian applications of nuclear technology do not foster the spread of nuclear weapons to states or terrorist groups.” *Id.* at 3.

<sup>21</sup> *Id.* at 4.

<sup>22</sup> See *Transnuclear, Inc.* (Export of 93.15% Enriched Uranium), CLI-94-1, 39 NRC 1, 5 (1994) (explaining that merely asserting an “institutional interest in providing information to the public” is insufficient for showing an affected interest.)

<sup>23</sup> The statutory determinations can be found in 42 U.S.C. § 2156, 42 U.S.C. § 2160d(a), and 42 U.S.C. § 2077(c). The regulatory determinations are found in 10 C.F.R. §§ 110.45 and 110.42(a)(1-5, 7-9).

<sup>24</sup> 10 C.F.R. § 110.84(a).

<sup>25</sup> See *U.S. Department of Energy*, CLI-04-17, 59 NRC at 369 (“Petitioners have already submitted detailed information as to the basis for their position. We do not believe a hearing will result in significant new information that is not already available to and considered by the Commission in making the requisite statutory determinations.”); see also *Transnuclear, Inc.* (Export of 93.3% Enriched Uranium), CLI-00-16, 52 NRC 68, 72 (2000) (explaining that nothing in the petitioner’s filings indicates it will be able to “present significant information not already available to and considered by the Commission”).

<sup>26</sup> Petition at 18.

an export of HEU that exceeds the demonstrated needs of the applicant.<sup>27</sup> Dr. Kuperman asserts that the NRC should not authorize a license to export a multi-year supply of HEU because of proliferation and terrorism risks and because of the impact on U.S. common defense and security.<sup>28</sup> Specifically, Dr. Kuperman articulates three reasons to support this argument: (1) approving exports in excess of need would provide a disincentive to converting European facilities to non-HEU fuel;<sup>29</sup> (2) approving a large export would aggravate the risk of interception;<sup>30</sup> and (3) the non-proliferation risks outweigh the benefits to the applicant when approving an export in excess of need.<sup>31</sup> Dr. Kuperman further argues that “only a public hearing in which issues related to the appropriateness of exporting HEU are fully aired and subjected to public scrutiny can serve to resolve legitimate public questions concerning both the need for granting this license application and the risks associated with such action.”<sup>32</sup>

Notwithstanding Dr. Kuperman’s extensive knowledge of nonproliferation issues and the points he makes in his petition, he has not adequately explained how a hearing would be in the public interest and assist us in making the required statutory and regulatory findings in this case. Dr. Kuperman has identified portions of the license application that, in his view, raise important public policy questions. But that is not sufficient to obtain a hearing. He must also identify how a hearing would provide new information to us, and how this information links to the findings that we must make. His petition does neither. Dr. Kuperman does not explain how a hearing would add to the points already made in his petition. Nor does he pinpoint which NRC export licensing determinations a hearing would address.<sup>33</sup> Dr. Kuperman’s arguments regarding breaking up the proposed HEU export are plain on the face of his petition and can be readily understood on that basis.<sup>34</sup> As a result, we deny Dr. Kuperman’s intervention petition and hearing request. Even though Dr. Kuperman has not met the threshold for obtaining a hearing, we still consider his views on DOE/NNSA’s export

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<sup>27</sup> *Id.*

<sup>28</sup> *Id.* at 19.

<sup>29</sup> *Id.* at 15-16, 19.

<sup>30</sup> *Id.* at 19-20.

<sup>31</sup> *Id.* at 20.

<sup>32</sup> *Id.* at 21.

<sup>33</sup> Sections 110.42 and 110.45 provide these criteria.

<sup>34</sup> *Cf. EnergySolutions, LLC* (Radioactive Waste Import/Export Licenses), CLI-11-3, 73 NRC 613, 623 (2011) (“Petitioners’ written views are on the record. We therefore need not devote adjudicatory resources on providing an oral hearing on Petitioners’ grievances when they have been unable to articulate material issues that require litigation at a hearing[.]”).

license application as written comments on the application.<sup>35</sup> We turn next to our determination on the application, taking into account Dr. Kuperman's views.

#### IV. STATUTORY AND REGULATORY DETERMINATIONS

Before granting an export license for HEU to a nuclear weapon state (like France), we must make the following determinations:

- The proposed export satisfies AEA § 127's nonproliferation criteria;<sup>36</sup>
- The proposed export satisfies the "Schumer Amendment," which is found in AEA § 134;<sup>37</sup>
- Finally, under AEA § 57c(2), the proposed export will not be "inimical to the common defense and security" of the United States.<sup>38</sup>

We address each in turn, responding to Dr. Kuperman's written views when appropriate.

##### A. Section 127 Criteria

Section 127 of the AEA lists five applicable nonproliferation criteria that govern exports of special nuclear material.<sup>39</sup> None of these criteria are the subject

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<sup>35</sup> 10 C.F.R. § 110.81(a).

<sup>36</sup> 42 U.S.C. § 2156; *see also* 10 C.F.R. § 110.42(a)(1)-(5).

<sup>37</sup> 42 U.S.C. § 2160d; *see also* 10 C.F.R. § 110.42(a)(9).

<sup>38</sup> 42 U.S.C. § 2077(c)(2); *see also* 10 C.F.R. § 110.42(a)(8). Additionally, our regulations require that we find any export "of more than 0.003 effective kilograms of special nuclear material . . . would be under the terms of an agreement for cooperation." *Id.* § 110.42(a)(7). As noted above, the proposed export would be under the term of the U.S.-Euratom Agreement for Cooperation in the Peaceful Uses of Nuclear Energy.

<sup>39</sup> 42 U.S.C. § 2156; *see also* 10 C.F.R. § 110.42(a)(1)-(5). Section 127 lists a sixth criterion, but that sixth criterion applies only to exports of nuclear technology and is not applicable to an export of nuclear material. In abbreviated form, the five applicable criteria are:

- (1) IAEA [International Atomic Energy Agency] safeguards will be applied with respect to any such material proposed to be exported;
- (2) No material proposed to be exported will be used for any nuclear explosive device or for research on or development of any nuclear explosive device;
- (3) Adequate physical security measures will be maintained with respect to such material proposed to be exported and to any special nuclear material used in or produced through the use thereof;

(Continued)

of Dr. Kuperman's petition, and on the basis of the Executive Branch's views and the record, we find that these nonproliferation criteria have been satisfied.

## **B. Section 134 Criteria**

Section 134 of the AEA requires the NRC to make additional findings before authorizing an applicant to export HEU.<sup>40</sup> Specifically, section 134a requires the NRC to determine that:

- (1) there is no alternative nuclear reactor fuel or target enriched in the isotope 235 to a lesser percent than the proposed export that can be used in the reactor;
- (2) the proposed recipient of that uranium has provided assurances that, whenever an alternative nuclear reactor fuel or target can be used in that reactor, it will use that alternative in lieu of highly enriched uranium; and
- (3) the United States Government is actively developing an alternative nuclear reactor fuel or target that can be used in that reactor.

The Executive Branch states that these three criteria have all been satisfied. Specifically, Argonne National Laboratory has confirmed that there is no low-enriched uranium fuel currently available that can be used in the Institut Laue-Langevin's High-Flux Reactor. The Institut Laue-Langevin (the recipient) has repeatedly confirmed its intent to convert the High-Flux Reactor so that it can use low-enriched uranium. And NNSA is currently cooperating with its European counterparts to develop low-enriched uranium fuel for this reactor.

Dr. Kuperman does not identify in his petition how this export violates section 134a. Instead, he maintains that failing to limit the export would undermine the general policy underlying the Schumer Amendment by exacerbating the risk that European operators will continue to delay conversion to low-enriched uranium.<sup>41</sup> Dr. Kuperman asserts that authorizing such a large export of HEU is contrary to the spirit of the Schumer Amendment (if not the technical criteria) because it could be viewed as promoting HEU use in Europe.

As previously noted, NNSA and its European counterparts already have an active program — the "HERACLES" program — under way to develop low-

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(4) No material proposed to be exported will be re-transferred to the jurisdiction of any other nation or group of nations unless the prior approval of the United States is obtained for such re-transfer;

(5) No material proposed to be exported and no special nuclear material produced through the use of such material will be reprocessed, and no irradiated fuel elements containing such material removed from a reactor shall be altered in form or content, unless the prior approval of the United States is obtained.

<sup>40</sup> 42 U.S.C. § 2160d; *see also* 10 C.F.R. § 110.42(a)(9).

<sup>41</sup> Petition at 15-16, 19.

enriched uranium that can be used in research reactors such as the Institut Laue-Langevin's High-Flux Reactor. But this alternative fuel will not be ready until 2027, as technical efforts to develop low-enriched fuel for this High-Flux Reactor are ongoing. Because this proposed export would supply the reactor until only 2023, the reactor will not be receiving all the HEU it needs prior to conversion. Dr. Kuperman's concern, therefore, that this export could push back the date of the expected conversion is misplaced — even after this export the Institut Laue-Langevin will still need more HEU. Nor would this export provide the Institut Laue-Langevin or Europe as a whole with a disincentive to convert to low-enriched uranium. The Executive Branch's views confirm that the Institut Laue-Langevin and its European partners are fully committed to converting to low-enriched uranium fuel.

Further, in December 2014, DOE and the Euratom Supply Agency entered into a Memorandum of Understanding whereby Euratom committed to further minimize HEU use in Europe by either sending excess unirradiated HEU back to the United States or downblending it in Euratom member states. The Executive Branch's views note that under the auspices of this 2014 agreement — as well as the Joint Statement issued at the 2016 Nuclear Security Summit — Europe will offset this proposed export by returning a greater amount of HEU back to the United States.<sup>42</sup> Therefore, from an HEU-minimization standpoint, the proposed export does not undermine the Schumer Amendment's objective of shifting away from HEU use overseas for nonmilitary purposes. Accordingly, we are not persuaded by Dr. Kuperman's view that this export undermines the Schumer Amendment, and we find that the section 134 criteria are satisfied.

### C. Noninimicality Finding

Finally, we must also determine under section 57c(2) of the AEA that the proposed export will not be “inimical to the common defense and security” of the United States.<sup>43</sup> Here, Dr. Kuperman raises two arguments that suggest inimicality concerns with this proposed export. First, Dr. Kuperman asserts that Commission approval of the pending export application would lead to unnecessary risks resulting from shipping a large quantity of weapons-grade nuclear material.<sup>44</sup> This, Dr. Kuperman states, raises the risk that terrorists or “rogue states” could attempt to intercept the export. Second, Dr. Kuperman maintains that this export could lead to a stockpiling of HEU abroad and thus be contrary

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<sup>42</sup>The text of the Joint Statement can be found here: <http://www.nss2016.org/document-center-docs/2016/4/1/joint-statement-on-eu-us-heu-exchange> (last visited August 18, 2016).

<sup>43</sup>42 U.S.C. § 2077(c)(2); *see also* 10 C.F.R. § 110.42(a)(8).

<sup>44</sup>Petition at 19-20.

to longstanding U.S. foreign policy objectives.<sup>45</sup> We address each argument in turn.

Dr. Kuperman is correct that any shipment of weapons-grade nuclear material entails some risk of diversion. Yet we note that the diversion or interception risk is especially minimal when the shipment is being conducted by a military transport, as is the case here. Further, upon close inspection, we conclude that increasing the number of HEU shipments — as Dr. Kuperman prefers — would serve to *increase* those risks rather than decrease them. Additional shipments increase the amount of planning effort and would therefore increase the risk that sensitive shipment information could be compromised. Increasing the number of shipments could also establish a pattern that would enable potential adversaries to collect intelligence and then execute an attempt to intercept a subsequent shipment. And additional shipments would increase the probability of equipment failure. This conclusion is buttressed by the Executive Branch’s views, which likewise conclude that breaking this proposed export into many shipments would increase security risks. Accordingly, we do not agree that this export poses unreasonable diversion risks.

Dr. Kuperman further argues that the proposed export of a multiyear supply of HEU is significantly in excess of the end user’s needs and raises stockpiling concerns. Dr. Kuperman, therefore, asserts that this export would be contrary to previous Commission precedent and longstanding U.S. foreign policy objectives.<sup>46</sup> As a preliminary matter, Dr. Kuperman notes previous export licenses that authorized only a 1-year supply of HEU.<sup>47</sup> Yet those export licenses were for medical-isotope targets rather than research reactor fuel. Fuel for research reactors entails longer fabrication timelines. And research reactors’ fuel requirements tend to be more stable and predictable over longer periods of time compared to medical-isotope targets — thereby rendering research reactors more suitable to large shipments of HEU compared to medical-isotope production. In fact, we previously decided to authorize the export of a 3- to 5-year supply of HEU to the Institut Laue-Langevin’s High-Flux Reactor.<sup>48</sup>

Although Dr. Kuperman is correct that our precedent generally discourages exports in excess of the end user’s actual needs,<sup>49</sup> we disagree that this pro-

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<sup>45</sup> *Id.* at 16-17, 19-20.

<sup>46</sup> *Id.* at 19.

<sup>47</sup> *Id.* at 11. Specifically, Dr. Kuperman references License Nos. XSNM-3708, XSNM-3726, XSNM-3729, XSNM-3730, XSNM-3745, XSNM-3730-1, XSNM-3729-1, XSNM-3752, XSNM-3755, and XSNM-3756.

<sup>48</sup> License No. XSNM-3633 authorized the export of almost 150 kilograms of HEU to the Institut Laue-Langevin’s High-Flux Reactor — DOE/NNSA shipped this material in 2012.

<sup>49</sup> See *Transnuclear, Inc.*, CLI-00-16, 52 NRC at 76 (noting that the requested export license gave the Commission the ability to monitor the conversion process and thus adjust the license as

posed export would actually exceed the reactor's needs and lead to stockpiling. The High-Flux Reactor's core features a single element composed of several hundred thin involute plates manufactured to exact tolerances. The associated fuel fabrication process is therefore highly complex — and it contains the very real possibility that some fuel will either be rejected during fabrication or fail during reactor operation. Fuel contingencies, therefore, serve as a reasonable hedge against fuel failure and provide a basis for exporting more than a 1-year supply of HEU. Further, as noted above, the reactor will require HEU until at least 2027. Even assuming that no fuel failure occurs, this export would not be sufficient to satisfy the Institut Laue-Langevin's annual requirement for HEU until it is able to convert to LEU; accordingly, this proposed export would not result in excess HEU that is susceptible to misuse.

Finally, Dr. Kuperman expresses concern that the reactor could shut down prematurely, thus leaving a stockpile of HEU in Europe that could be used to undermine U.S. nonproliferation policy.<sup>50</sup> This, Dr. Kuperman states, provides an additional reason to limit the export to a 1-year supply. We recognize the possibility that a nuclear reactor may need to shut down before planned decommissioning.<sup>51</sup> But Dr. Kuperman's second point — that an unexpected reactor shutdown would necessarily lead to a stockpile of fuel in Europe — does not necessarily follow from the first. At the 2016 Nuclear Security Summit, the United States and European Union issued a Joint Statement on HEU Exchange.<sup>52</sup> This Joint Statement significantly enhanced United States-European cooperation efforts so that Europe now has a strong incentive to repatriate any excess or unused HEU back to the United States in the unlikely event of a premature shutdown. Given this cooperative international framework, the possibility that other European end users could end up obtaining and using this fuel due to the High-Flux Reactor shutting down is very low.<sup>53</sup>

For these reasons, we find that the proposed export would not be inimical to the common defense and security of the United States.

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necessary to avoid the potential accumulation of HEU fuel significantly in excess of the reactor's actual needs).

<sup>50</sup> Petition at 16-17.

<sup>51</sup> According to the Executive Branch views, the Institut Laue-Langevin's High-Flux Reactor is a relatively young reactor with a strong safety record, well-defined mission, and strong financial backing, which reduces the likelihood of an unexpected shutdown.

<sup>52</sup> The text of the Joint Statement can be found here: <http://www.nss2016.org/document-center-docs/2016/4/1/joint-statement-on-eu-us-heu-exchange> (last visited August 18, 2016).

<sup>53</sup> The incident that Dr. Kuperman references on pages 11-12 of his petition occurred before this recent strengthening of U.S.-European cooperation regarding HEU.

## V. CONCLUSION

For the reasons stated above, we find that a hearing in this matter would not be in the public interest and would not assist us in making the required statutory and regulatory determinations. We further determine that the proposed export satisfies all applicable export-licensing criteria and that issuing this export license would not be inimical to the common defense and security of the United States. Accordingly, we deny Dr. Kuperman's request for a hearing and petition to intervene and direct the Office of International Programs to issue License No. XSNM3757 to DOE/NNSA for the export of up to 130 kilograms of highly enriched uranium.

IT IS SO ORDERED.

For the Commission

ANNETTE L. VIETTI-COOK  
Secretary of the Commission

Dated at Rockville, Maryland,  
this 5th day of October 2016.

UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

**COMMISSIONERS:**

**Stephen G. Burns**, Chairman  
**Kristine L. Svinicki**  
**Jeff Baran**

**In the Matter of**

**Docket Nos. 52-029-COL  
52-030-COL**

**DUKE ENERGY FLORIDA, LLC**  
**(Levy County Nuclear Power Plant,**  
**Units 1 and 2)**

**October 20, 2016**

**MANDATORY HEARINGS**

Section 189a of the Atomic Energy Act of 1954, as amended, requires that the Commission hold a hearing on each application to construct a nuclear power plant, regardless of whether an interested member of the public requests a hearing on the application.

**MANDATORY HEARINGS: SAFETY ISSUES**

With respect to safety matters, the Commission must determine whether (1) the applicable standards and requirements of the Atomic Energy Act and the Commission's regulations have been met; (2) any required notifications to other agencies or bodies have been duly made; (3) there is reasonable assurance that the facility will be constructed and will operate in conformity with the licenses, the provisions of the Atomic Energy Act, and the Commission's regulations; (4) the applicant is technically and financially qualified to engage in the activities authorized by the licenses; and (5) issuance of the licenses will not be inimical to the common defense and security or to the health and safety of the public.

## **MANDATORY HEARINGS: NATIONAL ENVIRONMENTAL POLICY ACT**

With respect to environmental matters, the Commission must: (1) determine whether the requirements of NEPA § 102(2)(A), (C), and (E), and the applicable regulations in 10 C.F.R. Part 51 (the NRC regulations implementing NEPA) have been met; (2) independently consider the final balance among conflicting factors contained in the record of the proceeding with a view to determining the appropriate action to be taken; (3) determine, after weighing the environmental, economic, technical, and other benefits against environmental and other costs, and considering reasonable alternatives, whether the combined licenses should be issued, denied, or appropriately conditioned to protect environmental values; and (4) determine whether the NEPA review conducted by the NRC Staff has been adequate.

## **MANDATORY HEARINGS**

The Commission does not review Duke's application *de novo*; rather, it considers whether the Staff's review was sufficient to support the required findings.

## **MANDATORY HEARINGS**

All safety and environmental matters relevant to the combined license application, except those resolved in the contested proceeding, are subject to the Commission's review in the uncontested proceeding.

## **EXEMPTIONS**

The Staff may approve an exemption where it finds that the exemption is authorized by law, will not present an undue risk to the public health and safety, is consistent with the common defense and security, and special circumstances exist that warrant the exemption. In addition, the Staff must determine that the special circumstances outweigh any decrease in safety resulting from the reduction in standardization that may result from the exemption.

## **ENDANGERED SPECIES ACT**

Section 7 of the Endangered Species Act requires federal agencies to ensure that any action authorized, funded, or carried out by the agency is not likely to jeopardize the continued existence of any listed endangered or threatened species or designated critical habitat. This process requires consultation with

Fish and Wildlife or the National Marine Fisheries Service (NMFS) — or both — for actions that “may affect” listed species.

#### **NATIONAL ENVIRONMENTAL POLICY ACT**

NEPA § 102(2)(A) requires agencies to use “a systematic, interdisciplinary approach which will insure the integrated use of the natural and social sciences and the environmental design arts” in decisionmaking that may impact the environment.

#### **NATIONAL ENVIRONMENTAL POLICY ACT**

NEPA § 102(2)(C) requires agencies to assess the relationship between short-term uses and long-term productivity of the environment, to consider alternatives, and to describe the unavoidable adverse environmental impacts and the irreversible and ir retrievable commitments of resources associated with the proposed action.

#### **NATIONAL ENVIRONMENTAL POLICY ACT**

NEPA § 102(2)(E) calls for agencies to study, develop, and describe appropriate alternatives.

### **MEMORANDUM AND ORDER**

On July 28, 2016, we held a hearing on the combined license (COL) application of Duke Energy Florida, LLC, to construct and operate two new nuclear reactors at the Levy Nuclear Plant site in Levy County, Florida. In this uncontested proceeding, we consider whether the review of the application by the NRC Staff has been adequate to support the findings set forth in 10 C.F.R. §§ 52.97(a) and 51.107(a). As discussed below, we conclude that the Staff’s review was sufficient to support the regulatory findings and authorize issuance of the combined licenses.

#### **I. BACKGROUND**

##### **A. Proposed Action**

Duke seeks to build two Advanced Passive 1000 (AP1000) reactors on a new site in Levy County, Florida. Duke’s predecessor, Progress Energy Florida, Inc.

(Progress Energy), applied for the combined licenses in July 2008.<sup>1</sup> The Staff accepted the application for review shortly thereafter.<sup>2</sup> Duke took over as the applicant following a corporate merger between Progress Energy, Inc. and Duke Energy Corporation.<sup>3</sup>

Consistent with 10 C.F.R. Part 52, Appendix D, Duke's application references the AP1000 certified design, as amended in design control document (DCD) Revision 19.<sup>4</sup> Accordingly, issues resolved in the AP1000 design certification rulemaking are closed and will not be revisited here, unless they are the subject of a departure or exemption. The Staff followed the design-centered review approach, under which the Staff performs one technical review for each standard issue outside the DCD. Under this approach, the first combined license application for a given design is designated the "reference COL" application (RCOLA) and later applications referencing the same design are designated "subsequent COL" applications (SCOLA). Where the Staff has already resolved an issue with respect to the RCOLA, its review of the same issue in an SCOLA consists of confirming that the information is identical in both applications. The application for Vogtle Electric Generating Plant, Units 3 and 4 was designated as the RCOLA for the AP1000 design; the Levy combined license application is therefore considered an SCOLA, with a correspondingly limited review.<sup>5</sup>

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<sup>1</sup> Progress Energy Florida, Inc., Notice of Receipt and Availability of Application for a Combined License, 73 Fed. Reg. 60,726 (Oct. 14, 2008).

<sup>2</sup> Progress Energy Florida, Inc., Acceptance for Docketing of an Application for Combined License for Levy County Nuclear Power Plant Units 1 and 2, 73 Fed. Reg. 60,726 (Oct. 14, 2008).

<sup>3</sup> See Letter from Christopher M. Fallon, Progress Energy, to NRC Document Control Desk (Apr. 15, 2013) (ADAMS Accession No. ML13109A046) (transmitting changes to combined license application for corporate name change from Progress Energy Florida, Inc., to Duke Energy Florida, Inc. following the merger between Duke Energy Corporation and Progress Energy, Inc.). Duke Energy Florida, Inc. subsequently changed its corporate name to Duke Energy Florida, LLC. See Ex. NRC-006A, Levy Nuclear Plant Units 1 and 2, COL Application, Part 1, General and Financial Information, rev. 8 (Apr. 2016), at 1-1 n.1 (ADAMS Accession No. ML16111A178). The combined license application was admitted into the record as exhibits NRC-006A through NRC-006L (excluding the letter "I" to avoid confusion with the number "1"). See Revised NRC Staff Exhibit List, attach. at 1-2 & n.2 (Sept. 7, 2016). Exhibits NRC-006H and NRC-006J contain sensitive information and are not publicly available. *Id.*, attach. at 2 n.3.

<sup>4</sup> See Ex. NRC-006B, Levy Nuclear Plant Units 1 and 2, COL Application, Part 2, Final Safety Analysis Report, rev. 9, § 1.1 (Apr. 6, 2016) (ADAMS Accession No. ML16111A957 (package)) (FSAR); see also Westinghouse AP1000 Design Control Document, rev. 19 (June 13, 2011) (ADAMS Accession No. ML11171A287 (package)) (AP1000 DCD). The Revision 19 design was certified in 10 C.F.R. Part 52, Appendix D, "Design Certification Rule for the AP1000 Design."

<sup>5</sup> See Ex. NRC-001, "Staff Statement in Support of the Uncontested Hearing for Issuance of Combined Licenses for the Levy Nuclear Plant Units 1 and 2 (Docket Nos. 52-029 and 52-030)," Commission Paper SECY-16-0076 (June 10, 2016), at 3-4 (ADAMS Accession No. ML16214A173)

(Continued)

Over the past 8 years, the Staff has spent approximately 83,000 hours on the safety and environmental reviews of the application.<sup>6</sup> During this time, the Staff conducted approximately 100 public meetings and teleconferences.<sup>7</sup> Over the course of the review, Duke responded to approximately 690 requests for additional information from the Staff.<sup>8</sup>

The Office of New Reactors led the Staff's technical review, with support from across the agency.<sup>9</sup> Because building on the proposed site will require permits from the U.S. Army Corps of Engineers (Corps), the Corps participated in preparing the Final Environmental Impact Statement (Final EIS) as a cooperating agency.<sup>10</sup> In addition, the Staff consulted with federal, state, local, and tribal organizations and governments concerning a variety of issues, including those arising under the National Environmental Policy Act of 1969 (NEPA), the National Historic Preservation Act (NHPA), and the Endangered Species Act.<sup>11</sup> The Advisory Committee on Reactor Safeguards (ACRS), a committee of technical experts advising the Commission, provided an independent assessment of the safety aspects of Duke's application.<sup>12</sup>

Duke's application does not reference an early site permit. Therefore, all site characteristics, including site geology, hydrology, seismology, and man-made hazards, as well as the potential environmental impacts of the project, were considered during the review of the combined license application.

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(Staff Information Paper). *See generally* NRC Regulatory Issue Summary 2006-06, New Reactor Standardization Needed to Support the Design-Centered Licensing Review Approach (May 31, 2006) (ADAMS Accession No. ML053540251).

<sup>6</sup> Tr. at 51 (Dr. Uhle).

<sup>7</sup> Ex. NRC-001, Staff Information Paper, at 5; Tr. at 51 (Dr. Uhle).

<sup>8</sup> Tr. at 51 (Dr. Uhle).

<sup>9</sup> Tr. at 51-52 (Dr. Uhle).

<sup>10</sup> *See* Exs. NRC-009A to NRC-009C, "Environmental Impact Statement for Combined Licenses (COLs) for Levy Nuclear Plant Units 1 and 2" (Final Report), NUREG-1941, vols. 1-3 (Apr. 2012) (ADAMS Accession Nos. ML16214A178, ML16214A179, ML16214A181) (Final EIS); *see* Tr. at 52 (Dr. Uhle). Other federal agencies, including the U.S. Department of Homeland Security, also contributed to the Staff's review. Ex. NRC-001, Staff Information Paper, at 6.

<sup>11</sup> Ex. NRC-001, Staff Information Paper, at 6.

<sup>12</sup> AEA § 182b, 42 U.S.C. § 2232(b); 10 C.F.R. §§ 1.13, 52.87; *see* Letter from Said Abdel-Khalik, Chairman, ACRS, to Gregory B. Jaczko, Chairman, NRC (Dec. 7, 2011) (ADAMS Accession No. ML11339A126) (2011 ACRS Letter) (generally recommending approval of the combined license application); Letter from J. Sam Armijo, Chairman, ACRS, to R.W. Borchardt, Executive Director for Operations, NRC (Apr. 25, 2012) (ADAMS Accession No. ML12108A270) (requesting additional information with regard to generic issues); Letter from Dennis Bley, Chairman, ACRS, to Stephen G. Burns, Chairman, NRC (Apr. 18, 2016) (ADAMS Accession No. ML16102A149) (2016 ACRS Letter) (regarding exemptions to the AP1000 certified design included in the Levy combined license application).

## B. Review Standards

Section 189a of the Atomic Energy Act of 1954, as amended (AEA), requires that we hold a hearing on each application to construct a nuclear power plant, regardless of whether an interested member of the public requests a hearing on the application.<sup>13</sup> With respect to safety matters, we must determine whether

- (i) The applicable standards and requirements of the [AEA] and the Commission's regulations have been met;
- (ii) Any required notifications to other agencies or . . . bodies have been duly made;
- (iii) There is reasonable assurance that the facility will be constructed and will operate in conformity with the license[s], the provisions of the [AEA], and the Commission's regulations;
- (iv) The applicant is technically and financially qualified to engage in the activities authorized [by the licenses]; and
- (v) Issuance of the license[s] will not be inimical to the common defense and security or to the health and safety of the public.<sup>14</sup>

With respect to environmental matters, we must:

- (1) Determine whether the requirements of NEPA Section[ ] 102(2)(A), (C), and (E), and the [applicable] regulations [in 10 C.F.R. Part 51 (the NRC regulations implementing NEPA)] have been met;
- (2) Independently consider the final balance among conflicting factors contained in the record of the proceeding with a view to determining the appropriate action to be taken;
- (3) Determine, after weighing the environmental, economic, technical, and other benefits against the environmental and other costs, and considering reasonable alternatives, whether the combined license[s] should be issued, denied, or appropriately conditioned to protect environmental values; and
- (4) Determine . . . whether the NEPA review conducted by the NRC staff has been adequate.<sup>15</sup>

We do not review Duke's application *de novo*; rather, our inquiry is whether the Staff's review was sufficient to support the findings described above.<sup>16</sup>

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<sup>13</sup> AEA § 189a, 42 U.S.C. § 2239(a).

<sup>14</sup> 10 C.F.R. § 52.97(a)(1).

<sup>15</sup> *Id.* § 51.107(a).

<sup>16</sup> *See, e.g., DTE Electric Co.* (Fermi Nuclear Power Plant, Unit 3), CLI-15-13, 81 NRC 555, 560-61 (2015).

### C. Contested Proceeding

After the Staff accepted the application for review, the NRC provided an opportunity to challenge the application in an adjudicatory hearing.<sup>17</sup> Three joint petitioners were granted a hearing in the contested proceeding: Nuclear Information and Resource Service, Inc. (NIRS), the Green Party of Florida, and the Ecology Party of Florida (collectively, Joint Intervenors).<sup>18</sup> The Atomic Safety and Licensing Board admitted three contentions at the outset of the proceeding.<sup>19</sup> One of these, Contention 4 (later designated Contention 4A), concerned hydroecology, particularly salt drift<sup>20</sup> and dewatering activities during construction and operation of the proposed facility and was the subject of an evidentiary hearing.<sup>21</sup>

Following the hearing, the Board held that the Staff's Final EIS had satisfied NEPA in its discussion of issues relating to the contention.<sup>22</sup> The Board made detailed findings of fact regarding dewatering in several areas: site characterization, groundwater modeling and modeling assumptions, seasonal fluctuations and hydroperiods, passive dewatering impact analysis, climate change and salt-water intrusion, cumulative impacts analysis, reliance on conditions of certification and state regulatory processes, connection to the Floridan Aquifer System, impacts to outstanding Florida waters, nutrient concentration impacts, and destructive wildfires.<sup>23</sup> The Board also made detailed findings of fact regarding salt drift and salt deposition.<sup>24</sup>

As a matter of law, the Board concluded that (1) the Final EIS contained an "adequate and fair analysis" of the potential impacts of the proposed facility that satisfied the NEPA rule of reason, (2) the NRC exercised independent judgment in its identification and assessment of the potential environmental impacts, and (3) the Staff's reliance in the Final EIS on certain monitoring and mitigation

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<sup>17</sup> Progress Energy Florida, Inc.; Application for the Levy County Nuclear Power Plant Units 1 and 2; Notice of Order, Hearing, and Opportunity to Petition for Leave to Intervene, 73 Fed. Reg. 74,532 (Dec. 8, 2008).

<sup>18</sup> LBP-09-10, 70 NRC 51 (2009). The Green Party of Florida subsequently withdrew from the contested proceeding. *See* Notice of Withdrawal (May 17, 2012).

<sup>19</sup> *Id.* at 147.

<sup>20</sup> The Levy site is located 8 miles inland and includes freshwater wetlands. The Applicant plans to use saltwater as coolant, which will cause some salt drift and deposition from the cooling towers. The Final EIS discusses environmental impacts from salt drift and salt deposition. *See* Ex. NRC-009A, Final EIS § 5.3.1.1, at 5-19 to 5-26; *id.* § 5.7.2, at 5-85 to 5-86.

<sup>21</sup> Memorandum and Order (Admitting Contention 4A) (Feb. 2, 2011) (unpublished); *see* LBP-13-4, 77 NRC 107, 116 (2013).

<sup>22</sup> LBP-13-4, 77 NRC 107.

<sup>23</sup> *See id.* at 143-50, 153-63, 165-67, 168-69, 170-71, 172-73, 178-97, 198-99, 200-02, 203-04, 205-06.

<sup>24</sup> *Id.* at 207-09.

measures required by the Florida Department of Environmental Protection (included in conditions of certification for the project) was reasonable.<sup>25</sup> The Joint Intervenors did not seek review of the Board's decision.

In the two other admitted contentions the Joint Intervenors asserted that Progress Energy lacked a plan for disposal of low-level radioactive waste. Specifically, Contentions 7 and 8 concerned the environmental and safety aspects, respectively, of storing class B and C low-level radioactive waste onsite beyond 2 years.<sup>26</sup> The Board ultimately dismissed both contentions as moot after Progress Energy developed a plan for handling low-level radioactive waste beyond the initial 2 years of plant operation; Joint Intervenors did not appeal the dismissals.<sup>27</sup> The issues litigated in Contentions 4A, 7, and 8 were resolved via the contested proceeding; therefore, we do not consider them further.

Joint Intervenors unsuccessfully sought to litigate several other matters after they filed their initial intervention petition. In 2011, the Board rejected as untimely a proposed Contention 12A that challenged the alternative site analysis in the Draft EIS.<sup>28</sup> The Board likewise rejected as untimely a proposed Contention 14/14A, in which Joint Intervenors claimed that the plant's proposed use of the

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<sup>25</sup> LBP-13-4, 77 NRC at 209-20.

<sup>26</sup> LBP-09-10, 70 NRC at 121-25. We upheld the Board's decision to admit these two contentions but narrowed both to exclude consideration of greater-than-class-C waste. CLI-10-2, 71 NRC 27, 47-48 (2010).

<sup>27</sup> The Board dismissed Contention 7 as moot following issuance of the Draft EIS. Order (Granting Motion for Summary Disposition of Contention 7 as Moot) (Sept. 8, 2010) (unpublished). The Joint Intervenors subsequently proposed Contention 7A, which asserted that the low-level radioactive waste analysis in the Draft EIS did not comply with NEPA. The Board found Contention 7A to be untimely and declined to admit it. Memorandum and Order (Denying Contention 7A) (Mar. 16, 2011) (unpublished).

Contention 8 was dismissed by consent and replaced by Contention 8A, which challenged the adequacy of Progress Energy's initial low-level radioactive waste management plan. *See* Memorandum and Order (Ruling on Joint Intervenors' Motion to File and Admit New Contention 8A) (Aug. 9, 2010) (unpublished). The Board denied Progress Energy's initial motion for summary disposition of Contention 8A, concluding that, as a matter of law, the plan did not contain enough information to enable the NRC to resolve whether Progress Energy's means for controlling and limiting effluents and radiation exposures would be within 10 C.F.R. Part 20 limits. *See* LBP-10-20, 72 NRC 571 (2010), *reconsideration denied*, Memorandum and Order (Denying Motion for Reconsideration of LBP-10-20) (Dec. 22, 2010) (unpublished). The Board granted a second motion for summary disposition following Progress Energy's further revision of its plan. LBP-11-31, 74 NRC 643 (2011).

<sup>28</sup> *See* Memorandum and Order (Denying Contention 12A) (Mar. 29, 2011) (unpublished). The Joint Intervenors asserted that the Staff improperly concluded that none of the alternative sites was preferable to the Levy site because the Staff, in the Draft EIS, did not adequately consider the consequences of placing the cooling water intake structure in the Cross Florida Barge Canal. *Id.* at 1-2.

Cross Florida Barge Canal would violate several federal and state statutes.<sup>29</sup> And the Board rejected motions to admit a proposed Contention 13, which related to the agency's activities following the Fukushima Dai-ichi accident and to reconsider a previously rejected Contention 5, which concerned consideration in the environmental review of the impacts of an accident at the neighboring Crystal River Energy Complex.<sup>30</sup> The Joint Intervenors did not appeal these decisions.

Certain intervenors also joined unsuccessful petitions for Commission action filed on several licensing dockets following the Fukushima Dai-ichi accident.<sup>31</sup> Relatedly, NIRS joined several petitioners that sought to suspend reactor licensing decisions pending the resolution of a petition for rulemaking concerning the environmental impacts of the expedited transfer of spent fuel from the spent fuel pool to dry cask storage.<sup>32</sup> We denied the suspension petition and provided direction on related requests.<sup>33</sup>

Also during the pendency of the contested proceeding, the U.S. Court of Appeals for the District of Columbia Circuit vacated and remanded our 2010 Waste Confidence Decision and Temporary Storage Rule, which for this and other NRC licensing actions served as part of the environmental analysis of the impacts of spent fuel storage after the end of a reactor's license term pending ultimate disposal in a repository.<sup>34</sup> NIRS and the Ecology Party of Florida joined a suspension petition filed on multiple dockets and a proposed "continued stor-

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<sup>29</sup> Memorandum and Order (Ruling on Motion for Leave to File Proposed Contentions 14 and 14A) (Mar. 19, 2012) (unpublished).

<sup>30</sup> Memorandum and Order (Denying Motion to Admit Contentions 13 and 5 and Granting Motion to Supplement) (Dec. 15, 2011) (unpublished). Contention 13 asserted that the Environmental Report and Draft EIS did not satisfy NEPA because they failed to address "the new and significant environmental implications of the findings and recommendations raised by NRC's Fukushima Task Force Report." *Id.* at 3 (internal quotations omitted). Crystal River Unit 3 (the only nuclear unit on the Crystal River Energy Complex, located approximately 9.6 miles from the Levy site) shut down permanently in February 2013.

<sup>31</sup> *Union Electric Co.* (Callaway Plant, Unit 2), CLI-11-5, 74 NRC 141 (2011); Environmental Impacts of Severe Reactor and Spent Fuel Pool Accidents, 80 Fed. Reg. 48,235 (Aug. 12, 2015) (internal quotations omitted).

<sup>32</sup> See Petition to Suspend Reactor Licensing Decisions and Reactor Re-licensing Decisions Pending Completion of Rulemaking Proceeding Regarding Environmental Impacts of High-Density Pool Storage of Spent Fuel and Mitigation Measures (Feb. 27, 2014).

<sup>33</sup> See *DTE Electric Co.* (Fermi Nuclear Power Plant, Unit 3), CLI-14-7, 80 NRC 1 (2014). The rulemaking petition was subsequently denied. Generic Determinations Regarding the Environmental Impacts of Spent Fuel Storage and Disposal When Considering Nuclear Power Reactor License Applications, 81 Fed. Reg. 31,532 (May 19, 2016).

<sup>34</sup> See *New York v. NRC*, 681 F.3d 471 (D.C. Cir. 2012). See generally Final Rule: "Consideration of Environmental Impacts of Temporary Storage of Spent Fuel After Cessation of Reactor Operation," 75 Fed. Reg. 81,032 (Dec. 23, 2010); Waste Confidence Decision Update, 75 Fed. Reg. 81,037 (Dec. 23, 2010).

age” contention.<sup>35</sup> In light of the D.C. Circuit’s vacatur and remand of the rule, and in response to the suspension petitions, we held in abeyance the issuance of final licensing decisions for affected matters while we addressed the court’s remand.<sup>36</sup>

To address the remand and provide comprehensive analysis of the environmental impacts of continued storage, we issued a final Continued Storage Rule and supporting Generic Environmental Impact Statement.<sup>37</sup> Concurrent with this action, we lifted the licensing suspension and dismissed, or directed licensing boards to dismiss, proposed contentions that had been filed with the multidocket suspension petitions and held in abeyance.<sup>38</sup> The Board dismissed the “continued storage” contention filed by NIRS and the Ecology Party of Florida in this proceeding consistent with our direction.<sup>39</sup> The Ecology Party of Florida and NIRS also joined other unsuccessful multiple-docket petitions related to continued storage that were later denied.<sup>40</sup> In March 2015, the Board terminated the contested proceeding.<sup>41</sup>

#### **D. Uncontested Proceeding**

All safety and environmental matters relevant to the combined license ap-

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<sup>35</sup> Intervenor’s Motion for Leave to File a New Contention Concerning Temporary Storage and Ultimate Disposal of Spent Reactor Fuel at Levy Nuclear Power Plant (July 9, 2012).

<sup>36</sup> *Calvert Cliffs 3 Nuclear Project, LLC* (Calvert Cliffs Nuclear Power Plant, Unit 3), CLI-12-16, 76 NRC 63, 67-69 (2012); see *Petition to Suspend Final Decisions in All Pending Reactor Licensing Proceedings Pending Completion of Remanded Waste Confidence Proceedings* (June 18, 2012).

<sup>37</sup> *Calvert Cliffs 3 Nuclear Project, LLC* (Calvert Cliffs Nuclear Power Plant, Unit 3), CLI-14-8, 80 NRC 71, 77 (2014). See generally Final Rule: “Continued Storage of Spent Nuclear Fuel,” 179 Fed. Reg. 56,238 (Sept. 19, 2014); Generic Environmental Impact Statement for Continued Storage of Spent Nuclear Fuel, 79 Fed. Reg. 56,263 (Sept. 19, 2014); “Generic Environmental Impact Statement for Continued Storage of Spent Nuclear Fuel” (Final Report), NUREG-2157, vols. 1 and 2 (Sept. 2014) (ADAMS Accession Nos. ML14196A105 and ML14196A107) (Continued Storage GEIS). The D.C. Circuit recently upheld the Continued Storage Rule. *New York v. NRC*, No. 14-1210 (D.C. Cir. June 3, 2016), *reh’g en banc denied per curiam* (Aug. 8, 2016).

<sup>38</sup> *Calvert Cliffs*, CLI-14-8, 80 NRC at 79-81.

<sup>39</sup> Memorandum and Order (Dismissing Environmental Waste Confidence Contention) (Oct. 1, 2014) (unpublished); see *Duke Energy Carolinas, LLC* (William States Lee III Nuclear Station, Units 1 and 2), CLI-15-15, 81 NRC 803 (2015) (declining to admit a “placeholder” contention in this and other proceedings in anticipation that the court of appeals would overturn the 2014 Continued Storage Rule).

<sup>40</sup> *DTE Electric Co.* (Fermi Nuclear Power Plant, Unit 3), CLI-15-4, 81 NRC 221 (2015) (holding that the Commission is not required, under the Atomic Energy Act, to make predictive findings regarding the technical feasibility of spent fuel disposal as part of its reactor licensing decisions); *DTE Electric Co.* (Fermi Nuclear Power Plant, Unit 3), CLI-15-10, 81 NRC 535 (2015) (declining to order the supplementation of final EISs to reference the Continued Storage GEIS).

<sup>41</sup> LBP-15-8, 81 NRC 393 (2015).

plication, except those resolved in the contested proceeding, are subject to our review in the uncontested proceeding.<sup>42</sup> The uncontested portion of the proceeding begins once the Staff has completed both its environmental and safety reviews; here, because the Final EIS was completed in 2012, the release of the Final Safety Evaluation Report (FSER) on May 31, 2016, triggered the uncontested proceeding.<sup>43</sup> Shortly after the FSER was released, we received the Staff's statement in support of the uncontested hearing, which serves as the Staff's initial testimony and provides an overview of its safety and environmental review of this application.<sup>44</sup> Consistent with the design-centered review approach, the Staff's paper focused on "non-routine matters, such as unique features of the facility or novel issues that arose as part of the review process."<sup>45</sup>

### ***1. Prehearing Activities***

We issued a Notice of Hearing on June 17, 2016, which set a schedule for the Staff and Duke to file their witness lists and for Duke to file its prehearing testimony.<sup>46</sup> The Notice of Hearing also invited interested states, local government bodies, or federally recognized Indian tribes to provide a statement of issues for us to consider as part of the uncontested proceeding.<sup>47</sup> We also issued prehearing questions to both the Staff and Duke.<sup>48</sup> Finally, the Secretary of the Commission transmitted a scheduling note to the Staff and Duke setting the hearing topics and order of presentations.<sup>49</sup>

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<sup>42</sup> See, e.g., *Fermi*, CLI-15-13, 81 NRC at 564-65.

<sup>43</sup> See Exs. NRC-007A & NRC-007B, "Final Safety Evaluation Report for Combined Licenses for Levy Nuclear Plant Units 1 and 2" (May 2016) (ADAMS Accession Nos. ML16214A176 and ML16214A177) (FSER). Chapter 19 of the FSER is nonpublic and was admitted into the record as NRC-008.

<sup>44</sup> Ex. NRC-001, Staff Information Paper.

<sup>45</sup> *Id.* at 2.

<sup>46</sup> Duke Energy Florida, LLC, Levy Nuclear Plant, Units 1 and 2; Combined License Application, 81 Fed. Reg. 39,720 (June 17, 2016) (Notice of Hearing); see also Ex. DEF-001, Duke Energy Florida's Corrected Pre-Filed Testimony in Support of the Mandatory Hearing for the Levy Nuclear Plant Units 1 and 2 Combined Licenses (July 7, 2016) (ADAMS Accession No. ML16214A164) (Duke Pre-Filed Testimony); Ex. DEF-002, Curriculum Vitae of Robert H. Kitchen (ADAMS Accession No. ML16214A165).

<sup>47</sup> Notice of Hearing, 81 Fed. Reg. at 39,721. We received no responses to this invitation.

<sup>48</sup> See Order (Transmitting Pre-Hearing Questions) (June 24, 2016) (unpublished) (Pre-Hearing Question Order); Ex. DEF-003, Duke Energy Florida's Responses to Pre-Hearing Questions (July 7, 2016) (ADAMS Accession No. ML16214A167) (Duke Pre-Hearing Responses); Ex. NRC-004, NRC Staff Responses to Pre-Hearing Questions (July 7, 2016) (ADAMS Accession No. ML16214A175) (Staff Pre-Hearing Responses).

<sup>49</sup> Scheduling Note, "Hearing on Combined Licenses for Levy Nuclear Project Units 1 and 2:  
(Continued)

## 2. *The Hearing*

The hearing presentations were made by witness panels. The first panel of witnesses for Duke and the Staff gave an overview of the license application and the Staff's review, respectively. The second panel focused on safety-related issues, and the third panel focused on environmental issues. Overall, the Staff made available eighty-five witnesses at the hearing, including scheduled panelists.<sup>50</sup> Seven witnesses offered testimony on behalf of Duke at the hearing and in prefiled written testimony.<sup>51</sup>

Duke's overview panelists discussed the general qualifications of Duke and the choice to reference the AP1000 design;<sup>52</sup> information regarding the Levy site's location, size, proximity to the Crystal River Energy Complex, and water intake and discharge systems and locations;<sup>53</sup> emergent issues related to the AP1000 design based on issues discovered through construction of AP1000 plants at the Vogtle and V.C. Summer sites and in China;<sup>54</sup> and the environmental impacts of the proposed project.<sup>55</sup>

The Staff panelists provided background on the review of the combined license application.<sup>56</sup> These panelists discussed the focus of the Staff's review on the plant-specific aspects of the application — operational programs, site-specific design features, combined license information items, and departures from the certified design;<sup>57</sup> the ACRS review of the application, its recommendations, and the Staff's responses;<sup>58</sup> and the Staff's safety and environmental

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Section 189a of the Atomic Energy Act Proceeding (Public Meeting)" (July 20, 2016) (ADAMS Accession No. ML16202A515).

<sup>50</sup> See Revised NRC Staff Witness List (July 22, 2016). Five of the listed witnesses did not appear at the hearing. Tr. at 12 (Mr. Roach); NRC Staff Motion to Correct the Hearing Transcript and to Admit Exhibit NRC-013 (Aug. 9, 2013), attach. at 1 n.1.

<sup>51</sup> See Duke Energy Florida's Witness List (filed July 7, 2016); Ex. DEF-001, Duke Pre-Filed Testimony.

<sup>52</sup> Tr. at 17-20 (Mr. Fallon); Tr. at 30-31 (Mr. Kitchen); Ex. DEF-004, Levy Nuclear Plant — Overview Panel (July 28, 2016), at 7 (ADAMS Accession No. ML16214A168) (Duke Overview Presentation).

<sup>53</sup> Tr. at 24-26 (Mr. Kitchen); Ex. DEF-004, Duke Overview Presentation, at 2-6.

<sup>54</sup> Tr. at 31-33 (Mr. Kitchen); Ex. DEF-004, Duke Overview Presentation, at 8.

<sup>55</sup> Tr. at 34-35 (Mr. Snead); Ex. DEF-004, Duke Overview Presentation, at 10.

<sup>56</sup> Tr. at 49-67; Ex. NRC-010, Combined License Application Review LNP Units 1 and 2 — Overview Panel (July 28, 2016) (ADAMS Accession No. ML16214A183) (Staff Overview Presentation).

<sup>57</sup> Tr. at 53 (Dr. Uhle); Ex. NRC-010, Staff Overview Presentation, at 5.

<sup>58</sup> Tr. at 54-57 (Mr. Akstulewicz); Ex. NRC-010, Staff Overview Presentation, at 6-7.

findings under 10 C.F.R. § 52.97(a), NEPA § 102(2)(A), (C), and (E), and 10 C.F.R. § 51.107(a).<sup>59</sup>

The safety panel focused on aspects of the Levy COL application requiring special engineering solutions, including the geologic and geotechnical characteristics of the site; design and construction of the proposed roller-compacted concrete foundation; and a departure from the certified design associated with the passive core cooling system condensate return.<sup>60</sup> The environmental panel discussed alternative sites and the U.S. Fish and Wildlife Service's Biological Opinion for the project.<sup>61</sup> These issues are discussed further in Sections II.B.1.a through 1.c and II.B.2.a and 2.b.

### 3. *Post-Hearing Activities*

After the hearing, we posed a single additional question to the Staff concerning the project's impacts to wetlands.<sup>62</sup> The Staff's written response was admitted as an exhibit, and after adopting corrections to the hearing transcript, we closed the evidentiary record.<sup>63</sup>

## II. DISCUSSION

Although our review encompassed the entire application, we discuss here a brief selection of topics. We first consider Duke's requested exemptions from our regulatory requirements and departures from the AP1000 certified design. Our discussion then turns to site-specific and novel issues.

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<sup>59</sup> Tr. at 58-60 (Mr. Akstulewicz), 64-67 (Mr. Lee); Ex. NRC-010, Staff Overview Presentation, at 8-10, 17-20.

<sup>60</sup> Tr. at 80-82 (Mr. Thrasher), 82-84 (Mr. Kitchen), 86-89 (Dr. Stirewalt), 89-93 (Mr. Thomas), 93-97 (Mr. Travis); *see* Ex. DEF-005, Levy Nuclear Plant — Safety Panel (July 28, 2016) (ADAMS Accession No. ML16214A169) (Duke Safety Presentation); Ex. NRC-011-R, Combined License Application Review Levy Nuclear Plant Units 1 and 2 — Safety Panel (July 28, 2016) (ADAMS Accession No. ML16214A186) (Staff Safety Presentation).

<sup>61</sup> Tr. at 114-17 (Mr. Snead), 118-21 (Ms. Sutton), 121-25 (Mr. Kugler); *see* Ex. NRC-012, Combined License Application Review Levy Units 1 and 2 — Environmental Panel (July 28, 2016) (ADAMS Accession No. ML16214A182) (Staff Environmental Presentation); Ex. DEF-006, Levy Nuclear Plant — Environmental Panel (July 28, 2016) (ADAMS Accession No. ML16214A170).

<sup>62</sup> Order (Transmitting Post-Hearing Question) (Aug. 4, 2016) (unpublished) (Post-Hearing Order).

<sup>63</sup> Order (Adopting Proposed Transcript Corrections, Admitting Post-Hearing Exhibits, and Closing the Record of the Proceeding) (Sept. 12, 2016) (unpublished).

## A. Exemptions and Departures

Duke requested seven exemptions and identified eleven departures from the AP1000 certified design.<sup>64</sup> Where a combined license applicant references a certified design, changes to the design may be made in the combined license if proposed as a departure from the certified design. Some departures from the certified design may be made without prior Commission approval.<sup>65</sup> However, departures that involve a change to the design as described in the rule certifying the design require an exemption from our regulations.<sup>66</sup> The Staff may approve an exemption where it finds that the exemption is authorized by law, will not present an undue risk to the public health and safety, is consistent with the common defense and security, and special circumstances exist that warrant the exemption.<sup>67</sup> In addition, the Staff must determine that the special circumstances outweigh any decrease in safety resulting from the reduction in standardization that may result from the exemption.<sup>68</sup>

### 1. Exemptions

Duke requested two exemptions that are similar to those previously granted to other combined license holders. The first of these corresponds to standard departure STD DEP 1.1-1, which relates to the numbering and organization of the application.<sup>69</sup> The second exempts the combined license holder from certain requirements pertaining to material control and accounting for special nuclear materials, such that the same requirements apply to both Part 52 and Part 50 licensees.<sup>70</sup>

Additionally, Duke requested five exemptions that are common to other combined license applicants referencing the AP1000 design.<sup>71</sup> The Staff's technical evaluation of these exemptions is described in FSER Chapter 21.<sup>72</sup> The ACRS reviewed these exemptions, found them necessary to enable components of the

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<sup>64</sup> Ex. NRC-001, Staff Information Paper, at 17.

<sup>65</sup> 10 C.F.R. Part 52, App. D, § VIII.B.5.a.

<sup>66</sup> *Id.* Part 52, App. D, § VIII.A.4. The requirements that combined license applicants must meet when seeking an exemption from the Commission's regulations are found in 10 C.F.R. § 52.93.

<sup>67</sup> *See id.* §§ 52.63(b)(1), 52.7, 50.12(a).

<sup>68</sup> *Id.* § 52.63(b)(1).

<sup>69</sup> Ex. NRC-007A, FSER § 1.5.4, at 1-44 to 1-46; *see* Ex. NRC-001, Staff Information Paper, at 18.

<sup>70</sup> Ex. NRC-007A, FSER § 1.5.4, at 1-46 to 1-47; *see Southern Nuclear Operating Co. (Vogtle Electric Generating Plant, Units 3 and 4), CLI-12-2, 75 NRC 63, 84 (2012) (citations omitted);* Ex. NRC-001, Staff Information Paper, at 18.

<sup>71</sup> *See* Ex. NRC-001, Staff Information Paper, at 19-21.

<sup>72</sup> Ex. NRC-007B, FSER, ch. 21.

certified design to perform their intended functions, and recommended their approval.<sup>73</sup>

The first of the five exemptions concerns modifications to the passive core cooling system condensate return.<sup>74</sup> This exemption involves a proposed design departure, LNP DEP 3.2-1, which would add components to the condensate return system to increase the amount of recovered condensate from the containment shell to the in-containment refueling water storage tank during accident scenarios.<sup>75</sup> The exemption also involves a second departure, LNP DEP 6.3-1, that would change the duration that the passive residual heat removal heat exchanger can maintain safe shutdown from an “indefinite” period of time to “at least [14] days.”<sup>76</sup> This issue is discussed further in Section II.B.1.c, *infra*.

The second exemption common to AP1000 applicants concerns the main control room habitability dose analysis. According to the Staff, the vendor for the AP1000 design, Westinghouse Electric Company, identified inaccuracies in its design basis accident dose analyses due to a failure to account for the main control room emergency habitability system filter direct dose and because the radiation monitor in the control room did not account for all release scenarios.<sup>77</sup> As a result, Duke submitted site-specific revisions to the AP1000 design and associated dose consequence analyses to ensure that operator dose following a design basis accident is maintained below regulatory limits.<sup>78</sup> The Staff evalu-

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<sup>73</sup> 2016 ACRS Letter at 1. We asked the Staff and Duke prior to the hearing whether the cumulative risk of the design changes associated with these five exemptions had been assessed. *See* Pre-Hearing Question Order at 19. Duke explained that because the design changes were all “implemented to restore the design to comply with the design basis assumptions . . . their cumulative risk impact is deemed insignificant.” Ex. DEF-003, Duke Pre-Hearing Responses, at 32. The Staff stated that because a qualitative analysis of each design change confirmed that each was too small to affect core damage frequency or large release frequency, and the number of changes is limited, the cumulative risk impact is too small to require revising the risk assessment. *See* Ex. NRC-004, Staff Pre-Hearing Responses, at 22.

The Staff testified that two AP1000 combined license holders are expected to seek the same exemptions and departures for the units currently under construction. *See* Tr. at 57-58 (Mr. Akstulewicz).

<sup>74</sup> *See* Ex. NRC-001, Staff Information Paper, at 19, 25-27; Tr. at 93-97 (Mr. Travis); *see also* Ex. NRC-004, Staff Pre-Hearing Responses, at 21-26; Ex. DEF-003, Duke Pre-Hearing Responses, at 32-43.

<sup>75</sup> Ex. NRC-001, Staff Information Paper, at 19; *see* Ex. NRC-007B, FSER § 21.1.2.

<sup>76</sup> *See* Ex. NRC-007B, FSER § 21.1.2.

<sup>77</sup> Ex. NRC-001, Staff Information Paper, at 19. Prior to the hearing, the parties responded to several questions about this exemption. *See* Ex. DEF-003, Duke Pre-Hearing Responses, at 43-47; Ex. NRC-004, Staff Pre-Hearing Responses, at 26-29. At the hearing, we asked the Staff about the instruments used to monitor control room radiation levels and the level of burden the monitoring would impose on plant staff. *See* Tr. at 99-103.

<sup>78</sup> *See* Ex. DEF-001, Duke Pre-Filed Testimony, at 7; *see also* Ex. NRC-007B, FSER § 21.2.2.

ated Duke's exemption request and found that it met the regulatory requirements for approval.<sup>79</sup> Duke also submitted a site-specific departure, LNP DEP 6.4-1, to reflect the revised dose analyses and associated design changes.<sup>80</sup>

The third common exemption concerns design changes necessary to limit heating in the control room during a design-basis event. According to the Staff, Westinghouse identified additional potential heat sources not accounted for in the original control room habitability analysis.<sup>81</sup> The Staff considered the design changes and determined that the changes support the system's intended design functions and will ensure that the system will maintain heat loads inside the control room within design-basis assumptions. Departure LNP DEP 6.4-2 is associated with this exemption.<sup>82</sup>

The fourth common exemption concerns the need to revise the Inspections, Tests, Analyses, and Acceptance Criteria (ITAAC) in the AP1000 DCD for control of containment hydrogen concentrations during a beyond-design-basis event.<sup>83</sup> According to the Staff, the applicant identified inconsistencies between the current detailed design and the ITAAC for hydrogen vents inside containment.<sup>84</sup> The Staff found that a change to the acceptance criteria for certain primary ventilation paths and the proximity of those paths to the containment shell would maintain the design margins of the containment hydrogen control system; the changes therefore would support the intended design function.<sup>85</sup> The exemption relates to departure LNP DEP 6.2-1.<sup>86</sup>

The fifth common exemption concerns revision of the boron dilution block safety system bypass to comply with Institute of Electrical and Electronics Engineers (IEEE) standard 603-1991, Clause 6.6, "Operating Bypasses." That standard requires that where conditions exist to allow a safety system to be bypassed, the safety system must automatically reset if conditions change so that bypassing the safety system is no longer permissible.<sup>87</sup> The AP1000 certified design does not comply with the IEEE standard in that it allows manual bypass of the boron dilution block safety system without including a mechanism to restore

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<sup>79</sup> Ex. NRC-007B, FSER § 21.2.4.A.3, at 21-32 to 21-36.

<sup>80</sup> Ex. NRC-001, Staff Information Paper, at 19.

<sup>81</sup> *Id.* at 19-20; *see also* Ex. NRC-007B, FSER § 21.3; *id.* § 21.3.4.A.3, at 21-59 to 21-63.

<sup>82</sup> Ex. NRC-007B, FSER § 21.3.2.

<sup>83</sup> *Id.* § 21.4.2, at 21-88.

<sup>84</sup> Ex. NRC-001, Staff Information Paper, at 20; *see also* Ex. NRC-007B, FSER § 21.4.2, at 21-88.

<sup>85</sup> *See* Ex. NRC-007B, FSER § 21.4.4.A.3, at 21-91 to 21-94.

<sup>86</sup> *See id.* § 21.4.2.

<sup>87</sup> *See* Ex. NRC-001, Staff Information Paper, at 20. More specifically, the safety system must either restore plant conditions so that the bypass is permissible, remove the active bypass, or initiate the safety function. *Id.*; *see also* Ex. NRC-007B, FSER § 21.5.1.

the function automatically when plant conditions require it.<sup>88</sup> The Staff evaluated the exemption and found that the design changes enable the plant-specific technical specifications to meet the requirements of IEEE 603-1991.<sup>89</sup> Departure LNP DEP 7.3-1 describes the changes to the final safety analysis report (FSAR) and technical specifications associated with this exemption.<sup>90</sup>

## 2. Departures

In addition to seven departures relating to the exemptions described above, the applicant proposed four additional departures from the AP1000 DCD. Two departures are standard for all combined license applicants adopting the AP1000 design.<sup>91</sup> A third departure “corrects an inconsistency in a DCD table” and does not involve a change to the reactor design.<sup>92</sup> The fourth departure, LNP DEP 3.7-1, unique to the Levy combined license application, involves the foundation design for the Annex and Turbine buildings.<sup>93</sup> It permits the use of site-specific horizontal seismic response spectra for the design of drilled shafts supporting the seismic Category II structures.<sup>94</sup> The Staff assessed the departure, and specifically, how the departure will impact the potential seismic interaction between the nuclear island and the adjacent structures.<sup>95</sup> The Staff determined that there was “reasonable assurance that the drilled shaft design under the horizontal site-specific seismic demands will be adequate to support the adjacent structures to the [nuclear island] so as to preclude seismic interaction under the [Levy Nuclear Plant] site-specific seismic demands.”<sup>96</sup> Accordingly, the Staff found the departure acceptable.<sup>97</sup>

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<sup>88</sup> Ex. NRC-007B, FSER § 21.5.1; *see also* 2016 ACRS Letter at 4.

<sup>89</sup> *See* Ex. NRC-007B, FSER § 21.5.4.A.3, at 21-103 to 21-105.

<sup>90</sup> *Id.* § 21.5.2.

<sup>91</sup> STD DEP 1.1-1 relates to organization of the application. Ex. NRC-007A, FSER § 1.5.4, at 1-44 to 1-46; *see* Ex. NRC-001, Staff Information Paper, at 21. STD DEP 8.3-1 involves using breakers and fuses to isolate current in Class 1E voltage regulating transformers and was previously evaluated with respect to the Vogtle and Summer COL applications. Ex. NRC-007A, FSER §§ 8.3.2.4, 8.3.2.6; *see* Ex. NRC-001, Staff Information Paper, at 23.

<sup>92</sup> Ex. NRC-001, Staff Information Paper, at 23; *see* Ex. NRC-007A, FSER § 3.11.4, at 3-115 to 3-116.

<sup>93</sup> *See* Ex. NRC-001, Staff Information Paper, at 21-22.

<sup>94</sup> *See id.* at 22; Ex. NRC-007A, FSER § 3.7.2.4, at 3-52 to 3-53; *see also* Ex. NRC-004, Staff Pre-Hearing Responses, at 8-10; Ex. DEF-003, Duke Pre-Hearing Responses, at 13-14, 16-18.

<sup>95</sup> Ex. NRC-007A, FSER § 3.7.2.4, at 3-52 to 3-53.

<sup>96</sup> *Id.* § 3.7.2.5, at 3-53.

<sup>97</sup> *Id.*

## **B. Site-Specific Issues Addressed in the Proceeding**

### ***1. Safety-Related Issues***

#### ***a. Site Characteristics***

The FSAR identified one geologic hazard at the Levy site: the potential for subsurface voids due to the dissolution of limestone (or karst development) in the foundation rock unit known as the Avon Park Formation.<sup>98</sup> The Staff provided an overview of site characteristics at the hearing and noted that its conclusions supported Duke's expectation that the majority of the karst features are less than 1 foot in diameter and stated that the "subsurface voids will not detrimentally affect the stability or the suitability of the Avon Park."<sup>99</sup>

The Staff concluded that Duke had provided a "thorough and accurate description of the potential for tectonic and non-tectonic surface deformation at the site."<sup>100</sup> The Staff has proposed a license condition under which Duke will perform geologic mapping during safety-related excavations at the site.<sup>101</sup> Prior to the hearing, we sought further information on the need for the license condition.<sup>102</sup> The Staff responded that the data it has reviewed are sufficient to support its safety finding, but additional site-specific information regarding geologic features will be available once excavations are completed.<sup>103</sup> And the Staff explained that if excavations reveal potentially detrimental geologic features, our regulations may require Duke to conduct additional site investigations.<sup>104</sup> At the hearing, the Staff further explained that the site characterization is based on both surface characteristics and borehole data, which do not give as complete a picture as will be available after completion of the foundation excavation.<sup>105</sup> Nonetheless, the Staff continues to support its finding that Duke provided an adequate description of the potential for tectonic and nontectonic surface deformation at the Levy site.<sup>106</sup>

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<sup>98</sup> See Ex. NRC-006B, FSAR § 2.5.0.1.2, at 2.5-4; Ex. NRC-007A, FSER § 2.5.1.2.2.6; see also Ex. NRC-011-R, Staff Safety Presentation, at 4; Tr. at 81 (Mr. Thrasher), 86 (Dr. Stirewalt).

<sup>99</sup> Tr. at 86-89 (Dr. Stirewalt); see Tr. at 86-88 (Dr. Stirewalt); see also Tr. at 81 (Mr. Thrasher).

<sup>100</sup> Ex. NRC-007A, FSER § 2.5.3.4.8.

<sup>101</sup> Ex. NRC-002-R2, Draft Combined License, Levy Nuclear Plant Unit 1, Duke Energy Florida, LLC, Docket No. 52-029 (Sept. 6, 2016), at 15 (ADAMS Accession No. ML16258A238) (Draft Combined License).

<sup>102</sup> Pre-Hearing Question Order at 2-3; see Ex. NRC-002-R2, Draft Combined License, at 15.

<sup>103</sup> Ex. NRC-004, Staff Pre-Hearing Responses, at 2-3.

<sup>104</sup> *Id.* at 3; see 10 C.F.R. § 100.23(d)(2).

<sup>105</sup> Tr. at 110-11 (Dr. Stirewalt).

<sup>106</sup> See Tr. at 111 (Dr. Stirewalt).

*b. Roller-Compacted Concrete Foundation*

Duke has proposed a roller-compacted concrete bridging mat for the Levy site.<sup>107</sup> The bridging mat, a structure not previously used at a nuclear plant, is the only safety-related structure outside the scope of the certified design.<sup>108</sup> The bridging mat, which will be constructed below the nuclear island, will address unique geologic characteristics and a lack of subsurface uniformity that could otherwise affect the stability of the nuclear island.<sup>109</sup> The 35-foot-thick mat is proposed to be constructed on top of the Avon Park Formation.<sup>110</sup> It will replace undifferentiated soils and sediments and bridge conservatively postulated voids between the nuclear island basemat and the grouted portion of the Avon Park Formation.<sup>111</sup> Duke designed the roller-compacted concrete bridging mat to transmit the nuclear island loads to the grouted portion of the Avon Park Formation.<sup>112</sup>

Prior to the hearing, the Staff explained that the bridging mat is designed to be able to bridge a 10-foot-diameter dissolution cavity in the Avon Park Formation.<sup>113</sup> The Staff found this design sufficient because the 10-foot diameter is a conservative estimate for cavity size at the Levy site.<sup>114</sup> Additionally, Duke will place a waterproof membrane between the bridging mat and the mudmat.<sup>115</sup> The Staff assessed both Duke's and Westinghouse's calculations and analysis and found that the stability of the nuclear island is not vulnerable to potential soil liquefaction.<sup>116</sup> The Staff also approved an ITAAC covering the interfaces between the roller-compacted concrete bridging mat, waterproof membrane, and concrete mudmat to ensure the stability of the nuclear island against sliding.<sup>117</sup> The Staff added that Duke has committed to construct the bridging mat ac-

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<sup>107</sup> Ex. NRC-001, Staff Information Paper, at 24-25; *see* Tr. at 89-90 (Mr. Thomas).

<sup>108</sup> Ex. NRC-001, Staff Information Paper, at 25; Ex. NRC-007A, FSER § 3.2.1.2; *see* 2011 ACRS Letter at 3; Tr. at 90 (Mr. Thomas), 106 (Mr. Thomas).

<sup>109</sup> *See* Tr. at 90 (Mr. Thomas); Ex. NRC-007A, FSER § 2.5.4.4.12.

<sup>110</sup> Ex. NRC-001, Staff Information Paper, at 24-25; Tr. at 81-82 (Mr. Kitchen), 90 (Mr. Thomas); *see* 2011 ACRS Letter at 3.

<sup>111</sup> Ex. NRC-001, Staff Information Paper, at 25; Tr. at 90 (Mr. Thomas).

<sup>112</sup> Ex. NRC-001, Staff Information Paper, at 25; Tr. at 90 (Mr. Thomas).

<sup>113</sup> Ex. NRC-001, Staff Information Paper, at 25; *see* Ex. NRC-007A, FSER § 2.5.4.4.3.7 (explaining that the Staff concluded "that the foundation system is designed to accommodate isolated voids of up to [10 feet] in size, which is at least double the conservatively estimated lateral dimension of any actual void intercepted"); *see also* 2011 ACRS Letter at 3.

<sup>114</sup> *See, e.g.*, Ex. NRC-007A, FSER § 2.5.1.4.2.5.2; *see also* Ex. NRC-001, Staff Information Paper, at 25; 2011 ACRS Letter at 3.

<sup>115</sup> *See* Ex. NRC-007A, FSER § 3.8.5.4, at 3-69; *see* Ex. NRC-001, Staff Information Paper, at 25.

<sup>116</sup> Ex. NRC-001, Staff Information Paper, at 25.

<sup>117</sup> *Id.*

ording to industry codes and standard methods, including American Concrete Institute code requirements.<sup>118</sup>

Given the novelty of this design concept in nuclear construction, we asked how other commercial uses of the roller-compacted concrete foundation informed Duke's proposed design.<sup>119</sup> The Staff explained that Duke has studied the use of roller-compacted concrete in dams and pavements.<sup>120</sup> Duke concurred that results from other uses of the roller-compacted concrete foundation will inform Duke's construction of the foundation at the Levy site.<sup>121</sup> Additionally, Duke proposed a license condition for testing the roller-compacted concrete bridging mat, as well as an ITAAC, both of which the Staff has included in the draft combined licenses.<sup>122</sup>

*c. Condensate Return Design Change*

General Design Criterion (GDC) 34, Residual Heat Removal, requires that nuclear power plant designs include "a system capable of removing residual heat, defined such that the decay heat does not exceed design limits for the fuel and pressure boundary" in the event of an accident unrelated to the loss of coolant.<sup>123</sup> In the event of such an accident, the AP1000 is designed to perform passive heat removal through closed-loop cooldown.<sup>124</sup> Reactor coolant circulates through a passive residual heat removal (PRHR) heat exchanger in the in-containment refueling water storage tank (IRWST).<sup>125</sup> The PRHR heat exchanger then converts IRWST water to steam, which condenses on the interior surface of the containment vessel, passively transferring residual heat by con-

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<sup>118</sup> Tr. at 91 (Mr. Thomas); *see* Ex. NRC-001, Staff Information Paper, at 25; Ex. NRC-007A, FSER § 3.8.5.4, at 3-75.

<sup>119</sup> Tr. at 105-06 (Chairman Burns).

<sup>120</sup> Tr. at 106 (Mr. Thomas); *see* Ex. NRC-007A, FSER § 3.8.5.4, at 3-75.

<sup>121</sup> Tr. at 106 (Mr. Thrasher); *see* Ex. NRC-006B, FSAR § 3.8.5.11.1.

<sup>122</sup> Ex. NRC-002-R2, Draft Combined License, at 16 (requiring Duke to complete roller-compacted concrete strength verification and constructability testing and provide the results to the NRC no later than 180 days before beginning construction); Ex. NRC-007A, FSER, at 3-130 tbl. 3.8-1 (requiring inspection of the bridging mat placement, roller-compacted concrete mix and bedding mix, and the as-built roller-compacted concrete thickness); *see* Ex. NRC-002-R2, Draft Combined License, at C-19.

<sup>123</sup> Ex. NRC-001, Staff Information Paper, at 25; *see* 10 C.F.R. Part 50, App. A, GDC 34; Tr. at 95 (Mr. Travis).

<sup>124</sup> *See* Tr. at 83 (Mr. Kitchen), 93-94 (Mr. Travis); *see* 2016 ACRS Letter at 2.

<sup>125</sup> 2016 ACRS Letter at 2; *see* Tr. at 93-94 (Mr. Travis); Ex. NRC-001, Staff Information Paper, at 25; Ex. NRC-007B, FSER § 21.1.1.

duction through the containment wall.<sup>126</sup> In order for this closed-loop cooling to work effectively, sufficient condensed water must return to the IRWST to continue the PRHR process.<sup>127</sup>

The AP1000 design assumes a condensate return rate of 90%, with a constant loss rate of 10%.<sup>128</sup> At the hearing, Duke explained that Westinghouse determined thorough testing involving full-scale mock-ups that the percent of condensate returning to the IRWST would be “much lower” than that assumed in the DCD.<sup>129</sup> The existing approved design, therefore, could not meet the design goal of passively bringing the reactor to a safe shutdown condition of 420 degrees or lower within 36 hours following a non-loss-of-coolant accident.<sup>130</sup> In 2013 and 2014, Duke submitted to the NRC proposed design changes to improve the amount of condensate returned by adding gutters, downspouts, and dams.<sup>131</sup> The proposed design changes would also block drain holes where condensate loss occurred during testing.<sup>132</sup>

The AP1000 design specifies that the PRHR heat exchanger will operate “indefinitely” after a non-loss-of-coolant accident.<sup>133</sup> Duke found that with the proposed design change, the system would operate with a “[72-hour] safety-related

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<sup>126</sup> 2016 ACRS Letter at 2; *see* Ex. NRC-001, Staff Information Paper, at 26; *see* Ex. NRC-007B, FSER § 21.1.1; Tr. at 83 (Mr. Kitchen).

<sup>127</sup> 2016 ACRS Letter at 2; *see* Ex. NRC-007B, FSER § 21.1.1; *see* Tr. at 94 (Mr. Travis).

<sup>128</sup> Tr. at 83 (Mr. Kitchen); *see* 2016 ACRS Letter at 3.

<sup>129</sup> Tr. at 83 (Mr. Kitchen); *see also* Letter from Christopher M. Fallon, Progress Energy, to NRC Document Control Desk (Apr. 18, 2013) (ADAMS Accession No. ML13109A533) (regarding submittal of exemption request and design change description for departure from AP1000 DCD Revision 19 to address containment condensate return cooling design) (Condensate Return Exemption Request), attach. 2, Westinghouse APP-GW-GLR-607 (nonproprietary) (Westinghouse APP-GW-GLR-607).

<sup>130</sup> *See* Westinghouse APP-GW-GLR-607 at 2; Ex. NRC-001, Staff Information Paper, at 26.

<sup>131</sup> *See* Condensate Return Exemption Request; Letter from Christopher M. Fallon, Duke Energy, to NRC Document Control Desk (June 3, 2014) (ADAMS Accession No. ML13156A007) (supplementing the request); Letter from Christopher M. Fallon, Duke Energy, to NRC Document Control Desk (Feb. 7, 2014) (ADAMS Accession No. ML14042A034); *see also* Ex. NRC-007B, FSER § 21.1.4, at 21-3; Tr. at 83-84 (Mr. Kitchen).

The two other current applicants for combined licenses referencing the AP1000 design have requested the same exemption and departure. Tr. at 57 (Mr. Akstulewicz); *see* Ex. NRC-001, Staff Information Paper, at 19. And the Staff stated that licensees for AP1000 units under construction have committed to seek license amendments to implement these design changes. Tr. at 57-58 (Mr. Akstulewicz).

<sup>132</sup> Ex. NRC-007B, FSER § 21.1.4, at 21-3.

<sup>133</sup> Ex. NRC-001, Staff Information Paper, at 26; *see* Tr. at 96 (Mr. Travis); AP1000 DCD, Tier 2 Chapter 19 — Probabilistic Risk Assessment — Sections 19.59 PRA Results and Insights, at 19.59-80 tbl.19.59-18.

period of operation and a [14-day] non-safety-related design requirement.”<sup>134</sup> The Staff explained that the 72-hour period is consistent with the NRC’s approach to compliance with GDC 34.<sup>135</sup> With regard to the 14-day duration, the Staff stated that it had verified the calculations that Duke provided, although it noted that “[o]peration of the [passive core cooling system] for 14 days in closed loop mode is not required to satisfy Commission regulations.”<sup>136</sup> Further, at the hearing, the Staff explained that its analyses confirmed that the PRHR heat exchanger will perform safely with a condensate return rate even lower than the rate proposed in the departure.<sup>137</sup> The Staff stated that the system as a whole can still provide indefinite performance by switching to open-loop cooling by actuating the automatic depressurization system.<sup>138</sup>

The Staff testified that the ACRS has reviewed the Staff’s evaluation of this design change, found that the Staff’s analysis confirmed Westinghouse’s calculations, and concluded that the departure was necessary for the certified design to perform as planned.<sup>139</sup> Additionally, the Staff stated that Duke responded to a number of requests for additional information on this topic and that Duke updated its FSAR to track changes associated with these requests.<sup>140</sup> As a result of its review, the Staff concluded that the proposed condensate return system design change conforms to our regulatory requirements.<sup>141</sup>

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<sup>134</sup> See Ex. NRC-004, Staff Pre-Hearing Responses, at 21; see also Ex. NRC-007B, FSER §§ 21.1.4.B.1.2.1, 21.1.4.B.1.3; Ex. NRC-001, Staff Information Paper, at 26.

<sup>135</sup> The Staff also confirmed that the 72-hour period is consistent with GDC 44. See 10 C.F.R. Part 50, App. A, DC 44 (requiring that each plant design include a system to transfer heat from safety-related structures, systems, and components under normal operating and accident conditions with sufficient redundancies to ensure operation); “Regulatory Treatment of Nonsafety Systems for Passive Advanced Light Water Reactors,” NUREG-0800, Standard Review Plan 19.3, rev. 0 (June 2014) (ADAMS Accession No. ML14035A149); see also Ex. NRC-001, Staff Information Paper, at 26.

We have previously approved the Staff’s use of the 72-hour safety-related period of operation of passive safety systems. See, e.g., Staff Requirements — SECY-95-132 — Policy and Technical Issues Associated with the Regulatory Treatment of Non-Safety Systems (RTNSS) in Passive Plant Designs (SECY-94-084) (June 28, 1995) (ADAMS Accession No. ML003708019).

<sup>136</sup> Ex. NRC-007B, FSER § 21.1.4.B.1.3; see “Audit Summary, Review of Levy Nuclear Plant, Units 1 and 2, Design Change Related to the Containment Condensate Return Pathway” (July 2015) (ADAMS Accession No. ML15187A248).

<sup>137</sup> Tr. at 98-99 (Mr. Travis).

<sup>138</sup> Tr. at 99 (Mr. Travis).

<sup>139</sup> Tr. at 97 (Mr. Travis); see 2016 ACRS Letter at 2-3.

<sup>140</sup> Tr. at 97 (Mr. Travis).

<sup>141</sup> Ex. NRC-007B, FSER § 21.1.4.A.3; see Tr. at 97 (Mr. Travis). Duke and the Staff responded to several additional prehearing questions regarding this design change, including questions related to the review process for the departure, the likelihood of certain protective screens becoming blocked,

(Continued)

## 2. *Environmental Issues*

The Staff's environmental review considered information from Duke's Environmental Report; consultation with federal, state, tribal, and local agencies; the Staff's independent review; and the Staff's consideration of comments received during the public scoping process and the comment period on the Draft EIS. At the hearing, the Staff addressed two particular alternative sites and the U.S. Fish and Wildlife Service (Fish and Wildlife) Biological Opinion. We briefly address below those issues as well as two other matters that were addressed at the hearing — the proposed project's impacts to wetlands and nonconcurrences that were filed during the Staff's environmental review.

### *a. U.S. Fish and Wildlife Service Biological Opinion*

Section 7 of the Endangered Species Act requires federal agencies to ensure that any action authorized, funded, or carried out by the agency is not likely to jeopardize the continued existence of any listed endangered or threatened species or designated critical habitat.<sup>142</sup> This process requires consultation with Fish and Wildlife or the National Marine Fisheries Service (NMFS) — or both — for actions that “may affect” listed species.<sup>143</sup> The Staff initiated consultation with Fish and Wildlife and NMFS in 2008.<sup>144</sup> During the consultation, the Staff submitted biological assessments to both agencies.<sup>145</sup> NMFS concurred with NRC's conclusion that the Levy project “may affect but is not likely to adversely affect” species under its jurisdiction.<sup>146</sup> This concluded the consultation and fulfilled the Staff's obligations under section 7 of the Endangered Species Act for listed species and critical habitats under NMFS's purview.<sup>147</sup>

For its part, Fish and Wildlife concluded that issuance of the licenses would

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the use of extrapolated predictions of condensate return losses, and whether final position of the polar crane will affect condensate return. *See* Ex. DEF-003, Duke Pre-Hearing Responses, at 31-43; Ex. NRC-004, Staff Pre-Hearing Responses, at 22-26.

<sup>142</sup> 16 U.S.C. § 1536.

<sup>143</sup> 50 C.F.R. § 402.14(a).

<sup>144</sup> Ex. NRC-001, Staff Information Paper, at 27. *See* Tr. at 118 (Ms. Sutton).

<sup>145</sup> Letter from Robert G. Schaaf, NRC, to Linda Walker, Fish and Wildlife (Aug. 5, 2010) (ADAMS Accession No. ML102020483); Ex. NRC-009C, Final EIS, app. F, at F-119 to F-194 (biological assessment submitted to Fish and Wildlife); Letter from Robert G. Schaaf, NRC, to David Bernhart, NMFS (Aug. 5, 2010) (ADAMS Accession No. ML102020516); Ex. NRC-009C, Final EIS, app. F, at F-65 to F-117 (biological assessment submitted to NMFS).

<sup>146</sup> Letter from Roy E. Crabtree, Regional Administrator, NMFS, to Robert G. Schaaf, NRC and Gordon A. Hambrick, III, Corps (Nov. 26, 2010) (ADAMS Accession No. ML103370190) (concluding NMFS consultation); *see also* Tr. at 119 (Ms. Sutton).

<sup>147</sup> Ex. NRC-001, Staff Information Paper, at 27; *see also* Tr. at 119 (Ms. Sutton).

adversely affect a bird species, the Florida scrub-jay.<sup>148</sup> Accordingly, it recommended additional surveys for the species and ultimately issued a Biological Opinion for the project, which identifies terms and conditions for the protection of the Florida scrub-jay.<sup>149</sup> The Staff and Fish and Wildlife cooperated to develop environmental protection plan conditions, which will be part of each COL and will implement those terms and conditions.<sup>150</sup> The environmental protection plan provides for protection of the Florida scrub-jay, the sand skink, and the indigo snake, as well as two plant species, Britton's beargrass and longspurred mint.<sup>151</sup>

*b. Alternative Sites*

As part of its review, the Staff assessed the applicant's process for selecting the Levy site.<sup>152</sup> The applicant first established the region of interest, the "geographic area considered in searching for potential and candidate sites."<sup>153</sup> Next, the applicant selected nine candidate areas, defined as one or more areas within the region of interest remaining after the exclusion from consideration of unsuitable areas.<sup>154</sup> The applicant identified potential sites from among the candidate areas, after which it narrowed the selection to eight candidate sites.<sup>155</sup> From among the candidate sites, the applicant selected five alternative sites and identified the Levy site as the proposed site.<sup>156</sup> The Staff performed an independent analysis of the applicant's site selection process and concluded that the process was reasonable.<sup>157</sup>

After the Staff issued the Draft EIS, the Staff identified and further examined issues regarding the Highlands and Crystal River alternative sites.<sup>158</sup> As to

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<sup>148</sup> Ex. NRC-009C, Final EIS, app. F, at F-195 to F-221; *see* Tr. at 119 (Ms. Sutton).

<sup>149</sup> Ex. NRC-009C, Final EIS, app. F, at F-216; *see* Ex. NRC-001, Staff Information Paper, at 27; Tr. at 119-20 (Ms. Sutton). The Staff has not previously received a Biological Opinion for a new reactor license application. Ex. NRC-001, Staff Information Paper, at 27.

<sup>150</sup> Ex. NRC-001, Staff Information Paper, at 27; Tr. at 120-21 (Ms. Sutton); Ex. NRC-004, Staff Pre-Hearing Response, at 33; *see* Ex. NRC-002-R2, Draft Combined License, app. B.

<sup>151</sup> Ex. NRC-002-R2, Draft Combined License, app. B, at B-2 to B-3; *see* Ex. NRC-001, Staff Information Paper, at 27-28; Ex. NRC-004, Staff Pre-Hearing Responses, at 40.

<sup>152</sup> Ex. NRC-009B, Final EIS § 9.3; *see* Ex. NRC-001, Staff Information Paper, at 28; Tr. at 121 (Mr. Kugler).

<sup>153</sup> "Environmental Standard Review Plan," NUREG-1555 (July 2007) § 9.3, at 9.3-1 (ADAMS Accession No. ML071800223) (ESRP); *see* Ex. NRC-009B, Final EIS § 9.3.1.1.

<sup>154</sup> Ex. NRC-009B, Final EIS § 9.3.1.2; *see* ESRP § 9.3, at 9.3-1 to 9.3-2.

<sup>155</sup> Ex. NRC-009B, Final EIS §§ 9.3.1.3, 9.3.1.4; *see* ESRP § 9.3, at 9.3-2.

<sup>156</sup> Ex. NRC-009B, Final EIS §§ 9.3.1.5, 9.3.1.6., 9.3.1.7.

<sup>157</sup> *Id.*; *see* Tr. at 121 (Mr. Kugler); *see also* ESRP § 9.3.

<sup>158</sup> Ex. NRC-001, Staff Information Paper, at 28; Tr. at 122 (Mr. Kugler).

Highlands, the South Florida Water Management District stated in comments on the Draft EIS that water availability was limited at the Highlands site.<sup>159</sup> The Staff considered these comments and determined that the Water Management District's determination was consistent with the Staff's own preliminary conclusion that water use at the Highlands site would result in moderate environmental impacts.<sup>160</sup>

After the Staff published the Final EIS for the Levy application, the Water Management District provided additional information regarding the Highlands site.<sup>161</sup> In the course of its review for another combined license application for a Florida site, the Staff reviewed an alternative site a few miles away from the Highlands site. During that review, the Water Management District discussed the possibility (previously not considered) of developing a water source for that alternative site.<sup>162</sup> The Staff stated that a similar strategy — use of “a combination of surface water and groundwater resources to meet the cooling-water needs” to avoid impacts to water restoration projects — could be used at the Highlands alternative site.<sup>163</sup> The Staff found this new information to be consistent with its earlier decision to retain the analysis of the Highlands site in the Final EIS and that no alteration of the analysis for the Highlands alternative site was warranted.<sup>164</sup>

As to the Crystal River site, adjacent to the Crystal River Energy Complex,<sup>165</sup>

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<sup>159</sup> Letter from James J. Golden, South Florida Water Management District, to Chief, Rules, Rule-making and Directives Branch, NRC (Oct. 6, 2010), at 2 (ADAMS Accession No. ML102980009) (stating that the Highlands site “could negatively impact hydrological conditions of the [Kissimmee River Restoration] area that is immediately upstream”); *see* Ex. NRC-009B, Final EIS § 9.3.4.2, at 9-156; Ex. NRC-009C, Final EIS, app. E, § E.1.24, at E-193 to E-194; *see* Ex. NRC-001, Staff Information Paper, at 29; Ex. NRC-012, Staff Environmental Presentation, at 8; Tr. at 122 (Mr. Kugler).

<sup>160</sup> Ex. NRC-001, Staff Information Paper, at 29; Ex. NRC-012, Staff Environmental Presentation, at 8-9; Tr. at 122 (Mr. Kugler).

<sup>161</sup> Letter from Rod A. Braun, South Florida Water Management District, to Alicia Williamson, NRC (June 29, 2012) (ADAMS Accession No. ML12191A171) (Water Management Letter) (providing comments on the pending Turkey Point combined license application); *see* Tr. at 123 (Mr. Kugler); Ex. NRC-001, Staff Information Paper, at 29; Ex. NRC-012, Staff Environmental Presentation, at 9.

<sup>162</sup> Water Management Letter at 1; *see* Ex. NRC-001, Staff Information Paper, at 29.

<sup>163</sup> “Environmental Impact Statement for Combined Licenses (COLs) for Turkey Point Nuclear Plant Units 6 and 7” (Draft Report for Comment), NUREG-2176, vol. 2 (Feb. 2015) § 9.3.1.7, at 9-42 (ADAMS Accession No. ML15055A109); *see id.* § 9.3.4.2, at 9-161; Ex. NRC-004, Staff Pre-Hearing Responses, at 46-47.

<sup>164</sup> Tr. at 123 (Mr. Kugler); Ex. NRC-001, Staff Information Paper, at 29; Ex. NRC-012, Staff Environmental Presentation, at 9.

<sup>165</sup> Tr. at 123 (Mr. Kugler); Ex. NRC-001, Staff Information Paper, at 29; Ex. NRC-012, Staff Environmental Presentation, at 10.

concurrent with the Staff's environmental analysis, the Corps performed review activities for a Clean Water Act section 404(b)(1) permit application.<sup>166</sup> Then-applicant Progress Energy determined (and communicated to the Corps) that the Crystal River site was impracticable; Progress Energy expressed concern that the concentration of a large fraction of its total generating capacity at one site could be subject to disruption by a single event.<sup>167</sup> Based on this concern, the Corps did not include Crystal River among the least environmentally damaging practicable alternatives for the purpose of its Clean Water Act review.<sup>168</sup>

The Staff considered the same information in the course of its environmental review but ultimately chose to include Crystal River in the Final EIS's alternative site analysis.<sup>169</sup> The Staff based this decision on the environmental impacts associated with the site and the viability of the site as an alternative for new nuclear construction.<sup>170</sup> In so doing, the Staff noted that Clean Water Act standards differ from the NEPA standards; thus, the Corps' conclusion under the Clean Water Act did not compel the same NEPA determination.<sup>171</sup>

Since the Staff published the Final EIS, operations have permanently ceased at Crystal River Unit 3; Duke also announced plans to retire two coal-fired units and to construct a new natural gas combined cycle plant adjacent to the Crystal River site, resulting in the retirement of 1730 MWe and the addition of 1640 MWe of generating capacity.<sup>172</sup> The environmental review team considered this new information and determined that its conclusions regarding the Crystal River

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<sup>166</sup> Ex. NRC-001, Staff Information Paper, at 29.

<sup>167</sup> Tr. at 123-24 (Mr. Kugler); Ex. NRC-001, Staff Information Paper, at 30; Ex. NRC-012, Staff Environmental Presentation, at 10. During the Staff's preparation of the Final EIS, the Crystal River Energy Complex had five operating units, including Crystal River Unit 3. Ex. NRC-001, Staff Information Paper, at 29.

<sup>168</sup> Letter from Robert Kitchen, Progress Energy, to Gordon Hambrick, III, Corps (June 30, 2010), encl. 2 at 1 (ADAMS Accession No. ML101820645); *see* Tr. at 124 (Mr. Kugler); Ex. NRC-012, Staff Environmental Presentation, at 10.

<sup>169</sup> Tr. at 124 (Mr. Kugler); Ex. NRC-001, Staff Information Paper, at 30; Ex. NRC-012, Staff Environmental Presentation, at 11.

<sup>170</sup> Ex. NRC-009B, Final EIS § 9.3.2; *see id.* § 9.3.1.6 (stating that Levy and Crystal River sites were the two highest ranked of the sites the applicant considered); Tr. at 124 (Mr. Kugler); Ex. NRC-001, Staff Information Paper, at 30; Ex. NRC-012, Staff Environmental Presentation, at 11.

<sup>171</sup> Tr. at 124 (Mr. Kugler); Ex. NRC-001, Staff Information Paper, at 30; Ex. NRC-012, Staff Environmental Presentation, at 11.

<sup>172</sup> *See* Letter from Jon A. Franke, Duke Energy, to NRC Document Control Desk (Feb. 20, 2013) (ADAMS Accession No. ML13056A005) (providing certification of permanent cessation of power operations and that fuel has been permanently removed from the reactor vessel); *see* Ex. NRC-001, Staff Information Paper, at 30.

alternative site are unaffected by this information; the site would continue to “have a high concentration of the applicant’s generating capacity.”<sup>173</sup>

*c. Environmental Impacts to Wetlands*

The U.S. Environmental Protection Agency (EPA) provided comments on the Draft EIS; these comments centered on wetlands impacts and particularly noted that “changes to the current site layout or application of mitigation measures . . . could reduce the environmental impacts [to wetlands].”<sup>174</sup> The Final EIS reflects that the Staff and the Corps coordinated with EPA to identify mitigation measures for wetlands impacts; these mitigation measures are identified in the Final EIS.<sup>175</sup>

Even taking into account these mitigation measures, the Final EIS finds that a larger area of wetlands on the site itself (approximately 450 acres) will be affected than was identified in the Draft EIS (403 acres).<sup>176</sup> The Staff stated that this change in the Final EIS reflected not greater impacts but rather the use of more accurate wetland delineation data.<sup>177</sup> In the FEIS, the Staff estimated that 668 acres of wetlands may reasonably be impacted, including impacts to offsite wetlands resulting from associated offsite support facilities, as well as impacts to wetlands on the Levy site itself.<sup>178</sup> At the hearing, we asked the Staff whether a reduction in impacts was realized as a result of work done between publication of the Draft EIS and the Final EIS.<sup>179</sup> The Staff stated that, to offset the impacts to wetlands, the applicant purchased credits from wetland mitigation banks, as well as developed a supplemental mitigation plan to create 91 acres of wetlands on the Levy site. As a result, the Staff’s assessment that the project would have moderate impact on wetlands did not change.<sup>180</sup>

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<sup>173</sup> Ex. NRC-001, Staff Information Paper, at 30; *see* DEF-003, Duke Pre-Hearing Responses, at 51-52.

<sup>174</sup> Ex. NRC-009C, Final EIS, app. E, at E-84; *see id.*, app. E, at E-84 to E-86.

<sup>175</sup> Ex. NRC-009C, Final EIS, app. E, at E-84; *see* Ex. NRC-009A, Final EIS § 4.3.1.7; Ex. NRC-004, Staff Pre-Hearing Responses, at 42.

<sup>176</sup> Ex. NRC-004, Staff Pre-Hearing Responses, at 42. *Compare* Ex. NRC-009A, Final EIS § 4.3.1, at 4-32, *with* “Draft Environmental Impact Statement for Combined Licenses (COLs) for Levy Nuclear Plant Units 1 and 2 (Draft Report for Comment), NUREG-1941, vol. 1 (Aug. 2010) § 7.3.1.1, at 7-22 (ADAMS Accession No. ML102140231).

<sup>177</sup> Ex. NRC-004, Staff Pre-Hearing Responses, at 42.

<sup>178</sup> Ex. NRC-009A, Final EIS, § 4.3.1.8, at 4-70; *see* Ex. NRC-014, NRC Staff Response to Commission Post-Hearing Question (Aug. 11, 2016), attach. (ADAMS Accession No. ML16258A236) (Staff Post-Hearing Response).

<sup>179</sup> Tr. at 125-26 (Chairman Burns).

<sup>180</sup> Tr. at 127 (Ms. Sutton); *see* Ex. NRC-007B, Final EIS § 7.3.1.

Following the hearing, we asked the Staff “to clarify for the record the extent of wetlands that are expected to be impacted by the proposed [Levy Nuclear Plant] project.”<sup>181</sup> The Staff explained that after publication of the Final EIS, the Corps and Duke continued to collaborate to identify wetlands impacts with greater precision for the purpose of completing the review for a Section 404 Clean Water Act permit.<sup>182</sup> These efforts identified 22 additional acres of wetlands impacts, bringing the total of wetlands impacts — both onsite and offsite — to 690 acres.<sup>183</sup> The Staff found the increase in impacts did not affect the Staff’s conclusion in the Final EIS that environmental impacts to wetlands would be moderate.<sup>184</sup>

*d. Staff Nonconcurrences Associated with the General License to Construct an Independent Spent Fuel Storage Installation*

During the Staff’s environmental review, two related nonconcurrences were filed by members of the Staff working on the review.<sup>185</sup> Both nonconcurrences related to whether additional steps were warranted under NEPA, the National Historic Preservation Act, and the Endangered Species Act, in view of the possibility that an independent spent fuel storage installation (ISFSI) could be constructed on the site at some future time.<sup>186</sup> In response to a prehearing question, the Staff advised that agency management reviewed the concerns raised by the nonconcurrences and concluded that no additional actions were required to meet the NRC’s statutory responsibilities. Nonetheless, in preparation for the mandatory hearing, the Staff held an additional conversation with the Florida State Historic Preservation Officer (SHPO).<sup>187</sup> In particular, the NRC Staff notified

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<sup>181</sup> Post-Hearing Order at 2.

<sup>182</sup> Ex. NRC-014, Staff Post-Hearing Response, attach. at 2.

<sup>183</sup> *Id.*

<sup>184</sup> *Id.*

<sup>185</sup> The nonconcurrences, NCP-2016-006 and NCP-2016-008, which are not publicly available, were attached to the Staff’s Information Paper.

<sup>186</sup> NRC regulations grant a general license to construct and operate an ISFSI to certain licensees, including combined license holders. The nonconcurrency centered on the concern that the consultations on the project did not include a specific discussion that an ISFSI potentially could be constructed onsite under the general license. Tr. at 133-36; *see* 10 C.F.R. § 72.210.

<sup>187</sup> Tr. at 138-39. Shortly before the hearing, the Florida SHPO also transmitted to the NRC a letter reiterating its view that the project review was conducted in accordance with NHPA Section 106 and its implementing regulations. *See* Ex. NRC-013, Letter from Timothy A. Parsons, Director, Division of Historical Resources and State Historic Preservation Officer, Florida Department of State, to Rochelle C. Bovol, Acting Secretary, NRC (July 27, 2016) (ADAMS Accession No. ML16258A235).

the SHPO that the Levy project could include an ISFSI.<sup>188</sup> The Staff stated at the hearing that the SHPO was not concerned with the potential construction of an ISFSI because he considered the consultation to include the entire site.<sup>189</sup> According to the Staff, consultation included all ground-disturbing activities across the entire site and is focused on properly identifying and surveying all areas that may be disturbed rather than the specific activity occurring at any given location.<sup>190</sup> The Staff further represented that the nonconcurring staff members' concerns were resolved by this additional outreach step, and that the nonconcurring individuals ultimately concurred in the Staff's review.<sup>191</sup>

### C. Findings

We have conducted an independent review of the sufficiency of the Staff's safety findings, with particular attention to the topics discussed above. Our findings, however, are based on the entire record. Based on the evidence presented in the uncontested hearing, including the Staff's review documents and the testimony provided, we find that the applicable standards and requirements of the AEA and NRC regulations have been met. The required notifications to other agencies or bodies have been duly made.<sup>192</sup> We find that Duke is technically and financially qualified to engage in the activities authorized. We further find that there is reasonable assurance that the facility will be constructed and operated in conformity with the licenses, the provisions of the AEA, and the NRC's regulations and that issuance of the licenses will not be inimical to the common defense and security or to the health and safety of the public. In addition, we find that the Staff's proposed regulatory exemptions meet the standards in 10 C.F.R. § 50.12. And finally, we find that the Staff's proposed license conditions are appropriately drawn and sufficient to provide reasonable assurance of adequate protection of public health and safety.

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<sup>188</sup> Tr. at 136.

<sup>189</sup> Tr. at 138.

<sup>190</sup> Tr. at 139-40.

<sup>191</sup> Ex. NRC-004, Staff Pre-Hearing Responses, at 44.

<sup>192</sup> The Staff notified the Florida Public Service Commission about the combined license application in 2011. Ex. NRC-001, Staff Information Paper, at 31 (citing Letter from Brian Anderson, NRC, to Ann Cole, Florida Public Service Commission (Dec. 15, 2011) (ADAMS Accession No. ML112521258)). The Staff published notices of the application in *The Newscaster/Nature Coast News*, the *Ocala Star Banner*, the *Levy County Journal*, and the *Citrus County Chronicle*. *Id.* In addition, pursuant to 10 C.F.R. § 50.43(a)(3), the Staff published notices of the application in the *Federal Register* on November 18, 2011, November 25, 2011, December 2, 2011, and December 9, 2011 (at 76 Fed. Reg. 71,608, 76 Fed. Reg. 72,725, 76 Fed. Reg. 75,566, and 76 Fed. Reg. 77,021, respectively). Ex. NRC-001, Staff Information Paper, at 31.

We also conducted an independent review of the Staff's environmental analysis in the Final EIS, taking into account the particular requirements of NEPA. NEPA § 102(2)(A) requires agencies to use "a systematic, interdisciplinary approach which will insure the integrated use of the natural and social sciences and the environmental design arts" in decisionmaking that may impact the environment.<sup>193</sup> We find that the environmental review team used the systematic, interdisciplinary approach that NEPA requires.<sup>194</sup> The environmental review team consisted of individuals with expertise in disciplines including ecology, geology, hydrology, radiological health, socioeconomics, and cultural resources.<sup>195</sup>

NEPA § 102(2)(C) requires us to assess the relationship between short-term uses and long-term productivity of the environment, to consider alternatives, and to describe the unavoidable adverse environmental impacts and the irreversible and irretrievable commitments of resources associated with the proposed action.<sup>196</sup> The discussion of alternatives is in Chapter 9 of the Final EIS; the other items are discussed in Chapter 10.<sup>197</sup> The review team found the principal short-term benefit of the project to be the production of electrical energy.<sup>198</sup> The review team also found that the site would have much greater economic productivity hosting the reactors than it would if used for agriculture or other probable uses of the site.<sup>199</sup> While the review team noted that there would be an impact to long-term productivity when the plant is not immediately dismantled at the end of operation, the team found that "the enhancement of regional productivity resulting from the electrical energy produced by the plant is expected to generate a correspondingly large increase in regional long-term productivity that would not be equaled by any other long-term use of the site."<sup>200</sup>

NEPA § 102(2)(E) calls for agencies to study, develop, and describe appropriate alternatives.<sup>201</sup> The alternatives analysis is the "heart of the environmental impact statement."<sup>202</sup> Based on the discussion in the Final EIS and the Staff's testimony at the hearing, we find that the Staff identified an appropriate range

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<sup>193</sup> 42 U.S.C. § 4332(2)(A).

<sup>194</sup> See, e.g., Tr. at 60-67 (Mr. Lee) (providing an overview of the Staff's environmental review methodology); Ex. NRC-010, Staff Overview Presentation, at 11-20.

<sup>195</sup> Ex. NRC-009C, Final EIS, app. A. The team consisted of individuals from the NRC and the Corps. *Id.*

<sup>196</sup> 42 U.S.C. § 4332(2)(C)(ii)-(v).

<sup>197</sup> See Ex. NRC-009B, Final EIS, chs. 9-10.

<sup>198</sup> *Id.* § 10.3, at 10-13 to 10-14.

<sup>199</sup> *Id.* § 10.3, at 10-14.

<sup>200</sup> *Id.* The review team also noted that "most long-term impacts resulting from land-use preemption by plant structures can be eliminated by removing these structures or by converting them to other productive uses." *Id.*

<sup>201</sup> 42 U.S.C. § 4332(2)(E).

<sup>202</sup> 10 C.F.R. Part 51, App. A, § 5.

of alternatives with respect to alternative power sources, alternative sites, and alternative system designs and adequately described the environmental impacts of each alternative.<sup>203</sup> We find reasonable the Staff's conclusion that none of the alternatives considered is environmentally preferable to the proposed action.<sup>204</sup>

Chapter 10 of the Final EIS includes tables listing the unavoidable adverse environmental impacts during preconstruction, construction, and operation, along with actions to mitigate those impacts.<sup>205</sup> The review team found that the unavoidable impacts during preconstruction and construction would be small for the following resource areas: water use, water quality, ecological resources (aquatic), demography, environmental justice, historic and cultural resources, meteorology and air quality, nonradiological health, radiological health, and nonradioactive waste.<sup>206</sup> The impacts for physical and aesthetic resources would be small to moderate, with the impacts from only NRC-regulated activities being small.<sup>207</sup> The impacts for infrastructure and community services would be small to moderate.<sup>208</sup> And the impacts for land use and ecological (terrestrial) would be moderate, with the impacts from only NRC-regulated activities being small.<sup>209</sup> The impacts for economics would be beneficial and small to moderate.<sup>210</sup>

For operation, the review team found that the unavoidable adverse impacts would be small for all resource areas except ecological (terrestrial), physical and aesthetic, and infrastructure and community services, where the impacts would be small to moderate.<sup>211</sup> And the impacts for economics would be beneficial and small to large.<sup>212</sup>

Finally, with regard to irreversible and irretrievable commitments of resources, the review team concluded that disposal of radioactive and nonradioactive wastes would require a long-term or irreversible commitment of land and over 28,600 gallons per minute of cooling water would be lost through evaporation during operation.<sup>213</sup> While there would be both temporary and long-term changes to the abundance and distribution of terrestrial biota at the site, popu-

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<sup>203</sup> See, e.g., Tr. at 121-25 (Mr. Kugler); Ex. NRC-009B, Final EIS, ch. 9.

<sup>204</sup> See, e.g., Tr. at 121 (Mr. Kugler); Ex. NRC-009B, Final EIS § 9.2.5, at 9-27; *id.* § 9.3.6.3, at 9-243; *id.* § 9.4, at 9-251.

<sup>205</sup> Ex. NRC-009B, Final EIS, tbls. 10-1 & 10-2.

<sup>206</sup> *Id.* tbl. 10-1.

<sup>207</sup> *Id.*

<sup>208</sup> *Id.*

<sup>209</sup> *Id.*

<sup>210</sup> *Id.* Beneficial economic impacts from NRC-regulated activities are small.

<sup>211</sup> *Id.* tbl. 10-2.

<sup>212</sup> *Id.*

<sup>213</sup> *Id.* §§ 10.4.1.1, 10.4.1.2.

lations of these species would not suffer adverse effects despite localized permanent loss of habitat.<sup>214</sup>

With respect to aquatic biota, the review team expects that preconstruction and construction would temporarily adversely affect the abundance and distribution of the aquatic community including essential fish habitat in the Cross Florida Barge Canal near the cooling-water intake structure, barge slip, and discharge pipeline placement.<sup>215</sup> But the review team predicts that operation activities would not adversely impact the abundance and distribution of the aquatic community, including essential fish habitat in both the Cross Florida Barge Canal and in the Crystal Bay shore area near the Gulf of Mexico.<sup>216</sup> The review team expects that the aquatic habitat and populations would recover after the units cease operations and are decommissioned.<sup>217</sup>

The review team also concluded that during the construction of the plant, the materials used, “while irretrievable, would be of small consequence with respect to the availability of such resources.”<sup>218</sup> With regard to operation of the proposed units, the review team determined that uranium would be irretrievably committed, but the amount would be negligible in comparison to the availability of uranium ore and existing stockpiles of highly enriched uranium in the United States and Russia that could be processed into fuel.<sup>219</sup>

We must weigh these unavoidable adverse environmental impacts and resource commitments — the environmental “costs” of the project — against the project’s benefits.<sup>220</sup> Considering the need for power in the region and the expected increase in productivity, jobs and tax revenue as described in the hearing and in the Final EIS, we find that the benefits of the project outweigh the costs described above. Moreover, we have considered each of the requirements of NEPA § 102(2)(C) and find nothing in the record that would contradict the Staff’s conclusions on those requirements.

In sum, for each of the environmental topics discussed at the hearing and in this decision, we find that the Staff’s review was reasonably supported in logic and fact and sufficient to support the Staff’s conclusions. Based on our review, we also find that the remainder of the Final EIS was reasonably supported and sufficient to support the Staff’s conclusions.

Therefore, as a result of our review of the Final EIS, and in accordance with the Notice of Hearing for this uncontested proceeding, we find that the

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<sup>214</sup> *Id.* § 10.4.1.3.

<sup>215</sup> *Id.*

<sup>216</sup> *Id.*

<sup>217</sup> *Id.*

<sup>218</sup> *Id.* § 10.4.2.

<sup>219</sup> *Id.*

<sup>220</sup> 10 C.F.R. § 51.107(a).

requirements of NEPA § 102(2)(A), (C), and (E), and the applicable regulations in 10 C.F.R. Part 51, have been satisfied with respect to the combined license application. We independently considered the final balance among conflicting factors contained in the record of this proceeding. We find, after weighing the environmental, economic, technical, and other benefits against environmental and other costs, and considering reasonable alternatives, that the combined licenses should be issued.

### III. CONCLUSION

We find that the Staff's review of Duke's combined license application was sufficient to support the findings in 10 C.F.R. §§ 52.97(a) and 51.107(a). We *authorize* the Director of the Office of New Reactors to issue the combined licenses for the construction and operation of Levy Nuclear Plant, Units 1 and 2. We *authorize* the Staff to issue the record of decision.

IT IS SO ORDERED.

For the Commission

ANNETTE L. VIETTI-COOK  
Secretary of the Commission

Dated at Rockville, Maryland,  
this 20th day of October 2016.

UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

**COMMISSIONERS:**

**Stephen G. Burns**, Chairman  
**Kristine L. Svinicki**  
**Jeff Baran**

**In the Matter of**

**Docket No. 50-271**

**ENTERGY NUCLEAR VERMONT  
YANKEE, LLC, and ENTERGY  
NUCLEAR OPERATIONS, INC.  
(Vermont Yankee Nuclear Power  
Station)**

**October 27, 2016**

**DECOMMISSIONING FUNDING**

The NRC's decommissioning regulations require that applicants and licensees provide reasonable assurance that funds will be available for the decommissioning process. One method by which a licensee may demonstrate reasonable assurance is by setting up a decommissioning trust fund that is segregated from licensee assets and in which the total amount of funds would be sufficient to pay decommissioning costs at the time permanent termination of operations is expected.

**DECOMMISSIONING**

The decommissioning process begins when the licensee certifies to the NRC Staff that it has permanently ceased operations and it has permanently removed fuel from the reactor vessel.

**DECOMMISSIONING**

The NRC's regulations require a licensee to submit a post-shutdown decom-

missioning activities report (PSDAR) prior to or within 2 years following the permanent cessation of operations. The Staff will then notice receipt of the PSDAR, make the PSDAR available for public comment, and hold a public meeting on its contents.

#### **DECOMMISSIONING**

Ninety days after the NRC Staff receives the post-shutdown decommissioning activities report — assuming the Staff does not object to its contents — the licensee may begin major decommissioning activities.

#### **DECOMMISSIONING**

Pursuant to 10 C.F.R. § 50.82(a)(6), a licensee may not perform decommissioning activities that would (1) foreclose the release of the site for possible unrestricted use, (2) result in significant environmental impacts not previously reviewed, or (3) result in the lack of reasonable assurance that adequate funds will be available for decommissioning.

#### **DECOMMISSIONING FUNDING**

The PSDAR must include a site-specific decommissioning cost estimate. Generally, once the licensee submits its decommissioning cost estimate, it is allowed “access to the balance of the [decommissioning] trust fund monies for the remaining decommissioning activities” with “broad flexibility.”

#### **DECOMMISSIONING FUNDING**

NRC regulations limit the use of a decommissioning trust fund in three ways: (A) the withdrawals must be for expenses for legitimate decommissioning activities consistent with the definition of decommissioning in 10 C.F.R. § 50.2; (B) the expenditure must not reduce the value of the decommissioning trust below an amount necessary to place and maintain the reactor in a safe storage condition if unforeseen conditions or expenses arise; and (C) the withdrawals must not inhibit the ability of the licensee to complete funding of any shortfalls in the decommissioning trust needed to ensure the availability of funds to ultimately release the site and terminate the license.

#### **DECOMMISSIONING FUNDING**

The NRC Staff monitors the licensee’s use of the decommissioning trust fund

via its review of the licensee's annual financial assurance status reports. These reports include the amount spent on decommissioning activities, the amount remaining in the fund, and an updated estimate of the costs required to complete decommissioning. In the event of a shortfall between the remaining funds and the updated cost to complete decommissioning (discovered as a result of these annual status reports or otherwise), the licensee must provide additional financial assurance.

#### **HEARING RIGHTS: LICENSE AMENDMENTS**

Any unilateral action taken by Entergy — including a disbursement from the trust fund — cannot in and of itself constitute a *de facto* license amendment. The Commission has made clear that unilateral “licensee action without an NRC approval of an increase in authority or alteration of the terms of the license does not constitute a *de facto* amendment.”

#### **HEARING RIGHTS: EXEMPTIONS**

Exemption requests are not subject to a hearing opportunity under the Atomic Energy Act. The Commission has previously held that agency actions that are not among those listed in section 189a of the Atomic Energy Act do not give rise to a hearing right for interested persons.

#### **EXEMPTIONS**

Section 50.12 of 10 C.F.R. permits the approval of an exemption provided that the exemption is authorized by law, will not present an undue risk to the public health and safety, and is consistent with the common defense and security. Additionally, special circumstances must be present before an exemption may be granted.

#### **DECOMMISSIONING FUNDING**

NRC regulations require annual review of expenses and funding by both the Staff and the licensee through license termination. This annual review provides an additional mechanism to assure that adequate funds will be available for decommissioning. If the NRC determines, as the result of this annual review, that costs of decommissioning exceed the remaining decommissioning funds, then the licensee must provide additional financial assurance to cover the estimated cost of completion.

**DECOMMISSIONING: NATIONAL ENVIRONMENTAL POLICY ACT**

The Staff provides an opportunity for public comment when a licensee submits its PSDAR. But the PSDAR does not amend the license — and as such the licensee is not required to submit a corresponding environmental report. In line with the Decommissioning GEIS, with respect to environmental impacts, a PSDAR must include a discussion that provides the reasons for concluding that the environmental impacts associated with site-specific decommissioning activities will be bounded by appropriate previously issued environmental impact statements.

**NATIONAL ENVIRONMENTAL POLICY ACT: DECOMMISSIONING**

With respect to environmental impacts, a PSDAR must include a discussion that provides the reasons for concluding that the environmental impacts associated with site-specific decommissioning activities will be bounded by appropriate previously issued environmental impact statements.

**NATIONAL ENVIRONMENTAL POLICY ACT**

An agency's NEPA obligations are triggered by agency action.

**NATIONAL ENVIRONMENTAL POLICY ACT**

The NRC's regulations provide that certain types of exemptions may be categorically excluded from environmental review.

**MEMORANDUM AND ORDER**

The State of Vermont, the Vermont Yankee Nuclear Power Corporation, and Green Mountain Power Corporation (together, Petitioners) seek review of, and a discretionary hearing on, a number of issues associated with use of decommissioning trust funds at Vermont Yankee Nuclear Power Station.<sup>1</sup>

As discussed below, we have reviewed all the filings before us and consid-

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<sup>1</sup> See Petition of the State of Vermont, the Vermont Yankee Nuclear Power Corporation, and Green Mountain Power Corporation for Review of Entergy Nuclear [Operations], Inc.'s Planned Use of the Vermont Yankee Nuclear Decommissioning Trust Fund (Nov. 4, 2015) (Petition).

ered Petitioners' claims in detail. We conclude that an adjudicatory hearing is not appropriate in the circumstances presented here; Petitioners have not identified, and we do not otherwise find, a *de facto* license amendment that would trigger an opportunity for a hearing under the Atomic Energy Act of 1954, as amended (AEA). Additionally, we decline to convene a discretionary hearing to perform the various reviews requested by Petitioners. Petitioners' concerns about the use of decommissioning trust funds largely raise oversight matters that are appropriately addressed via requests for enforcement action under 10 C.F.R. § 2.206.

Petitioners also request a comprehensive environmental analysis of a variety of activities related to the decommissioning of Vermont Yankee by Entergy Nuclear Vermont Yankee, LLC and Entergy Nuclear Operations, Inc. (together, Entergy). For the reasons discussed below, we deny this request in all respects save one. Because we find Entergy's exemption request for use of decommissioning funds for spent fuel management to be ineligible for a categorical exclusion under our rules implementing the National Environmental Policy Act (NEPA), we direct the Staff to perform an environmental review of that request.

## I. BACKGROUND

We begin our decision with a brief overview of our regulations governing decommissioning funding, the requirements in place for Vermont Yankee, and recent activities that gave rise to the petition.

### A. Regulations Governing Decommissioning of Nuclear Power Plants

Our decommissioning regulations require that applicants and licensees provide "reasonable assurance that funds will be available for the decommissioning process."<sup>2</sup> One method by which a licensee may demonstrate reasonable assurance is by setting up a decommissioning trust fund that is "segregated from licensee assets" and "in which the total amount of funds would be sufficient to pay decommissioning costs at the time permanent termination of operations is expected."<sup>3</sup>

The decommissioning process begins when the licensee certifies to the NRC Staff that it has permanently ceased operations and it has permanently removed fuel from the reactor vessel.<sup>4</sup> Our regulations require a licensee to submit a

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<sup>2</sup> 10 C.F.R. § 50.75(a).

<sup>3</sup> *Id.* § 50.75(e)(1)(ii).

<sup>4</sup> *Id.* § 50.82(a)(1). The regulations define "decommission" as "to remove a facility or site safely  
(Continued)

post-shutdown decommissioning activities report (PSDAR) prior to or within 2 years following the permanent cessation of operations.<sup>5</sup> The Staff will then notice receipt of the PSDAR, make the PSDAR available for public comment, and hold a public meeting on its contents.<sup>6</sup> This process does not give rise to a hearing opportunity.<sup>7</sup>

Ninety days after the Staff receives the PSDAR — assuming the Staff does not object to its contents — the licensee may begin “major decommissioning activities.”<sup>8</sup> Pursuant to 10 C.F.R. § 50.82(a)(6), a licensee may not perform decommissioning activities that would (1) foreclose the release of the site for possible unrestricted use, (2) result in significant environmental impacts not previously reviewed, or (3) result in the lack of reasonable assurance that adequate funds will be available for decommissioning.

The PSDAR must include a site-specific decommissioning cost estimate.<sup>9</sup> Generally, once the licensee submits its decommissioning cost estimate, it is allowed “access to the balance of the [decommissioning] trust fund monies for the remaining decommissioning activities” with “broad flexibility.”<sup>10</sup> But the regulations limit the use of a decommissioning trust fund in three ways:

(A) The withdrawals [must be] for expenses for legitimate decommissioning activities consistent with the definition of decommissioning in [10 C.F.R.] § 50.2[;]

(B) The expenditure [must] not reduce the value of the decommissioning trust below an amount necessary to place and maintain the reactor in a safe storage condition if unforeseen conditions or expenses arise[; and]

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from service and reduce residual radioactivity to a level that permits (1) release of the property for unrestricted use and termination of the license; or (2) release of the property under restricted conditions and termination of the license.” *Id.* § 50.2.

<sup>5</sup> *Id.* § 50.82(a)(4)(i).

<sup>6</sup> *Id.* § 50.82(a)(4)(ii). The Staff presents comments received at the public meeting held on the PSDAR and makes available to the public a written transcript of the meeting. *See* “Standard Format and Content for Post-Shutdown Decommissioning Activities Report,” Regulatory Guide 1.185, rev. 1 (June 2013), at 4 (ADAMS Accession No. ML13140A038) (Regulatory Guide 1.185).

<sup>7</sup> Ultimately, the licensee must submit a license amendment request in order to terminate its operating license; accordingly, at that stage, there is an opportunity for interested persons to request a hearing. 10 C.F.R. § 50.82(a)(9).

<sup>8</sup> *Id.* § 50.82(a)(5). A “major decommissioning activity” for a nuclear power plant such as Vermont Yankee is defined as “any activity that results in permanent removal of major radioactive components, permanently modifies the structure of the containment, or results in dismantling components for shipment containing greater than class C waste in accordance with [10 C.F.R. § 61.55].” *Id.* § 50.2.

<sup>9</sup> *Id.* § 50.82(a)(4)(i).

<sup>10</sup> *See* Final Rule: “Decommissioning of Nuclear Power Reactors,” 61 Fed. Reg. 39,278, 39,285 (July 29, 1996) (Decommissioning Final Rule).

(C) The withdrawals [must] not inhibit the ability of the licensee to complete funding of any shortfalls in the decommissioning trust needed to ensure the availability of funds to ultimately release the site and terminate the license.<sup>11</sup>

As an additional safeguard, the Staff monitors the licensee's use of the decommissioning trust fund via its review of the licensee's annual financial assurance status reports. These reports include the amount spent on decommissioning activities, the amount remaining in the fund, and an updated estimate of the costs required to complete decommissioning.<sup>12</sup> In the event of a shortfall between the remaining funds and the updated cost to complete decommissioning (discovered as a result of these annual status reports or otherwise), the licensee must provide additional financial assurance.<sup>13</sup>

Historically, rate regulators exercised oversight of decommissioning trust agreements. In view of deregulation, in 2002 we revised our regulations to take a more active oversight role over such agreements. The revisions were intended to provide "assurance that an adequate amount of decommissioning funds will be available for their intended purpose" at non-rate-regulated facilities.<sup>14</sup>

As relevant here, the rules promulgated in 2002 provided licensees with the option of maintaining existing license conditions or following the new requirements:

The provisions of [10 C.F.R. § 50.75(h)(1)-(3)] do not apply to any licensee that as of December 24, 2003, has existing license conditions relating to decommissioning trust agreements, so long as the licensee does not elect to amend those license conditions. If a licensee with existing license conditions relating to decommissioning trust agreements elects to amend those conditions, the license amendment shall be in accordance with the provisions of [10 C.F.R. § 50.75(h)].<sup>15</sup>

In sum, a non-rate-regulated reactor licensee with decommissioning trust fund license conditions may elect either to maintain those conditions or to seek a license amendment to remove those conditions, in which case it would be subject

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<sup>11</sup> 10 C.F.R. § 50.82(a)(8)(i).

<sup>12</sup> *Id.* § 50.82(a)(8)(v).

<sup>13</sup> *Id.* § 50.82(a)(8)(vi). The determination whether a shortfall exists takes into account a 2% annual real rate of return. Relatedly, a licensee is required to submit to the Staff annual reports regarding the status of its funding for irradiated fuel management, including a plan to obtain additional funds to cover any expected shortfalls. *Id.* § 50.82(a)(8)(vii).

<sup>14</sup> Final Rule: "Decommissioning Trust Provisions," 67 Fed. Reg. 78,332, 78,332 (Dec. 24, 2002). See generally 10 C.F.R. § 50.75(h)(1)-(3) (providing standards for managing the decommissioning trust fund).

<sup>15</sup> 10 C.F.R. § 50.75(h)(5); see Direct Final Rule: "Minor Changes to Decommissioning Trust Fund Provisions," 68 Fed. Reg. 65,386, 65,387 (Nov. 20, 2003).

to 10 C.F.R. § 50.75(h)(1)-(3).<sup>16</sup> These requirements likewise place restrictions on the management and use of the decommissioning trust fund.

Vermont Yankee Nuclear Power Corporation, the prior owner and operator of Vermont Yankee, was a rate-regulated utility. In October 2001, prior to the 2002 revisions to the decommissioning requirements discussed above, it sought to transfer the Vermont Yankee license to the non-rate-regulated entities Entergy Nuclear Vermont Yankee, LLC, and Entergy Nuclear Operations, Inc. The Staff approved the transfer subject to several conditions related to the decommissioning trust fund, and these conditions were incorporated into the license.<sup>17</sup> Entergy retained the license conditions put in place at the time of the license transfer rather than electing to be governed by the 2002 regulations and thus, upon commencement of the events giving rise to the petition, decommissioning of the plant was not subject to 10 C.F.R. § 50.75(h)(1)-(3).

## **B. Procedural Posture**

### ***1. License Amendment Proceeding Before the Atomic Safety and Licensing Board***

In September 2014, Entergy submitted to the NRC a request to amend the Vermont Yankee operating license to delete the decommissioning trust fund license conditions.<sup>18</sup> As discussed above, approval of this request would have required Entergy to follow 10 C.F.R. § 50.75(h)(1)-(3) instead of the license conditions that were imposed upon the transfer of the plant to Entergy.<sup>19</sup> Four months later, while its license amendment request was still pending, Entergy requested an exemption from 10 C.F.R. § 50.82(a)(8)(i)(A) to allow it to make withdrawals from the Vermont Yankee decommissioning trust fund for certain

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<sup>16</sup>The revised regulations provide a streamlined process for licensees seeking license amendments to conform to the updated requirements. *See* 10 C.F.R. § 50.75(h)(4) (providing that a license amendment application that “does no more than delete specific license conditions relating to the terms and conditions of decommissioning trust agreements involves ‘no significant hazards consideration’”).

<sup>17</sup>*See* Order Approving Transfer of License for Vermont Yankee Nuclear Power Station from Vermont Yankee Nuclear Power Corporation to Entergy Nuclear Vermont Yankee, LLC, and Entergy Nuclear Operations, Inc., and Approving Conforming Amendment (May 17, 2002), encl. 1, Order Approving Transfer of License and Conforming Amendment, at 3-6; encl. 3, Safety Evaluation (nonproprietary), at 8-9 (ADAMS Accession No. ML020390198).

<sup>18</sup>Letter from Christopher J. Wamser, Site Vice President, Entergy Nuclear Operations, Inc., to NRC Document Control Desk (Sept. 4, 2014) (ADAMS Accession No. ML14254A405).

<sup>19</sup>The Staff published a notice of opportunity to request a hearing on the license amendment application. Biweekly Notice; Applications and Amendments to Facility Operating Licenses and Combined Licenses Involving No Significant Hazards Considerations, 80 Fed. Reg. 8355, 8656, 8359 (Feb. 17, 2015).

irradiated fuel management costs.<sup>20</sup> The exemption request also sought to relieve Entergy from two of the requirements in 10 C.F.R. § 50.75(h)(1)(iv), which were to become applicable to Entergy (in place of its existing license conditions) upon issuance of the requested license amendment.<sup>21</sup> First, Entergy requested an exemption from the requirement that the decommissioning trust agreement provide that “disbursements . . . from the trust . . . [be] restricted to decommissioning expenses . . . until final decommissioning has been completed.”<sup>22</sup> Second, Entergy requested an exemption from the requirement that it provide 30 working days’ advance notice to the NRC of intended disbursements.<sup>23</sup>

The Staff approved the exemption request in June 2015.<sup>24</sup> In so doing, the Staff determined that the exemption was eligible for a categorical exclusion and therefore required neither an environmental assessment (EA) nor an environmental impact statement (EIS) to comply with NEPA.<sup>25</sup> Thereafter, Entergy was permitted to make withdrawals from the Vermont Yankee decommissioning trust fund for spent fuel management expenses because it was exempted from 10 C.F.R. § 50.82(a)(8)(i)(A). But it was still required to provide 30-day notices of withdrawals for nonadministrative expenses because the Staff had not yet granted the license amendment request subjecting Entergy to 10 C.F.R. § 50.75(h)(1)(iv); the license condition requiring such notices remained in effect.<sup>26</sup>

Vermont sought a hearing on Entergy’s license amendment request, which the Board granted.<sup>27</sup> Shortly thereafter, Entergy moved to withdraw its license amendment request and to dismiss the proceeding.<sup>28</sup> The Board granted the motion and imposed two conditions on the withdrawal: first, it directed Entergy to provide written notice to Vermont of any new license amendment application

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<sup>20</sup> See Letter from Christopher J. Wamser, Site Vice President, Entergy Nuclear Operations, Inc., to NRC Document Control Desk (Jan. 6, 2015) (ADAMS Accession No. ML15013A171) (Exemption Request).

<sup>21</sup> *Id.* at 2.

<sup>22</sup> 10 C.F.R. § 50.75(h)(1)(iv); see Exemption Request at 2.

<sup>23</sup> Exemption Request at 2.

<sup>24</sup> Entergy Nuclear Operations, Inc.; Vermont Yankee Nuclear Power Station, 80 Fed. Reg. 35,992 (June 23, 2015) (Exemption Issuance); see 10 C.F.R. § 50.12 and Section II.B, *infra*.

<sup>25</sup> Exemption Issuance, 80 Fed. Reg. at 35,994; see also 10 C.F.R. § 51.22(c)(25).

<sup>26</sup> See *Entergy Nuclear Vermont Yankee, LLC* (Vermont Yankee Nuclear Power Station), LBP-15-24, 82 NRC 68, 100 (2015).

<sup>27</sup> See State of Vermont’s Petition for Leave to Intervene and Hearing Request (Apr. 20, 2015); State of Vermont’s Motion for Leave to File a New Contention Including the Proposed New Contention and to Add Additional Bases and Support to Existing Contentions I, III, and IV (July 6, 2015); *Vermont Yankee*, LBP-15-24, 82 NRC at 104.

<sup>28</sup> See Entergy’s Motion to Withdraw Its September 4, 2014 License Amendment Request (Sept. 22, 2015) (Motion to Withdraw).

relating to the Vermont Yankee decommissioning trust fund at the time of the application.<sup>29</sup> Second, it directed Entergy to specify in its 30-day notices if any of the proposed disbursements are to be used for particular expenses.<sup>30</sup>

## 2. *The Instant Petition*

On November 4, 2015, Petitioners filed before us the instant petition seeking “a robust, comprehensive, and participatory review of Entergy’s use of the Vermont Yankee Nuclear Decommissioning Trust Fund.”<sup>31</sup> Entergy and the Staff oppose the petition.<sup>32</sup> The petition is not contemplated by our procedural rules and, as set forth below, Petitioners have not established that they have a right to an adjudicatory hearing pursuant to AEA § 189a with respect to any of the issues they have raised. We nonetheless have considered the petition and all

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<sup>29</sup> *Entergy Nuclear Vermont Yankee, LLC* (Vermont Yankee Nuclear Power Station), LBP-15-28, 82 NRC 233, 244 (2015).

<sup>30</sup> *Id.* Those expenses, which were challenged as part of one of Vermont’s contentions that was admitted, but not litigated, were: a 5-million-dollar settlement payment, emergency preparedness costs, shipments of nonradiological asbestos waste, insurance, property taxes, and replacement of structures during SAFSTOR (e.g., a bituminous roof). *Entergy Nuclear Vermont Yankee, LLC* (Vermont Yankee Nuclear Power Station), CLI-16-8, 83 NRC 463, 466 n.17 (2016); see *Vermont Yankee*, LBP-15-28, 82 NRC at 242. The Staff moved to vacate LBP-15-24, in which the Board had granted Vermont’s hearing request. See NRC Staff Motion to Vacate LBP-15-24 (Oct. 26, 2015). We granted the Staff’s motion. *Vermont Yankee*, CLI-16-8, 83 NRC at 464.

<sup>31</sup> Petition at 1.

<sup>32</sup> Entergy’s Answer Opposing November 4, 2015 Petition Filed by the State of Vermont, Vermont Yankee Nuclear Power Corporation, and Green Mountain Power Corporation (Dec. 7, 2015) (Entergy Answer); NRC Staff Answer to the Vermont Petition for Review of Entergy Nuclear [Operations], Inc.’s Planned Use of the Vermont Yankee Nuclear Decommissioning Trust Fund (Dec. 7, 2015) (Staff Answer); see Reply of the State of Vermont, the Vermont Yankee Nuclear Power Corporation, and Green Mountain Power Corporation in Support of Petition for Review of Entergy Nuclear [Operations], Inc.’s Planned Use of the Vermont Yankee Nuclear Decommissioning Trust Fund (Dec. 17, 2015) (Petitioners’ Reply). Entergy and the Staff request that we strike portions of Petitioners’ reply. Motion to Strike Portions of December 17, 2015 Reply Filed by the State of Vermont, Vermont Yankee Nuclear Power Corporation, and Green Mountain Power Corporation (Dec. 28, 2015) (Entergy Motion to Strike); *NRC Staff Motion to Strike Portions of the December 17, 2015 Reply of the State of Vermont, the Vermont Yankee Nuclear Power Corporation, and Green Mountain Power Corporation* (Dec. 28, 2015) (Staff Motion to Strike). The Commonwealth of Massachusetts and the States of Connecticut and New Hampshire filed a joint reply to Entergy’s and the Staff’s answers. See Reply of the Commonwealth of Massachusetts and the States of Connecticut and New Hampshire to NRC Staff’s and Entergy’s Answers to the Petition of the State of Vermont, the Vermont Yankee Nuclear Power Corporation, and Green Mountain Power Corporation for Review of Entergy Nuclear [Operations], Inc.’s Planned Use of the Vermont Yankee Nuclear Decommissioning Trust Fund (Dec. 17, 2015). Entergy seeks to strike the States’ Reply. Motion to Strike Impermissible December 17, 2015 Reply Filed by the Commonwealth of Massachusetts and the States of Connecticut and New Hampshire (Dec. 28, 2015).

related filings as a discretionary exercise of our inherent supervisory authority over agency proceedings,<sup>33</sup> in large part because of the unusual posture of the matter, which concerns issues similar to those raised in a recent license amendment proceeding before the Board.

## II. DISCUSSION

Petitioners request review of a number of discrete issues. We consider each in turn below.

### A. Use of the Decommissioning Trust Fund

At the heart of the petition is Petitioners' concern that Entergy plans to use the decommissioning trust fund for impermissible purposes and that such expenditures may lead to premature depletion of the fund, which could in turn result in risk to public health, safety, and the environment.<sup>34</sup> Petitioners argue in particular that Entergy's planned use of the fund contravenes the terms of the Vermont Yankee operating license, NRC regulations, and the Master Trust Agreement.<sup>35</sup> Additionally, Petitioners note that a shortfall in the fund may create an economic risk for Vermont taxpayers.<sup>36</sup> Petitioners therefore request that we "review all of Entergy's requests for withdrawals from the Decommissioning

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<sup>33</sup> See, e.g., *Union Electric Co.* (Callaway Plant, Unit 2), CLI-11-5, 74 NRC 141, 158 (2011). Because we have reviewed the petition in our supervisory capacity, we need not — and do not — address a number of procedural arguments advanced by the litigants that would merit further discussion in a traditional adjudicatory setting, with one exception. In their motions to strike portions of Petitioners' reply, both Entergy and the Staff request that, if we do not strike the requested material, we allow them an opportunity to respond. Entergy Motion to Strike at 5; Staff Motion to Strike at 5. Because we find that the record is sufficient to support our decision, no additional briefing was needed; we deny Entergy's and the Staff's requests.

<sup>34</sup> Petition at 15.

<sup>35</sup> *Id.* at 12-13, 18-20, 23-25. Petitioners likewise contend that Entergy's use of the fund contravenes Federal Energy Regulatory Commission (FERC) regulations and certain rulings of the Vermont Public Safety Board. *Id.* at 24-25, 30-31. We lack jurisdiction over these matters and therefore decline to consider these arguments. See *PPL Susquehanna LLC* (Susquehanna Steam Electric Station, Units 1 and 2), CLI-07-25, 66 NRC 101, 107 (2007) (denying an appeal claiming "that [the] NRC ought to concern itself with . . . matters within the jurisdiction of other state and federal agencies"); *GPU Nuclear, Inc.* (Oyster Creek Nuclear Generating Station), CLI-00-6, 51 NRC 193, 211 (2000) (clarifying that the proper forum for an argument regarding rate regulation is the FERC or a state board of public utilities).

<sup>36</sup> Petition at 16.

Fund, and prohibit Entergy from making future withdrawals for expenses that do not meet the NRC's definition of decommissioning."<sup>37</sup>

With regard to Petitioners' general claim that Entergy's proposed expenditures will prematurely deplete the fund, as explained above, we promulgated our regulations to ensure that licensees would retain adequate funding to complete decommissioning. Moreover, our ongoing oversight of Entergy's compliance with our regulatory structure provides reasonable assurance that sufficient funds will be available to decommission Vermont Yankee in accordance with our regulations. As explained more fully below none of Petitioners' specific challenges persuades us otherwise.

We first address the terms of the license itself. License condition 3.J.a.iii provides as follows:

The decommissioning trust agreement must provide that no disbursements or payments from the trust, other than for ordinary administrative expenses, shall be made by the trustee until the trustee has first given the NRC 30 days prior written notice of payment. The decommissioning trust agreement shall further contain a provision that no disbursements or payments from the trust shall be made if the trustee receives prior written notice of objection from the Director of the Office of Nuclear Reactor Regulation.<sup>38</sup>

Additionally, license condition 3.J.a.iv states that "[t]he decommissioning trust agreement must provide that the agreement cannot be amended in any material respect without 30 days prior written notification to the Director of the Office of Nuclear Reactor Regulation."<sup>39</sup> Petitioners argue that Entergy's disbursements from the trust without notification to the Staff and the use of these funds for purposes other than decommissioning violate the terms of the license and materially amend the decommissioning trust agreement specified in the license condition — the Master Trust Agreement. They further contend that these actions constitute a *de facto* license amendment and assert that this *de facto* license amendment triggers a hearing opportunity.<sup>40</sup>

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<sup>37</sup> *Id.* at 59.

<sup>38</sup> Entergy Nuclear Vermont Yankee, LLC and Entergy Nuclear Operations, Inc. (Vermont Yankee Nuclear Power Station), Renewed Operating License No. DPR-28 (Mar. 21, 2011), at 7 (ADAMS Accession No. ML092110054) (License). The decommissioning trust license conditions are reproduced as an Appendix to this decision.

<sup>39</sup> *Id.*

<sup>40</sup> See Petitioners' Reply at 11-12 ("Entergy should not be permitted to contravene the terms of its license, and the Staff should not be permitted to tacitly approve such contraventions."); Petition at 13 ("Entergy's [disbursements from the decommissioning trust fund without thirty days' prior written notice to the NRC and its amendment of the Master Trust Agreement] are in derogation of those license conditions.").

As an initial matter, any unilateral action taken by Entergy — including a disbursement from the trust fund — cannot in and of itself constitute a *de facto* license amendment. We have made clear that unilateral “licensee action without an NRC approval of an increase in authority or alteration of the terms of the license does not constitute a *de facto* amendment.”<sup>41</sup> And the NRC’s grant of an exemption from 10 C.F.R. § 50.82(a)(8)(i)(A) — “approving” the use of trust funds for a purpose other than decommissioning — does not amount to endorsement of conduct inconsistent with any provision of the Vermont Yankee license, including conditions 3.J.a.iii and 3.J.a.iv. The license does not preclude exemptions from regulations. Thus, issuance of an exemption from our *regulations* does not mean, as Petitioners suggest, that the Staff has approved an amendment to the license.<sup>42</sup> Petitioners have not established a right to a hearing with respect to their assertions about noncompliance with the license. Instead, Petitioners’ assertions that Entergy’s unilateral actions have contravened the terms of its license are properly raised through the enforcement process, as discussed below.

We turn next to Petitioners’ assertions that Entergy has acted in violation of NRC rules. Petitioners argue that NRC rules prohibit the disbursement of decommissioning funds for certain costs that Entergy has included in its decommissioning cost estimate. Specifically, Petitioners object to Entergy’s inclusion of a 5-million-dollar settlement payment, emergency preparedness costs (including legal fees), shipments of nonradiological asbestos waste, insurance, property taxes, and replacement of structures during the time Entergy maintains Vermont Yankee in a safe storage condition (SAFSTOR).<sup>43</sup> Petitioners assert that, for these costs, use of decommissioning funds contravenes the requirement that such funds are only to be used for activities that “reduce residual radioactivity.”<sup>44</sup> We find that, at bottom, Petitioners raise an issue of noncompliance that should be filed as a petition for enforcement action, and not as a matter before us or the Licensing Board.

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<sup>41</sup> *Pacific Gas and Electric Co.* (Diablo Canyon Nuclear Power Plant, Units 1 and 2), CLI-15-14, 81 NRC 729, 735 (2015) (citing *Florida Power & Light Co.* (St. Lucie Nuclear Power Plant, Unit 2), CLI-14-11, 80 NRC 167, 173 (2014)).

<sup>42</sup> See *Massachusetts v. NRC*, 878 F.2d 1516, 1521 (1st Cir. 1989).

To the extent Petitioners argue (Petitioners’ Reply at 11-12) that the Staff has tacitly approved Entergy’s request to no longer make required notifications, they are incorrect. Entergy has withdrawn its license amendment application; as such, Entergy’s obligations under its license to provide notice of disbursements remain in place. See note 56, *infra*.

<sup>43</sup> Petition at 20-21, 22. Petitioners also object to Entergy’s inclusion of spent fuel management expenses in its decommissioning cost estimate. However, spent fuel management expenses are the subject of an exemption that the Staff has approved. See discussion *infra* at Section II.B and note 56.

<sup>44</sup> Petition at 20 (citation omitted).

To determine whether a particular expense may appropriately be used for decommissioning, it is appropriate to look to the governing regulations regarding the use of decommissioning trust funds. These regulations permit licensees to use decommissioning trust funds only for “legitimate decommissioning activities” consistent with the definition of decommissioning in 10 C.F.R. § 50.2.<sup>45</sup> Our rules, however, do not themselves define “legitimate decommissioning activities.” The Staff, when reviewing notifications for withdrawal of funds to be used for decommissioning purposes, therefore must look to whether the activity or expense is directly related to the radiological decontamination of the facility or qualifies as an administrative expense consistent with our regulations and to the applicable license conditions.<sup>46</sup> In determining whether an expense is allowable, the Staff is informed by the Statements of Consideration for the 1988 decommissioning rule and applicable regulatory guidance.<sup>47</sup>

The general objections lodged by Petitioners here do not reveal a manifest inconsistency with our rules warranting relief as part of our supervisory review. But we decline to make a broad statement about the propriety of a withdrawal to pay for any particular expense. The Staff reviews notifications of withdrawal of funds from decommissioning trusts on a case-by-case basis.<sup>48</sup> Petitioners may

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<sup>45</sup> 10 C.F.R. § 50.82(a)(8)(i)(A).

<sup>46</sup> *See id.* § 50.2; *see also* License at 7. Section 50.75(h)(1)(iv) contains this requirement for plants subject to that provision.

<sup>47</sup> *See* Final Rule: “General Requirements for Decommissioning Nuclear Facilities,” 53 Fed. Reg. 24,018 (June 27, 1988); *see also* Final Rule: “Financial Assurance Requirements for Decommissioning Nuclear Power Reactors,” 63 Fed. Reg. 50,465 (Sept. 22, 1998); Decommissioning Final Rule, 61 Fed. Reg. at 39,278.

As Entergy correctly observes, NRC guidance contemplates classifying a number of the expenses Petitioners contest as decommissioning costs. Entergy Answer at 20-21 & nn. 90, 92-95 (citations omitted). For example, NUREG/CR-5884 classifies removal and disposal of asbestos as a “cascading cost” — that is, a cost associated with the removal of noncontaminated and releasable material in support of the decommissioning process. “Revised Analyses of Decommissioning for the Reference Pressurized Water Reactor Power Station” (Final Report), NUREG/CR-5884 (Nov. 1995), app. B, at B.34 & n.16 (ADAMS Accession No. ML14008A187). And Regulatory Guide 1.159 contemplates the inclusion of insurance in the decommissioning cost estimate. “Assuring the Availability of Funds for Decommissioning Nuclear Reactors,” Regulatory Guide 1.159, rev. 2 (Oct. 2011), at 11 (ADAMS Accession No. ML112160012). Further, Regulatory Guide 1.202 contemplates including both property tax and insurance in the decommissioning cost estimate. “Standard Format and Content of Decommissioning Cost Estimates for Nuclear Power Reactors,” Regulatory Guide 1.202 (Feb. 2005), at 9 (ADAMS Accession No. ML050230008). But these expenses may not be allowable uses for decommissioning trust funds in all circumstances.

<sup>48</sup> And we have directed that “the [S]taff should not allow the withdrawal of funds that have been deposited to meet NRC decommissioning objectives, as identified in a site-specific study as being necessary to complete radiological decommissioning or are necessary to satisfy the generic formula amounts set forth in 10 C.F.R. § 50.75(c).” Staff Requirements — SECY-02-0085 — Recent

(Continued)

likewise challenge any individual notification via the section 2.206 process if they believe that a particular withdrawal is not authorized by the license or applicable regulations. To raise a sufficient challenge Petitioners must do more than they have done here. They must identify a particular disbursement and explain why it contravenes applicable requirements.<sup>49</sup>

Regarding the Master Trust Agreement, Petitioners argue as a general matter that it prohibits the use of the decommissioning trust fund for nondecommissioning expenses.<sup>50</sup> They point out that, by its terms, the “exclusive purpose” of the Master Trust Agreement is

to accumulate and hold funds for the contemplated Decommissioning of the Station and to use such funds, in the first instance, for expenses related to the Decommissioning of the Station as defined by the NRC in its [r]egulations and issuances, and as provided in the licenses issued by the NRC for the Station and any amendments thereto.<sup>51</sup>

Petitioners are correct insofar as they assert that, pursuant to the Master Trust Agreement, decommissioning trust funds are in the first instance to be used for the purpose of decommissioning the Vermont Yankee site. But the “[r]egulations and issuances” that define whether this standard has been satisfied are not necessarily static; they may be amended or an exemption may be issued without effecting an amendment of the Master Trust Agreement.<sup>52</sup> Accordingly, Entergy may use the trust funds consistent with the Master Trust Agreement, as modified

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Issues with Respect to Decommissioning Funding Assurance That Have Arisen as Part of License Transfer Applications and Other Licensing Requests (Jan. 3, 2003), at 1 (ADAMS Accession No. ML030030539).

<sup>49</sup>To the extent that the NRC has issued exemptions regarding use of the decommissioning trust fund to Entergy, Entergy’s use of such funds consistent with approved exemptions would not violate NRC regulations. If Petitioners (or any person) seek to argue that a specific disbursement is inconsistent with an approved exemption, such a challenge likewise is appropriately raised via the section 2.206 process.

<sup>50</sup>Petition at 26-29. In framing their argument, Petitioners assert that “[b]oth entities that reviewed Entergy’s proposed purchase of Vermont Yankee — the NRC and the [Vermont] Public Service Board — conditioned their approvals of the purchase on establishment of and compliance with a trust agreement to protect the Decommissioning Fund.” *Id.* at 23. For the purpose of this petition, the rationale behind the authorization of Entergy’s purchase of the facility is not relevant. The relevant inquiry is what the Master Trust Agreement requires and how the Agreement relates to Entergy’s license for the facility and our governing regulations.

<sup>51</sup>*Id.* at 26 (emphasis omitted) (quoting Master Trust Agreement for Vermont Yankee Nuclear Power Station (July 31, 2002), § 2.01 (attached to Petition as Exhibit 1) (Master Trust Agreement)).

<sup>52</sup>For the same reason, Petitioners’ arguments asserting that Entergy’s actions violate license condition 3.J.a.i (Petitioners’ Reply at 12) are unavailing. Issuance of an exemption does not render the form of the decommissioning trust agreement unacceptable to the NRC.

by any exemptions that the NRC has approved. The use of decommissioning funds in these circumstances (that is, consistent with approved exemptions) does not contravene the terms of the Agreement.

Nor does Entergy's use of funds in accordance with the exemption effectuate an amendment to the Master Trust Agreement not authorized by either the Agreement itself or the corresponding portion of Entergy's license. Section 9.05(d) of the Master Trust Agreement states:

[T]his Agreement cannot be amended in any material respect without 30 days' prior written notice to the [Director of the Office of Nuclear Reactor Regulation (NRR Director)]; provided, however, that if the Company receives prior written notice of objection from either the NRR Director or the [Director of the Office of Nuclear Material Safety and Safeguards], as appropriate, no such material amendment, modification, or alteration shall be made.<sup>53</sup>

This restriction reflects license condition 3.J.a.iv, which in turn states that "[t]he decommissioning trust agreement must provide that the agreement cannot be amended in any material respect without [30 days'] prior written notification to the Director of the Office of Nuclear Reactor Regulation."<sup>54</sup> We understand this provision to mean that Entergy may not alter the terms of the Master Trust Agreement without prior notice to the NRC. But for the reasons stated above, this does not mean that use of the fund in accordance with an exemption somehow constitutes an alteration of the Master Trust Agreement. The license condition requiring Entergy to provide notice of an amendment to the Master Trust Agreement remains in place, and no provision of the Agreement has been amended.

In sum, use of the decommissioning trust funds must comply with our regulations, as exempted, and Entergy's license for the facility. As we explained with respect to Petitioners' arguments regarding the costs Entergy has included in its decommissioning cost estimate, challenges regarding the propriety of particular uses of the fund under the license or our regulations are appropriate for the Staff's consideration under section 2.206. Indeed, that is precisely what the 2.206 process is for. But in the absence of any demonstration that the NRC has approved conduct in derogation of Entergy's license, we deny Petitioners' request that we "review all of Entergy's requests for withdrawals from the Decommissioning Fund, and prohibit Entergy from making future withdrawals for expenses that do not meet the NRC's definition of decommissioning."<sup>55</sup>

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<sup>53</sup> Master Trust Agreement § 9.05(d).

<sup>54</sup> License at 7.

<sup>55</sup> Petition at 59.

## B. Exemption Request

In addition to their general concerns about how decommissioning funds should be used, Petitioners challenge a particular exemption that allows Entergy to use decommissioning trust funds for irradiated fuel management and contend that Entergy is not entitled to such an exemption.<sup>56</sup> Essentially, Petitioners claim that spent fuel costs will reduce funds set aside for decommissioning far beyond Entergy's estimates.<sup>57</sup> Petitioners argue that the Staff's approval of the exemption for Vermont Yankee was arbitrary and an abuse of discretion because Entergy's decommissioning cost estimate underestimates the cost of decommissioning the facility.<sup>58</sup> They further argue that Entergy underestimates the cost of spent fuel management.<sup>59</sup> And Petitioners generally challenge the NRC's practice of granting exemptions without providing an opportunity for a hearing.<sup>60</sup>

The Staff and Entergy both counter that the Staff's issuance of the exemption is not subject to a hearing.<sup>61</sup> As to the merits, Entergy asserts that Petitioners' arguments regarding the cost of decommissioning are "highly speculative, lack a basis in fact, and fail to satisfy the stringent 'clear and material error' standard — a required demonstration for a petition for reconsideration."<sup>62</sup> The Staff argues that Petitioners' concerns regarding depletion of the decommissioning trust fund are misplaced due to regulatory safeguards.<sup>63</sup>

As both the Staff and Entergy observe, exemption requests are not subject to a hearing opportunity under the Atomic Energy Act. AEA § 189a states:

In any proceeding under this Act, for the granting, suspending, revoking, or amending of any license . . . and in any proceeding for the issuance or modification of

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<sup>56</sup> *Id.* at 31; *see* Exemption Issuance, 80 Fed. Reg. at 35,992. Entergy also sought — and the Staff granted — an exemption from 10 C.F.R. § 50.75(h)(1)(iv), which would have permitted Entergy to use the funds for spent fuel management without providing notice to the NRC. *See id.* But 10 C.F.R. § 50.75(h)(1)(iv) would only have applied to Entergy following the approval of the license amendment application discussed above. Because Entergy has now withdrawn that application, the exemption from 10 C.F.R. § 50.75(h)(1)(iv) has no effect. *See Vermont Yankee*, LBP-15-28, 82 NRC at 238.

<sup>57</sup> Petition at 43-47.

<sup>58</sup> *Id.* at 35-41. In this vein, Petitioners assert that Entergy did not demonstrate special circumstances justifying the exemption, as required by 10 C.F.R. § 50.12(a)(2). *Id.* at 31-35.

<sup>59</sup> *Id.* at 41-47.

<sup>60</sup> *Id.* at 33.

<sup>61</sup> Staff Answer at 33-34; Entergy Answer at 30.

<sup>62</sup> Entergy Answer at 32-34. Entergy examines Petitioners' arguments under 10 C.F.R. § 2.345, which governs petitions for reconsideration in adjudications; it argues that under these standards, the petition does not fulfill the regulatory requirements and is impermissibly late. *Id.* at 30-31.

<sup>63</sup> Staff Answer at 36-37.

rules and regulations dealing with the activities of licensees . . . the Commission shall grant a hearing upon the request of any person whose interest may be affected by the proceeding . . . .<sup>64</sup>

As we have previously held, “[a]gency actions that are not among those listed [in section 189a] do not give rise to a hearing right for interested persons.”<sup>65</sup> Petitioners acknowledge this, but they note that “[a]lthough stand-alone exemption requests generally do not create hearing rights, hearings on exemption requests that are ‘directly related’ to a license amendment request are excepted from that general rule.”<sup>66</sup> Petitioners argue that this case fits within that exception because of the interrelationship between Entergy’s license amendment request and its exemption request. But the exception does not apply here because Entergy has withdrawn its license amendment request and the Board has approved that withdrawal.<sup>67</sup> Therefore, no active license amendment request remains that is arguably related to Entergy’s exemption request.<sup>68</sup>

Although no hearing opportunity attaches to the exemption request, we briefly address the merits of Petitioners’ arguments. As an initial matter, our current decommissioning process expressly contemplates the issuance of exemptions from regulatory requirements applicable to operating reactors where the Staff determines that such exemptions are warranted.<sup>69</sup> Further, Petitioners are correct that, under our decommissioning rules, a licensee may not use decommissioning trust funds to pay for spent fuel management costs. Footnote 1 to 10 C.F.R. § 50.75(c) states that the minimum amounts required to demonstrate reasonable assurance of funds for decommissioning set forth in that section “are based on activities related to the definition of ‘Decommission’ in [10 C.F.R. § 50.2] and do not include the cost of removal and disposal of spent fuel or of non-radioactive

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<sup>64</sup> 42 U.S.C. § 2239.

<sup>65</sup> *Private Fuel Storage, L.L.C.* (Independent Spent Fuel Storage Installation), CLI-01-12, 53 NRC 459, 466 (2001) (citing *Massachusetts*, 878 F.2d at 1516).

<sup>66</sup> Petition at 13 (citing *Private Fuel Storage*, CLI-01-12, 53 NRC at 476).

<sup>67</sup> Motion to Withdraw at 1; *Vermont Yankee*, LBP-15-28, 82 NRC at 244.

<sup>68</sup> Petitioners also request a hearing on the Vermont Yankee PSDAR. Petition at 59. Although the Staff solicited comments on the Vermont Yankee PSDAR, our regulations do not provide a hearing opportunity on it. 10 C.F.R. § 50.82(a)(4)(ii); see 42 U.S.C. § 2239. See generally Entergy Nuclear Operations, Inc., Vermont Yankee Nuclear Power Station Post-Shutdown Decommissioning Activities Report, 80 Fed. Reg. 1975 (Jan. 14, 2015).

<sup>69</sup> See Staff Requirements — SECY-14-0118 — Request by Duke Energy Florida, Inc., for Exemptions from Certain Emergency Planning Requirements (Dec. 30, 2014) (ADAMS Accession No. ML14364A111) (directing the Staff to continue reviewing exemption requests and providing recommendations to the Commission while proceeding with a rulemaking on decommissioning).

structures and materials beyond that necessary to terminate the license.”<sup>70</sup> To use decommissioning funds for spent fuel management at Vermont Yankee, Entergy was therefore required to seek an exemption from that provision. And the relevant question is not, as Petitioners assert, whether, in the abstract, issuing exemptions is an appropriate means of regulating but, rather, whether in this case approval of the exemption was warranted.

We therefore look to whether Entergy satisfied the criteria for obtaining an exemption pursuant to 10 C.F.R. § 50.12. That section permits the approval of an exemption provided that the exemption is authorized by law, will not present an undue risk to the public health and safety, and is consistent with the common defense and security.<sup>71</sup> Additionally, special circumstances must be present before an exemption may be granted.<sup>72</sup>

For its part, the Staff reasonably determined that Entergy satisfied the requirements for the exemption. First, the Staff determined that Entergy’s requested exemption was authorized by law.<sup>73</sup> Our regulations contemplate exemptions under appropriate circumstances, and the Staff found that the exemption requested would not result in violation of the AEA or NRC regulations.<sup>74</sup> Next, the Staff determined that the exemption presented no undue risk to public health and safety.<sup>75</sup> Entergy’s exemption request stated that the contemplated use of part of the trust fund for irradiated fuel management would not “adversely impact [Entergy’s] ability to terminate the [Vermont Yankee] license (i.e.,) complete radiological decommissioning) . . . consistent with the schedule and costs contained in the [Vermont Yankee] updated Irradiated Fuel Management Program and PSDAR.”<sup>76</sup> Entergy’s request further stated that the probability of accidents, consequences of accidents, and types and amounts of effluents that may be released offsite did not change with the proposed use of the trust fund in the exemption request.<sup>77</sup> Additionally, Entergy noted that there was no significant increase in occupational or public radiation exposure with the proposed use of the funds.<sup>78</sup> The Staff further found that the exemption was consistent with the common defense and security.<sup>79</sup> As Entergy’s exemption request stated, the

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<sup>70</sup> See also 10 C.F.R. § 50.82(a)(8). Our regulations separately require a plan for fuel management following cessation of reactor operations, including funding. See *id.* § 50.54(bb).

<sup>71</sup> *Id.* § 50.12(a)(1).

<sup>72</sup> *Id.* § 50.12(a)(2)(i)-(vi) (defining what may constitute special circumstances).

<sup>73</sup> Exemption Issuance, 80 Fed. Reg. at 35,993.

<sup>74</sup> See Exemption Request, attach. 1, at 9.

<sup>75</sup> Exemption Issuance, 80 Fed. Reg. at 35,993.

<sup>76</sup> Exemption Request, attach. 1, at 9.

<sup>77</sup> *Id.*

<sup>78</sup> *Id.*

<sup>79</sup> Exemption Issuance, 80 Fed. Reg. at 35,993.

change would “not alter the scope of, or availability of sufficient funding for the [Vermont Yankee] security program and does not adversely affect the ability to physically secure the site and to protect special nuclear material.”<sup>80</sup>

Petitioners contend that the Staff’s regulatory findings rely on a number of faulty assumptions. Specifically, Petitioners claim that the exemption rests on an unreasonably low estimation of decommissioning costs because it does not “provide any contingency for discovery of additional contaminants, such as the discovery of strontium-90 in locations where that contaminant had not previously been identified.”<sup>81</sup> Additionally, Petitioners assert that the exemption unreasonably truncates the likely cost of spent fuel management because it assumes that the Department of Energy will take possession of the spent nuclear fuel onsite by 2052.<sup>82</sup> In support of this claim, Petitioners point to our recent Continued Storage Rule, which codified a generic environmental impact statement that (among other things) acknowledged that spent fuel could remain on site indefinitely.<sup>83</sup>

As explained above, even after the Staff granted the exemption, the regulations still prohibit Entergy from making a withdrawal that would “inhibit its ability to complete funding of any shortfalls in the decommissioning trust,” require Entergy to submit an annual financial assurance report, and require Entergy to provide additional funds if the report reveals insufficient funds to complete decommissioning.<sup>84</sup> Therefore, the applicable regulations provide reasonable assurance that adequate funds will remain to complete decommissioning by requiring Entergy and the Staff to monitor the projected cost of decommissioning and available funding and ensure more funding is available as needed. Moreover, as Entergy and the Staff observed, with regard to their decommissioning costs claim, Petitioners have not shown how the identified contaminants will elevate decommissioning costs.<sup>85</sup> Likewise, with regard to the fuel-costs claim, while the Continued Storage generic environmental impact statement acknowledges for purposes of NEPA that fuel could remain on site indefinitely, it finds the short-term period of storage most likely.<sup>86</sup> Therefore, we find that Petitioners

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<sup>80</sup> Exemption Request, attach. 1, at 9-10.

<sup>81</sup> Petition at 36.

<sup>82</sup> *Id.* at 46.

<sup>83</sup> *Id.* at 46-47; see 10 C.F.R. § 51.23; “Generic Environmental Impact Statement for Continued Storage of Spent Nuclear Fuel” (Final Report), NUREG-2157, vol. 1 (Sept. 2014) (ADAMS Accession No. ML14196A105) (NUREG-2157).

<sup>84</sup> See *supra* p. 105 (citing 10 C.F.R. § 50.82(a)(8)(i)(C), (a)(8)(v), and (a)(8)(vi)).

<sup>85</sup> Entergy Answer at 32-33 (noting that the identified levels of strontium-90 at Vermont Yankee are below regulatory limits); Staff Answer at 43 & n.211 (same).

<sup>86</sup> NUREG-2157, app. B at B-2 (finding the short-term period of storage, 60 years after a facility’s license expires, to be the most likely scenario for onsite spent fuel storage).

have not demonstrated that in granting the exemption, the Staff relied on unreasonable assumptions.

Additionally, the Staff found that “special circumstances” within the meaning of 10 C.F.R. § 50.12(a)(ii) were present, because the application of the regulations in question — 10 C.F.R. §§ 50.82(a)(i)(A) and 50.75(h)(1)(iv) — “would not serve the underlying purpose of the rule[s] or [was] not necessary to achieve the underlying purpose of the rule[s].”<sup>87</sup> The Staff observed that the underlying purpose of the regulation “is to provide reasonable assurance that adequate funds will be available for radiological decommissioning of power reactors.”<sup>88</sup> On that point, the Staff found that “there are sufficient funds in the [t]rust to complete legitimate radiological decommissioning activities as well as to conduct irradiated fuel management.”<sup>89</sup>

As the Staff argued before the Board in the license amendment matter, Entergy’s election to maintain Vermont Yankee in SAFSTOR helps to provide assurance that there will be sufficient funds for decommissioning.<sup>90</sup> Further, the regulatory limit on the interest rate licensees may use in funding projections is 2%.<sup>91</sup> The Staff noted that when a 2% return is applied to the current balance of the decommissioning trust fund, the projected funds at the end of the decommissioning period would be sufficient to fund both decommissioning and the irradiated fuel management expenses that are the subject of the exemption.<sup>92</sup> The Staff further stated that Entergy’s decommissioning cost estimate employed “numerous conservatisms in its calculation of costs.”<sup>93</sup> Ultimately, the Staff rea-

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<sup>87</sup> Exemption Issuance, 80 Fed. Reg. at 35,993; *see also* 10 C.F.R. § 50.12(a)(2)(ii).

<sup>88</sup> Exemption Issuance, 80 Fed. Reg. at 35,993; *see also* Exemption Request, attach. 1, at 10.

<sup>89</sup> Exemption Issuance, 80 Fed. Reg. at 35,994; *see also* Exemption Request, attach. 1, at 3-6 (providing a cash flow analysis and explaining that it “demonstrates that with earnings, the trust fund is sufficient to cover the estimated costs not only of radiological decommissioning but also the irradiated fuel management activities that are within the scope of the exemption requests”).

<sup>90</sup> NRC Staff Answer to State of Vermont Petition for Leave to Intervene and Hearing Request (May 15, 2015) at 43-44 (Staff Answer to Vermont Intervention Petition). SAFSTOR “allows natural radioactive decay to proceed over time, which will reduce the amount of contamination and radioactivity that will have to be addressed in decommissioning and thus reduce the overall expense of decommissioning.” *Id.* at 44 (citing “Decommissioning of Nuclear Power Reactors,” Regulatory Guide 1.184, rev. 1 (Oct. 2013), at 4 (ADAMS Accession No. ML13144A840); “Staff Responses to Frequently Asked Questions Concerning Decommissioning of Nuclear Power Plants” (Final Report), NUREG-1628 (June 2000), at 5-7 (ADAMS Accession No. ML003726190)); *see also* Exemption Request, attach. 1, at 1, 7.

<sup>91</sup> 10 C.F.R. § 50.75(e)(1)(ii); *see* Staff Answer to Vermont Intervention Petition at 44.

<sup>92</sup> Staff Answer to Vermont Intervention Petition at 44; *see also* Exemption Request, attach. 1, at 10.

<sup>93</sup> Staff Answer to Vermont Intervention Petition at 44 & n.197 (summarizing the conservatisms set forth in the decommissioning cost estimate such as “the use of a contingency factor, a work

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sonably concluded that the period of decommissioning, the projected earnings of the fund, and the conservatisms in the decommissioning cost estimate provide assurance that sufficient funds will be available for decommissioning.

Petitioners argue that special circumstances are not present in this proceeding with regard to this exemption because the Staff has “granted [the] exemption to every nuclear power plant that has requested it.”<sup>94</sup> Petitioners conclude, “The exemption cannot be the rule.”<sup>95</sup> But, our regulations specifically delineate the circumstances in which we will find special circumstances, and whether other facilities have requested or received similar exemptions is not an enumerated factor.<sup>96</sup> Petitioners remind us that we have previously observed that exemptions are an “extraordinary equitable remedy to be used sparingly” in light of our robust rulemaking process.<sup>97</sup> But, this observation does not override the explicit language in our regulations. We do not see any conflict between that principle and the agency’s actions; the NRC has granted this exemption, to one part of our extensive regulatory structure, to a handful of plants. These exemptions are hardly the rule. Additionally, in light of our recent experience with decommissioning facilities, we commenced a rulemaking to update our regulations regarding decommissioning reactors.<sup>98</sup> As a result, the NRC continues to adhere to the principle that exemptions should be granted sparingly and is taking action to consider whether recently granted exemptions suggest a need to change our regulatory structure to ensure, in part, that the agency’s use of exemptions remains appropriate.<sup>99</sup>

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difficulty factor, the assumption that the [U.S. Department of Energy] will accept older irradiated fuel before it accepts newer irradiated fuel, and an estimate of the volume of soil to be removed for controlled disposal that is not adjusted downward for the natural decay of radionuclides over time”).

<sup>94</sup> Petition at 32.

<sup>95</sup> *Id.* at 33.

<sup>96</sup> 10 C.F.R. § 50.12(a)(2).

<sup>97</sup> Petition at 32-33 (quoting *Honeywell International, Inc.* (Metropolis Works Uranium Conversion Facility), CLI-13-1, 77 NRC 1, 9 (2013) (internal quotations omitted)).

<sup>98</sup> Regulatory Improvements for Decommissioning Power Reactors, 80 Fed. Reg. 72,358 (Nov. 19, 2015) (Advance Notice of Proposed Rulemaking).

<sup>99</sup> As reflected in today’s order, we have carefully considered the views expressed to us. While we are not persuaded by Commissioner Baran’s dissenting views, we are mindful of the concerns he has raised. The full Commission has separately directed the Staff to consider options for addressing requests for decommissioning-related exemptions between now and the time the agency completes its larger decommissioning rulemaking. With respect to this matter, we have discretionarily provided the Petitioners and others a greater opportunity to participate than is contemplated by our regulations. *See supra* pp. 108-09. Moreover it would be unfair, and potentially arbitrary, to treat this request — one that meets the requirements for an exemption — differently simply because of where it falls

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Finally, in granting the exemption, the Staff determined that special circumstances were present for another reason — Entergy’s compliance with the rule would result in undue hardship or other costs that are significantly in excess of those contemplated when the regulation was adopted, or that are significantly in excess of those incurred by others similarly situated.<sup>100</sup> On that point, Entergy stated that preventing access to excess trust funds for irradiated fuel management “would create an unnecessary financial burden without any corresponding safety benefit” because the amounts in the trust fund are adequate to cover both decommissioning activities and irradiated fuel management.<sup>101</sup> As noted above, the Staff agreed with this analysis, and we have identified no reason to second-guess this judgment.

We reiterate that the approval of this exemption is not the end of the story. NRC regulations require annual review of expenses and funding by both the Staff and the licensee through license termination.<sup>102</sup> This annual review provides an additional mechanism to assure that adequate funds will be available for decommissioning. If the NRC determines, as the result of this annual review, that costs of decommissioning exceed the remaining decommissioning funds, “then the licensee must provide additional financial assurance to cover the estimated cost of completion.”<sup>103</sup>

In short, we have examined the record associated with the Staff’s approval of the exemption. We conclude that the Staff followed the process set forth in 10 C.F.R. § 50.12 and articulated a reasonable basis for granting the exemption. We therefore deny Petitioners’ request that we reverse the Staff’s approval of

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in a series of similar requests. *E.g., Eagle Broadcasting Group, Ltd. v. Federal Communications Commission*, 563 F.3d 543, 551, 554 (D.C. Cir. 2009) (observing that “an agency may not treat like cases differently” (internal quotations marks omitted)).

<sup>100</sup> Exemption Issuance, 80 Fed. Reg. at 35,994; *see also* 10 C.F.R. § 50.12(a)(2)(iii).

<sup>101</sup> Exemption Request, attach. 1, at 11.

<sup>102</sup> Staff Answer to Vermont Intervention Petition at 44 (citing 10 C.F.R. § 50.82(a)(8)(v)); *see also* Exemption Request, attach. 1, at 7 (stating that the annual reporting requirements in 10 C.F.R. § 50.82(a)(8)(v) and (vi) will allow continual NRC oversight of the status of the trust fund if Entergy is not required to submit 30-day notices of disbursements for irradiated fuel management).

<sup>103</sup> *See* Staff Answer at 36 (citing 10 C.F.R. § 50.82(a)(v)-(vii)). *See generally* “Summary Findings Resulting from the Staff Review of the 2013 Decommissioning Funding Status Reports for Operating Power Reactors,” Commission Paper SECY-13-0105 (Oct. 2, 2013) (ADAMS Accession No. ML13266A084). The Staff recently completed its annual review of decommissioning funding status reports and concluded that, among other licensees, Entergy has demonstrated compliance with section 50.82(a)(8)(v)-(vii), thereby providing assurance that it is maintaining sufficient funds to safely decommission Vermont Yankee. *See* Memorandum from Anthony Bowers, Office of Nuclear Reactor Regulation, NRC, to Bruce A. Watson, Office of Nuclear Material Safety and Safeguards, NRC, “Summary of the 2016 Annual Review of Decommissioning Funding Status Reports for Plants in Decommissioning” (Oct. 4, 2016) (ADAMS Accession No. ML16274A027).

Entergy's exemption request to use decommissioning trust funds for spent fuel management expenses.

### C. Request for Additional Detail in Notices of Disbursement

Petitioners next ask that we direct Entergy to provide additional information in its notices of disbursements or payments from the decommissioning trust.<sup>104</sup> As noted above, when the Board granted Entergy's motion to withdraw its license amendment request, it imposed a condition on the withdrawal requiring that Entergy specify in its notification to NRC that it is reimbursing itself from the decommissioning trust fund for certain expenses.<sup>105</sup> Petitioners assert that "[this 30-day] notice requirement is necessary to protect against encroachments on the Decommissioning Fund, like those now pursued by Entergy."<sup>106</sup> They therefore request that we "require Entergy to provide detailed information supporting *all* proposed withdrawals from the Decommissioning Fund, not just those in the six categories that were the subject of the license amendment proceeding."<sup>107</sup> Petitioners seek this information for past and future withdrawals from the fund.<sup>108</sup>

We decline to grant Petitioners' requested relief. The proper avenue for Petitioners' challenge — whether they seek more detail on a specific notification or greater specificity in the license condition, such that all notifications would require more detail — is to pursue an enforcement action under 10 C.F.R. § 2.206. Regarding the content of Entergy's notifications, Petitioners do not demonstrate

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<sup>104</sup> Petition at 47. Condition 3.J.a.iii of the Vermont Yankee license states that the Master Trust Agreement shall prohibit disbursements from the trust other than for ordinary administrative expenses unless the trustee first gives the NRC 30 days' prior written notice. The Master Trust Agreement must also provide that the trustee may not make payments from the fund if the NRR Director objects in writing. License at 7.

<sup>105</sup> Petition at 47-48 (citing *Vermont Yankee*, LBP-15-28, 82 NRC at 244 (requiring that Entergy "specify in its 30-day notice if the disbursement includes one of the six line items or legal expenses to which Vermont objected in its admitted contention").

<sup>106</sup> *Id.* at 48.

<sup>107</sup> *Id.* at 49. When Entergy sought to withdraw its license amendment request, the State of Vermont requested that the Board impose a broad condition on that withdrawal: "Entergy shall provide [Vermont] all supporting documentation for the specific expenses for which Entergy has filed 30-day notices from the Vermont Yankee Nuclear Decommissioning Trust Fund, and shall continue to provide that information for future withdrawals." State of Vermont's Response to Entergy's Motion to Withdraw (Oct. 2, 2015) at 3. The Board declined to do so. *Vermont Yankee*, LBP-15-28, 82 NRC at 242. To the extent that Petitioners seek to challenge the Board's disinclination to apply this condition to Entergy's withdrawals from the fund, the proper avenue for doing so would have been to challenge that aspect of LBP-15-28. *See* Entergy Answer at 35.

<sup>108</sup> Petition at 49.

that the information that Entergy currently provides is inadequate. Accordingly, we deny the request.

#### **D. Environmental Requirements for Decommissioning Activities**

Petitioners request a full environmental analysis of a variety of activities related to Entergy's decommissioning of the Vermont Yankee facility.<sup>109</sup> We provide the regulatory background and consider each of Petitioners' arguments below.

##### ***1. Regulatory Framework and Generic Environmental Impact Statement***

In 2002, the NRC published an update to its generic analysis of decommissioning impacts — the Final Generic Environmental Impact Statement on Decommissioning of Nuclear Power Reactors.<sup>110</sup> Although this GEIS reflects the NRC's determination that decommissioning is not itself a major federal action, it serves "to establish an envelope of environmental impacts associated with decommissioning activities."<sup>111</sup> This envelope defines the scope of permissible actions that a licensee who has entered the decommissioning process may take. As the NRC explained in the GEIS:

[L]icensees can rely on the information in this [GEIS] as a basis for meeting the requirements in 10 [C.F.R. §§] 50.82(a)(6)(ii). This requirement states that the licensee must not perform any decommissioning activity that causes any significant environmental impact not previously reviewed. Prior to conducting a decommissioning activity, the licensee must make a determination that the resulting environmental impacts fall within the bounds of this [GEIS] or of another EIS related to its facility.<sup>112</sup>

Licensees may rely on the Decommissioning GEIS only if the expected environmental impacts of a particular decommissioning activity are bounded by its analysis. If contemplated decommissioning activities are expected to result in environmental impacts *outside* the bounds of the Decommissioning GEIS (or

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<sup>109</sup> *Id.* at 50, 52-53.

<sup>110</sup> "Generic Environmental Impact Statement on Decommissioning of Nuclear Facilities, Supplement 1 Regarding the Decommissioning of Nuclear Power Reactors" (Final Report), NUREG-0586, Supplement 1, vols. 1-2 (Nov. 2002) (ADAMS Accession Nos. ML023470304, ML023470323, ML023500187, ML023500211, ML023500223) (Decommissioning GEIS) (supplementing the Final Generic Environmental Impact Statement on Decommissioning of Nuclear Facilities, published in 1988).

<sup>111</sup> *Id.* at 1-1.

<sup>112</sup> *Id.* at 1-10 to 1-11.

a prior site-specific environmental review), then the licensee should apply for a license amendment and submit a supplemental environmental report as part of that application describing and evaluating the additional environmental impacts.<sup>113</sup> In that case, the Staff will review the report and prepare, as appropriate, either an environmental assessment or an environmental impact statement.<sup>114</sup> In sum, the Decommissioning GEIS — consistent with our regulations — sets forth a structure by which a licensee submitting a PSDAR (and performing decommissioning activities consistent with that PSDAR) may rely on a previously performed environmental analysis so long as the impacts fall within the bounds of that analysis.<sup>115</sup>

As discussed above, the Staff provides an opportunity for public comment when a licensee submits its PSDAR.<sup>116</sup> But the PSDAR does not amend the license — and as such the licensee is not required to submit a corresponding environmental report.<sup>117</sup> In line with the Decommissioning GEIS, with respect to environmental impacts, a PSDAR must include “a discussion that provides the reasons for concluding that the environmental impacts associated with site-specific decommissioning activities will be bounded by appropriate previously issued environmental impact statements.”<sup>118</sup> Later, at the license termination stage, the licensee must submit a license amendment request in order to terminate its license.<sup>119</sup> The Decommissioning GEIS, mirroring the regulations

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<sup>113</sup> *Id.* at 1-11, 2-3.

<sup>114</sup> *Id.* at 2-3.

<sup>115</sup> The Decommissioning GEIS provides guidance regarding which decommissioning activities fall within the scope of its analysis. Table 1-1 lists “[a]ctivities performed up to license termination and their resulting impacts as provided in the definition of decommissioning” and “[n]onradiological impacts occurring after license termination from activities conducted during decommissioning” as within the scope of the GEIS. *Id.* at 1-6.

<sup>116</sup> 10 C.F.R. § 50.82(a)(4)(ii); *see* Decommissioning Final Rule, 61 Fed. Reg. at 39,281 (“The purpose of the PSDAR is to provide a general overview for the public and the NRC of the licensee’s proposed decommissioning activities until 2 years before termination of the license. The PSDAR is part of the mechanism for informing and being responsive to the public prior to any significant decommissioning activities taking place.”).

<sup>117</sup> 10 C.F.R. § 50.82(a)(4)(i); *see id.* § 51.53(d); *see also* Decommissioning Final Rule, 61 Fed. Reg. at 39,284 (“A more formal public participation process is appropriate at the termination stage of decommissioning . . .”).

<sup>118</sup> 10 C.F.R. § 50.82(a)(4)(i); *see* Decommissioning Final Rule, 61 Fed. Reg. at 39,293. When taking actions under 10 C.F.R. § 50.59 following submission of the PSDAR, the licensee must notify the NRC in writing and provide a copy to the affected State, “before performing any decommissioning activity inconsistent with, or making any significant schedule change from,” activities and schedules described in the PSDAR, “including changes that significantly increase the decommissioning cost.” 10 C.F.R. § 50.82(a)(7).

<sup>119</sup> *See* Decommissioning Final Rule, 61 Fed. Reg. at 39,284. That request provides an opportunity for a hearing on the license termination plan. *Id.* at 39,284, 39,286.

discussed above, contemplates assessing site-specific impacts at the license termination stage. The GEIS explains that the license termination plan must include a supplement to the previous environmental analysis describing any new information or significant environmental change associated with the proposed termination activities.<sup>120</sup>

Consistent with the process contemplated in the Decommissioning GEIS, Entergy's PSDAR for Vermont Yankee states that it "has concluded that the environmental impacts associated with planned [Vermont Yankee Nuclear Power Station] site-specific decommissioning activities are less than and bounded by the impacts addressed by previously issued environmental impact statements."<sup>121</sup> The PSDAR contains analysis of various environmental impacts and an explanation of how those impacts fall within the analysis in the Decommissioning GEIS.<sup>122</sup>

## 2. NEPA Analysis of PSDAR and 30-Day Notices

Petitioners contend that the Staff failed to perform NEPA review for several actions. First, they argue that the PSDAR requires a separate NEPA review.<sup>123</sup> Entergy and the Staff counter that the NRC's review of the PSDAR is not a major federal action that triggers NEPA review.<sup>124</sup> As support for their argument that the PSDAR requires a separate NEPA analysis, Petitioners cite *Citizens Awareness Network, Inc. v. NRC*, in which the First Circuit Court of Appeals held that decommissioning activities require NEPA compliance.<sup>125</sup> But *Citizens Awareness* predated the 1996 Decommissioning Final Rule. And as part of that rulemaking, the NRC expressly addressed the *Citizens Awareness* decision. The revised regulations addressed the court's decision by prohibiting any major decommissioning that results in environmental impacts outside of the bounds of previous environmental analysis (i.e., the Decommissioning GEIS or a site-specific EIS).<sup>126</sup> The NRC further explained that the updated rule also provides that a PSDAR must include a section discussing how the planned activities'

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<sup>120</sup> Decommissioning GEIS at 1-11, 2-4; see 10 C.F.R. §§ 50.82(a)(9)(ii)(G), 51.53(d); see also *id.* § 51.95(d).

<sup>121</sup> Letter from Christopher J. Wamsler, Site Vice President, Entergy Nuclear Operations, Inc., to NRC Document Control Desk (Dec. 19, 2014), encl. § 5.0 (ADAMS Accession No. ML14357A110) (PSDAR).

<sup>122</sup> *Id.* §§ 5.1.1 to 5.1.18.

<sup>123</sup> Petition at 52-53.

<sup>124</sup> Entergy Answer at 39-40; Staff Answer at 58.

<sup>125</sup> Petition at 52 (citing *Citizens Awareness Network, Inc. v. NRC*, 59 F.3d 284, 293 (1st Cir. 1995)).

<sup>126</sup> Decommissioning Final Rule, 61 Fed. Reg. at 39,286.

environmental impacts will be bounded by previous environmental analysis.<sup>127</sup> Additionally, the licensee must provide written notice if the intended decommissioning activities are inconsistent with what the PSDAR describes.<sup>128</sup>

In promulgating the Final Decommissioning Rule, the NRC specifically considered and rejected the idea that review of the PSDAR should be defined as a major federal action under NEPA because environmental analysis of activities to be performed under the PSDAR will necessarily have been performed in accordance with prior site-specific or generic analysis.<sup>129</sup> Unless the environmental impacts of particular decommissioning activities will fall outside the previously performed analysis, the rule does not contemplate additional NEPA analysis at the PSDAR stage. As discussed above, Entergy's PSDAR for Vermont Yankee states that it "has concluded that the environmental impacts associated with planned [Vermont Yankee Nuclear Power Station] site-specific decommissioning activities are less than and bounded by the impacts addressed by previously issued environmental impact statements."<sup>130</sup> The PSDAR contains analysis of various environmental impacts and an explanation of how those impacts fall within the analysis in the GEIS.<sup>131</sup> Accordingly, Petitioners' reliance on *Citizens Awareness* to support its argument for a separate environmental analysis of the PSDAR is unavailing.<sup>132</sup>

Petitioners argue that because the Staff has the authority to "find the PSDAR deficient," the Staff's failure to do so in this instance converts its review of the PSDAR into a major federal action requiring NEPA review.<sup>133</sup> Petitioners cite *Ramsey v. Kantor*<sup>134</sup> for the proposition that an agency's failure to disapprove

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<sup>127</sup> *Id.*

<sup>128</sup> *Id.*

<sup>129</sup> *Id.* at 39,279, 39,283, 39,286; see Entergy Answer at 39-40.

<sup>130</sup> PSDAR § 5.0. As discussed above, while the Staff does not formally approve a licensee's PSDAR, it reviews the PSDAR. See Regulatory Guide 1.185 at 10 (noting that the Staff may find a PSDAR deficient if it proposes activities "that would result in a significant detrimental impact to the environment that is not bounded by the current environmental impact statements"); see also 10 C.F.R. § 50.82(a)(5) (prohibiting licensees from performing major decommissioning activities until 90 days after the Staff has received the PSDAR). Here, the Staff did not find Entergy's PSDAR deficient.

<sup>131</sup> PSDAR §§ 5.1.1 to 5.1.18.

<sup>132</sup> Moreover, as discussed above, the updated regulations "require[ ] a formal license termination plan by the licensee. The activities in the licensee's plan which do not meet the environmental criteria must be approved by the NRC by a license amendment that follows NRC procedures for amendments, including applicable hearing rights . . . and the preparation of environmental assessments." Decommissioning Final Rule, 61 Fed. Reg. at 39,286. Therefore, our rules contemplate environmental analysis for any activities and impacts that have not previously been evaluated at a later stage of the decommissioning process.

<sup>133</sup> Petition at 53 (citations omitted).

<sup>134</sup> 96 F.3d 434 (9th Cir. 1996).

of plans when it has a mandatory obligation to review those plans renders its review a major federal action.<sup>135</sup> But in *Ramsey*, the failure of the agency to take action meant that the government entity's plan in that case attained the force of law.<sup>136</sup> By contrast, the fact that the Staff did not find Entergy's PSDAR deficient does not result in the PSDAR attaining the force of law.<sup>137</sup> Rather, as the Staff observes, the PSDAR does not permit Entergy to perform any task it could not already perform under 10 C.F.R. § 50.59.<sup>138</sup>

Petitioners separately argue that the Staff has NEPA responsibilities when it comes to its policing of Entergy's 30-day notices prior to withdrawals from the decommissioning trust fund.<sup>139</sup> We disagree. An agency's NEPA obligations are triggered by agency action.<sup>140</sup> As Petitioners themselves state, "NEPA and applicable NRC regulations require environmental review before the *NRC acts* on matters affecting the quality of the human environment."<sup>141</sup> The 30-day notices do not involve NRC action; they merely serve to apprise the NRC of expenditures that the licensee intends to take.<sup>142</sup> The notice requirement imposes obligations on Entergy; it requires neither Staff action nor approval.<sup>143</sup> Accordingly, the requirement that Entergy submit notices of proposed disbursements to the Staff does not warrant separate NEPA review.<sup>144</sup>

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<sup>135</sup> Petition at 53.

<sup>136</sup> *Ramsey*, 96 F.3d at 445; see Staff Answer at 59.

<sup>137</sup> Staff Answer at 59 (citing *Anglers Conservation Network v. Pritzker*, 70 F. Supp. 3d 427, 442 (D.C. Cir. 2014)). And we find persuasive the Staff's argument that Entergy submitted its PSDAR "pursuant to regulatory provisions and in the rulemaking for those provisions, NEPA was considered and applied." *Id.* at 59 n.279.

<sup>138</sup> Decommissioning Final Rule, 61 Fed. Reg. at 39,279; see Staff Answer at 59.

<sup>139</sup> Petition at 53.

<sup>140</sup> See *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 349 (1989) ("The statutory requirement that a federal agency *contemplating a major action* prepare . . . an environmental impact statement serves NEPA's action-forcing purpose . . ." (emphasis added) (internal quotations and citations omitted)).

<sup>141</sup> Petition at 50 (emphasis added) (citing 10 C.F.R. § 51.20 and 42 U.S.C. § 4332).

<sup>142</sup> As discussed at length above, the Final Decommissioning Rule does not contemplate Staff approval of site-specific decommissioning expenditures that are bounded by prior environmental analysis. Final Decommissioning Rule, 61 Fed. Reg. at 39,286.

<sup>143</sup> See License at 7.

<sup>144</sup> In their reply brief, Petitioners claim that the Staff "places undue reliance on past environmental reviews . . . that presupposed that decommissioning [would be] accomplished with adequate funding from a decommissioning trust fund that had not been depleted by way of exemptions allowing the fund to be used for non-decommissioning expenses." Petitioners' Reply at 17. However, as noted above, the regulations applicable to Vermont Yankee after the exemptions provide reasonable assurance that adequate funds remain to complete decommissioning at the site. Therefore, we see no error in continuing to rely on previous environmental analyses, such as the Decommissioning GEIS.

### 3. *The Staff's Application of a Categorical Exclusion to Entergy's Exemption Request*

Petitioners challenge the Staff's determination that issuance of the exemption to Entergy allowing use of the decommissioning trust fund for spent fuel management was eligible for a categorical exclusion, under 10 C.F.R. § 51.22(c)(25). They argue that the NRC is required to conduct a NEPA analysis in conjunction with the exemption request.<sup>145</sup> First, Petitioners assert that the Staff should have performed a cumulative impacts analysis when determining that the exemption's issuance was eligible for a categorical exclusion.<sup>146</sup> Second, they claim that Staff's analysis supporting the categorical exclusion "consisted merely of a recitation of the factors listed in 10 C.F.R. § 51.22(b) and 10 C.F.R. § 51.22(c)(25)."<sup>147</sup>

In response, Entergy disputes Petitioners' argument that "exemption requests . . . constitute 'major federal actions' within the meaning of NEPA."<sup>148</sup> Regarding the exemption itself, the Staff contends that Petitioners' arguments constitute an impermissible collateral challenge to our regulations governing categorical exclusions.<sup>149</sup> And both Entergy and the Staff assert that the application of a categorical exclusion was proper and that no cumulative impacts analysis was necessary.<sup>150</sup> As discussed below, on this issue we agree with Petitioners and direct the Staff to analyze the environmental impacts associated with the exemption request.

Our regulations provide that certain types of exemptions may be categorically excluded from environmental review. Specifically, the regulation from which the exemption is sought must involve one of the following: recordkeeping requirements; reporting requirements; inspection or surveillance requirements; equipment servicing or maintenance scheduling requirements; education, training, experience, qualification, requalification, or other employment suitability requirements; safeguard plans, and materials control and accounting inventory scheduling requirements; scheduling requirements; surety, insurance, or indemnity requirements; or other requirements of an administrative, managerial, or organizational nature.<sup>151</sup>

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<sup>145</sup> Petition at 52, 56-58.

<sup>146</sup> *Id.* at 57-58.

<sup>147</sup> *Id.* at 57 (citing Exemption Issuance, 80 Fed. Reg. at 35,994).

<sup>148</sup> Entergy Answer at 40 (citing Petition at 52, 56-58).

<sup>149</sup> Staff Answer at 61.

<sup>150</sup> Entergy Answer at 41-42; Staff Answer at 65-66, 67-68.

<sup>151</sup> See 10 C.F.R. § 51.22(c)(25)(vi). In addition, an exemption may only be issued if none of the following is present: (1) significant hazards consideration; (2) significant change in the types

*(Continued)*

Petitioners claim that the Staff’s “analysis consisted merely of a recitation of the factors in 10 C.F.R. § 51.22(b) and 10 C.F.R. § 51.22(c)(25).”<sup>152</sup> We need not reach the adequacy of the Staff’s analysis of the factors set forth in 10 C.F.R. § 51.22(c)(25)(i)-(v), because the sixth factor is dispositive of the question. With respect to 10 C.F.R. § 51.22(c)(25)(vi), the Staff determined that “[t]he requirements for using decommissioning trust funds for decommissioning activities . . . involve . . . other requirements of an administrative, managerial, or organizational nature.”<sup>153</sup> Petitioners do not specifically question the Staff’s analysis with respect to 10 C.F.R. § 51.22(c)(25)(vi). As part of our discretionary review of the exemption, however, we reviewed the Staff’s reliance on the provision in this instance.

The terms “administrative,” “managerial,” and “organizational” are not defined in 10 C.F.R. Part 51. The regulatory history of section 51.22(c)(25) suggests that these terms refer to exemptions associated with ministerial changes rather than to exemptions with substantive effects, such as the one at issue here. The final rule promulgating the categorical exclusion for exemptions explained that “[f]or example, current ambiguities in the categorical exclusion regulations have created delays in licensee decisions when organizational name changes occur, because these decisions must await the completion of an [environmental assessment and finding of no significant impact].”<sup>154</sup> And the proposed rule stated that:

[f]or example, the majority of the [environmental assessments and findings of no significant impact] addressed exemption requests concerning the following administrative issues: (1) Revising the schedule for the biennial exercise requirements for nuclear reactors in 10 CFR Part 50, Appendix E, Sections IV.F.2.b and c; (2) Applying updated NRC-approved ASME Codes; and (3) Training and experience requirements in 10 CFR Part 35, “Medical Use of Byproduct Material.”<sup>155</sup>

In our view, use of decommissioning funds for matters other than reduction of residual radioactivity is not analogous to the examples provided above. The regulatory history of the categorical exclusion for exemptions does not support

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or significant increase in the amounts of any effluents that may be released offsite; (3) significant increase in individual or cumulative public or occupational radiation exposure; (4) significant construction impact; and (5) significant increase in the potential for or consequences from radiological accidents. *Id.* § 51.22(c)(25).

<sup>152</sup> Petition at 57 (citing Exemption Issuance, 80 Fed. Reg. at 35,994).

<sup>153</sup> Exemption Issuance, 80 Fed. Reg. at 35,994.

<sup>154</sup> Final Rule: “Categorical Exclusions from Environmental Review,” 75 Fed. Reg. 20,248, 20,250 (Apr. 19, 2010).

<sup>155</sup> Proposed Rule: “Categorical Exclusions from Environmental Review,” 73 Fed. Reg. 59,540, 59,545 (Oct. 9, 2008).

considering an exemption from a substantive requirement an “administrative, managerial, or organizational matter,” particularly where, as here, the Staff provides insufficient explanation for its conclusion. And the regulatory requirement is substantive in nature; it is intended to provide reasonable assurance that sufficient funds will be available for radiological decommissioning. For these reasons, we find that the requirement in section 50.82(a)(8)(i)(A) as applied in this instance is not administrative, managerial, or organizational in nature.

In sum, the Staff has not provided adequate support for its finding regarding 10 C.F.R. § 51.22(c)(25)(vi). Noting that the Staff has conducted environmental assessments for several exemptions of this type at other facilities,<sup>156</sup> we direct the Staff to conduct an environmental assessment to examine the environmental impacts, if any, associated with the exemption.<sup>157</sup> We deny Petitioners’ remaining requests for further environmental review.<sup>158</sup>

### III. CONCLUSION

For the foregoing reasons, we *direct* the Staff to analyze the environmental effects of the exemption request. We *deny* Petitioners’ remaining requests for relief. As discussed above, Petitioners have not shown that they are entitled to a hearing under the Atomic Energy Act. Further, we decline to grant a discretionary hearing in this matter; we have reviewed Petitioners’ claims as discussed in this decision and *decline to undertake* the other actions that Petitioners seek here. Petitioners raise challenges to oversight matters that are concerned with Entergy’s compliance with the terms of its license. As discussed above, Petitioners’ recourse in these circumstances is to seek enforcement action pursuant to 10 C.F.R. § 2.206 as discussed herein.<sup>159</sup>

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<sup>156</sup> See, e.g., Duke Energy Florida, Inc.; Crystal River Unit 3 Nuclear Generating Plant, 80 Fed. Reg. 3662 (Jan. 23, 2015) (Crystal River Environmental Assessment); Southern California Edison; San Onofre Nuclear Generating Station, Units 2 and 3, 79 Fed. Reg. 42,837 (July 23, 2014); Environmental Assessment and Finding of No Significant Impact; Final Issuance: Dominion Energy Kewaunee; Kewaunee Power Station, 79 Fed. Reg. 25,156 (May 2, 2014).

<sup>157</sup> We expect that the Staff will undertake the environmental analysis promptly, including considering whether “public participation [is] deemed practicable or appropriate with respect to the challenged exemption.” See *Brodsky v. NRC*, 704 F.3d 113, 122 (2d Cir. 2013). If the Staff’s review results in a determination of significant impacts, the Staff should promptly notify us and, at that time, we may reconsider whether the exemption should be stayed or vacated.

<sup>158</sup> The Staff has undertaken a comprehensive rulemaking on the decommissioning process. Recognizing that Petitioners seek relief now, we nonetheless encourage Petitioners to participate in that rulemaking to the extent that their concerns extend to general plant decommissioning efforts. See *generally* Advance Notice of Proposed Rulemaking, 80 Fed. Reg. at 72,358.

<sup>159</sup> Other than the issues we have expressly resolved today, nothing in our decision should be understood to prejudice the Staff’s resolution of any such enforcement action.

IT IS SO ORDERED.

For the Commission

ANNETTE L. VIETTI-COOK  
Secretary of the Commission

Dated at Rockville, Maryland,  
this 27th day of October 2016.

**APPENDIX**

**Entergy Nuclear Vermont Yankee, LLC and Entergy  
Nuclear Operations, Inc.**

**(Vermont Yankee Nuclear Power Station)**

**Docket No. 50-271**

**Renewed Facility Operating License; Renewed  
Operating License No. DPR-28**

- J. License Transfer Conditions
  - a. Decommissioning Trust
    - (i) The decommissioning trust agreement must be in a form acceptable to the NRC.
    - (ii) With respect to the decommissioning trust funds, investments in the securities or other obligations of Entergy Corporation and its affiliates, successors, or assigns shall be prohibited. In addition, except for investments tied to market indexes or other non-nuclear-sector mutual funds, investments in any entity owning one or more nuclear power plants are prohibited.
    - (iii) The decommissioning trust agreement must provide that no disbursements or payments from the trust, other than for ordinary administrative expenses, shall be made by the trustee until the trustee has first given the NRC 30 days prior written notice of payment. The decommissioning trust agreement shall further contain a provision that no disbursements or payments from the trust shall be made if the trustee receives prior written notice of objection from the Director of the Office of Nuclear Reactor Regulation.
    - (iv) The decommissioning trust agreement must provide that the agreement cannot be amended in any material respect without 30 days prior written notification to the Director of the Office of Nuclear Reactor Regulation.
    - (v) The appropriate section of the decommissioning trust agreement shall state that the trustee, investment advisor, or anyone else directing the investments made in the trust shall adhere to a "prudent investor" standard, as specified in 18 CFR 35.32(a)(3) of the Federal Energy Regulatory Commission's regulations.

### Commissioner Svinicki, Dissenting in Part

I fully join the majority position that the Petitioners have not provided a sufficient basis to find that the NRC unreasonably granted Entergy's exemption request. I dissent on the limited question of whether the Petitioners sufficiently supported their NEPA claim. I find that they have not. As a result, I would uphold the Staff's reliance on the categorical exclusion to satisfy NEPA.

Even when we have considered petitions not contemplated by our regulations, such as the instant one, we have still applied our normal rules for adjudication.<sup>1</sup> One such longstanding rule is our requirement that petitioners must raise specific challenges, both to fairly notify the other parties of the claims against them and to ensure that agency adjudications remain focused.<sup>2</sup> In this case, the Petition only asserted that the Staff's categorical exclusion analysis "consisted merely of a recitation of the factors listed," which falls far short of meeting our stringent pleading requirements.<sup>3</sup> The Petition does not challenge the Staff's analysis of any specific factor, let alone demonstrate why that analysis is lacking. Moreover, contrary to Petitioners' assertions, the Staff did not only recite the relevant factors but in fact explained why the exemption met each factor for a categorical exclusion in 10 C.F.R. § 51.22(c)(25)(vi).<sup>4</sup>

While the Petitioners' reply brief may have provided additional detail and arguments, such efforts to rehabilitate an unsupported contention also contravene our longstanding procedural rules.<sup>5</sup> Moreover, even when given full consideration, the reply brief does not contain sufficient information to show that the categorical exclusion is inapplicable. Petitioners argue,

Staff is incorrect in claiming that the exemption it granted Entergy was from "an administrative requirement that does not affect the environment." It is more than just "administrative" to approve the use of hundreds of millions of dollars that would otherwise be reserved for removing radiological contamination from a nuclear site.<sup>6</sup>

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<sup>1</sup> See generally *Union Electric Co.* (Callaway Plant, Unit 2), CLI-11-5, 74 NRC 141 (2011).

<sup>2</sup> 10 C.F.R. § 2.309(f); *USEC Inc.* (American Centrifuge Plant), CLI-06-10, 63 NRC 451, 455-57, 472 (2006).

<sup>3</sup> Petition at 57.

<sup>4</sup> Exemption Issuance, 80 Fed. Reg. at 35,994. While the Staff's explanation for why the exemption met each factor is concise, the Staff's analysis is sufficient, particularly when read in context of the complete document, which explains why granting the exemption will not jeopardize Entergy's ability to decommission the Vermont Yankee site. *Id.*

<sup>5</sup> *Louisiana Energy Services, L.P.* (National Enrichment Facility), CLI-04-25, 60 NRC 223, 225 (2004).

<sup>6</sup> Petitioners' Reply at 18 (quoting Staff Answer at 66).

But Petitioners' argument rests on the same error as the rest of their pleading; in granting the exemption, the Staff confirmed that adequate funding will be available to decommission Vermont Yankee and the Petitioners have not demonstrated any error in this conclusion. As a result, Petitioners have also failed to show how the exemption, which simply pertains to how Entergy will fund ongoing activities at Vermont Yankee, would have an impact on the environment or constitutes anything beyond administrative.

Finally, my colleagues note that the Staff prepared environmental assessments, as opposed to relying on a categorical exclusion, for similar decommissioning exemption requests.<sup>7</sup> But, the analyses in those documents are almost identical to the analysis the Staff provided in support of the categorical exclusion for Vermont Yankee. For example, in the most recent environmental assessment, the Staff noted, "[t]he proposed action involves exemptions from requirements that are of a financial or administrative nature and that do not have an impact on the environment."<sup>8</sup> The Staff justified this conclusion by explaining that because the agency's other regulations would provide a reasonable assurance that the decommissioning fund would be sufficient, "[t]here is no decrease in safety associated with the use of the Trust to fund activities associated with irradiated fuel management."<sup>9</sup>

For Vermont Yankee, the Staff's analysis of the categorical exclusion concluded that the exemption request met the requirements for a categorical exclusion because it involved "recordkeeping requirements, reporting requirements, or other requirements of an administrative, managerial, or organizational nature."<sup>10</sup> This conclusion is supported by the earlier discussion of the exemption request that determined that in light of the remaining regulations, the agency has assurance that adequate funds would be available to decommission Vermont Yankee.<sup>11</sup> Consequently, requiring the Staff to publish a new NEPA document that will simply reiterate the discussion in the earlier one strikes me as a needless exercise in formalism.

For the foregoing reasons, I respectfully dissent from my colleagues' decision to direct the Staff to prepare a new environmental analysis in this case but join them in the remainder of the decision.

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<sup>7</sup> *E.g.*, Crystal River Environmental Assessment, 80 Fed. Reg. at 3662.

<sup>8</sup> *Id.* at 3663.

<sup>9</sup> *Id.*

<sup>10</sup> Exemption Issuance, 80 Fed. Reg. at 35,994.

<sup>11</sup> *Id.* at 35,993-94.

### **Commissioner Baran, Concurring in Part and Dissenting in Part**

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

I respectfully dissent from Sections II.A and II.B of the decision. I would vacate the decommissioning trust fund exemption in this case and remand Entergy's exemption request to the Staff for reconsideration as a rule using a public notice and comment process. However, I join Section I of the majority decision and, recognizing that the Commission has allowed the exemption to remain in effect, I also join Sections II.C and II.D of the Commission decision regarding Vermont's arguments on 30-day notices and the need to prepare an environmental assessment.

In prior cases, the Commission has consistently held that, although NRC's regulations authorize exemptions, "we consider an exemption to be an extraordinary equitable remedy to be used only sparingly."<sup>1</sup> In *Honeywell*, the Commission explained:

The reason for this high standard is simple. Every NRC regulation has gone through the rulemaking process, including public notice-and-comment, and its underlying rationale has been explained in our Statements of Considerations . . . . Our exemption regulations are in place to provide equitable relief only when supported by compelling reasons — they are not intended to serve as a vehicle for challenging the fundamental basis for the rule itself.<sup>2</sup>

The Staff has granted two basic types of exemptions to decommissioning plants. Most exemptions are from regulatory requirements written to apply to operating reactors. Broadly speaking (and without opining on the merits of any particular exemption), the special circumstances justifying such exemptions are that the plant has shut down and many of the requirements for operating plants are unnecessary for or ill-suited to decommissioning plants.

The exemption in this case is different. The Staff granted Entergy an exemption from the decommissioning trust fund requirements in order to allow Entergy to use decommissioning funds for spent fuel management expenses — a nondecommissioning purpose. The Commission promulgated the applicable regulation specifically for decommissioning plants like Vermont Yankee. Section 50.82(a)(8)(i)(A) explicitly limits how a licensee may spend the money in a decommissioning trust fund. In promulgating the decommissioning rule, the Commission established the requirement to use decommissioning funds for only

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<sup>1</sup> See, e.g., *Honeywell International, Inc.* (Metropolis Works Uranium Conversion Facility), CLI-13-1, 77 NRC 1, 9 (2013) (internal quotation marks omitted) (citing, *inter alia*, *Washington Public Power Supply System* (WPPSS Nuclear Project Nos. 3 and 5), CLI-77-11, 5 NRC 719, 723 (1977)).

<sup>2</sup> *Id.*

decommissioning activities to ensure that the fund would be adequate to complete the decommissioning tasks necessary to protect public health and safety.<sup>3</sup>

There are no special circumstances here warranting an exemption. The Staff points to a cash flow analysis to conclude that there is more money in the Vermont Yankee decommissioning trust fund now than is required by the formula in our regulations. But there is nothing unusual about that. This is the exact situation for which the rule was written. Our regulations require a minimum amount of funds in the account in given years to provide assurance that adequate funds will be available to eventually decommission the site. Every licensee complying with this requirement will necessarily have an amount equal to or greater than the minimum amount required in any given year. In fact, the regulations explicitly reference “an amount which may be more, but not less, than the amount” required by the formula established in the regulation.<sup>4</sup> And the amount in the account today is far less than will ultimately be required to complete decommissioning.

The Staff has granted exemptions from NRC’s decommissioning trust fund regulation for five different decommissioning power plants — every power plant licensee that has requested this exemption — based on nearly identical analyses.<sup>5</sup> While there is no limit on the precise number of exemptions of a certain type that can be issued, the Commission has previously recognized that the agency should not erode a rule by the overuse of exemptions.<sup>6</sup>

Here, the Staff has effectively repealed a Commission-approved rule promulgated in accordance with the Administrative Procedure Act (APA) and replaced it with a new Staff-generated rule without following the APA’s requirements for public notice and an opportunity for comment and without Commission approval. Because the Staff has granted every decommissioning trust fund ex-

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<sup>3</sup> Final Rule: “Decommissioning of Nuclear Power Reactors,” 61 Fed. Reg. 39,278, 39,289 (July 29, 1996) (Decommissioning Final Rule).

<sup>4</sup> 10 C.F.R. § 50.75(b)(1).

<sup>5</sup> See Exemption Issuance, 80 Fed. Reg. at 35,992; Duke Energy Florida, Inc.; Crystal River Unit 3 Nuclear Generating Plant, 80 Fed. Reg. 5795 (Feb. 3, 2015) (Crystal River Exemption Issuance); Southern California Edison Company; San Onofre Nuclear Generating Station, Units 2 and 3, 79 Fed. Reg. 55,019 (Sept. 14, 2014) (SONGS Exemption Issuance); Zion Solutions, LLC; Zion Nuclear Power Station, Units 1 and 2; Exemption from Certain Requirements, 79 Fed. Reg. 44,213 (July 30, 2014); License Exemption Request for Dominion Energy Kewaunee, Inc., 79 Fed. Reg. 30,900 (May 29, 2014) (Kewaunee Exemption Issuance).

<sup>6</sup> For example, when the Commission promulgated the exemption provisions in section 50.12, it stated: “the Commission will exercise its discretion to limit exemptions in any particular area if the ‘exceptions’ to the rule threaten to erode the rule itself.” Final Rule: “Specific Exemptions; Clarification of Standards,” 50 Fed. Reg. 50,764, 50,765 (Dec. 12, 1985).

emption requested on nearly identical bases, I conclude that the Staff's action is a *de facto* rulemaking that triggers the APA's rulemaking requirements.<sup>7</sup>

Consequently, I would vacate the exemption and remand it to the Staff for consideration as a rule.<sup>8</sup> One option would be for the Staff to use a rule of particular applicability when considering the exemption. As stated in the Attorney General's manual on the APA, the term "rule" in the APA "includes agency statements not only of general applicability but also those of particular applicability applying either to a class or to a single person."<sup>9</sup> I would direct the Staff to publish rules relating to decommissioning trust funds in the *Federal Register*. Further, I would direct the Staff to consider future requests for exemptions from the decommissioning trust fund requirements as rules until the broad decommissioning power reactor rulemaking is complete. This approach would ensure that the NRC is complying with the APA and in turn allow for greater public participation in the decommissioning process.

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<sup>7</sup> As the D.C. Circuit explained in *Environmental Defense Fund, Inc. v. Gorsuch*, "Scrutiny of a claimed exemption should be exacting where an agency seeks . . .] to undo all it accomplished through its rulemaking without giving all parties an opportunity to comment on the wisdom of repeal." *Environmental Defense Fund, Inc. v. Gorsuch*, 713 F.2d 802, 816-17 (D.C. Cir. 1983) (internal quotation marks omitted).

<sup>8</sup> Entergy also requested and the Staff granted an exemption from the 30-day notification requirement of section 50.75(h)(1)(iv) for intended disbursements from the decommissioning trust fund. Exemption Issuance, 80 Fed. Reg. at 35,992. Entergy withdrew the license amendment request that would have subjected it to 10 C.F.R. § 50.75(h)(1)(iv), and the license condition requiring such notices is still in effect. Therefore, this exemption does not have a practical effect for Vermont Yankee. However, the Staff granted exemptions from the 30-day notification requirements of section 50.75(h)(1)(iv) and (h)(2) to three other decommissioning reactor licensees on the basis of nearly identical analyses. See *Crystal River Exemption Issuance*, 80 Fed. Reg. at 5795; *SONGS Exemption Issuance*, 79 Fed. Reg. at 55,019; *Kewaunee Exemption Issuance*, 79 Fed. Reg. at 30,900. The Commission specifically promulgated the requirements of section 50.75(h) for decommissioning plants. Therefore, this type of exemption also falls into the category of exemptions that should be addressed through notice and comment rulemaking.

<sup>9</sup> Attorney General's Manual on the Administrative Procedure Act (1947) at 13 (citation omitted).



UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

**ATOMIC SAFETY AND LICENSING BOARD**

**Before Administrative Judges:**

**Paul S. Ryerson, Chairman**  
**Dr. Gary S. Arnold**  
**Nicholas G. Trikouros**

**In the Matter of**

**Docket Nos. 50-259**  
**50-260**  
**50-296-LA**  
**(ASLBP No. 16-948-03-LA-BD01)**

**TENNESSEE VALLEY AUTHORITY**  
**(Browns Ferry Nuclear Plant,**  
**Units 1, 2, and 3)**

**November 2, 2016**

In this Order, the Atomic Safety and Licensing Board concluded that the Petitioner, Bellefonte Efficiency & Sustainability Team/Mothers Against Tennessee River Radiation, had standing to intervene, but had not pled an admissible contention regarding the license amendment request of the Tennessee Valley Authority for an extended power uprate at Browns Ferry Nuclear Power Plant, Units 1, 2, and 3. Because Petitioner's proffered contentions impermissibly challenged NRC regulations, the Board denied the request for a hearing and dismissed the Petition.

**RULES OF PRACTICE: GENERAL REQUIREMENTS TO OBTAIN  
A HEARING**

To obtain a hearing, a petitioner must establish standing and propose at least one admissible contention.

**RULES OF PRACTICE: STANDING (REPRESENTATIONAL)**

An organization may establish representational standing by showing that at least one member has standing to intervene in their own right and has authorized the organization to request a hearing on their behalf.

**RULES OF PRACTICE: STANDING (PROXIMITY PRESUMPTION)**

In license amendment proceedings, a petitioner may claim standing based upon a residence or visits near the plant, if the proposed action quite obviously entails an increased potential for offsite consequences.

**RULES OF PRACTICE: STANDING (PROXIMITY PRESUMPTION)**

Extended power uprate proceedings involve an obvious potential for offsite consequences.

**RULES OF PRACTICE: CHALLENGE TO COMMISSION REGULATIONS**

Pursuant to 10 C.F.R. § 2.335, “no rule or regulation of the Commission, or any provision thereof, concerning the licensing of production and utilization facilities . . . is subject to attack by way of discovery, proof, argument, or other means in any adjudicatory proceeding subject to [10 C.F.R. Part 2 procedural rules].”

**RULES OF PRACTICE: WAIVER OF RULES OR REGULATIONS**

A petitioner may not challenge a regulatory requirement, unless it petitions for a waiver. To obtain a waiver, a petitioner must demonstrate special circumstances.

**RULES OF PRACTICE: RULEMAKING (EFFECT ON ADJUDICATION)**

Generally, licensing boards should not accept in individual license proceedings contentions that are the subject of rulemaking by the Commission.

**RULES OF PRACTICE: CONTENTIONS (CHALLENGE TO LICENSE AMENDMENT APPLICATION)**

Proffered contentions are inadmissible if the petition fails to demonstrate

a genuine dispute with the license amendment application, as required by 10 C.F.R. § 2.309(f)(1)(vi).

**RULES OF PRACTICE: REPLY (NEW ARGUMENTS)**

Generally, licensing boards do not consider arguments that are raised for the first time in a reply.

**RULES OF PRACTICE: STAY OF LICENSE AMENDMENT PROCEEDING**

The Commission has authority to stay a license amendment proceeding in light of a pending rulemaking.

**ADMINISTRATIVE PROCEDURE ACT: UNREASONABLE DELAY**

A licensing board does not have the authority to review a claim of unreasonable delay regarding a petition for rulemaking that is before the Commission. Any such challenge should be raised directly with the Commission, or possibly before the courts.

**ORDER**

**(Ruling on Petition to Intervene and Request for a Hearing)**

Before the Board is a Petition by Bellefonte Efficiency & Sustainability Team/Mothers Against Tennessee River Radiation (Petitioner).<sup>1</sup> Petitioner seeks a hearing on a license amendment request submitted by the Tennessee Valley Authority (TVA) for an extended power uprate at Browns Ferry Nuclear Power Plant, Units 1, 2, and 3.

Because Petitioner's proffered contentions impermissibly challenge NRC regulations, we deny the request for a hearing and dismiss the Petition.

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<sup>1</sup> Bellefonte Efficiency & Sustainability Team/Mothers Against Tennessee River Radiation's Hearing Request and Petition to Intervene Regarding Tennessee Valley Authority's License Amendment Request for Extended Power Uprates for Browns Ferry Nuclear Plant Units 1, 2, and 3 (Sept. 9, 2016) [hereinafter Petition]. This Board was established to preside over the proceeding on September 20, 2016. Establishment of Atomic Safety and Licensing Board, 81 Fed. Reg. 66,301 (Sept. 27, 2016).

## I. BACKGROUND

On September 21, 2015, TVA submitted to the NRC a license amendment request for an extended power uprate.<sup>2</sup> In response to a *Federal Register* notice of an opportunity to request a hearing,<sup>3</sup> Petitioner timely filed its *pro se* Petition.<sup>4</sup> The NRC Staff and TVA oppose.<sup>5</sup>

To increase electricity generation at Browns Ferry, the proposed power uprate would increase the authorized maximum steady-state reactor core power level for each unit from 3458 to 3952 megawatts thermal.<sup>6</sup> AREVA, on behalf of TVA, performed modeling to establish the safety of the extended power uprate during a loss of coolant accident.<sup>7</sup> NRC regulations require that, when performing such modeling, certain variables “shall be calculated using the Baker-Just equation.”<sup>8</sup> It is not disputed that TVA performed such calculations using the Baker-Just equation.

Rather, Petitioner proffers three contentions that, directly or indirectly, challenge the adequacy of the Baker-Just equation itself.<sup>9</sup> First, Petitioner claims TVA’s modeling in the loss of coolant accident analysis is “scientifically indefensible” because the Baker-Just calculation required by the NRC’s regulations underpredicts the rate of heat generation, hydrogen generation, and zirconium

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<sup>2</sup> 81 Fed. Reg. 43,661, 43,666 (July 5, 2016).

<sup>3</sup> *Id.* at 43,662.

<sup>4</sup> The deadline to file a petition was extended by the Secretary of the Commission. Secretary of the Commission Order (Granting Extension Request) (Sept. 6, 2016) (unpublished).

<sup>5</sup> NRC Staff Answer to BEST/MATRR Petition to Intervene and Hearing Request (Oct. 4, 2016) [hereinafter NRC Staff Answer]; Tennessee Valley Authority’s Answer Opposing Petition for Leave to Intervene and Request for Hearing (Oct. 4, 2016) [hereinafter TVA Answer]. Petitioner replied on October 14, 2016. Reply of the Bellefonte Efficiency & Sustainability Team/Mothers Against Tennessee River Radiation to Answers of the Nuclear Regulatory Commission Staff and Tennessee Valley Authority on the License Amendment Request for Extended Power Uprates for Browns Ferry Nuclear Plant Units 1, 2, and 3 (Oct. 14, 2016) [hereinafter Reply]. Pursuant to 10 C.F.R. § 2.309(i)(2), a reply must be filed within 7 days of any answer. Apparently misreading our regulations, *see* 10 C.F.R. § 2.306(a), Petitioner filed its Reply within 7 business days, rather than within 7 calendar days. Absent a motion to strike, and in light of the NRC’s established practice of “treating *pro se* litigants more leniently than litigants with counsel,” *Entergy Nuclear Vermont Yankee, LLC* (Vermont Yankee Nuclear Power Station), CLI-10-17, 72 NRC 1, 45 n.246 (2010), we nevertheless consider the arguments made in Petitioner’s Reply. *But see Yankee Atomic Electric Co.* (Yankee Nuclear Power Station), CLI-98-21, 48 NRC 185, 201 (1998) (stating that *pro se* parties are “still expected to comply with our basic procedural rules — especially ones as simple to understand as those establishing filing deadlines”).

<sup>6</sup> *See* 81 Fed. Reg. at 43,666.

<sup>7</sup> ANP-3377NP, Browns Ferry Units 1, 2, and 3 LOCA Break Spectrum Analysis for ATRIUM 10XM Fuel (EPU), Rev. 3 (Aug. 31, 2015), at 1-1 (ADAMS Accession No. ML15282A184).

<sup>8</sup> 10 C.F.R. Part 50, App. K, ¶I.A.5.

<sup>9</sup> Petition at 29-30.

fuel-cladding oxidation during a loss of coolant accident.<sup>10</sup> Second, because it asserts the Baker-Just equation is inadequate, Petitioner argues that TVA did not “scientifically demonstrate” that the peak cladding temperature will not exceed regulatory limits<sup>11</sup> during a loss of coolant accident after the extended power uprate.<sup>12</sup> Third, Petitioner claims that, as a result of this deficiency, its members and the public are threatened by the proposed power uprate.<sup>13</sup>

Petitioner’s contentions all depend on its fundamental claim that the calculations required by paragraph I.A.5 of Appendix K to 10 C.F.R. Part 50 (Appendix K) are “non-conservative” and “inadequate” for extended power uprate modeling.<sup>14</sup> Although Appendix K requires the use of the Baker-Just equation to calculate the rate of energy release, hydrogen generation, and fuel cladding oxidation during a loss of coolant accident,<sup>15</sup> Petitioner asserts that analysis using the Baker-Just equation is inadequate for the purposes for which the Commission has required it.<sup>16</sup>

Petitioner provides a lengthy historical account of zirconium oxidation as relevant to Appendix K analysis and its alleged inadequacies.<sup>17</sup> Petitioner describes the development of the Baker-Just equation, arguing that it is not applicable to loss of coolant accidents and is inadequate for use in extended power uprate modeling.<sup>18</sup> Petitioner then summarizes and in essence attempts to relitigate a 45-year-old challenge to the Baker-Just equation raised during an Indian Point Unit 2 licensing proceeding, including a new allegation that a Westinghouse witness committed perjury.<sup>19</sup> Finally, Petitioner describes a pending petition for rulemaking before the Commission (submitted by Mark Leyse, the same individual whose declaration supports its Petition)<sup>20</sup> that challenges the adequacy of the Baker-Just equation for modeling zirconium oxidation during loss of coolant accidents.<sup>21</sup>

Petitioner claims that the NRC knows the inadequacies of the Baker-Just

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<sup>10</sup> *See id.* at 7, 29.

<sup>11</sup> 10 C.F.R. § 50.46(b)(1).

<sup>12</sup> *See* Petition at 30-31.

<sup>13</sup> *See id.* at 30.

<sup>14</sup> *See, e.g., id.* at 7.

<sup>15</sup> 10 C.F.R. Part 50, App. K, ¶I.A.5.

<sup>16</sup> *See* Petition at 7, 28-29.

<sup>17</sup> *Id.* at 7-28.

<sup>18</sup> *See id.* at 7-10.

<sup>19</sup> *Id.* at 10-23.

<sup>20</sup> Petition for Rulemaking by Mark Leyse, PRM-50-93 (Nov. 17, 2009) (Adams Accession No. ML093290250).

<sup>21</sup> Petition at 23-28.

equation, but has not adopted more conservative regulatory requirements.<sup>22</sup> Petitioner contends that, as a result, inadequate and nonconservative modeling is used to justify the Browns Ferry extended power uprate.<sup>23</sup> Petitioner does not claim, however, that TVA failed in any way to properly perform the Baker-Just calculation required by Appendix K.

## II. DISCUSSION

To obtain a hearing, a petitioner must establish standing and propose at least one admissible contention.<sup>24</sup>

### A. Standing

An organization may establish representational standing by showing that at least one member has standing to intervene in their own right and has authorized the organization to request a hearing on their behalf.<sup>25</sup> Petitioner submitted affidavits of ten members showing that they live or own property within 50 miles of Browns Ferry and have authorized Petitioner to represent their interests in this proceeding.<sup>26</sup> No party opposes Petitioner's claim to standing.<sup>27</sup> We conclude that Petitioner has demonstrated standing.

### B. Contention Admissibility

Petitioner's contentions are inadmissible for three reasons.

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<sup>22</sup> See *id.* at 9-28, 30-33.

<sup>23</sup> See *id.* at 28-29.

<sup>24</sup> 10 C.F.R. § 2.309(a); see also *id.* § 2.309(d) (listing standing requirements); *id.* § 2.309(f)(1) (listing contention admissibility requirements).

<sup>25</sup> *Georgia Institute of Technology* (Georgia Tech Research Reactor, Atlanta, Georgia), CLI-95-12, 42 NRC 111, 115 (1995).

<sup>26</sup> Standing Declarations (Sept. 9, 2016). In license amendment proceedings, a petitioner may claim standing based upon a residence or visits near the plant, if the proposed action "quite 'obvious[ly]' entails an increased potential for offsite consequences." *Commonwealth Edison Co.* (Zion Nuclear Power Station, Units 1 and 2), CLI-99-4, 49 NRC 185, 191 (1999) (quoting *Florida Power & Light Co.* (St. Lucie Nuclear Power Plant, Units 1 and 2), CLI-89-21, 30 NRC 325, 329-30 (1989)). Extended power uprate proceedings involve an obvious potential for offsite consequences. *Florida Power & Light Co.* (St. Lucie Nuclear Power Plant, Unit 1), LBP-11-29, 74 NRC 612, 619 (2011); *PPL Susquehanna LLC* (Susquehanna Steam Electric Station, Units 1 and 2), LBP-07-10, 66 NRC 1, 18, *aff'd on other grounds*, CLI-07-25, 66 NRC 101 (2007); *Entergy Nuclear Vermont Yankee, LLC* (Vermont Yankee Nuclear Power Station), LBP-04-28, 60 NRC 548, 553 (2004).

<sup>27</sup> The NRC Staff agrees that representational standing exists, NRC Staff Answer at 4, and TVA does not address standing, see TVA Answer at 1-12.

*First*, pursuant to 10 C.F.R. § 2.335, “no rule or regulation of the Commission, or any provision thereof, concerning the licensing of production and utilization facilities . . . is subject to attack by way of discovery, proof, argument, or other means in any adjudicatory proceeding subject to [10 C.F.R. Part 2 procedural rules].”<sup>28</sup> Therefore, a petitioner may not challenge a regulatory requirement, unless it petitions for a waiver.<sup>29</sup>

The proffered contentions are all expressions of Petitioner’s fundamental challenge to Appendix K and its required use of the Baker-Just equation.<sup>30</sup> Therefore, they are inadmissible absent a waiver. Petitioner has not requested a waiver of the prohibition of 10 C.F.R. § 2.335, nor could it. To obtain a waiver, a petitioner must demonstrate “special circumstances.”<sup>31</sup> There are no special circumstances here. Petitioner’s challenge is a generic attack on a regulation of general applicability, not a challenge to its application in any unique circumstance.<sup>32</sup>

*Second*, even if Petitioner’s contentions did not impermissibly challenge an existing NRC regulation, the pendency before the Commission of Mr. Leyse’s rulemaking petition constitutes a separate and independent ground for rejecting them. The pending petition for rulemaking raises the very same issues that are addressed in the Petition before this Board and in Mr. Leyse’s accompanying declaration.<sup>33</sup> Generally, licensing boards should not accept in individual license proceedings contentions that are the subject of rulemaking by the Commission.<sup>34</sup>

*Third*, the proffered contentions are inadmissible because the Petition fails to demonstrate a genuine dispute with the license amendment application, as required by 10 C.F.R. § 2.309(f)(1)(vi). Petitioner does not allege that the extended power uprate modeling was not performed in accordance with regulatory requirements, or point to any other error in TVA’s application. Rather, Petitioner’s basis for its contentions is that TVA’s modeling applied an allegedly inadequate and nonconservative NRC regulatory requirement (that is, use of the Baker-Just equation), not that NRC regulations were evaded or misapplied.<sup>35</sup>

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<sup>28</sup> 10 C.F.R. § 2.335(a).

<sup>29</sup> *Id.* § 2.335(b).

<sup>30</sup> 10 C.F.R. Part 50, App. K, ¶ I.A.5.

<sup>31</sup> 10 C.F.R. § 2.335(b).

<sup>32</sup> See *Pacific Gas and Electric Co.* (Diablo Canyon Nuclear Power Plant, Units 1 and 2), CLI-15-21, 82 NRC 295, 302 (2015) (setting out four-factor test for special circumstances).

<sup>33</sup> See Petition at 32.

<sup>34</sup> See *Duke Energy Corp.* (Oconee Nuclear Station, Units 1, 2, and 3), CLI-99-11, 49 NRC 328, 345 (1999).

<sup>35</sup> Petitioner’s allegation that peak cladding temperature may exceed regulatory limits is based on its advocated modeling approach, not the current modeling requirements of Appendix K. See Petition at 31, 35.

### C. Stay Request

In its Reply, Petitioner alleges for the first time that the NRC has engaged in “bad faith” or “improper behavior” in connection with Mr. Leyse’s pending rulemaking petition.<sup>36</sup> Petitioner asserts that the nearly 7-year delay in resolving the rulemaking petition violates the Administrative Procedure Act (APA),<sup>37</sup> warranting a denial or stay of the extended power uprate license amendment.<sup>38</sup>

Generally, we do not consider arguments that are raised for the first time in a reply.<sup>39</sup> In any event, insofar as Petitioner claims unreasonable delay by the Commission, this Board cannot provide a remedy. The Commission — not this Board — has authority to stay a license amendment proceeding in light of pending rulemaking.<sup>40</sup> Nor does this Board have authority to review a claim of unreasonable delay regarding a petition for rulemaking that is before the Commission.<sup>41</sup> Any such challenge should be raised directly with the Commission, or possibly before the courts.<sup>42</sup>

### III. CONCLUSION

Although Petitioner has standing to intervene, it has not pled an admissible contention. Therefore, the Petition is *denied*. Petitioner may appeal this decision to the Commission, pursuant to 10 C.F.R. § 2.311, within 25 days of service of this Order.

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<sup>36</sup> Reply at 4.

<sup>37</sup> *Id.* at 2.

<sup>38</sup> *Id.* at 12.

<sup>39</sup> *Louisiana Energy Services, L.P.* (National Enrichment Facility), CLI-04-25, 60 NRC 223, 225 (2004).

<sup>40</sup> See 10 C.F.R. § 2.802(e); *Entergy Nuclear Vermont Yankee, LLC* (Vermont Yankee Nuclear Power Station), CLI-07-3, 65 NRC 13, 22 n.37 (2007).

<sup>41</sup> See APA, 5 U.S.C. § 706 (the “reviewing court” shall compel agency action unlawfully withheld or unreasonably delayed).

<sup>42</sup> See *In re Aiken County*, 725 F.3d 255, 267 (D.C. Cir. 2013); *Telecommunications Research & Action Center v. Federal Communications Commission*, 750 F.2d 70, 75-77 (D.C. Cir. 1984).

It is so ORDERED.

THE ATOMIC SAFETY AND  
LICENSING BOARD

Paul S. Ryerson, Chairman  
ADMINISTRATIVE JUDGE

Dr. Gary S. Arnold  
ADMINISTRATIVE JUDGE

Nicholas G. Trikouros  
ADMINISTRATIVE JUDGE

Rockville, Maryland  
November 2, 2016

UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

**ATOMIC SAFETY AND LICENSING BOARD**

**Before Administrative Judges:**

**William J. Froehlich, Chairman**  
**G. Paul Bollwerk, III**  
**Dr. Gary S. Arnold**

**In the Matter of**

**Docket Nos. 50-387**

**50-388**

**72-28**

**(ASLBP No. 16-949-01-LT-BD01)**

**SUSQUEHANNA NUCLEAR, LLC**  
**(Susquehanna Steam Electric Station,**  
**Units 1 and 2)**

**November 21, 2016**

In ruling on a *pro se* hearing petitioner's appeal contesting an NRC Staff decision denying the petitioner contention preparation access to sensitive, unclassified, nonsafeguards information (SUNSI) material submitted in licensee Susquehanna Nuclear, LLC's application for an indirect transfer of control of the 10 C.F.R. Part 50 operating licenses for Susquehanna Steam Electric Station, Units 1 and 2, the Licensing Board, while declining to reach the issue of whether the petitioner had demonstrated a reasonable basis for establishing standing in the license transfer proceeding, affirmed the Staff's determination that the petitioner failed to demonstrate a legitimate need for access to SUNSI.

**OPERATING LICENSE(S): TRANSFER OF CONTROL**

"Indirect transfers involve corporate restructuring or reorganizations which leave the licensee itself intact as a corporate entity . . ." *Kansas Gas and Electric Co.* (Wolf Creek Generating Station, Unit 1), CLI-99-19, 49 NRC 441,

459-60 n.14 (1999). “By contrast, a direct license transfer entails a change to operating and/or possession authority.” *Entergy Nuclear Operations, Inc.* (Palisades Nuclear Plant), CLI-08-19, 68 NRC 251, 255 n.3 (2008) (citing *AmerGen Energy Co., LLC* (Three Mile Island Nuclear Station, Unit 1), CLI-05-25, 62 NRC 572, 574 (2005)).

**RULES OF PRACTICE: PROPRIETARY INFORMATION  
(REQUESTING SUNSI FOR CONTENTION PREPARATION)**

A *Federal Register* notice of receipt of a license transfer application, which also affords the opportunity for any interested person to request a hearing on the application, indicates whether the application includes SUNSI and provides procedures for potential parties that may wish to request access to proprietary documents for contention preparation. The notice also instructs that a potential party seeking access to SUNSI must file a request within 10 days and that the request must include, *inter alia*:

1. “The name and address of the potential party and a description of the potential party’s particularized interest that could be harmed by the [licensing] action;” and
2. “[T]he requester’s basis for the need for the information in order to meaningfully participate in this adjudicatory proceeding. In particular, the request must explain why publicly available versions of the information requested would not be sufficient to provide the basis and specificity for a proffered contention.”

Susquehanna Nuclear, LLC; Susquehanna Steam Electric Station, Units 1 and 2; Consideration of Indirect License Transfer, 81 Fed. Reg. 68,462, 68,463-66 (Oct. 4, 2016).

The notice further states that the NRC Staff will grant access to SUNSI if it determines that (1) the request demonstrates “a reasonable basis to believe the petitioner is likely to establish standing” to intervene; and (2) “[t]he requestor has established a legitimate need for access to SUNSI.” *Id.* at 68,465. If the NRC Staff denies access, the notice indicates that a potential party could file an appeal within 5 days before the presiding officer designated for the license transfer proceeding or, if a presiding officer had not yet been appointed, before the Chief Administrative Judge. *Id.* at 68,466.

**RULES OF PRACTICE: PROPRIETARY INFORMATION  
(REQUESTING SUNSI FOR CONTENTION PREPARATION)**

In adjudicating an appeal from the NRC Staff’s denial of a petitioner’s re-

quest for access to SUNSI for contention preparation, a Licensing Board will consider whether the NRC Staff correctly applied the criteria established by the Commission in the hearing opportunity notice for the proceeding, namely (1) whether the SUNSI request demonstrates “a reasonable basis to believe the petitioner is likely to establish standing”; and (2) whether the SUNSI request demonstrates the proposed recipient has a “legitimate need” for SUNSI. *Id.* at 68,465.

**LICENSING BOARD(S): JURISDICTION (APPEAL FROM STAFF DENIAL OF SUNSI ACCESS REQUEST)**

A Licensing Board established to preside over a hearing petitioner’s appeal from an NRC Staff denial of access to SUNSI information does not have jurisdiction over the request for a hearing, which remains before the Commission. Accordingly, all concerns raised by a petitioner that do not pertain to the legality of the NRC Staff’s denial of petitioner’s request for access to SUNSI material would not be considered by the Board as they are beyond the scope of the Board’s authority.

**RULES OF PRACTICE: STANDARD OF REVIEW**

The Licensing Board’s standard of review in an appeal from an NRC Staff denial of a request for access to SUNSI is *de novo*. *South Texas Project Nuclear Operating Co.* (South Texas Project, Units 3 and 4), LBP-09-5, 69 NRC 303, 310 (2009).

**RULES OF PRACTICE: STANDING (PROXIMITY PRESUMPTION)**

The Commission has found proximity-based standing accrues in direct license transfer cases to individuals living within the distance that the petitioner has indicated he resides from the Susquehanna facility, i.e., 2 miles. *See Exelon Generation Co.* (Peach Bottom Atomic Power Station, Units 2 and 3), CLI-05-26, 62 NRC 577, 583 nn.28-30 (2005) (citing direct license transfer cases in which proximity standing was granted to individuals residing between 6.5 and 1 miles of a power reactor facility). Moreover, while the Commission to date has “never granted proximity-based standing to a petitioner in an indirect license transfer adjudication,” it also has not ruled out the possibility of such. *Palisades*, CLI-08-19, 68 NRC at 269. Rather, when pleaded, the Commission reviews the circumstances of the indirect license transfer. For example in *Palisades*, the Commission noted that the

proposed license transfer is an *indirect* one in that it does not involve transfer of either ownership or operating rights to the subject facilities. Nor does it entail any changes in the facilities themselves or in their operation. Given *these facts*, we can see no “obvious potential for offsite consequences” stemming from this indirect license transfer.

*Id.* (second emphasis added) (footnote omitted); *see also Three Mile Island, CLI-05-25, 62 NRC at 575; Northeast Nuclear Energy Co. (Millstone Nuclear Power Station, Units 1, 2, and 3), CLI-00-18, 52 NRC 129, 132-33 (2000)* (“The transfer application at issue here proposes no change in the Millstone licensees, no change in the Millstone facility, no change in its operation, no change in its personnel, and no change in its financing. It is far from obvious how NU’s corporate restructuring would affect Petitioners’ interests.”).

#### **RULES OF PRACTICE: PLEADING BY *PRO SE* INTERVENORS**

A *pro se* intervenor generally is given some leniency in pleading. *See, e.g., Entergy Nuclear Vermont Yankee, LLC (Vermont Yankee Nuclear Power Station), CLI-10-17, 72 NRC 1, 45 n.246 (2010)* (declining to reject argument on procedural grounds given practice of “treating *pro se* litigants more leniently than litigants with counsel”).

#### **RULES OF PRACTICE: STANDING (INJURY IN FACT)**

As would be the case regarding a petitioner’s need to submit an admissible contention to obtain a hearing, the fact that a petitioner’s showing regarding the “merits” of an access request is deficient does not mean that the petitioner lacks standing. Nor does a petitioner have to establish a link between the interests/injury it asserts establish its standing and the issues that it wishes to litigate relative to an application. *See Strata Energy, Inc. (Ross In Situ Recovery Uranium Project), LBP-12-3, 75 NRC 164, 190 n.28 (citing cases), aff’d, CLI-12-12, 75 NRC 603 (2012).*

#### **RULES OF PRACTICE: PROPRIETARY INFORMATION (SHOWING NECESSARY TO ACCESS SUNSI FOR CONTENTION PREPARATION)**

In an indirect transfer of control proceeding in which a petitioner questions the financial stability of the licensee’s parent companies, in seeking access to SUNSI the petitioner has not connected his concerns with any specificity to the redacted information relating to the licensee and explained how the redacted information would be of use to him. While the redacted attachments to the

application did not contain figures, the headings describing the redacted information are provided. Yet, the petitioner does not indicate how having the specific information set forth under these headings relative to licensee's operation of its reactor facility will aid his challenge regarding the financial status of the licensee's parent companies.

**RULES OF PRACTICE: PROPRIETARY INFORMATION  
(SHOWING NECESSARY TO ACCESS SUNSI FOR CONTENTION  
PREPARATION)**

The guidance provided for obtaining access to SUNSI also states that "the request must explain why publicly available versions of the information requested would not be sufficient to provide the bases and specificity for a proffered contention." 81 Fed. Reg. at 68,465. The petitioner's request failed to address this requirement.

**MEMORANDUM AND ORDER  
(Affirming Denial of Access to SUNSI)**

On October 11, 2016, Sabatini Monatesti filed a request for a hearing and petition for leave to intervene<sup>1</sup> in a Nuclear Regulatory Commission (NRC) proceeding concerning an application filed by Susquehanna Nuclear, LLC (Susquehanna Nuclear) for an indirect license transfer.<sup>2</sup> In conjunction with his request, Mr. Monatesti requested access to all sensitive, unclassified, nonsafeguards information (SUNSI) material in the License Transfer Application.<sup>3</sup> On October 20, 2016, the NRC Staff denied his request for access to SUNSI, concluding that he had failed to demonstrate a reasonable basis for standing to participate

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<sup>1</sup> Request for Hearing and Information — License Transfer (Oct. 11, 2016) (ADAMS Accession No. ML16312A431) [hereinafter Access Request]. Although Mr. Monatesti's filings are found in the agency's Electronic Hearing Docket, to avoid any uncertainty about which submissions are being referenced, we are including the ADAMS Accession Number for each, as well as the ADAMS Accession Numbers for Susquehanna Nuclear, LLC's application and the NRC Staff's pre-Board establishment submissions.

<sup>2</sup> See Letter from Timothy S. Rausch, President and Chief Nuclear Officer, Susquehanna Nuclear, to NRC Document Control Desk (June 29, 2016) (ADAMS Accession No. ML16181A415 (Susquehanna Steam Electric Station Request for Order Approving Indirect Transfer of Control PLA-7500 and enclosed Application for Order Approving Indirect Transfer of Control of Facility Operating License Nos. NPF-14 and NPF-22 with figs. 1, 2 & 3 and attachs. 1-2), ML16181A417 (attach. 3NP), ML16181A419 (attachs. 4NP & 5), ML16181A420 (attach. 6)) [hereinafter License Transfer Application].

<sup>3</sup> Access Request at 1.

in the license transfer proceeding and failed to establish a need for access to SUNSI.<sup>4</sup> On October 23, 2016, Mr. Monatesti appealed the NRC Staff's denial of his request for access to SUNSI.<sup>5</sup> We affirm the NRC Staff's denial.<sup>6</sup>

## I. BACKGROUND

On June 29, 2016, Susquehanna Nuclear filed an application in accordance with 10 C.F.R. §§ 50.80 and 72.50(a) for the NRC's consent to the indirect transfer<sup>7</sup> of control of Susquehanna Nuclear's interests in 10 C.F.R. Part 50 Facility Operating License Nos. NPF-14 and NPF-22 for Susquehanna Steam Electric Station, Units 1 and 2, as well as the general license for the independent spent fuel storage installation at the facility.<sup>8</sup> Currently, the ultimate parent company of Susquehanna Nuclear is Talen Energy Corporation (Talen). Approximately 65% of Talen's stock is held by public shareholders and 35% is held by portfolio companies ultimately controlled by Riverstone Holdings, LLC (Riverstone).<sup>9</sup> The License Transfer Application discusses a shareholder transaction in which Talen will become wholly owned by Riverstone, thus making Riverstone the new ultimate parent company of Susquehanna Nuclear.<sup>10</sup>

In accordance with the regulations and NRC Staff Guidance for license transfer applications,<sup>11</sup> Susquehanna Nuclear included in its License Transfer Application certain financial information.<sup>12</sup> Susquehanna Nuclear asserted, however, that Attachments 3 and 4 of the Application contained confidential commercial and financial information subject to protection from public disclosure under

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<sup>4</sup> Letter from Tanya Hood, Project Manager, NRC Office of Nuclear Reactor Regulation (NRR), to Sabatini Monatesti (Oct. 20, 2016) (ADAMS Accession No. ML16294A385) [hereinafter Denial Letter].

<sup>5</sup> E-Mail from Sabatini Monatesti to Tanya Hood, Project Manager, NRC NRR (Oct. 23, 2016) (ADAMS Accession No. ML16312A434) [hereinafter Appeal].

<sup>6</sup> Mr. Monatesti's request for a hearing and petition to intervene remain pending before the Commission.

<sup>7</sup> "Indirect transfers involve corporate restructuring or reorganizations which leave the licensee itself intact as a corporate entity . . ." *Kansas Gas and Electric Co.* (Wolf Creek Generating Station, Unit 1), CLI-99-19, 49 NRC 441, 459-60 n.14 (1999). "By contrast, a direct license transfer entails a change to operating and/or possession authority." *Entergy Nuclear Operations, Inc.* (Palisades Nuclear Plant), CLI-08-19, 68 NRC 251, 255 n.3 (2008) (citing *AmerGen Energy Co., LLC* (Three Mile Island Nuclear Station, Unit 1), CLI-05-25, 62 NRC 572, 574 (2005)).

<sup>8</sup> License Transfer Application at 1.

<sup>9</sup> See *id.* encl., fig. 1.

<sup>10</sup> See *id.* encl. at 1-2.

<sup>11</sup> See *infra* Section III.B.

<sup>12</sup> See, e.g., License Transfer Application, encl. at 11-16.

10 C.F.R. § 2.390.<sup>13</sup> The NRC Staff agreed and made only the nonproprietary, redacted versions of these documents publicly available.<sup>14</sup>

On October 4, 2016, a notice was published in the *Federal Register* that the NRC had received the License Transfer Application and was considering its approval.<sup>15</sup> The notice, which also afforded the opportunity for any interested person to request a hearing on the application, stated that the application included SUNSI, and provided procedures for potential parties that may wish to request access to proprietary documents for contention preparation.<sup>16</sup> Notably, the notice instructed that a potential party seeking access to SUNSI must file a request within 10 days and that the request must include, *inter alia*:

1. “The name and address of the potential party and a description of the potential party’s particularized interest that could be harmed by the [licensing] action;” and
2. “[T]he requester’s basis for the need for the information in order to meaningfully participate in this adjudicatory proceeding. In particular, the request must explain why publicly available versions of the information requested would not be sufficient to provide the basis and specificity for a proffered contention.”<sup>17</sup>

As is relevant here, the notice stated that the NRC Staff would grant access to SUNSI if it determined that (1) the request demonstrates “a reasonable basis to believe the petitioner is likely to establish standing” to intervene; and (2) “[t]he requestor has established a legitimate need for access to SUNSI.”<sup>18</sup> If the NRC Staff denied access, the notice indicated that a potential party could file an appeal within 5 days before the presiding officer designated for the license transfer proceeding or, if a presiding officer had not yet been appointed, before the Chief Administrative Judge.<sup>19</sup>

On October 11, 2016, Mr. Monatesti submitted a letter requesting a hearing

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<sup>13</sup> License Transfer Application at 2.

<sup>14</sup> Letter from Tanya Hood, Project Manager, NRC NRR, to Timothy S. Rausch, President and Chief Nuclear Officer, Susquehanna Nuclear at 2 (Aug. 26, 2016) (ADAMS Accession No. ML-16215A008).

<sup>15</sup> Susquehanna Nuclear, LLC; Susquehanna Steam Electric Station, Units 1 and 2; Consideration of Indirect License Transfer, 81 Fed. Reg. 68,462, 68,462 (Oct. 4, 2016).

<sup>16</sup> *Id.* at 68,463-66. The *Federal Register* notice provided information on how to obtain a publicly available version of the License Transfer Application, including the redacted versions of Attachments 3 and 4. *Id.* at 68,463.

<sup>17</sup> *Id.* at 68,465.

<sup>18</sup> *Id.*

<sup>19</sup> *Id.* at 68,466.

and access to SUNSI.<sup>20</sup> Mr. Monatesti stated that he lives 2 miles from the facility and that he needs the documents “to discern whether Riverstone Holdings includes provisions and capital available for decommissioning” of the facility and that he required “information regarding their continued support of Salem Township property and recreational facilities.”<sup>21</sup> He also wished to know “if sufficient, trained work force will be available to ensure a successful transfer of responsibilities, and if Riverstone Holdings staffing adjustments exist in the planning for the transfer and subsequent operation of the Salem Township nuclear plant.”<sup>22</sup> Further, he raised concerns about future site spent fuel storage expansion plans, past safety performance, outstanding health and safety issues, the continued downturn in energy prices, and Talen’s “loss of \$341 [m]illion” in 2015.<sup>23</sup> Six days later, after the deadline for the filing of access requests, Mr. Monatesti also submitted an e-mail with additional “areas of investigation.”<sup>24</sup>

On October 20, 2016, the NRC Staff denied Mr. Monatesti’s SUNSI re-

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<sup>20</sup> Access Request at 1.

<sup>21</sup> *Id.* at 1-2.

<sup>22</sup> *Id.* at 2.

<sup>23</sup> *Id.*

<sup>24</sup> E-Mail from Sabatini Monatesti to Hearing Docket at 1 (Oct. 17, 2016) (ADAMS Accession No. ML16312A432). In that e-mail, Mr. Monatesti’s concerns were presented as questions in bullet points:

- ROI and impact deal will have on the unit price for energy? Anticipated hurdle rate, and costing/pricing assumptions? Impact of continued erosion of price per unit due to the ever increasing availability of energy and decreasing cost of energy? Net present value of the investment?
- Arrangements for continued maintenance and provisioning for park areas? Investment required to meet future needs?
- Impact deal has on current and future workforce, and how it will impact health and safety?
- Expectation of new owner regards continued expansion of onsite storage? Investment required to meet future needs?
- Impact deal will have on capital improvements for the facility and eventual funding for decommissioning of Plant? Investment required to meet future needs?
- Commitment to ethical business practices?
- Evaluation of health and safety concerns in an area w[h]ere population is aging and continued support of police and fire as it might relate to evacuation and emergency plans could be suspect? Investment required to meet future needs?
- Evaluation of seismic activity and its impact on current or future construction as a risk factor?
- Integrated deal provisions for study of future vulnerabilities, threats and risks? Probabilities associated with each area of vulnerability? Sensitivity model outputs and key variables associated with each area of vulnerability?

*Id.*

quest.<sup>25</sup> Addressing his attempt to demonstrate a reasonable basis for standing, the NRC Staff declared that Mr. Monatesti asserted proximity-based standing.<sup>26</sup> However, the NRC Staff found this to be inadequate “since there is no obvious potential for offsite radiological consequences”<sup>27</sup> from the indirect license transfer and concluded that proximity to the site “on its own, is not sufficient.”<sup>28</sup> Likewise the NRC Staff concluded that the Access Request failed to demonstrate traditional standing.<sup>29</sup> The NRC Staff also concluded that Mr. Monatesti failed to show that he had a legitimate need for access to SUNSI “to meaningfully participate in the license transfer proceeding.”<sup>30</sup>

On October 23, 2016, Mr. Monatesti appealed the NRC Staff’s determination by sending an e-mail to the NRC Staff member in NRR who issued the Staff’s denial.<sup>31</sup> He attached a document with additional areas of concern over increased storage of nuclear waste and stated “I will need longer than five days to review your position, the information provided, and to prosper [sic] a proper response.”<sup>32</sup> Mr. Monatesti then supplemented his appeal with (1) two additional e-mails sent to all parties dated October 24, 2016;<sup>33</sup> (2) an e-mail and an attached letter sent to all parties on November 1, 2016;<sup>34</sup> (3) a letter and

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<sup>25</sup> Denial Letter at 1. The NRC Staff also indicated it did not consider the areas of investigation in Mr. Monatesti’s October 17, 2016 e-mail due to untimeliness, but stated that even had the NRC Staff considered the additional information, it would not have changed the NRC Staff’s denial determination. *Id.* at 4 n.27.

<sup>26</sup> *Id.* at 4.

<sup>27</sup> *Id.* at 5.

<sup>28</sup> *Id.*

<sup>29</sup> *Id.* at 5-6.

<sup>30</sup> *Id.* at 6.

<sup>31</sup> Appeal at 1-2.

<sup>32</sup> *Id.* at 2; *see also id.* at 3-7 (document entitled Health and Safety Review — Susquehanna Site).

<sup>33</sup> E-Mail from Sabatini Monatesti to Hearing Docket (Oct. 24, 2016) (ADAMS Accession No. ML16312A435) [hereinafter First October 24 E-Mail]; E-Mail from Sabatini Monatesti to Hearing Docket (Oct. 24, 2016) (ADAMS Accession No. ML16312A436) [hereinafter Second October 24 E-Mail]. Both e-mails questioned the financial qualifications of Talen Energy. First October 24 E-Mail at 1; Second October 24 E-Mail at 1. In the second e-mail, Mr. Monatesti stated “I plan to review Talen Energy and Riverstone 10K reports. . . . These numbers need further review, and until the impact of this deal to the citizen is understood, this license transfer should be scrutinized in detail and tabled until citizen review is completed.” Second October 24 E-Mail at 1.

<sup>34</sup> E-Mail from Sabatini Monatesti to Hearing Docket, Licensing Board, and Other Parties (Nov. 1, 2016) (ADAMS Accession No. ML16312A437) [hereinafter November 1 Supplement]. In the attached letter, Mr. Monatesti requested that the license transfer be tabled and “that a thorough in-

(Continued)

attachment submitted via E-Filing on November 3, 2016;<sup>35</sup> and (4) a letter and attachment submitted via E-Filing on November 4, 2016.<sup>36</sup>

On October 31, 2016, the NRC Staff replied, stating that “the Appeal does not make any argument with respect to the [NRC] Staff’s finding that the Access Request did not demonstrate that Mr. Monatesti was likely to establish standing. [And f]or this reason alone, this Atomic Safety and Licensing Board . . . should deny the Appeal.”<sup>37</sup> Similarly, on November 3, 2016, Susquehanna Nuclear submitted a motion for leave to respond and a response opposing Mr. Monatesti’s challenge.<sup>38</sup> Susquehanna Nuclear urged the Board to affirm the NRC Staff’s denial because he (1) “did not submit any proper hearing request by the deadline in this proceeding;”<sup>39</sup> (2) failed “to demonstrate that he would likely have standing;”<sup>40</sup> and (3) failed “to show a need for the information.”<sup>41</sup> Finally, Susquehanna Nuclear in its Reply, and NRC Staff in a filing dated November 7, 2016, urged that Mr. Monatesti’s filings submitted after the October 25, 2016 deadline should be disregarded as untimely and irrelevant.<sup>42</sup>

On October 25, 2016, the Commission referred Mr. Monatesti’s appeal to the Chief Administrative Judge of the Atomic Safety and Licensing Board Panel

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vestigation of the document presentations made by Talen Energy and Riverside [sic] Holdings be undertaken.” *Id.* attach. at 1, 5 (Letter from Sabatini Monatesti, President, ES Enterprises, Inc., to E. Roy Hawkens, Chief Administrative Judge (Oct. 30, 2016)). “[T]o complete an in depth review and analysis of the Securities and Exchange Filings, the review of the 10K reports from Talen Energy and Riverstone Holdings, and the materials filed with the Federal Energy Regulatory Commission,” Mr. Monatesti requested “a minimum of ninety (90) days to complete this work and report my findings back to the Atomic Safety and Licensing Board Panel.” *Id.* at 5.

<sup>35</sup> Letter from Sabatini Monatesti, President, ES Enterprises Inc., to E. Roy Hawkens, Chief Administrative Judge (Nov. 3, 2016) (ADAMS Accession No. ML16308A165).

<sup>36</sup> Letter from Sabatini Monatesti, President, ES Enterprises Inc., to E. Roy Hawkens, Chief Administrative Judge (Nov. 4, 2016) (ADAMS Accession No. ML16309A341). The attachment to the letter provided a timeline of Mr. Monatesti’s correspondence concerning the License Transfer Application.

<sup>37</sup> NRC Staff Answer to Appeal of NRC Denial of Access Request (Oct. 31, 2016) at 2 [hereinafter NRC Staff Reply].

<sup>38</sup> Susquehanna Nuclear’s Motion for Leave to Respond to Mr. Sabatini Monatesti’s Challenge to the NRC’s Denial of His Request for Access to [SUNSI] (Nov. 3, 2016); Susquehanna Nuclear’s Response Opposing Mr. Sabatini Monatesti’s Challenge to the NRC’s Denial of His Request for Access to [SUNSI] (Nov. 3, 2016) [hereinafter Susquehanna Nuclear Reply]. With this issuance, the Board *grants* Susquehanna Nuclear’s motion for leave to file a response.

<sup>39</sup> Susquehanna Nuclear Reply at 1-2, 9-12.

<sup>40</sup> *Id.* at 2, 12-18.

<sup>41</sup> *Id.* at 2, 19-22.

<sup>42</sup> *Id.* at 22-23; NRC Staff Reply to Additional Information Filed by Mr. Monatesti (Nov. 7, 2016) at 2.

for appropriate action.<sup>43</sup> On November 1, 2016, this Licensing Board was established to preside over the appeal of the NRC Staff's denial of Mr. Monatesti's request for access to SUNSI.<sup>44</sup>

## II. STANDARD OF REVIEW

In adjudicating an appeal from the NRC Staff's denial of a petitioner's request for access to SUNSI, we consider whether the NRC Staff correctly applied the criteria established by the Commission in the hearing opportunity notice for this proceeding, namely (1) whether the SUNSI request demonstrates "a reasonable basis to believe the petitioner is likely to establish standing"; and (2) whether the SUNSI request demonstrates the proposed recipient has a "legitimate need" for SUNSI.<sup>45</sup>

Our standard of review here is *de novo*.<sup>46</sup>

## III. ANALYSIS

The NRC Staff found that Mr. Monatesti both failed to demonstrate a reasonable basis for being likely to establish standing to intervene and that he does not have a legitimate need for SUNSI. We review each prong of the NRC Staff's analysis below. While we agree with the NRC Staff's conclusions regarding the need for SUNSI as set forth in Section III.B, *infra*, we consider the NRC Staff's analysis rejecting Mr. Monatesti's standing to be oversimplified and outline our concerns in Section III.A, below.

### A. The Likelihood of Standing Criterion

In the Denial Letter responding to Mr. Monatesti's asserted proximity-based standing, the NRC Staff states:

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<sup>43</sup> Memorandum from Annette L. Vietti-Cook, Secretary, NRC, to E. Roy Hawkens, Chief Administrative Judge, Atomic Safety and Licensing Board Panel, Appeal from a Determination of the NRC Staff to Deny a Request for Access to [SUNSI] from an Individual Who Has Indicated an Intent to Request a Hearing Regarding Susquehanna Nuclear, LLC's Application for Indirect License Transfer (Docket Nos. 50-387, 50-388, and 72-28) at 1 (Oct. 25, 2016).

<sup>44</sup> Susquehanna Nuclear, LLC; Establishment of Atomic Safety and Licensing Board, 81 Fed. Reg. 75,860, 75,860 (Nov. 1, 2016). As noted earlier, *see supra* note 6, the Board does not have jurisdiction over Mr. Monatesti's request for a hearing, which remains before the Commission. Accordingly, all concerns raised by Mr. Monatesti that do not pertain to the legality of the NRC Staff's denial of his request for access to SUNSI material are not considered by the Board as they are beyond the scope of the Board's authority.

<sup>45</sup> 81 Fed. Reg. at 68,465.

<sup>46</sup> *South Texas Project Nuclear Operating Co.* (South Texas Project, Units 3 and 4), LBP-09-5, 69 NRC 303, 310 (2009).

whether proximity to an operating nuclear power plant gives rise to a presumption of standing in an NRC proceeding involves a case-by-case analysis considering the “‘obvious potential for offsite [radiological] consequences,’ or lack thereof, from the application at issue, and specifically ‘taking into account the nature of the proposed action and the significance of the radioactive source.’” The Commission has found that license transfers, even for operating nuclear power plants, “typically involve little if any radiological risk, as there are generally no changes to the physical plant, its operating procedures, or its design basis accident analysis.” Thus, since there is no obvious potential for offsite radiological consequences from the proposed [Susquehanna Steam Electric Station] indirect license transfer, your assertion of your proximity to the site, on its own, is not sufficient to demonstrate standing.<sup>47</sup>

The NRC Staff correctly cites binding Commission precedent and lays out the proper framework with which to review the adequacy of proximity-based standing. The NRC Staff, however, appears to reject Mr. Monatesti’s standing solely on the grounds that it rests on proximity-based standing without providing any “case-by-case analysis” of the facts of the transfer. We question the NRC Staff’s reasoning, which seemingly leaves no possibility of proximity-based standing in indirect license transfers.

To be sure, the Commission has found proximity-based standing accrues in direct license transfer cases to individuals living within the distance that Mr. Monatesti has indicated he resides from the Susquehanna facility, i.e., 2 miles.<sup>48</sup> Moreover, while the Commission to date has “never granted proximity-based standing to a petitioner in an indirect license transfer adjudication,” it also has not ruled out the possibility of such.<sup>49</sup> Rather, when pleaded, the Commission reviews the circumstances of the indirect license transfer. For example in *Palisades*, the Commission noted that the

proposed license transfer is an *indirect* one in that it does not involve transfer of either ownership or operating rights to the subject facilities. Nor does it entail any changes in the facilities themselves or in their operation. Given *these facts*, we can see no “obvious potential for offsite consequences” stemming from this *indirect* license transfer.<sup>50</sup>

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<sup>47</sup> Denial Letter at 4-5 (footnotes omitted).

<sup>48</sup> See *Exelon Generation Co.* (Peach Bottom Atomic Power Station, Units 2 and 3), CLI-05-26, 62 NRC 577, 583 nn.28-30 (2005) (citing direct license transfer cases in which proximity standing was granted to individuals residing between 6.5 and 1 miles of a power reactor facility).

<sup>49</sup> *Palisades*, CLI-08-19, 68 NRC at 269.

<sup>50</sup> *Id.* (second emphasis added) (footnote omitted); see also *Three Mile Island*, CLI-05-25, 62 NRC at 575; *Northeast Nuclear Energy Co.* (Millstone Nuclear Power Station, Units 1, 2, and 3), CLI-00-18, 52 NRC 129, 132-33 (2000) (“The transfer application at issue here proposes no change in the

(Continued)

The License Transfer Application at issue here is similar to that in *Palisades*. The application indicates that the indirect transfer of control

will result in no change to the role of Susquehanna Nuclear as the licensed operator of the nuclear units, no change to its technical qualifications, and no change in its ownership interest or that of Allegheny Electric Cooperative, Inc. No changes will be made to the units or their licensing bases as a result of the Shareholder Transaction or to the day-to-day management and operations of the units.<sup>51</sup>

Without more, these reasons suggest there is no “obvious potential for offsite [radiological] consequences.”<sup>52</sup>

But Mr. Monatesti has referenced Talen’s “2015 loss of \$341 Million and continued downturn in energy prices,”<sup>53</sup> as well as asserted that “[t]he revenue stream for nuclear is under severe strain, energy prices are going down, maintenance costs are increasing”<sup>54</sup> and indicated that “Riverstone Holdings LLC plans to reduce Corporate Overhead . . . does this imply Riverstone Holding would cut staff in half?”<sup>55</sup> Arguably, these kinds of assertions about the potential impact on facility operations of financial considerations arising from an indirect transfer of control might provide, as financial impact-related assertions have afforded in direct license transfer cases,<sup>56</sup> a basis for proximity standing in an indirect transfer of control case.<sup>57</sup> This is particularly relevant for a *pro se* intervenor who generally is given some leniency in pleading.<sup>58</sup>

Nonetheless, whether that is the case here is a matter we need not decide

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Millstone licensees, no change in the Millstone facility, no change in its operation, no change in its personnel, and no change in its financing. It is far from obvious how NU’s corporate restructuring would affect Petitioners’ interests.”).

<sup>51</sup> License Transfer Application at 1.

<sup>52</sup> *Consumers Energy Co.* (Big Rock Point Independent Spent Fuel Storage Installation), CLI-07-19, 65 NRC 423, 426 (2007) (quoting *Peach Bottom*, CLI-05-26, 62 NRC at 580-81).

<sup>53</sup> Access Request at 2.

<sup>54</sup> First October 24 E-Mail at 1.

<sup>55</sup> November 1 Supplement, attach. at 1.

<sup>56</sup> See *supra* note 48.

<sup>57</sup> Certainly, to the degree agency regulations and NRC Staff guidance require the submission of financial information as part of an indirect transfer of control license application, see *infra* notes 60-63 and accompanying text, a hearing on petitioner’s health, safety, and/or environmental interests that might be impacted by such financial considerations seemingly would provide a basis for standing.

<sup>58</sup> See, e.g., *Entergy Nuclear Vermont Yankee, LLC* (Vermont Yankee Nuclear Power Station), CLI-10-17, 72 NRC 1, 45 n.246 (2010) (declining to reject argument on procedural grounds given practice of “treating *pro se* litigants more leniently than litigants with counsel”).

because, for the reasons set forth in Section III.B, below, we find that Mr. Monatesti has not shown a need for the SUNSI at issue.<sup>59</sup>

## **B. The Need for SUNSI Criterion**

The NRC Staff concluded that Mr. Monatesti failed to establish a legitimate need for SUNSI. For the reasons explained by the NRC Staff, we agree.

As part of the License Transfer Application, in accordance with 10 C.F.R. § 50.33(f)<sup>60</sup> and the NRC Staff's standard review plan regarding reactor licensee financial qualifications and decommissioning funding assurance, which is applicable to direct and indirect license transfer applications,<sup>61</sup> Susquehanna Nuclear provided two proprietary attachments: (1) a projected income statement and estimates of fixed costs for the 5-year period from January 1, 2017, until December 31, 2021;<sup>62</sup> and (2) the capacity factor assumptions involved in their income estimates.<sup>63</sup> Mr. Monatesti requested access to these documents

to discern whether Riverstone Holdings includes provisions and capital available for decommissioning of the Salem Township nuclear plant (aka. Susquehanna), and I require information regarding their continued support of Salem Township property and recreational facilities.

I also wish to know if sufficient, trained work force will be available to ensure a successful transfer of responsibilities, and if Riverstone Holdings staffing adjust-

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<sup>59</sup> Of course, as would be the case regarding his need to submit an admissible contention to obtain a hearing, the fact that Mr. Monatesti's showing regarding the "merits" of his access request is deficient does not mean that he lacks standing. Nor does a petitioner have to establish a link between the interests/injury it asserts establish its standing and the issues that it wishes to litigate relative to an application. See *Strata Energy, Inc.* (Ross In Situ Recovery Uranium Project), LBP-12-3, 75 NRC 164, 190 n.28 (citing cases), *aff'd*, CLI-12-12, 75 NRC 603 (2012).

<sup>60</sup> This regulation, applicable to 10 C.F.R. Part 50 operating license transfers under 10 C.F.R. § 50.80(b)(1)(i), requires that a direct or indirect transfer of control application include "information sufficient to demonstrate to the Commission the financial qualification of the applicant to carry out, in accordance with regulations in this chapter, the activities for which the permit or license is sought." 10 C.F.R. § 50.33(f).

<sup>61</sup> NRR, NRC, Standard Review Plan on Power Reactor Licensee Financial Qualifications and Decommissioning Funding Assurance, NUREG-1577, at 5-7 (rev. 1 Feb. 1999) (ADAMS Accession No. ML013330264).

<sup>62</sup> License Transfer Application, encl., attach. 3NP (Projected Income Statement and Calculation of Six-Month Fixed Costs). As mentioned in the background section, redacted nonproprietary versions of these documents, referred to as Attachments 3NP and 4NP, are available for public review. See *supra* note 14 and accompanying text; see also *supra* note 2.

<sup>63</sup> License Transfer Application, encl., attach. 4NP (Capacity Factor Assumptions).

ments exist in the planning for the transfer and subsequent operation of the Salem Township nuclear plant.<sup>64</sup>

We agree with the NRC Staff that Mr. Monatesti has not demonstrated that he “need[s] the information that is in these documents and that was redacted from Attachment 3NP and Attachment 4NP in order to meaningfully participate in the license transfer proceeding.”<sup>65</sup> This is especially true because his Access Request does not “make any arguments that are related to the redacted financial information.”<sup>66</sup>

Mr. Monatesti questions the financial stability of Riverstone and Talen.<sup>67</sup> Mr. Monatesti, however, has not connected his concerns with any specificity to the redacted information relating to Susquehanna Nuclear and explained how the redacted information would be of use to him. While the redacted attachments did not contain figures, the headings describing the redacted information are provided. The headings for Attachment 3NP, Projected Income Statement and Calculation of Six-Month Fixed Costs, include “Assumptions,” “Revenues,” and

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<sup>64</sup> Access Request at 1-2 (bullet formatting omitted).

<sup>65</sup> Denial Letter at 6.

<sup>66</sup> *Id.*

<sup>67</sup> *See, e.g.*, Access Request at 2 (“I also wish to know if sufficient, trained work force will be available to ensure a successful transfer of responsibilities, and if Riverstone Holdings staffing adjustments exist in the planning for the transfer and subsequent operation of the Salem Township nuclear plant. . . . Given Talen Energy 2015 loss of \$341 Million and continued downturn in energy prices . . . . Who will be responsible . . . if the license holder goes bankrupt?”); Second October 24 E-Mail at 1 (“I plan to review Talen Energy and Riverstone 10K reports. . . . It will be very interesting to discern how Riverstone will cut operating expenditures by \$100 million per year, reduce capital expenditures by another \$50 million and in so doing erase the \$340 million shortfall reported by Talen Energy.”); November 1 Supplement, attach. at 1 (“Recent documents note that Riverside Holding LLC plans to . . . reduce Corporate Overhead (currently 400 management personnel reside in Allentown and 3,000 Technical staff are situated at plant facilities, estimate cost to Talen Energy \$300 million, does this imply Riverstone Holding would cut staff in half?) . . . .” (citing <http://www.mcall.com/business/energy>)).

In this regard, Susquehanna Nuclear in its reply to Mr. Monatesti’s appeal explained that the “2015 net loss was largely the result of non-cash goodwill and other asset impairment charges, and a one-time charge for the retirement of certain debt securities.” Susquehanna Nuclear Reply at 16 n.13. Moreover, the Board notes that the website provided by Mr. Monatesti in referencing “[r]ecent documents” refers to the Energy section of the Morning Call newspaper. Presumably Mr. Monatesti meant to cite an article published a month before his filing. *See* Scott Kraus, *Riverstone reveals plans to cut \$100M in costs at Talen Energy*, The Morning Call, Sept. 29, 2016, available at <http://www.mcall.com/business/energy/mc-talen-energy-cuts-coming-20160929-story.html>. While this article states that Riverstone asserted it “can cut [Talen Energy] operating expenditures by \$100 million a year, and capital expenditures by another \$50 million,” this apparently is across Talen’s total operating expenses, which were “\$1.5 billion for the first six months of 2016.” *Id.* The impact to Susquehanna Nuclear is not stated. Talen Energy has power plants in eight different states and a workforce of some 3000 employees. *Id.*

“Expenses.”<sup>68</sup> Importantly, subheadings from the “Expenses” were provided: “Fuel Expense,” “Decommissioning Accretion Expenses,” “Direct [Operations and Maintenance],” “Taxes (Non Income),” “Depreciation,” and “Other Expenses.”<sup>69</sup> Yet, Mr. Monatesti does not indicate how having the specific information set forth under these headings relative to Susquehanna Nuclear’s operation of the Susquehanna facility will aid his challenge regarding the financial status of Riverstone and Talen Energy.<sup>70</sup>

The guidance provided for obtaining access to SUNSI also states that “the request must explain why publicly available versions of the information requested would not be sufficient to provide the bases and specificity for a proffered contention.”<sup>71</sup> Mr. Monatesti’s request failed to address this requirement.

Because Mr. Monatesti fails to explain why access to SUNSI redacted from Attachments 3NP and 4NP would provide the basis for a proffered contention or refute statements made in the License Transfer Application, we find that he has failed to establish a legitimate need for SUNSI.

#### IV. CONCLUSION

For the foregoing reasons, we *affirm* the NRC Staff’s denial of Mr. Monatesti’s request for access to SUNSI.

Pursuant to 10 C.F.R. § 2.311, a litigant wishing to appeal this decision to the Commission must do so within 25 days after service of this Memorandum and Order.<sup>72</sup>

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<sup>68</sup> License Transfer Application, encl., attach. 3NP, at 1.

<sup>69</sup> *Id.*

<sup>70</sup> At the same time, we find the other bases that Mr. Monatesti relies on to illustrate his need to access SUNSI insufficient. Decommissioning trust funds are prepaid pursuant to 10 C.F.R. § 50.75(e)(1)(i) to monetary levels required by 10 C.F.R. § 50.75(b) and (c), and also are “segregated from the licensee’s assets and outside its administrative control.” License Transfer Application, encl. at 15. As such, this indirect license transfer will have no bearing on those funds. And what, if any, impact this indirect license transfer might have on Salem Township property and recreational facilities is a matter that falls outside the general interests protected by the Atomic Energy Act and is not within the scope of this proceeding.

<sup>71</sup> 81 Fed. Reg. at 68,465.

<sup>72</sup> *See id.* at 68,466.

It is so ORDERED.

THE ATOMIC SAFETY AND  
LICENSING BOARD

William J. Froehlich, Chairman  
ADMINISTRATIVE JUDGE

G. Paul Bollwerk, III  
ADMINISTRATIVE JUDGE

Dr. Gary S. Arnold  
ADMINISTRATIVE JUDGE

Rockville, Maryland  
November 21, 2016

### **Concurring Opinion of Judge Arnold**

I agree fully with the Board decision that the Staff decision to withhold SUNSI is correct. However, I do not agree with the Board majority discussion of Mr. Monatesti's standing and the statement "we consider the NRC Staff's analysis rejecting Mr. Monatesti's standing to be oversimplified."<sup>73</sup> The Board's discussion of this issue references several statements made by Mr. Monatesti and hypothesizes that such assertions "might provide . . . a basis for proximity standing in an indirect transfer of control case."<sup>74</sup>

But Mr. Monatesti never makes any such argument. These cited statements are only statements made in an apparently random manner in his request.<sup>75</sup> They are not stated as a coherent argument in favor of standing. Even Mr. Monatesti's statement "I live two miles from the Salem Township plant" appears in an apparently random place in his request, and is not connected with any attempt to demonstrate standing.

While I agree that pleadings of *pro se* petitioners should be treated leniently, I do not believe that Boards should assemble arguments from disparate statements of the pleadings when petitioners do not first forward that argument. I believe in this case that Mr. Monatesti makes no arguments sufficient to indicate that he is likely to establish standing, and I believe the Staff argument adequately supports their similar conclusion.

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<sup>73</sup> Majority Op. at p. 158.

<sup>74</sup> Majority Op. at p. 160.

<sup>75</sup> Access Request at 2.



UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

**COMMISSIONERS:**

**Stephen G. Burns**, Chairman  
**Kristine L. Svinicki**  
**Jeff Baran**

**In the Matter of**

**Docket Nos. 50-250-LA  
50-251-LA**

**FLORIDA POWER & LIGHT  
COMPANY  
(Turkey Point Nuclear Generating  
Units 3 and 4)**

**December 15, 2016**

**NATIONAL ENVIRONMENTAL POLICY ACT; LICENSING  
PROCEEDINGS**

The decision of a licensing board following an evidentiary hearing can supplement the environmental record.

**NATIONAL ENVIRONMENTAL POLICY ACT; RECORD OF  
DECISION**

When the environmental record of decision is supplemented by the adjudicatory process, the disclosure purpose of NEPA is satisfied through the public vetting of environmental issues at an evidentiary hearing and issuance of a decision.

**NATIONAL ENVIRONMENTAL POLICY ACT**

NEPA does not mandate that an agency undertake studies to obtain information that is not already available.

## **NATIONAL ENVIRONMENTAL POLICY ACT**

NEPA, as a procedural statute, does not require any particular substantive result. NEPA serves the purpose of environmental protection through “action-forcing” procedures that require agencies to take a “hard look” at environmental impacts and that provide for “broad dissemination of relevant environmental information.”

## **STANDARD OF REVIEW**

The Commission defers to a licensing board’s findings with respect to the underlying facts unless the findings are clearly erroneous. A petitioner must demonstrate that a licensing board’s factual findings are not even plausible in light of the record viewed in its entirety to show clear error.

## **MEMORANDUM AND ORDER**

Citizens Allied for Safe Energy, Inc. (CASE) challenges the Atomic Safety and Licensing Board’s ruling on the merits of Contention 1 in this license amendment matter.<sup>1</sup> For the reasons stated below, we deny review.

### **I. BACKGROUND**

Turkey Point Nuclear Generating Station employs a cooling canal system as its ultimate heat sink. As described by the Board, “[a]fter being discharged from the plant into the cooling canal system, heated water flows over a 13-mile loop before returning to the plant, where the water is recirculated for cooling purposes and the entire process is repeated.”<sup>2</sup> The renewed operating licenses for Units 3 and 4 included Technical Specifications that set an upper limit on the water temperature in the ultimate heat sink at 100 degrees Fahrenheit (°F).<sup>3</sup>

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<sup>1</sup> Citizens Allied for Safe Energy Petition for Review (June 27, 2016) (Petition); *see* LBP-16-8, 83 NRC 417 (2016).

<sup>2</sup> LBP-16-8, 83 NRC at 421 (citation omitted).

<sup>3</sup> Ex. FPL-008, Letter from Michael Kiley, FPL, to NRC Document Control Desk, “License Amendment Request No. 231, Application to Revise Technical Specifications to Revise Ultimate Heat Sink Temperature Limit” (July 10, 2014), Attachment to Enclosure (ADAMS accession no. ML16015A380) (Application).

If the temperature limit were to be exceeded, the licensee, Florida Power & Light Company (FPL), was required to shut down the plant.<sup>4</sup>

In July 2014, the water temperature in the cooling canal system approached the 100°F limit.<sup>5</sup> As a result, FPL requested license amendments to increase the ultimate heat sink temperature at Units 3 and 4 from 100°F to 104°F and to revise related surveillance requirements for monitoring the ultimate heat sink temperature and component cooling water heat exchangers.<sup>6</sup> FPL requested expedited consideration of the proposed amendments.<sup>7</sup>

The NRC Staff published the Environmental Assessment and Finding of No Significant Impact for these license amendments in the *Federal Register* on July 31, 2014.<sup>8</sup> Concurrently, the Staff determined that the amendments involved no significant hazards considerations and indicated that it would process FPL's license amendment request under the regulations applicable to amendments granted under exigent circumstances.<sup>9</sup> The Staff approved the amendments on August 8, 2014, and published a notice of issuance in the *Federal Register*.<sup>10</sup> As approved by the Staff, the license amendments revise the ulti-

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<sup>4</sup> LBP-16-8, 83 NRC at 421 (citation omitted).

<sup>5</sup> *Id.*

<sup>6</sup> Ex. FPL-008, Application, Enclosure at 2.

<sup>7</sup> FPL initially requested that the application be approved by August 30, 2014. *Id.*, Cover Letter at 1. Shortly thereafter, in a supplement to the application, FPL requested that the NRC approve the application on an emergency basis. Ex. NRC-011, Letter from Michael Kiley, FPL, to NRC Document Control Desk, "License Amendment Request No. 231, Application to Revise Ultimate Heat Sink Temperature Limit — Request for Emergency Approval" (July 17, 2014), at 1 (ML16015A355) (requesting "timely review of this application to avoid . . . a [dual-unit] shutdown [that] would impact grid reliability"); see 10 C.F.R. § 50.91(a)(5).

<sup>8</sup> Ex. NRC-009, Florida Power & Light Company; Turkey Point Nuclear Generating Unit Nos. 3 and 4; Environmental Assessment and Finding of No Significant impact, 79 Fed. Reg. 44,464 (July 31, 2014).

<sup>9</sup> Florida Power & Light Company; Turkey Point Nuclear Generating Units 3 and 4, License Amendment Application; Opportunity to Comment, Request a Hearing, and Petition for Leave to Intervene, 79 Fed. Reg. 44,214, 44,215 (July 30, 2014); see 10 C.F.R. § 50.91(a)(6) (setting forth the notice and comment process for those circumstances involving a license amendment where the NRC finds that exigent circumstances exist, in that a licensee and the NRC must act quickly and that time does not permit 30 days' notice for prior public comment, and the amendment involves no significant hazards considerations). This notice also included an opportunity for interested persons to request a hearing.

<sup>10</sup> Ex. NRC-006, Letter from Audrey L. Klett, NRC, to Mano Nazar, NextEra Energy (Aug. 8, 2014) (ML16015A349) (License Amendments Issuance); see Florida Power & Light Company; Turkey Point Nuclear Generating Units 3 and 4; License Amendment; Issuance, Opportunity to Request a Hearing, and Petition for Leave to Intervene, 79 Fed. Reg. 47,689 (Aug. 14, 2014). In this notice, the Staff reset the period to request a hearing. *Id.* at 47,690.

mate heat sink water-temperature limit in the Technical Specifications and the related surveillance requirements.<sup>11</sup>

In response to the notice of issuance, CASE requested and was granted a hearing. The Board admitted Contention 1 for hearing, related to the environmental impacts of the proposed action, as follows:

The NRC's environmental assessment, in support of its finding of no significant impact related to the 2014 Turkey Point Units 3 and 4 license amendments, does not adequately address the impact of increased temperature and salinity in the [cooling canal system] on saltwater intrusion arising from (1) migration out of the [cooling canal system]; and (2) the withdrawal of fresh water from surrounding aquifers to mitigate conditions within the [cooling canal system].<sup>12</sup>

Following an evidentiary hearing in January 2016, the Board "conclude[d] that the [Environmental Assessment] fails to satisfy the requirements of the National Environmental Policy Act (NEPA) because of its deficient discussion of saltwater migration, saltwater intrusion, and aquifer withdrawals."<sup>13</sup> But the Board found that the evidence developed during the adjudicatory proceeding cured the identified deficiencies in the Environmental Assessment and obviated the need for the Staff to further revise it.<sup>14</sup>

The Board found that it could uphold the Staff's proposed action despite deficiencies in the Staff's NEPA documents "if sufficient evidence is developed in an adjudicatory proceeding concerning the environmental impacts of the proposed action."<sup>15</sup> As the Board explained, "[i]n such situations, the licensing board's findings and conclusions are deemed to amend the NRC Staff's NEPA documents and become the agency record of decision on those matters."<sup>16</sup> The Board generated a robust record in this proceeding based on an evidentiary hearing, written testimony, and exhibits. Based on this record, the Board found that the Environmental Assessment, as supplemented, fulfills the agency's NEPA obligation to take a "hard look" at environmental impacts and justifies the finding of no significant environmental impact.<sup>17</sup>

CASE now petitions for review and seeks "proper and appropriate redress

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<sup>11</sup> Ex. NRC-006, License Amendments Issuance at 1.

<sup>12</sup> LBP-16-8, 83 NRC at 423 (as reformulated by the Board).

<sup>13</sup> *Id.* at 420.

<sup>14</sup> *Id.* at 420-21.

<sup>15</sup> *Id.* at 447 (citing *Entergy Nuclear Operations, Inc.* (Indian Point, Units 2 and 3), CLI-15-6, 81 NRC 340, 388 (2015)).

<sup>16</sup> *Id.* (citing *Indian Point*, CLI-15-6, 81 NRC at 387-88; *Friends of the River v. Fed. Energy Regulatory Comm'n*, 720 F.2d 93, 106 (D.C. Cir. 1983)).

<sup>17</sup> *Id.* at 460; *see also id.* at 451, 455, 457.

and relief of [its members'] proven grievances.”<sup>18</sup> FPL and the Staff oppose the Petition; CASE replied to those answers.<sup>19</sup>

## II. DISCUSSION

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

- (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;
- (iii) a substantial and important question of law, policy, or discretion has been raised;
- (iv) the conduct of the proceeding involved a prejudicial procedural error; or
- (v) the proceeding raises any other consideration that we may deem to be in the public interest.<sup>20</sup>

We review questions of law *de novo*, but we defer to the Board’s findings with respect to the underlying facts unless the findings are “clearly erroneous.”<sup>21</sup> The standard for showing “clear error” is a difficult one to meet — a petitioner must demonstrate that the Board’s determination is “not even plausible” in light of the record as a whole.<sup>22</sup>

Fundamentally, CASE challenges the legality of the Board’s decision to supplement the environmental record.<sup>23</sup> This practice, however, has a long history at the agency. The Board cited to case law from the Commission, the Atomic Safety and Licensing Appeal Board, and the United States Court of Appeals for the D.C. Circuit to support its approach, and CASE does not call these

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<sup>18</sup> Petition at 24.

<sup>19</sup> Florida Power & Light Company’s Answer Opposing CASE’s Petition for Review of LBP-16-08 (July 22, 2016); NRC Staff’s Response to Citizens Allied for Safe Energy Petition for Review (July 22, 2016); Citizens Allied for Safe Energy Answer to NRC Staff and FPL Regarding Petition for Review (Aug. 1, 2016) (Reply).

<sup>20</sup> 10 C.F.R. § 2.341(b)(4).

<sup>21</sup> *Honeywell International, Inc.* (Metropolis Works Uranium Conversion Facility), CLI-13-1, 77 NRC 1, 18-19 (2013).

<sup>22</sup> See, e.g., *Shaw AREVA MOX Services, LLC* (Mixed Oxide Fuel Fabrication Facility), CLI-15-9, 81 NRC 512, 519 (2015).

<sup>23</sup> See Petition at 5.

authorities into question.<sup>24</sup> As we recently explained, our hearing procedures “[allow] for additional and a more rigorous public scrutiny of the [FSEIS] than does the usual ‘circulation for comment.’”<sup>25</sup> When the environmental record of decision is supplemented by the adjudicatory process, the disclosure purpose of NEPA is satisfied through the public vetting of environmental issues at an evidentiary hearing and issuance of a decision; consequently, the Staff is not required to otherwise supplement or amend its NEPA documents.<sup>26</sup> Relatedly, CASE asserts that the Board should have addressed the process that the Staff followed in conducting the Environmental Assessment and issuing the Finding of No Significant Impact.<sup>27</sup> At issue in the hearing, however, was the single contention admitted by the Board — regarding the adequacy of the Environmental Assessment’s discussion of particular impacts — not the Staff’s process for preparing the environmental assessment. CASE’s dissatisfaction with supplementation generally, and with the Staff’s NEPA process in this case, does not present an issue for review.

Below, we address CASE’s remaining asserted errors related to the Staff’s NEPA process and the Board’s factual findings. CASE raises issues that are either outside the scope of this license amendment proceeding or are insufficiently supported to challenge the Board’s decision. Moreover, CASE has not identified any legal or factual error in the Board’s decision, either as a result

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<sup>24</sup> LBP-16-8, 83 NRC at 447. In *Friends of the River*, the Federal Court of Appeals for the District of Columbia Circuit declined to remand a NEPA case where the Federal Energy Regulatory Commission had issued a public order during the adjudicatory process that cured the deficiencies in the Environmental Impact Statement. 720 F.2d at 106.

<sup>25</sup> *Indian Point*, CLI-15-6, 81 NRC at 388 (quoting *Philadelphia Electric Co.* (Limerick Generating Station, Units 1 and 2), ALAB-819, 22 NRC 681, 707 (1985), *aff’d in part*, CLI-86-5, 23 NRC 125 (1986), *remanded in part on other grounds sub nom. Limerick Ecology Action, Inc. v. NRC*, 869 F.2d 719 (3d Cir. 1989)). Allowing the adjudicatory proceeding to supplement an environmental assessment, in the same manner as is done for environmental impact statements, is also appropriate. See *Pacific Gas and Electric Co.* (Diablo Canyon Power Plant Independent Spent Fuel Storage Installation), CLI-08-26, 68 NRC 509, 526 (2008).

<sup>26</sup> LBP-16-8, 83 NRC at 447 (citing *Philadelphia Electric Co.* (Limerick Generating Station, Units 1 and 2), ALAB-262, 1 NRC 163, 197 n.54 (1975)).

<sup>27</sup> Petition at 6-7. To the extent that CASE challenges the NRC’s NEPA process generally (*see id.* at 7-8), CASE presents an impermissible challenge to the agency’s generally applicable rules. Such challenges are not cognizable in individual licensing proceedings. 10 C.F.R. § 2.335; *see also Vermont Yankee Nuclear Power Corp. and AmerGen Vermont, LLC* (Vermont Yankee Nuclear Power Station), CLI-00-20, 52 NRC 151, 165-66 (2000). Further, to the extent that CASE suggests that the Board should have directed a change in the Staff’s internal procedures, licensing boards lack the authority to direct the Staff’s non-adjudicatory actions, and therefore, such a remedy is beyond the scope of this proceeding. *See Shaw AREVA MOX Services, LLC* (Mixed Oxide Fuel Fabrication Facility), CLI-09-2, 69 NRC 55, 63 (2009).

of how it weighed the evidence or as a result of the supplementation. In sum, CASE has not raised a substantial question for review of the Board's decision.

### ***1. Adequacy of the NRC Staff's NEPA Review***

CASE takes issue with the Board's decision for the Board's asserted failure to explore the underlying cause of the conditions being experienced in the cooling canal system.<sup>28</sup> CASE further claims that the NRC is "responsible for the safe and ecologically neutral operation of the [cooling canal system]."<sup>29</sup> At issue in the admitted contention was whether the Staff's Environmental Assessment adequately described the existing environmental conditions in the cooling canal system and the reasonably foreseeable environmental impacts of the license amendment; resolution of the contention on the merits did not require a precise finding of the historical contributors to the conditions in the cooling canal system. The record nonetheless contains testimony and evidence related to the salinity levels in the canals through the years, purported causes for the rise in salinity, acknowledgment that the canals are a complex ecosystem, and FPL's mitigation measures.<sup>30</sup> CASE does not acknowledge, let alone challenge, these portions of the record and, therefore, does not identify any particular deficiency in the Board's decision.

In any event, NEPA does not mandate that an agency undertake studies to obtain information that is not already available, and CASE does not support its claim that the NRC must undertake studies to determine the cause of particular environmental conditions or to determine the best mitigation measures for a potential environmental harm.<sup>31</sup> The Staff's Environmental Assessment,

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<sup>28</sup> Petition at 8-9.

<sup>29</sup> *Id.* at 8.

<sup>30</sup> See, e.g., Tr. at 412-17 (testimony of Mr. Bolleter and Mr. Scroggs, for FPL, discussing conditions in the cooling canal system as they relate to algae blooms, drought, FPL actions to manage sediment and flow distribution in the system, and power operation of all units); Ex. NRC-001, NRC Staff Testimony of Audrey L. Klett, Briana A. Grange, William Ford, and Nicholas P. Hobbs Concerning Contention 1 (Nov. 10, 2015), at 27-29 (testimony of Mr. Ford, for the Staff, describing the increase in the cooling canal system's salinity over time due to evaporation, the migration of higher salinity water from the canals into the Biscayne Aquifer underneath the canals, and the framework agreed to by FPL and the State for monitoring and potentially mitigating the hypersaline plume originating from the cooling canal system); Ex. NRC-044, Hughes et al., *Effect of Hypersaline Cooling Canals on Aquifer Salinization*, 18 Hydrogeology Journal 25 (2010) (ML16015A179) (non-public) (modelling effect of hypersaline cooling canals at Turkey Point on aquifer salinization).

<sup>31</sup> See *Luminant Generation Co., LLC* (Comanche Peak Nuclear Power Plant, Units 3 and 4), CLI-12-7, 75 NRC 379, 391-92 (2012) (citations omitted) ("NEPA requires that we conduct our environmental review with the best information available today."); see also *Lee v. U.S. Air Force*, 354 F.3d 1229, 1244 (10th Cir. 2004); *Entergy Nuclear Operations, Inc.* (Indian Point, Units 2 and 3), CLI-16-7, 83 NRC 293, 323 (2016).

combined with the Board's decision, disclosed the environmental impacts of the proposed action and discussed FPL's mitigation measures. CASE's assertion that the NRC must undertake studies and develop information does not raise a substantial question for review.

Similarly, CASE appears to call for the NRC to impose mitigation measures on FPL.<sup>32</sup> CASE claims that the Environmental Assessment, even when taken together with the Board's decision, does not remedy its members' potential for injury because the Biscayne Aquifer and surrounding waters are still being affected.<sup>33</sup> But NEPA, as a procedural statute, does not require any particular substantive result.<sup>34</sup> NEPA serves the purpose of environmental protection through "action-forcing" procedures that require agencies to take a "hard look" at environmental impacts and that provide for "broad dissemination of relevant environmental information."<sup>35</sup> Therefore, CASE has not identified any legal error in the Board's decision not to impose mitigation measures on FPL or direct other "substantive" actions related to water quality or saltwater migration.

Seemingly related to its argument that the NRC must impose mitigation measures on FPL, CASE disputes FPL's ability and willingness to follow any such measures due to its past violations of water quality standards.<sup>36</sup> CASE references, without more, a violation of an agreement with the South Florida Water Management District related to the movement of saline water from the cooling canal system and notice of violation issued by Miami-Dade County related to water quality.<sup>37</sup> But CASE does not link these two instances of past violations to the Board's decision and therefore does not raise a substantial question for review.<sup>38</sup>

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<sup>32</sup> See, e.g., Petition at 7 (claiming need for "meaningful redress"), 22-23 (questioning the efficacy of mitigation measures due to reliance on computer analyses and criticizing the lack of "field testing" of proposed mitigation measures).

<sup>33</sup> *Id.* at 7.

<sup>34</sup> See *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 350 (1989); *Vermont Yankee Nuclear Power Corp. v. NRDC*, 435 U.S. 519, 558 (1978); *Indian Point*, CLI-16-7, 83 NRC at 328 (quoting *Massachusetts v. NRC*, 708 F.3d 63, 78 (1st Cir. 2013)).

<sup>35</sup> *Methow Valley*, 490 U.S. at 350 (quoting *Kleppe v. Sierra Club*, 427 U.S. 390, 410 n.21 (1976)); *Entergy Nuclear Operations, Inc.* (Indian Point, Units 2 and 3), CLI-16-10, 83 NRC 494, 510 (2016).

<sup>36</sup> Petition at 11-12 (citing LBP-16-8, 83 NRC at 452 (citing Ex. INT-004, Florida Department of Environmental Protection, Administrative Order, OGC No. 14-0741 (Dec. 23, 2014), ¶¶ 28-29; Ex. INT-005, Miami-Dade County, Notice of Violation and Orders for Corrective Action (Oct. 2, 2015), at 1 (ML16015A337) (Notice of Violation)).

<sup>37</sup> *Id.*

<sup>38</sup> In any event, we decline to assume that FPL will not comply with applicable requirements. The record indicates that FPL was issued a notice of violation by Miami-Dade County for exceeding groundwater standards for chlorides. LBP-16-8, 83 NRC at 429 (citing Ex. INT-005, Notice of

(Continued)

Additionally, CASE argues that the NRC’s NEPA review in this matter was flawed because there is a “limited official flow of information between the NRC Staff and State and local agencies.”<sup>39</sup> Along the same lines, CASE challenges the Staff’s point of contact for the State of Florida and would have us review these interactions.<sup>40</sup> As we previously held, however, the selection of the State official with whom the Staff consulted on the license amendment (an issue initially identified not by CASE, but by the Board itself) is not within the scope of this proceeding.<sup>41</sup> Consequently, arguments related to that selection do not provide a basis for us to review the Board’s decision. And in any event, CASE has not demonstrated a link between assertedly limited consultations between the Staff and State and local agencies and a specific deficiency in the environmental analysis. As a result, this claim does not present a substantial question for review.

## **2. CASE’s Challenges to Board Factual Findings**

In its petition, CASE also disputes various “ecological conclusions and statements in the Decision.”<sup>42</sup> These assertions amount to thinly supported challenges to Board findings of fact. As noted above, CASE must demonstrate that the Board’s findings are “not even plausible in light of the record viewed in its entirety.”<sup>43</sup> None of CASE’s asserted errors clears that bar. CASE does not explain how evidence in the record in any way contradicts the Board’s decision.<sup>44</sup> Indeed, prior to the evidentiary hearing FPL and the Staff filed several

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Violation, at 1). But CASE has not shown a reason, for purposes of the NEPA review at issue here, to doubt that FPL will comply with environmental conditions required by State and local authorities. Indeed, the Notice of Violation, which resulted in a consent agreement between the County and FPL, demonstrates that FPL’s compliance with other environmental requirements at Turkey Point is subject to ongoing oversight by the appropriate authorities. *See id.* (citing Ex. INT-006, Consent Agreement Between Miami-Dade County’s Division of Environmental Resources Management and FPL (Oct. 6, 2015) (ML16015A339)).

<sup>39</sup> Petition at 9.

<sup>40</sup> *Id.* at 10.

<sup>41</sup> CLI-15-25, 82 NRC 389, 406 n.110 (2015).

<sup>42</sup> Petition at 13.

<sup>43</sup> *See, e.g., MOX*, CLI-15-9, 81 NRC at 519.

<sup>44</sup> *See* Petition at 13-14 (arguing that the Board incorrectly found that CASE presented no evidence that the Biscayne Aquifer is freshwater but citing to portions of the testimony regarding the salinity of the L-31 E canal without demonstrating that the L-31E canal is part of the Biscayne Aquifer); *compare* Petition at 16-18 (arguing that the Board unreasonably found that adding saline water to the cooling canal system would reduce the spread of the hypersaline plume into the Biscayne Aquifer) *with* LBP-16-8, 83 NRC at 450 (concurring with the Applicant’s modelling showing that diluting

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motions pertaining to (among other things) the quality of CASE's evidence; it is clear that the Board took a lenient view and admitted into evidence all of the material CASE submitted relevant to Contention 1.<sup>45</sup> The Board's thorough decision demonstrates that it considered the entire record, including information and evidence put forth by CASE, FPL and the Staff, and CASE has not shown that the Board erred. Therefore, CASE does not present a substantial question for review with respect to the Board's findings of fact.

### III. CONCLUSION

For the foregoing reasons, we *deny* the petition for review.  
IT IS SO ORDERED.

For the Commission

ANNETTE L. VIETTI-COOK  
Secretary of the Commission

Dated at Rockville, Maryland,  
this 15th day of December 2016.

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the salinity of the cooling canal system would reduce the spread of the plume); *compare* Petition at 18-20 (contending that the Board did not fully consider the impacts from withdrawals of freshwater from the Biscayne Aquifer and Upper Floridan Aquifer particularly with respect to "coning" and lowering of the water table) *with* LBP-16-8, 83 NRC at 454-56 (noting that FPL's modelling showed that the withdrawals from the Upper Floridan Aquifer would not "have a significant impact on the aquifer itself or on other users of the aquifer" and finding that proposed withdrawals from the Biscayne Aquifer were not freshwater and that CASE did not present any evidence to the contrary); *see* Petition at 20-23 (challenging the adequacy of the Board's finding regarding confinement of the aquifers by relying on a summary of a report without demonstrating that the report applies to the aquifers in question). CASE also makes brief unsupported assertions regarding matters outside the scope of the proceeding — the Board's asserted failure to "address or redress" wildlife impacts in the area and the presence of cyanobacteria in the cooling canal system. *See* Petition at 15, 18.

<sup>45</sup> *See, e.g.*, Order (Denying Application for Subpoenas, Denying Motion for Summary Disposition, and Granting in Part and Denying in Part Motions to Strike) (Dec. 22, 2015), at 17 (unpublished) (Dec. 22, 2015, Order) (excluding only evidence outside the scope of admitted Contention 1). In its reply brief, CASE explains the lack of testimony resulted from the Board's refusal to subpoena witnesses. Reply at 3-4. But the record establishes that the Board gave CASE an opportunity to renew its request for the issuance of subpoenas, "an extraordinary remedy," and that CASE's requests did not meet our procedural requirements. Dec. 22, 2015, Order at 2-3 (internal quotations omitted); Order (Denying CASE's Application for Subpoenas) (Nov. 12, 2015), at 3 (unpublished).

### Commissioner Baran, Dissenting

As I stated in my opinion dissenting in part in the *Strata* proceeding, a core requirement of NEPA is that an agency decisionmaker must consider an adequate environmental review *before* making a decision on a licensing action.<sup>1</sup> If the Commission allows a Board to supplement and cure an inadequate NEPA document *after* the agency has already made a licensing decision, then this fundamental purpose of NEPA is frustrated.

In this case, the Staff found that there were exigent circumstances and used the process in 10 C.F.R. § 50.91(a)(6), which allows the hearing to be held after the Staff's issuance of the license amendments. However, this regulatory provision does not relieve the agency of its responsibility to comply with NEPA. An adequate environmental review still must precede the licensing decision, and I agree with the Board that it did not.

The Board found that the Staff's environmental assessment (EA) was inadequate and it identified a litany of deficiencies. Here is a sampling of the Board's conclusions about the EA upon which the Staff based its finding of no significant impact (FONSI):

- “Such a Rube Goldberg attempt at incorporation by reference disregards the clearly prescribed methods for incorporation, and ultimately, vitiates the underlying purpose of NEPA.”<sup>2</sup>
- “It is difficult to comprehend how the NRC Staff could deem this dramatic increase [in aquifer withdrawals] to have no practical environmental significance.”<sup>3</sup>
- “within the four corners of the 2014 EA there is no evaluation of groundwater impacts. . . . The 2014 EA provides no technical analysis that would justify either of these conclusions [about impacts on groundwater resources], nor does the 2014 EA even acknowledge the potential migration of hypersaline water from the unlined cooling canal system into the groundwater beneath the canals. Consequently, the 2014 EA does not satisfy the ‘hard look’ standard required under NEPA with respect to groundwater resources.”<sup>4</sup>
- “nowhere is there any characterization of the summer 2014 temperatures

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<sup>1</sup> *Strata Energy, Inc.* (Ross In Situ Uranium Recovery Project), CLI-16-13, 83 NRC 566, 604 (2016) (citing *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 349 (1989)), *appeal docketed*, No. 16-1298 (D.C. Cir. Aug. 24, 2016).

<sup>2</sup> LBP-16-8, 83 NRC at 433.

<sup>3</sup> *Id.* at 440.

<sup>4</sup> *Id.* at 441.

as being unique, much less is there any explanation to justify such a characterization.”<sup>5</sup>

- “the cumulative effects analysis section of the 2014 EA fails because, after noting the likelihood of higher salinity, it offers no analysis of how this might impact the preexisting saltwater plume.”<sup>6</sup>
- “By failing to review and discuss the full consequences of the state-mandated mitigation measures on which the NRC Staff relied, the NRC Staff abdicated this core NEPA responsibility. Because of these glaring absences, the 2014 EA failed to take an adequate ‘hard look’ and is deficient.”<sup>7</sup>

In my view, a FONSI cannot be based on such an inadequate EA. The information gleaned during the Board’s hearing process is valuable, but it cannot resuscitate the flawed EA or the licensing decision that was made in reliance on that NEPA analysis.

As the Commission has observed many times, NEPA is a procedural statute.<sup>8</sup> It establishes a process to ensure that, when an agency makes a decision that could affect the environment, that decision is informed by a meaningful evaluation of the expected environmental impacts. A basic premise of the statute is that informed decisionmaking will help protect the environment by forcing agencies to consider the consequences of potential actions and alternatives that could be less environmentally damaging. That commonsense approach simply does not work if the agency decision precedes the environmental review. Here, the true environmental review occurred during the thorough Board hearing held 17 months after the Staff issued the license amendments. If we take NEPA’s dictates seriously (and we must), we cannot avoid the conclusion that the statute was violated in these circumstances.

In federal court, a violation of NEPA, by itself, is not always sufficient to justify suspending or revoking a licensing action.<sup>9</sup> But the Commission is not a federal court. We have an independent responsibility to ensure that the agency

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<sup>5</sup> *Id.* at 443.

<sup>6</sup> *Id.* at 444.

<sup>7</sup> *Id.* at 446-47.

<sup>8</sup> See, e.g., *Entergy Nuclear Operations, Inc.* (Indian Point, Units 2 and 3), CLI-11-14, 74 NRC 801, 813 (2011).

<sup>9</sup> *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); *Cry. 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).

we lead complies with NEPA. We should take this opportunity to refine our jurisprudence to prevent post-decision supplementation of NEPA analyses.<sup>10</sup>

For these reasons, I respectfully dissent. The Commission should review the merits of the Board's decision under section 2.341(b)(4)(v), on the ground that such consideration is deemed to be in the public interest. The Commission should then uphold the Board's determination that the Staff's EA was inadequate and hold that the Board cannot supplement a NEPA environmental document through the hearing process after a licensing action is taken under 10 C.F.R. § 50.91(a)(6). The Commission should vacate the license amendments and the Staff's FONSI, upon which the amendments rely. In order to re-issue the license amendments, the Staff would need to determine whether it can issue a FONSI in light of all of the relevant environmental information, including all information in the record of this adjudicatory proceeding.

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<sup>10</sup>This approach would not require completing the hearing before making a licensing decision, and it would not change Commission jurisprudence allowing for supplementation of the environmental record before a licensing action is taken. Rather, if a licensing decision is based on an environmental document that the Board or Commission later finds to be deficient, then I would hold that supplementation of the NEPA analysis with the hearing record is not available as an option to cure the deficiency.

UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

**COMMISSIONERS:**

**Stephen G. Burns**, Chairman  
**Kristine L. Svinicki**  
**Jeff Baran**

**In the Matter of**

**Docket Nos. 52-018-COL  
52-019-COL**

**DUKE ENERGY CAROLINAS, LLC  
(William States Lee III Nuclear  
Station, Units 1 and 2)**

**December 15, 2016**

**MANDATORY HEARINGS**

Issues resolved in the AP1000 design certification rulemaking are closed and will not be revisited here, unless they are the subject of a departure or exemption.

**MANDATORY HEARINGS**

Section 189a. of the Atomic Energy Act of 1954, as amended (AEA), requires that the Commission hold a hearing on each application to construct a nuclear power plant, regardless of whether an interested member of the public requests a hearing on the application.

**MANDATORY HEARINGS, SAFETY ISSUES**

With respect to safety matters, the Commission must determine whether: (1) the applicable standards and requirements of the Atomic Energy Act and the Commission's regulations have been met; (2) any required notifications to other agencies or bodies have been duly made; (3) there is reasonable assurance that the facility will be constructed and will operate in conformity with the licenses, the provisions of the Atomic Energy Act, and the Commission's regulations; (4)

the applicant is technically and financially qualified to engage in the activities authorized by the licenses; and (5) issuance of the licenses will not be inimical to the common defense and security or to the health and safety of the public.

#### **MANDATORY HEARINGS, NATIONAL ENVIRONMENTAL POLICY ACT**

With respect to environmental matters, the Commission must consider and determine: (1) whether the requirements of NEPA section 102(2)(A), (C), and (E), and the applicable regulations in 10 C.F.R. Part 51 (the NRC regulations implementing NEPA), have been met; (2) the final balance among conflicting factors contained in the record of the proceeding with a view to determining the appropriate action to be taken; after weighing the environmental, economic, technical, and other benefits against environmental and other costs, and considering reasonable alternatives, whether the combined license should be issued, denied, or appropriately conditioned to protect environmental values; and (4) whether the NEPA review conducted by the Staff has been adequate.

#### **MANDATORY HEARINGS**

The Commission's inquiry is whether the Staff's review was sufficient to support the findings.

#### **MANDATORY HEARINGS**

All safety and environmental matters relevant to the combined license application, except those resolved in the contested proceeding, are subject to the Commission's review in the uncontested proceeding.

#### **EMERGENCY OPERATIONS FACILITY**

Among other things, an applicant's emergency plan must make provisions for an EOF from which effective direction can be given and effective control can be exercised during an emergency.

#### **EMERGENCY OPERATIONS FACILITY**

The Commission's express approval is required where an applicant or licensee proposes to locate the EOF more than twenty-five miles from the nuclear power plant site.

### **EMERGENCY OPERATIONS FACILITY**

Additionally, for EOFs located more than twenty-five miles from a nuclear power plant site, “provisions must be made for locating NRC and offsite responders closer to the nuclear power [plant] site so that NRC and offsite responders can interact face-to-face with emergency response personnel entering and leaving the . . . site.” These provisions must include adequate space and supplies for NRC and offsite responders to function effectively during an emergency.

### **NATIONAL ENVIRONMENTAL POLICY ACT**

NEPA section 102(2)(A) requires agencies to use “a systematic, interdisciplinary approach which will insure the integrated use of the natural and social sciences and the environmental design arts” in decision-making that may impact the environment.

### **NATIONAL ENVIRONMENTAL POLICY ACT**

NEPA section 102(2)(E) calls for agencies to study, develop, and describe appropriate alternatives.

### **NATIONAL ENVIRONMENTAL POLICY ACT**

NEPA section 102(2)(C) requires agencies to assess the relationship between local short-term uses and long-term productivity of the environment, to consider alternatives, and to describe the unavoidable adverse environmental impacts and the irreversible and irretrievable commitments of resources associated with the proposed action.

## **MEMORANDUM AND ORDER**

On October 5, 2016, we held a hearing on the combined license (COL) application of Duke Energy Carolinas, LLC to construct and operate two new nuclear reactors in Cherokee County, South Carolina. In this uncontested proceeding, we consider whether the review of the application by the NRC Staff has been adequate to support the findings set forth in 10 C.F.R. §§ 52.97(a) and 51.107(a). As discussed below, we conclude that the Staff’s review was sufficient to support the regulatory findings, and we authorize issuance of the combined licenses.

## I. BACKGROUND

### A. Proposed Action

In December 2007, Duke applied to build two Advanced Passive 1000 (AP-1000) reactors on the William States Lee III Nuclear Station site in Cherokee County, South Carolina. Consistent with 10 C.F.R. Part 52, Appendix D, Duke's application references the AP1000 certified design, as amended in design control document (DCD) Revision 19.<sup>1</sup> Issues resolved in the AP1000 design certification rulemaking are closed and will not be revisited here, unless they are the subject of a departure or exemption. The Staff accepted the application for review in February 2008.<sup>2</sup>

The Staff followed the design-centered review approach, under which the Staff performs one technical review for each standard issue outside the DCD. Under this approach, the first combined license application for a given design is designated the "reference COL" application (RCOLA) and later applications referencing the same design are designated "subsequent COL" applications (SCOLA). Where the Staff has already resolved an issue with respect to the RCOLA, the Staff's review of the same issue in an SCOLA consists of confirming that the information is identical in both applications. The application for Vogtle Electric Generating Plant, Units 3 and 4 was designated as the RCOLA for the AP1000 design; the Lee combined license application is therefore considered an SCOLA, with a correspondingly limited review.<sup>3</sup>

Over the past eight years, the Staff has spent approximately 67,000 hours on the safety and environmental reviews of the application.<sup>4</sup> During this time, the Staff conducted several public meetings and teleconferences.<sup>5</sup> Duke responded to approximately 950 Staff requests for additional information, 700 of which

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<sup>1</sup> See Ex. NRC-011A, William States Lee III Nuclear Station Units 1 and 2, COL Application — Part 2, Final Safety Analysis Report, rev. 11 (Apr. 2016), at 1.1-1 (ADAMS Accession No. ML16124A665 (package)) (FSAR); see also Westinghouse AP1000 Design Control Document, rev. 19 (June 13, 2011) (ML11171A287 (package)) (AP1000 DCD). The Revision 19 design was certified in 10 C.F.R. Part 52, Appendix D, "Design Certification Rule for the AP1000 Design."

<sup>2</sup> Duke Energy; Acceptance for Docketing of an Application for [Combined Licenses] for William States Lee III Units 1 and 2, 73 Fed. Reg. 11,156, 11,156 (Feb. 29, 2008).

<sup>3</sup> See Ex. NRC-001, "Staff Statement in Support of the Uncontested Hearing for Issuance of Combined Licenses for the William States Lee III Nuclear Station Units 1 and 2 (Docket Nos. 52-018 and 52-019)," Commission Paper SECY-16-0094 (Aug. 8, 2016), at 4 (ML16123A064) (Staff Information Paper).

<sup>4</sup> Tr. at 51-52 (Ms. Ordaz).

<sup>5</sup> See Ex. NRC-001, Staff Information Paper, at 5; Tr. at 52 (Ms. Ordaz).

were associated with the safety review and 250 of which were associated with the environmental review.<sup>6</sup>

The Office of New Reactors led the Staff's technical review, with support from across the agency.<sup>7</sup> Because building on the proposed site will require permits from the U.S. Army Corps of Engineers (Corps), the Corps participated in preparing the Final Environmental Impact Statement (Final EIS) as a cooperating agency.<sup>8</sup> In addition, the Staff consulted with federal, state, local, and tribal organizations and governments concerning a variety of issues, including those arising under the National Environmental Policy Act of 1969 (NEPA), the National Historic Preservation Act (NHPA), and the Endangered Species Act.<sup>9</sup> The Advisory Committee on Reactor Safeguards (ACRS), a committee of technical experts advising the Commission, provided an independent assessment of the safety aspects of Duke's application.<sup>10</sup>

Duke's application does not reference an early site permit.<sup>11</sup> Therefore, all site characteristics, including site geology, hydrology, seismology, and man-made hazards, as well as the potential environmental impacts of the project, were considered during the review of the combined license application.

## **B. Review Standards**

Section 189a. of the Atomic Energy Act of 1954, as amended (AEA), requires that we hold a hearing on each application to construct a nuclear power plant, regardless of whether an interested member of the public requests a hearing on the application.<sup>12</sup> With respect to safety matters, we must determine whether:

- (1) the applicable standards and requirements of the AEA and the Commission's regulations have been met;

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<sup>6</sup> Tr. at 52 (Ms. Ordaz).

<sup>7</sup> *Id.* at 52-53 (Ms. Ordaz).

<sup>8</sup> Ex. NRC-010, "Final Environmental Impact Statement for Combined Licenses (COLs) for William States Lee III Nuclear Station Units 1 and 2," NUREG-2111, vols. 1-3 (Dec. 2013), at xxxi to xxxii (ML16281A350) (Final EIS); Tr. at 59 (Mr. Lee).

<sup>9</sup> Tr. at 60 (Mr. Lee); Ex. NRC-001, Staff Information Paper, at 6.

<sup>10</sup> AEA § 182b., 42 U.S.C. § 2232(b); 10 C.F.R. §§ 1.13, 52.87; *see* Letter from John W. Stetkar, Chairman, ACRS, to Stephen G. Burns, Chairman, NRC (Dec. 14, 2015), at 5 (ML15348A196) (2015 ACRS Letter) (generally recommending approval of the combined license application); Letter from Dennis C. Bley, Chairman, ACRS, to Stephen G. Burns, Chairman, NRC (Apr. 18, 2016) (ML16102A149) (2016 ACRS Letter). In 2016, the ACRS recommended the approval of five departures from the AP1000 design and associated exemption requests, which are discussed in more detail below. 2016 ACRS Letter at 1-2.

<sup>11</sup> *See* 10 C.F.R. pt. 52, subpt. A, "Early Site Permits" (describing the process for obtaining and the effect of early site permits).

<sup>12</sup> AEA § 189a., 42 U.S.C. § 2239(a).

- (2) any required notifications to other agencies or bodies have been duly made;
- (3) there is reasonable assurance that the facility will be constructed and will operate in conformity with the licenses, the provisions of the AEA, and the Commission's regulations;
- (4) the applicant is technically and financially qualified to engage in the activities authorized by the licenses; and
- (5) issuance of the licenses will not be inimical to the common defense and security or to the health and safety of the public.<sup>13</sup>

With respect to environmental matters, we must:

- (1) determine whether the requirements of NEPA section 102(2)(A), (C), and (E), and the applicable regulations in 10 C.F.R. Part 51 (the NRC regulations implementing NEPA) have been met;
- (2) independently consider the final balance among conflicting factors contained in the record of the proceeding with a view to determining the appropriate action to be taken;
- (3) determine, after weighing the environmental, economic, technical, and other benefits against environmental and other costs, and considering reasonable alternatives, whether the combined licenses should be issued, denied, or appropriately conditioned to protect environmental values; and
- (4) determine whether the NEPA review conducted by the NRC Staff has been adequate.<sup>14</sup>

With the exception of one issue for which, as discussed in more detail below, we must provide our express approval, we do not review Duke's application *de novo*; rather, our inquiry is whether the Staff's review was sufficient to support these findings.<sup>15</sup>

### **C. Contested Proceeding**

After the Staff accepted the application for review, it provided an opportunity

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<sup>13</sup> 10 C.F.R. § 52.97(a).

<sup>14</sup> *Id.* § 51.107(a).

<sup>15</sup> *See, e.g., DTE Electric Co.* (Fermi Nuclear Power Plant, Unit 3), CLI-15-13, 81 NRC 555, 560-61 (2015).

to challenge the application in an adjudicatory hearing.<sup>16</sup> The Blue Ridge Environmental Defense League (BREDL) filed a petition to intervene with eleven proposed contentions.<sup>17</sup> The South Carolina Office of Regulatory Staff and the North Carolina Utilities Commission filed requests to participate as interested government entities.<sup>18</sup>

The Atomic Safety and Licensing Board, which was established to preside over the contested proceeding, found all of BREDL's contentions inadmissible, denied the hearing request, and therefore denied as moot the participation requests of the two government entities.<sup>19</sup> The Board, however, referred to us its dismissal of BREDL's Contention 2 in keeping with the Board's approach in the *Bellefonte* combined license proceeding, which had referred the dismissal of a substantively similar contention in that proceeding.<sup>20</sup> Contention 2 pertained to the consideration of greenhouse gas emissions from the construction and operation of the new units.<sup>21</sup>

We declined review of the referred rulings.<sup>22</sup> But in so doing, we observed that the Boards in this case and in *Bellefonte* had raised a general policy question concerning the consideration of greenhouse gas and carbon footprint impacts in environmental reviews for power plants.<sup>23</sup> We stated our expectation that environmental reviews for major licensing actions would include the consideration of carbon dioxide and other greenhouse gas emissions and that reviews of reactor applications, like the combined license application at issue here, should

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<sup>16</sup> Duke Energy; Notice of Hearing and Opportunity to Petition for Leave to Intervene and Order Imposing Procedures for Access to Sensitive Unclassified Non-Safeguards Information and Safeguards Information for Contention Preparation on [Combined Licenses] for the William States Lee III Units 1 and 2, 73 Fed. Reg. 22,978 (Apr. 28, 2008).

<sup>17</sup> Petition for Intervention and Request for Hearing by the Blue Ridge Environmental Defense League (June 27, 2008) (Petition). BREDL's proposed contentions were numbered 1-10, but one contention contained two separate parts.

<sup>18</sup> Request of the South Carolina Office of Regulatory Staff for an Opportunity to Participate in any Hearing and to Be Added to the Official Service List (June 27, 2008); Request of the North Carolina Utilities Commission for an Opportunity to Participate in any Hearing and to Be Added to the Official Service List (July 28, 2008).

<sup>19</sup> LBP-08-17, 68 NRC 431, 458 (2008).

<sup>20</sup> *Id.* at 445 (citing *Tennessee Valley Authority* (Bellefonte Nuclear Power Plant, Units 3 and 4), LBP-08-16, 68 NRC 361, 419-20 (2008)).

<sup>21</sup> See Petition at 11-14.

<sup>22</sup> *Duke Energy Carolinas, LLC* (William States Lee III Nuclear Station, Units 1 and 2), CLI-09-21, 70 NRC 927, 930 (2009). BREDL did not appeal the Board's ruling denying its hearing request.

<sup>23</sup> *Id.*

encompass emissions from construction, operation, and the uranium fuel cycle.<sup>24</sup> The Staff's Final EIS discusses greenhouse gas emissions.<sup>25</sup>

During the pendency of the referred ruling on Contention 2, BREDL filed a new contention with the Board that challenged the agency's 2008 Proposed Waste Confidence Decision and Proposed Temporary Storage Rule.<sup>26</sup> The Board dismissed the contention and found that jurisdiction to review it did not rest with the Board.<sup>27</sup> BREDL did not seek our review; nor did BREDL refile the contention.

In April 2011, BREDL joined several petitioners across multiple dockets in the filing of a petition to suspend final reactor licensing and rulemaking decisions and for other relief in light of the March 2011 Fukushima Dai-ichi accident.<sup>28</sup> We declined to suspend the proceedings, but we granted the request for a safety analysis of the accident based on the agency's plans for a short-term and long-term lessons-learned review, and we referred portions of the petition relating to pending certified design applications, including the AP1000 amendment, to the Staff as comments on the then-pending design certification rulemaking.<sup>29</sup>

Later that year, BREDL joined petitioners from other dockets to file a new contention asserting that the completed lessons-learned report of the Fukushima Near-Term Task Force had raised new and significant information that must be considered in the pending licensing proceedings.<sup>30</sup> A Board tasked specifically with ruling on these contentions found the filings premature and denied them

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<sup>24</sup> *Id.* at 930-31.

<sup>25</sup> See Ex. NRC-010, Final EIS at 4-113, 5-66 to 5-67, 6-10, 7-41 to 7-42, app. J.

<sup>26</sup> New Contention Eleven (Mar. 9, 2009; served Mar. 10, 2009). See generally Waste Confidence Decision Update, 73 Fed. Reg. 59,551 (Oct. 9, 2008); Proposed Rule, Consideration of Environmental Impacts of Temporary Storage of Spent Fuel after Cessation of Reactor Operation, 73 Fed. Reg. 59,547 (Oct. 9, 2008).

<sup>27</sup> Licensing Board Memorandum and Order (Regarding BREDL's New Contention Eleven) (Apr. 29, 2009), at 4-5 (unpublished). (The Board's jurisdiction ended when the Board denied BREDL's hearing request.)

<sup>28</sup> Emergency Petition to Suspend all Pending Reactor Licensing Decisions and Related Rulemaking Decisions Pending Investigation of Lessons Learned from Fukushima Daiichi Nuclear Power Station Accident (Apr. 18, 2011).

<sup>29</sup> *Union Electric Co. d/b/a Ameren Missouri* (Callaway Plant, Unit 2), CLI-11-5, 74 NRC 141, 175-76 (2011). The Staff responded to these comments in the Statement of Considerations for the final rule. See Final Rule, AP1000 Design Certification Amendment, 76 Fed. Reg. 82,079, 82,081 (Dec. 30, 2011); "NRC Responses to Public Comments, Final Rule: Amendment to AP1000 Design Certification Rule, 10 CFR Part 52, Appendix D" (Dec. 2011), at 9 n.1 (ML113480018).

<sup>30</sup> Motion to Admit New Contention Regarding the Safety and Environmental Implications of the Nuclear Regulatory Commission Task Force Report on the Fukushima Dai-ichi Accident (Aug. 11, 2011); Contention Regarding NEPA Requirement to Address Safety and Environmental Implications of the Fukushima Task Force Report (Aug. 11, 2011).

on that basis.<sup>31</sup> BREDL appealed, but we found that BREDL had not raised a substantial question to warrant our review.<sup>32</sup>

A new round of litigation commenced in 2012 in response to the D.C. Circuit's vacatur and remand of the agency's Waste Confidence Decision Update and Temporary Storage Rule.<sup>33</sup> BREDL and several other petitioners sought to suspend pending licensing decisions, among other requested relief, until the agency completed action on the court's remand.<sup>34</sup> About a month later, BREDL filed a motion to reopen the proceeding to admit a contention challenging Duke's Environmental Report in light of the court's decision.<sup>35</sup> We granted the petitions in part — we suspended final licensing decisions until the court's remand was appropriately addressed and held any related contentions, including BREDL's proposed contention in this matter, in abeyance until further order.<sup>36</sup>

We lifted the suspension on final licensing decisions after we approved a generic environmental impact statement (GEIS) and final Continued Storage Rule that addressed the issues in the D.C. Circuit's remand.<sup>37</sup> We dismissed

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<sup>31</sup> *PPL Bell Bend, LLC* (Bell Bend Nuclear Power Plant), LBP-11-27, 74 NRC 591, 595, 603 (2011).

<sup>32</sup> *Luminant Generation Co., LLC* (Comanche Peak Nuclear Power Plant, Units 3 and 4), CLI-12-7, 75 NRC 379, 389, 392 (2012). A few months after the Board's dismissal of the new Fukushima-related contentions as premature, BREDL and a subset of the other petitioners filed motions to reinstate their contentions based on a Commission tasking memorandum that directed the Staff to implement some of the recommendations of the Near-Term Task Force. Motion to Reinstate and Supplement the Basis for Fukushima Task Force Report Contention (Oct. 28, 2011), at 1-2 (citing Staff Requirements — SECY-11-0124 — Recommended Actions to Be Taken without Delay from the Near-Term Task Force Report (Oct. 18, 2011) (ML112911571)). The Board denied the motions for lack of jurisdiction: the Board found that the reinstatement motions were not included in the referral from the Secretary of the Commission or in the associated assignment from the Chief Administrative Judge. *Luminant Generation Co., LLC* (Comanche Peak Nuclear Power Plant, Units 3 and 4), LBP-11-36, 74 NRC 768, 772-73 (2011). We acknowledged the Board's ruling when we denied the petition for review. CLI-12-7, 75 NRC at 386-87 n.23.

<sup>33</sup> See generally *New York v. NRC*, 681 F.3d 471 (D.C. Cir. 2012); Final Rule, Consideration of Environmental Impacts of Temporary Storage of Spent Fuel After Cessation of Reactor Operation, 75 Fed. Reg. 81,032 (Dec. 23, 2010); Waste Confidence Decision Update, 75 Fed. Reg. 81,037 (Dec. 23, 2010).

<sup>34</sup> Petition to Suspend Final Decisions in all Pending Reactor Licensing Proceedings Pending Completion of Remanded Waste Confidence Proceedings (June 18, 2012).

<sup>35</sup> Motion to Reopen the Record for William States Lee III Units 1 and 2 (July 9, 2012); Intervenors' Motion for Leave to File a New Contention Concerning Temporary Storage and Ultimate Disposal of Nuclear Waste at William States Lee III Units 1 and 2 (July 9, 2012).

<sup>36</sup> *Calvert Cliffs 3 Nuclear Project, LLC and UniStar Nuclear Operating Services, LLC* (Calvert Cliffs Nuclear Power Plant, Unit 3), CLI-12-16, 76 NRC 63, 67-69 (2012).

<sup>37</sup> *Calvert Cliffs 3 Nuclear Project, LLC and UniStar Nuclear Operating Services, LLC* (Calvert Cliffs Nuclear Power Plant, Unit 3), CLI-14-8, 80 NRC 71, 74-75 (2014). See generally Final Rule,

(Continued)

BREDL’s proposed contention as a challenge to the new rule.<sup>38</sup> BREDL thereafter joined another multi-docket suspension petition with a proposed new contention that challenged the Continued Storage Rule’s lack of safety findings, later followed by a motion to supplement the Lee Final EIS to cross-reference the Continued Storage Rule and GEIS and a motion to lodge an associated “placeholder” contention.<sup>39</sup> We denied the petitions and motions.<sup>40</sup> All contested issues in this proceeding have now been resolved.

#### **D. Uncontested Proceeding**

All safety and environmental matters relevant to the combined license application, except those resolved in the contested proceeding, are subject to our review in the uncontested proceeding.<sup>41</sup> The uncontested portion of the proceeding begins once the Staff has completed both its environmental and safety reviews. Here, the Final EIS was completed in 2013, therefore the release of the Final Safety Evaluation Report (FSER) on August 1, 2016, triggered the uncontested proceeding.<sup>42</sup> Shortly after the FSER was released, we received the Staff’s

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Continued Storage of Spent Nuclear Fuel, 79 Fed. Reg. 56,238 (Sept. 19, 2014); Generic Environmental Impact Statement for Continued Storage of Spent Nuclear Fuel, 79 Fed. Reg. 56,263 (Sept. 19, 2014); “Generic Environmental Impact Statement for Continued Storage of Spent Nuclear Fuel,” NUREG-2157 (Aug. 2014) (ML14188B749).

<sup>38</sup> *Calvert Cliffs*, CLI-14-8, 80 NRC at 81.

<sup>39</sup> Petition to Suspend Final Decisions in all Pending Reactor Licensing Proceedings Pending Issuance of Waste Confidence Safety Findings (Sept. 29, 2014; errata filed Oct. 1, 2014); Petitioner’s Motion for Leave to File a New Contention Concerning the Absence of Required Waste Confidence Safety Findings in the Licensing Proceeding at William States Lee III Nuclear Power Plant (Sept. 29, 2014); Motion to Reopen the Record for William States Lee III Nuclear Power Plant (Sept. 29, 2014); Petition to Supplement Reactor-Specific Environmental Impact Statements to Incorporate by Reference the Generic Environmental Impact Statement for Continued Spent Fuel Storage (Jan. 28, 2015); Blue Ridge Environmental Defense League’s Hearing Request and Petition to Intervene in Combined License Proceeding for W.S. Lee Nuclear Power Plant (Apr. 22, 2015); Blue Ridge Environmental Defense League’s Motion to Reopen the Record of Combined License Proceeding for W.S. Lee Nuclear Power Plant (Apr. 22, 2015).

<sup>40</sup> *Duke Energy Carolinas, LLC* (William States Lee III Nuclear Station, Units 1 and 2), CLI-15-15, 81 NRC 803, 804-05 (2015); *DTE Electric Co.* (Fermi Nuclear Power Plant, Unit 3), CLI-15-10, 81 NRC 535, 544 (2015); *DTE Electric Co.* (Fermi Nuclear Power Plant, Unit 3), CLI-15-4, 81 NRC 221, 242 (2015). Several petitioners sought review of the Continued Storage Rule and GEIS in the D.C. Circuit. The court denied the petitions for review, and a subset of petitioners, including BREDL, filed a petition for rehearing *en banc* that was also denied. *New York v. NRC*, 824 F.3d 1012 (D.C. Cir. 2016); Petition for Rehearing En Banc at 1 n.1, *New York v. NRC*, No. 14-1210 (D.C. Cir. July 18, 2016); *New York v. NRC*, No. 14-1210 (D.C. Cir. Aug. 8, 2016) (order denying petition for rehearing *en banc*).

<sup>41</sup> See, e.g., *Fermi*, CLI-15-13, 81 NRC at 564-65.

<sup>42</sup> See Ex. NRC-009-R, “Final Safety Evaluation Report for Combined Licenses for William States  
(Continued)

statement in support of the uncontested hearing, which serves as the Staff's initial testimony and provides an overview of its safety and environmental review of the application.<sup>43</sup> Consistent with the design-centered review approach, the Staff's paper focused on "non-routine matters, such as unique features of the facility or novel issues that arose as part of the review process."<sup>44</sup>

### ***1. Pre-Hearing Activities***

We issued a Notice of Hearing on August 10, 2016, which set a schedule for pre-hearing filings.<sup>45</sup> We also invited interested states, local government bodies, and federally recognized Indian tribes to provide a statement of issues for us to consider as part of the uncontested proceeding.<sup>46</sup> We received comments from the Attorney General of the State of South Carolina, the Secretary of Environmental Quality for the State of North Carolina, and the Tribal Historic Preservation Office for the Eastern Band of the Cherokee Indians.<sup>47</sup> The letter from South Carolina expressed support for the proposed Lee Nuclear Station.<sup>48</sup> The letter from North Carolina expressed support for nuclear power and suggested that a larger region of interest for the consideration of alternative sites

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Lee III Nuclear Station Units 1 and 2" (Aug. 2016) (ML16281A330) (FSER). A portion of the FSER is non-public and was admitted into the record as NRC-009A.

<sup>43</sup> Ex. NRC-001, Staff Information Paper.

<sup>44</sup> *Id.* at 2.

<sup>45</sup> Duke Energy Carolinas, LLC; William States Lee III Nuclear Station, Units 1 and 2, 81 Fed. Reg. 54,622, 54,623 (Aug. 16, 2016) (Notice of Hearing); *see also* DEC-001, Applicant's Pre-Filed Testimony in Support of the Mandatory Hearing for the William States Lee III Nuclear Station, Units 1 and 2 Combined Licenses (Sept. 28, 2016) (Duke Pre-Filed Testimony); Ex. DEC-002, Curriculum Vitae of Robert H. Kitchen (Sept. 28, 2016).

<sup>46</sup> Notice of Hearing, 81 Fed. Reg. at 54,623-24.

<sup>47</sup> Letter from Alan Wilson, Attorney General, State of South Carolina, to Annette L. Vietti-Cook, Secretary of the Commission (Aug. 26, 2016) (ML16245A223) (South Carolina); Letter from Donald R. van der Vaart, Secretary, North Carolina Department of Environmental Quality, to Annette L. Vietti-Cook, Secretary of the Commission, NRC (Aug. 25, 2016) (ML16245A222) (North Carolina); E-mail from Holly Austin, Federal Cultural Resource Law Liaison, Tribal Historic Preservation Office, Eastern Band of the Cherokee Indians, to Hearing Docket, NRC (Sept. 7, 2016 09:07 EDT) (ML16252A117) (Eastern Band of the Cherokee Indians). The South Carolina Public Service Commission sent a letter acknowledging the date of the hearing and our invitation to comment and indicated that information about the hearing had been shared with the Executive Director of the South Carolina Office of Regulatory Staff. Letter from Swain E. Whitfield, Chairman, South Carolina Public Service Commission, to Annette L. Vietti-Cook, Secretary of the Commission (Sept. 13, 2016) (ML16278A721).

<sup>48</sup> South Carolina at 1.

“may identify a more suitable location with closer proximity to load centers.”<sup>49</sup> The Eastern Band of the Cherokee Indians discussed the project in relation to consultation under the NHPA and indicated that the project “will not result in any ground disturbing activities which might adversely affect any cultural resources or archaeological sites significant to the Cherokee people.”<sup>50</sup> The Tribe requested, however, that if plans change or if cultural resources or human remains are discovered, work on the project should cease and consultation under the NHPA should continue with the Tribe.<sup>51</sup>

Also as part of our pre-hearing activities we issued questions to both the Staff and Duke and directed they file written responses before the hearing.<sup>52</sup> The questions ranged in topic from the safety-related issues of fire protection, emergency preparedness, and characteristics of the Lee site, to environmental issues that included the Staff’s consideration of potentially new and significant information since issuance of the Final EIS, environmental impacts on terrestrial and aquatic resources, the Staff’s interaction with other federal agencies, and the consideration of impacts from greenhouse gases.<sup>53</sup> The Secretary of the Commission transmitted a scheduling note to the Staff and Duke that provided the topics for, and the order of presentations at, the hearing.<sup>54</sup>

## 2. *The Hearing*

The hearing presentations were made by witness panels. The first panel of witnesses for Duke and the Staff gave an overview of the license application and the Staff’s review, respectively. The second panel focused on safety-related issues, and the third panel focused on environmental issues. Overall, the Staff made available seventy-six witnesses at the hearing, including scheduled pan-

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<sup>49</sup> North Carolina at 1; *see infra* notes 219-37 and accompanying text (discussing the consideration of alternative sites).

<sup>50</sup> Eastern Band of Cherokee Indians at 1.

<sup>51</sup> *Id.*; *see infra* notes 245-47 and accompanying text (discussing Duke’s obligations in the event cultural or historic resources are inadvertently discovered).

<sup>52</sup> Order of the Secretary (Transmitting Pre-Hearing Questions) (Sept. 1, 2016) (unpublished) (Pre-Hearing Questions Order); Ex. DEC-003, Duke Energy Carolinas’ Responses to Pre-Hearing Questions (Sept. 28, 2016) (Duke Pre-Hearing Responses); Ex. NRC-007, NRC Staff Responses to Commission Pre-Hearing Questions (Sept. 28, 2016) (Staff Pre-Hearing Responses). We also issued two questions that contain sensitive unclassified non-safeguards information and that therefore were filed on the non-public docket for the proceeding. The parties’ responses to those questions were likewise filed on the non-public docket.

<sup>53</sup> *See* Pre-Hearing Questions Order at 2-16.

<sup>54</sup> Scheduling Note, “Hearing on Combined Licenses for William States Lee III Nuclear Station, Units 1 and 2: Section 189a. of the Atomic Energy Act (Public Meeting)” (Sept. 21, 2016; revised Sept. 26, 2016) (ML16270A560).

elists.<sup>55</sup> Five witnesses offered testimony on behalf of Duke at the hearing and in pre-filed written testimony.<sup>56</sup>

Among other things, Duke's overview panelists discussed the general qualifications of Duke; the selection of the Lee site; and Duke's Integrated Resource Plan, including factors that would influence a future decision whether to build the new units.<sup>57</sup> Additionally, the Duke panelists provided information regarding the Lee site, including the fact that it had served as the site of the former Cherokee Nuclear Station, a project that received NRC construction permits in 1977 but was ultimately cancelled prior to completion.<sup>58</sup> The Staff panelists provided background on the review of the combined license application and a summary of the Staff's safety and environmental findings under 10 C.F.R. § 52.97(a), NEPA sections 102(2)(A), (C), and (E), and 10 C.F.R. § 51.107(a).<sup>59</sup>

The safety panel focused on two novel issues in the Staff's review: (1) a departure from the AP1000 certified design involving the site foundation response spectra; and (2) Duke's request to consolidate the Lee Emergency Operations Facility (EOF) with its existing Charlotte, North Carolina EOF for the McGuire, Catawba, and Oconee Nuclear Stations.<sup>60</sup> The environmental panel discussed Duke's proposal to build an offsite reservoir, Make-Up Pond C, to provide supplemental cooling for the new units, as well as the environmental impacts, the consideration of alternatives, and the proposed mitigation measures associated with that proposal.<sup>61</sup> These issues are discussed further in section II.

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<sup>55</sup> See Revised NRC Staff Witness List (Sept. 30, 2016). Fifteen of the listed witnesses did not appear at the hearing. *Compare id.*, attach. at 1-4, *with* Tr. at 14-16 (Ms. Wright).

<sup>56</sup> See Duke Energy Carolinas' Witness List (Sept. 14, 2016); Ex. DEC-001, Duke Pre-Filed Testimony; Tr. at 12 (Mr. Lewis).

<sup>57</sup> See Tr. at 19-37; Ex. DEC-005, Lee Nuclear Station — Overview (Sept. 28, 2016) (Duke Overview Presentation).

<sup>58</sup> See Tr. at 28-31 (Mr. Kitchen); Duke Power Co., Cherokee Nuclear Station, Units 1, 2 and 3, 43 Fed. Reg. 2022, 2022 (Jan. 13, 1978) (Notice of Issuance of Construction Permits).

<sup>59</sup> See Tr. at 50-65; NRC-012, Combined License Application Review William States Lee III Units 1 and 2, Overview Panel (Sept. 28, 2016) (Staff Overview Presentation).

<sup>60</sup> See Tr. at 84-96; Ex. DEC-006, Lee Nuclear Station — Safety Panel (Sept. 28, 2016) (Duke Safety Presentation); Ex. NRC-013, Combined License Application Review William States Lee III Units 1 and 2, Safety Panel (Sept. 28, 2016) (Staff Safety Presentation).

<sup>61</sup> See Tr. at 120-36; Ex. DEC-007, Lee Nuclear Station — Environmental (Sept. 28, 2016) (Duke Environmental Presentation); Ex. NRC-014-R, Combined License Application Review William States Lee III Units 1 and 2, Environmental Panel (Sept. 28, 2016) (Staff Environmental Presentation).

### 3. *Post-Hearing Activities*

After the hearing, we posed three additional questions to the Staff and Duke.<sup>62</sup> The parties' written responses were admitted as exhibits, and after adopting corrections to the hearing transcript, we closed the evidentiary record.<sup>63</sup>

## II. DISCUSSION

Although our review encompassed the entire application, we discuss here a brief selection of the safety and environmental topics addressed during the uncontested portion of the proceeding.

### A. Safety-Related Issues

#### 1. *The Lee Nuclear Station Site*

The Lee site sits near the border of North Carolina and South Carolina on the bank of the Broad River, approximately forty miles southwest of Charlotte, North Carolina and approximately twenty-five miles northeast of Spartanburg, South Carolina.<sup>64</sup> In the 1970s Duke Power Company selected the site to build the Cherokee Nuclear Station.<sup>65</sup> The NRC issued construction permits for the project, but it was cancelled a few years later.<sup>66</sup> Before the Cherokee project was terminated, however, considerable site preparation work had been done, including the installation of roads; the construction of reservoirs, including Make-Up Ponds A and B; and excavation of the power block and partial construction of Cherokee Unit 1.<sup>67</sup>

As part of its site investigation work for the Lee application, Duke removed several of the above-ground structures remaining from the Cherokee project and used a significant amount of this material for fill, as well as for stabilizing the

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<sup>62</sup> Order of the Secretary (Transmitting Post-Hearing Questions) (Oct. 12, 2016), at 2-3 (unpublished).

<sup>63</sup> Order of the Secretary (Adopting Proposed Transcript Corrections, Admitting Post-Hearing Exhibits, and Closing the Record of the Proceeding) (Nov. 4, 2016) (unpublished). The Staff subsequently notified us of minor revisions to the license conditions in 2.D(12), which we have taken into account. Revisions to Draft Combined Licenses (Dec. 7, 2016) (attaching table of revisions).

<sup>64</sup> Tr. at 26 (Mr. Kitchen); Ex. DEC-005, Duke Overview Presentation, at 2.

<sup>65</sup> Tr. at 28 (Mr. Kitchen); Ex. NRC-011A, FSAR at 2.1-2; Ex. NRC-010, Final EIS at 2-5.

<sup>66</sup> See Notice of Issuance of Construction Permits, 43 Fed. Reg. at 2022; *Duke Power Co.* (Cherokee Nuclear Station, Units 1, 2, and 3), ALAB-745, 18 NRC 746, 747 & n.1 (1983).

<sup>67</sup> Tr. at 28-29 (Mr. Kitchen); Ex. DEC-005, Duke Overview Presentation, at 4; EX. NRC-011A, FSAR at 2.1-2 to 2.1-3.

banks of the existing reservoirs.<sup>68</sup> Additionally, Duke verified the geologic mapping and investigation that had been done for the Cherokee project to ensure its applicability to Lee.<sup>69</sup> Duke confirmed that the Cherokee geologic mapping had been correctly documented and “confirmed that the Cherokee foundation concrete meets the strength requirements for the AP1000 in the certified design.”<sup>70</sup> Lee Unit 1 will be located on the foundation for what was to become Cherokee Unit 1.<sup>71</sup>

The Staff conducted a confirmatory analysis of Duke’s site investigation activities.<sup>72</sup> At the hearing, the Staff explained that it looked “carefully at the rejuvenation of the original [mapping]” and that it had the opportunity to ask questions of the individual who had led the mapping effort for the Cherokee project.<sup>73</sup> The Staff also visited the site to observe the orientation of particular geologic features relative to the proposed units.<sup>74</sup> Based on Duke’s site investigations and the Staff’s confirmatory analysis, the Staff “conclude[d] that the applicant properly characterized regional and site lithology, stratigraphy, geologic and tectonic history, and structural geology, as well as subsurface soil materials and rock units at [the Lee site].”<sup>75</sup>

Additional work must be completed to remove former Cherokee legacy structures. For example, a proposed license condition would require Duke to confirm that a particular legacy stormwater drain line and its associated bedding material (if any) have been removed and the excavation backfilled with compacted native soils.<sup>76</sup> In the FSAR, Duke assumed the removal and backfill of this drain line to curb a potential preferential groundwater flow pathway for radionuclide transport

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<sup>68</sup> Ex. DEC-005, Duke Overview Presentation, at 5-6; Tr. at 29-30 (Mr. Kitchen).

<sup>69</sup> Tr. at 30 (Mr. Kitchen); *see also, e.g.*, Ex. NRC-011A, FSAR § 2.5.1.2.5.5.

<sup>70</sup> Tr. at 30-31 (Mr. Kitchen).

<sup>71</sup> *Id.* at 30 (Mr. Kitchen); Ex. NRC-011A, FSAR at 2.5-206.

<sup>72</sup> *See* NRC-009-R, FSER § 2.5.1.4.

<sup>73</sup> Tr. at 106 (Dr. Stirewalt).

<sup>74</sup> *Id.* at 106-07 (Dr. Stirewalt); *see also* Ex. NRC-009-R, FSER at 2-238 (describing visits “between April 27 and May 2, 2008, [between] January 27 and 28, 2009, [between] July 12 to 14, 2011, and on February 10, 2014, to meet with the applicant regarding the geologic, seismic, geophysical, and geotechnical investigations conducted to characterize the site”). Technical experts from the U.S. Geological Survey accompanied the Staff on the January 2009 site visit. Ex. NRC-009-R, FSER at 2-238.

<sup>75</sup> Ex. NRC-009-R, FSER at 2-265. A proposed license condition in the draft license for Unit 2 would require Duke to perform mapping for that unit and inform the NRC once excavations for its safety-related structures are open for examination. Ex. NRC-003, Combined License, William States Lee III Nuclear Station Unit 2 (Sept. 9, 2016), at 15 (ML16281A338) (Draft Combined License — Unit 2); Tr. at 104-05.

<sup>76</sup> Ex. NRC-002, Combined License, William States Lee III Nuclear Station Unit 1 (Sept. 9, 2016), at 14 (ML16281A336) (Draft Combined License — Unit 1); Ex. NRC-003, Draft Combined License — Unit 2, at 14.

from a postulated accident.<sup>77</sup> The Staff proposed the license condition because the line's removal was the basis for finding Duke's analysis acceptable.<sup>78</sup> Additionally, Duke has committed to removing or modifying other legacy structures to prepare the nuclear island foundation for Lee Unit 1.<sup>79</sup> Specifically, "the isolation joint material between the legacy Cherokee reactor and auxiliary building basemats within the Lee Unit 1 Nuclear Island foundation support zone will be removed"; "the legacy Cherokee groundwater drainage system will be sealed with fill concrete where exposed by excavation"; and "protective sheathing and waterproofing membranes associated with the legacy Cherokee pit/pump rooms will be removed."<sup>80</sup>

## ***2. The Lee Nuclear Station Site Foundation Response Spectra***

With regard to seismic considerations, Duke explained that the site spectra for the Lee site were developed using the 2012 Central Eastern United States Seismic Source Characterization for Nuclear Facilities and the Electric Power Research Institute's 2013 Ground Motion Model.<sup>81</sup> The seismic design basis for the AP1000 standard plant is a Certified Seismic Design Response Spectra (CSDRS).<sup>82</sup> The AP1000 standard plant design also has been qualified for the Hard Rock High Frequency Spectra (HRHF Spectra) to address high-frequency spectra exceedances for hard rock sites in the Central and Eastern United States.<sup>83</sup> The Lee site is a uniform hard rock site.<sup>84</sup> When compared to the CSDRS and HRHF Spectra, the Lee site-specific vertical and horizontal foundation response

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<sup>77</sup> Ex. DEC-003, Duke Pre-Hearing Responses, at 16; Ex. NRC-011A, FSAR §§ 2.4.12.2.3, 2.4.13.

<sup>78</sup> Tr. at 103 (Mr. Hughes); Ex. NRC-007, Staff Pre-Hearing Responses, at 10. At the hearing, the Staff explained that the drain line removal was solely part of the hydrologic analysis; neither the removal of the drain line nor the removal of other legacy structures impacted the seismic analysis. Tr. at 104 (Mr. Hughes).

<sup>79</sup> See Ex. NRC-011A, FSAR § 2.5.4.5.2.1; Ex. DEC-003, Duke Pre-Hearing Responses, at 16-17.

<sup>80</sup> Ex. DEC-003, Duke Pre-Hearing Responses, at 16-17 (citing Ex. NRC-011A, FSAR § 2.5.4.5.2.1, figs. 2.5.4-244a to 2.5.4-244e, 2.5.4-266).

<sup>81</sup> Tr. at 85 (Mr. Thrasher).

<sup>82</sup> See AP1000 DCD, Tier 2 Material, at 3.7-1; Tr. at 84 (Mr. Thrasher).

<sup>83</sup> Tr. at 84 (Mr. Thrasher); AP1000 DCD, Tier 2 Material, at 3I-1.

<sup>84</sup> Tr. at 85 (Mr. Thrasher).

spectra exceed both the CSDRS and the HRHF Spectra in the high frequency range.<sup>85</sup> Accordingly, Duke has requested a departure from the AP1000 DCD.<sup>86</sup>

To justify this departure, a site-specific seismic evaluation was performed to demonstrate that the exceedance in the high frequency range is non-damaging and therefore acceptable.<sup>87</sup> The site-specific analysis used “the same general screening criteria documented in . . . Appendix 3I [of the AP1000 DCD] . . . to identify a representative sample of structures, components, supports, piping and equipment to evaluate . . . the acceptability of the AP1000 certified design for the Lee Nuclear Station [high frequency] motion.”<sup>88</sup> The “site-specific analysis include[d] evaluations of building structures, reactor pressure vessel internals, primary component supports, primary loop nozzles, piping[,] and electro-mechanical equipment.”<sup>89</sup> With regard to design forces and moments for structures and equipment, Duke stated that the analysis confirmed that the CSDRS bounds the Lee site-specific spectra results with significant margin.<sup>90</sup> Duke also stated that “CSDRS and HRHF piping stresses envelope the Lee site-specific spectra piping stresses,” and that “[t]est [r]esponse [s]pectra used to qualify AP1000 high-frequency sensitive equipment bound the required response spectra for the Lee site-specific equipment qualification.”<sup>91</sup> Duke concluded that “the high frequency seismic input for the Lee site is non-damaging and the Lee site is qualified for deployment of the AP1000 standard plant.”<sup>92</sup>

The Staff reviewed the site-specific analyses and Duke’s responses to requests for additional information and concluded that the AP1000 design “is adequate for use at the Lee site.”<sup>93</sup> The Staff thus found Duke’s requested departure

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<sup>85</sup> Tr. at 85-86 (Mr. Thrasher); DEC-001, Duke Pre-Filed Testimony, at 10; NRC-013, Staff Safety Presentation, at 5-6; NRC-011E, William States Lee III Nuclear Station Units 1 and 2 COL Application — Part 7 Departures and Exemption Requests, rev. 11 (Apr. 2016), at 9-10 (ML16124A093) (Departures and Exemptions).

<sup>86</sup> See Ex. NRC-011E, Departures and Exemptions, at 10-13; Ex. NRC-001, Staff Information Paper, at 21-22.

<sup>87</sup> Tr. at 91 (Mr. Roche-Rivera); see also *id.* at 85-86 (Mr. Thrasher); Ex. NRC-011E, Departures and Exemptions, at 10.

<sup>88</sup> Ex. NRC-011E, Departures and Exemptions, at 10; see AP1000 DCD, Tier 2 Material, app. 3I.

<sup>89</sup> Ex. NRC-011E, Departures and Exemptions, at 11.

<sup>90</sup> Tr. at 86 (Mr. Thrasher); see also Ex. NRC-011E, Departures and Exemptions, at 11.

<sup>91</sup> Tr. at 86 (Mr. Thrasher). The required response spectra “defines the response spectra or seismic demand for which equipment must remain functional during a Safe Shutdown Earthquake.” Ex. NRC-007, Staff Pre-Hearing Responses, at 9. Equipment qualification testing was performed in support of the entire fleet of AP1000s. See Ex. DEC-003, Duke Pre-Hearing Responses, at 15-16.

<sup>92</sup> Tr. at 86-87 (Mr. Thrasher).

<sup>93</sup> *Id.* at 93 (Mr. Roche-Rivera).

acceptable.<sup>94</sup> The ACRS reviewed the requested departure and determined that the “[s]ite seismic inputs . . . have been adequately addressed by [Duke] and the [S]taff.”<sup>95</sup> The ACRS recommended that the departure be approved.<sup>96</sup>

Duke committed to ensure “that future equipment qualification testing for high frequency sensitive equipment envelopes the [Lee] site-specific [required response spectra], in addition to the CSDRS and HRHF [required response spectra].”<sup>97</sup> We asked whether Duke or the Staff had considered imposing a license condition (as opposed to accepting a commitment) given the need for a departure from the design.<sup>98</sup> In response, the Staff and Duke noted, as mentioned above, that the test response spectra used in the AP1000 equipment qualification testing bound the Lee site-specific required response spectra.<sup>99</sup> The Staff also noted that “[t]here are system-based ITAAC that require the seismic Category I high frequency sensitive equipment to withstand seismic design basis loads without loss of safety function.”<sup>100</sup> According to the Staff, the ITAAC and the commitment together “provide reasonable assurance that the high frequency sensitive equipment will be qualified for the [Lee] site-specific [required response spectra].”<sup>101</sup> Additionally, the Staff pointed out that during operation, any replacement equipment must meet seismic suitability requirements in accordance with Duke’s Quality Assurance Program.<sup>102</sup> The Staff therefore concluded that a license condition in lieu of the FSAR commitment was not necessary.<sup>103</sup> Similarly, Duke “believes that the . . . FSAR commitment is the appropriate measure to ensure long-term attention to this aspect of equipment qualification for [Lee] Units 1 and 2.”<sup>104</sup>

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<sup>94</sup> *Id.* (Mr. Roche-Rivera); *see also* Ex. NRC-009-R, FSER § 3.7.2.4. With regard to the requirements in 10 C.F.R. Part 52 and Part 100 and siting issues more generally, the Staff “conclude[d] that the proposed . . . site is acceptable from the standpoint of geologic and seismic information and meets the requirements of 10 CFR 100.23 and 10 CFR 52.79(a)(1)(iii).” Ex. NRC-009-R, FSER at 2-265.

<sup>95</sup> 2015 ACRS Letter at 1.

<sup>96</sup> *Id.*

<sup>97</sup> Ex. DEC-003, Duke Pre-Hearing Responses, at 15 (citing Ex. NRC-011A, FSAR § 3.7.2.15, at 3.7-9).

<sup>98</sup> Pre-Hearing Questions Order at 5-6.

<sup>99</sup> Ex. DEC-003, Duke Pre-Hearing Responses, at 16; NRC-007, Staff Pre-Hearing Responses at 9.

<sup>100</sup> Ex. NRC-007, Staff Pre-Hearing Responses, at 9.

<sup>101</sup> *Id.*

<sup>102</sup> *Id.*

<sup>103</sup> *Id.*

<sup>104</sup> Ex. DEC-003, Duke Pre-Hearing Responses, at 16.

### 3. Exemptions and Departures from the AP1000 Certified Design

Duke requested seven exemptions and identified thirteen departures, including the departure regarding the Lee Nuclear Station site-specific foundation response spectra.<sup>105</sup> Duke explained at the hearing that its goal was to minimize the number of departures from the design while still recognizing that some changes were necessary to maintain standardization.<sup>106</sup>

Ten of Duke's identified departures are common to other combined license applications referencing the AP1000 certified design.<sup>107</sup> Five of these departures are identical to those proposed for the first time in the Levy Nuclear Plant combined license application, which also referenced the AP1000 certified design.<sup>108</sup> These departures concern the condensate return system and passive residual heat removal cooling; the main control room habitability dose analysis; heat load in the main control room; hydrogen control in containment; and the boron dilution block safety system bypass.<sup>109</sup> Because these departures require changes to AP1000 Tier 1 information and technical specifications, exemptions also are required for their approval.<sup>110</sup> Thus, five of Duke's seven exemption requests pertain to these departures.<sup>111</sup>

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<sup>105</sup> Ex. NRC-001, Staff Information Paper, at 13.

<sup>106</sup> Tr. at 44-45 (Mr. Kitchen).

<sup>107</sup> Ex. NRC-001, Staff Information Paper, at 13.

<sup>108</sup> *Id.*; see Ex. NRC-009-R, FSER, ch. 21; 2016 ACRS Letter. We recently authorized issuance of the combined licenses for Levy Nuclear Plant Units 1 and 2; the Staff issued the combined licenses on October 26, 2016. *Duke Energy Florida, LLC* (Levy County Nuclear Power Plant, Units 1 and 2), CLI-16-16, 84 NRC 66 (2016); Letter from Francis M. Akstulewicz, NRC, to Christopher M. Fallon, Duke Energy Florida (Oct. 26, 2016) (ML16176A200).

<sup>109</sup> See Ex. NRC-001, Staff Information Paper, at 15-17; Ex. NRC-011E, Departures and Exemptions, at 1; Ex. NRC-009-R, FSER § 1.2.3. The remaining five departures of the ten common to other AP1000 applications concern the organization and numbering of the FSAR; a regulatory citation in an interface description; revisions to the "Envir. Zone" numbers for spent fuel pool level instrumentation; quantification of the term "indefinitely" in the DCD for maintenance of safe shutdown conditions using the passive residual heat removal heat exchanger during a non-loss-of-coolant accident; and isolating current in Class 1E voltage regulating transformers. Ex. NRC-001, Staff Information Paper, at 18-19.

<sup>110</sup> Ex. NRC-001, Staff Information Paper, at 13-14.

<sup>111</sup> The remaining two exemption requests are similar to those previously granted to other combined license holders. The first relates to the organization and numbering of the combined license application. The second exempts the combined license holder from certain requirements pertaining to material control and accounting for special nuclear material, such that the same requirements apply to both Part 52 and Part 50 licensees. The Staff stated that its reasoning for finding the exemptions acceptable for the Lee application is the same as its reasoning for the previously approved exemption requests. *Id.* at 14-15; see also *Southern Nuclear Operating Co.* (Vogtle Electric Generating Plant, Units 3 and 4), CLI-12-2, 75 NRC 63, 82, 84 (2012).

Consistent with the design-centered review approach, the Staff designated the Levy combined license application as the “reference” application for the five common departures and exemptions; the Lee application is a “subsequent” application.<sup>112</sup> The Staff performed one review, then confirmed that the information was identical in the Lee application.<sup>113</sup> The ACRS reviewed and recommended approval of the requested departures and exemptions.<sup>114</sup> As discussed in further detail in our decision authorizing issuance of the combined licenses for the Levy Nuclear Plant, the Staff found each of the requested departures and their accompanying exemptions acceptable.<sup>115</sup>

Three departures are unique to the Lee combined license application.<sup>116</sup> One departure relates to the Lee site-specific foundation response spectra, discussed in section II.A.2 above.<sup>117</sup> The second Lee-specific departure addresses lateral earth pressure on below-grade nuclear island walls at the Lee site.<sup>118</sup> An evaluation of lateral earth pressures on below-grade nuclear island walls at the site was performed and compared to the corresponding pressures in the AP1000 DCD.<sup>119</sup> Duke determined that the lateral pressure of one of the evaluated load combinations slightly exceeds the corresponding load combination in the AP1000 DCD.<sup>120</sup> According to Duke, this exceedance is attributable to the groundwater level at the Lee site (eight feet below ground surface) compared to the groundwater level assumed in the AP1000 DCD (two feet below ground surface), resulting in “six additional feet of non-buoyant (heavier) soil than considered in the AP1000 standard evaluations, . . . [and] a corresponding higher passive earth pressure component” for that load combination.<sup>121</sup>

A site-specific analysis was performed to demonstrate that the site-specific lateral earth pressures are bounded by the AP1000 certified design.<sup>122</sup> Duke determined that “the site-specific nuclear island below-grade wall pressures resulting from the [nuclear island foundation input response spectra] will be less than those used in the standard AP1000 design for this load combination.”<sup>123</sup> Based

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<sup>112</sup> Ex. NRC-009-R, FSER at 21-1.

<sup>113</sup> *Id.*

<sup>114</sup> 2016 ACRS Letter at 1.

<sup>115</sup> Levy, CLI-16-16, 84 NRC at 79-82; *see also* Ex. NRC-001, Staff Information Paper, at 15.

<sup>116</sup> Ex. NRC-001, Staff Information Paper, at 13.

<sup>117</sup> *Id.* at 18-19.

<sup>118</sup> *Id.*

<sup>119</sup> Ex. NRC-011E, Exemptions and Departures, at 16.

<sup>120</sup> *Id.*; *see also* Ex. NRC-009-R, FSER at 3-59.

<sup>121</sup> Ex. NRC-011E, Departures and Exemptions, at 16.

<sup>122</sup> *Id.*; Ex. NRC-001, Staff Information Paper, at 19.

<sup>123</sup> Ex. NRC-009-R, FSER at 3-60.

on Duke's responses to requests for additional information and a review of the site-specific analysis, the Staff concluded that the departure is acceptable.<sup>124</sup>

The third Lee-specific departure relates to the location of the Technical Support Center (TSC) and the Operations Support Centers (OSC).<sup>125</sup> The TSC is "[t]he on-site facility that provides plant management and technical support to reactor operating personnel located in the [c]ontrol [r]oom during an emergency," and the OSCs are "on-site assembly area[s] separate from the [c]ontrol [r]oom and TSC where licensee operations support personnel report in an emergency."<sup>126</sup> Duke plans to move the TSC to a central location so that it can serve both units at the Lee site.<sup>127</sup> The TSC therefore would be located outside the control support area, which is a departure from the AP1000 DCD.<sup>128</sup> The OSCs would then occupy the space vacated by the TSC in the control support area for each unit.<sup>129</sup> Placement of the TSC in the centralized location would mean a slight increase in travel time to the TSC in an emergency — from two minutes to about five minutes.<sup>130</sup>

Duke reviewed the departure criteria for the AP1000 DCD in 10 C.F.R. Part 52, Appendix D, and determined that relocating the TSC and OSCs would not adversely affect their function, that the departure has no safety-significance, and that NRC approval is not required.<sup>131</sup> The Staff agreed that the departure does not require NRC approval.<sup>132</sup> Nonetheless, as part of its analysis of Duke's Emergency Plan, the Staff confirmed that the TSC and the OSCs would serve their intended emergency functions.<sup>133</sup> The Staff's finding with respect to the OSCs is subject to a demonstration of their adequacy during the full participation exercise that would be required before fuel load, as reflected in the inspections, tests, analyses, and acceptance criteria (ITAAC) in the draft combined licenses.<sup>134</sup> The

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<sup>124</sup> *Id.*

<sup>125</sup> Ex. NRC-001, Staff Information Paper, at 19-20; Ex. NRC-011E, Departures and Exemptions, at 8.

<sup>126</sup> Ex. NRC-011D, William States Lee III Nuclear Station Units 1 and 2 COL Application — Part 5 Emergency Plan, rev. 7 (Nov. 2015), at ix (ML15336A127) (Emergency Plan).

<sup>127</sup> *See id.* at A10-2.

<sup>128</sup> Ex. NRC-001, Staff Information Paper, at 20; Ex. NRC-011E, Departures and Exemptions, at 8.

<sup>129</sup> Ex. NRC-011E, Departures and Exemptions, at 8; Ex. NRC-011D, Emergency Plan, at II-40.

<sup>130</sup> 2015 ACRS Letter at 4.

<sup>131</sup> *See* Ex. NRC-011E, Departures and Exemptions, at 8-9; *see* 10 C.F.R. pt. 52, app. D, VIII.B.5.

<sup>132</sup> Ex. NRC-001, Staff Information Paper, at 20; Ex. NRC-009-R, FSER at 13-53, 13-58.

<sup>133</sup> Ex. NRC-009-R, FSER at 13-58 to 13-59.

<sup>134</sup> *Id.*; *see* Draft Combined License — Unit 1, at C-18 to C-19; Draft Combined License — Unit 2, at C-18 to C-19; Ex. NRC-011H, William States Lee III Nuclear Station Units 1 and 2

(Continued)

ACRS reviewed Duke’s proposal and found it acceptable “based on the communication and data links [that will be] provided, and based on the fact that it allows each unit’s [OSC] to be located adjacent to the [c]ontrol [r]oom where the TSC would have been located.”<sup>135</sup>

#### 4. *The Lee Nuclear Station Emergency Operations Facility*

Also related to the issue of emergency preparedness, Duke has requested to consolidate the EOF for the Lee site with the EOF for its McGuire, Catawba, and Oconee plants at its corporate headquarters in Charlotte, North Carolina, which, according to Duke, “has proven to be an effective facility for implementation of [its] nuclear station emergency plans.”<sup>136</sup> The Lee Nuclear Station therefore would benefit from the application of Duke’s corporate emergency response structure and experience.<sup>137</sup> The Charlotte EOF is located approximately forty miles from the Lee Nuclear Station site.<sup>138</sup>

The EOF is the support facility responsible for “evaluating, coordinating, and directing the overall activities involved in coping with a radiological emergency.”<sup>139</sup> Among other things, an applicant’s emergency plan must make provisions for an EOF “from which effective direction can be given and effective control can be exercised during an emergency.”<sup>140</sup> Section IV.E.8.b of 10 C.F.R.

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COL Application — Part 10 License Conditions and Inspections, Tests, Analyses, and Acceptance Criteria, rev. 11 (Apr. 2016), tbl. 3.8-1 (ML16124A672) (License Conditions and ITAAC); 10 C.F.R. pt. 50, app. E, IV.F.2.a(ii).

<sup>135</sup> 2015 ACRS Letter at 4.

<sup>136</sup> Ex. NRC-011D, Emergency Plan, at A9-3.

<sup>137</sup> *Id.* at A9-2. The McGuire and Catawba stations have used a consolidated EOF since 1987; Duke obtained Commission approval to add the Oconee Nuclear Station in 2005. *See id.*; Staff Requirements — SECY-05-0172 — Duke Power Company’s Request to Incorporate the Oconee Emergency Operations Facility into the EOF Shared by Catawba and McGuire Nuclear Stations (Nov. 2, 2005) (ML053070025). The current EOF has been in use since 2005. Ex. NRC-011D, Emergency Plan, at A9-2. Duke has filed a license amendment request for approval to incorporate the EOFs for Brunswick Steam Electric Plant Units 1 and 2, Shearon Harris Nuclear Power Plant Unit 1, and H.B. Robinson Steam Electric Plant Unit 2 into the Charlotte EOF. *See* Ex. NRC-001, Staff Information Paper, at 21 n.1; Tr. at 35 (Mr. Kitchen); Ex. DEC-005, Duke Overview Presentation, at 15. Our decision today does not address the license amendment request, which will be considered separately.

<sup>138</sup> Tr. at 87 (Mr. Thrasher).

<sup>139</sup> Ex. NRC-009-R, FSER at 13-60; *see also* Ex. NRC-015, NRC Staff Responses to Commission Post-Hearing Questions (Oct. 20, 2016), at 2 (Staff Post-Hearing Responses); “Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants,” NUREG-0654/FEMA-REP-1, rev. 1 (Nov. 1980), at 52 (ML040420012).

<sup>140</sup> 10 C.F.R. pt. 50, app. E, IV.E.8.a(i); *see also id.* § 52.79(a)(21) (requiring combined license)  
(Continued)

Part 50, Appendix E expressly permits an EOF to serve more than one nuclear power plant site.<sup>141</sup> But our express approval is required where — as here — an applicant or licensee proposes to locate the EOF more than twenty-five miles from the nuclear power plant site.<sup>142</sup> Additionally, for EOFs located more than twenty-five miles from a nuclear power plant site, “provisions must be made for locating NRC and offsite responders closer to the nuclear power [plant] site so that NRC and offsite responders can interact face-to-face with emergency response personnel entering and leaving the . . . site.”<sup>143</sup> These provisions must include adequate space and supplies for NRC and offsite responders to function effectively during an emergency.<sup>144</sup>

Both parties discussed the EOF as part of the safety panel presentation at the hearing, and we asked pre- and post-hearing questions specific to this issue. As the Staff noted in its pre-filed testimony, this is the first time we have reviewed a consolidated EOF for a new facility as part of the final review in a combined license proceeding.<sup>145</sup>

With the EOF proposed to be located approximately forty miles from the Lee site, Duke also plans to establish a near-site assembly area at a Duke Energy facility in Kings Mountain, North Carolina, approximately fifteen miles from the Lee site.<sup>146</sup> According to Duke, the Kings Mountain facility provides space “sufficient for members of an NRC site team and Federal, State, and local responders” and it “includes an area for briefing emergency response personnel, communication capability with other licensee and offsite response facilities, access to plant data and radiological information[,] and access to copying equipment and supplies.”<sup>147</sup>

As part of its review, the Staff verified that the consolidated EOF has the capability (1) “to obtain and display plant data and radiological information for each reactor at a nuclear power reactor site and for each nuclear power reactor site that the facility serves”; and (2) “to analyze plant technical information and provide technical briefings on event conditions and prognosis to licensee and

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applicants to provide an emergency plan that complies with 10 C.F.R. § 50.47 and 10 C.F.R. pt. 50, app. E).

<sup>141</sup> 10 C.F.R. pt. 50, app. E, IV.E.8.b.

<sup>142</sup> *See id.*; *see also* Staff Requirements — SECY-10-0078 — Centralized Emergency Operations Facilities and Combined License Applications (Sept. 7, 2010) (ML102500511) (approving the Staff’s proposal to make the determination on the acceptability of consolidated EOFs as part of its review of combined license and early site permit applications).

<sup>143</sup> 10 C.F.R. pt. 50, app. E, IV.E.8.b.

<sup>144</sup> *See id.* (including requirements for “space for conducting briefings,” “access to plant data and radiological information,” and “access to copying equipment and office supplies”).

<sup>145</sup> Ex. NRC-001, Staff Information Paper, at 21.

<sup>146</sup> Ex. DEC-006, Duke Safety Presentation, at 5.

<sup>147</sup> Ex. NRC-011D, Emergency Plan, at A9-7.

offsite response organizations for each reactor at a nuclear power reactor site and for each nuclear power reactor site that the facility serves.”<sup>148</sup> The Staff noted that “[p]lant and effluent data would be provided on as timely a basis at an EOF in Charlotte as it would be at a near-site location,” that the data can be displayed at the Charlotte EOF, and that the data would be “sufficient to perform accident assessment and [to] evaluate potential onsite and offsite environmental consequences of an emergency at [the] Lee Nuclear Station.”<sup>149</sup> The Staff also noted that use of the consolidated EOF enables “commonality of communication and interface with offsite officials and liaisons.”<sup>150</sup> Regarding Duke’s proposed near-site facility in Kings Mountain, North Carolina, the Staff testified that the facility has “everything that the staff would need” — including integrated communication systems and adequate space for the NRC and other emergency responders.<sup>151</sup>

A proposed license condition would require Duke to demonstrate, prior to fuel load, “the integrated capability and functionality of the EOF for activation and operation of the facility to respond to emergency events at both the [Lee Nuclear Station] and one additional nuclear facility that is supported by the EOF.”<sup>152</sup> Additionally, the draft combined licenses include ITAAC that will require Duke to demonstrate the functionality of the EOF prior to fuel load.<sup>153</sup> The Staff concluded that the information that Duke provided for the consolidated EOF meets the NRC’s emergency planning requirements, subject to completion of the ITAAC and satisfaction of the license condition, and the Staff recommends that we approve Duke’s request.<sup>154</sup>

The ACRS reviewed Duke’s request to consolidate the EOF for the Lee Nuclear Station and likewise recommends approval.<sup>155</sup> The ACRS reasoned that “[t]he distance from the Lee site to the common EOF is not excessive,” and also noted Duke’s proposed near-site facility in Kings Mountain, North Carolina.<sup>156</sup> The ACRS based its recommendation “on the advantages provided by use of a

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<sup>148</sup> “Centralized Emergency Operations Facilities and Combined License Applications,” Commission Paper SECY-10-0078 (June 16, 2010), at 3 (ML091970250); *see also* Ex. NRC-013, Staff Safety Presentation, at 15-16; Tr. at 95 (Mr. Thomas).

<sup>149</sup> Ex. NRC-009-R, FSER at 13-60 to 13-61.

<sup>150</sup> *Id.* at 13-61.

<sup>151</sup> Tr. at 110 (Mr. Hughes).

<sup>152</sup> NRC-009-R, FSER at 13-63.

<sup>153</sup> *See* Ex. NRC-002, Draft Combined License — Unit 1, at C-18 to C-19; Ex. NRC-003, Draft Combined License — Unit 2, at C-18 to C-19; Ex. NRC-011H, License Conditions and ITAAC, tbl. 3.8-1; Tr. at 95-96 (Mr. Thomas).

<sup>154</sup> NRC-009-R, FSER at 13-63; Tr. at 95-96 (Mr. Thomas).

<sup>155</sup> *See* 2015 ACRS Letter at 1, 4.

<sup>156</sup> *Id.* at 4.

common EOF . . . with the resources necessary to support more than a single site.”<sup>157</sup>

Before the hearing, we asked Duke and the Staff to address several questions related to emergency preparedness, including the proposed consolidated EOF. Among other things, we asked the parties to discuss the capability of the EOF to handle a common event across multiple sites and the potential need for changes to the EOF to meet any AP1000-specific requirements for the Lee Nuclear Station.<sup>158</sup> We also asked about the potential need for additional training to accommodate the Lee site, whether it be related to addressing a common event at facilities with different reactor designs, or, more specifically, training related to the AP1000 design for members of the EOF staff.<sup>159</sup> We further explored this issue at the hearing; the parties discussed EOF staff training and the potential advantages and disadvantages of using the Charlotte EOF for the Lee Nuclear Station.<sup>160</sup>

Duke explained that “[k]ey positions of EOF staff that include the EOF Director, Assistant EOF Director, and Accident Assessment Manager are required to take training to cover multiple technologies,”<sup>161</sup> which will include the AP1000 and will be focused particularly on mitigating beyond-design-basis events.<sup>162</sup> Duke also stated that it will expand its training program for multi-site event response to include the Lee site.<sup>163</sup> In addition, Duke explained that the only changes necessary to the Charlotte EOF would be to display site and plant parameters from the Lee units, and Duke listed relevant ITAAC that will ensure that AP1000 technology and data specific to the Lee Nuclear Station are addressed in the EOF.<sup>164</sup>

Duke represented that it is also possible that some of the other staff at its corporate office would be trained in AP1000 technology or have familiarity with the Lee Nuclear Station site and would be available to staff the EOF.<sup>165</sup> Duke stated, however, that it was less important for staff beyond key EOF positions to be trained in AP1000 technology because the EOF’s function for accident mitigation is for coordination and other “bigger-picture aspects” of

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<sup>157</sup> *Id.*

<sup>158</sup> Pre-Hearing Questions Order at 3-4.

<sup>159</sup> *Id.*

<sup>160</sup> *See, e.g.*, Tr. at 96-97 (Commissioner Baran); *id.* at 109-10 (Chairman Burns); *id.* at 112 (Commissioner Svinicki).

<sup>161</sup> Ex. DEC-003, Duke Pre-Hearing Responses, at 6.

<sup>162</sup> Tr. at 97-98 (Mr. Kitchen); Ex. DEC-003, Duke Pre-Hearing Responses, at 6.

<sup>163</sup> Ex. DEC-003, Duke Pre-Hearing Responses, at 6.

<sup>164</sup> *Id.* at 6-7.

<sup>165</sup> Ex. DEC-012, Duke Energy Carolinas’ Response to Post-Hearing Question (Oct. 20, 2016), at 2 (Duke Post-Hearing Responses); Tr. at 97-98 (Mr. Kitchen).

accident response, whereas staff at the nuclear power plant site in the OSCs, TSC, and the control room — individuals with experience at the site — would be directing the tactical response to the event.<sup>166</sup> The Staff explained that it found Duke’s plan to provide AP1000-specific training to the EOF Director, Assistant EOF Director, and Accident Assessment Manager “adequate to fulfill the EOF mission and to ensure that supervisors are able to direct the [Emergency Response Organization] members in the performance of their duties.”<sup>167</sup>

The Staff also noted that job and task analyses for staffing the Emergency Response Organization, once developed, will help determine whether additional AP1000-specific training is necessary.<sup>168</sup> The Staff stated that these job tasks and analyses are not required at this time; they will be completed in preparation for the full participation exercise that will be conducted at the Lee Nuclear Station prior to fuel load.<sup>169</sup> The Staff explained that it will verify the adequacy of Duke’s training program by inspecting Duke’s ability to adequately perform designated Emergency Response Organization functions during the required exercise described in the emergency preparedness ITAAC and subsequent biennial exercises if the NRC later makes the finding required by 10 C.F.R. § 52.103(g) allowing operation of the facility.<sup>170</sup> According to the Staff, its inspections “will verify, initially and continuously, whether key EOF positions, such as the EOF Director, Assistant Director, and Accident Assessment Manager, and any other EOF personnel identified based on job and task analyses, are receiving adequate AP1000-specific training to perform their designated emergency plan functions.”<sup>171</sup>

We also asked whether an expansion of the Charlotte EOF might become necessary depending on the number of plants added to the facility.<sup>172</sup> Duke stated that a physical expansion of the facility was not planned for the addition of the Lee Nuclear Station.<sup>173</sup> Duke further asserted that computer capability and the ability to display data, rather than strictly floor space, are the important considerations.<sup>174</sup> For its part, the Staff stated that the most important aspect of the issue is not the number of plants added to the Charlotte facility but

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<sup>166</sup> Tr. at 99-100 (Mr. Kitchen).

<sup>167</sup> Ex. NRC-015, Staff Post-Hearing Responses, at 2.

<sup>168</sup> *Id.*

<sup>169</sup> *Id.*; see *supra* note 134.

<sup>170</sup> Ex. NRC-015, Staff Post-Hearing Responses, at 2; see 10 C.F.R. § 52.103(g) (stating that operation of the facility is not permitted until the Commission finds that the acceptance criteria in the combined licenses are met).

<sup>171</sup> Ex. NRC-015, Staff Post-Hearing Responses, at 2.

<sup>172</sup> Tr. at 114-15 (Commissioner Svinicki).

<sup>173</sup> *Id.* at 115 (Mr. Kitchen).

<sup>174</sup> *Id.* (Mr. Kitchen).

rather the advantage afforded by the location of the EOF in relation to the plants in two states, South Carolina and North Carolina, where most of the emergency responders would be the same for Lee as for the existing units and would therefore be familiar with the Charlotte EOF.<sup>175</sup> But the Staff explained that any recommendation to the Commission on EOF consolidation is made on a case-by-case basis.<sup>176</sup>

## **B. Environmental Issues**

### ***1. Make-Up Pond C***

When it filed its combined license application in 2007, Duke proposed to use Make-Up Ponds A and B for the Lee Nuclear Station's operational water requirements.<sup>177</sup> The two water impoundments were created during the construction phase of the cancelled Cherokee project.<sup>178</sup> Make-Up Pond A draws water from the Ninety-Nine Islands Reservoir — the water source for the Ninety-Nine Islands Hydroelectric Project; the Hydroelectric Project and the reservoir are under the jurisdiction of the Federal Energy Regulatory Commission (FERC).<sup>179</sup> Make-Up Pond B was formed by an impoundment of McKowns Creek.<sup>180</sup> Make-Up Ponds A and B are now jurisdictional waters of the United States under the jurisdiction of the Corps.<sup>181</sup> Duke planned to use water from Make-Up Pond A more than ninety-five percent of the time and to use Make-Up Pond B during low flow conditions.<sup>182</sup>

In 2007 and 2008, the region surrounding the Lee site experienced a severe drought.<sup>183</sup> The Staff noted that water data from these drought years had not been included in Duke's combined license application.<sup>184</sup> The drought raised concerns that a severe, long-term drought could affect the reliability of the Lee Nuclear

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<sup>175</sup> See *id.* at 116-17 (Mr. Barss). South Carolina and North Carolina acknowledged their support for the Charlotte EOF location in their letters certifying their agreement with Duke's Emergency Plan for the Lee Nuclear Station. Ex. NRC-009-R, FSER at 13-60.

<sup>176</sup> *Id.* at 116-17 (Mr. Barss).

<sup>177</sup> Ex. NRC-001, Staff Information Paper, at 22; Ex. NRC-010, Final EIS at 2-6.

<sup>178</sup> Ex. NRC-001, Staff Information Paper, at 22.

<sup>179</sup> *Id.*; Ex. NRC-010, Final EIS at 2-24. Duke operates the Ninety-Nine Islands Hydroelectric Project. Ex. NRC-010, Final EIS at 2-24.

<sup>180</sup> Ex. NRC-010, Final EIS at 2-6.

<sup>181</sup> *Id.* at 2-42.

<sup>182</sup> Ex. NRC-001, Staff Information Paper, at 23; Ex. NRC-014-R, Staff Environmental Presentation, at 3; Tr. at 125-26 (Ms. Vokoun).

<sup>183</sup> See Tr. at 121-22 (Mr. Snead).

<sup>184</sup> Ex. NRC-014-R, Staff Environmental Presentation, at 4; Tr. at 126 (Ms. Vokoun).

Station as a source of baseload power.<sup>185</sup> In addition, the Staff “determined that low water flows at certain times of the year would have resulted in adverse impacts to aquatic biota and downstream water users.”<sup>186</sup>

Duke revised its water balance calculations to include the 2007 and 2008 drought years.<sup>187</sup> Thereafter, Duke proposed to build Make-Up Pond C, an off-site reservoir that would be used for supplemental cooling water as a drought contingency to minimize the need to shut down the plant during low river flow conditions.<sup>188</sup> With Make-Up Ponds A, B, and C providing cooling water to the plant, Duke also plans to use a closed-cycle wet cooling system with mechanical draft cooling towers to transfer waste heat to the atmosphere.<sup>189</sup>

Duke filed a supplement to its application to include Make-Up Pond C in September 2009, and the Staff held additional public scoping meetings in the spring and summer of 2010.<sup>190</sup> As proposed, the “Make-Up Pond C site encompasses approximately 2110 ac[res] and is located northwest of the Lee Nuclear Station on the London Creek watershed.”<sup>191</sup> Approximately 3.16 miles of London Creek would be dammed to create Make-Up Pond C.<sup>192</sup> Of the total proposed site acreage, approximately 643 acres would be used for “Make-Up Pond C itself, including the impoundment, dam footprint, saddle dikes, and spillway.”<sup>193</sup> An additional 404 acres would be used “for other elements of Make-Up Pond C, including spoils placement areas, vegetation maintenance areas, and various roads, transmission lines, and ancillary [support] facilities.”<sup>194</sup> At the hearing, the Staff discussed its analysis of the environmental impacts of the construction and use of Make-Up Pond C, measures to mitigate these impacts, and the Staff’s consideration of alternative technologies for plant cooling.<sup>195</sup> We asked a number of questions to evaluate the sufficiency of the Staff’s review in this area.<sup>196</sup>

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<sup>185</sup> Ex. NRC-010, Final EIS at 3-8 to 3-9; Tr. at 126 (Ms. Vokoun). Commenters at the scoping sessions and commenters on the Draft EIS expressed concern about water availability and potential droughts. See Tr. at 81 (Mr. Akstulewicz); Ex. NRC-010, Final EIS, apps. D-E.

<sup>186</sup> Tr. at 126 (Ms. Vokoun).

<sup>187</sup> *Id.* (Ms. Vokoun).

<sup>188</sup> *Id.* at 122 (Mr. Snead).

<sup>189</sup> Ex. NRC-010, Final EIS at xxxiii, 3-50, 9-207. A portion of the water will be returned through a discharge structure on the Broad River upstream of the Ninety-Nine Islands Dam; the remaining water will be released to the atmosphere via evaporative cooling. *Id.* at xxxiii.

<sup>190</sup> Ex. DEC-007, Duke Environmental Presentation, at 4; Ex. NRC-010, Final EIS at 1-5.

<sup>191</sup> Ex. NRC-010, Final EIS at 2-9.

<sup>192</sup> *Id.* at 2-17.

<sup>193</sup> *Id.* at 2-11.

<sup>194</sup> *Id.*

<sup>195</sup> See Tr. at 124-36; Ex. NRC-014-R, Staff Environmental Presentation, at 3-13.

<sup>196</sup> Pre-Hearing Questions Order at 7-11, 15; Tr. at 139-41, 143-49.

The Staff determined that creation of Make-Up Pond C would “inundate most of the London Creek stream network and forested valley,” impacting approximately 12.5 miles of streams, 3.5 acres of wetlands, and 17.5 acres of open water, turning the existing creek system into a deep water lake habitat.<sup>197</sup> The Staff also found that the terrestrial impacts of the proposal would include loss of habitat and wildlife mortality that “would be substantial and mostly permanent in nature.”<sup>198</sup> Additionally, the Staff determined that building “Make-Up Pond C would alter the functionality of the London Creek corridor as a wildlife travel corridor, particularly for some migrant songbirds, many of which are conservation priority in South Carolina.”<sup>199</sup> For aquatic impacts, the Staff determined that there would be “a clearly noticeable and permanent change in aquatic resources to London Creek and its tributaries.”<sup>200</sup> Accordingly, the Staff considered the impacts to aquatic and terrestrial resources to be “moderate,” because “[t]he impacts would noticeably alter these resources, but the important aspects of these attributes would not be destabilized as habitat and wildlife resources found in the London Creek watershed are also found in other areas of the surrounding upstate Piedmont Region.”<sup>201</sup>

To determine whether these impacts could be minimized or avoided, the Staff considered alternative ways to address a potential water shortage.<sup>202</sup> The Staff “evaluated water storage options, other pond locations[,] and other cooling system designs,” but focused on a hybrid-cooling-technology option because the Staff found that to be “the alternative with the best potential to eliminate entirely or reduce the size of Make-Up Pond C.”<sup>203</sup> Hybrid cooling uses a combination of wet and dry cooling towers to reduce water use.<sup>204</sup> Although this design has never been used to cool nuclear or fossil fuel plants the size of the proposed Lee Nuclear Station and it “poses several significant technical challenges for its installation and operation,” the Staff concluded that it would be feasible for the Lee Nuclear Station site.<sup>205</sup> Nevertheless, the Staff determined that the hybrid system “would not eliminate the need for Make-Up Pond C” and therefore

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<sup>197</sup> Tr. at 130, 132 (Ms. Vokoun).

<sup>198</sup> *Id.* at 131 (Ms. Vokoun).

<sup>199</sup> *Id.* (Ms. Vokoun).

<sup>200</sup> *Id.* at 132 (Ms. Vokoun).

<sup>201</sup> *Id.* (Ms. Vokoun); *see* Ex. NRC-015, Staff Post-Hearing Responses, at 3 (clarifying that the Staff’s “moderate” finding did not depend on the consideration of proposed mitigation measures).

<sup>202</sup> *See* Tr. at 127-28 (Mr. Vail).

<sup>203</sup> *Id.* at 128 (Mr. Vail).

<sup>204</sup> *Id.* (Mr. Vail).

<sup>205</sup> Ex. NRC-010, Final EIS at 9-210; *see also* Tr. at 128 (Mr. Vail).

concluded that it “would not be an environmentally preferable alternative.”<sup>206</sup> After its consideration of alternative water storage options, the Staff concluded that Make-Up Pond C would be necessary for supplemental cooling.<sup>207</sup>

The Staff also considered other measures to mitigate the environmental impacts of the project. The Final EIS includes a discussion of various mitigation approaches, such as implementation of best management practices for erosion control and implementation of a stormwater pollution prevention plan.<sup>208</sup> One approach developed as part of Duke’s permit application with the Corps under section 404 of the Clean Water Act was a compensatory mitigation plan to offset the unavoidable impacts on jurisdictional waters of the United States from Make-Up Pond C, which Duke plans to pursue if it completes the project.<sup>209</sup> In addition to purchasing mitigation credits,<sup>210</sup> “Duke plans to accomplish a stream restoration and preservation effort at two separate locations, the privately owned Turkey Creek Tract and the Woods Ferry Study Area in the Sumter National Forest.”<sup>211</sup> For the Woods Ferry Study Area, the goal will be to “reconnect streams to their respective flood plains, . . . reduce sedimentation and stabilize stream banks, . . . improve in-stream and adjacent habitats[,] and . . . improve water quality.”<sup>212</sup> Duke will provide preservation and buffer enhancement at the Turkey Creek Tract.<sup>213</sup>

The Woods Ferry project required a Special Use Permit from the United States Forest Service. In accordance with NEPA, the Forest Service prepared an Environmental Impact Statement to support the permit action.<sup>214</sup> The Forest Service has issued its record of decision, and the Staff anticipates that it will issue the Special Use Permit.<sup>215</sup> The Corps issued its record of decision and a Section 404 Permit for the Lee Nuclear Station in 2015.<sup>216</sup> The Staff stated that “[t]he mitigation measures and requirements ultimately [to be] imposed by the Forest Service and the Corps . . . are consistent with the analysis and

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<sup>206</sup> Tr. at 129-30 (Mr. Vail); *see also* Ex. NRC-010, Final EIS at 9-210; Ex. NRC-014-R, Staff Environmental Presentation, at 7.

<sup>207</sup> Ex. NRC-014-R, Staff Environmental Presentation, at 7.

<sup>208</sup> *See, e.g.*, Ex. NRC-010, Final EIS tbl.10-1.

<sup>209</sup> *See id.* at 4-54; Tr. at 132-33 (Ms. Vokoun).

<sup>210</sup> Ex. NRC-010, Final EIS at 4-56.

<sup>211</sup> Tr. at 133 (Ms. Vokoun). Duke selected these locations as part of an outreach effort with governmental and non-governmental stakeholder organizations. Ex. NRC-010, Final EIS at 4-55 to 4-56.

<sup>212</sup> Tr. at 133 (Ms. Vokoun); *see also* Ex. NRC-010, Final EIS at 4-56, 4-58.

<sup>213</sup> Ex. NRC-010, Final EIS at 4-58.

<sup>214</sup> Tr. at 134 (Ms. Vokoun).

<sup>215</sup> *Id.* (Ms. Vokoun).

<sup>216</sup> *Id.* (Ms. Vokoun); Ex. NRC-007, Staff Pre-Hearing Responses, at 23.

conclusions in the . . . [Final] EIS.”<sup>217</sup> Although the Staff found that restoration efforts under the compensatory mitigation plan “are expected to mitigate the environmental impacts of Make-Up Pond C,” the Staff determined that “impacts to the resource[ ] areas would remain moderate, given that the stream ecosystem [at the Make-Up Pond C site] will be removed.”<sup>218</sup>

## 2. *Alternative Sites*

As part of its environmental review, the Staff assessed Duke’s process for selecting the Lee site.<sup>219</sup> Duke first established the region of interest, the “geographic area considered in searching for potential and candidate sites.”<sup>220</sup> Duke defined its region of interest consistent with its franchised service area.<sup>221</sup> Within this area, Duke selected six candidate sites — “two in North Carolina, three in South Carolina, and one that extended across both States” — based on their “seismic [characteristics]/geology, population density, water availability, dedicated land use, regional ecological features, proximity to high-voltage transmission and load centers, and access to rail lines.”<sup>222</sup> After additional screening of the candidate sites, Duke identified the Lee Nuclear Station site as the proposed site and identified three alternative sites: (1) the Perkins site in Davie County, North Carolina; (2) the Keowee site, adjacent to the Oconee Nuclear Station, in Oconee County, South Carolina; and (3) the Middleton Shoals site in Anderson County, South Carolina.<sup>223</sup> The three alternative sites are considered greenfield sites.<sup>224</sup>

The Staff performed an independent analysis of Duke’s site selection process and concluded that it was reasonable.<sup>225</sup> In addition, the Staff reviewed each of the alternative sites to determine if any were environmentally preferable to the Lee site.<sup>226</sup> The Staff visited each of the three alternative sites and its analysis

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<sup>217</sup> Tr. at 134-35 (Ms. Vokoun).

<sup>218</sup> *Id.* at 133-34 (Ms. Vokoun).

<sup>219</sup> See Ex. NRC-010, Final EIS § 9.3.

<sup>220</sup> “Environmental Standard Review Plan,” NUREG-1555 (July 2007) § 9.3, at 9.3-1 (ML-071800223); see Ex. NRC-010, Final EIS § 9.3.1.

<sup>221</sup> Ex. NRC-010, Final EIS at 9-42.

<sup>222</sup> *Id.* at 9-43.

<sup>223</sup> *Id.* at 9-45.

<sup>224</sup> *Id.* The Lee site is considered previously disturbed by virtue of the construction activity associated with the cancelled Cherokee project. See *id.* at 2-5, 3-3.

<sup>225</sup> *Id.* at 9-42, 9-45.

<sup>226</sup> *Id.* at 9-203.

includes the information it collected from these visits, in addition to information from Duke and other federal and state agencies.<sup>227</sup>

The Perkins site is wholly owned by Duke and was previously characterized when the site was selected for the proposed Perkins Nuclear Station in the 1970s.<sup>228</sup> It is currently maintained as forested land by the North Carolina Wildlife Resources Commission and would “require extensive grading and cut-fill activities to support a two-unit nuclear power facility.”<sup>229</sup> The Keowee site also is wholly owned by Duke and is maintained as forested land.<sup>230</sup> Because it is adjacent to the Oconee Nuclear Station, it “would share many of the same resources and services.”<sup>231</sup> To support two new nuclear units, the Keowee site “would require extensive grading and the development of an offsite supplemental water reservoir.”<sup>232</sup> The Middleton Shoals site is located on the eastern bank of the Savannah River, near Lake Russell.<sup>233</sup> Like the Perkins and Keowee sites, the Middleton Shoals site has been maintained as forested land, and it “would require extensive grading and cut-fill activities to support a two-unit nuclear power facility.”<sup>234</sup>

For each of these sites, the Staff evaluated impacts associated with land use, water use and quality, terrestrial and wetland resources, aquatic resources, socioeconomics, environmental justice, historic and cultural resources, air quality, nonradiological health impacts, radiological health impacts from normal operations, and postulated accidents.<sup>235</sup> Comparing its analysis of the three alternative sites with the proposed Lee site, the Staff found the environmental impacts “generally comparable.”<sup>236</sup> Since no alternative site was environmentally preferable to the Lee site, the Staff concluded that none of the alternative sites would be “obviously superior” to the Lee site.<sup>237</sup>

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<sup>227</sup> *Id.* at 9-45.

<sup>228</sup> *Id.* at 9-47, 9-54. The Perkins nuclear project was cancelled before a decision was made on the construction permit. *See Duke Power Co.* (Perkins Nuclear Station, Units 1, 2, and 3), ALAB-668, 15 NRC 450, 451-52 (1982).

<sup>229</sup> Ex. NRC-010, Final EIS at 9-54.

<sup>230</sup> *Id.* at 9-104.

<sup>231</sup> *Id.* at 9-95.

<sup>232</sup> *Id.* at 9-106.

<sup>233</sup> *Id.* at 9-159, 9-177.

<sup>234</sup> *Id.* at 9-159.

<sup>235</sup> *See id.* §§ 9.3.3 to 9.3.5.

<sup>236</sup> *Id.* at 9-206.

<sup>237</sup> *Id.* at 9-203, 9-206.

### 3. *Staff Non-Concurrence Associated with the General License to Construct an Independent Spent Fuel Storage Installation*

During the Staff's environmental review, a non-concurrence was filed by members of the Staff working on the review.<sup>238</sup> The non-concurrence related to whether additional steps were warranted under NEPA, the NHPA, and the Endangered Species Act, in view of the possibility that an independent spent fuel storage installation (ISFSI) could be constructed on the site at some future time.<sup>239</sup>

In response to a pre-hearing question, the Staff stated that it met the requirements for consultation under the NHPA because it consulted on the entirety of the Lee Nuclear Station site.<sup>240</sup> In January 2012, the South Carolina State Historic Preservation Officer (SHPO) informed the Staff that it had determined that the project, including the new units, "Make-Up Pond C, railroad spur, and transmission line corridors would cause no adverse effect on . . . identified historic properties if conditions were met" under the Cultural Resource Management Plan and Memorandum of Agreement between the SHPO, Duke, the Catawba Indian Nation, and the Corps.<sup>241</sup> The Staff explained that although it "did not explicitly discuss with the SHPO and Tribes the issuance of a general license," it referenced relevant information about the general license in the consultation record.<sup>242</sup> For example, the Staff noted that the Final EIS references an analysis in the Generic Environmental Impact Statement for License Renewal "that supports a conclusion that the impacts of building and operating an ISFSI on the site would be minor."<sup>243</sup> Nonetheless, the Staff notified the South Carolina SHPO in a follow-up phone call in July 2016 that issuance of a combined license includes authorization to construct and operate an ISFSI; the Staff represented that the SHPO expressed no concerns.<sup>244</sup>

According to the Staff, its conclusion that construction of the ISFSI would not

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<sup>238</sup> The non-concurrence, NCP-2016-007, which is not publicly available, was attached to the Staff's Information Paper. A substantively similar non-concurrence was filed during the review of the combined license application for the Levy Nuclear Plant and was addressed as part of that review. See Ex. NRC-001, Staff Information Paper, at 32; Levy, CLI-16-16, 84 NRC at 93-94.

<sup>239</sup> NRC regulations grant a general license to construct and operate an ISFSI to certain licensees, including combined license holders. The non-concurrence centered on the concern that the consultations on the project did not include a specific discussion that an ISFSI potentially could be constructed onsite under the general license. Ex. NRC-001, Staff Information Paper, at 32; Ex. NRC-007, Staff Pre-Hearing Responses, at 27-28; see 10 C.F.R. § 72.210.

<sup>240</sup> Ex. NRC-007, Staff Pre-Hearing Responses, at 27.

<sup>241</sup> *Id.*; Ex. NRC-010, Final EIS at I-4 to I-5.

<sup>242</sup> Ex. NRC-007, Staff Pre-Hearing Responses, at 27.

<sup>243</sup> *Id.*

<sup>244</sup> *Id.*

contribute to adverse effects “is further reinforced by the provision in the [Cultural Resource Management Plan and Memorandum of Agreement] and Duke’s corporate procedures,” which require Duke “to stop work and coordinate with the SHPO if it inadvertently discovers cultural or historic objects on the site.”<sup>245</sup> Additionally, the Staff explained that if Duke constructs an ISFSI at the Lee site, not only would historic and cultural resources be protected through the Memorandum of Agreement and the associated Cultural Resource Management Plan, but also through conditions in the Section 404 Permit from the Corps and the combined licenses.<sup>246</sup> The Staff also noted that the Section 401 Clean Water Act Certification from the State of South Carolina includes two permit conditions related to inadvertent discovery of archeological or paleontological resources.<sup>247</sup> The Staff advised that the nonconcurring staff ultimately concurred in the Staff’s review.<sup>248</sup>

### C. Findings

With regard to Duke’s request to consolidate the EOF for the Lee Nuclear Station with its existing EOF for the McGuire, Catawba, and Oconee plants in Charlotte, North Carolina, we find that Duke has satisfied the requirements in 10 C.F.R. Part 50, Appendix E, section IV.E.8. Duke has shown that, from the Charlotte EOF, “effective direction can be given and effective control can be exercised during an emergency” at the Lee Nuclear Station.<sup>249</sup> Further, in accordance with section IV.E.8.b, Duke has made provision for a near-site facility — the Kings Mountain Facility — that will provide adequate space, supplies, and data and communications capability to support the NRC and other emergency responders so that they may “interact face-to-face with emergency response personnel entering and leaving the . . . [Lee] site.”<sup>250</sup> We find that the proposed license condition and the ITAAC associated with the consolidated EOF are appropriately drawn to ensure the functionality of the EOF with respect to the Lee site.<sup>251</sup> Therefore, we approve Duke’s request to consolidate the Lee EOF with its existing facility in Charlotte, North Carolina.

With regard to our findings for issuance of the combined licenses, we have conducted an independent review of the sufficiency of the Staff’s safety findings, with particular attention to the topics discussed above. Our findings, how-

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<sup>245</sup> *Id.* (citing Ex. NRC-010, Final EIS at 4-111).

<sup>246</sup> *Id.* at 27-28.

<sup>247</sup> *Id.* at 28.

<sup>248</sup> Ex. NRC-001, Staff Information Paper, at 32.

<sup>249</sup> 10 C.F.R. pt. 50, app. E, IV.E.8.a(i); *see, e.g.*, Ex. NRC-011D, Emergency Plan, app. 9.

<sup>250</sup> 10 C.F.R. pt. 50, app. E, IV.E.8.b; *see, e.g.*, Ex. DEC-006, Duke Safety Presentation, at 5-6.

<sup>251</sup> *See, e.g.*, Ex. NRC-009-R, FSER at 13-60 to 13-63; Tr. at 95-96 (Mr. Thomas).

ever, are based on the entire record. Based on the evidence presented in the uncontested hearing, including the Staff's review documents and the testimony provided, we find that the applicable standards and requirements of the AEA and NRC regulations have been met. The required notifications to other agencies or bodies have been duly made.<sup>252</sup> We find that Duke is technically and financially qualified to engage in the activities authorized. We further find that there is reasonable assurance that the facility will be constructed and operated in conformity with the licenses, the provisions of the AEA, and the NRC's regulations and that issuance of the licenses will not be inimical to the common defense and security or to the health and safety of the public. In addition, we find that the proposed regulatory exemptions meet the standards in 10 C.F.R. § 50.12. And finally, we find that the proposed license conditions are appropriately drawn and sufficient to provide reasonable assurance of adequate protection of public health and safety.

We also conducted an independent review of the Staff's environmental analysis in the Final EIS, taking into account the particular requirements of NEPA. NEPA section 102(2)(A) requires agencies to use "a systematic, interdisciplinary approach which will insure the integrated use of the natural and social sciences and the environmental design arts" in decision-making that may impact the environment.<sup>253</sup> We find that the environmental review team used the systematic, interdisciplinary approach that NEPA requires.<sup>254</sup>

NEPA section 102(2)(C) requires us to assess the relationship between short-term uses and long-term productivity of the environment, to consider alternatives, and to describe the unavoidable adverse environmental impacts and the irreversible and irretrievable commitments of resources associated with the proposed action.<sup>255</sup> The discussion of alternatives is in Chapter 9 of the Final EIS; the other items are discussed in Chapter 10.<sup>256</sup> The review team found the princi-

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<sup>252</sup> The Staff notified the Public Service Commission of South Carolina, the North Carolina Utilities Commission, and FERC about the combined license application in December 2011. Ex. NRC-001, Staff Information Paper, at 25-26. The Staff published notices of the application in the Federal Register on November 18, 2011, November 25, 2011, December 2, 2011, and December 9, 2011 (at 76 Fed. Reg. 71,608; 76 Fed. Reg. 72,725; 76 Fed. Reg. 75,566; and 76 Fed. Reg. 77,021, respectively). Ex. NRC-001, Staff Information Paper, at 26.

<sup>253</sup> 42 U.S.C. § 4332(2)(A).

<sup>254</sup> See, e.g., Tr. at 58-62 (Mr. Lee) (providing an overview of the Staff's environmental review methodology); Ex. NRC-012, Staff Overview Presentation, at 9-13. The environmental review team consisted of individuals with expertise in disciplines including ecology, geology, hydrology, radiological health, socioeconomics, and cultural resources. Ex. NRC-010, Final EIS, app. A. The team consisted of individuals from the NRC and the Corps. *Id.*

<sup>255</sup> 42 U.S.C. § 4332(2)(C)(ii)-(v).

<sup>256</sup> Ex. NRC-010, Final EIS, chs. 9-10.

pal short-term benefit of the project to be the production of electrical energy.<sup>257</sup> The review team also found that the economic productivity of the site would be much greater hosting the reactors than it would if used for agriculture, mining, or other probable uses for the site.<sup>258</sup> With regard to long-term productivity, the review team noted that there would be an impact if the plant were not immediately dismantled at the end of operation, but the team found that “the enhancement of regional productivity resulting from electrical-energy production by the plant is expected to result in a correspondingly large increase in regional long-term productivity that would not be equaled by other long-term uses of the site.”<sup>259</sup>

NEPA section 102(2)(E) calls for agencies to study, develop, and describe appropriate alternatives.<sup>260</sup> The alternatives analysis is the “heart of the environmental impact statement.”<sup>261</sup> Based on the discussion in the Final EIS, the Staff’s testimony, and its responses to pre-hearing questions, we find that the Staff identified an appropriate range of alternatives with respect to alternative power sources, alternative sites, and alternative system designs and adequately described the environmental impacts of each alternative.<sup>262</sup> We find reasonable the Staff’s conclusion that none of the alternatives considered is environmentally preferable to the proposed action.<sup>263</sup>

Chapter 10 of the Final EIS includes tables listing the unavoidable adverse environmental impacts during preconstruction, construction, and operation, along with actions to mitigate those impacts.<sup>264</sup> The review team found that the unavoidable impacts during preconstruction and construction would be small for the following resource areas: water use, water quality, demography, economic impacts on the community, environmental justice, air quality, non-radiological health, radiological health, and non-radioactive waste.<sup>265</sup> The preconstruction and construction impacts for land use, terrestrial and aquatic ecology, physical resources, and historic and cultural resources would be moderate, but when considering NRC-authorized construction activities only, the impacts would be small.<sup>266</sup> The preconstruction and construction impacts to infrastructure and com-

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<sup>257</sup> *Id.* at 10-16.

<sup>258</sup> *Id.*

<sup>259</sup> *Id.* The review team also noted that “most long-term impacts resulting from land-use preemption by plant structures can be eliminated by removing these structures or by converting them to other productive uses.” *Id.*

<sup>260</sup> 42 U.S.C. § 4332(2)(E).

<sup>261</sup> 10 C.F.R. pt. 51, app. A, § 5.

<sup>262</sup> *See, e.g.*, Tr. at 150-51; Ex. NRC-010, Final EIS, ch. 9.

<sup>263</sup> *See, e.g.*, Ex. NRC-010, Final EIS at 10-20 to 10-21.

<sup>264</sup> *Id.* tbls.10-1 & 10-2.

<sup>265</sup> *Id.* tbl.10-1.

<sup>266</sup> *Id.*

munity services would be moderate for traffic impacts; all other infrastructure and community service impacts would be small.<sup>267</sup> For operation, the review team found that the unavoidable adverse impacts would be small for all resource areas.<sup>268</sup>

Finally, with regard to irreversible and irretrievable commitments of resources, the review team concluded that disposal of radioactive and nonradioactive wastes would require an irreversible commitment of land and that over 24,600 gallons per minute of cooling water would be lost through evaporation during operation.<sup>269</sup> There would be some losses to terrestrial biota at the site — “[o]f particular note, the loss of habitat at Make-Up Pond C would permanently reduce wildlife populations in the London Creek watershed and the functionality of the watershed as a wildlife travel corridor.”<sup>270</sup> With respect to aquatic biota, the review team found that preconstruction and construction activities “would result in a permanent change to an estimated 9.37 ac[res] of open water on the Lee Nuclear Station site” and that “[b]uilding Make-Up Pond C would result in permanent effects on an estimated 17.58 ac[res] of open water and 64,911 linear [feet] of stream offsite.”<sup>271</sup> Additionally, the review team concluded that “[b]uilding Make-Up Pond C would fundamentally alter the physical and biological characteristics of London Creek, a tributary to the Broad River.”<sup>272</sup> According to the review team, building Make-Up Pond C also will result in the permanent alteration of historic and cultural resources — specifically, “[t]he Service Family Cemetery would be relocated prior to impoundment of London Creek and inundation of the Make-Up Pond C area, permanently altering the cultural setting of this cultural resource and its relationship to regional history, settlement patterns, and the historical uses of the land.”<sup>273</sup>

During construction of the plant, the review team concluded that the materials used, “while irretrievable, would be of small consequence with respect to the availability of such resources.”<sup>274</sup> And with regard to operation of the proposed units, the review team determined that uranium would be irretrievably committed, but the amount would be negligible in comparison to the availability of uranium ore and existing stockpiles of highly enriched uranium in the United States and Russia that could be processed into fuel.<sup>275</sup>

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<sup>267</sup> *Id.*

<sup>268</sup> *Id.* tbl.10-2.

<sup>269</sup> *Id.* at 10-17.

<sup>270</sup> *Id.* at 10-18.

<sup>271</sup> *Id.*

<sup>272</sup> *Id.*

<sup>273</sup> *Id.* at 10-19.

<sup>274</sup> *Id.*

<sup>275</sup> *Id.* at 10-19 to 10-20.

We must weigh these unavoidable adverse environmental impacts and resource commitments — the environmental “costs” of the project — against the project’s benefits.<sup>276</sup> Considering the need for power in the region and the expected increase in productivity, jobs, and tax revenue as described in the hearing and in the Final EIS, we find that the benefits of the project outweigh the costs described above. Moreover, we have considered each of the requirements of NEPA section 102(2)(C) and find nothing in the record that would contradict the Staff’s conclusions on those requirements.

In sum, for each of the environmental topics discussed at the hearing and in this decision, we find that the Staff’s review was reasonably supported in logic and fact and sufficient to support the Staff’s conclusions. Based on our review, we also find that the remainder of the Final EIS was reasonably supported and sufficient to support the Staff’s conclusions.

Therefore, as a result of our review of the Final EIS, and in accordance with the Notice of Hearing for this uncontested proceeding, we find that the requirements of NEPA section 102(2)(A), (C), and (E), and the applicable regulations in 10 C.F.R. Part 51, have been satisfied with respect to the combined license application. We independently considered the final balance among conflicting factors contained in the record of this proceeding. We find, after weighing the environmental, economic, technical, and other benefits against environmental and other costs, and considering reasonable alternatives, that the combined licenses should be issued.

### III. CONCLUSION

We find that the Staff’s review of Duke’s combined license application was sufficient to support the findings in 10 C.F.R. §§ 52.97(a) and 51.107(a). We *approve* Duke’s request to consolidate the Lee EOF with the existing EOF at its corporate headquarters in Charlotte, North Carolina. We *authorize* the Director of the Office of New Reactors to issue the combined licenses for the construction and operation of William States Lee III Nuclear Station, Units 1 and 2. And finally, we *authorize* the Staff to issue the record of decision.

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<sup>276</sup> 10 C.F.R. § 51.107(a).

IT IS SO ORDERED.

For the Commission

ANNETTE L. VIETTI-COOK  
Secretary of the Commission

Dated at Rockville, Maryland,  
this 15th day of December 2016.

UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

**COMMISSIONERS:**

**Stephen G. Burns**, Chairman  
**Kristine L. Svinicki**  
**Jeff Baran**

**In the Matter of**

**Docket No. 40-9075-MLA**

**POWERTECH (USA), INC.**  
**(Dewey-Burdock *In Situ* Uranium**  
**Recovery Facility)**

**December 23, 2016**

**STANDARD OF REVIEW**

The Commission will grant a petition for review at its 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; (iii) a substantial and important question of law, policy, or discretion has been raised; (iv) the conduct of the proceeding involved a prejudicial procedural error; or (v) any other consideration that the Commission may deem to be in the public interest.

**STANDARD OF REVIEW**

The Commission reviews questions of law *de novo*, but it defers to the Board's findings with respect to the underlying facts unless they are "clearly erroneous." The standard for showing "clear error" is a difficult one to meet: petitioners must demonstrate that the Board's determination is "not even plausible" in light of the record as a whole. For this reason, where a petition for review relies primarily on claims that the Board erred in weighing the evidence in a merits decision, the Commission seldom grants review.

## **STANDARD OF REVIEW**

The Commission gives substantial deference to the Board on issues of contention admissibility and will affirm admissibility determinations absent a showing of an error of law or abuse of discretion.

## **CONTENTIONS; ENVIRONMENTAL ISSUES**

Although it is true that “the ultimate burden with respect to NEPA lies with the NRC Staff,” our regulations require that intervenors file environmental contentions on the applicant’s environmental report.

## **CONTINUED STORAGE RULE**

Neither the waste confidence rule nor the continued storage rule applies to 11e.(2) byproduct material. These rules only apply to environmental impacts of spent fuel storage at power reactors and spent fuel storage facilities after the end of a reactor’s license term and before disposal in a deep geologic repository.

## **SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT**

Section 51.92(d) of 10 C.F.R. states: “[t]he supplement to a *final environmental impact statement* will be prepared in the same manner as the *final environmental impact statement* except that a scoping process need not be used.” This provision provides an exception from the scoping process for supplements to *final* EISs.

## **NATIONAL ENVIRONMENTAL POLICY ACT**

It is well settled that parties challenging an agency’s NEPA process are not entitled to relief unless they demonstrate harm or prejudice. Federal case law makes clear that procedural violations of NEPA do not automatically void an agency’s ultimate decision.

## **NATIONAL HISTORIC PRESERVATION ACT; NATIONAL ENVIRONMENTAL POLICY ACT**

Federal case law supports the legal principle that NHPA and NEPA compliance do not necessarily mirror one another.

## **NATIONAL HISTORIC PRESERVATION ACT**

The NHPA imposes several obligations on federal agencies, which proceed in a step-by-step manner. The consultation requirement continues throughout the steps. The first step is identifying any historic properties that might be affected by the federal undertaking (here licensing), and in doing so, making a reasonable and good faith effort to seek information from consulting parties, including Native American Tribes, to aid in that identification. But, as discussed by the Board, the identification of historic properties is not the end of the NHPA consultation process. After it identifies eligible sites that might be affected by the project, an agency must assess and resolve potential adverse effects in consultation with tribes that attach religious and cultural significance to those sites.

## **LICENSING BOARDS, AUTHORITY**

NRC regulations provide the Board with the authority to “take appropriate action to control the hearing . . . process,” “[r]egulate the course of the hearing and the conduct of the participants,” and “[i]ssue orders necessary to carry out the presiding officer’s duties and responsibilities under [10 C.F.R. Part 2].”

## **STANDARD OF REVIEW**

The Commission’s deference to the Board is particularly great when it comes to weighing the credibility of witnesses.

## **MEMORANDUM AND ORDER**

This decision addresses four petitions for review relating to a materials license application for an *in situ* uranium recovery facility filed by Powertech (USA), Inc.<sup>1</sup> All parties to the proceeding — the Oglala Sioux Tribe, Consolidated Intervenors, Powertech, and the NRC Staff — have filed petitions for review of the Atomic Safety and Licensing Board’s Partial Initial Decision and in the case

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<sup>1</sup> Powertech (USA) Inc.’s Submission of an Application for a Nuclear Regulatory Commission Uranium Recovery License for Its Proposed Dewey-Burdock In Situ Leach Uranium Recovery Facility in the State of South Dakota (Feb. 25, 2009) (ADAMS accession no. ML091030707).

of the Oglala Sioux Tribe and Consolidated Intervenors, earlier Board decisions finding several of their proffered contentions inadmissible.<sup>2</sup>

As discussed below, we take review of these petitions in part. We grant each party's petition with respect to the finality of the Board's ruling on Contentions 1A and 1B, find that these contentions should be considered "final" for the purposes of the petitions for review at issue here, and, pursuant to our inherent supervisory authority over agency adjudications, direct that the proceeding remain open for the narrow issue of resolving the deficiencies identified in Contentions 1A and 1B. We deny the remainder of Consolidated Intervenors' petition for review. With respect to Powertech's and the Staff's petitions for review, we also take review of the Board's direction to the Staff to address the deficiencies identified in Contentions 1A and 1B and we affirm the Board's direction to the Staff to submit monthly status reports and to file an agreement between the parties or a motion for summary disposition to resolve the deficiencies identified by the Board. We deny the remainder of Powertech's and the Staff's petitions for review. With respect to the Tribe's petition for review, we take review of the Board's rejection of Contention 8 as inadmissible. We find that the Board erred in its reasoning for dismissing Contention 8, but we affirm the Board's decision. We deny the remainder of the Tribe's petition for review.

## I. BACKGROUND

*In situ* uranium recovery involves injecting a solution, called lixiviant, into an ore body through an injection well. As it flows through the ore body, the lixiviant dissolves the underground uranium. A separate production well extracts the uranium-containing solution from the ground. The uranium is then extracted from the solution through a process called ion exchange. After extraction, the lixiviant is recycled and reinjected into the ore body to dissolve more uranium.<sup>3</sup> The *in situ* uranium recovery process is used widely throughout

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<sup>2</sup> LBP-15-16, 81 NRC 618 (2015); *see* Oglala Sioux Tribe's Petition for Review of LBP-15-16 and Decisions Finding Tribal Contentions Inadmissible (May 26, 2015) (Tribe's Petition); Consolidated Intervenors' Petition for Review of LBP-15-16 (May 26, 2015) (Consolidated Intervenors' Petition); Brief of Powertech (USA), Inc. Petition for Review of LBP-15-16 (May 26, 2015) (Powertech's Petition); NRC Staff's Petition for Review of LBP-15-16 (May 26, 2015) (Staff's Petition).

The Board has referred to Susan Henderson, Dayton Hyde, and Aligning for Responsible Mining as Consolidated Intervenors, although it originally called them Consolidated Petitioners. *See* LBP-14-5, 79 NRC 377, 379 n.3 (2014); LBP-13-9, 78 NRC 37, 42 n.2 (2013).

<sup>3</sup> Ex. APP-021-A, "Powertech (USA), Inc., Dewey-Burdock Project Application for NRC Uranium Recovery License Fall River and Custer Counties, South Dakota Technical Report" (Feb. 2009), at 1-6 (ML14247A342).

Wyoming, South Dakota, Nebraska, and New Mexico to recover subterranean uranium for enrichment and later use in nuclear power plants.

In order to comply with its National Environmental Policy Act (NEPA) obligations and recognizing the widespread use of this technology in this region of the country, the Staff prepared a generic environmental impact statement (GEIS) to address certain aspects of the environmental analysis for these facilities that tend to be similar across sites.<sup>4</sup> The GEIS also identifies resource areas that require site-specific information to fully analyze the environmental impacts. It also notes that subsequent site-specific environmental review documents may summarize and incorporate by reference information from the GEIS.<sup>5</sup> Any subsequent site-specific environmental impact analysis must also include new and significant information necessary to evaluate the *in situ* recovery license application.<sup>6</sup>

This proceeding began in February 2009, when Powertech filed an application for an *in situ* uranium recovery facility in Custer and Fall River Counties, South Dakota. In response, the Oglala Sioux Tribe and Consolidated Intervenors challenged the license application.<sup>7</sup> The Board granted their hearing requests in August 2010.<sup>8</sup> On November 26, 2012, the Staff issued the Draft Supplemental Environmental Impact Statement (DSEIS) for public comment.<sup>9</sup> The NRC

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<sup>4</sup> Exs. NRC-010-A-1 to NRC-010-B-2, “Generic Environmental Impact Statement for In-Situ Leach Uranium Milling Facilities” (Final Report), NUREG-1910, vols. 1-2 (May 2009) (ML14246-A328, ML14247A345, ML14246A333, ML14246A332, ML14246A351) (GEIS).

<sup>5</sup> Ex. NRC-010-A-1, GEIS, at xxxvii.

<sup>6</sup> *Id.*

<sup>7</sup> Petition to Intervene and Request for Hearing of the Oglala Sioux Tribe (Apr. 6, 2010) (Tribe’s Petition to Intervene); Consolidated Request for Hearing and Petition for Leave to Intervene (Mar. 8, 2010) (Consolidated Intervenors’ Petition to Intervene).

<sup>8</sup> LBP-10-16, 72 NRC 361, 443-44 (2010).

<sup>9</sup> Exs. NRC-009-A-1 to NRC-009-B-2, “Environmental Impact Statement for the Dewey-Burdock Project in Custer and Fall River Counties, South Dakota, Supplement to the Generic Environmental Impact Statement for *In-Situ* Leach Uranium Milling Facilities” (Draft Report for Comment), NUREG-1910, Supplement 4, vols. 1-2 (Nov. 2012) (ML14247A350, ML14246A329, ML14246-A330, ML14246A331) (DSEIS).

Both the Tribe and individual members of Consolidated Intervenors (Susan Henderson and Dayton Hyde) commented on the DSEIS and later filed proposed contentions relating to the DSEIS. Exs. NRC-008-A-1 to NRC-008-B-2, “Environmental Impact Statement for the Dewey-Burdock Project in Custer and Fall River Counties, South Dakota, Supplement to the Generic Environmental Impact Statement for *In-Situ* Leach Uranium Milling Facilities” (Final Report), NUREG-1910, Supplement 4, vols. 1-2 (Jan. 2014), app. E, at E-5 to E-6 (ML14246A350, ML14246A326, ML14246A327, ML14247A334) (FSEIS); *see* Consolidated Intervenors’ New Contentions Based on DSEIS (Jan. 25, 2013) (Consolidated Intervenors’ DSEIS Contentions); List of Contentions of the Oglala Sioux Tribe

(Continued)

Staff issued a Safety Evaluation Report (SER) in March 2013.<sup>10</sup> On January 29, 2014, the Staff issued the FSEIS.<sup>11</sup> The Staff issued the license to Powertech on April 8, 2014.<sup>12</sup> The Board held an evidentiary hearing on all nine admitted contentions in August 2014. In November 2014, the Tribe moved to file two new environmental contentions.<sup>13</sup>

The Board decision, LBP-15-16, resolved seven contentions in favor of Powertech and the Staff but found deficiencies in the Staff's NEPA analysis and NHPA consultation.<sup>14</sup> The Board upheld the license with an additional license condition, ruled inadmissible the two post-hearing contentions proffered by the Tribe, and directed the Staff to submit monthly reports regarding its progress in resolving the identified deficiencies.<sup>15</sup>

Our decision today involves four petitions for review that were filed by the parties to this proceeding. We summarize each petition below, along with the relevant procedural history for each set of issues. A full procedural history can be found in the Board's various decisions on this matter.<sup>16</sup>

#### **A. The Oglala Sioux Tribe's and Consolidated Intervenor's Petitions for Review**

The Oglala Sioux Tribe appeals the Board's resolution of several of its admit-

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Based on the Draft Supplemental Environmental Impact Statement (Jan. 25, 2013) (Tribe's DSEIS Contentions). On July 22, 2013, the Board admitted three of the new contentions and migrated seven of the originally admitted contentions. LBP-13-9, 78 NRC at 113-15.

<sup>10</sup> Ex. NRC-135, "Safety Evaluation Report for the Dewey-Burdock Project Fall River and Custer Counties, South Dakota" (Mar. 2013) (ML13052A182). The Staff issued a revised SER in April 2014 to correct certain technical references. Ex. NRC-134, "Safety Evaluation Report (Revised) for the Dewey-Burdock Project Fall River and Custer Counties, South Dakota" (Apr. 2014) (ML14245-A347).

<sup>11</sup> Exs. NRC-008-A-1 to NRC-008-B-2, FSEIS. On March 17, 2014, the Tribe and Consolidated Intervenor filed additional contentions related to the FSEIS. Consolidated Intervenor's Statement of Contentions (Mar. 17, 2014) (Consolidated Intervenor's FSEIS Contentions); Statement of Contentions of the Oglala Sioux Tribe Following Issuance of Final Supplemental Environmental Impact Statement (Mar. 17, 2014) (Tribe's FSEIS Contentions). The Board ruled that the contentions previously admitted in reference to the DSEIS migrated to the FSEIS and held inadmissible the remaining proposed contentions. LBP-14-5, 79 NRC at 401.

<sup>12</sup> Ex. NRC-012, License Number SUA-1600, Materials License for Powertech (USA) Inc. (Apr. 8, 2014) (ML14246A408) (License).

<sup>13</sup> Motion for Leave to File New or Amended Contention on Behalf of the Oglala Sioux Tribe (Nov. 7, 2014) (Tribe's Motion for New Contentions).

<sup>14</sup> LBP-15-16, 81 NRC at 657-58, 708-10.

<sup>15</sup> *Id.* at 708-10.

<sup>16</sup> *See id.* at 626-35; *see also* LBP-14-5, 79 NRC at 379-81; LBP-13-9, 78 NRC at 43-45; LBP-10-16, 72 NRC at 376-78.

ted contentions in favor of Powertech and the Staff.<sup>17</sup> The Tribe also seeks review of the Board's ruling on two of its admitted contentions that left the license in place and required the Staff to conduct additional consultation.<sup>18</sup> Consolidated Intervenor's petition for review of the Board's decision resolving their admitted contentions in favor of Powertech and the Staff.<sup>19</sup> They further challenge the Board's ruling that left the license in place despite ruling in Consolidated Intervenor's favor on two of their admitted contentions.<sup>20</sup>

In Contentions 1A and 1B, the Tribe and Consolidated Intervenor's challenged the NEPA analysis of cultural resources in the FSEIS and the Staff's compliance with the National Historic Preservation Act (NHPA).<sup>21</sup> The Board concluded that the Staff had fulfilled its NHPA obligations with respect to identification of historic properties. It nonetheless held that the Staff's analysis in the FSEIS did not satisfy NEPA's hard look requirement regarding cultural resources and that the Staff's consultation with the Tribe had been insufficient to comply with the Staff's additional obligations under the NHPA.<sup>22</sup> The Board retained jurisdiction over these contentions and required the Staff to "promptly initiat[e] a government-to-government consultation with the Oglala Sioux Tribe" to address the deficiencies identified in the Board's decision.<sup>23</sup> The Tribe and Consolidated Intervenor's seek review of the Board's decision to leave the license in place pending resolution of Contentions 1A and 1B.<sup>24</sup>

In Contention 2, the Tribe and Consolidated Intervenor's argued that the FSEIS did not contain sufficient background groundwater characterization.<sup>25</sup> The

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<sup>17</sup> Tribe's Petition at 19-25.

<sup>18</sup> *Id.* at 18-19.

<sup>19</sup> Consolidated Intervenor's Petition at 2 & n.3, 4-7.

<sup>20</sup> *Id.* at 3, 6-7.

Consolidated Intervenor's have requested that we set a briefing schedule for any issues that we accept for review. *Id.* at 8-9. In accordance with 10 C.F.R. § 2.341(c)(2), we have decided these matters on the basis of the petitions for review, and therefore deny Consolidated Intervenor's request to establish a briefing schedule.

Consolidated Intervenor's also challenge the Board's ruling in LBP-10-16 that "certain petitioners" lacked standing to intervene. *Id.* at 2. In their petition, Consolidated Intervenor's do not identify which petitioners they are referencing. We therefore deny review of that portion of their petition.

<sup>21</sup> Oglala Sioux Tribe's Post-Hearing Initial Brief with Findings of Fact and Conclusions of Law (Jan. 9, 2015), at 12, 27 (Tribe's Post-Hearing Brief); Consolidated Intervenor's Proposed Findings of Fact and Conclusions of Law and Response to Post-Hearing Order (Jan. 9, 2015), at 1-2, 14 (Consolidated Intervenor's Post-Hearing Brief).

<sup>22</sup> LBP-15-16, 81 NRC at 653-57.

<sup>23</sup> *Id.* at 657-58, 708, 710.

<sup>24</sup> Tribe's Petition at 18-19; Consolidated Intervenor's Petition at 6-7.

<sup>25</sup> Tribe's Post-Hearing Brief at 38; Consolidated Intervenor's Post-Hearing Brief at 21.

Board resolved this contention in favor of Powertech and the Staff, and the Tribe seeks review of the Board's decision.<sup>26</sup>

In Contention 3, the Tribe and Consolidated Intervenors argued that the FSEIS insufficiently analyzed certain geological and manmade features that may permit groundwater migration.<sup>27</sup> The Board resolved this contention in favor of Powertech and the Staff but added a license condition regarding the proper treatment of unplugged boreholes.<sup>28</sup> Both the Tribe and Consolidated Intervenors seek review of the Board's decision.<sup>29</sup>

In Contention 6, the Tribe and Consolidated Intervenors challenged the FSEIS's analysis of mitigation measures and argued that it impermissibly deferred the development of additional mitigation measures.<sup>30</sup> The Board resolved this contention in favor of Powertech and the Staff, and the Tribe seeks review of the Board's decision.<sup>31</sup>

Additionally, the Tribe challenges the Board's decision in LBP-15-16 to reject as inadmissible new contentions submitted after the hearing regarding borehole data and an Environmental Protection Agency (EPA) Preliminary Assessment regarding potential Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) cleanup.<sup>32</sup> Further, it seeks review of earlier Board decisions that found two of its contentions (Contentions 7 and 8) inadmissible.<sup>33</sup> In proposed Contention 7, the Tribe argued that the application was deficient because it did not include a reviewable plan for disposal of byproduct material or discuss the environmental effects of such disposal.<sup>34</sup> The Tribe resubmitted this contention on both the DSEIS and the FSEIS, and the Board dismissed it as inadmissible each time.<sup>35</sup> In proposed Contention 8, the Tribe argued that the DSEIS had been issued without the requisite scoping process.<sup>36</sup> The Board held this contention inadmissible, finding that it did not articulate a material dispute, as required by the contention admissibility standards.<sup>37</sup>

Finally, Consolidated Intervenors challenge the Board's decision at the outset

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<sup>26</sup> LBP-15-16, 81 NRC at 666, 708-09; *see* Tribe's Petition at 19-21.

<sup>27</sup> Tribe's Post-Hearing Brief at 43; Consolidated Intervenors' Post-Hearing Brief at 28, 47.

<sup>28</sup> LBP-15-16, 81 NRC at 681, 709.

<sup>29</sup> Tribe's Petition at 22-23; Consolidated Intervenors' Petition at 2 n.3, 4-7.

<sup>30</sup> Tribe's Post-Hearing Brief at 61-62; Consolidated Intervenors' Post-Hearing Brief at 53-56.

<sup>31</sup> LBP-15-16, 81 NRC at 697, 709; Tribe's Petition for Review at 23-25.

<sup>32</sup> Tribe's Petition at 8-11; *see* LBP-15-16, 81 NRC at 704-06, 709.

<sup>33</sup> Tribe's Petition at 3-8.

<sup>34</sup> Tribe's Petition to Intervene at 31-34.

<sup>35</sup> Tribe's FSEIS Contentions at 33-39; Tribe's DSEIS Contentions at 27-30, *see* LBP-14-5, 79 NRC at 396-97; LBP-13-9, 78 NRC at 71-72.

<sup>36</sup> Tribe's DSEIS Contentions at 30-33.

<sup>37</sup> LBP-13-9, 78 NRC at 74-75.

of the proceeding finding one of their contentions inadmissible.<sup>38</sup> In proposed Contention D, Consolidated Intervenors argued that Powertech's application was so disorganized that it violated 10 C.F.R. § 40.9, and the Board rejected this portion of the contention as inadmissible.<sup>39</sup>

## **B. Powertech's and the NRC Staff's Petitions for Review**

On appeal, the Staff and Powertech challenge the Board's resolution of Contentions 1A and 1B in favor of the Tribe and Consolidated Intervenors.<sup>40</sup> Additionally, both parties seek review of the Board's retention of jurisdiction over these contentions.<sup>41</sup> Finally, Powertech challenges the Board's imposition of an additional license condition in resolving Contention 3 that requires Powertech to locate and properly abandon unplugged boreholes within each wellfield prior to operations.<sup>42</sup>

## **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;
- (iii) A substantial and important question of law, policy, or discretion has been raised;
- (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.<sup>43</sup>

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<sup>38</sup> Consolidated Intervenors' Petition at 2 n.3, 3-4, 7.

<sup>39</sup> Consolidated Intervenors' Petition to Intervene at 36; *see* LBP-10-16, 72 NRC at 402.

<sup>40</sup> Powertech's Petition at 6-22; Staff's Petition at 17, 23. The Tribe filed a response to both petitions on June 22, 2015. Oglala Sioux Tribe's Consolidated Response to Petitions for Review of LBP-15-16 (June 22, 2015) (Tribe's Response).

<sup>41</sup> Powertech's Petition at 5-6, 6 n.9; Staff's Petition at 13-16, 16 n.73.

<sup>42</sup> Powertech's Petition at 22-25; *see* LBP-15-16, 81 NRC at 709.

<sup>43</sup> 10 C.F.R. § 2.341(b)(4).

We review questions of law *de novo*, but we defer to the Board’s findings with respect to the underlying facts unless they are “clearly erroneous.”<sup>44</sup> The standard for showing “clear error” is a difficult one to meet: petitioners must demonstrate that the Board’s determination is “not even plausible” in light of the record as a whole.<sup>45</sup> 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.<sup>46</sup> In addition, we give substantial deference to the Board on issues of contention admissibility and will affirm admissibility determinations absent a showing of an error of law or abuse of discretion.<sup>47</sup> In *Pa’ina Hawaii, LLC* (Materials License Application) we said the following about our standard of review:

We refrain from exercising our authority to make *de novo* findings of fact in situations where a Licensing Board has issued a plausible decision that rests on carefully rendered findings of fact. As we have stated many times, while we have discretion to review all underlying factual issues *de novo*, we are disinclined to do so where a Board has weighed arguments presented by experts and rendered reasonable, record-based factual findings. Our standard of “clear error” for overturning a Board’s factual findings is quite high. We defer to a board’s factual findings, correcting only clearly erroneous findings — that is, findings not even plausible in light of the record viewed in its entirety — where we have strong reason to believe that a board has overlooked or misunderstood important evidence.<sup>48</sup>

## **B. Contentions Rejected Prior to Hearing**

The Tribe and Consolidated Intervenors seek review of three Board decisions that found several of their proposed contentions inadmissible.

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<sup>44</sup> *Honeywell International, Inc.* (Metropolis Works Uranium Conversion Facility), CLI-13-1, 77 NRC 1, 18-19 (2013); *David Geisen*, CLI-10-23, 72 NRC 210, 224-25, 242 (2010).

<sup>45</sup> *Honeywell*, CLI-13-1, 77 NRC at 18 n.102; *Geisen*, CLI-10-23, 72 NRC at 224-25.

<sup>46</sup> *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, 46 (2012) (stating “where a Board’s decision rests on a weighing of extensive fact-specific evidence presented by technical experts, we generally will defer”); *Entergy Nuclear Vermont Yankee, LLC and Entergy Nuclear Operations, Inc.* (Vermont Yankee Nuclear Power Station), CLI-10-17, 72 NRC 1, 30 (2010) (noting that the Commission is “generally disinclined to upset *fact-driven* Licensing Board determinations”) (internal quotations omitted).

<sup>47</sup> *Entergy Nuclear Operations, Inc.* (Indian Point, Units 2 and 3), CLI-15-6, 81 NRC 340, 354-55 (2015); *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); *Southern Nuclear Operating Co.* (Vogtle Electric Generating Plant, Units 3 and 4), CLI-09-16, 70 NRC 33, 35 (2009).

<sup>48</sup> *Pa’ina Hawaii, LLC*, CLI-10-18, 72 NRC 56, 72-73 (2010) (internal quotations and citations omitted).

### *1. The Tribe's Proposed Contention 7*

In proposed Contention 7, the Tribe challenged the lack of a reviewable plan for disposal of byproduct material as defined in Section 11e.(2) of the Atomic Energy Act of 1954, as amended (byproduct material).<sup>49</sup> The Tribe submitted this contention three times: with respect to the environmental report, the DSEIS, and the FSEIS.<sup>50</sup> In each case, the Tribe provided a different basis for the contention, and the Board dismissed each iteration as inadmissible.<sup>51</sup> In its petition for review, the Tribe argues that the Board “erred at law and abused its discretion” each time it found Contention 7 inadmissible.<sup>52</sup> We do not find that the Tribe raises a substantial question regarding the admissibility of this contention. With respect to each Board decision, the Tribe provides a separate basis to support its petition.

#### *a. Proposed Contention and Board Orders LBP-10-16, LBP-13-9, and LBP-14-5*

The Board rejected Contention 7 in LBP-10-16, finding that the Tribe did not show that Powertech had failed to comply with any NRC or other federal regulation.<sup>53</sup> The Tribe argued that 10 C.F.R. § 40.31(h) and Criterion 1 in Appendix A to 10 C.F.R. Part 40 require Powertech to provide a specific plan for disposal of byproduct material in its application. The Board rejected this argument and explained that — per our case law — these provisions apply to uranium mills, not *in situ* recovery sites.<sup>54</sup> Additionally, the Tribe argued that NEPA required that the application contain a specific disposal plan. The Board

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<sup>49</sup>Tribe's Petition to Intervene at 31-34. Section 11e.(2) of the Atomic Energy Act of 1954, as amended, defines “byproduct material” as “the tailings or wastes produced by the extraction or concentration of uranium or thorium from any ore processed primarily for its source material content.” 42 U.S.C. § 2014(e)(2).

<sup>50</sup>Tribe's FSEIS Contentions at 33-39; Tribe's DSEIS Contentions at 27-30; Tribe's Petition to Intervene at 31-34.

<sup>51</sup>See Tribe's FSEIS Contentions at 33-39; Tribe's DSEIS Contentions at 27-30; Tribe's Petition to Intervene at 31-34; see also LBP-14-5, 79 NRC at 397; LBP-13-9, 78 NRC at 71-72; LBP-10-16, 72 NRC at 434-35.

<sup>52</sup>Tribe's Petition at 3.

<sup>53</sup>LBP-10-16, 72 NRC at 434. The Tribe called this Contention 7 in its initial petition and its DSEIS Contentions. It refers to the same contention as FSEIS Contention 2 in its FSEIS Contentions. To minimize confusion, we will refer to this contention as Contention 7 throughout this decision.

<sup>54</sup>*Id.* (citing *Hydro Resources, Inc.* (2929 Coors Road, Suite 101, Albuquerque, NM 87120), CLI-99-22, 50 NRC 3, 8 (1999) (“We agree with the Presiding Officer's general conclusion that section 40.31(h) and Part 40, Appendix A, ‘were designed to address the problems related to mill tailings and not problems related to [*in situ*] mining.’”)).

disagreed, holding that the Staff, not the applicant, is bound by NEPA.<sup>55</sup> But the Board noted that the Tribe would have the opportunity, if it were not satisfied with the treatment of this issue in the Staff's environmental documents, to renew this contention after issuance of those documents.<sup>56</sup>

The Tribe did just that when it filed a similar contention with respect to the analysis in the DSEIS, which the Board ruled inadmissible in LBP-13-9.<sup>57</sup> The Board determined that the Staff had addressed impacts related to byproduct material in both the DSEIS and the GEIS.<sup>58</sup> The Board observed that, insofar as the Tribe claimed that the contention was one of "omission," the contention was moot because the DSEIS contained the information the Tribe claimed was missing.<sup>59</sup> The Board stated that

because the Oglala Sioux Tribe neither substantively disputes the analysis of impacts related to disposal of byproduct material in relevant sections of the DSEIS and the GEIS, nor addresses the license condition related to disposal of byproduct material, the Board rejects this contention as failing to comply with the admissibility dictates of 10 C.F.R. § 2.309(f)(1)(vi).<sup>60</sup>

Upon issuance of the FSEIS, the Tribe refiled an identical contention alleging inadequate analysis of direct, indirect, and cumulative impacts of disposal of byproduct material.<sup>61</sup> The Board found the contention inadmissible and explained that the section of the FSEIS the Tribe cited did not differ materially from the parallel section in the DSEIS. Accordingly, the Board held that the Tribe failed to meet the requirements of 10 C.F.R. § 2.309(c)(1)(ii) for the filing of a new contention.<sup>62</sup>

*b. The Tribe's Petition for Review*

On appeal, the Tribe challenges the Board's ruling, supported by both the plain language of the regulation and our precedent, that 10 C.F.R. § 40.31(h) and

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<sup>55</sup> *Id.* at 435.

<sup>56</sup> *Id.*

<sup>57</sup> Tribe's DSEIS Contentions at 27-30; *see* LBP-13-9, 78 NRC at 71-72.

<sup>58</sup> LBP-13-9, 78 NRC at 71.

<sup>59</sup> *Id.*

<sup>60</sup> *Id.* at 71-72.

<sup>61</sup> Tribe's FSEIS Contentions at 33-39.

<sup>62</sup> LBP-14-5, 79 NRC at 397. Additionally, the Board noted that Powertech's draft license contained license conditions requiring that "Powertech [have a] byproduct material disposal contract in place prior to the commencement of operations." *Id.*

Part 40 Appendix A, Criterion 1, are inapplicable to *in situ* recovery facilities. We disagree — this point is well settled and we see no reason to revisit it here.<sup>63</sup>

Further, the Tribe argues that Part 40 Appendix A, Criterion 2, which is applicable to *in situ* uranium recovery facilities, requires a plan for waste disposal in the application. Based on the plain language of Criterion 2, we disagree. Criterion 2 states that “byproduct material from [*in situ*] extraction operations . . . must be disposed of at existing large mill tailings disposal sites . . . .”<sup>64</sup> This provision mandates that disposal of byproduct material take place at an existing disposal site — it does not require that the application include a waste disposal plan or designate which waste disposal site will be used.

Next, the Tribe argues that the Standard Review Plan “specifically discusses the need for a . . . waste disposal plan.”<sup>65</sup> But the Tribe’s argument regarding the Standard Review Plan does not demonstrate Board error. The Standard Review Plan is not a regulation; it is guidance for the Staff in reviewing an application, and it provides one way to comply with our regulations.<sup>66</sup> Additionally, as the Board explained in LBP-10-16, the Staff’s standard practice allows applicants *either* to identify a waste disposal site in their applications *or* to implement a license condition regarding waste disposal.<sup>67</sup> As discussed below, Powertech’s license includes two conditions related to waste disposal.<sup>68</sup> The Tribe has not identified any regulation to the contrary.

Additionally, the Tribe takes issue with the Board’s statement that an applicant is not bound by NEPA.<sup>69</sup> The Board had stated that although “[t]he Tribe also argue[d] that a specific disposal plan must be included in Powertech’s Application in order to comply with NEPA. . . . It is settled law that an applicant is not bound by NEPA, but by NRC regulations in Part 51.”<sup>70</sup> Insofar as it could be interpreted as implying that the Tribe was premature in filing its environmental contentions on the application, the Board’s decision was incorrect. Although it is true that “the ultimate burden with respect to NEPA lies with the NRC Staff,” our regulations require that intervenors file environmental contentions on the applicant’s environmental report.<sup>71</sup> In any case, any Board error here was

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<sup>63</sup> *Hydro Resources, Inc.*, CLI-99-22, 50 NRC at 8.

<sup>64</sup> 10 C.F.R. pt. 40, app. A, Criterion 2.

<sup>65</sup> Tribe’s Petition at 4.

<sup>66</sup> *Crow Butte Resources, Inc.* (Marsland Expansion Area), CLI-14-2, 79 NRC 11, 23 n.70 (2014) (citing *Curators of the University of Missouri*, CLI-95-1, 41 NRC 71, 98 (1995)).

<sup>67</sup> LBP-10-16, 72 NRC at 435.

<sup>68</sup> See Ex. NRC-012, License, at 6, 12.

<sup>69</sup> Tribe’s Petition at 4.

<sup>70</sup> LBP-10-16, 72 NRC at 435.

<sup>71</sup> *Progress Energy Florida, Inc.* (Levy County Nuclear Power Plant, Units 1 and 2), CLI-10-2, 71 NRC 27, 34 (2010); see 10 C.F.R. § 2.309(f)(2).

harmless because it also stated that the Tribe would have the opportunity to formulate a contention regarding disposal of byproduct material on the DSEIS, and indeed, the Tribe did so.<sup>72</sup>

The Tribe asserts that the Board's recognition that planning for waste disposal is an important aspect of our regulations necessarily raises a substantial question for our review.<sup>73</sup> In support of this argument, the Tribe refers to concerns the Board expressed regarding whether waste disposal would be addressed in Powertech's license.<sup>74</sup> In LBP-10-16, the Board noted that "if a condition dealing with . . . byproduct material is not included in the license, the Tribe has no recourse because it cannot challenge the license at that time."<sup>75</sup> However, Powertech's license contains multiple conditions regarding disposal of byproduct material. License Condition 12.6 requires Powertech to submit to the NRC a disposal agreement with a licensed disposal site before beginning operations.<sup>76</sup> License Condition 9.9 requires Powertech to maintain such a disposal agreement; if the agreement expires or otherwise terminates, Powertech must halt operations.<sup>77</sup>

Although the Board held that Contention 7 was rendered moot by the analysis of the impacts of the disposal of byproduct material in the DSEIS, the Tribe argues that the DSEIS only identified a possible site for the disposal of byproduct material; the Tribe reiterates its argument that the DSEIS's analysis of the impacts of byproduct material disposal was lacking.<sup>78</sup> On appeal, the Tribe argues that the Board erred in rejecting Contention 7 as a contention of omission.<sup>79</sup> But, as explained above, the Board found that the DSEIS and the GEIS analyzed the impacts of the disposal of byproduct material, and it pointed to specific sections of both documents.<sup>80</sup> The Board's ruling did not rest on the

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<sup>72</sup> LBP-10-16, 72 NRC at 435. See Tribe's DSEIS Contentions at 27-30; see also *Geisen*, CLI-10-23, 72 NRC at 245 ("[T]o prevail on appeal, [a party] must show not only that the majority erred but also that the error had a prejudicial effect on the [party's] case." (citations omitted)).

<sup>73</sup> The Tribe argues that "[a]lthough the [Board] excluded Contention 7, the Board recommended 'that this issue be considered by the Commission (or Board) when it conducts the mandatory review and hearing that must be held in this case.'" Tribe's Petition at 4 (quoting LBP-10-16, 72 NRC at 435). The Board cited 10 C.F.R. § 51.107(a), which refers to issuance of a combined license for a nuclear power reactor; it has no applicability to *in situ* leach facilities. Mandatory hearings are not held in materials licensing proceedings like this one.

<sup>74</sup> Tribe's Petition at 4.

<sup>75</sup> LBP-10-16, 72 NRC at 435.

<sup>76</sup> Ex. NRC-012, License, at 12.

<sup>77</sup> *Id.* at 6.

<sup>78</sup> Tribe's Petition at 5; see LBP-13-9, 78 NRC at 71.

<sup>79</sup> Tribe's Petition at 5. As the Board noted, the Tribe itself characterized this contention as one of omission. See Tribe's DSEIS Contentions at 28; see also LBP-13-9, 78 NRC at 71.

<sup>80</sup> LBP-13-9, 78 NRC at 71.

distinction between a contention of omission and one of inaccuracy — it found that the Tribe’s proposed contention failed to challenge or address the information in the DSEIS and the draft license condition related to waste disposal.<sup>81</sup> On appeal, the Tribe argues that the discussion of waste disposal in the GEIS was insufficient to fulfill the Staff’s responsibilities, but the Tribe fails to consider that, as the Board noted, both the DSEIS and the draft license condition also addressed waste disposal.<sup>82</sup> The Tribe does not identify any error regarding the Board’s ruling on this point; therefore it does not raise a substantial question for our review.

Next, the Tribe argues that the Board dismissed Contention 7 as inadmissible “simply because the draft license contained a provision requiring the applicant to establish a disposal plan at some point in the future.”<sup>83</sup> But the Tribe misstates the Board’s basis for its ruling. The Board based its ruling on the Staff’s analysis in the GEIS, the DSEIS, and expectation that the license would include conditions regarding waste disposal.<sup>84</sup> Given the Board’s reliance on the Staff’s analysis and the expected license conditions — which are indeed present in Powertech’s license — we see no substantial question for review here.

The Tribe’s final argument in its petition for review with respect to Contention 7 invokes the United States Court of Appeals for the District of Columbia Circuit’s decision vacating the waste confidence rule, now called the continued storage rule (10 C.F.R. § 51.23).<sup>85</sup> The Tribe argues that the court’s vacatur of the former waste confidence rule confirms that the Tribe has raised a substantial question regarding the Board’s dismissal of its proposed Contention 7 in LBP-14-5 and is analogous to this proceeding.<sup>86</sup>

But the court’s decision regarding continued storage has no bearing on this issue. Neither the waste confidence rule nor the continued storage rule applies to 11e.(2) byproduct material. These rules only apply to environmental impacts of spent fuel storage at power reactors and spent fuel storage facilities after the end of a reactor’s license term and before disposal in a deep geologic repository.<sup>87</sup> Moreover, License Condition 12.6 expressly prevents Powertech from beginning operations — and therefore producing byproduct material — before it has in

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<sup>81</sup> *Id.* at 71-72.

<sup>82</sup> Tribe’s Petition at 5; *see* LBP-13-9, 78 NRC at 71-72.

<sup>83</sup> Tribe’s Petition at 5.

<sup>84</sup> LBP-13-9, 78 NRC at 71-72.

<sup>85</sup> Tribe’s Petition at 5-6; *see New York v. NRC*, 681 F.3d 471 (D.C. Cir. 2012).

<sup>86</sup> In a decision issued on June 3, 2016, the U.S. Court of Appeals for the District of Columbia Circuit denied the petitions for review challenging the NRC’s updated continued storage rule. *New York v. NRC*, 824 F.3d 1012 (D.C. Cir. 2016), *reh’g denied*, 2016 U.S. App. LEXIS 14584 (D.C. Cir. Aug. 8, 2016).

<sup>87</sup> *See* 10 C.F.R. § 51.23.

place an agreement with a licensed waste disposal site. And License Condition 9.9 prevents Powertech from continuing to operate if the waste disposal agreement expires or is otherwise terminated. In sum, the continued storage rule is inapplicable to Powertech's facility and Powertech's license is conditioned to ensure that it will not produce byproduct material without a plan for disposal. Accordingly, the Tribe does not raise a substantial question for review.

## **2. The Tribe's Proposed Contention 8**

The Tribe petitions for review of the Board's rejection of its proposed Contention 8, in which it argued that the DSEIS had been issued without the requisite scoping process.<sup>88</sup> The Board rejected the contention for failing to demonstrate that a "genuine dispute exists with the applicant/licensee on a material issue of law or fact."<sup>89</sup> The Board held that 10 C.F.R. §§ 51.26(d) and 51.92(d) both exempt the Staff from conducting a scoping process for a "supplemental" EIS based on a plain language reading of the regulation.<sup>90</sup> Further, the Board found that the Staff had engaged in a scoping process when it developed the GEIS and had conducted additional outreach during development of the SEIS, thereby satisfying the scoping requirement.<sup>91</sup> Therefore, the Board concluded that the Tribe's contention was inadmissible.<sup>92</sup>

In its petition for review, the Tribe argues that the exceptions to the scoping requirements in 10 C.F.R. §§ 51.26(d) and 51.92(d) do not apply to site-specific EISs that tier off of a GEIS merely because the Staff may describe them as supplements.<sup>93</sup> In support of this argument, the Tribe refers to an Office of Inspector General (OIG) Audit Report from August 2013.<sup>94</sup> With respect to scoping, the Audit Report concluded that

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<sup>88</sup>Tribe's Petition at 7; *see* Tribe's DSEIS Contentions at 30-33; LBP-13-9, 78 NRC at 74-75. In Contention 8, which the Tribe submitted on both the application and the DSEIS, the Tribe also challenged the requirement to submit environmental contentions before the Staff's completion of its NEPA analysis. The Board rejected — in both LBP-10-16 and LBP-13-9 — the Tribe's argument that this requirement violates NEPA. LBP-13-9, 78 NRC at 74; LBP-10-16, 72 NRC at 437-38. The Board explained that the challenge "could be properly characterized as 'an impermissible attack on NRC regulations, in contravention of 10 C.F.R. § 2.335.'" LBP-13-9, 78 NRC at 74 (quoting LBP-10-16, 72 NRC at 436). The Tribe has not challenged the Board's reasoning on this portion of Contention 8.

<sup>89</sup>LBP-13-9, 78 NRC at 74-75 (quoting 10 C.F.R. § 2.309(f)(1)(vi)).

<sup>90</sup>*Id.* at 75.

<sup>91</sup>*Id.*

<sup>92</sup>*Id.*

<sup>93</sup>Tribe's Petition at 7.

<sup>94</sup>"Audit of NRC's Compliance with 10 CFR Part 51 Relative to Environmental Impact State-  
(Continued)

NRC did not fully comply with the scoping regulations because of incorrect understanding of the regulations related to scoping for EISs that tier off of a generic EIS. Specifically, NRC staff refer to the tiered site-specific EIS as a “supplement” to the generic EIS, leading to the belief that the exception in 10 [C.F.R.] § 51.26(d) applies to tiered EISs. Some NRC managers assert that the public scoping process for the generic EIS for [*in situ*] uranium recovery suffices for subsequent, site-specific uranium recovery applications.

However, during that generic EIS scoping process in 2007, NRC staff emphasized in response to public comments that all applications would receive a site-specific review. Staff also emphasized that there would be a request for public input on scoping through a “scoping meeting” on site-specific issues if an EIS were prepared for a future application.<sup>95</sup>

The Audit Report specifically identified the DSEIS for this project as deficient because it lacked a formal scoping process.<sup>96</sup>

We take review of the Board’s denial of the Tribe’s proposed Contention 8 with respect to scoping pursuant to 10 C.F.R. § 2.341(b)(4)(ii).<sup>97</sup> The Tribe’s contention identifies an issue of law with respect to our NEPA scoping process. We find that the Board’s reasoning was flawed because it relied on a section of our NEPA regulations (10 C.F.R. § 51.92) that is not applicable here. Despite this error on the part of the Board, we affirm the Board’s ruling and find that, even without a separate scoping process on the SEIS, the Staff provided the Tribe with ample opportunities at an early stage in the process to participate in the development of the site-specific, supplemental EIS. The Tribe had the opportunity to participate in the NEPA process from the beginning, and it has not demonstrated harm or prejudice resulting from the lack of a separate, formal scoping process on the site-specific SEIS; thus, the Board’s error was harmless.

We agree with the Staff’s observation that tiering and supplementing are not mutually exclusive concepts.<sup>98</sup> However, we agree with the petitioners that the exception in 10 C.F.R. § 51.92(d) does not apply to a supplemental, site-specific EIS that tiers off a GEIS. Section 51.92(d) states: “[t]he supplement to a *final environmental impact statement* will be prepared in the same manner as the *final environmental impact statement* except that a scoping process need not

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ments,” OIG-13-A-20 (Aug. 20, 2013) (ML13232A192) (Audit Report). The OIG published the Audit Report after the Board’s dismissal of the scoping portion of the Tribe’s proposed Contention 8 in LBP-13-9.

<sup>95</sup> *Id.* at 24.

<sup>96</sup> *Id.* at 22; see Tribe’s Petition at 7.

<sup>97</sup> We review questions of law *de novo*. See *Geisen*, CLI-10-23, 72 NRC at 242.

<sup>98</sup> NRC Staff’s Response to Oglala Sioux Tribe’s Petition for Review of LBP-15-16 (June 22, 2015), at 8 (Staff’s Response to Tribe).

be used.”<sup>99</sup> This provision provides an exception from the scoping process for supplements to *final* EISs. The GEIS is not a final EIS for the purpose of the specific federal action here — the proposed licensing of Powertech’s *in situ* uranium recovery facility. The Powertech site-specific SEIS is not a supplement in the sense meant by 10 C.F.R. § 51.92(d). The Staff’s reference to the SEIS for this project as a supplement does not change the applicability of the exception in 10 C.F.R. § 51.92(d) — it applies to supplements to final EISs, not site-specific supplements to a GEIS.

Because we determine that the Tribe is correct that 10 C.F.R. § 51.92 does not apply here, we now turn to the effect of the Board’s error. After considering the Staff’s involvement with the Tribe and other interested stakeholders throughout the NEPA process, we find that the Tribe has not shown that the lack of scoping resulted in harm or prejudice. Despite the fact that the Staff did not engage in a separate, formal scoping process in preparing the DSEIS, the Staff provided the Tribe with ample opportunities at an early stage in the process to participate in the development of the site-specific EIS.<sup>100</sup> For example, the Staff states that in 2009 it proposed a meeting with the Tribe to discuss the project, but that the Tribe was unable to attend.<sup>101</sup> Further, “[i]n early 2010, the Staff placed advertisements in six newspapers with circulation in the Dewey-Burdock area, including the Lakota Country Times and the Native Sun, inviting the public to comment on the Dewey-Burdock Project.”<sup>102</sup> This public outreach demonstrates that the Tribe and the public had sufficient opportunity to provide input to the Staff regarding the scope of the Staff’s environmental analysis. Moreover, the Staff conducted full scoping for the GEIS, which considered specific features of the Black Hills and identified Dewey-Burdock on maps and figures. The GEIS also specified that it would serve as part of Dewey-Burdock’s environmental analysis.<sup>103</sup>

It is well settled that parties challenging an agency’s NEPA process are not entitled to relief unless they demonstrate harm or prejudice — and the Tribe has not done so here.<sup>104</sup> Federal case law makes clear that procedural violations of NEPA do not automatically void an agency’s ultimate decision.<sup>105</sup> For ex-

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<sup>99</sup> 10 C.F.R. § 51.92(d) (emphasis added).

<sup>100</sup> See, e.g., Staff’s Response to Tribe at 8-9 (listing opportunities for the Tribe’s participation).

<sup>101</sup> *Id.* at 8-9; see Tr. at 771.

<sup>102</sup> Staff’s Response to Tribe at 9; see Ex. NRC-008-A-1, FSEIS § 1.4.2.

<sup>103</sup> See Staff’s Response to Tribe at 9.

<sup>104</sup> *Nw. Coal. for Alts. to Pesticides v. Lyng*, 844 F.2d 588, 594-95 (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, 300-01 (W.D. Va. 1995).

<sup>105</sup> *Lyng*, 844 F.2d at 595.

ample, in *Northwest Coalition for Alternatives to Pesticides v. Lyng*, although the Bureau of Land Management had not properly notified the plaintiff during the scoping process, the Ninth Circuit upheld the District Court's determination that the plaintiff was unable to demonstrate prejudice after having participated in the development of the EIS.<sup>106</sup> Also in *Lyng*, the court, discussing the high bar for overturning a federal administrative decision, referred to a Fourth Circuit case holding that individuals not given notice of public hearings on a proposed wastewater treatment plant did not suffer prejudice, even though they were not provided the opportunity to participate until "the eleventh hour" of the NEPA process.<sup>107</sup> Here, by contrast, the Tribe was involved from the beginning of the process, despite the acknowledged lack of formality in the scoping for this EIS.

Further, the scoping process is intended to provide notice to individuals potentially affected by the proposed federal action.<sup>108</sup> Here, although the Staff did not conduct a formal scoping process for the DSEIS for the Dewey-Burdock project, the Tribe had ample notice of the project and numerous opportunities throughout the process to participate in the development of the DSEIS. The Tribe argues that it was "deprived . . . of the opportunity to present its concerns at the proper time," but it has not argued that any particular section of the site-specific EIS is deficient because of the lack of a formal scoping process.<sup>109</sup>

We are satisfied that the Tribe had the opportunity to provide input on the development of the DSEIS in this case; therefore, the Tribe has not demonstrated harm or prejudice resulting from the lack of a formal scoping process. We find that any error by the Board was harmless and decline to order a hearing on the merits of this contention.<sup>110</sup>

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<sup>106</sup> *Id.* at 594-95.

<sup>107</sup> *Id.* at 595 (citing *Providence Rd. Cmty. Ass'n v. EPA*, 683 F.2d 80, 82 (4th Cir. 1982)).

<sup>108</sup> *Kootenai Tribe of Idaho v. Veneman*, 313 F.3d 1094, 1116 (9th Cir. 2002) ("The primary purpose of the scoping period is to notify those who may be affected by a proposed government action which is governed by NEPA that the relevant entity is beginning the EIS process; this notice requirement ensures that interested parties are aware of and therefore are able to participate meaningfully in the entire EIS process, from start to finish." (citing *Lyng*, 844 F.2d at 594-95)), *abrogated on other grounds by Wilderness Soc'y v. U.S. Forest Serv.*, 630 F.3d 1173 (9th Cir. 2011).

<sup>109</sup> Tribe's Petition at 8.

<sup>110</sup> Notably, the Tribe has not articulated a request for any specific relief regarding the Board's dismissal of this portion of Contention 8 on the DSEIS. Because the Staff has revised its guidance to provide for scoping for future supplemental EISs that tier off of a generic EIS, we decline to delve into the underlying legal issue. Memorandum from Catherine Haney, NMSS, to Stephen D. Dingbaum, OIG (June 30, 2015), at 2 (ML15166A406).

### 3. Consolidated Intervenors' Proposed Contention D

#### a. Proposed Contention and Board Order

Consolidated Intervenors challenge the Board's partial denial of their proposed Contention D in LBP-10-16.<sup>111</sup> In the dismissed part of Contention D, Consolidated Intervenors argued that Powertech's application violated 10 C.F.R. § 40.9 "by being disorganized . . . ."<sup>112</sup> In denying this portion of Contention D, the Board found that the application was not "so incomprehensible as to be useless to the public" and stated that "issues of disorganization in an application cannot be said to be germane to the licensing process."<sup>113</sup>

#### b. Consolidated Intervenors' Petition for Review

On appeal, Consolidated Intervenors argue that the Board created "new standards for accuracy and completeness under [10 C.F.R. § 40.9]" and held "that [a]pplications must be 'incomprehensible' and 'useless to the public' to be deficient under [10 C.F.R. § 40.9]."<sup>114</sup> They claim that the Board's decision "undermines the entire purpose of having an [a]pplication if the standard is so low that it will pass muster if it is barely comprehensible and a hair better than 'useless.'"<sup>115</sup> Finally, Consolidated Intervenors argue that "[t]he public has a strong interest in the standard for accuracy and completeness of source material license applications being higher than that set by the Board ('incomprehensible[;] 'useless to the public')."<sup>116</sup>

We find that Consolidated Intervenors have not identified a substantial question for our review here. They have not demonstrated that the Board erred at law or abused its discretion in dismissing this portion of Contention D. Consolidated Intervenors have misconstrued the Board's holding; the Board did not adopt or create a new standard for an application to be deemed deficient under 10 C.F.R.

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<sup>111</sup>Consolidated Intervenors' Petition at 2 n.3, 3-4, 7. In their petition for review, Consolidated Intervenors cite LBP-15-16 as the Board order that dismissed portions of their proposed Contention D. *Id.* at 2 n.3. To clarify, the Board actually held inadmissible the relevant portions of Contention D in LBP-10-16. *See* LBP-10-16, 72 NRC at 402-03.

<sup>112</sup>Consolidated Intervenors' Petition to Intervene at 36; *see* LBP-10-16, 72 NRC at 400-01. The Board only denied Consolidated Intervenors' Contention D with respect to the comprehensibility of the application. LBP-10-16, 72 NRC at 402-03. The Board admitted portions of the contention that related to the technical adequacy of baseline water quality and adequate confinement of the host aquifer. *Id.* at 403.

<sup>113</sup>*Id.* at 402-03 (quoting *Hydro Resources, Inc.* (2929 Coors Road, Suite 101, Albuquerque, NM 87120), LBP-98-9, 47 NRC 261, 280 (1998)).

<sup>114</sup>Consolidated Intervenors' Petition at 2 n.3, 7.

<sup>115</sup>*Id.* at 3-4.

<sup>116</sup>*Id.* at 7.

§ 40.9. Rather, the Board determined that Powertech’s application was sufficiently comprehensible for compliance with our regulations. That is, the Board simply disagreed with Consolidated Intervenors’ argument that the application was incomprehensible and useless. Pursuant to 10 C.F.R. § 2.341(b)(4)(i), we will take review of a Board’s factual findings when those findings are clearly erroneous or in conflict with a finding regarding the same fact in a different proceeding.<sup>117</sup> Consolidated Intervenors have not raised a substantial question with respect to the Board’s factual conclusions here. Therefore, we deny Consolidated Intervenors’ petition for review.

### C. New Contentions Held Inadmissible

The Tribe has petitioned for review of the Board’s ruling in LBP-15-16 finding its two newly proposed contentions inadmissible.<sup>118</sup> The Tribe filed these two contentions after the conclusion of the evidentiary hearing in August 2014 in response to the Board’s post-hearing order directing Powertech to disclose to all parties additional information regarding borehole log data concerning the project site.<sup>119</sup> The Staff reviewed the data and determined that it did not contradict the findings in the FSEIS.<sup>120</sup> Thereafter, the Tribe proposed two new contentions: the first related to the Staff’s October 2014 submissions regarding the data and the second related to EPA documents regarding potential CERCLA cleanup at the Powertech site.<sup>121</sup>

#### 1. The Tribe’s New Contention 1

##### a. Proposed Contention and Board Order

In its first new contention, the Tribe argued that the Staff was required to evaluate the well log data as part of the NEPA process, and that the methodology the Staff used to evaluate the well logs (by conducting a “spot check”) was unacceptable.<sup>122</sup>

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<sup>117</sup> See *Honeywell*, CLI-13-1, 77 NRC at 18-19; *Geisen*, CLI-10-23, 72 NRC at 224-25.

<sup>118</sup> Tribe’s Petition at 8-11; see LBP-15-16, 81 NRC at 704-06.

<sup>119</sup> Post Hearing Order (Sept. 8, 2014), at 19 (unpublished) (Post-Hearing Order); see Ex. OST-19, Press Release, Powertech Uranium Corp., Powertech Uranium (Azarga Uranium) Enters into Data Purchase Agreement for Dewey-Burdock Project (July 16, 2014) (ML14247A415).

<sup>120</sup> NRC Staff’s Motion to Admit Testimony and Exhibits Addressing Powertech’s September 14, 2014 Disclosures (Oct. 14, 2014), at 1; Ex. NRC-158, Supplemental Testimony Regarding NRC Staff Analysis of TVA Well Log Data (Oct. 14, 2014) at 12 (ML14344A931) (Staff’s Supplemental Testimony).

<sup>121</sup> Tribe’s Motion for New Contentions at 2-3.

<sup>122</sup> *Id.* at 6-9.

The Board found that the contention did not meet the requirements of 10 C.F.R. § 2.309(c)(1)(ii) because the information in the well logs was not materially different from information already in the record.<sup>123</sup> The Board also noted that the Tribe failed to meet the requirements of 10 C.F.R. § 2.309(f)(1)(vi) because it had not raised a genuine dispute on a material issue of law or fact — the Staff’s method for evaluating borehole data by reviewing representative borehole logs had not changed throughout the proceeding.<sup>124</sup> Further, the Board noted that the Tribe had not met the requirements in 10 C.F.R. § 51.92 for demonstrating the need to supplement a FSEIS — in particular that the information in question was “new and significant.”<sup>125</sup>

*b. The Tribe’s Petition for Review*

On appeal, the Tribe argues that the Board’s denial of the Tribe’s request to develop and present its contention presents a substantial question for review.<sup>126</sup> It challenges the Board’s factual determinations that new well log data did not present materially different information and that the NRC’s “spot check” methodology has been used throughout the Staff’s review and issuance of Powertech’s license.<sup>127</sup> But this challenge does not show how the Board’s determination here is in error. The Board determined that the Tribe did not present

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<sup>123</sup> LBP-15-16, 81 NRC at 704-05. *See* 10 C.F.R. § 2.309(c)(1)(i)-(iii); *see also* Amendments to Adjudicatory Process Rules and Related Requirements, 77 Fed. Reg. 46,562, 46,571 (Aug. 3, 2012) (clarifying the requirements governing hearing requests, intervention petitions, and motions for leave to file new or amended contentions). Although this proceeding began in 2009, the Board ruled on the Tribe’s proposed new contentions in 2015 and had previously adopted the 2012 amendments to 10 C.F.R. Part 2 for this proceeding. Order (Concerning Changes to 10 C.F.R. Part 2) (Aug. 21, 2012) (unpublished).

<sup>124</sup> LBP-15-16, 81 NRC at 705.

<sup>125</sup> *Id.* The Tribe objects to the Board’s discussion of this point in its petition for review. The Tribe argues that the Board “conflate[d] the contention admissibility standard with the substantive standard of whether the new information would require a supplement to the NEPA documents.” Tribe’s Petition at 9. Regardless, the Tribe’s challenge does not raise a substantial question for review, because the Tribe’s New Contention 1 did not meet the requirements of 10 C.F.R. §§ 2.309(c)(1)(ii) and 2.309(f)(1)(vi). If the information is not materially different from previously available information, it stands to reason that it does not “paint a seriously different picture of the environmental landscape” for this proceeding. *Hydro Resources, Inc.*, CLI-99-22, 50 NRC at 14 (quoting *Sierra Club v. Froehlke*, 816 F.2d 205, 210 (5th Cir. 1987)).

<sup>126</sup> The Tribe argues that the Board’s post-hearing order provides support for its argument that rejection of this contention presents a substantial question for review. Tribe’s Petition at 10. There, the Board ordered disclosure of various documents. Post-Hearing Order at 10-12, 19. The Board denied the Tribe’s request for sanctions, and denied Powertech’s motion for reconsideration. *Id.* at 12, 16. While the Tribe’s description of the Board’s post-hearing order is accurate, those rulings do not support its petition for review.

<sup>127</sup> Tribe’s Petition at 8-10.

any information that was materially different than what was previously available.<sup>128</sup> The Tribe raised this contention after the hearing was complete and the Board had the benefit of hearing from all of the parties on the borehole information and the Staff's review methodology. On appeal, the Tribe does not give us a reason to find that the Board, which was familiar with the information available throughout the pendency of the proceeding, committed an error or abuse of discretion. Therefore, we decline to take review of the Board's dismissal of this contention as inadmissible.

## **2. *The Tribe's New Contention 2***

### **a. *Proposed Contention and Board Order***

In its second new contention, the Tribe argued that the Staff had not considered in its NEPA analysis information in a newly released EPA assessment regarding a historic hardrock uranium mine site within the Dewey-Burdock project area.<sup>129</sup> The Tribe argued that "the EPA states that it has determined that a CERCLA removal action is recommended for the site and will proceed."<sup>130</sup> In its contention, the Tribe asserted that the CERCLA removal action was therefore reasonably foreseeable, and that the Staff should have considered the action in the cumulative impacts analysis in the EIS.<sup>131</sup>

The Board held this contention inadmissible because the Tribe "fail[ed] to present sufficient information to show a genuine dispute exists on a material issue of law or fact, as required by 10 C.F.R. § 2.309(f)(1)(vi)."<sup>132</sup> Moreover, the Board found that the Tribe disregarded the analysis in the FSEIS of the environmental concerns raised in the EPA Preliminary Assessment, as well as the EPA Preliminary Assessment's repeated references to the FSEIS.<sup>133</sup> Given that the EPA documents themselves referred to the Staff's analysis in both the DSEIS and FSEIS, the Board concluded that the Tribe had not met the contention admissibility requirements, specifically 10 C.F.R. § 2.309(f)(1)(vi).<sup>134</sup>

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<sup>128</sup> See LBP-15-16, 81 NRC at 704-05; see also Ex. NRC-158, Staff's Supplemental Testimony, at 9-13.

<sup>129</sup> Tribe's Motion for New Contentions at 11; see also Ex. OST-026, Letter from Ryan M. Lunt, Task Order Project Manager, Seagull Env'tl. Techs., Inc., to Victor Ketellapper, Site Assessment Team Leader, U.S. Env'tl. Prot. Agency, Region 8 (Sept. 24, 2014), attach. "Preliminary Assessment Report Regarding the Darrow/Freezeout/Triangle Uranium Mine Site Near Edgemont, South Dakota" (ML14344A926).

<sup>130</sup> Tribe's Motion for New Contentions at 11.

<sup>131</sup> *Id.*

<sup>132</sup> LBP-15-16, 81 NRC at 706.

<sup>133</sup> *Id.*

<sup>134</sup> *Id.*

*b. The Tribe's Petition for Review*

In its petition for review, the Tribe argues that the Board erred because it “glossed over” the fact that “[t]he EPA identified a new contamination pathway with implications for pollution containment at the site that is not addressed in the application, any NRC materials, or the FSEIS.”<sup>135</sup> The Tribe asserts that the FSEIS discusses the unreclaimed mines but does not address “the contamination pathway from the unreclaimed mines to the groundwater” and argues that this presents a substantial question for our review.<sup>136</sup>

Contrary to the Tribe’s argument on appeal, the Board did not overlook the Tribe’s arguments regarding environmental concerns related to the abandoned mines. In finding New Contention 2 inadmissible, the Board determined that the Tribe had “fail[ed] to show that the Preliminary Assessment is or contains significant new information” and therefore did not demonstrate a genuine dispute on a material issue of law or fact.<sup>137</sup> The Board’s ruling was based on its determination that the information in the Preliminary Assessment, including information regarding groundwater contamination, did not differ significantly from that in the FSEIS so as to demonstrate that a genuine dispute existed on a material issue of law or fact.<sup>138</sup> The Tribe’s petition does not raise a substantial question regarding the Board’s finding that the information in the Preliminary Assessment about unreclaimed mines was insufficient to meet the requirements of 10 C.F.R. § 2.309(f)(1)(vi). Therefore, we deny review of the Board’s dismissal of New Contention 2.

We now turn to the parties’ claims with respect to the Board’s merits decision.

**D. Contentions Decided on the Merits**

***1. Contentions 1A and 1B***

As we discuss in detail below, we find that the Board’s ruling on Contentions 1A and 1B is final, and consideration of the petitions for review under 10 C.F.R. § 2.341(b)(4) is appropriate at this time. We deny each party’s petition for review with respect to Contentions 1A and 1B — thus leaving in place the Board’s ruling in favor of the Tribe and Consolidated Intervenors. Further, under our inherent supervisory authority over agency adjudications, we leave the proceeding open for the narrow issue of resolving the deficiencies identified by the Board.

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<sup>135</sup> Tribe’s Petition at 11.

<sup>136</sup> *Id.*

<sup>137</sup> LBP-15-16, 81 NRC at 706.

<sup>138</sup> *Id.*

a. *Partial Initial Decision*

First, we must clarify the appropriate standard of review of the Board's decision on these contentions. By its terms, the Board presented LBP-15-16 as a "partial initial decision" that left the ultimate resolution of Contentions 1A and 1B for a future decision.<sup>139</sup> Under this approach, the Board retained jurisdiction pending the Staff's remedy of the deficiencies the Board identified in the Board's ruling on Contentions 1A and 1B.<sup>140</sup> Each party, in turn, questioned the Board's decision to retain jurisdiction.<sup>141</sup>

The Board received full briefing and held oral argument and a merits hearing on the issues raised in Contentions 1A and 1B. The Board found in favor of the Tribe and Consolidated Intervenors and identified deficiencies in the Staff's efforts to comply with NEPA and the NHPA.<sup>142</sup> With briefing on these issues completed and the Board's having found in favor of the Tribe and Consolidated Intervenors, we find that the Board's resolution of Contentions 1A and 1B is final and consideration of the petitions for review of these contentions is appropriate at this time.<sup>143</sup>

b. *Contentions and Board Order*

In Contention 1A, the Tribe and Consolidated Intervenors challenged the FSEIS's treatment of historic and cultural resources under the NHPA and NEPA.<sup>144</sup> In Contention 1B, the Tribe and Consolidated Intervenors challenged the adequacy of the Staff's NHPA consultation process.<sup>145</sup>

With respect to Contention 1A, the Board held that the Staff had complied with the NHPA requirement to "make a good faith and reasonable effort to

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<sup>139</sup> *Id.* at 658, 710.

<sup>140</sup> *Id.*

<sup>141</sup> Consolidated Intervenors' Petition at 2 & n.3, 3, 6-7; Powertech's Petition at 5-6, 6 n.9; Staff's Petition at 13-16; *see also* Tribe's Petition at 18-19 (arguing that the "proper remedy" is to "vacate the [licensing] decision and remand back to the agency for further proceedings").

<sup>142</sup> *See* LBP-15-16, 81 NRC at 708.

<sup>143</sup> *See* 10 C.F.R. § 2.341(b)(4); *Pa'ina*, CLI-10-18, 72 NRC at 69-74 (fully reviewing appeals from a licensing board order on an issue where the board ruled in favor of the intervenor on the merits but directed further corrective action); *Vermont Yankee*, CLI-10-17, 72 NRC at 4-9 (same).

<sup>144</sup> Tribe's FSEIS Contentions at 5-9; Consolidated Intervenors' FSEIS Contentions at 6-14. The Tribe and Consolidated Intervenors previously filed similar contentions on the application and the DSEIS. *See* Tribe's DSEIS Contentions at 4-10; Consolidated Intervenors' DSEIS Contentions at 2-7; Petitioners' Request for Leave to File a New Contention Based on SUNSI Material (April 30, 2010), at 1-6; Tribe's Petition to Intervene at 12-17.

<sup>145</sup> Tribe's FSEIS Contentions at 9-14; Consolidated Intervenors' FSEIS Contentions at 14-20. The Tribe previously filed similar contentions on the application and the DSEIS. Tribe's DSEIS Contentions at 4-10; Tribe's Petition to Intervene at 12-17.

identify properties . . . eligible for inclusion in the National Register of Historical Places within the Dewey-Burdock [*in situ* leach] project area.”<sup>146</sup> The Board found that the Staff had largely complied with Advisory Council on Historic Preservation (ACHP) guidance on identification of historic properties.<sup>147</sup> However, with respect to the Staff’s NEPA responsibilities, the Board found insufficient the Staff’s analysis of the environmental effects of the Dewey-Burdock project on Native American cultural, historic, and religious resources.<sup>148</sup> Accordingly, it held that the Record of Decision was incomplete because the Staff “did not give this issue its required hard look in the FSEIS.”<sup>149</sup> Regarding Contention 1B, section 106 consultation, the Board acknowledged that it could not definitively determine whether the Staff or the Tribe bore responsibility for what the Board considered a breakdown in consultation. But the Board found that the NHPA consultation process between the Staff and the Tribe was inadequate because it did not provide sufficient opportunity for the Tribe to articulate its views on the Dewey-Burdock project’s effects on historic properties and participate in the resolution of adverse effects.<sup>150</sup>

The Board directed the Staff to conduct additional consultation with the Tribe “to satisfy the hard look at impacts required by NEPA . . . [and] to satisfy the consultation requirements of the NHPA.”<sup>151</sup> By the terms of its order, the Board issued a partial initial decision with respect to these contentions and, therefore, retained jurisdiction over the proceeding pending the Staff’s curing of the deficiencies in the FSEIS and consultation with the Tribe.<sup>152</sup> On appeal, each party challenged the Board’s issuance of a partial initial decision and retention of jurisdiction.<sup>153</sup>

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<sup>146</sup> LBP-15-16, 81 NRC at 654.

<sup>147</sup> *Id.*

<sup>148</sup> *Id.* at 655. More specifically, the Board found a deficiency in the analysis of sites that might be significant to the Oglala Sioux Tribe.

<sup>149</sup> *Id.*

<sup>150</sup> *Id.* at 656-57.

<sup>151</sup> *Id.* at 657. The Board noted that it could have suspended Powertech’s license, and it attributed its decision to leave the license in place to the Tribe’s incomplete participation in the consultation process. *Id.* at 658.

<sup>152</sup> *Id.* at 710.

<sup>153</sup> Consolidated Intervenor’s Petition at 2 & n.3, 3, 6-7; Powertech’s Petition at 5-6, 6 n.9; Staff’s Petition at 13-16; *see also* Tribe’s Petition at 18-19 (arguing that the “proper remedy” is to “vacate the [licensing] decision and remand back to the agency for further proceedings”).

c. *Petitions for Review*

(1) THE TRIBE'S AND CONSOLIDATED INTERVENORS' PETITIONS FOR REVIEW

Although the Board found in favor of the Tribe and Consolidated Intervenors, both parties have appealed the relief the Board granted with respect to these contentions.

(a) *The Tribe's Petition for Review*

The Tribe challenges the Board's decision to leave the license in place, despite finding that the NRC Staff's analysis did not comply with NEPA or the NHPA.<sup>154</sup> Given the Board's decision, the Tribe argues that NEPA and the NHPA prohibit the Board from leaving the license in place and asserts that "the proper remedy is that employed by federal courts up[on] a finding of a violation of NEPA: to vacate the decision and remand back to the agency for further proceedings necessary to achieve compliance."<sup>155</sup>

We disagree. It is well settled that a failure to comply with every aspect of procedural statutes like those at issue here does not necessarily void agency action; federal courts have required that parties demonstrate harm or prejudice to disturb an agency's decision.<sup>156</sup> Here, the Tribe has not articulated any harm or prejudice; in fact, it did not request a stay of the effectiveness of the license, despite the Board's invitation for it to do so.<sup>157</sup> Nor has the Tribe raised a substantial question that would merit granting its petition for review with respect to this issue.<sup>158</sup> Therefore, we deny this portion of the Tribe's petition for review and its request that we vacate Powertech's license.

(b) *Consolidated Intervenors' Petition for Review*

Consolidated Intervenors argue that "the Board improperly withheld an initial decision and refused to rule on Contentions 1A [and] 1B thereby depriving the Tribe and tribal members . . . an opportunity to appeal the Board's decision."<sup>159</sup> Despite their argument that the Board's decision deprived them of an opportunity to appeal the decision, Consolidated Intervenors challenge the Board's

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<sup>154</sup> Tribe's Petition at 19.

<sup>155</sup> *Id.* (citing *New York*, 681 F.3d at 471).

<sup>156</sup> *Lyng*, 844 F.2d at 594-95; *Cty. of Del Norte*, 732 F.2d at 1467; *Cent. Delta Water Agency*, 653 F. Supp. 2d at 1086-87; *Muhly*, 877 F. Supp. at 300-01.

<sup>157</sup> See LBP-15-16, 81 NRC at 658.

<sup>158</sup> See *Pa'ina*, CLI-10-18, 72 NRC at 69-74 (noting that the board ruled in favor of the intervenor after a merits hearing but directed the parties to undertake additional action to cure identified deficiencies); *Vermont Yankee*, CLI-10-17, 72 NRC at 4-9 (same).

<sup>159</sup> Consolidated Intervenors' Petition at 2.

decision to leave the license in place — tying their objection to the NRC’s federal trust responsibility.<sup>160</sup> But they do not articulate why the federal trust responsibility precludes the Board from finding as it did; nor do Consolidated Intervenor attempt to demonstrate the existence of a substantial question that would merit granting their petition for review. Instead, they argue that the Board misconstrued the trust responsibility federal agencies owe to the Tribe by “presuming that the Tribe will act ‘[u]nreasonably.’”<sup>161</sup> This argument misconstrues the Board’s decision and does not raise a legal question or demonstrate factual error on the part of the Board. In ruling on Contentions 1A and 1B, the Board did not presume that the Tribe would act unreasonably. Rather, the Board stated that “[e]ven after a thorough review of the record . . . [it was] not able to decide definitively which party or specific actions led to the impasse preventing an adequate tribal cultural survey.”<sup>162</sup> Therefore, the Board directed the Staff to resume consultation with the Tribe, but it reminded the Tribe of its obligation to engage in a meaningful manner with the Staff.<sup>163</sup> We do not see how this statement presumes any unreasonable action or misconstrues the NRC’s trust responsibility, nor does it satisfy our standards for granting a petition for review. Therefore, we deny Consolidated Intervenor’s petition for review with respect to these contentions.

(2) POWERTECH AND THE STAFF’S PETITIONS FOR REVIEW

Powertech and the Staff appeal the Board’s rulings on Contentions 1A and 1B as well as the Board’s retention of jurisdiction.<sup>164</sup>

(a) *Powertech’s Petition for Review*

On appeal, Powertech argues, at length, that the Board’s ruling on Contentions 1A and 1B was inconsistent, legally flawed, and factually incorrect. Specifically, Powertech claims that the Board erred in finding the Staff’s NHPA analysis deficient by committing clear error of law, ignoring the ACHP’s determinations regarding the propriety of the Staff’s analysis, providing “special treatment” to the Tribe as a litigant and consulting party, and ignoring critical facts regarding the nature of the government-to-government consultation between the NRC Staff and the Tribe.<sup>165</sup> With respect to the Board’s NEPA determination, Powertech argues that the Board erred in finding that the Staff’s

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<sup>160</sup> *Id.* at 3.

<sup>161</sup> *Id.*; *see also id.* at 6.

<sup>162</sup> LBP-15-16, 81 NRC at 656.

<sup>163</sup> *Id.* at 657-58, 658 n.236.

<sup>164</sup> Powertech’s Petition at 6-22; Staff’s Petition at 14-25.

<sup>165</sup> Powertech’s Petition at 7, 9-11, 16.

analysis does not comply with NEPA. In Powertech’s view, the NRC Staff has satisfied its NEPA obligation to assess the impacts to historic and cultural resources by considering and evaluating all the available information or information that could reasonably be obtained.<sup>166</sup> Powertech asserts that in requiring more from the Staff, the Board has committed a clear error of law.<sup>167</sup> We disagree. At bottom, Powertech’s dispute with the Board’s decision is factual, not legal. When assessing a petition for review on factual issues, we typically defer to a Board’s findings, absent a showing of clear error.<sup>168</sup> Here, Powertech challenges the Board’s weighing of the evidence to find that the Staff’s NEPA and NHPA analyses do not satisfy the NRC’s statutory obligations. For example, with respect to the Staff’s NEPA analysis, Powertech claims that the Staff considered and evaluated “all available information or information that reasonably could be obtained . . . .”<sup>169</sup> Yet none of Powertech’s claims show clear error on the part of the Board, absent which we will not reconsider the Board’s resolution of factual issues.<sup>170</sup> We therefore deny Powertech’s petition for review with respect to the Board’s findings in Contentions 1A and 1B.

*(b) The Staff’s Petition for Review*

On appeal, the Staff argues that the Board misapplied NEPA’s hard-look standard as a matter of law, under which the Board should assess whether the Staff “made reasonable efforts” to obtain complete information on the cultural resources at issue here.<sup>171</sup> In its brief, the Staff describes the efforts it undertook and argues that these efforts were sufficient to meet the hard-look standard.<sup>172</sup> The Staff asks us to view the Board’s application of the hard look standard as a legal issue under 10 C.F.R. § 2.341(b)(4)(ii).<sup>173</sup> But the fundamental issue here — whether Staff complied with NEPA — is inherently factual.

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<sup>166</sup> *Id.* at 20-22.

<sup>167</sup> *Id.* at 17.

<sup>168</sup> 10 C.F.R. § 2.341(b)(4)(i).

<sup>169</sup> Powertech’s Petition at 21-22.

<sup>170</sup> We recognize that, as Powertech notes, the ACHP participated in the section 106 process and concluded that the NRC Staff’s process complies with the “content and spirit” of the section 106 process. Ex. NRC-031, Letter from John Fowler, ACHP, to Waste Win Young, Standing Rock Sioux Tribe, at 3 (Apr. 7, 2014) (ML14241A473); see Powertech’s Petition at 3, 9, 11, 15-16. The Staff likewise asks us to treat the ACHP’s and North Dakota SHPO’s views as dispositive of the fact that it complied with the NHPA. Staff’s Petition at 24. Here, where the Board has weighed the relevant facts, including the cited exhibits, and determined that the Staff has not satisfied its obligations under the NHPA and NEPA, we will not disturb the Board’s findings absent clear error.

<sup>171</sup> Staff’s Petition at 17-18.

<sup>172</sup> *Id.* at 19-20.

<sup>173</sup> *Id.* at 17.

As a general matter, we defer to the Board's findings with respect to the underlying facts unless they are "clearly erroneous."<sup>174</sup> Here, the Board weighed the evidence and determined that the analysis of the environmental effects on cultural resources in the FSEIS was insufficient.<sup>175</sup> The Staff challenges this determination, describing the efforts it made to gather information on cultural resources, but the Staff has not demonstrated that the Board's findings are clearly erroneous.<sup>176</sup> Given the complexity of this proceeding, which involved hundreds of exhibits and over five years of litigation, we are not inclined to second guess the Board's fact-finding.

The Staff next challenges the Board's determination that, on the one hand, the Staff complied with the NHPA regarding identification of historic properties, but the Staff's analysis of cultural, religious, and historic resources under NEPA was insufficient. It argues that the Board's finding that it had complied with the NHPA in identifying historic properties compels the Board to conclude that the Staff also complied with NEPA with respect to cultural resources.<sup>177</sup> The Staff acknowledges that the Board relied on precedent in stating that NEPA compliance does not necessarily follow from NHPA compliance.<sup>178</sup> But it challenges the Board's application of that legal principle to the facts in this case, stating that it had taken a hard look at cultural resources in the FSEIS and arguing that "[t]he Board did not cite any authority supporting its divergent findings on whether the Staff complied with a common requirement of both statutes . . . ."<sup>179</sup> The Staff's challenge to the Board's alleged failure to cite authority for its findings is misplaced. Federal case law supports the legal principle that NHPA and NEPA compliance do not necessarily mirror one another.<sup>180</sup> The Board found that NEPA requires an analysis of the effects on all of the cultural resources present at the site, not only those properties eligible for listing on the National Register of Historic Places, which is the standard for further analysis under the NHPA.<sup>181</sup> The Staff does not demonstrate that the Board's factual finding was implausible. Therefore, we decline to disturb the Board's finding here.

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<sup>174</sup> *Honeywell*, CLI-13-1, 77 NRC at 18-19; *Geisen*, CLI-10-23, 72 NRC at 224-25.

<sup>175</sup> LBP-15-16, 81 NRC at 644-55.

<sup>176</sup> Staff's Petition at 19-20.

<sup>177</sup> *Id.* at 21-22.

<sup>178</sup> *Id.*; see LBP-15-16, 81 NRC at 654-55 (citing *Te-Moak Tribe of W. Shoshone of Nev. v. U.S. Dep't of Interior*, 608 F.3d 592, 606, 610 (9th Cir. 2010); *Hydro Resources, Inc.* (P.O. Box 777, Crownpoint, New Mexico 87313), LBP-05-26, 62 NRC 442, 472 (2005)).

<sup>179</sup> Staff's Petition at 22.

<sup>180</sup> See *Te-Moak*, 608 F.3d at 606-07, 610.

<sup>181</sup> See 36 C.F.R. § 800.4 (requiring agencies to identify "historic properties"); *id.* § 800.16 (defining historic properties as "districts, sites, buildings, structures, or objects included in or eligible for inclusion in, the National Register of Historic Places"); see generally *id.* § 60.4 (providing the criteria for inclusion in the National Register of Historic Places).

Next, the Staff seeks review of the Board's ruling on Contention 1B that the Staff failed to adequately consult with the Tribe under the NHPA.<sup>182</sup> The Staff argues that the Board's holdings on Contentions 1A and 1B are contradictory because in Contention 1A the Board held "that the Staff complied with the NHPA when identifying cultural resources" while in Contention 1B, the Board held that the NHPA consultation process was inadequate.<sup>183</sup> But the Board's rulings on compliance with the NHPA are not contradictory; its rulings on NHPA compliance in Contentions 1A and 1B relate to different obligations.

The NHPA imposes several obligations on federal agencies, which proceed in a step-by-step manner.<sup>184</sup> The consultation requirement continues throughout the steps. The first step is identifying any historic properties that might be affected by the federal undertaking (here licensing), and in doing so, making a reasonable and good faith effort to seek information from consulting parties, including Native American Tribes, to aid in that identification.<sup>185</sup> In ruling on Contention 1A, the Board determined that the Staff had satisfied the NHPA's consultation requirements with respect to identifying historic properties.<sup>186</sup> In other words, the Board determined that the Staff had satisfactorily completed the first step in the process.

But, as discussed by the Board, the identification of historic properties is not the end of the NHPA consultation process. After it identifies eligible sites that might be affected by the project, an agency must assess<sup>187</sup> and resolve<sup>188</sup> potential adverse effects in consultation with tribes that attach religious and cultural significance to those sites.<sup>189</sup> In its ruling on Contention 1B, the Board found that the Staff had not adequately consulted with the Tribe on the second and third steps; that is, despite its good faith effort to consult in order to identify historic properties, the Staff had not demonstrated that it provided the Tribe with the opportunity to identify concerns about those properties and participate in the resolution of any adverse effects.<sup>190</sup> The Board, after a merits hearing, reasonably concluded that the Staff's consultation with the Tribe was insufficient to meet these requirements. Thus, the Staff has not raised a substantial question for review. For the reasons stated above, we deny review of the Staff's petition with respect to Contentions 1A and 1B.

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<sup>182</sup> Staff's Petition at 23.

<sup>183</sup> *Id.* Compare LBP-15-16, 81 NRC at 654, with *id.* at 657.

<sup>184</sup> *Id.* at 638-41.

<sup>185</sup> 36 C.F.R. § 800.4.

<sup>186</sup> LBP-15-16, 81 NRC at 654.

<sup>187</sup> 36 C.F.R. § 800.5.

<sup>188</sup> *Id.* § 800.6.

<sup>189</sup> *Id.* § 800.2(c)(2)(ii)(A).

<sup>190</sup> LBP-15-16, 81 NRC at 656-57. See also 36 C.F.R. § 800.2(c)(2)(ii)(A).

(3) RETENTION OF JURISDICTION

Both the Staff and Powertech appeal the Board's retention of jurisdiction pending resolution of the deficiencies identified in Contentions 1A and 1B.<sup>191</sup> In retaining jurisdiction, the Board directed the Staff to: (1) initiate government-to-government consultation with the Tribe; (2) file monthly status reports; and (3) submit "an agreement reflecting the parties' settlement . . . or a motion for summary disposition of Contentions 1A and 1B."<sup>192</sup> Both the Staff and Powertech argue that in each instance the Board "exceeded its authority" by retaining jurisdiction over the proceeding and prescribing "a process for the Staff to resolve" the deficiencies identified in Contentions 1A and 1B.<sup>193</sup> Consolidated Intervenor also questioned the Board's retention of jurisdiction over these contentions. Consolidated Intervenor argue that doing so constitutes prejudicial procedural error.<sup>194</sup>

With respect to the Board's specific direction to the Staff to initiate "government-to-government" consultation, we agree in principle with the Staff and Powertech. To the extent that the Board's ruling can be viewed as providing specific direction to the Staff, the Board overstepped its authority.<sup>195</sup> But, based upon our review of the Board's decision, the Board has not stated that it will direct or oversee the Staff's review of cultural resources; instead, it leaves it to the Staff — either by agreement among the parties or by motion for summary disposition — to determine when it has addressed the deficiencies identified by the Board.<sup>196</sup> All the Board has required is that the Staff provide reports regarding its consultation efforts in a manner similar to that in which it reports on the progress of its review and the Board's directions to the parties in this respect do not exceed the bounds of its authority. Our regulations provide the Board with the authority to "take appropriate action to control the . . . hearing process," "[r]egulate the course of the hearing and the conduct of the participants," and "[i]ssue orders necessary to carry out the presiding officer's duties and responsibilities under [10 C.F.R. Part 2]."<sup>197</sup> In circumstances like these, we have made it clear that a Board has relative latitude to fashion appropriate

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<sup>191</sup> Staff's Petition at 15-16; Powertech's Petition at 6.

<sup>192</sup> LBP-15-16, 81 NRC at 708, 710.

<sup>193</sup> Staff's Petition at 15-16; *see also* Powertech's Petition at 5-6, 6 n.9.

<sup>194</sup> Consolidated Intervenor's Petition at 6-7.

<sup>195</sup> *See, e.g., Duke Energy Corp. (Catawba Nuclear Station, Units 1 and 2), CLI-04-6, 59 NRC 62, 74 (2004)* ("NRC Staff Reviews, which frequently proceed in parallel to adjudicatory proceedings, fall under the direction of Staff management and the Commission itself, not the licensing boards.").

<sup>196</sup> LBP-15-16, 81 NRC at 710.

<sup>197</sup> 10 C.F.R. § 2.319.

remedies regarding issues properly before it.<sup>198</sup> The Staff is free to select whatever course of action it deems appropriate to address the deficiencies identified in the Board’s order, including, but not limited to further government-to-government consultation.<sup>199</sup> For these reasons, we decline to disturb the Board’s approach — the Staff must still file monthly reports, along with an agreement or a motion for summary disposition — depending on the outcome of its efforts to address the deficiencies. Therefore, we deny Powertech’s, the Staff’s, and Consolidated Intervenors’ petitions for review of the Board’s retention of jurisdiction over these contentions.

## 2. *Contention 2*

### a. *Contention and Board Order*

The Tribe seeks review of the Board’s resolution of Contention 2 in favor of Powertech and the Staff. In Contention 2, the Tribe argued that

the FSEIS violates 10 C.F.R. Part 40, Appendix A, Criterion 7, 10 C.F.R. §§ 51.10, 51.70 and 51.71, and the National Environmental Policy Act, and implementing regulations . . . in that it fails to provide an adequate baseline groundwater characterization or demonstrate that ground water samples were collected in a scientifically defensible manner, using proper sample methodologies.<sup>200</sup>

The Tribe also challenged the fact that “while the FSEIS contains data from 2007-2009, the background water quality for use in the actual regulatory process for the facility will be established [at] a future date, outside of the NEPA process, and outside of the public’s review.”<sup>201</sup> The Tribe objected to the collection of additional background groundwater quality data after issuance of the license,

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<sup>198</sup> *Pa’ina*, CLI-10-18, 72 NRC at 96 (affirming the Board’s decision to require an additional period for written public comment on a supplemental EA); see also *Offshore Power Systems* (Floating Nuclear Power Plants), ALAB-489, 8 NRC 194, 206 (1978) (“[T]he boards have broad and strong discretionary authority to conduct their functions with efficiency and economy. However, they must exercise it with fairness to all the parties . . . .” (citation omitted)); *Wisconsin Electric Power Co.* (Point Beach, Unit 2), ALAB-82, 5 AEC 350, 351 (1972) (“Administrative agencies and courts have long been accepted as ‘collaborative instrumentalities of justice.’” (quoting *United States v. Morgan*, 313 U.S. 409, 422 (1941))); *Duke Power Co., et al.* (Catawba Nuclear Station, Units 1 and 2), LBP-83-24A, 17 NRC 674, 680 (1983).

<sup>199</sup> We note, however, that in licensing reviews such as this one, where Native American Tribes could be affected by the NRC’s licensing action, we expect the Staff’s actions to be guided by the principles outlined in the NRC’s Tribal Protocol Manual. “Tribal Protocol Manual,” NUREG-2173 (2014) (ML14274A014).

<sup>200</sup> Tribe’s Post-Hearing Brief at 38.

<sup>201</sup> *Id.* at 39.

but before the facility begins operating, and argued that the practice violates NEPA.<sup>202</sup>

In ruling on Contention 2, the Board noted that NRC case law supports the industry practice of definitively establishing groundwater quality baselines after licensing but before operation.<sup>203</sup> Additionally, the Board noted that it found the testimony offered by the Staff's and Powertech's witnesses more detailed and persuasive than the testimony offered by the Tribe's witness.<sup>204</sup> In reaching its decision, the Board examined the Tribe's exhibits regarding the EPA's Preliminary Assessment to determine that document's relevance to this contention.<sup>205</sup> The Board found unavailing the Tribe's argument that the conclusions in the Preliminary Assessment translated to an insufficient discussion of historic mining operations in the FSEIS.<sup>206</sup>

*b. The Tribe's Petition for Review*

On appeal, the Tribe challenges the Board's ruling, claiming that the Board erred as a matter of law when it permitted Powertech to defer collection of groundwater data to after licensing but before operation.<sup>207</sup> Based on our review of the record, we find that the Tribe has not raised a substantial question of law with respect to the applicable standards for site characterization. The Tribe mischaracterizes the Board's ruling when it claims that the Board allowed the Staff and Powertech to defer gathering groundwater data until after licensing.<sup>208</sup> The Board did not rule that "meaningful" baseline characterization may be deferred until the post-licensing period. Rather, it held that the pre-licensing groundwater monitoring used to describe the site for NEPA purposes need not conform to the post-licensing, pre-operation groundwater monitoring requirements applicable to a licensed facility because the monitoring activities at these two stages serve

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<sup>202</sup> *Id.* at 38-39.

<sup>203</sup> LBP-15-16, 81 NRC at 665 (quoting *Hydro Resources, Inc.* (P.O. Box 777, Crownpoint, New Mexico 87313), CLI-06-1, 63 NRC 1, 6 (2006)).

<sup>204</sup> *Id.* at 666.

<sup>205</sup> *Id.*

<sup>206</sup> *Id.* The Board reasoned that the conclusion in the Preliminary Assessment that lack of groundwater sampling data limited the availability of background concentrations did not force a conclusion that the FSEIS's discussion of background water quality data was insufficient. It explained that the Preliminary Assessment was focused on CERCLA and the FSEIS was focused on our environmental regulations and the CEQ regulations. CERCLA's objectives are different from NEPA's objectives. With respect to CERCLA, it is important to determine the background levels to assess the impact of *past* mining activities on the site. By contrast, for NEPA purposes, the site's current baseline is important to determine the potential future impacts of the proposed project on the site.

<sup>207</sup> Tribe's Petition at 19-20.

<sup>208</sup> *Id.* at 20.

different purposes.<sup>209</sup> We see no substantial question of law relating to NEPA's site characterization requirements.

The Tribe further asserts that the Board "committed . . . error and abused its discretion" by not requiring the Staff to account for past mining activity in its baseline water quality data.<sup>210</sup> In support of this argument, the Tribe argues that "[t]he Board even ignored evidence from the EPA Preliminary Assessment . . . confirming the lack of meaningful data as to the impacts associated with historic mining at the site and how that impacts current water quality and future impacts from the Dewey-Burdock site."<sup>211</sup> Contrary to the Tribe's assertions, the Board did not disregard the Preliminary Assessment; it specifically addressed the Tribe's argument regarding the Preliminary Assessment in its decision.<sup>212</sup> The Board found that due to the different objectives of NEPA and CERCLA, the Preliminary Assessment's finding regarding background data did not impact the adequacy of the analysis in the FSEIS.<sup>213</sup> The Tribe does not explain how the Board's determination on this point constitutes clear error or abuse of discretion.<sup>214</sup> The Tribe does not present a substantial question for review with respect to the Board's ruling on Contention 2; therefore, we decline to take review.<sup>215</sup>

### 3. Contention 3

#### a. Contention and Board Order

In Contention 3, the Tribe and Consolidated Intervenors argued that the Dewey-Burdock site contains numerous geological and man-made features that will permit groundwater migration.<sup>216</sup> Overall, the Board resolved this contention

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<sup>209</sup> LBP-15-16, 81 NRC at 665 (quoting *Strata Energy, Inc. (Ross In Situ Uranium Recovery Project)*, LBP-15-3, 81 NRC 65, 91-92 (2015)). In the *Strata* proceeding, we recently denied review of the Board's decision on a contention that was substantially similar to the Tribe's Contention 2, on the same grounds. *Strata Energy, Inc. (Ross In Situ Uranium Recovery Project)*, CLI-16-13, 83 NRC 566, 583-84 (2016) ("[T]he 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. The two standards serve different purposes.") (citations omitted).

<sup>210</sup> Tribe's Petition at 20.

<sup>211</sup> *Id.*

<sup>212</sup> LBP-15-16, 81 NRC at 666.

<sup>213</sup> *Id.*

<sup>214</sup> See Tribe's Petition at 20.

<sup>215</sup> The Tribe also argues that the Board abused its discretion in disregarding the Tribe's argument that Regulatory Guide 4.14 is outdated. *Id.* at 20-21. The Tribe's dissatisfaction with Regulatory Guide 4.14 does not demonstrate Board error presenting a substantial question for our review, particularly since, as the Staff points out, the Regulatory Guide did not form a basis for the Board's decision. See LBP-15-16, 81 NRC at 665-66; see also Staff's Response to Tribe at 17-18.

<sup>216</sup> See Tribe's Post-Hearing Brief at 43-56.

in favor of Powertech and the Staff.<sup>217</sup> The Board carefully and extensively considered evidence presented by all four parties, and it concluded that the Staff had taken the required hard look at the confinement of the overall ore zone.<sup>218</sup> Because of the numerous issues covered by this contention, the Board explained its ruling on each specific technical issue related to fluid containment separately.<sup>219</sup>

In its ruling on Contention 3, the Board conditioned Powertech's license as follows:

Prior to conducting tests for a wellfield data package, the licensee will attempt to locate and properly abandon all historic drill holes located within the perimeter well ring for the wellfield. The licensee will document, and provide to the NRC, such efforts to identify and properly abandon all drill holes in the wellfield data package.<sup>220</sup>

The Board explained that it conditioned the license because “despite the NRC Staff’s claim that ‘because there are a number of improperly plugged or abandoned boreholes at the Dewey-Burdock site, as a condition of its license Powertech must address these boreholes before beginning operations,’ [the Board] did not find any such explicit condition in the license.”<sup>221</sup> It concluded that with the additional license condition, the FSEIS and the record contain “adequate hydrogeological information to demonstrate the ability to contain fluid migration and assess potential impacts to groundwater.”<sup>222</sup>

*b. Petitions for Review*

Both the Tribe and Consolidated Intervenors have petitioned for review of the Board’s ruling on this contention.<sup>223</sup> Additionally, Powertech has petitioned for review of the license condition the Board imposed as part of its ruling.<sup>224</sup> As explained below, none of the petitions for review regarding this contention raise a substantial question.

(1) THE TRIBE’S PETITION FOR REVIEW

Although the Tribe characterizes its challenges to the Board’s ruling on Con-

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<sup>217</sup> LBP-15-16, 81 NRC at 681.

<sup>218</sup> *Id.* at 676.

<sup>219</sup> *See id.* at 676-81.

<sup>220</sup> *Id.* at 679, 709.

<sup>221</sup> *Id.* at 679 (quoting NRC Staff’s Reply Brief (Jan. 29, 2015), at 26).

<sup>222</sup> *Id.* at 681.

<sup>223</sup> Tribe’s Petition at 22-23; Consolidated Intervenors’ Petition at 2 & n.3, 4-7.

<sup>224</sup> Powertech’s Petition at 22-25.

tention 3 as legal arguments, the arguments generally relate to how the Board weighed the evidence.<sup>225</sup> With respect to those challenges, based upon our review of the record, we find that none of the Tribe’s arguments demonstrate a substantial question for review regarding the Board’s factual findings.

The Tribe argues that the Board committed legal error in holding that, while “small faults and joints may be present in the project area, their presence does not support Intervenor’s assertions [regarding the impacts of the faults and joints.]”<sup>226</sup> The Tribe asserts that the Board “appl[ied] an inappropriate legal standard when it effectively placed the burden on the Tribe to demonstrate the impacts associated with these faults and fractures.”<sup>227</sup> We disagree — the Board has neither shifted the burden of proof nor applied an inappropriate legal standard. In its ruling, the Board made clear that “[t]his is not simply a question of whether faults and joints are present, but rather whether they are large and open enough to produce a substantial breach in the confining layers . . . .”<sup>228</sup> The Board carefully weighed the evidence and made a factual finding that the faults and joints would not provide pathways for groundwater migration.<sup>229</sup> We defer to the Board’s findings with respect to the underlying facts unless they are “clearly erroneous.”<sup>230</sup> Here, the Tribe has not raised a substantial question of clear error on the part of the Board.

Next, the Tribe objects to the Board’s imposition of a license condition requiring Powertech to attempt to locate and abandon boreholes.<sup>231</sup> The Tribe characterizes the license condition imposed by the Board as the sole means of achieving compliance and preventing leakage.<sup>232</sup> We disagree. In addition to the license condition imposed by the Board, License Condition 11.5 requires Powertech to monitor for excursions and take corrective action — including potentially terminating injection of lixiviant within the wellfield until the excursion is corrected.<sup>233</sup> This requirement provides incentive for Powertech to locate and abandon the boreholes. Moreover, the Board’s additional license condition requires Powertech to “document its efforts” to find and fill the boreholes, enabling the Staff to assess whether Powertech’s efforts are undertaken in good

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<sup>225</sup> See Tribe’s Petition at 22.

<sup>226</sup> LBP-15-16, 81 NRC at 678.

<sup>227</sup> Tribe’s Petition at 23.

<sup>228</sup> LBP-15-16, 81 NRC at 677.

<sup>229</sup> *Id.* at 671-73; 677-78.

<sup>230</sup> *Honeywell*, CLI-13-1, 77 NRC at 18-19; *Geisen*, CLI-10-23, 72 NRC at 224-25.

<sup>231</sup> Tribe’s Petition at 22-23.

<sup>232</sup> *Id.* at 22.

<sup>233</sup> Ex. NRC-012, License, at 10-11.

faith.<sup>234</sup> Additionally, absent evidence to the contrary, we assume at the licensing stage that a licensee will comply with its obligations.<sup>235</sup>

The Tribe argues that the Board “relie[d] entirely” on a license condition outside the NEPA process.<sup>236</sup> But the Tribe’s assertion is inaccurate. As explained above, the Board relied on much more than one license condition; it weighed all parties’ evidence and testimony on this contention, along with the information in the FSEIS and the record.<sup>237</sup> We see no clear error in the Board’s reasonable conclusion that the additional license condition will ensure Powertech’s compliance with the requirement to attempt to find and plug historic boreholes. Accordingly, we deny the Tribe’s petition for review with respect to Contention 3.

## (2) CONSOLIDATED INTERVENORS’ PETITION FOR REVIEW

Like the Tribe, Consolidated Intervenors challenge the Board’s weighing of the evidence in its ruling on Contention 3. Consolidated Intervenors argue that the Board shifted the burden of proof and instituted “a new ‘compelling’ standard”; they refer to the Board’s findings with respect to whether leakage was caused by unplugged boreholes or by naturally occurring fissures and joints.<sup>238</sup>

Contrary to Consolidated Intervenors’ argument, the Board’s decision contains careful consideration of the parties’ evidence regarding several subjects in dispute.<sup>239</sup> The Board neither shifted the burden of proof nor created a new standard of proof. It appropriately weighed the evidence presented by the parties and made factual determinations based on that evidence.<sup>240</sup>

Additionally, Consolidated Intervenors argue that the Board erred when it accepted a witness’s “unsubstantiated opinion,” and they argue generally that the Board committed factual error regarding leakage at the site.<sup>241</sup> Consolidated Intervenors argue that the Board should not have credited an expert witness proffered by Powertech because that witness was “speaking from the perspective of the mining industry” rather than in the interest of public health and safety.<sup>242</sup> The witness the Board cited is an experienced engineer and hydrolo-

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<sup>234</sup> LBP-15-16, 81 NRC at 679, 709.

<sup>235</sup> See *Curators of the University of Missouri*, CLI-95-8, 41 NRC 386, 400 (1995); cf. *Pacific Gas and Electric Co.* (Diablo Canyon Nuclear Power Plant, Units 1 and 2), CLI-03-2, 57 NRC 19, 29 (2003).

<sup>236</sup> Tribe’s Petition at 22.

<sup>237</sup> LBP-15-16, 81 NRC at 676-81; Ex. NRC-008-A-2, FSEIS § 4.5.2.1.1.2.2.

<sup>238</sup> Consolidated Intervenors’ Petition at 2 & n.3, 4, 6-7; see LBP-15-16, 81 NRC at 677.

<sup>239</sup> LBP-15-16, 81 NRC at 676-81.

<sup>240</sup> *Id.*

<sup>241</sup> Consolidated Intervenors’ Petition at 2 & n.3, 4-6.

<sup>242</sup> *Id.* at 5.

gist.<sup>243</sup> Consolidated Intervenors have raised no objection to his qualifications aside from the fact that he testified for the applicant. Our deference to the Board is particularly great when it comes to weighing the credibility of witnesses.<sup>244</sup> Our review of the record demonstrates that the Board examined the exhibits, questioned witnesses, and considered the parties' pleadings and statements of position in making its decision.<sup>245</sup> Because Consolidated Intervenors have not raised a substantial question regarding the Board's findings of fact, we deny their petition with respect to this contention.

(3) POWERTECH'S PETITION FOR REVIEW

Powertech seeks review of the Board's imposition of an additional license condition regarding location and abandonment of historic boreholes. It argues that the Board's addition of this license condition constituted clear error of fact because Powertech had already committed to plugging historic boreholes.<sup>246</sup> We find that any factual error in the Board's determination that the license did not contain an explicit condition regarding historic boreholes was harmless. While Powertech is bound by License Condition 9.2 to its commitment to plug boreholes, we do not see the inherent conflict between that commitment and the Board's additional license condition that Powertech and the Staff assert exists. The Board's general license condition can be implemented through the more specific procedures contained in Powertech's commitment. We also see little in the way of additional burden here, particularly if, as Powertech asserts, the Dewey-Burdock site's artesian conditions make it easier to identify improperly plugged boreholes, and it has documentation that historical boreholes were plugged according to State regulations.<sup>247</sup>

Next, Powertech asserts that the Board committed factual and legal error in imposing the license condition *sua sponte*.<sup>248</sup> Powertech argues that because "[n]one of the argument or testimony pertained to plugging and abandoning *all* boreholes prior to the commencement of licensed operations in a given well-field," the Board imposed the license condition *sua sponte*.<sup>249</sup> But as the record reflects, historical boreholes were one of the issues raised in Contention 3; the Board imposed this license condition in ruling on that contention, which was the

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<sup>243</sup> See Ex. APP-014, Curriculum Vitae of Hal. P. Demuth, M.S., Petrotek Engineering Corporation (ML14240A422).

<sup>244</sup> See, e.g., *Private Fuel Storage, L.L.C.* (Independent Spent Fuel Storage Installation), CLI-03-8, 58 NRC 11, 26 (2003) (citations omitted).

<sup>245</sup> See, e.g., LBP-15-16, 81 NRC at 667-81.

<sup>246</sup> Powertech's Petition at 22-23.

<sup>247</sup> *Id.* at 25 n.57.

<sup>248</sup> *Id.* at 23-25.

<sup>249</sup> *Id.* at 24.

subject of a full evidentiary hearing.<sup>250</sup> Moreover, as the Staff points out in its response to Powertech's petition, "[the Tribe's and Consolidated Intervenors'] arguments could reasonably be construed as claiming that, in order to ensure adequate containment, Powertech must properly abandon all boreholes within the perimeter of each wellfield."<sup>251</sup> The Board ruled on a matter properly before it in imposing an additional license condition on Powertech. Powertech's argument that the license condition was imposed *sua sponte* does not raise a substantial question for review. We deny review of Powertech's petition regarding Contention 3.

#### **4. Contention 6**

In Contention 6, the Tribe argued that discussion of mitigation measures in the FSEIS was inadequate for two reasons. First, the Tribe asserted that the FSEIS's discussion and evaluation of mitigation measures was insufficiently detailed.<sup>252</sup> Second, it argued that the Staff erroneously deferred development of further mitigation measures until after the issuance of the FSEIS and the Record of Decision.<sup>253</sup> In its petition, the Tribe challenges the Board's ruling by asserting that the Board failed to address several of its arguments and that the Board's ruling on Contention 6 is inconsistent with its ruling on Contention 1A.

##### *a. Contention and Board Order*

With respect to the portion of its contention that challenged the discussion of mitigation measures in the FSEIS, the Tribe argued before the Board that NEPA requires an EIS to "detail[] with [a] specific description, supporting data, and analysis of process and effectiveness" each mitigation measure.<sup>254</sup> The Tribe asserted that the Dewey-Burdock project FSEIS merely listed potential mitigation measures and lacked scientific evidence or analysis regarding the effectiveness of each measure.<sup>255</sup>

The Board, after a merits hearing and review of the record, determined that

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<sup>250</sup> See LBP-15-16, 81 NRC at 674-75, 679.

<sup>251</sup> NRC Staff's Response to Powertech's Petition for Review of LBP-15-16 (June 22, 2015), at 7 n.16.

<sup>252</sup> Oglala Sioux Tribe's Statement of Position on Contentions (June 20, 2014), at 27-28 (Tribe's Statement of Position). Consolidated Intervenors adopted the Tribe's arguments with respect to Contention 6. Consolidated Intervenors' Opening Statement (July 7, 2014), at 9.

<sup>253</sup> Tribe's Statement of Position at 28.

<sup>254</sup> *Id.* at 38.

<sup>255</sup> *Id.* at 30-32.

the Staff's discussion and evaluation of mitigation measures was sufficient.<sup>256</sup> The Board agreed with the Tribe's arguments regarding NEPA's requirements for analysis of mitigation measures, but it found that the Staff had met those requirements.<sup>257</sup> In its holding, the Board determined that the Tribe completely overlooked Chapter 4 of the FSEIS, which contained extensive analysis of mitigation measures.<sup>258</sup> Further, the Board stated that the FSEIS "fully evaluated the impacts and mitigation strategies detailed under other [expert agency] permits."<sup>259</sup> Finally, the Board concluded that Powertech's license requires compliance with mitigation and monitoring measures described in the FSEIS, the Record of Decision, and the license.<sup>260</sup> Accordingly, the Board found that Powertech would be required to comply with mitigation strategies analyzed in the FSEIS from initial, pre-licensing activities through decommissioning.<sup>261</sup>

In the second portion of Contention 6, the Tribe argued that the Staff violated NEPA by deferring development of certain mitigation measures — particularly mitigation of adverse effects on cultural resources — until after issuance of the FSEIS.<sup>262</sup> The Tribe also challenged the Staff's analysis of the proposed monitoring well network, historical well hole plugging, and wildlife protections and monitoring.<sup>263</sup>

Regarding the development of mitigation measures after FSEIS completion, the Board ruled that "[t]he release of an FSEIS does not mark the completion of the NEPA review process."<sup>264</sup> The Board noted that the FSEIS referenced the yet-to-be-issued Programmatic Agreement and explained that mitigation measures adopted in the Programmatic Agreement could mitigate impacts on historic or cultural resources.<sup>265</sup> Further, the Board determined that the FSEIS included analysis of certain mitigation measures to be implemented post-licensing.

In finding the FSEIS's analysis adequate, the Board relied upon the generally accepted presumption that Powertech will comply with its obligations as listed in the license, the FSEIS, and associated documents.<sup>266</sup> The Board noted that monitoring programs are "a principal aid" to the Staff and the licensee in

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<sup>256</sup> LBP-15-16, 81 NRC at 690-91.

<sup>257</sup> *Id.* at 690.

<sup>258</sup> *Id.* at 690-91.

<sup>259</sup> *Id.* at 692.

<sup>260</sup> *Id.* at 691.

<sup>261</sup> *Id.*

<sup>262</sup> Tribe's Statement of Position at 28.

<sup>263</sup> *Id.* at 33-34.

<sup>264</sup> LBP-15-16, 81 NRC at 694.

<sup>265</sup> *Id.*

<sup>266</sup> *Id.* at 695.

determining whether mitigation measures are effective.<sup>267</sup> Moreover, it stated that several of Powertech's license conditions require Powertech to document, maintain, and submit to NRC its monitoring results.<sup>268</sup> In sum, the Board held that the mitigation and monitoring plans in the FSEIS, while not final, complied with NEPA.<sup>269</sup> Accordingly, the Board resolved Contention 6 in favor of Powertech and the Staff.

*b. The Tribe's Petition for Review*

On appeal, the Tribe argues that it had identified significant analytical gaps in the agency's review of mitigation measures, and that the Board failed to address all of its arguments when ruling on Contention 6.<sup>270</sup> We disagree. The Board, after a careful examination of the record, determined that the FSEIS contained sufficient analysis of mitigation measures.<sup>271</sup> Absent clear error, which the Tribe has not demonstrated, we decline to disturb the Board's determination that the FSEIS's analysis of mitigation measures was sufficient for NEPA compliance. Therefore, we deny the Tribe's petition with respect to this point.

The Tribe also seeks review of the Board's decision regarding deferral of development of mitigation measures and argues that the Board erred at law and abused its discretion.<sup>272</sup> For the reasons stated below, we deny the Tribe's petition for review with respect to this issue.

First, the Tribe argues that future development of mitigation measures through the Programmatic Agreement violated NEPA.<sup>273</sup> The Tribe asserts that the Board's ruling disregarded the Tribe's claim that the Programmatic Agreement failed to include "any actual mitigation [measures]," in violation of NEPA.<sup>274</sup> We disagree with the Tribe's argument regarding lack of analysis in the Programmatic Agreement. Our examination of the record reveals that the Programmatic Agreement and the FSEIS contain discussion of mitigation measures for cultural resources, and the Board did not find deficiencies in those discussions.<sup>275</sup> Be-

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<sup>267</sup> *Id.*

<sup>268</sup> *Id.* at 695-97.

<sup>269</sup> *Id.* at 694 (quoting *Hydro Resources, Inc.* (P.O. Box 777, Crownpoint, NM 87313), CLI-06-29, 64 NRC 417, 426-27 (2006)).

<sup>270</sup> Tribe's Petition at 24 (citing LBP-15-16, 81 NRC at 689).

<sup>271</sup> LBP-15-16, 81 NRC at 690-92.

<sup>272</sup> Tribe's Petition at 24.

<sup>273</sup> *Id.*

<sup>274</sup> *Id.*

<sup>275</sup> See, e.g., Ex. NRC-018-A, "Programmatic Agreement Among U.S. Nuclear Regulatory Commission, U.S. Bureau of Land Management, South Dakota State Historic Preservation Office,

(Continued)

cause the Tribe fails to address these discussions, it does not raise a substantial question for review of the Board's finding that they are adequate for NEPA compliance.

Next, the Tribe challenges the Board's ruling regarding the FSEIS's discussion of mitigation measures in numerous areas, including wildlife protection, wellfield testing, air impacts, and historical well hole plugging and abandonment.<sup>276</sup> It argues that "the [Board's] ruling also substantially ignore[d] the Tribe's arguments regarding other mitigation issues," which, in the Tribe's view, the Staff did not sufficiently describe or analyze in the FSEIS.<sup>277</sup>

We disagree. In ruling on these points, the Board did not disregard the Tribe's arguments; it determined — based on precedent and its review of the record — that the mitigation and monitoring plans discussed in the FSEIS and Programmatic Agreement contained the level of detail required by NEPA.<sup>278</sup> The Tribe's petition does not articulate a substantial question for review with respect to this portion of the Board's decision.

Finally, the Tribe asserts that the Board's ruling with respect to Contention 6 is "internally inconsistent" because it conflicts with the Board's ruling on Contention 1A where it found, in part, that the Staff's analysis of mitigation measures for cultural resources did not satisfy NEPA.<sup>279</sup> The Board found generally that the Staff's analysis of mitigation was sufficient. Specifically regarding mitigation of cultural resources, the Board ruled that

[t]he FSEIS . . . explains that mitigation measures adopted in the Programmatic Agreement "could reduce an adverse impact to a historic or cultural resource." . . . Therefore, the Board finds that the NRC Staff completing the Programmatic Agreement after the FSEIS was released, but before the issuance of the Record of Decision or the license, adequately satisfied NEPA.<sup>280</sup>

Regarding Contention 6, the Board concluded that the Staff's analysis of miti-

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Powertech (USA), Inc., and Advisory Council on Historic Preservation Regarding the Dewey-Burdock [*In Situ*] Recovery Project Located in Custer and Fall River Counties, South Dakota" (Mar. 3, 2014), at 5 (requiring Powertech to protect all unevaluated properties until National Register-eligibility determinations are completed), at 10 (requiring Powertech to halt ground-disturbing activities within a 150-foot area and take numerous additional steps if a previously unknown cultural resource is discovered during the implementation of the Dewey-Burdock Project) (ML14246A401) (Programmatic Agreement); Ex. NRC-008-A-2, FSEIS § 4.9.1.1.1. The Staff's mitigation recommendations appear in the far-right columns of Tables 4.9-1 through 4.9-6.

<sup>276</sup> Tribe's Petition at 25.

<sup>277</sup> *Id.*

<sup>278</sup> LBP-15-16, 81 NRC at 694-95.

<sup>279</sup> Tribe's Petition at 25; *see* LBP-15-16, 81 NRC at 655.

<sup>280</sup> LBP-15-16, 81 NRC at 694.

gation measures for cultural resources fulfilled NEPA's requirements. We agree with the parties, however, that this statement is inconsistent with the Board's ruling on Contention 1A. Specifically, there the Board stated that "the FSEIS does not include mitigation measures sufficient to protect [the Tribe's] cultural, historical, and religious sites that may be affected by the Powertech project."<sup>281</sup> With this statement, the Board appears to be mixing the requirements of NEPA and the NHPA — NEPA does not require the adoption of mitigation measures, only a discussion of their potential effects. Regardless, by pointing out these inconsistent Board statements, the Tribe has demonstrated only harmless error because the mitigation measures for cultural resources are covered by Contentions 1A and 1B. Thus, a separate ruling on this specific issue under Contention 6 is not necessary. Therefore, we find that the Tribe does not raise a substantial question for our review with respect to Contention 6.

### III. CONCLUSION

For the foregoing reasons, we *deny* in part each party's petition for review. We *grant* each party's petition with respect to the finality of the Board's ruling on Contentions 1A and 1B and find that these contentions should be considered "final" for the purposes of the petitions for review at issue here. We *grant* the Staff's and Powertech's petitions for review with respect to the Board's direction to the Staff regarding the resolution of Contentions 1A and 1B. Pursuant to our inherent supervisory authority over agency adjudications, we *direct* that the proceeding remain open for the narrow purpose of resolving the deficiencies identified by the Board in Contentions 1A and 1B and *affirm* the Board's direction to the Staff to submit monthly status reports and the Board's direction to file an agreement between the parties or a motion for summary disposition to resolve the deficiencies identified by the Board. We *grant* the Tribe's petition for review with respect to proposed Contention 8 and dismiss that contention.

IT IS SO ORDERED.

For the Commission

ANNETTE L. VIETTI-COOK  
Secretary of the Commission

Dated at Rockville, Maryland,  
this 23d day of December 2016

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<sup>281</sup> *Id.* at 655.

**Commissioner Svinicki, dissenting in part.**

I fully join the majority's order today with one exception: the Staff's and Powertech's appeals of Contentions 1A and 1B. For the reasons expressed below, I would take review of these petitions because the Board applied the wrong legal standards to these contentions. Moreover, when considered under the correct legal standards, the evidentiary record supports resolving Contentions 1A and 1B in favor of the Staff. Therefore, I would enter judgment in favor of the Staff and direct the Board to terminate this proceeding.

**A. Contention 1A**

On appeal, the Staff argues that the Board's ruling on Contention 1A constitutes legal error because it misapplied NEPA's hard look standard, under which the Board should assess whether the Staff "made reasonable efforts" to obtain adequate information on the cultural resources at issue here.<sup>1</sup> In its brief, the Staff describes the efforts it undertook and argues that these efforts were sufficient to meet the hard look standard.<sup>2</sup> The Staff asks us to view the Board's application of the hard look standard as a legal issue under 10 C.F.R. § 2.341(b)(4)(ii).<sup>3</sup> I would take review of the Staff's petition for review of Contention 1A and reverse the Board's ruling that the Staff's environmental analysis did not adequately address the environmental effects of the Dewey-Burdock project on Native American cultural, religious, and historic resources.

We have previously acknowledged that for some NEPA reviews, necessary data may "prove to be unavailable, unreliable, inapplicable, or simply not adaptable."<sup>4</sup> In such cases, we have directed the Staff to provide a reasonable analysis of the available information with a "disclosure of incomplete or unavailable information."<sup>5</sup> Likewise, Federal courts have upheld agency determinations not to analyze impacts "for which there are not yet standard methods of measurement or analysis."<sup>6</sup> Moreover, the NRC looks for guidance to the Council on Environmental Quality's implementing regulations for NEPA, which specify that an

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<sup>1</sup> Staff's Petition at 17-18.

<sup>2</sup> *Id.* at 19-20.

<sup>3</sup> *Id.* at 17.

<sup>4</sup> *Entergy Nuclear Generation Co. and Entergy Nuclear Operations, Inc. (Pilgrim Nuclear Power Station)*, CLI-10-22, 72 NRC 202, 208 (2010).

<sup>5</sup> *Id.*

<sup>6</sup> *Town of Winthrop v. F.A.A.*, 535 F.3d 1, 13 (1st Cir. 2008).

agency need not include relevant information if “the overall costs of obtaining it are exorbitant.”<sup>7</sup>

While the Board cited to these principles in its discussion of legal standards, it did not apply these rules to the FSEIS.<sup>8</sup> Instead of responding to the Staff’s argument that “it complied with NEPA by making repeated attempts to obtain information on cultural resources,”<sup>9</sup> the Board examined whether the FSEIS “adequately catalogued” the “cultural, historical, and religious sites of the Oglala Sioux Tribe.”<sup>10</sup> Because it found that the FSEIS did not contain this information, the Board concluded that the “NRC Staff did not give this issue its required hard look in the FSEIS.”<sup>11</sup> Consequently, the Staff is correct that the Board’s ruling on Contention 1A constitutes legal error. Instead of considering whether the Staff could reasonably obtain the information it acknowledged was missing, the Board invalidated the FSEIS simply because the information was missing in the first place.<sup>12</sup> This approach is facially inconsistent with our precedent, Federal case law, and the CEQ regulations, which recognize that in some instances information relevant to an EIS will not be reasonably available and direct the agency to proceed in accord with NEPA’s rule of reason in the face of such lacunae.<sup>13</sup> Therefore, the Board’s ruling on Contention 1A rests on a legal error.<sup>14</sup>

While the Commission would normally hesitate to wade through such a detailed factual record ourselves, particularly when we have not had the advantage of observing testimony first hand,<sup>15</sup> in this case other findings from the Board indicate that the missing information was not reasonably available. Specifically, upon reviewing the record in its entirety, the Board concluded that the amount of “funds requested to collect tribal cultural information” by the Oglala Sioux was “patently unreasonable.”<sup>16</sup> If information is only available at a patently unreasonable cost, here potentially four million dollars to conduct one part of the cultural survey (itself only one part of the larger NEPA review), it follows that

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<sup>7</sup> 40 C.F.R. § 1502.22; see also *Pacific Gas and Electric Co.* (Diablo Canyon Nuclear Power Plant, Units 1 and 2), CLI-11-11, 74 NRC 427, 443-44 (2011) (observing that while the NRC is not bound by CEQ regulations, it looks to them for guidance).

<sup>8</sup> LBP-15-16, 81 NRC at 638 (noting that “an environmental impact statement is not intended to be a research document” (internal quotation marks omitted)).

<sup>9</sup> *Id.* at 652.

<sup>10</sup> *Id.* at 655.

<sup>11</sup> *Id.*

<sup>12</sup> *Id.*

<sup>13</sup> *Pilgrim*, CLI-10-22, 72 NRC at 208; *Town of Winthrop*, 535 F.3d at 13; 40 C.F.R. § 1502.22.

<sup>14</sup> 10 C.F.R. § 2.341(b)(4)(ii).

<sup>15</sup> *Northern Indiana Public Service Co.* (Bailly Generating Station, Nuclear 1), ALAB-303, 2 NRC 858, 867 (1975) (noting that “Licensing Boards are the Commission’s primary fact finding tribunals”).

<sup>16</sup> LBP-15-16, 81 NRC at 657 & n.229.

such information is not reasonably available.<sup>17</sup> Moreover, because this information missing from the FSEIS was not reasonably available, its absence from the FSEIS analysis cannot be a basis upon which the FSEIS fails to meet NEPA's hard look standard.

In its Response, the Tribe argues that the precedents cited by Staff do not stand for the legal principle that when relevant information to an EIS is unavailable, the agency must only make reasonable efforts to obtain the information.<sup>18</sup> Specifically, the Tribe argues that many of the cases relied on by the Staff only hold that agencies need not consider remote and speculative impacts in an EIS.<sup>19</sup> But, it appears that the Staff only cited to these precedents to establish NEPA's general rule of reason.<sup>20</sup> Moreover, several of the authorities relied on by the Staff appear to support the position that agencies need only undertake reasonable efforts to acquire missing information, such as 40 C.F.R. § 1502.22, *Town of Winthrop*, and *Pilgrim*.<sup>21</sup> For the most part, the Tribe did not discuss these authorities in its response.<sup>22</sup> While the Tribe asserts that *Pilgrim* "simply confirmed" that an EIS is "not intended to be a research document,"<sup>23</sup> these quotations from *Pilgrim* support the Staff's position because they indicate that an agency need not take extraordinary efforts to obtain or create missing information.

## **B. Contention 1B**

Powertech advances a similar argument with respect to Contention 1B — that the Board did not apply the correct standard for tribal consultation under the NHPA implementing regulations.<sup>24</sup> I would take review of Powertech's petition with respect to Contention 1B and reverse the Board's ruling that the consultation process between the Staff and the Tribe was inadequate.

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<sup>17</sup> Staff's Petition at 6 (citing Tr. at 804, 807).

<sup>18</sup> Tribe's Response at 15-17.

<sup>19</sup> *Id.* (citing *Ground Zero Ctr. for Non-Violent Action v. U.S. Dep't of the Navy*, 383 F.3d 1082 (9th Cir. 2004); *Warm Springs Dam Task Force v. Gribble*, 621 F.2d 1017 (9th Cir. 1980); *Entergy Nuclear Generation Co. (Pilgrim Nuclear Power Station)*, CLI-10-11, 71 NRC 287 (2010)).

<sup>20</sup> Staff's Petition at 17-18.

<sup>21</sup> *Id.* (citing *Pilgrim*, CLI-10-22, 72 NRC at 208; *Town of Winthrop*, 535 F.3d at 13; 40 C.F.R. § 1502.22).

<sup>22</sup> Tribe's Response at 16.

<sup>23</sup> *Id.* (quotation marks omitted).

<sup>24</sup> See Powertech's Petition at 9-11 ("[T]he Licensing Board's attempt to distinguish between the characterizations of consultation as 'reasonable' versus 'meaningful' is not part of the NHPA statutory framework or regulatory regime.").

Under the NHPA's implementing regulations, the NRC must provide every tribe "a reasonable opportunity to identify its concerns about historic properties, advise on the identification and evaluation of historic properties, including those of traditional religious and cultural importance, articulate its view on the undertaking's effects on such properties, and participate in the resolution of such adverse effects."<sup>25</sup> While the "Tribe is entitled to 'identify its concerns,' to 'advise,' to 'articulate,' and to 'participate,'" courts have warned that "consultation is not the same thing as control over a project."<sup>26</sup> Even if a party's involvement is limited, if that limited involvement is by choice, the agency has provided the party with a reasonable opportunity to participate.<sup>27</sup>

With regard to Contention 1B, the Board initially stated the correct legal standard, whether the Staff provided a "reasonable opportunity" for consultation.<sup>28</sup> However, in evaluating Contention 1B, rather than apply that standard, the Board sought to determine "which party or specific action led to the impasse preventing an adequate tribal cultural survey."<sup>29</sup> Ultimately, the Board determined that the "NRC Staff is at least partly at fault for the failed consultation process" largely because it never "held a single consultation session, on a government-to-government basis, solely with members of the Oglala Sioux Tribe."<sup>30</sup> Likewise, the Board concluded that the "Oglala Sioux Tribe does share some responsibility for the . . . lack of meaningful consultation."<sup>31</sup> Therefore, because the Board focused its attention on apportioning culpability for what became an impasse, instead of determining whether the opportunity for consultation itself was a reasonable one, the Board's decision constituted legal error.<sup>32</sup>

As noted above, the Commission generally hesitates to make factual findings in the first instance, but again the record developed by the Board is sufficient to answer the question posed: here, whether the Staff provided a reasonable opportunity for consultation. One of the most striking aspects of this record is that the ACHP, the agency expert in implementing the NHPA, signed the NRC's Programmatic Agreement for the Dewey-Burdock project, and in so do-

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<sup>25</sup> 36 C.F.R. § 800.2(c)(2)(ii)(A).

<sup>26</sup> *Narragansett Indian Tribe v. Warwick Sewer Authority*, 334 F.3d 161, 168 (1st Cir. 2003).

<sup>27</sup> *Montana Wilderness Ass'n v. Connell*, 725 F.3d 988, 1009 (9th Cir. 2013).

<sup>28</sup> LBP-15-16, 81 NRC at 639 (quoting 36 C.F.R. § 800.2(c)(2)(ii)(A)).

<sup>29</sup> *Id.* at 656.

<sup>30</sup> *Id.* And the Tribe's status as a litigant in this proceeding does not alter its role as a consulting party. To be sure, the ACHP's regulations list various consulting parties, including both Indian tribes and "[c]ertain individuals and organizations with a demonstrated interest in the undertaking . . . due to their legal or economic relation to the undertaking or affected properties." See 36 C.F.R. § 800.2(c)(2) and (5). But the Board's implication that the Tribe's status as an intervenor somehow elevates its status as a consulting party is incorrect. See LBP-15-16, 81 NRC at 656.

<sup>31</sup> LBP-15-16, 81 NRC at 656.

<sup>32</sup> 10 C.F.R. § 2.341(b)(4)(ii).

ing, found that it set forth a phased process for compliance with section 106.<sup>33</sup> While the ACHP's agreement is not binding on the Commission, its findings are entitled to considerable weight.<sup>34</sup> On balance, the record demonstrates that the Staff has committed to phased compliance with section 106, as endorsed by the ACHP. I fully expect the Staff to satisfy its obligations under the Programmatic Agreement, which include consultation. Accordingly, I would conclude that the Staff has provided the Tribe with a reasonable opportunity to consult and will continue to take appropriate actions under the Programmatic Agreement.

In its Response, the Tribe argues that the factual record contains sufficient information to rebut the Staff's and Powertech's efforts to "blame the Tribe for the problems with NRC Staff's NHPA compliance."<sup>35</sup> But, as noted above, the correct standard is not whether there is sufficient evidence to apportion blame, but whether the opportunity to consult was reasonable. While the Tribe may well be disappointed with how the consultation unfolded, courts have consistently held that "a reasonable opportunity to consult" does not guarantee any specific results.<sup>36</sup> Consequently, this argument is not persuasive.

Next, the Tribe argues that Federal case law supports the reasonableness of the Board's holding.<sup>37</sup> But, it appears that these cases involve very different

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<sup>33</sup> Ex. NRC-018-D, Letter from Charlene Dwin Vaughn, Advisory Council on Historic Preservation, to Kevin Hsueh, NRC (Apr. 7, 2014) (ML14246A405); see Ex. NRC-18-E, Advisory Council on Historic Preservation Signature Page of Programmatic Agreement Among U.S. Nuclear Regulatory Commission, U.S. Bureau of Land Management, South Dakota State Historic Preservation Office, Powertech (USA), Inc., and Advisory Council on Historic Preservation Regarding the Dewey-Burdock [*In Situ*] Recovery Project Located in Custer and Fall River Counties South Dakota (Apr. 7, 2014) (ML14246A417); see also Ex. NRC-018-A, Programmatic Agreement, at 2; Ex. NRC-018-B, Appendices Related to the Programmatic Agreement Among U.S. Nuclear Regulatory Commission, U.S. Bureau of Land Management, South Dakota State Historic Preservation Office, Powertech (USA), Inc., and Advisory Council on Historic Preservation Regarding the Dewey-Burdock [*In Situ*] Recovery Project Located in Custer and Fall River Counties South Dakota, app. A, at 2-7 (ML14246A406); 36 C.F.R. § 800.4(b)(2).

<sup>34</sup> *Public Service Co. of New Hampshire, et al.* (Seabrook Station, Units 1 and 2), CLI-77-8, 5 NRC 503, 527 (1977).

<sup>35</sup> Tribe's Response at 19.

<sup>36</sup> *Narragansett Indian Tribe*, 334 F.3d at 168. While some courts have determined that agency shortcomings, such as misrepresenting important facts or only relying on written communications, may render an opportunity to consult unreasonable, *Pueblo of Sandia v. United States*, 50 F.3d 856, 860-62 (10th Cir. 1995), on balance the record does not support such findings here.

<sup>37</sup> Tribe's Response at 19-21 (citing *Quechan Indian Tribe of Fort Yuma Indian Reservation v. Dep't of the Interior*, 755 F. Supp. 2d 1104 (D. Ariz. 2008); *Attakai v. United States*, 746 F. Supp. 1395 (D. Ariz. 1990); *Slockish v. U.S. Federal Highway Admin.*, 682 F. Supp. 2d 1178 (D. Or. 2010); *Pueblo of Sandia*, 50 F.3d at 856).

factual backgrounds.<sup>38</sup> Indeed, the Tribe concedes that many of the cases have distinguishing characteristics from the instant case.<sup>39</sup> Finally, some aspects of these cases appear to be unfavorable to the Tribe's position; for example one district court noted, "None of this analysis is meant to suggest federal agencies must acquiesce to every tribal request."<sup>40</sup> Consequently, I am not persuaded by the Tribe's efforts to rehabilitate the Board's legal analysis.

Therefore, because the Board applied the incorrect legal standards to Contentions 1A and 1B, I would overturn the Board's determinations with respect to those two contentions and find (1) that the Staff's NEPA analysis of the environmental effects of the Dewey-Burdock project on Native American cultural, religious, and historic resources was adequate and (2) the Staff has provided the Tribe with a reasonable opportunity to consult under the NHPA. Consequently, I would find in favor of the Staff on these two contentions and direct the Board to terminate this proceeding.

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<sup>38</sup> *Quechan Tribe*, 755 F. Supp. 2d at 1119 (noting that the Tribe was not provided with adequate information or time); *Slockish*, 682 F. Supp. 2d at 1197 (stating that in deciding whether the NHPA claim was moot, the court "must begin by assuming . . . that the defendants have violated the NHPA").

<sup>39</sup> Tribe's Response at 21-22 (observing that *Attakai* and *Pueblo of Sandia* involved cases in which the agency wholly failed to consult with an affected Tribe).

<sup>40</sup> *Quechan Tribe*, 755 F. Supp. 2d at 1119.

**Commissioner Baran, dissenting in part.**

I join in the Commission's decision except for the portion of the decision that denies review of the Tribe's claim that the Board erred by not vacating the license for failure to complete an adequate NEPA review. I respectfully dissent on this issue.

As I stated in my partial dissent in the *Strata* proceeding and my dissent in the *Turkey Point* proceeding, a core requirement of NEPA is that an agency decisionmaker must consider an adequate environmental review *before* making a decision on a licensing action.<sup>1</sup> If the Commission allows a Board to supplement and cure an inadequate NEPA document *after* the agency has already made a licensing decision, then this fundamental purpose of NEPA is frustrated.

In this case, the Board found that the Staff's FSEIS did not meet the requirements of NEPA because the FSEIS was deficient with respect to the effects of the licensing action on Native American cultural, religious, and historic resources.<sup>2</sup> Thus, the agency did not have an adequate environmental analysis at the time it decided whether to issue the license. In fact, the deficiencies in the NEPA analysis remain unaddressed today, and therefore the Staff still cannot make an adequately informed decision on whether to issue the license. The Staff's licensing decision was based on (and continues to rest on) an inadequate environmental review. As a result, the Staff has not complied with NEPA.

The Commission should suspend the license until the Staff has, in accordance with the Board's order, filed its final monthly status report demonstrating that the FSEIS complies with NEPA and our regulations. Once the Staff had satisfied the Board's order and completed an adequate NEPA analysis on which to base its decision, the Staff would then be in a position to decide whether to modify, reinstate, condition, or revoke the license.

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<sup>1</sup> *Strata Energy*, CLI-16-13, 83 NRC at 604 (citing *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 349 (1989)), *appeal docketed*, No. 16-1298 (D.C. Cir. Aug. 24, 2016); *Florida Power & Light Company* (Turkey Point Nuclear Generating Units 3 and 4), CLI-16-18, 84 NRC 167 (2016).

<sup>2</sup> LBP-15-16, 81 NRC at 708, 655-58. The Board also identified a NEPA deficiency with respect to hydrogeological information, the subject of Contention 3, and conditioned Powertech's license to cure this deficiency. *See id.* at 679, 681, 709.



UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

**ATOMIC SAFETY AND LICENSING BOARD**

**Before Administrative Judges:**

**Michael M. Gibson**, Chairman  
**Dr. Richard E. Wardwell**  
**Brian K. Hajek**

**In the Matter of**

**Docket No. 40-8943**  
**(ASLBP No. 08-867-02-OLA-BD01)**

**CROW BUTTE RESOURCES, INC.**  
**(In Situ Leach Facility, Crawford,**  
**Nebraska)**

**December 6, 2016**

On November 27, 2007, Crow Butte Resources, Inc. (Crow Butte) timely filed to renew its Source Materials License for continued operation of its in situ leach uranium recovery facility near Crawford, Nebraska. Several intervenors challenged Crow Butte's license renewal application, and the Board admitted a number of contentions. In this Partial Initial Decision, the Board addressed Contentions A, C, D, F, 6, 9, 12, and 14. Six of these contentions — Contentions A, C, D, F, 6, and 9 — implicate several aspects of the NRC Staff's analysis of the subsurface hydrogeology at or near the Crow Butte License Area. Intervenors are concerned that contaminants escaping from Crow Butte's operations could migrate offsite, potentially as far as the Pine Ridge Indian Reservation (PRIR), which is home to members of the Oglala Sioux Tribe, and that excessive groundwater consumed during post-operational aquifer restoration may adversely impact the environment. The remaining two contentions do not involve the hydrogeology of the License Area, but rather the environmental risk of tornadoes and the possible land application of ISL wastewater (Contention 12) and the environmental risk of earthquakes (Contention 14). Intervenors generally argue that the NRC Staff did not adequately address these issues in its Environmental Assessment (EA) associated with Crow Butte's renewed license.

For seven of these contentions and for part of the eighth (Contention 12), we conclude that, supplemented by the evidentiary record in this proceeding, the EA satisfies the NRC Staff's obligation to conduct a thorough environmental review. For the remaining part of Contention 12, we find for Intervenors and conclude that the EA is deficient as to its discussion of the possible land application of ISL wastewater. Given that the record with respect to the land application of ISL wastewater, as authorized by Crow Butte's renewed license, is inadequate to support the NRC Staff's Finding of No Significant Impact, we have determined that the NRC Staff must augment its EA analysis and reach its own independent conclusion on the environmental risk of Crow Butte's possible land application of its ISL wastewater, in conformance with the National Environmental Policy Act (NEPA).

**NEPA: "HARD LOOK" REQUIREMENT; NRC STAFF RESPONSIBILITY**

NEPA requires the NRC Staff to take a hard look at any significant environmental consequences of a proposed licensing action.

**NEPA: RECORD OF DECISION**

Where an adjudicatory hearing tests the adequacy of an Environmental Assessment (EA) or Environmental Impact Statement (EIS), evidence adduced at the hearing may cure a defective NEPA document — because in contested proceedings with a hearing, a licensing board creates the final record of decision under NEPA, i.e., the entire adjudicatory record in addition to the EA or EIS.

**COUNCIL ON ENVIRONMENTAL QUALITY: EIS**

In order to incorporate outside documents into a NEPA document, the Council on Environmental Quality regulations, adopted by the Nuclear Regulatory Commission, require that: "[t]he incorporated material shall be cited in the statement and its content briefly described."

**COUNCIL ON ENVIRONMENTAL QUALITY: EIS**

The EA or EIS should identify documents that are incorporated by reference and indicate where these references are available for public review. Relevant portions of the incorporated analysis should be referenced by page or section number and summarized in the EA or EIS. Incorporating by reference should not result in a loss of comprehension to the reader.

#### **RULES OF PRACTICE: BURDEN OF PROOF**

The Commission has made clear that a party is responsible for ensuring that there is sufficient evidence on the record to meet its burden of proof. And at the hearing phase, the NRC Staff is the party bearing the burden of proof.

#### **NEPA: RULE OF REASON**

NEPA requires only a discussion of “reasonably foreseeable” impacts, which excludes “remote and speculative” impacts or “worst-case” scenarios. Courts typically exclude impacts either with a low probability of occurrence or where the link between the agency action and the claimed impact is too attenuated to find the proposed federal action to be the “proximate cause” of that impact.

#### **NEPA: RELIANCE ON STATE ENVIRONMENTAL REVIEW**

The NRC Staff may afford a state agency’s competent and thorough environmental review of a site “substantial weight” in conducting its own NEPA analysis. However, any such limited reliance on the State’s environmental review of the site cannot act as a substitute for the NRC Staff engaging in its own independent NEPA review of potential environmental impacts on the site.

#### **REMEDIES: INJUNCTION**

Where an agency fails to comply with procedural statutes such as NEPA or the NHPA, an injunction is sometimes the proper recourse.

#### **REMEDIES: INJUNCTION**

The United States Supreme Court has made clear that such injunctive relief is only warranted when the traditional test justifying it is met, i.e., “(1) that [the plaintiff] suffered an irreparable injury; (2) that remedies available at law, such as monetary damages, are inadequate to compensate for that injury; (3) that, considering the balance of hardships between the plaintiff and defendant, a remedy in equity is warranted; and (4) that the public interest would not be disserved by a permanent injunction.” *Monsanto Co. v. Geertson Seed Farms*, 561 U.S. 139, 156-57 (2010).

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### ACRONYMS AND ABBREVIATIONS

ACL	Alternate Concentration Limit
BC/CPF	Basal Chadron/Chamberlain Pass Formation
cm/s	Centimeters per Second
EA	Environmental Assessment
EIS	Environmental Impact Statement
FWS	United States Fish and Wildlife Service
GEIS	Generic Environmental Impact Statement
gpm	Gallons per Minute
gal/ft <sup>2</sup>	Gallons per Square Foot
ISL	In Situ Leach
LCU	Lower Confining Unit
LRA	License Renewal Application
MBRP	Model-Based Restoration Plan
MIT	Mechanical Integrity Testing
µg/L	Micrograms per Liter
NDEQ	Nebraska Department of Environmental Quality
NEPA	National Environmental Policy Act of 1969
NMSS	Office of Nuclear Material Safety and Safeguards
NPDES	National Pollutant Discharge Elimination System
NRC	United States Nuclear Regulatory Commission
NTEA	North Trend Expansion Area
NTS	Not to Scale
PRIR	Pine Ridge Indian Reservation

SDDENR	South Dakota Department of Environment and Natural Resources
SER	Safety Evaluation Report
SPCC	Spill Prevention, Control, and Countermeasures
Th	Thorium
U	Uranium
UCL	Upper Control Limits
UCU	Upper Confining Unit
UIC	Underground Injection Control
USGS	United States Geological Survey

## SECOND PARTIAL INITIAL DECISION

### I. INTRODUCTION

This proceeding arises from a challenge by the Oglala Sioux Tribe and Consolidated Intervenor (together “Intervenor”)<sup>1</sup> to the application of Crow Butte Resources, Inc. (Crow Butte), to renew its Source Materials License No. SUA-1534 for the continued operation of its in situ leach (ISL) uranium recovery facility near Crawford, Nebraska.<sup>2</sup> We admitted nine of Intervenor’s contentions,<sup>3</sup> and held an evidentiary hearing on those environmental contentions in Crawford, Nebraska, from August 24 to 28, 2015,<sup>4</sup> and in Rockville, Maryland, on October 23, 2015.<sup>5</sup> On May 16, 2016, we resolved Contention 1 in part for Intervenor and in part for the NRC Staff.<sup>6</sup>

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<sup>1</sup> Request for Hearing and/or Petition to Intervene, Oglala Sioux Tribe (July 28, 2008) [hereinafter Tribe Petition]; Consolidated Request for Hearing and Petition for Leave to Intervene (July 28, 2008).

<sup>2</sup> Ex. CBR-011, Application for 2007 License Renewal USNRC Source Materials License SUA-1534 Crow Butte LA (Nov. 27, 2007) [hereinafter LRA].

<sup>3</sup> See LBP-15-11, 81 NRC 401, 404 (2015), *petition for interlocutory review denied*, CLI-15-17, 82 NRC 33, 47 (2015); LBP-08-24, 68 NRC 691, 699 (2008), *aff’d in part and rev’d in part*, CLI-09-9, 69 NRC 331 (2009). The lengthy procedural background of this case is set forth in our first Partial Initial Decision, LBP-16-7, 83 NRC 340, 347-49 (2016), and so will not be repeated here.

<sup>4</sup> Tr. at 945-2375.

<sup>5</sup> Tr. at 2404-2640.

<sup>6</sup> LBP-16-7, 83 NRC at 411-12.

This Second Partial Initial Decision resolves the eight remaining contentions in this proceeding. Six of these contentions — Contention A, Contention C, Contention D, Contention F, Contention 6, and Contention 9 — address various issues regarding the NRC Staff’s analysis of the subsurface hydrogeology at or near the Crow Butte License Area. Intervenors are concerned that contaminants escaping from Crow Butte’s operations could migrate offsite, potentially as far as the Pine Ridge Indian Reservation (PRIR), which is home to members of the Oglala Sioux Tribe, and that excessive groundwater consumed during post-operational aquifer restoration may adversely impact the environment. The remaining two contentions do not directly implicate the hydrogeology of the License Area. Contention 12 concerns the environmental risk of tornadoes and the possible land application of ISL wastewater, while Contention 14 concerns the environmental risk of earthquakes. Intervenors generally argue that the NRC Staff did not adequately address these issues in the Environmental Assessment (EA) associated with Crow Butte’s renewed license.<sup>7</sup>

For seven of these contentions and for part of the eighth (Contention 12), we conclude that, supplemented by the evidentiary record in this proceeding, the EA satisfies the NRC Staff’s obligation to conduct a thorough environmental review. For the remaining part of Contention 12, we find for Intervenors and conclude that the EA is deficient as to its discussion of the possible land application of ISL wastewater. Given that the record with respect to the land application of ISL wastewater, as authorized by Crow Butte’s renewed license, is inadequate to support the NRC Staff’s Finding of No Significant Impact, we have determined that the NRC Staff must augment its EA analysis and reach its own independent conclusion on land application of ISL wastewater, in conformance with the National Environmental Policy Act (NEPA).

#### A. Legal Standards

NEPA requires the NRC Staff to take a hard look at any significant environmental consequences of a proposed licensing action,<sup>8</sup> which, in this case, is the renewal of Crow Butte’s license for an additional 10 years. As part of its analysis, the NRC Staff categorizes the potential environmental impacts on a scale from small to large:

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<sup>7</sup> Consolidated Intervenors’ and Oglala Sioux Tribe’s Joint Position Statement at 108-24 (May 8, 2015) [hereinafter Intervenors’ Joint Position Statement]; see Ex. NRC-010, Office of Nuclear Material Safety and Safeguards, Division of Fuel Cycle Safety, Safeguards, and Environmental Review, Final Environmental Assessment for the License Renewal of U.S. Nuclear Regulatory Commission License No. SUA-1534 (Oct. 2014) [hereinafter EA].

<sup>8</sup> *Pa’ina Hawaii, LLC*, CLI-10-18, 72 NRC 56, 74-75 (2010); see also *LBP-16-7*, 83 NRC at 351-53.

SMALL — environmental effects are not detectable or are so minor that they will neither destabilize nor noticeably alter any important attribute of the resource.

MODERATE — environmental effects are sufficient to alter noticeably, but not to destabilize, important attributes of the resource.

LARGE — environmental effects are clearly noticeable and are sufficient to destabilize important attributes of the resource.<sup>9</sup>

Intervenors argue that the EA did not adequately assess and categorize a variety of environmental impacts related to the renewal of Crow Butte’s license, primarily hydrogeological impacts related to the ore-bearing body and associated aquifer from which Crow Butte obtains its uranium. At an evidentiary hearing, the NRC Staff bears the ultimate burden of showing that it satisfied NEPA’s information-disclosure mandate by meaningfully considering significant impacts and addressing those impacts in the EA.<sup>10</sup>

At issue is not just the extent of the discussion in the EA itself, but also the adequacy of other documents that the NRC Staff has purported to incorporate by reference. To incorporate outside documents into a NEPA document, the Council on Environmental Quality regulations provide that “[t]he incorporated material shall be cited in the statement and its content briefly described.”<sup>11</sup> The NRC Staff’s guidance states more specifically:

The EA or EIS [Environmental Impact Statement] should identify documents that are incorporated by reference and indicate where these references are available for public review. Relevant portions of the incorporated analysis should be referenced by page or section number and summarized in the EA or EIS. Incorporating by reference should not result in a loss of comprehension to the reader.<sup>12</sup>

One particular form of incorporation by reference at issue here is tiering. Tiering occurs when an agency incorporates a Generic Environmental Impact Statement (GEIS) into a site-specific analysis.<sup>13</sup> The Council on Environmental Quality

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<sup>9</sup> EA at 8; *see* Ex. NRC-014, Environmental Review Guidance for Licensing Actions Associated with [Office of Nuclear Material Safety and Safeguards] Programs, NUREG-1748, § 4.2.5.3 at 4-14 (Aug. 2003) [hereinafter Ex. NRC-014, NUREG-1748]; *AREVA Enrichment Services, LLC* (Eagle Rock Enrichment Facility), LBP-11-26, 74 NRC 499, 546 (2011).

<sup>10</sup> *Duke Power Co.* (Catawba Nuclear Station, Units 1 and 2), CLI-83-19, 17 NRC 1041, 1049 (1983); *see also Entergy Nuclear Operations, Inc.* (Indian Point, Units 2 and 3), CLI-16-7, 83 NRC 293, 306-07 (2016); *see also Hydro Resources, Inc.* (P.O. Box 777, Crownpoint, New Mexico 87313), CLI-06-11, 63 NRC 483, 493 (2006).

<sup>11</sup> 40 C.F.R. § 1502.21; *see also* 10 C.F.R. Part 51, Subpart A, App. A, § 1(b).

<sup>12</sup> Ex. NRC-014, NUREG-1748, § 1.6.4 at 1-11.

<sup>13</sup> 40 C.F.R. §§ 1502.20, 1508.28.

regulations require that, just as with incorporation by reference, an agency must reference and summarize the specific issues addressed in the GEIS that are to be tiered into a site-specific EIS or EA.<sup>14</sup> Thus, the mere existence of a GEIS is not sufficient to tier its contents into a site-specific EIS or EA.<sup>15</sup>

## B. Parties' Witnesses

A total of thirteen witnesses testified about the contentions addressed in this second Partial Initial Decision. No party challenged the qualifications of any witness to give the testimony provided.

Four witnesses testified for Intervenors: Dr. Hannan LaGarry, Michael Wireman, Dr. David Kreamer, and Linsey McLean. Dr. LaGarry received his Ph.D. in Geology from the University of Nebraska–Lincoln and is a conservation biology instructor/researcher and co-chair in the Department of Math, Science and Technology at Oglala Lakota College in South Dakota.<sup>16</sup> Mr. Wireman is a hydrogeologist with over 29 years of experience, including serving as the EPA Region VIII National Ground-Water Expert.<sup>17</sup> Dr. Kreamer received his Ph.D. in Hydrology from the University of Arizona and is a Professor of Hydrology/Geoscience at the University of Nevada, Las Vegas.<sup>18</sup> Ms. McLean is an environmental biochemist with 40 years of experience researching toxic environmental exposures in animals and humans.<sup>19</sup>

Four witnesses testified for the NRC Staff: David Back, Dr. Elise Striz, Thomas Lancaster, and Nathan Goodman. Mr. Back received his M.S. in Geology with a hydrogeology concentration from Oklahoma State University and is a hydrogeologist at an environmental consulting firm.<sup>20</sup> Dr. Striz received her Ph.D. in Petroleum Engineering from the University of Oklahoma and is a hydrogeologist in the NRC's Uranium Recovery Licensing Branch.<sup>21</sup> Mr. Lancaster is a hydrogeologist and regulatory Project Manager in the NRC's Uranium Re-

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<sup>14</sup> 40 C.F.R. § 1502.20; *see also* 10 C.F.R. Part 51, App. A, § 1(b) (adopting “[t]he techniques of tiering and incorporation by reference described respectively in 40 CFR 1502.20 and 1508.28 and 40 CFR 1502.21 of CEQ’s NEPA regulations” (footnote omitted)); Ex. NRC-014, NUREG-1748, § 1.6.2 at 1-10.

<sup>15</sup> LBP-15-11, 81 NRC at 440 n.258 (citing *Powertech USA, Inc.* (Dewey-Burdock In Situ Uranium Recovery Facility), LBP-13-9, 78 NRC 37, 67 (2013)).

<sup>16</sup> Ex. INT-062, Curriculum Vitae of Hannan E. LaGarry (Mar. 4, 2010).

<sup>17</sup> Ex. INT-064, Curriculum Vitae of Michael Wireman (June 2014).

<sup>18</sup> Ex. INT-063, Curriculum Vitae of David Kenneth Kreamer (Mar. 30, 2015).

<sup>19</sup> Ex. INT-048, Expert Opinion Testimony of Linsey McLean at 1 (May 1, 2015); Ex. INT-065, Curriculum Vitae of Witness Linsey McLean (undated).

<sup>20</sup> Ex. NRC-002, Curriculum Vitae of David Back (May 8, 2015).

<sup>21</sup> Ex. NRC-008, Curriculum Vitae of Dr. Elise A. Striz (May 8, 2015).

covery Licensing Branch.<sup>22</sup> Mr. Goodman received his M.S. in Environmental Science from Johns Hopkins University and is a Project Manager and Terrestrial and Aquatic Biologist at the NRC.<sup>23</sup>

Five witnesses testified for Crow Butte: Wade Beins, Matthew Spurlin, Larry Teahon, Robert Lewis, and Doug Pavlick. Mr. Beins is a Senior Geologist at Crow Butte and has approximately 20 years of experience as a geologic technician and geologist at the Crow Butte site.<sup>24</sup> Mr. Spurlin received his M.S. in Geology from the University of California, Los Angeles, and is a Senior Geologist at an environmental consulting firm.<sup>25</sup> Mr. Teahon received his B.A. in Chemistry and Biology from Chadron State College and is the Crow Butte Manager of Safety, Health, Environment, and Quality.<sup>26</sup> Mr. Lewis is a certified professional geologist and the owner and Principal Hydrogeologist of an environmental consulting firm.<sup>27</sup> Mr. Pavlick is the general manager for three uranium mines, including Crow Butte, and has 20 years of experience processing uranium and sodium carbonate ore in the western United States.<sup>28</sup>

### **C. Intervenor Issues and Admitted Contentions**

In their written submissions and at the evidentiary hearing, Intervenor's do not present evidence on a contention-by-contention basis for Contentions A, C, D, F, 6, and 9. Instead, they challenged the EA's analysis of a variety of related hydrogeologic issues that cut across these contentions. Furthermore, these related overarching issues apply to all of these contentions, either as direct issues raised by Intervenor's, or as an indirect influence on understanding the background hydrogeologic conditions in and around the License Area, and so they serve to impact our findings of facts for each contention. Given this presentation of evidence, we address these overarching factual issues and disputes concerning the hydrogeological conditions at or near the License Area separately from our consideration of the individual issues raised in each specific contention.

To provide context for our technical findings of fact, we briefly review the bases for each contention. First, Contention A challenges the adequacy of the NRC Staff's required biweekly testing of monitoring wells and its omission

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<sup>22</sup> Ex. NRC-005, Curriculum Vitae of Thomas R. Lancaster (May 8, 2015).

<sup>23</sup> Ex. NRC-004, Statement of Professional Qualifications of Nathan E. Goodman (May 8, 2015).

<sup>24</sup> Ex. CBR-001, Initial Written Testimony of Crow Butte Resources Witnesses Wade Beins, Bryan Soliz, Robert Lewis, Matthew Spurlin, and Larry Teahon on Contentions A, C, D, F, and 14 at 1 (May 8, 2015); Ex. CBR-002, Affidavit of Wade Beins (May 8, 2015).

<sup>25</sup> Ex. CBR-005, Affidavit of Matthew Spurlin (May 8, 2015).

<sup>26</sup> Ex. CBR-006, Affidavit of Larry Teahon (May 8, 2015).

<sup>27</sup> Ex. CBR-003, Affidavit of Robert Lewis (May 8, 2015).

<sup>28</sup> Ex. CBR-009, Affidavit of Doug Pavlick (May 8, 2015).

of uranium as a parameter to detect an excursion (i.e., the unintended spread of processing liquids beyond Crow Butte's mining units). Contention C challenges the EA's conclusion that the impact from accidental surface spills will be minimal because there are no nearby surface water features. In Contention D, Intervenor claim the EA incorrectly states that there is no communication among the aquifers in the general area of the License Area, and that, based on potential connections between such aquifers, the EA's Environmental Justice analysis should be expanded to consider the impacts of the renewal of Crow Butte's license on the drinking water supplies within the PRIR. Contention F alleges the EA fails to include the results of recent research that would have resulted in the EA adopting an updated and more accurate depiction of the geologic formations in the general vicinity of the License Area. Contention 6 takes issue with the EA's estimations of restoration impacts and asserts that water consumption during restoration will produce a LARGE impact to the ore-bearing aquifer, rather than the MODERATE one the EA projected. Contention 9 alleges that the EA does not adequately discuss groundwater restoration mitigation measures and, in particular, whether Crow Butte will be able to return the License Area to preoperational water quality levels.

Apart from the above contentions that involve factual disputes over the hydrogeologic features in the general area of the License Area, there are two other contentions we address as stand-alone issues at the end of this decision. Contention 12 has two separate parts that we address as Contention 12A, concerning the EA's lack of discussion of tornadoes, and Contention 12B, addressing the adequacy of the EA's analysis of the environmental impacts from land application of ISL wastewater. Finally, Contention 14 asserts that the EA fails to analyze the impacts of earthquakes on contaminant migration due to seismic-induced alteration of the geologic formation.

For each contention, we have considered all the prefiled testimony, the evidence presented at the hearing, and the parties' proposed findings of facts and conclusions of law. Insofar as the parties' evidence directly relates to and impacts our decision, it is summarized for each contention. On the other hand, where we deemed the evidence to be of no relevance to our decision, we did not summarize it. Where there is an evidentiary dispute, we make any necessary factual findings based on a preponderance of the evidence.<sup>29</sup>

Immediately below is Section II, which summarizes undisputed background information relating to Crow Butte's mining operations, the regional geologic setting, and the regional hydrogeologic conditions surrounding the License

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<sup>29</sup> *Pacific Gas and Electric Co.* (Diablo Canyon Power Plant Independent Spent Fuel Storage Installation), CLI-08-26, 68 NRC 509, 521 (2008); *see also Entergy Nuclear Operations, Inc.* (Indian Point, Units 2 and 3), CLI-15-6, 81 NRC 340, 388 n.258 (2015).

Area.<sup>30</sup> It is followed by Section III, which presents an analysis of the overarching geologic and hydrogeologic disputes raised by Intervenors. That, in turn, is followed by Section IV, which addresses all of the individual contentions.

## II. BACKGROUND INFORMATION

Many of the contentions herein raise factual issues concerning mining operations and the geology and hydrogeology of the Crow Butte License Area. Some of these are in dispute, while others are not. This section is devoted only to the latter, i.e., uncontested facts that provide needed background information on mining operations and the region's geologic and hydrogeologic conditions.

### A. Mining Operations at Crow Butte

The Crow Butte ISL facility is located southeast of Crawford, Nebraska, in Dawes County.<sup>31</sup> Crow Butte's license renewal application (LRA) shows that the area of review for its license renewal is defined by a 2.25-mile radius that surrounds a series of mine units — i.e., Mine Units 1 through 11.<sup>32</sup>

In these mine units, Crow Butte injects a liquid “lixiviant” into wells screened<sup>33</sup> in the Ore Zone Aquifer to mobilize the uranium. The uranium is then recovered through a production well and piped to a processing facility for uranium capture via an ion exchange process.<sup>34</sup> Each mine unit has a “seven spot” well design, a production well at the center of the mine unit, surrounded by six injection wells in a hexagon pattern, with equal 75-foot spacing between each of the injection wells and the production well.<sup>35</sup> To detect potential excursions around the Ore Zone, Crow Butte installed a perimeter ring of monitoring wells about 300 feet from each active mining wellfield, with no more than 400 feet of distance between each monitoring well.<sup>36</sup> These excursion monitoring

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<sup>30</sup>To assist in understanding the geography of the site surrounding the License Area and the sequencing of the subsurface geology, we have prepared a schematic layout of the region and the varying profiles of the geologic strata and have included it in an Appendix to this decision. These sketches are based on our understanding of the site features and their relative positions based on the testimony in the record. The aspects of these figures are not drawn to any scale and are provided for illustrative purposes only.

<sup>31</sup>EA § 1.1 at 14.

<sup>32</sup>LRA, fig. 2.6-3, at 2-109; *see also* EA, fig. 4-3, at 97; Ex. CBR-024, Crow Butte Resources, Inc., fig. 2.6-3, Cross Section Location (Apr. 9, 2009).

<sup>33</sup>A well is screened if a well screen is added to the bottom of the well casing.

<sup>34</sup>EA § 1.3 at 14-15.

<sup>35</sup>Tr. at 1028-29.

<sup>36</sup>EA § 4.6.2.2.4 at 91-92; Tr. at 1030.

wells are screened at the depth of the Ore Zone, where mining occurs, in order to detect contaminants that move horizontally and that may have the potential to escape the mining operation.<sup>37</sup> To detect contaminants that migrate vertically from the Ore Zone up through the overlying Upper Confining Unit (UCU) into the Upper Brule Aquifer, additional excursion wells (one in every 4 acres of mine unit) are placed in this overlying aquifer.<sup>38</sup>

## **B. Undisputed Regional Geologic Setting**

### **1. General Stratigraphic Units**

EA §§ 3.4.1 and 3.5.2 discuss regional and onsite stratigraphy (i.e., geologic layers beneath the License Area) and hydrostratigraphy (i.e., groundwater within those geologic layers).<sup>39</sup> As described in EA § 3.4.1, the geologic formations in the Crow Butte region are (starting from the youngest to oldest and including the thicknesses of the unit underlying the License Area): (a) the White River alluvium;<sup>40</sup> (b) the Upper Aquifer consisting in places of the Arikaree Aquifer (200 to 400 feet thick) and the Upper Brule Aquifer of the Brule Formation<sup>41</sup> (200 to 400 feet thick); (c) the UCU consisting of the Lower Brule Formation (200 to 300 feet thick) and the underlying Upper and Middle Chadron Formations (approximately 28 feet thick); (d) a sandstone layer, called the Basal Chadron Formation by some and the Chamberlain Pass Formation by others<sup>42</sup> and referred to in this decision as the “Basal Chadron/Chamberlain Pass Formation” (BC/CPF);<sup>43</sup> and (e) the Lower Confining Unit (LCU) consisting of the

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<sup>37</sup> EA § 4.6.2.2.4 at 91-92; Tr. at 1030.

<sup>38</sup> EA § 4.6.2.2.4 at 91-92; Ex. CBR-001 at 36; Ex. CBR-074, Supplemental Rebuttal Testimony of Crow Butte Resources, at 5 (Sept. 28, 2015).

<sup>39</sup> EA § 3.4.1 at 37-40; *id.* § 3.5.2 at 47-53.

<sup>40</sup> Alluvium is surface soil, usually consisting of sand, silt, and gravel, deposited by surface water, and, as such, is found in isolated areas underlying a river channel and its floodplain. *See* Ex. INT-003, Hannan E. LaGarry, Expert Opinion Regarding ISL Mining in Dawes County, Nebraska, at 2-3 (undated).

<sup>41</sup> The Brule Formation varies in lithology with depth, transitioning from a more permeable aquifer-type material labeled as the Upper Brule Formation to a much less permeable confining zone labeled as the Lower Brule Formation. In this decision, the Brule Formation refers to the combined geologic strata, the Upper Brule Formation refers to the upper portion of the Brule Formation, the Upper Brule Aquifer refers to the groundwater contained in the pores and fractures in the formation, and the Lower Brule Formation refers to the lower portion of the formation which forms one layer of the upper confining unit overlying the Ore Zone.

<sup>42</sup> *See infra* Section IV.D.1.b, Parties’ Positions on Nomenclature for the Ore Zone Formation at pp. 399-401.

<sup>43</sup> Intervenors’ witnesses challenged the appropriateness of continuing to use the historic term-

(Continued)

Pierre Shale (1500 to 2000 feet thick).<sup>44</sup> The Chadron and Brule Formations are collectively known as the “White River Group.”<sup>45</sup> The Ore Zone (10 to 80 feet thick) being mined in the License Area is part of the BC/CPF. While Intervenors’ witnesses agreed with the EA’s characterization of these stratigraphic units,<sup>46</sup> they also noted that in regions beyond the mines at the License Area, the Ogallala Aquifer overlies the Arikaree Aquifer as part of the High Plains Aquifer.<sup>47</sup>

The NRC Staff’s witnesses testified that “[t]he cross-sections provided in Figures 2.6-4 to 2.6-11 of the LRA provide[ ] the best depiction of the stratigraphy at and in the vicinity of the Crow Butte [In Situ Recovery] facility”<sup>48</sup> as augmented with the presentation of the actual geophysical logs and Crow Butte’s picks (i.e., elevation contact between different units) of those individual sedimentary strata.<sup>49</sup> Crow Butte’s witnesses noted that within these continuous geologic units, physical characteristic heterogeneities<sup>50</sup> are present, but the overall interpretation of lateral continuity is not affected by local rock unit variations.<sup>51</sup>

Dr. LaGarry testified for Intervenors that the northwest portion of Nebraska is underlain by sedimentary formations that vary from consolidated layers (i.e., compacted, cemented, rock-like material) to unconsolidated zones (i.e., small particles like beach sand, silt, and clay), and everything in between.<sup>52</sup> According

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nology of the “Basal Chadron” for this formation, and instead advocated for the use of the more recent name of “Chamberlain Pass Formation.” We discuss the correct nomenclature for this formation elsewhere, *see infra* Section IV.D.2.b, Board Findings on Nomenclature for the Ore Zone Formation at pp. 402-03; for purposes of this decision, we use the combined term of Basal Chadron/Chamberlain Pass Formation (BC/CPF). In addition, when used alone, BC/CPF refers to the geologic formation or structure. By contrast, BC/CPF Aquifer refers to the groundwater contained in the pores and fractures of this formation.

<sup>44</sup> EA § 3.4.1 at 37-40; *see also* Ex. NRC-009, Safety Evaluation Report (Revised), License Renewal of the Crow Butte Resources ISR Facility Dawes County, Nebraska Materials License No. SUA-1534, § 2.3.3.2 at 33-35 (Aug. 2014) [hereinafter SER]; Ex. CBR-001 at 11; LRA § 2.6.2 at 2-106-31.

<sup>45</sup> EA § 3.4.1.3 at 39; *see also* Ex. INT-003, Hannan E. LaGarry, Expert Opinion Regarding ISL Mining in Dawes County, Nebraska, at 2 (undated).

<sup>46</sup> Tr. at 1036-37.

<sup>47</sup> Tr. at 1045.

<sup>48</sup> Ex. NRC-001-R, NRC Staff’s Initial Testimony at 55 (May 8, 2015) (citing LRA, figs. 2.6-4 to 2.6-11, at 2-111-19).

<sup>49</sup> Tr. at 1041-43 (citing Ex. CBR-024).

<sup>50</sup> We use the term “heterogeneous” when referring to a geologic formation that has varying hydraulic properties with location, e.g., permeability varies with distance and depth within the aquifer.

<sup>51</sup> Ex. CBR-001 at 11.

<sup>52</sup> Ex. INT-003 at 2; Tr. at 1034-36, 1040.

to Dr. LaGarry, the sedimentary rocks in the Crow Butte region are loosely consolidated, poorly hardened, and “in places one can work them with one’s hands.”<sup>53</sup>

## 2. *Upper Aquifers*

Regionally, the surface aquifers include the aquifer associated with the White River alluvium, the Ogallala Aquifer, the Arikaree Aquifer, and the Upper Brule Aquifer.<sup>54</sup> The White River alluvium borders the White River and is derived from the weathering of the surficial stratigraphic units.<sup>55</sup> The White River runs approximately 2 miles northerly from the northwest edge of the License Area and then runs northeasterly from Crawford toward Chadron and thence to the PRIR in South Dakota (i.e., about 50 miles northeast of the License Area).<sup>56</sup> Where the White River alluvium is not present, the surficial aquifer in the License Area is associated with the Upper Brule Aquifer and, in one isolated location, with the Arikaree Formation. As shown in LRA Figure 2.6-1, the Arikaree Formation, composed of sandstones, is only present at the farthest southeast portion of Mine Unit 11.<sup>57</sup> While the Ogallala Formation overlies the Arikaree Aquifer under the PRIR in South Dakota,<sup>58</sup> it is not present anywhere in the License Area, and is only found several miles to the south.<sup>59</sup>

As a result, most of the License Area is underlain by 130- to 480-foot-thick portions of the Upper Brule Aquifer,<sup>60</sup> which is often encountered at depths from 60 to 100 feet below the surface. This aquifer is underlain by the less permeable aquitard (i.e., a geologic layer that restricts the vertical flow of groundwater between aquifers) formed by the Lower Brule and the Upper and Middle Chadron Formations (i.e., the UCU discussed below).<sup>61</sup> The EA states that the Upper Brule Aquifer is an important aquifer in that it produces sufficient quantities

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<sup>53</sup> Tr. at 1035.

<sup>54</sup> LRA, figs. 2.6-2 to 2.6-4, at 2-107 to 2-111; *id.*, fig. 2.6-6, at 2-115; *id.*, fig. 2.6-11, at 2-124; Ex. NRC-001-R at 41-55; INT-003 at 2-3; Tr. at 1223-24.

<sup>55</sup> Ex. NRC-001-R at 55.

<sup>56</sup> *Id.* at 28, 34; Ex. NRC-095, NRC Staff’s Supplemental Direct Testimony, at 26-27 (Sept. 18, 2015); Tr. at 1224.

<sup>57</sup> LRA, fig. 2.6-1, at 2-99; *id.*, fig. 2.6-9, at 2-120; *id.*, fig. 2.6-11, at 2-124; *see also* Ex. NRC-001-R at 41, 55.

<sup>58</sup> Ex. BRD-003, Kyle W. Davis, Larry D. Putnam, & Anneka R. LaBelle, U.S. Geological Survey, Conceptual and Numerical Models of Groundwater Flow in the Ogallala and Arikaree Aquifers, Pine Ridge Indian Reservation Area, South Dakota, Water Years 1980-2009, Scientific Investigations Report 2014-5241, tbl. 3, at 10 (Feb. 2015); LRA, fig 2.6.1, at 2-99; Ex. NRC-001-R at 41, 55.

<sup>59</sup> LRA, fig. 2.6-1, at 2-99; Ex. NRC-001-R at 41, 55.

<sup>60</sup> EA § 3.4.1.6 at 39.

<sup>61</sup> *Id.* § 3.4.1.6 at 39; *id.* § 3.5.2.2 at 48-50; Tr. at 1039-40.

of water suitable for domestic and agricultural purposes, both regionally and locally.<sup>62</sup> As such, the EA states that Crow Butte designated the Upper Brule Aquifer as the overlying aquifer for the Ore Zone.<sup>63</sup> While the Upper Brule Formation may be an important source of water, the EA notes that it exhibits rather low unfractured hydraulic conductivity.<sup>64</sup>

### **3. Upper Confining Unit (UCU)**

#### *a. Extent of the UCU*

LRA § 2.6.2 states that the Ore Zone is locally separated from the overlying aquifer (the Upper Brule Aquifer) by 200 feet or more of a thick, regionally continuous UCU.<sup>65</sup> All parties agreed that this UCU consists of (1) the Middle and Upper Chadron Formations; and (2) the overlying Lower Brule Formation. This UCU lies between the overlying Upper Brule Aquifer and the BC/CPF Aquifer that, as noted earlier, contains the Ore Zone in the License Area.<sup>66</sup> The top of the UCU ranges in depth from 130 feet to 480 feet beneath the ground surface, depending on the thickness of the overlying Upper Brule Formation.<sup>67</sup>

The LRA describes the geological conditions at the License Area with cross sections.<sup>68</sup> These cross sections suggest that the UCU is continuous across the License Area,<sup>69</sup> which is consistent with the testimony of Crow Butte's expert Mr. Beins, who stated that drill cuttings and geophysical logs from over 10,000 boreholes onsite show that these strata extend over the entire License Area.<sup>70</sup> Based on this drilling and geophysical measurements, Crow Butte's witnesses maintained that the thickness of the UCU ranges from approximately 100 feet along the northwest boundary of the area of review to over 500 feet along its southeast boundary.<sup>71</sup> In the immediate vicinity of the mining wellfields, the

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<sup>62</sup> EA § 4.13.6.2 at 128-29.

<sup>63</sup> *Id.* § 4.6.2.2.4 at 91-92.

<sup>64</sup> EA § 3.5.2.2 at 48-50. Several exhibits use the term "hydraulic conductivity" while others use the term "permeability" to describe movement of groundwater through soil or rock in terms of velocity (i.e., distance/time). While there is some difference between the two terms, for purposes of this decision, we use the two terms interchangeably.

<sup>65</sup> See LRA § 2.6.2.6 at 2-135-36; see also Ex. CBR-045, Rebuttal Testimony of Crow Butte Resources Witnesses Wade Beins, Bryan Soliz, Robert Lewis, Matthew Spurlin and Larry Teahon on Contentions A, C, D, F, and 14, at 32 (June 8, 2015); Tr. at 1112-13.

<sup>66</sup> EA § 3.4.1.6 at 39; LRA § 2.6.2.3 at 2-128; Tr. at 1092-93.

<sup>67</sup> EA § 3.4.1.6 at 39.

<sup>68</sup> LRA, figs. 2.6-4 to 2.6-11, at 2-111 to 2-124; see also Ex. NRC-001-R at 29.

<sup>69</sup> LRA, figs. 2.6-4 to 2.6-11, at 2-111 to 2-124; see also Ex. NRC-001-R at 29.

<sup>70</sup> Tr. at 1058-59.

<sup>71</sup> Ex. CBR-001 at 20; Tr. at 1093-95.

thickness of the UCU ranges from 200 feet on the north to 500 feet on the south,<sup>72</sup> of which 40 to 100 feet of this thickness is attributable to the Middle Chadron Formation.<sup>73</sup> While Intervenor's witnesses did not dispute this description of the onsite strata, Dr. LaGarry added that the Chadron Formation portion of the UCU outcrops (i.e., manifests itself as exposed bedrock) about 15 miles northwest of the License Area.<sup>74</sup>

*b. Composition of the UCU*

The formations making up the UCU consist of clays and fine-grained mudstones of the Middle and Upper Chadron Formations, and interbedded siltstone, mudstone, and claystone of the Lower Brule Formation.<sup>75</sup> Both the Middle and Upper Chadron Formations contain significant amounts of montmorillonite (i.e., a type of clay that absorbs water easily and, in absorbing water, expands to seal cracks in the formation) and other plastic clays with low vertical permeability.<sup>76</sup> The LRA states that the contact between the Upper Chadron Formation and the Lower Brule Formation is “gradational and cannot be consistently picked accurately in drill cuttings or on [geophysical] logs. Therefore, the upper part of the Chadron Formation and the lower part of the Brule Formation are combined within the [License Area].”<sup>77</sup> Crow Butte's witnesses also testified that, across the License Area, not only is the average thickness of the UCU about 300 feet, but, because its composition is predominantly low permeability silts and clays, there are effectively more than 100 feet of clay-type materials within this zone.<sup>78</sup>

The Upper Chadron Formation is light green-gray bentonitic clay, which grades downward to green and red clay (Red Clay Horizon),<sup>79</sup> an ancient fossil soil that the LRA claims serves as “an excellent marker bed in drill cuttings” that has been observed in virtually all drill holes within the License Area.<sup>80</sup> According to Crow Butte's witnesses, this persistent, 25-foot-thick “sticky” clay

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<sup>72</sup> Ex. CBR-001 at 20.

<sup>73</sup> Ex. NRC-021, Stephen P. Collings and Ralph H. Knode, *Geology and Discovery of the Crow Butte Uranium Deposit, Dawes County, Nebraska*, 7 Ann. Symp. Uranium and Precious Metals 5-14 at 3 (1984).

<sup>74</sup> Tr. at 1076.

<sup>75</sup> EA § 3.4.1.5 at 39; *id.* § 3.4.1.6 at 39.

<sup>76</sup> LRA § 2.6.2.2 at 2-127 to 2-128; Tr. at 1100-01.

<sup>77</sup> LRA § 2.6.2.3 at 2-131.

<sup>78</sup> Tr. at 1105.

<sup>79</sup> LRA § 2.6.1.5 at 2-103; Tr. at 1098-99.

<sup>80</sup> LRA § 2.6.2.3 at 2-131.

horizon (made of 44% montmorillonite) generally marks the upper limit of the Ore Zone.<sup>81</sup>

Crow Butte's witnesses testified that the remainder of the UCU above this Red Clay Horizon is characterized by interbedded silts and clays of varying composition,<sup>82</sup> and that samples from those zones contain more than 50% clay.<sup>83</sup> These witnesses also stated that the UCU material is only partially converted from sediments to rock (i.e., lithified), based on observations from core and drill cuttings,<sup>84</sup> and that some of the clay rapidly swells when exposed to excess water.<sup>85</sup> Based on laboratory tests of core samples from the UCU, this layer has a very low permeability of less than  $1.0 \times 10^{-10}$  centimeters per second (cm/s).<sup>86</sup>

Intervenors did not dispute the existence either of the Red Clay Horizon extending over the full License Area or of the high percentage of clay in the remaining portions of the UCU. Although Intervenors' witness Mr. Wireman agreed that there is clay within the UCU, he did posit two preferential flow paths through the UCU: (1) higher transmissivity through secondary porosity (i.e., the highly fractured and jointed strata); and (2) the presence of more permeable sand or silt lenses within the clay or claystone.<sup>87</sup>

While we address the issue of secondary porosity below in Section III (in conjunction with our analysis of the potential fracturing of the UCU),<sup>88</sup> we note that, with respect to the possibility of there being more permeable sand and silt lenses, Mr. Wireman agreed that the lenses would have to be continuous in order for the groundwater to move through them.<sup>89</sup> However, he offered no evidence or expert opinion that such continuous layers of higher permeability sand and silt lenses are present either in the Red Clay Horizon or in the remainder of the overlying UCU. Both Mr. Wireman and Dr. LaGarry agreed that the most likely flow path would be associated with the alleged fracturing of the UCU,<sup>90</sup> which, as noted, is discussed below in Section III.<sup>91</sup>

The NRC Staff agreed that the lower portion of the Brule Formation consists

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<sup>81</sup> Ex. NRC-001-R at 110; Tr. at 1107-08, 1113; *see also* LRA, tbl. 2.6-2, at 2-107.

<sup>82</sup> Tr. at 1108.

<sup>83</sup> *Id.*

<sup>84</sup> Ex. CBR-001 at 21.

<sup>85</sup> *Id.*; Tr. at 1101.

<sup>86</sup> LRA § 2.6.2.3 at 2-131; Tr. at 1116-17.

<sup>87</sup> Tr. at 1120-21.

<sup>88</sup> *See infra* Section III.D.2.b, Board Findings on Secondary Porosity/Permeability from Fracturing, at pp. 346-48.

<sup>89</sup> Tr. at 1121-22.

<sup>90</sup> Tr. at 1122.

<sup>91</sup> *See infra* Section III.D.1.b, Parties' Positions on Secondary Porosity/Permeability from Fracturing at pp. 334-40.

of interbedded siltstone, mudstone, and claystone with occasional sandstone, and that the Upper Brule Formation includes brown siltstones and sandstone members.<sup>92</sup> Although these units are classified as sandstones, mudstones, and siltstones, Crow Butte's descriptions during its logging of the drill holes indicated that substantial portions of these materials are unconsolidated.<sup>93</sup> Less clay and more sand in these upper portions of the UCU is consistent with increasing permeabilities in the higher zones.<sup>94</sup>

In conjunction with his explanation of the geologic condition of this portion of the UCU (i.e., the Middle and Upper Chadron Formation and Lower Brule Formation), Dr. LaGarry agreed with the NRC Staff that this lower portion of the UCU is more claylike, with the Red Clay Horizon consisting of devitrified (i.e., converted from glass to clay) volcanic ash that fell from the sky forming a thick, widespread deposit.<sup>95</sup>

Crow Butte's witnesses concurred with this characterization, stating that "the sediments overlying the mined aquifer have not undergone complete lithification, as observed in cores and drill cuttings during drilling investigations."<sup>96</sup> From this, Crow Butte's witnesses claimed that the Upper Chadron Formation is primarily unconsolidated clays, with a few layers of dense, lithified, semi-consolidated mudstones, siltstones, and claystones.<sup>97</sup> Crow Butte's witnesses further testified that they encountered semiconsolidated clays, silts, and muds of the Upper and Middle Chadron Formations in every one of the 12,000 drill holes made during more than 20 years of exploration.<sup>98</sup> Intervenors did not contest Crow Butte's characterization of the UCU as incompletely lithified sediments consisting of unconsolidated clays with semiconsolidated layers of clay, silt, and mudstones.

#### **4. Basal Chadron/Chamberlain Pass Formation (BC/CPF)**

The BC/CPF, a portion of which is the Ore Zone being mined by Crow Butte in the License Area, underlies the UCU. EA §§ 3.4.1 and 3.5.2.3.2 confirm that the BC/CPF is confined on the top by the UCU,<sup>99</sup> and on the bottom by the LCU, which is composed of the Pierre Shale.<sup>100</sup> The NRC Staff's witnesses testified that the Ore Zone portion of the BC/CPF trends southeast from Crawford, the

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<sup>92</sup> Ex. NRC-001-R at 29.

<sup>93</sup> Tr. at 1127.

<sup>94</sup> Tr. at 1126-28.

<sup>95</sup> Tr. at 1128-31.

<sup>96</sup> Ex. CBR-001 at 21.

<sup>97</sup> Tr. at 1098-99.

<sup>98</sup> Tr. at 1099.

<sup>99</sup> EA § 3.4.1 at 37-40; *id.* § 3.5.2.3.2 at 51.

<sup>100</sup> *Id.* § 3.5.2.3.2 at 51.

result of sandstone being deposited by a major drainage feature — a west-to-east, through-flowing, historic buried valley about 25 miles wide entering present-day Nebraska in northwestern Sioux County and then turning southeast in western Dawes County.<sup>101</sup> According to the NRC Staff's witnesses, the BC/CPF, which is not present beyond about 5 miles north and east of Crawford, is the only portion of the Chadron Formation that is considered an aquifer.<sup>102</sup> They also testified that, because the BC/CPF thins at the extremities of its 25-mile width, it is not present anywhere between the License Area and the PRIR.<sup>103</sup>

Dr. LaGarry largely agreed with the NRC Staff's witnesses, only adding that the BC/CPF sandstone deposit also follows the slope that leads south from the Black Hills.<sup>104</sup> He testified that, in this portion of northwestern Nebraska, the orientation of this sandstone deposit followed a historic northwest-southeast trending valley with tributaries that enter Nebraska from the northwest and head southeast toward the North Platte River.<sup>105</sup> Dr. LaGarry also stated that the BC/CPF is present in a semicircle running northwest of the License Area around the southeast and northern flanks of the Black Hills and that it outcrops on the land surface of the PRIR.<sup>106</sup> He agreed that the NRC Staff accurately described the hydraulic barrier to the northeast that lies between the License Area and the PRIR (i.e., the Chadron Arch of the Pierre Shale).<sup>107</sup> Dr. LaGarry also testified that the BC/CPF is located 200 to 700 feet below ground surface<sup>108</sup> and does not outcrop anywhere in the License Area or in Crow Butte's proposed North Trend Expansion Area (NTEA),<sup>109</sup> which lies northwest of the License Area.<sup>110</sup>

The NRC Staff's witnesses agreed with Dr. LaGarry and noted that the geologic cross sections contained in the LRA appear to corroborate this location of the BC/CPF.<sup>111</sup> The NRC Staff's witnesses further testified that a United States Geological Survey (USGS) map shows the extent of this valley-filled sandstone

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<sup>101</sup> Ex. NRC-001-R at 32 (citing Ex. NRC-024, J. B. Swinehart, V. L. Souders, H. M. Degraw, & R. F. Diffendal, Jr., *Cenozoic Paleogeography of Western Nebraska*, in *Cenozoic Paleogeography of the West-Central United States* at 212 (R. Flores and S. Kaplan eds., 1985)).

<sup>102</sup> *Id.*

<sup>103</sup> *Id.*; Ex. NRC-023, Kendall A. Dickinson, Distribution of the basal elastic unit of the Oligocene Chadron Formation in the Alliance 2-degree quadrangle, northwestern Nebraska, U.S. Geological Survey, Open-File Report 90-416, fig. 1, at 3 (1990).

<sup>104</sup> Tr. at 1068.

<sup>105</sup> *Id.*; see also Ex. INT-003 at 2-3.

<sup>106</sup> Tr. at 1074.

<sup>107</sup> Tr. at 1074, 2578.

<sup>108</sup> Tr. at 1075.

<sup>109</sup> The NTEA is the subject of a separate, pending license amendment proceeding. See Ex. NRC-001-R at 73.

<sup>110</sup> Tr. at 1075.

<sup>111</sup> Ex. NRC-001-R at 32 (citing LRA, fig. 2.6-12, at 2-129).

feature.<sup>112</sup> It was the opinion of the NRC Staff's witnesses that the BC/CPF is not present beyond about 5 miles north and east of Crawford between the License Area and the city of Chadron due to the presence of the Chadron Arch, which prevents sand deposition any further east.<sup>113</sup> Neither Crow Butte's nor Intervenor's witnesses disputed this interpretation.<sup>114</sup>

The EA also states that the BC/CPF Aquifer, at a depth of 400 to 900 feet below the ground surface, acts as a local supply of stock water<sup>115</sup> but, because of its greater depth and inferior water quality, is not routinely used as a domestic water supply in the License Area or in nearby areas.<sup>116</sup>

### **5. Pierre Shale Lower Confining Unit**

The Pierre Shale that underlies the Basal Chadron sandstone reaches a thickness of over 1500 feet in the License Area.<sup>117</sup> The LRA describes the Pierre Shale as a "black marine shale [that] is an ideal confining bed with measured vertical hydraulic conductivity in the [License Area] of less than  $2.0 \times 10^{-9}$  [cm/s]."<sup>118</sup> There is no dispute among the parties that the very low permeability of the Pierre Shale in the LCU prevents mining liquids from flowing downward from the base of the BC/CPF Aquifer.<sup>119</sup>

### **6. White River Geologic Feature**

Northeast trending geologic features have been identified or proposed in Sioux and Dawes Counties.<sup>120</sup> One of these is the White River Feature, a geologic unit which the White River follows north of Crawford, and which was first postulated by Crow Butte during its exploration drilling,<sup>121</sup> as one of the six northeast-trending features near the License Area.<sup>122</sup> The White River Feature passes along the southeast boundary of Crow Butte's proposed NTEA, which is approximately 2 miles from the northern boundary of the License Area.<sup>123</sup>

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<sup>112</sup> *Id.*

<sup>113</sup> *Id.* at 32-33.

<sup>114</sup> Tr. at 1071-72, 1074-75, 2578.

<sup>115</sup> EA § 3.5.2.2 at 50.

<sup>116</sup> *Id.*

<sup>117</sup> *Id.*, tbl. 3-5, at 38.

<sup>118</sup> LRA, fig. 2.6-2, at 2-107.

<sup>119</sup> Tr. at 1027-28.

<sup>120</sup> EA § 3.4.2 at 40.

<sup>121</sup> *Id.*

<sup>122</sup> *Id.*

<sup>123</sup> *Id.* § 3.5.2.3.3 at 51-52.

## C. Undisputed Regional Hydrogeologic Conditions in the License Area

### 1. Surface and Subsurface Water Resources

As summarized in the EA and as shown in Figure 2.2-3 of the LRA, the License Area lies within the watersheds of three small southern tributaries of the White River, i.e., White Clay Creek, Squaw Creek, and English Creek.<sup>124</sup> While White Clay Creek is located primarily outside of the License Area on the west side of the Crow Butte facility, Squaw Creek and English Creek flow from southeast to northwest within the License Area.<sup>125</sup> There are also eight surface water impoundments in or near the License Area, generally used for livestock watering.<sup>126</sup> Four of these impoundments are physically within the License Area near Squaw and English Creeks.<sup>127</sup> White Clay Creek, Squaw Creek, and English Creek all converge and enter the White River approximately 8 miles north of the License Area and 2 miles downstream from the city of Crawford.<sup>128</sup> The White River flows northeast toward Chadron and through Dawes County into South Dakota.<sup>129</sup>

As summarized in the EA, Crow Butte identified the following major water-bearing subsurface formations in the region of the License Area: (1) the aquifer associated with the White River alluvium; (2) the Upper Brule Aquifer; and (3) the BC/CPF Aquifer.<sup>130</sup> The first of these, the aquifer associated with the White River alluvium, occurs intermittently in ephemeral drainages and is not a reliable water source.<sup>131</sup> As previously mentioned,<sup>132</sup> the Upper Brule Aquifer is an important aquifer that produces sufficient quantities of water suitable for domestic and agricultural purposes. The EA states that the BC/CPF Aquifer has limited use as a groundwater supply because of its generally poor water quality and its high radionuclide content.<sup>133</sup> The base of the BC/CPF Aquifer is the low-permeability Pierre Shale that acts as an LCU for the BC/CPF.<sup>134</sup>

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<sup>124</sup> *Id.* § 3.5.1 at 45; LRA, fig. 2.2-3, at 2-25.

<sup>125</sup> Ex. NRC-001-R at 16 (citing LRA, fig. 2.2-3, at 2-25).

<sup>126</sup> EA § 3.5.1 at 45.

<sup>127</sup> *Id.*; LRA, fig. 2.7-1, at 2-159; *id.* § 2.7.1.3 at 2-163; *id.* § 2.7.1.4 at 2-163.

<sup>128</sup> EA § 3.5.1 at 45; LRA, fig. 2.2-3, at 2-25.

<sup>129</sup> EA § 3.5.1 at 45.

<sup>130</sup> *Id.*

<sup>131</sup> *Id.* § 3.5.2.1 at 47.

<sup>132</sup> See *supra* Section II.B.2, Upper Aquifers, at pp. 290-91.

<sup>133</sup> EA § 3.5.2.1 at 47.

<sup>134</sup> *Id.*

## 2. *Groundwater Levels, Flow Directions, Hydraulic Parameters in the License Area*

### a. *Groundwater Levels and Flow Directions*

#### (i) UPPER BRULE AQUIFER LEVELS AND FLOW DIRECTIONS

The shallowest productive aquifer within (and surrounding) the License Area is the Upper Brule Aquifer, which is unconfined and which produces usable amounts of water only where it is sufficiently jointed to form saturated zones.<sup>135</sup> The saturated zones of the Upper Brule Aquifer are often encountered at depths from 60 to 100 feet,<sup>136</sup> but are generally discontinuous and are of limited areal extent.<sup>137</sup> The EA points to a 1995 water table map showing that a groundwater divide occurs to the south of the License Area along the Pine Ridge Escarpment, and that groundwater north of this divide flows to the north, northwest, and northeast, depending upon its position relative to the White River.<sup>138</sup> All record evidence indicates that the White River acts as a regional drain for groundwater and, as a consequence, groundwater flow in the Upper Brule Aquifer, at least within the License Area, is northerly towards the White River.<sup>139</sup>

Consistent with the EA's characterization of regional groundwater flow, the LRA maintains that flow in the Upper Brule Aquifer was to the northwest prior to mining and that it remained so during the subsequent 20 years of mining operations.<sup>140</sup> This statement is based not only on Crow Butte's current system of more than 200 shallow monitoring wells in the Upper Brule Aquifer (approximately one well every 4 acres),<sup>141</sup> but also on long-term water level data that were first collected just prior to mining, and then were collected every 2 weeks during operations for each individual mine unit, including its restoration period.<sup>142</sup>

#### (ii) BC/CPF LEVELS AND FLOW DIRECTIONS

The EA states that the Ore Zone at all mine units is within the BC/CPF Aquifer.<sup>143</sup> The thickness of the BC/CPF Aquifer within the License Area varies

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<sup>135</sup> *Id.*

<sup>136</sup> *Id.* § 3.5.2.2 at 49.

<sup>137</sup> *Id.* § 3.5.2.1 at 47.

<sup>138</sup> *Id.*

<sup>139</sup> Ex. NRC-076-R2, NRC Staff's Rebuttal Testimony, at 2 (June 8, 2015).

<sup>140</sup> LRA, figs. 2.7-3a to 2.7-3d, at 2-173 to 2-179.

<sup>141</sup> Ex. CBR-001 at 36; Ex. CBR-074 at 5.

<sup>142</sup> Ex. CBR-074 at 5.

<sup>143</sup> EA § 3.5.2.3.1 at 50-51.

from 40 feet to 80 feet with an average thickness of 60 feet.<sup>144</sup> The thickness of the BC/CPF Aquifer decreases to zero approximately 1 mile northeast of the License Area. The depth to the Ore Zone varies between 400 feet and 900 feet, increasing in the southeastern direction.<sup>145</sup>

Prior to mining, the potentiometric levels (i.e., the imaginary surface that defines the level to which water in a confined aquifer would rise were it pierced by a well) in the BC/CPF Aquifer were above the ground surface in the northern part of the License Area.<sup>146</sup> Comparing recent water levels to the premining water level data in the BC/CPF Aquifer, the NRC Staff's witnesses estimated that drawdown (i.e., lowering of the potentiometric level produced by pumping) within the mine units over 20-plus years of Crow Butte's operations averaged approximately 47 feet.<sup>147</sup> As a result, no present day potentiometric surface level is above the ground surface.<sup>148</sup>

Originally, the groundwater flow direction in the BC/CPF Aquifer was to the northwest away from the License Area.<sup>149</sup> Once Crow Butte initiated mining in 1991,<sup>150</sup> groundwater levels fell due to the inward gradients established during mining operations and restoration as required by Crow Butte's renewed license (License Condition 10.7) to ensure that none of the mining liquids escaped the License Area.<sup>151</sup> These pumping operations resulted in a variety of new localized flow directions and gradients,<sup>152</sup> as evident from the potentiometric levels established during active ISL operations in 2008 to 2009.<sup>153</sup>

(iii) ARIKAREE FORMATION

There is no dispute among the parties that the Arikaree Formation is present within the License Area only along the farthest southeastern portion of Mine

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<sup>144</sup> *Id.*

<sup>145</sup> *Id.*

<sup>146</sup> Ex. NRC-001-R at 87 (citing SER § 3.1.3.5.6 at 61).

<sup>147</sup> *Id.*; *see also* EA § 4.6.2.2.1 at 87-88.

<sup>148</sup> Tr. at 1420.

<sup>149</sup> Ex. NRC-001-R at 41; *see also* LRA, fig. 2.7-4a, at 2-183.

<sup>150</sup> EA § 1.1 at 14.

<sup>151</sup> Ex. NRC-012, U.S. NRC Materials License SUA-1534, at 8 (Nov. 5, 2014) (License Condition 10.7).

<sup>152</sup> *See* LRA, figs 2.7-4b to 2.7-4d, at 2-185 to 2-189.

<sup>153</sup> *See* EA § 3.5.2.2 at 49.

Unit 11,<sup>154</sup> where it is on a hill and dry.<sup>155</sup> As such there is no aquifer associated with the Arikaree Formation in the License Area.

(iv) PINE RIDGE INDIAN RESERVATION (PRIR) AQUIFERS

According to the USGS, “[t]he Ogallala and Arikaree [A]quifers are the largest sources of groundwater on the [PRIR] and are used extensively for irrigation and public and domestic water supplies,”<sup>156</sup> while the White River Group (i.e., Chadron and Brule Formations) beneath the PRIR has a permeability that is generally too low for it to serve as a source of groundwater.<sup>157</sup> As we discussed earlier,<sup>158</sup> the EA notes that a groundwater divide occurs along the Pine Ridge Escarpment to the south of the License Area, and that groundwater north of this divide flows in a northerly direction toward the White River.<sup>159</sup>

The parties agreed that the PRIR’s water wells (set in the Arikaree Aquifer) that are closest to the License Area are about 50 miles east-northeast of the License Area.<sup>160</sup> The parties also agreed that the Arikaree Aquifer groundwater enters the southern portion of the PRIR from Nebraska and thus this water flows from the southwest (i.e., where the License Area is located) to the northeast in the direction of the PRIR.<sup>161</sup>

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<sup>154</sup> LRA, fig. 2.6-1, at 2-99; *id.*, fig. 2.6-9, at 2-121; *id.*, fig. 2.6-11, at 2-125; *see also* Ex. NRC-001-R at 41, 55; Ex. NRC-102, Scott Summerside, Michael Ponte, Vincent Dreeszen, Stephen Hartung, & Joe Szilagyi, Conservation and Survey Division, University of Nebraska–Lincoln, Geology and 1995 Water Table Contours in the Upper Niobrara White Natural Resources District (2001).

<sup>155</sup> Tr. at 1170, 2620; *see also* Ex. NRC-102.

<sup>156</sup> Ex. BRD-003 at 1.

<sup>157</sup> Ex. NRC-025, Allen J. Heakin, U.S. Geological Survey, Water Quality of Selected Springs and Public-Supply Wells, Pine Ridge Indian Reservation, South Dakota, 1992-97, Water-Resources Investigations Report 99-4063 at 10 (2000).

<sup>158</sup> *See supra* Section II.C.2.a(i), Upper Brule Aquifer Levels and Flow Directions, at p. 298.

<sup>159</sup> EA § 3.5.2.1 at 47.

<sup>160</sup> We examined Dr. LaGarry about a map of the PRIR (Ex. BRD-017) that shows directions of groundwater flow and on which Dr. LaGarry made annotations denoting the names of the towns with water wells that are set in the Arikaree Aquifer. Ex. BRD-017, Janet M. Carter and Allen J. Heakin, Generalized Potentiometric Surface of the Arikaree Aquifer, Pine Ridge Indian Reservation and Bennett County, South Dakota, U.S. Geological Survey Scientific Investigations Map 2993 (2007); Ex. NRC-095 at 26. Using the distance measuring tool in Google Maps, the NRC Staff’s witnesses determined that the closest point of the PRIR area encircled by Dr. LaGarry in BRD-017 is about 50 miles east-northeast of the License Area. Ex. NRC-095 at 26-27.

<sup>161</sup> Ex. OST-001, Statement of Charmaine White Face (a.k.a. Zumila Wobaga) at Ex. 4 (May 5, 2015); Ex. NRC-095 at 27 (citing (1) the elliptical area drawn on Ex. BRD-017; (2) the leftmost arrow within the circled area of Ex. NRC-101; and (3) Ex. NRC-102, which consists of annotated Figures 29 and 30 from the Ex. BRD- 004).

b. *Hydraulic Parameters in the License Area*

(i) VERTICAL HYDRAULIC GRADIENT: UPPER BRULE AQUIFER TO BC/CPF AQUIFER

Crow Butte maintains an inward flow of groundwater in the production zone by pumping water through a waste “bleed stream,” that removes more water than it injects during mining, resulting in a drawing down of the potentiometric level in the BC/CPF Aquifer to create a hydraulic cone of depression.<sup>162</sup> Because of this inward gradient caused by the groundwater drawdown, Crow Butte’s witnesses asserted that, by comparing measurements of the potentiometric surface of the BC/CPF Aquifer before mining began (1982-1983) with the measurements at the time the LRA was submitted (2008-2009), it becomes clear that Crow Butte’s mining activities have lowered the BC/CPF Aquifer’s potentiometric surface 40 to 60 feet across the License Area.<sup>163</sup> These witnesses further maintained that pumping the BC/CPF Aquifer produces strong downward hydraulic gradients within the License Area that ensure containment of the processing liquids within the Ore Zone.<sup>164</sup> As a result, the vertical hydraulic gradient in the permit area is strongly downward.<sup>165</sup> Neither witnesses for the NRC Staff nor Intervenors disputed these facts.

(ii) HORIZONTAL HYDRAULIC GRADIENT: UPPER BRULE AQUIFER WATER TABLE ELEVATIONS

The EA states that a preoperational (1982-1983) potentiometric surface study for the Brule Formation indicated that, under natural conditions, groundwater flows northwest toward the White River at a gradient of about 0.012.<sup>166</sup> The EA referenced a series of Crow Butte’s more recent potentiometric surface measurements from water level data it collected in 2008 and 2009 that shows similar trends, though with somewhat steeper hydraulic gradients ranging from 0.025 to 0.043.<sup>167</sup>

(iii) HORIZONTAL HYDRAULIC GRADIENT: BC/CPF AQUIFER POTENTIOMETRIC SURFACE ELEVATIONS

The EA states that preoperational (1982-1983) groundwater elevation data show that groundwater flow in the BC/CPF was to the north at a gradient of

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<sup>162</sup> LRA § 2.7.2.1 at 2-193.

<sup>163</sup> Ex. CBR-001 at 15-16, 49; *see also* LRA § 2.7.2.1 at 2-193; EA § 3.5.2.2 at 49.

<sup>164</sup> Ex. CBR-074 at 5-6; *see also* EA § 3.5.2.2 at 49.

<sup>165</sup> Ex. CBR-074 at 5.

<sup>166</sup> EA § 3.5.2.2 at 49.

<sup>167</sup> *Id.*

about 0.001.<sup>168</sup> In addition, Crow Butte's witnesses maintained that the most recent data (i.e., after years of mining activities) indicated that local hydraulic gradients in the BC/CPF are highly variable within the permit area,<sup>169</sup> ranging from 0.004 to 0.064 during the 2008 to 2009 time period.<sup>170</sup> Intervenors did not dispute these calculations.

(iv) HYDRAULIC CONDUCTIVITY/PERMEABILITY OF THE UCU

Based on Crow Butte's hydraulic conductivity values (calculated from consolidation tests on samples of cores from the Red Clay Horizon that ranged from  $2.22 \times 10^{-11}$  to  $4.46 \times 10^{-11}$  cm/s),<sup>171</sup> the EA states that the UCU is a tight formation that isolates the BC/CPF from overlying aquifers with several hundred feet of clay and siltstones.<sup>172</sup>

### III. OVERARCHING GEOLOGIC AND HYDROGEOLOGIC ISSUES

As previously mentioned, Intervenors did not always present evidence on a contention-by-contention basis, but instead, challenged the EA's analysis of a variety of related hydrogeologic issues that cut across multiple contentions.<sup>173</sup> The majority of Intervenors' Contentions, specifically Contentions A, C, D, F, 6, and 9, all concern, or are in part dependent on, the factual premise that the EA was deficient insofar as it misinterpreted several geologic and hydrogeologic conditions underlying the License Area, and, as such, did not adequately discuss potential pathways through which contaminants could migrate from the License Area to the PRIR. Intervenors criticize the EA for (1) failing to consider possible connections between the BC/CPF Aquifer beneath the License Area and the aquifers underlying the PRIR in South Dakota; (2) incorrectly identifying the structure of the White River Feature; (3) misinterpreting Crow Butte's aquifer pumping tests; (4) failing to demonstrate that the UCU has sufficient integrity to assure containment of the mining liquids within the BC/CPF Aquifer (by ignoring known faulting, fracturing or cracking within the UCU when assessing the containment performance of this strata); (5) inadequately monitoring for, or quantifying, water quality impacts to surface water and groundwater; and (6)

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<sup>168</sup> *Id.*

<sup>169</sup> Ex. CBR-001 at 25-26.

<sup>170</sup> LRA § 2.7.2.1 at 2-193.

<sup>171</sup> Ex. BRD-002B-R, Crow Butte Resources, Inc., Industrial Ground Water Permit Amendment, Aquifer Test #2 at 2.7-17, -24 to -25, -50 (July 29, 1987).

<sup>172</sup> EA § 3.5.2.3.2 at 51.

<sup>173</sup> See *supra* Section I.C, Intervenor Issues and Admitted Contentions, at pp. 285-86.

failing to consider potential pathways for contaminant migration. Each of these disputed topics is discussed in separate sections below.

Given that these critiques all contribute to Intervenor's overarching premise that the EA did not adequately address potential contaminant pathways for mining contaminants to migrate from the License Area, and that this premise underscores the majority of their contentions, we will resolve these common, disputed facts prior to assessing each of Intervenor's contentions.

#### **A. Presence of the BC/CPF Underlying PRIR and Connection to the Ore Zone**

Intervenor raised the possibility of a connection between the BC/CPF in the Ore Zone and the BC/CPF in the PRIR. Herein, we look at the evidence for the BC/CPF to underlie the PRIR and whether that formation could provide a pathway for mining contaminants to directly migrate to the PRIR through the BC/CPF.

##### ***1. Parties' Positions on the Presence of the BC/CPF Underlying the PRIR and Its Connection to the Ore Zone***

Intervenor's witness Dr. LaGarry testified that "the [BC/CPF] occurs at the land surface on the [PRIR] and in the butte tops north of the Black Hills."<sup>174</sup> And, while conceding that the BC/CPF in the License Area is deposited as depicted in a USGS report,<sup>175</sup> Dr. LaGarry asserted that this USGS report does not show the complete areal extent of this formation.<sup>176</sup>

Dr. LaGarry used several photographs<sup>177</sup> and other exhibits<sup>178</sup> to identify out-

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<sup>174</sup> Tr. at 1074.

<sup>175</sup> Ex. NRC-023 at 3.

<sup>176</sup> Tr. at 1074.

<sup>177</sup> Ex. INT-080, Supplemental Testimony of Dr. Hannan LaGarry, at 5 (Sept. 18, 2015).

<sup>178</sup> See Ex. INT-072, Prajukti Bhattacharyya, Kathryn Converse, John Ejnik, Hannan E. LaGarry, & Alyssa L. Riesen, *Studying Uranium Contamination Levels in Groundwater from the Pine Ridge Reservation, South Dakota: A Community-University Partnership*, 44(6) *Geological Soc'y of America Abstracts with Programs* at 77 (May 2012); Ex. INT-073, Hannan E. LaGarry, Leigh Anne LaGarry, James Swinehart, & Michael B. Leite, *Ten Years After: Revised Lithostratigraphy of the Eocene-Oligocene White River Group, Nebraska and South Dakota*, 38(7) *Geological Soc'y of America Abstracts with Programs* at 201 (Oct. 2006); Ex. INT-074, Hannan E. LaGarry and Elisha Yellow Thunder, *Surface and Subsurface Distributions of Uranium-Bearing Strata In Northwestern Nebraska and Southwestern South Dakota*, *Proceedings of the 122d Ann. Meeting of the Neb. Acad. of Sciences* at 91-92 (2012); Ex. INT-075, Hannan E. LaGarry and Leigh Anne LaGarry, *Proposed Lithostratigraphic Revision, Redescription, and Redefinition of the White River Group*  
(Continued)

crofts of the BC/CPF in Badlands National Park north of the License Area, and opined that the BC/CPF is present in several locations on the PRIR (having been deposited there in historic river valleys or depositional outstreams).<sup>179</sup> It is significant, however, that these exhibits to which Dr. LaGarry referred in this testimony neither define the extent of the BC/CPF beneath the PRIR, nor demonstrate any physical connection between the BC/CPF Aquifer beneath the License Area and any outcrops of the BC/CPF in the PRIR.<sup>180</sup> Essentially, Dr. LaGarry conceded that the BC/CPF Ore Zone being mined by Crow Butte<sup>181</sup> is not contiguous with any BC/CPF that may underlie the PRIR.<sup>182</sup> Dr. LaGarry also conceded that the only possible hydraulic connections between the BC/CPF at the License Area and the BC/CPF at the PRIR is via the White River alluvium.<sup>183</sup>

The NRC Staff's witnesses testified that they were aware of only two reported field observations of outcrops of the BC/CPF, and that both are located in Whitehead Creek in northern Sioux County, approximately 12 miles northwest of the city of Crawford, which is far north of the White River alluvium.<sup>184</sup> As a result, it was their opinion that there is no pathway through an outcrop of the BC/CPF for contaminants from mining operations within the License Area to reach the White River alluvium.<sup>185</sup> While Dr. LaGarry did not dispute these two outcrops in Whitehead Creek, he maintained there are others — but did not identify the location of any such outcrops.<sup>186</sup>

While Dr. LaGarry's testimony and the exhibits he sponsored<sup>187</sup> failed to identify specific locations where the BC/CPF exists at or beneath the surface of the PRIR, he did maintain that the outcrops of the BC/CPF in the western area of South Dakota are part of the same deposit as the Ore Zone being mined in the License Area.<sup>188</sup> He also testified that “[a]lthough there is no subsurface data

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(*Eoceneoligocene*), *South Dakota*, 42(3) Geological Soc'y of America Abstracts with Programs at 14 (Apr. 2010); Ex. INT-076, Philip W. Stoffer, Paula Messina, John A. Chamberlain, Jr., & Dennis O. Terry, Jr., The Cretaceous-Tertiary Boundary Interval in Badlands National Park, South Dakota, U.S. Geological Survey Open-File Report 01-56 (2001); Ex. INT-077, Philip W. Stoffer, Geology of Badlands National Park: A Preliminary Report, U.S. Geological Survey Open-File Report 03-35 (2003).

<sup>179</sup> Ex. INT-080 at 5; Tr. at 2575.

<sup>180</sup> See Exs. INT-072-077.

<sup>181</sup> Tr. at 1068; see also Ex. INT-003 at 2-3.

<sup>182</sup> Tr. at 2576.

<sup>183</sup> Tr. at 2582.

<sup>184</sup> Ex. NRC-001-R at 20-21.

<sup>185</sup> *Id.* at 21 (citing Ex. NRC-021 at 7-8).

<sup>186</sup> Tr. at 1076-77.

<sup>187</sup> See Ex. INT-072; see also Ex. INT-080 at 5.

<sup>188</sup> Tr. at 2571-72.

identifying the Chamberlain Pass formation on the reservation, there's ample surface data that does so."<sup>189</sup> At the same time, however, he conceded that "in large part the existence of the Chamberlain Pass formation under the land surface is inferred and interpolated by connecting between surface exposures."<sup>190</sup>

Moreover, Dr. LaGarry admitted it is likely that the BC/CPF in the License Area is not in direct contact with the BC/CPF in the PRIR.<sup>191</sup> Dr. LaGarry's concession was echoed by Crow Butte's witness Mr. Spurlin, who testified that, while the BC/CPF is likely present at the PRIR, this deposit is cut off from the BC/CPF beneath the License Area as a result of the erosion of the White River Group (i.e., the Brule and Chadron Formations) exposing the Pierre Shale of the Chadron Arch that lies between the PRIR and the License Area.<sup>192</sup>

Intervenors' witnesses testified that residents of the PRIR must rely, at least in part, on the BC/CPF Aquifer for their domestic water supply even though this aquifer contains naturally elevated levels of uranium due to historic weathering of the BC/CPF.<sup>193</sup> When queried as to the locations and types of these sources, however, Dr. LaGarry conceded that (1) there had been no comprehensive survey of the groundwater sources for the PRIR population;<sup>194</sup> and (2) naturally occurring uranium, ubiquitous within BC/CPF outcrops, is the source for much of the uranium contamination of soils, sediments, and surface waters in parts of Nebraska and several communities in the PRIR.<sup>195</sup>

The NRC Staff's witness Dr. Striz testified that a USGS groundwater study (Ex. BRD-003) at the PRIR had not identified the BC/CPF in any test hole data at depths down to 2000 feet.<sup>196</sup> In addition to Dr. LaGarry acknowledging there had been no drilling to define the presence of the BC/CPF within the PRIR,<sup>197</sup> the NRC Staff's witnesses testified that there had been two groundwater studies performed by USGS<sup>198</sup> and that neither identified the BC/CPF in the subsurface geology at the PRIR.<sup>199</sup> Dr. LaGarry countered that there are cross sections of the geology in and around the License Area that, based on data from 12,500 drill holes, clearly mark the BC/CPF (i.e., therein labeled the Chadron A or

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<sup>189</sup> Tr. at 2566.

<sup>190</sup> Tr. at 2574.

<sup>191</sup> Tr. at 2576.

<sup>192</sup> Tr. at 2577-78.

<sup>193</sup> Ex. INT-072 at 1.

<sup>194</sup> Tr. at 2565.

<sup>195</sup> Tr. at 2567-69; *see also* Ex. INT-074 at 1.

<sup>196</sup> Tr. at 2579.

<sup>197</sup> Tr. at 2580-81.

<sup>198</sup> *See* Ex. BRD-003; Ex. NRC-025.

<sup>199</sup> Ex. NRC-095 at 15.

Chamberlain Pass Formation) as being present under the entire panhandle of Nebraska.<sup>200</sup>

**2. Board Findings on the Presence of the BC/CPF Underlying PRIR and Connection to the Ore Zone**

Based on the expert testimony presented in this proceeding, we find that the reported outcrops of the BC/CPF on the PRIR indicate it is very likely that the BC/CPF underlies the PRIR in places. Although Intervenors never referenced a map showing the specific location of these outcrops and admitted that it is necessary to infer and interpolate the existence of the BC/CPF under the land surface from the surface exposures, Intervenors' documented photographs of these features (which were not contested by either the NRC Staff or Crow Butte) are sufficient to establish that this formation does exist at least in some locations of the PRIR. While the NRC Staff's witnesses were skeptical of this conclusion (by pointing out that the USGS never identified the BC/CPF on the PRIR in its numerical modeling of groundwater flow in the Ogallala and Arikaree Aquifers),<sup>201</sup> they never challenged the presence of the observed outcrops or tried to explain how these outcrops could exist unless the BC/CPF underlies at least part of the PRIR lands.

We also note that the BC/CPF beneath the PRIR is the same deposit as the Ore Zone being mined in the License Area but, as Intervenors conceded, the BC/CPF in the License Area is not directly connected to the BC/CPF that lies beneath the PRIR. We also find the natural weathering of the BC/CPF outcrops is the likely source of uranium contamination of soils, sediments, groundwater, and surface waters within the PRIR.

**B. White River Feature: Fault or Fold?**

The White River follows a path north of the License Area along a structural feature that has been variously described as either a fault or a fold — on the premise that a fault would be more transmissive than a fold. The evidence supporting a characterization of the White River Feature as a fault vs. a fold, as well as the potential transmissivity of the White River as a pathway for the migration of mining contaminants, is discussed immediately below.

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<sup>200</sup> Tr. at 2580.

<sup>201</sup> Ex. BRD-003.

### *1. Parties' Positions on White River Feature*

The NRC Staff's witnesses testified that the White River Feature is the only field-documented structural feature near the License Area.<sup>202</sup> The parties dispute whether the White River Feature is a fault or a fold, and thus the extent to which contaminants can migrate through it, given that the fracturing within a fault is likely to be more transmissive than within a fold.

The NRC Staff employed groundwater modeling to support the EA's characterization of the White River Feature.<sup>203</sup> During the hearing, the NRC Staff's witnesses admitted that the NRC Staff's groundwater modeling files were never provided to the other parties as part of its mandatory disclosures.<sup>204</sup> Dr. Striz subsequently testified that the NRC Staff was unable to defend some of the assumptions made by the original modeler, who had left the NRC by the time of the hearing.<sup>205</sup> Accordingly, Dr. Stritz recommended that no weight be given to the NRC Staff's modeling effort.<sup>206</sup> We agree. Accordingly, we have not considered the NRC Staff's modeling in evaluating the record evidence as to whether the White River Feature is a fault or a fold. Likewise, we have not considered this modeling in making the related determination as to the transmissive nature of the White River Feature.

In both its initial and its rebuttal testimony, the NRC Staff's witnesses maintained that, even if the modeling were not considered, the EA's conclusions do not need to be altered because the NRC Staff's modeling was only one of a number of bases for its dual conclusion that the White River Feature is not a transmissive fault and that it would not serve as a conduit for transporting contaminants from the License Area to the White River and then to the PRIR.<sup>207</sup>

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<sup>202</sup> Ex. NRC-001-R at 34 (citing LRA, fig. 2.6-13, at 2-133; Ex. NRC-028, Crow Butte Resources, Inc., Class III UIC Permit Application, fig. F4-1, at 1 (Jan. 6, 2010)).

<sup>203</sup> SER § 2.4.3.3.1 at 42-43. More specifically, the NRC Staff used Groundwater Modeling System numerical software and a Bayesian maximum likelihood analysis of the model results to ascertain the nature of the White River Feature. The Bayesian maximum likelihood analysis of the model results addressed baseline data, as well as other scenarios to test for varying behavior of the White River Feature, using procedures documented in NUREG/CR-6940. *Id.*

<sup>204</sup> Tr. at 1338-40. Once the NRC Staff provided these groundwater modeling files to the parties during the hearing, we subsequently directed Intervenors to provide a list of questions for the NRC Staff to address regarding inputs and assumptions for modeling the White River Feature. We also directed the NRC Staff to prepare and submit a report responding to those questions. *See* Ex. NRC-093, NRC Staff Response to Intervenors' Request for Modeling Information (Sept. 8, 2015). As noted in the accompanying text, during the hearing the NRC Staff abandoned any reliance on its modeling and the Bayesian maximum likelihood analysis that was based on this modeling. *Id.*

<sup>205</sup> Tr. at 2587-88.

<sup>206</sup> Tr. at 2588, 2590-91; *see also* Ex. NRC-095 at 20-22.

<sup>207</sup> Ex. NRC-001-R at 38-39, 47; Ex. NRC-095 at 22; Ex. NRC-076-R2, NRC Staff's Rebuttal Testimony at 43-44 (June 8, 2015).

*a. Parties' Positions on Structural Evidence Supporting Fold or Fault*

Dr. LaGarry testified on behalf of Intervenors that information set forth in Crow Butte's NTEA license amendment application demonstrates that there is "a fault along the White River that could transport contaminants from the ISL mine to the White River, and from the river directly to Pine Ridge, South Dakota."<sup>208</sup> Dr. LaGarry also opined that if the White River Feature is a fold, the White River would not follow it; however, if the White River Feature is a fault, then not only would the White River follow it, but the White River would also preferentially erode the fault further.<sup>209</sup>

Mr. Wireman's testimony echoed Dr. LaGarry's comments in this regard. He stated that a number of northwest to southeast trending faults have been identified within, and near, the License Area, including the White River Feature (which he opined is a fault).<sup>210</sup> He also referenced several reports indicating that there are fractures within the White River Feature that may increase BC/CPF permeability in some areas.<sup>211</sup> Mr. Wireman also claimed that, in its LRA, Crow Butte reported 200 to 400 feet of offset strata displacement indicative of a fault on the White River Feature.<sup>212</sup> It was Mr. Wireman's opinion that there is a significant likelihood of extensive secondary porosity associated with a fractured fault within the White River Feature and that (1) questions remain as to the nature of the White River fault/fold; (2) there are no rigorous data to support Crow Butte's claim that the White River Feature is a fold in the Pierre Shale; and (3) the 2014 Safety Evaluation Report's (SER) analysis, which characterizes the White River Feature as a fold, is based on too much uncertainty and a lack of empirical data from drilling.<sup>213</sup> Dr. Kreamer further opined that "[t]he EA treats 'fold' features and 'fault' features, such as the White River [F]eature, as mutually exclusive, whereas folds can include many faulted regions."<sup>214</sup>

Crow Butte's witnesses testified that the White River Feature is oriented southwest-northeast generally along the White River drainage.<sup>215</sup> Based on recent close-spaced drilling of over 100 boreholes in conjunction with Crow Butte's NTEA license amendment application, as well as its 3-D modeling performed for NDEQ in support of a Petition for Aquifer Exemption for the NTEA,<sup>216</sup>

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<sup>208</sup> Ex. INT-003 at 3.

<sup>209</sup> Tr. at 1174.

<sup>210</sup> Ex. INT-047, Expert Opinion Testimony of Mickel Wireman at 2-3 (Apr. 29, 2015).

<sup>211</sup> *Id.*

<sup>212</sup> *Id.* at 3.

<sup>213</sup> *Id.*

<sup>214</sup> Ex. INT-046, Expert Opinion Testimony of David K. Kreamer, at 3 (Apr. 29, 2015).

<sup>215</sup> Ex. CBR-001 at 23-24.

<sup>216</sup> See generally Ex. CBR-013, Arcadis, Crow Butte Resources, Inc., Petition for Aquifer Exemption, North Trend Expansion Area at 24 (Aug. 2008); Tr. at 1352-53.

Crow Butte’s witnesses opined that the White River Feature is best interpreted as a fold.<sup>217</sup> This is so, they claim, because the White River Feature, “which at depth offsets the Pierre Formation, is manifested at shallower depths as a northeast trending, subsurface fold . . . within the formations of interest near the License Area.”<sup>218</sup> According to the LRA, Crow Butte’s “review of more than 130 geophysical logs [and] three-dimensional geologic modeling indicates that the fault associated with the structural feature does not truncate or offset members of the White River Group along a discrete fault surface. Rather, members of the White River Group are broadly folded and are continuous across the structural feature.”<sup>219</sup>

The EA reached similar conclusions.<sup>220</sup> In addition, the NRC Staff’s witnesses testified that NDEQ’s review of Crow Butte’s Aquifer Exemption Petition for the NTEA<sup>221</sup> included an evaluation of the White River Feature by an independent panel of geology experts that concluded Crow Butte’s interpretation of this feature as a fold was plausible.<sup>222</sup> Intervenors, however, sought to characterize the panel’s evaluation in a different light. Specifically, they claimed that, in 2007, NDEQ provided technical comments<sup>223</sup> that allegedly (1) raised several questions disputing Crow Butte’s assertion that there is no hydraulic connection among regional aquifers and the White River; and (2) challenged Crow Butte’s interpretation of the White River Feature as a fold instead of a fault.<sup>224</sup>

Nevertheless, after receiving Crow Butte’s response to these technical comments, NDEQ approved Crow Butte’s Aquifer Exemption Petition on April 7, 2011,<sup>225</sup> concluding that Crow Butte’s interpretation of this feature as a fold was plausible, and that there was no evidence of faults or contaminant pathways between the BC/CPF Aquifer and the Upper Brule Aquifer — a position supported by the NRC Staff’s witnesses.<sup>226</sup> With respect to the potential for the White River Feature to act as a conduit between the aquifers, NDEQ concluded (as

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<sup>217</sup> Ex. CBR-001 at 23-24.

<sup>218</sup> *Id.*

<sup>219</sup> LRA § 2.6.2.5 at 2-135.

<sup>220</sup> EA § 3.5.2.3.3 at 51-52; *see also* Ex. NRC-001-R at 37-39.

<sup>221</sup> Ex. NRC-001-R at 36-37.

<sup>222</sup> Ex. NRC-095 at 23.

<sup>223</sup> *See* Ex. INT-011, Letter from the State of Nebraska Department of Environmental Quality to Stephen P. Collings, President, Crow Butte, attach., Technical Review of Aquifer Exemption Petition for North Trend Expansion (Nov. 8, 2007).

<sup>224</sup> *See* Ex. INT-010, Oglala Sioux Tribe’s Request for Hearing and/or Petition to Intervene at 20-21 (July 28, 2008).

<sup>225</sup> Ex. CBR-019, In re the Request of Crow Butte Resources, Inc. for an Aquifer Exemption for Portions of the Chadron Formation in Dawes County, Nebraska at 6 (Neb. Dep’t of Env’tl. Quality, Apr. 7, 2011) (granting Aquifer Exemption Order).

<sup>226</sup> Ex. NRC-095 at 23.

did the NRC Staff's witnesses) that the BC/CPF Aquifer underlying the NTEA is hydraulically isolated from the other aquifers based on several lines of evidence, including: (1) Crow Butte's 3-D geological modeling suggesting that any disruption of geologic units — such as structural thinning, structural thickening, missing units, or linear features associated with fault rupture — could plausibly be associated with other geological processes; (2) drilling data from the proposed NTEA demonstrating that “there is no evidence that a fault offsets the geologic contact with the Pierre Shale and overlying White River Group, nor individual members of the White River Group (i.e., Brule and Chadron formations);” (3) agreement among NDEQ's panel of independent geologic experts that Crow Butte's geologic interpretations, including those concerning structural geology, are plausible; (4) the flowing artesian conditions (i.e., groundwater flowing vertically to the surface due to the natural pressure of the aquifer) observed in the proposed NTEA; and (5) the results of a 2006 pumping test performed by Crow Butte.<sup>227</sup>

*b. Parties' Positions on Apparent Transmissivity of White River Feature*

All parties agreed that, ultimately, the critical issue with respect to the White River Feature is not whether it is a fold or a fault, but rather its actual transmissivity — for that governs whether contaminants can migrate from the mining area to public receptors.<sup>228</sup> Dr. LaGarry stated that Crow Butte's NTEA license amendment application reported a fault along the White River that could transport contaminants from Crow Butte's ISL mine to the White River, and from the White River directly to the PRIR.<sup>229</sup>

The NRC Staff's witnesses, on the other hand, supported their claim that the White River Feature is not transmissive and so does not serve as a conduit for transporting contaminants to the White River and the PRIR, by citing to Crow Butte's Petition for Aquifer Exemption for the NTEA. They asserted that Crow Butte's petition supports the following technical conclusions: (1) the White River Feature does not displace the geologic contact either between the Pierre Shale and the BC/CPF or between members of the Chadron Formation and the Brule formation, based on Crow Butte's 3-D geologic modeling of more than a hundred geophysical logs;<sup>230</sup> (2) there is a consistent vertical gradient and a large difference in potentiometric groundwater surfaces between the BC/CPF

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<sup>227</sup> Ex. CBR-019, attach. C, at 2-8; *see also* Ex. NRC-001-R at 37-39.

<sup>228</sup> Ex. CBR-001 at 23-25; Ex. NRC-095 at 22; Tr. at 1173, 1187, 1192.

<sup>229</sup> *See* Ex. INT-003 at 3.

<sup>230</sup> Ex. NRC-001-R at 39 (citing Ex. NRC-028, figs. F.3-3a to F.3-3d).

Aquifer and the Upper Brule Aquifer over the area of the White River Feature;<sup>231</sup> (3) aquifer pumping tests in the area demonstrated the integrity of the overlying UCU;<sup>232</sup> and (4) there were distinct geochemical variations between the BC/CPF Aquifer and the Upper Brule Aquifer that are inconsistent with transmissivity within the White River Feature.<sup>233</sup>

Moreover, the NRC Staff's witnesses maintained that even if the White River Feature were transmissive, Crow Butte's mining operation in the License Area would not have a significant impact on the environment during mining operations and restoration activities because (1) onsite conditions preserve confinement of mining liquids within the BC/CPF; and (2) Crow Butte's renewed license requires it to maintain an inward hydraulic gradient within the mining units,<sup>234</sup> which creates a cone of depression that pulls aquifer water into the License Area and away from the White River Feature.<sup>235</sup> The NRC Staff's witnesses opined that this cone of depression has reversed the groundwater flow direction within the BC/CPF Aquifer; originally, the aquifer's groundwater flow was northwest, but after more than 20 years of mining operations, it is southeast (at least in the northwest portion of the License Area nearest the White River Feature), thereby preventing the movement of water through the BC/CPF Aquifer towards the White River.<sup>236</sup>

Furthermore, in light of the fact that the White River Feature is approximately 2 miles from the northwest boundary of the License Area<sup>237</sup> and the groundwater flow velocity in the BC/CPF Aquifer is estimated to be less than 20 feet per year,<sup>238</sup> the NRC Staff's witnesses opined that, even if contaminants were somehow to migrate from the License Area toward the White River, the time of travel from the License Area boundary to the White River Feature would be several hundred years.<sup>239</sup> In addition to this considerable travel time, the NRC Staff's witnesses identified several naturally occurring subsurface processes (i.e., advection, dispersion, sorption, and geochemical reactions) that would reduce the concentration of any contaminants of concern and thus further minimize any potential impacts.<sup>240</sup>

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<sup>231</sup> *Id.* (citing Ex. NRC-028 at G-15 to G-16).

<sup>232</sup> *Id.* (citing Ex. NRC-028 at G-9 to G-11).

<sup>233</sup> *Id.* (citing Ex. NRC-028 at G-9).

<sup>234</sup> Ex. NRC-001-R at 38-39.

<sup>235</sup> *Id.* at 38.

<sup>236</sup> Ex. NRC-095 at 22.

<sup>237</sup> EA § 3.5.2.3.3 at 51.

<sup>238</sup> *Id.* § 4.13.6.2.2 at 131.

<sup>239</sup> Ex. NRC-095 at 22-23.

<sup>240</sup> *Id.*

Mr. Wireman disputed the NRC Staff's characterization that the White River Feature would have minimal impact on the vertical gradients and on the potentiometric surface of the Upper Brule Aquifer, maintaining that there is insufficient information regarding the effect of the White River Feature on the potentiometric surface of the BC/CPF Aquifer.<sup>241</sup> Mr. Wireman's primary focus in this regard concerned the impact of pumping water from the BC/CPF Aquifer on the area where this aquifer naturally discharges to surface water (although Mr. Wireman was unable to identify where any such discharge occurs, much less the surface water bodies that might be influenced by the pumping of water from the BC/CPF Aquifer at individual mine sites within the License Area).<sup>242</sup> Mr. Wireman also expressed concern for anyone with a downstream water supply well that is set in the BC/CPF Aquifer because such a well might experience a lower yield from the reduced potentiometric thickness.<sup>243</sup> But, there is no record evidence of any such potentially affected wells around the White River Feature and so there is no indication of the extent, if any, to which this poses a problem.

Dr. Kreamer opined that the impact to the surface water receptors hydraulically connected with the Upper Brule Aquifer is not a water quality issue, but rather a water quantity issue.<sup>244</sup> Although Dr. Kreamer argued that the inward gradient maintained in the BC/CPF Aquifer by Crow Butte's mining and reclamation efforts in the License Area would be very detrimental to well supplies that are in the Upper Brule Aquifer, wetlands, and streams, he was unable to verify whether the level of the Upper Brule Aquifer had dropped as a result of Crow Butte's pumping of water from the BC/CPF Aquifer or whether any water resources had been affected by Crow Butte's operations at the License Area.<sup>245</sup>

Mr. Wireman claimed that, regardless of whether the White River Feature is deemed a fold or a fault, it is likely to have an impact on the potentiometric surface in the BC/CPF because even a folded feature will have increased transmissivity.<sup>246</sup> Mr. Wireman further opined that, due to the long transport times, impacts to these aquifers may not have been detected to date, but once the mining stops and the potentiometric surface rises in the BC/CPF, impacts may be observed similar to those previously experienced at other mine units.<sup>247</sup>

Dr. Kreamer concurred with Mr. Wireman, maintaining that, because both folds and faults can have high permeability, the exact structure of the White

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<sup>241</sup> Tr. at 2600-01.

<sup>242</sup> *Id.*

<sup>243</sup> *Id.*

<sup>244</sup> Tr. at 2601-02.

<sup>245</sup> *Id.*

<sup>246</sup> Tr. at 2605-06.

<sup>247</sup> *Id.*

River Feature is largely inconsequential.<sup>248</sup> Although Dr. Kreamer also stressed that Intervenor were not provided with the NRC Staff's travel time calculations,<sup>249</sup> the travel time calculations were discussed in both the EA and the NRC Staff's testimony.<sup>250</sup> In addition, Dr. Kreamer failed to provide any alternative calculations, based on known onsite data.

Moreover, the various claims of Intervenor's witnesses that the White River Feature is a conductive fault likely to transport contaminants to, and impact the quality of, the White River were contradicted by the NRC Staff's initial and rebuttal testimony. Specifically, the NRC Staff's witnesses' testimony supported the EA's conclusion that the White River Feature is a fold with low transmissivity characteristics, independent of any consideration of the NRC Staff's modeling.<sup>251</sup>

## ***2. Board Findings on the Structure of the White River Feature***

We find it more likely than not that the White River Feature is a fold rather than a fault. We make this finding primarily on two factors. First, there is no evidence of a geologic displacement that would exist with a fault, either along the contact between the Pierre Shale and the BC/CPF, or along the contact between the BC/CPF and the overlying members of the UCU. The absence of any apparent offset of the geologic layering is based on Crow Butte's field explorations involving 130 geophysical logs of the White River Feature and the surrounding geology that, in turn, formed the basis for Crow Butte's 3-D geological modeling of the White River Feature demonstrating that feature's continuity. The second factor is NDEQ's independent evaluation of the White River Feature, which concluded that Crow Butte's interpretation of the White River Feature as a fold was plausible and that there is no evidence of faults between the BC/CPF Aquifer and the Upper Brule Aquifer.<sup>252</sup>

Having said this, we note that all parties were in agreement that characterizing the White River Feature as a fold or a fault is less important than determining whether it is transmissive. In this regard, Intervenor did not offer evidence supporting their claims that the White River Feature is a conductive fault that either altered the vertical gradients or potentiometric levels in the aquifers or transported sufficient contaminants from the License Area to impact the water quality of the White River. Specifically, Intervenor's witnesses simply asserted

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<sup>248</sup> Tr. at 2606-07.

<sup>249</sup> *Id.*

<sup>250</sup> Ex. NRC-095 at 22-23; *see also* EA § 4.13.6.2.2 at 130-31.

<sup>251</sup> Ex. NRC-095 at 23-24.

<sup>252</sup> *Id.* at 23.

that the distortion of the White River Feature (i.e., whether folded or faulted) creates higher permeabilities, which, in turn, may have some effect on the potentiometric surface elevations.<sup>253</sup> But, they presented no field data to support this claim. While Intervenors' witnesses asserted that more study is needed to assess the hydraulic conductivity of the White River Feature,<sup>254</sup> they provided scant evidence in support of this assertion.

By contrast, we find that Crow Butte and the NRC Staff presented several different lines of compelling evidence supporting their position that the White River Feature is not sufficiently transmissive to act as a significant conduit for the migration of contaminated groundwater from the mining operation. This evidence includes: (1) the lack of geologic displacement either along the interface between the Pierre Shale and the BC/CPF or along the interface between members of the Chadron Formation and the Brule Formation; (2) consistency in the vertical gradients; (3) large differences in potentiometric levels between the BC/CPF Aquifer and the Upper Brule Aquifer; (4) the demonstrated integrity of the UCU from numerous pumping tests; and (5) geochemical variations in aquifer water quality between the BC/CPF Aquifer and the Upper Brule Aquifer.

Accordingly we find the record evidence supports the NRC Staff's position that, in the event any Crow Butte mining liquids were to escape containment, the White River Feature has not shown (and is unlikely to show) any propensity to act as a permeable conduit for the transport of such contaminants.

Because the NRC Staff abandoned its hydrogeologic modeling of the White River Feature at the hearing, we accord it no weight. Nevertheless, even after disregarding such modeling results, we find that the NRC Staff has taken the hard look required by NEPA and reached a reasonable conclusion that (1) the White River Feature is most likely a fold rather than a fault; and (2) regardless of its characterization as a fold, the White River Feature offers little increased transmissivity to act as conduit for significant contamination transport and adverse receptor impacts.

While the importance of the NRC Staff's hydrologic modeling in defining the structure of the White River Feature is stressed in the EA,<sup>255</sup> our decision effectively amends the EA to eliminate any reliance on its modeling of the White River Feature. Where an adjudicatory hearing tests the adequacy of the NRC Staff's environmental review, a licensing board decision, as the final record of decision under NEPA, can amend the NRC Staff's NEPA documents to "be-

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<sup>253</sup> Tr. at 2605-06.

<sup>254</sup> See Tr. at 2605-06.

<sup>255</sup> EA § 3.5.2.3.3 at 51-52.

come, in effect, part of the [final NEPA document].”<sup>256</sup> Although there are limits on the extent to which a licensing board can amend or cure a NEPA document,<sup>257</sup> as noted above, we find that even putting aside the hydrologic modeling, the NRC Staff still took the requisite hard look at the potential transmissivity of the White River Feature. As a consequence, notwithstanding the significant procedural deficiencies associated with its handling of that modeling in this proceeding,<sup>258</sup> the NRC Staff is not required to amend the EA to eliminate its stated reliance on that modeling.

### C. Aquifer Pumping Tests

In accordance with NDEQ Underground Injection Control (UIC) Permit Number NE 0122611 (Ex. CBR-017), Crow Butte conducted four aquifer pumping tests on the BC/CPF Aquifer within the License Area boundary to evaluate the properties of that aquifer and the integrity of the confining layer at the site.<sup>259</sup> These tests were conducted between 1982 and 2002 at four different locations, as Crow Butte was developing particular portions of the License Area.<sup>260</sup>

According to the EA, the data from these tests were evaluated using generally accepted hydrogeological analysis methods.<sup>261</sup> The NRC Staff’s witnesses

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<sup>256</sup> *Louisiana Energy Services, L.P.* (Claiborne Enrichment Center), CLI-98-3, 47 NRC 77, 89 (1998); *see also Indian Point*, CLI-15-6, 81 NRC at 388 (“We therefore affirm the Board’s ruling that the environmental record of decision may be supplemented by the hearing and relevant Board and Commission decisions.”).

<sup>257</sup> *See, e.g., Sierra Club v. Marsh*, 976 F.2d 763, 770 (1st Cir. 1992). As we stated in our first Partial Initial Decision in this proceeding, “even where the contested hearing’s record of decision supplements a deficient factual analysis in an EA or EIS, if the end result raises other questions about the sufficiency of the NRC Staff’s analysis that should be explored under NEPA, a remand to the NRC Staff would be required to address all such NEPA concerns.” LBP-16-7, 83 NRC at 352.

<sup>258</sup> *See supra* notes 203-07 and accompanying text.

<sup>259</sup> *See* Ex. CBR-067, Supplemental Direct Testimony of Crow Butte Resources, at 7-8 (Sept. 18, 2015); *see also* Ex. CBR-017, Nebraska Department of Environmental Quality Authorization for Underground Injection and Mineral Production Wells, Permit Number NE0122611 at 3-4 (Apr. 23, 1990). In addition to these tests, Crow Butte performed six other aquifer pumping tests in conjunction with its NTEA license amendment application. *See* Ex. CBR-074 at 10; *see also* Ex. CBR-013 at 36-38; Ex. NRC-028 at G-10 to G-15. While detailed information on these tests is documented in Ex. CBR-001 at 29, these tests have little bearing on our resolution of the contentions in this proceeding (except to show that those tests likewise suggested there is adequate confinement of the BC/CPF in Crow Butte’s NTEA, which indicates there is regional competency of the UCU). We also note that nothing in these NTEA tests undermines any of our findings with respect to the testimony and evidence made in this license renewal proceeding, and as such, they play no part in this Partial Initial Decision. Accordingly, these tests will not be discussed further herein.

<sup>260</sup> *See* LRA, fig. 2.7-8, at 2-203.

<sup>261</sup> EA § 3.5.2.3 at 50-52. Along with the Theis recovery method, these analysis methods included  
(Continued)

asserted that “the most important information obtained from these aquifer pumping tests was the assessment of the behavior of the units overlying the [BC/CPF Aquifer] to determine the degree of confinement created by the overlying low permeability layers [i.e., the UCU].”<sup>262</sup>

Data collected and analyzed as part of these aquifer pumping tests included pumping rate, test duration, formation characteristics, transmissivity, hydraulic conductivity (i.e., permeability), storativity (i.e., the volume of available water within an aquifer, expressed as a coefficient), and radius of influence (i.e., the radius defining the area over which drawdown occurs). Crow Butte’s aquifer testing (performed in accordance with regulatory requirements as reviewed and approved in advance by NDEQ) suggested there were overlapping areas of influence across the length of the site.<sup>263</sup>

## ***1. Parties’ Positions on Aquifer Pumping Tests***

### ***a. Parties’ Positions on Aquifer Pumping Test Program***

Crow Butte’s witnesses testified that, not only were Crow Butte’s aquifer pumping tests reviewed and approved by NDEQ, but they were consistent with the industry standard techniques for this type of test.<sup>264</sup> There is no record evidence contradicting Crow Butte’s claim that these tests met NDEQ requirements and industry standard techniques.<sup>265</sup>

Although the LRA briefly summarizes Crow Butte’s four aquifer pumping tests,<sup>266</sup> it is the individual test reports themselves that (1) contain specific details both about how these tests were performed;<sup>267</sup> and (2) discuss and summarize the key resulting hydraulic characteristics, including hydraulic conductivity, storativity, transmissivity, and the radius of influence.<sup>268</sup> Three to four observation wells were installed in the Ore Zone around the pumping well to monitor draw-

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one or more combinations of the following accepted techniques: Jacob’s modified nonequilibrium method, the Cooper and Jacob distance-drawdown method, Hantush’s method, and the Neuman and Witherspoon method. *Id.*

<sup>262</sup> Ex. NRC-076-R2 at 66.

<sup>263</sup> See LRA, fig. 2.7-8, at 2-203.

<sup>264</sup> Ex. CBR-045 at 20.

<sup>265</sup> See Tr. at 1275.

<sup>266</sup> LRA § 2.7.2.3 at 2-202 to 2-214.

<sup>267</sup> Ex. BRD-002A, Crow Butte Resources, Inc., Industrial Ground Water Permit Amendment, Aquifer Test #1 (July 29, 1987); Ex. BRD-002B-R; Ex. BRD-002C, Harlan & Associates, Inc., Ground-Water Pumping Test #3, Data Evaluation Report (Oct. 15, 1996); Ex. CBR-012, Petrotek Engineering Corporation, Ground-Water Pumping Test #4, Data Evaluation Report (Oct. 10, 2002).

<sup>268</sup> LRA, tbl. 2.7-7, at 2-200; Ex. NRC-076-R2 at 37; Ex. CBR-012 at 1.

down in the BC/CPF Aquifer.<sup>269</sup> The NRC Staff's witnesses testified that all four tests also utilized an observation well in the overlying Upper Brule Aquifer, and that for Test #2, Crow Butte placed an additional piezometer (i.e., a device to monitor water pressure indicative of groundwater levels in an aquifer) in both the UCU and the LCU.<sup>270</sup> None of the observation wells and piezometers in the Upper Brule Aquifer, the UCU, or the LCU showed a response to pumping, indicating that the confining layers act as an impermeable unit.<sup>271</sup>

Because these four aquifer test results demonstrated that the wells' radii of influence overlap (varying from 4000 to 5700 feet),<sup>272</sup> the EA states that the results of these tests approximate the hydraulic conditions over most of the License Area.<sup>273</sup> The EA also notes that Crow Butte used the drawdown and recovery data from these tests to estimate the hydrogeological properties of the BC/CPF Aquifer and the UCU using the previously mentioned analysis methods.<sup>274</sup>

In their testimony, Intervenors' witnesses maintained that Crow Butte's "aquifer tests are entirely insufficient and potentially misleading, as typically only one observation well was placed in the overlying Brule Aquifer to determine vertical migration"<sup>275</sup> and "[o]nly two of the aquifer tests performed between 1982 and 2006 included a monitoring well in the [UCU]."<sup>276</sup> Noting the large size of the License Area, Mr. Wireman stated that the aquifer tests were not adequate for characterizing the potential for movement of groundwater from the BC/CPF upward through the UCU, given the heterogeneity of the strata and the extensive fracturing in the rocks that form the UCU.<sup>277</sup> He also testified that there are far too few monitoring wells in the Upper Brule Aquifer to monitor adequately for long-term water level trends in the Upper Brule Aquifer.<sup>278</sup> Specifically, three of the aquifer pumping tests included only one monitoring well in the Upper Brule Aquifer and the fourth included only two Upper Brule Aquifer monitoring wells.<sup>279</sup>

The NRC Staff's witness, Dr. Striz, countered this, testifying that the number of monitoring wells Crow Butte installed in the License Area was consistent with

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<sup>269</sup> Tr. at 1265-68.

<sup>270</sup> Ex. NRC-076-R2 at 35-37.

<sup>271</sup> *Id.*

<sup>272</sup> Ex. NRC-076-R2 at 37.

<sup>273</sup> EA § 3.5.2.3 at 50.

<sup>274</sup> *Id.*; see *supra* note 261 and accompanying text.

<sup>275</sup> Ex. INT-069, Rebuttal Statement of Dr. David K. Kreamer, at 4 (June 8, 2015).

<sup>276</sup> Ex. INT-070, Rebuttal Statement of Mickel Wireman, at 1 (June 8, 2015).

<sup>277</sup> *Id.*

<sup>278</sup> Ex. INT-081, Supplemental Testimony of Mickel Wireman, at 1 (Sept. 16, 2015).

<sup>279</sup> *Id.*

the standardized aquifer pumping tests that NDEQ had approved.<sup>280</sup> It was her opinion that (1) three to four observation wells in the Ore Zone were sufficient to assess the drawdown of the potentiometric levels from pumping; and (2) one overlying well per pumping test in the Upper Brule Aquifer, placed close to the pumping well, was sufficient because its location was optimal for detecting leakage in the UCU.<sup>281</sup> Furthermore, she observed, Crow Butte supplemented its aquifer pumping tests of the overlying well by conducting consolidation tests to measure the permeability of the overlying UCU aquitard.<sup>282</sup> Dr. Striz also testified that the NRC has based many of its licensing decisions on aquifer pumping testing with a similar configuration to that employed by Crow Butte.<sup>283</sup> In this regard, Crow Butte's witnesses confirmed that Crow Butte performed site-specific testing of cores from the UCU and detected very low permeability,<sup>284</sup> which indicates both that a well in the UCU would not readily respond to an aquifer pumping test and that the recovery of the water levels would be slow.<sup>285</sup>

*b. Parties' Positions on Aquifer Pumping Test Analysis Methods*

The NRC Staff's witnesses testified that Crow Butte's aquifer pumping test drawdown data were analyzed using a variety of scientifically reliable methods,<sup>286</sup> including the Theis recovery method and standard laboratory consolidation testing.<sup>287</sup> The NRC Staff's witnesses testified that, while Crow Butte used these analytical techniques to evaluate the aquifer pumping tests for the initial planning and design phase of its mining operations, "[o]nce each well field became fully operational, the actual measured data (e.g., flow rates and drawdown) were used to verify and adjust as necessary the extent of the influence of well extraction and injection to maintain an inward gradient."<sup>288</sup>

Intervenors' experts disputed the claims of the NRC Staff. Dr. Kreamer criticized Crow Butte's aquifer pumping test calculations on the grounds that they relied on old data, as well as on outdated research and methods that are inappropriate for analyzing the heterogeneous, anisotropic,<sup>289</sup> nonuniform lay-

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<sup>280</sup> Tr. at 1283; *see also* Ex. CBR-045 at 20.

<sup>281</sup> *See* Tr. at 1283.

<sup>282</sup> *See id.*

<sup>283</sup> *Id.*

<sup>284</sup> Ex. CBR-045 at 29.

<sup>285</sup> *Id.* at 31-32; Tr. at 1142-43.

<sup>286</sup> *See supra* note 261 and accompanying text.

<sup>287</sup> Ex. NRC-076-R2 at 33-34; *see also* LRA § 2.7.2.3 at 2-205.

<sup>288</sup> Ex. NRC-076-R2 at 34.

<sup>289</sup> We use "anisotropic" when referring to an aquifer that has varying hydraulic properties with  
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ering of the geologic strata within the pumping test areas.<sup>290</sup> In Dr. Kreamer's estimation, Crow Butte's misinterpretation of these variable aquifer characteristics led to Crow Butte's failure to recognize the potential vertical flow and the extent of the influence of well pumping and injection during operations.<sup>291</sup> While Dr. Kreamer was critical of the methods that Crow Butte selected to analyze the aquifer pumping tests, he conceded that these methods are common industry-accepted analyses for evaluating the results of such tests.<sup>292</sup> Moreover, Dr. Kreamer failed to identify any specific analyses that could be used in lieu of these methodologies.<sup>293</sup>

The NRC Staff's witnesses supported Crow Butte's use of these data analysis methods on the ground that they are widely used and accepted standard methods that have been incorporated into American Society of Testing and Materials standards related to aquifer testing.<sup>294</sup> The NRC Staff's witnesses also disputed Dr. Kreamer's claim that these methods are only reliable for homogeneous, isotropic<sup>295</sup> aquifers, asserting that no hydrogeologic systems are truly homogeneous and isotropic,<sup>296</sup> and that "at some scale all geologic systems are heterogeneous and anisotropic, and application of these 'basic equations' to these systems is done with an understanding of the assumptions inherent to their use."<sup>297</sup>

Furthermore, the NRC Staff's witnesses maintained, while the aquifer pumping tests initially assumed homogeneous, isotropic responses, the actual test results would show whether there were significant deviations from the assumed homogeneity and isotropy which, in turn, would establish the need for the use of more complex analysis methods.<sup>298</sup> Here, the NRC Staff's witnesses opined that, with the exception of a small amount of anisotropy in two of the aquifer

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direction at any given point, e.g., when permeability varies between the horizontal and vertical directions at a point in the aquifer.

<sup>290</sup> Ex. INT-046 at 2.

<sup>291</sup> *Id.*; see also Ex. INT-079, Supplemental Testimony of Dr. David K. Kreamer, at 8 (Sept. 16, 2015).

<sup>292</sup> Tr. at 1299.

<sup>293</sup> See Tr. at 1299.

<sup>294</sup> Ex. NRC-076-R2 at 33-34; Ex. NRC-080, NRC Staff, List of ASTM Standards for the Analysis of Hydraulic Characteristic of Aquifer by Aquifer Pumping Tests (undated).

<sup>295</sup> We use "homogenous" when referring to an aquifer that has constant hydraulic properties at all locations (e.g., permeability is the same at all distances and depths within the aquifer) and "isotropic" when referring to an aquifer that has constant hydraulic properties in all directions at any given point (e.g., permeability is the same between the horizontal and vertical directions).

<sup>296</sup> Ex. NRC-076-R2 at 34.

<sup>297</sup> *Id.* at 66.

<sup>298</sup> Tr. at 1284-85.

pumping tests, the responses obtained were very close to those one would expect for a homogeneous, isotropic aquifer.<sup>299</sup>

*c. Parties' Positions on Aquifer Pumping Test Data Interpretation*

(i) PARTIES' POSITION ON CROW BUTTE'S TEST #1

Crow Butte conducted its first aquifer pumping test in the southeast portion of the License Area in November 1982.<sup>300</sup> In addition to the pumping well, four observation wells were set in the BC/CPF while two observation wells were set in the Upper Brule Aquifer.<sup>301</sup> The pumping well operated for almost 51 hours at 24 gallons per minute (gpm), resulting in a radius of influence of 4000 feet.<sup>302</sup> Thereafter, the wells were monitored during recovery for nearly 28 hours.<sup>303</sup>

The NRC Staff's witnesses testified that data from the aquifer pumping test report show the two observation wells completed in the Upper Brule Aquifer (PM-6 and PM-7) did not demonstrate any responsive water pressure change due to pumping in the BC/CPF.<sup>304</sup> Moreover, the NRC Staff's witnesses asserted, the drawdown curves of the aquifer pumping test data (i.e., graphs depicting water level decrease with the duration of pumping) indicate that the BC/CPF Aquifer is fully confined.<sup>305</sup>

According to witnesses for Crow Butte and the NRC Staff, the variation from the Theis curves for one observation well (PT-2)<sup>306</sup> indicated either (1) the occurrence of some small leakage squeezed from confining beds during the pumping test (as demonstrated by the "leaky aquifer" analysis);<sup>307</sup> or (2) as shown by the Theis analysis, variations in local transmissivity (caused by an increase in the aquifer thickness or permeability) over the test area gave the false impression of aquifer leakage or of a recharge boundary (i.e., an area or zone of the aquifer with increased groundwater flow).<sup>308</sup> Regardless of the cause of these deviations, Crow Butte's witnesses claimed that by far the most important

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<sup>299</sup> See Tr. at 1285-86.

<sup>300</sup> Ex. BRD-002A at 2.7A(1).

<sup>301</sup> *Id.*

<sup>302</sup> *Id.*; Ex. CBR-012 at 3.

<sup>303</sup> Ex. BRD-002A at 2.7A(1); Ex. CBR-012 at 3.

<sup>304</sup> Ex. NRC-095 at 9 (citing Ex. BRD-002A at 2.7A(9)).

<sup>305</sup> *Id.* (citing Ex. BRD-002A at 2.7A(15)).

<sup>306</sup> See Ex. BRD-002A, fig. 2.7A-6, at 2.7A(18).

<sup>307</sup> Ex. NRC-095 at 9; Tr. at 2530-31; Ex. CBR-067 at 9; see also LRA § 2.7.2.3 at 2-213; Ex. BRD-002A at 2.7A(8), 2.7A(24)-(29) (detailing the aquifer leakage analysis calculations).

<sup>308</sup> Ex. NRC-103, NRC Staff's Supplemental Rebuttal Testimony, at 19-20 (Sept. 28, 2015); Ex. CBR-074 at 13; Tr. at 2533-34; see also Ex. BRD-002A at 2.7A(8), 2.7A(13).

conclusion to glean from the data is that there were extremely low recharge or leakage rates, which is consistent with a fully confined aquifer response.<sup>309</sup>

Separate and apart from the significance of the data obtained in the later stages of the aquifer pumping test, Intervenor's witness Dr. Kreamer asserted it was the early drawdown data that were most important — and that these data indicated potential aquifer leakage between the overlying Upper Brule Aquifer and the BC/CPF Aquifer.<sup>310</sup> Dr. Kreamer posited that if the Theis curves are correctly matched with the early-time data (data collected during the time required to account for wellbore storage),<sup>311</sup> the results “clearly show a break in the data, moving below the [Theis]-type curve for the late data, indicating [a] reduction in the rate of expected drawdown” and signifying “an unexpected water source, or recharge boundary.”<sup>312</sup>

Witnesses for both the NRC Staff and Crow Butte disputed Dr. Kreamer's interpretation of the data. They maintained that early time periods should be ignored because early-time drawdown data are negatively influenced by a number of factors not related to the aquifer response to pumping and, therefore, are inappropriate for estimating aquifer behavior.<sup>313</sup> They gave two reasons for this position. First, they argued that theoretical equations rely on the assumption that the well discharge remains constant and that the release of water from the aquifer is immediate and directly proportional to the rate of decline of the pressure.<sup>314</sup> As a result, they claimed there is “initial disagreement between theory and actual flow — and that, as the time of pumping extends, these effects are minimized and closer agreement may be attained.”<sup>315</sup> Second, Crow Butte's witnesses testified that wellbore storage can also affect the early-time data, especially for the type of wells that Crow Butte installed, which are large-diameter, deep production wells with large water column height.<sup>316</sup> Because the amount of water stored within the wellbore can be substantial, it must be removed before the

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<sup>309</sup> See Ex. CBR-067 at 9 (stating that  $\sim 0.00002$  gal/ft<sup>2</sup> in 51 hours is equivalent to  $4 \times 10^{-10}$  cm/s).

<sup>310</sup> Ex. INT-079 at 3-4.

<sup>311</sup> These are shown in red on page 4 of Ex. INT-079.

<sup>312</sup> *Id.* at 3.

<sup>313</sup> Ex. NRC-103 at 16-17; Ex. CBR-074 at 11 (citing Ex. CBR-081, G. P. Kruseman and N. A. de Ridder, *Analysis and Evaluation of Pumping Test Data*, International Institute for Land Reclamation and Improvement Publication 47, at 64 (2000)).

<sup>314</sup> Ex. NRC-103 at 16-17 (citing Ex. NRC-110, G. P. Kruseman and N. A. de Ridder, *Analysis and Evaluation of Pumping Test Data* (2nd ed.), ILRI Publication 47 (1994) at 2 (excerpt)); Ex. CBR-074 at 11-12.

<sup>315</sup> Ex. NRC-103 at 16-17 (citing Ex. NRC-110 at 2); *see also* Ex. CBR-081 at 64.

<sup>316</sup> Ex. CBR-074 at 11-12.

aquifer can respond properly to the induced drawdown, which further reduces the value of early-time data.<sup>317</sup>

As a result of these factors, these witnesses opined, measured drawdown in early time is less than matching techniques with These curves would predict, thus giving the false impression of aquifer leakage.<sup>318</sup> In this regard, Crow Butte's witnesses testified that it required more than 21 minutes to purge a single casing volume from the pumped well (using a 4 1/2-inch-diameter well casing and a 500-foot head).<sup>319</sup> Accordingly, they declared that this substantiates their claim that less weight should be given to the early-time data.<sup>320</sup>

Crow Butte's witnesses also asserted that Dr. Kreamer ignored the fact that Crow Butte's aquifer pumping test report accounted for wellbore storage in assessing the drawdown from the aquifer pumping test data.<sup>321</sup> While Dr. Kreamer conceded that decreased drawdown might occur due to greater aquifer thicknesses, he maintained that the increase in thickness must occur in all parts of the aquifer affected by the pumping test.<sup>322</sup> In response, witnesses for Crow Butte and the NRC Staff maintained that Dr. Kreamer's position (i.e., relying on early-time data, thus failing to account for the effects of wellbore storage) is inconsistent with aquifer analysis guidance advocating the use of later time data.<sup>323</sup>

(ii) PARTIES' POSITIONS ON CROW BUTTE'S TEST #2

During late June and early July 1987, Crow Butte's Test #2 was conducted in the central portion of the License Area just northwest of Crow Butte's Test #1.<sup>324</sup> In addition to the pumping well, three observation wells were set in the BC/CPF Aquifer, while one observation well was set in the overlying Upper Brule Aquifer and two high-sensitivity piezometers (equipped with small, porous tips to improve measurements in low-permeability strata) were placed, one each, in the LCU and UCU.<sup>325</sup> The pumping well was operated for about 72 hours at almost 48 gpm, resulting in a radius of influence of 5000 feet, and it was monitored for close to 72 hours during the recovery after pumping stopped.<sup>326</sup>

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<sup>317</sup> *Id.* at 12.

<sup>318</sup> *Id.*

<sup>319</sup> Tr. at 2539.

<sup>320</sup> Ex. CBR-074 at 12.

<sup>321</sup> *Id.* at 13 (citing Ex. BRD-002A at 2.7A(8)); Tr. at 2533-34.

<sup>322</sup> Ex. INT-079 at 5.

<sup>323</sup> Ex. CBR-074 at 11; Ex. NRC-103 at 16-17.

<sup>324</sup> Ex. BRD-002B-R at 2.7(15)-(16).

<sup>325</sup> *Id.* at 2.7(18)-(23).

<sup>326</sup> *Id.* at 2.7(28), 2.7(55).

Witnesses for both the NRC Staff and Crow Butte opined that Crow Butte's Test #2 demonstrated that the BC/CPF Aquifer is hydraulically isolated from the overlying Upper Brule Aquifer because (1) the overlying UCU piezometer (UCP-1) showed no response to pumping from the BC/CPF Aquifer;<sup>327</sup> (2) the Upper Brule Aquifer monitoring well (BMW-1) showed no response to pumping from the BC/CPF Aquifer;<sup>328</sup> (3) all of the drawdown graphs indicated a fully confined aquifer;<sup>329</sup> and (4) there were no indications of recharge in the recovery graphs.<sup>330</sup>

Dr. Kreamer testified that he conducted additional early-time interpretation of the drawdown relationship for one of the observation wells (COW-3).<sup>331</sup> Based on his interpretation, Dr. Kreamer opined that there was a distinct break point between the early and late drawdown curves at about 30 minutes, and that this can be interpreted as additional vertical flow from the UCU.<sup>332</sup> Furthermore, Dr. Kreamer stated that recovery data for this same well also exhibited this recharge boundary.<sup>333</sup>

The NRC Staff's witnesses disputed Dr. Kreamer's reinterpretation of the data that led him to opine a recharge boundary appeared at the 30-minute break in Crow Butte's Test #2. They disputed Dr. Kreamer's reinterpretation largely by restating the same arguments they made with respect to Test #1, i.e., that early-time data should not be used to estimate aquifer properties.<sup>334</sup> Because deviations not associated with the aquifer characteristics occur during the early time periods, the NRC Staff's witnesses maintained that the generally accepted hydrogeological practice is to look to the middle-time data to establish aquifer properties and to the late-time data to assess whether recharge boundaries exist.<sup>335</sup>

In addition, the NRC Staff's witnesses testified that if the recharge boundary alleged by Dr. Kreamer had been encountered during the early time of the pumping test, there would only be time for the water to come from the UCU. Were this the case, the resulting drawdown would have been detected in the overlying

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<sup>327</sup> Ex. NRC-095 at 10 (citing Ex. BRD-002B-R, fig. 2.7-21, at 2.7(49)); Ex. CBR-067 at 9-10.

<sup>328</sup> Ex. NRC-095 at 10 (citing BRD-002B-R, fig. 2.7-21, at 2.7(49)); Ex. CBR-067 at 9-10.

<sup>329</sup> Ex. NRC-095 at 10 (citing BRD-002B-R, figs. 2.7-12 to 2.7-14, at 2.7(38)-(40)); *see also* CBR-074 at 14.

<sup>330</sup> Ex. NRC-095 at 10 (citing BRD-002B-R, figs. 2.7-18 to 2.7-20, at 2.7(44)-(46)); *see also* CBR-074 at 14.

<sup>331</sup> Ex. BRD-002B-R, fig. 2.7-14, at 2.7(40).

<sup>332</sup> Ex. INT-079 at 7.

<sup>333</sup> *Id.* (citing Ex. BRD-002B-R, fig. 2.7-14, at 2.7(40)).

<sup>334</sup> Ex. NRC-103 at 24-25.

<sup>335</sup> *Id.* (citing Ex. NRC-111 at 1).

UCU piezometer (UPC-1) based on its close proximity to the pumping well.<sup>336</sup> In fact, however, no response to pumping was observed at this monitoring point during the pumping test, and the NRC Staff's witnesses maintained that this refuted Dr. Kreamer's hypothesis of leakage through the UCU.<sup>337</sup>

In regards to the inappropriate use of early-time data, Crow Butte's witnesses criticized Dr. Kreamer's claims with respect to Crow Butte's Test #2 for the same reason it criticized his claims with respect to Crow Butte's Test #1.<sup>338</sup> More specifically, Crow Butte's witnesses testified that his reliance on early-time data during the first 37 minutes for Test #2 was flawed.<sup>339</sup> Crow Butte's witnesses maintained that Dr. Kreamer's assertion that "'a distinct breakpoint at about 30 minutes' represent[s] [a] 'recharge boundary'" is in error because of the cited problems with the use of early-time data collected during the first 37 minutes of the test.<sup>340</sup>

In support of their assertion that wellbore storage can give the false impression of leakage in the early time period of an aquifer pumping test, Crow Butte's witnesses pointed to a specific figure in a scientific paper authored by Kruseman and de Ridder that they claim demonstrates the effect of wellbore storage on early-time drawdown at observation wells.<sup>341</sup> In particular, Crow Butte's witnesses asserted that a wellbore storage curve in the Kruseman and de Ridder paper bears a striking resemblance to the early-time data that were collected in COW-3 during Crow Butte's Test #2 and that Dr. Kreamer used as justification for his opinion that these test results indicated leakage through the UCU.<sup>342</sup> According to Crow Butte's witnesses, the close match of the COW-3 data with Kruseman and de Ridder's wellbore storage curve further demonstrated that Dr. Kreamer's reliance on early drawdown data is flawed.<sup>343</sup>

As with Crow Butte's Test #1, witnesses for both the NRC Staff and Crow Butte contended that it is likely the UCU and LCU aquitards yielded small amounts of water that were squeezed from storage due to pore pressure changes during the aquifer pumping test.<sup>344</sup> In addition, Crow Butte's witnesses asserted not only that the amounts of water obtained were relatively insignificant, but

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<sup>336</sup> Ex. NRC-103 at 25 (citing Ex. BRD-002B-R, tbl. 2.7.3, at 2.7(21), 2.7(49)).

<sup>337</sup> *Id.* (citing Ex. BRD-002B-R, fig. 2.7-21, at 2.7(49)).

<sup>338</sup> Ex. CBR-074 at 13-15.

<sup>339</sup> *Id.* at 14-15.

<sup>340</sup> *Id.* (quoting Ex. INT-079 at 7).

<sup>341</sup> *Id.* at 12 (citing Ex. CBR-081, fig. 2-15, at 52).

<sup>342</sup> *Id.*

<sup>343</sup> *Id.*

<sup>344</sup> Ex. NRC-095 at 10; Ex. CBR-067 at 9.

that it would take more than 2.8 million years for water to move through the UCU.<sup>345</sup>

Crow Butte's witnesses testified that the high-sensitivity piezometers in the UCU and LCU detected no change during the aquifer pumping test, and thus provided no data for estimating the hydrologic characteristics of these low-permeability units.<sup>346</sup> As an alternative to aquifer pumping tests for determining the vertical hydraulic conductivity of the confining layers, Crow Butte performed consolidation tests on samples of the cores that were taken from the Red Clay Horizon of the Middle and Upper Chadron Formations during the installation of the piezometers.<sup>347</sup> Based on the results of this consolidation testing that is presented in the Crow Butte's Test #2 report, Crow Butte's witnesses maintained that data assessing the hydraulic properties of the UCU indicated the Red Clay Horizon is very impermeable with vertical hydraulic conductivities of less than  $1 \times 10^{-10}$  cm/s.<sup>348</sup>

Dr. Kreamer and Mr. Wireman criticized Crow Butte's approach in this regard.<sup>349</sup> Specifically, Dr. Kreamer asserted that "ensemble field data were not used to characterize the hydraulic conductivity of these underlying and overlying formations, but the characterization was simply done in the laboratory geotechnical analysis on selected samples from a single borehole."<sup>350</sup> Crow Butte's witnesses responded that, for the same reasons discussed above, it is not possible to obtain hydraulic properties in tight confinement layers from an aquifer pumping test.<sup>351</sup>

(iii) PARTIES' POSITIONS ON CROW BUTTE'S TEST #3

During September 1996, Crow Butte's Test #3 was conducted in the north-west portion of the License Area.<sup>352</sup> The pumping well operated for 55 hours at 51.2 gpm to create a radius of influence of 5700 feet.<sup>353</sup> Thereafter, it was monitored for nearly 44 hours during recovery.<sup>354</sup> In addition to the pumping well, three observation wells were set in the BC/CPF Aquifer, while one observation well was set in the overlying Upper Brule Aquifer.<sup>355</sup>

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<sup>345</sup> Ex. CBR-067 at 9; *see also* Ex. BRD-002B-R at 2.7(50).

<sup>346</sup> Ex. CBR-067 at 9.

<sup>347</sup> Ex. CBR-045 at 31-32; *see also* Tr. at 1283.

<sup>348</sup> *See* Ex. CBR-001 at 14-15; Ex. CBR-045 at 31-32.

<sup>349</sup> Ex. INT-047 at 4-5; Ex. INT-079 at 8.

<sup>350</sup> Ex. INT-079 at 5, 8.

<sup>351</sup> Ex. CBR-045 at 31-32.

<sup>352</sup> Ex. BRD-002C at 2.

<sup>353</sup> *Id.* at 5-6.

<sup>354</sup> *Id.* at 5.

<sup>355</sup> *Id.* at 1, 4; *see also* Ex. CBR-067 at 8.

Witnesses for the NRC Staff testified that the information in Crow Butte's Test #3 report demonstrated that the BC/CPF Aquifer is hydraulically isolated from the overlying Upper Brule Aquifer because (1) the water level in the Upper Brule Aquifer monitoring well (BOW96.1) did not change as a result of pumping the BC/CPF Aquifer;<sup>356</sup> (2) all of the drawdown graphs for the observation wells indicated that the BC/CPF is a fully confined aquifer;<sup>357</sup> and (3) there were no indications of recharge in the recovery graphs.<sup>358</sup>

While Dr. Kreamer did not dispute the interpretation of the drawdown curves for Crow Butte's Test #3, he nevertheless asserted that "[t]he possibility of secondary porosity and fractures in the strata overlying the [BC/CPF] was not even considered [by Crow Butte or the NRC Staff]."<sup>359</sup> But Dr. Kreamer did not point to any specific data indicating where leakage through fractures was observed in the results of this aquifer test. In other respects, he provided the same criticism he raised with respect to Crow Butte's Tests #1 and #2 — i.e., that there is an inadequate number of observation wells in the Upper Brule Aquifer, that additional testing is needed, and that there is a lack of long-term testing.<sup>360</sup>

(iv) PARTIES' POSITIONS ON CROW BUTTE'S TEST #4

During August 2002, Aquifer Pumping Test #4 was conducted in the southeastern portion of the License Area.<sup>361</sup> Crow Butte installed five new wells (CPW2002, COW2002, CM9-04, CM9-13, and CM9-14) in the BC/CPF Aquifer prior to initiating this test.<sup>362</sup> CPW2002 was installed specifically for use as the pumping well, while the others served as observation wells in the BC/CPF.<sup>363</sup> One new observation well (SM9-10) was installed in the monitoring zone within the Brule Formation.<sup>364</sup> The pumping well was operated for almost 65 hours at 51 gpm creating a radius of influence of 5500 feet.<sup>365</sup> Thereafter, it was monitored for nearly 96 hours during recovery.<sup>366</sup>

Witnesses for the NRC Staff and Crow Butte testified that the results of Crow Butte's Test #4 (Ex. CBR-012) demonstrated that the BC/CPF Aquifer is

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<sup>356</sup> Ex. NRC-095 at 10-11.

<sup>357</sup> *Id.* (citing Ex. BRD-002C, app. C).

<sup>358</sup> *Id.*

<sup>359</sup> Ex. INT-079 at 9.

<sup>360</sup> *Id.* at 9-10.

<sup>361</sup> Ex. CBR-012 at 1, 9.

<sup>362</sup> *Id.* at 4.

<sup>363</sup> *Id.*

<sup>364</sup> *Id.*, fig. 3.

<sup>365</sup> *Id.* at 6, 9.

<sup>366</sup> *Id.* at 6.

hydraulically isolated from the Upper Brule Aquifer for the following reasons: (1) no drawdown was observed in the well installed in the Brule Formation (SM9-10);<sup>367</sup> (2) the data, plotted on drawdown graphs, indicated a fully confined aquifer;<sup>368</sup> and (3) there were no indications of recharge in the data plotted on recovery graphs.<sup>369</sup>

Dr. Kreamer, however, testified that there was “a recharge boundary in the data (indicated potential vertical leakage)” from Crow Butte Test #4 in the form of a variance in the drawdown plot for CM9-14.<sup>370</sup> Dr. Kreamer’s interpretation of the data is based on the observed variant responses in the straight-line graph of time vs. drawdown at about 700 minutes.<sup>371</sup>

While there were some variances in the data plotted on drawdown graphs, the NRC Staff’s witnesses testified such variances were transient and did not reflect a recharge boundary.<sup>372</sup> Disputing Dr. Kreamer’s interpretation, Mr. Back for the NRC Staff testified that, for the data to indicate a recharge boundary, the plot of time vs. drawdown would continue to deviate from the straight-line plot with increasing time, i.e., the plot would continue to deviate and never return to the straight line again.<sup>373</sup> Ultimately, Dr. Kreamer agreed with Mr. Back that the plot would continue to deviate from the straight-line drawdown curve when a recharge boundary had been encountered.<sup>374</sup>

Crow Butte’s witnesses also testified that the drawdown rates were likely affected by pumping from operations at adjacent wellfields with overlapping radii of influence, which, in turn, produced the variances observed in the drawdown curves.<sup>375</sup> As Crow Butte’s witness Mr. Lewis testified, pumping in adjacent mine units was turned off at the point in the test when the variances in the drawdown curve were observed and the subject data returned to expected values.<sup>376</sup> Thus, according to Crow Butte and the NRC Staff, the Test #4 curve does not indicate recharge of the aquifer.<sup>377</sup>

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<sup>367</sup> Ex. NRC-095 at 11.

<sup>368</sup> *Id.*

<sup>369</sup> *Id.*

<sup>370</sup> Ex. INT-079 at 1-2; *see also* Tr. at 1276.

<sup>371</sup> Tr. at 1276.

<sup>372</sup> Tr. at 1303-13; Ex. NRC-095 at 11.

<sup>373</sup> Tr. at 1304-05; Ex. NRC-103 at 10-11.

<sup>374</sup> Tr. at 1307-08.

<sup>375</sup> Tr. at 1306; *see also* Ex. CBR-012 at 10-11.

<sup>376</sup> Tr. at 1306.

<sup>377</sup> Tr. at 1304-06; Ex. NRC-095 at 11; Ex. NRC-103 at 11; Ex. CBR-067 at 9-10.

*d. Summary of Aquifer Pumping Test Results*

Crow Butte's witnesses testified that, in all four of the aquifer pumping tests, there was no drawdown in the observation wells set in the overlying Upper Brule Aquifer, and that this demonstrates the impermeability of the UCU.<sup>378</sup> In regards to the analytical methods used to evaluate the tests, Crow Butte collected actual drawdown data from wells in the BC/CPF Aquifer,<sup>379</sup> then analyzed those data using industry-accepted methods.<sup>380</sup> And the NRC Staff's witnesses maintained that, in every instance, the accepted methods indicated that the pumping test data overestimated the actual drawdown, and, as a result, provide a conservative estimate of the aquifer drawdown at any consumptive use rate during operations and restorations.<sup>381</sup>

Crow Butte's witnesses also emphasized that, in Crow Butte's Test #1, which utilized two observation wells set in the Upper Brule Aquifer, no drawdown occurred in either observation well.<sup>382</sup> Likewise, in Crow Butte's Test #2, which included a piezometer set in the lower portion of the UCU, there was no measurable drawdown observed — signifying that the UCU is a significant hydraulic barrier.<sup>383</sup> Finally, in the remaining two Aquifer Pumping Tests (#3 and #4), both of which utilized an observation well in the Brule Formation, no drawdown was observed.<sup>384</sup>

The report for Crow Butte's Test #1 states (1) that the leakage rate through the UCU would be less than 0.00002 gal/ft<sup>2</sup> in 51 hours (i.e.,  $4 \times 10^{-10}$  cm/s); and (2) that it would take more than 12,000 years for water to move through just a 15-foot-thick section of the Red Clay Horizon that directly overlies the BC/CPF.<sup>385</sup> The report for Crow Butte's Test #2 states (1) that neither the overlying confining layer piezometer nor the overlying aquifer monitor well showed any response to the pumping from the BC/CPF Aquifer during the test; and (2) that it would take more than 2.8 million years for a molecule of water to move through the entire UCU.<sup>386</sup> The report for Crow Butte's Test #3 concludes (1) that there is integrity of the UCU above the mining zone; and (2) that there is no evidence of confining-layer leakage.<sup>387</sup> Finally, the report for Crow Butte's

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<sup>378</sup> Ex. CBR-045 at 31-32.

<sup>379</sup> See Ex. NRC-087, Crow Butte Resources, Drawdown Predictions and 2009 Measured Values (undated); Tr. at 2561.

<sup>380</sup> EA § 3.5.2.3 at 50; Ex. CBR-045 at 20.

<sup>381</sup> Ex. NRC-076-R2 at 67.

<sup>382</sup> Ex. CBR-045 at 32 n.2.

<sup>383</sup> *Id.*

<sup>384</sup> *Id.*

<sup>385</sup> See Ex. BRD-002A at 2.7(28)-(29); see also Ex. CBR-067 at 9.

<sup>386</sup> See Ex. BRD-002B-R at 2.7(53)-(54); see also Ex. CBR-067 at 9-10.

<sup>387</sup> Ex. BRD-002C at 6, 8.

Test #4 concludes (1) that there is integrity of the UCU above the Ore Zone; (2) that the BC/CPF exhibits a hydrologic response consistent with a relatively homogeneous and isotropic aquifer within the southern portion of the License Area; and (3) that there was no evidence of confining-layer leakage.<sup>388</sup>

The NRC Staff's witnesses testified that the LRA's "test data (e.g., laboratory tests of core samples, confining unit piezometer responses, and drawdown analysis of the [BC/CPF Aquifer]) indicated an extremely small recharge from the extensive stress applied to the confining unit during the aquifer pumping tests."<sup>389</sup> They further testified that "all four aquifer pumping tests . . . showed that no leakage occurs through the 200 to 500 feet thick overlying confining unit and that no communication exists between the [BC/CPF Aquifer] and the overlying [Upper] Brule [A]quifer."<sup>390</sup>

## **2. Board Findings on Aquifer Pumping Testing**

We find that Crow Butte conducted four aquifer pumping tests in the License Area (during 1982, 1987, 1996, and 2002) using well casing sealed into the BC/CPF, pumping rates that varied from 24 gpm to 51 gpm, and pumping durations extending from 51 to 72 hours that created radii of influence from 4000 to 5700 feet. These tests were conducted in an effort to ensure that the Ore Zone of the BC/CPF is hydraulically isolated from the Upper Brule Aquifer by the surrounding aquitards, which consist of the Pierre Shale underlying the Ore Zone (i.e., the LCU) and the Middle/Upper Chadron and Lower Brule Formations (i.e., the UCU) overlying the BC/CPF. As a secondary goal, these tests sought to enable Crow Butte to estimate the aquifer parameters needed to predict the flow rates and drawdown in the BC/CPF Aquifer during long-term pumping associated with operations and restoration.

All four pumping tests indicated that there is no hydraulic connection between the Upper Brule Aquifer and the BC/CPF Aquifer. Overall, there is strong evidence (1) that the Upper Brule Aquifer is hydraulically isolated from the Ore Zone of the BC/CPF; and (2) that a competent UCU exists in the License Area (with all Brule wells demonstrating no drawdown), which indicates that groundwater flow pathways between the production zone and overlying aquifer are not present.

Dr. Kreamer attempted to discredit Crow Butte's aquifer pumping tests using early-time drawdown data that he opined were indicative of potential aquifer

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<sup>388</sup> See Ex. CBR-012 at 7, 12-13; Ex. CBR-067 at 10.

<sup>389</sup> Ex. NRC-076-R2 at 38.

<sup>390</sup> *Id.*

leakage.<sup>391</sup> But we find that relying upon early-time drawdown data is inconsistent with aquifer testing guidance, and that the use of later-time drawdown data is superior for estimating aquifer parameters and detecting leakage.<sup>392</sup>

We also find that Crow Butte analyzed this aquifer pumping test data by using well-established and professionally accepted methods that have been incorporated into the American Society of Testing and Materials standards. We further find that, even though these test methods are designed for homogenous, isotropic, nonleaky strata, Crow Butte recognized these shortcomings for the subject aquifers and was prepared to make appropriate allowances for the use of more complex algorithms if there were any deviations in these aquifer characteristics.

Nevertheless, we find that none of the results indicated sufficient deviations to necessitate the use of more complex models. While two of the aquifer pumping tests suggested a small amount of leakage and anisotropy, this conclusion was only inferred from Aquifer Pumping Test #1 as a result of the “leaky aquifer” analysis performed at the NRC Staff’s request. We also find that the other analyses, including the two-stage Theis aquifer curve matching method, concluded that leakage was not evident and that the deviation from the ideal confined aquifer drawdown curve in late time was solely due to changes in local transmissivity.<sup>393</sup>

While Intervenors’ witnesses claimed that Crow Butte’s calculations for estimating the rate of leakage are “inappropriate,”<sup>394</sup> they did not provide an independent estimate for the rate of leakage, nor did they suggest an alternative, superior method. We find that Crow Butte’s estimated rates of leakage were reasonably calculated, and are so low as to be considered negligible and within the range expected for a fully confined aquifer.

Accordingly, we find that all four pumping tests are consistent with other lines of evidence discussed in the next section of this Partial Initial Decision, which finds that there is no significant hydraulic connection between the Upper Brule Aquifer and BC/CPF Aquifer. We also find that Crow Butte’s four aquifer pumping tests demonstrated that it properly plugged and abandoned its exploration, development, and pilot test holes that were drilled onsite, ensuring they cannot serve as a secondary conduit between these aquifers. Likewise, we find that Crow Butte’s analysis of the pumping test data established that the Upper Brule Aquifer is isolated and that there is adequate confinement of the BC/CPF Aquifer.

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<sup>391</sup> Ex. INT-079 at 3-4.

<sup>392</sup> See Ex. CBR-074 at 11; Ex. NRC-103 at 16-17.

<sup>393</sup> See Ex. CBR-074 at 13; Tr. at 2533-34.

<sup>394</sup> Ex. INT-079 at 6.

## **D. Integrity of the UCU**

We now turn to questions raised by Intervenor witnesses relating to the integrity of the UCU, which is needed to assure containment of mining contaminants within the BC/CPF.

### ***1. Parties' Positions on Integrity of the UCU***

Intervenor witnesses disputed whether the UCU will restrict communication between the BC/CPF Aquifer and the Upper Brule Aquifer, based on three major considerations: (1) the presence of lineaments regionally, and specifically in the License Area, that may be indicative of bedrock fracturing; (2) the existence of secondary porosity, and the associated increase in permeability of the UCU; and (3) the detection of changes in the groundwater levels in the Upper Brule Aquifer when Crow Butte conducts mining operations by pumping in the BC/CPF. We address the parties' positions on these topics immediately below.

#### ***a. Parties' Positions on Lineaments***

Based mostly on the presence of lineaments in the region and fractures in outcrops outside of the License Area, Intervenor witnesses asserted that contaminants can pass through the UCU via faults, fractures, joints, and cracks in the consolidated strata.<sup>395</sup>

Dr. LaGarry defined lineaments as any unexplained, straight-line topographic feature observed in remotely sensed imagery.<sup>396</sup> While initially stating that these lines represent fracturing that may compromise the containment properties of the UCU,<sup>397</sup> Dr. LaGarry clarified that there is no certainty that an unexplained linear feature is a fracture, as opposed to some other type of straight-line image — a conflict that can only be resolved through onsite ground investigation.<sup>398</sup> And, as Dr. LaGarry stated, even though they are obvious when viewed from Earth's orbit, lineaments indicating fracturing are difficult to observe when covered by surficial deposits (as is the case with the UCU).<sup>399</sup>

In his testimony, Dr. LaGarry asserted that multiple sets of parallel linea-

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<sup>395</sup> Ex. INT-043, Hannan E. LaGarry, Ph.D., Additional Testimony Regarding Lineaments, Joints, and Faults as Contaminant Pathways Near Crawford, Nebraska (Crow Butte Resources ISL Facility), at 3-4 (undated); Tr. at 1212-13, 1225.

<sup>396</sup> Ex. INT-043 at 2; Tr. at 1175.

<sup>397</sup> Tr. at 1173-75.

<sup>398</sup> Tr. at 1177-78.

<sup>399</sup> Ex. INT-013, Hannan E. LaGarry, Ph.D., Supplemental Expert Opinion Regarding the Renewal of ISL Uranium Mining (Crow Butte Resources) Near Crawford, Nebraska, at 3 (undated).

ments, oriented generally northwest-southeast and southwest-northeast, were mapped in 1994 throughout northwestern Nebraska, including the License Area.<sup>400</sup> But, as Dr. LaGarry acknowledged, these lineaments do not necessarily represent fracturing because extensive fieldwork is required to check each lineament.<sup>401</sup> Dr. LaGarry also noted that a 2011 study field-checked and analyzed lineaments south of Chadron in a 20-square-kilometer area of northwestern Nebraska, and concluded that, in this survey area, lineaments representing fracturing were identified on the ground.<sup>402</sup> At the same time, however, Dr. LaGarry recognized that this 2011 study was conducted more than 20 miles northeast of the License Area, and its applicability to the issues in this proceeding is uncertain.<sup>403</sup> Dr. LaGarry also described a poster presentation that reviewed detailed fieldwork to support his claims that fracturing existed at the License Area.<sup>404</sup> While Dr. LaGarry described these studies as an effort to define the regional structure of the geology in northwestern Nebraska and southwestern South Dakota,<sup>405</sup> the NRC Staff's witnesses disputed Dr. LaGarry's claim, asserting that, because the fieldwork in this study was limited to locations distant from the License Area, it failed to establish the existence of fractures at this site.<sup>406</sup>

In addition, Crow Butte's witness Mr. Beins disputed Dr. LaGarry's claim on a separate ground — that the composition of the rock layers in the License Area would largely prevent fractures:

While we at Crow Butte realize that there may be some joints and fractures in the Brule portion, the upper Brule Formation and everything, we don't feel that those fractures extend at depth down into the lower Brule and into the Chadron Formation. And so, because of the plasticity or the plastic nature of those sediments, any fracture that is present there, if there were to be movement, is likely

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<sup>400</sup> Ex. INT-043 at 2-3 (citing Ex. INT-055, Robert F. Diffendal, Jr., Geomorphic and structural features of the Alliance 1° × 2° Quadrangle, western Nebraska, discernible from synthetic-aperture radar imagery and digital shaded-relief maps, 30(2) U. of Wyo. Contributions to Geology 137-47 (1994)); Tr. at 1177.

<sup>401</sup> Ex. INT-043 at 4.

<sup>402</sup> *Id.* at 2-3 (citing Ex. INT-056, Jennifer L. Balmat, Chadron State College, Subtle Structures of the Pine Ridge Region, Northwestern Nebraska at 53 (June 21, 2011)).

<sup>403</sup> Ex. NRC-076-R2 at 24-25; Tr. at 1176-77.

<sup>404</sup> Ex. INT-043 at 3-4 (citing Ex. INT-060, Harmon Maher Jr. and Robert D. Shuster, Significance of an ESE Fracture Direction in Tertiary Strata of South Dakota and Nebraska, 44(7) Geological Society of America Abstracts with Programs 547 (2012)); Tr. at 1176-77, 1181.

<sup>405</sup> Ex. INT-043 at 3.

<sup>406</sup> Ex. NRC-076-R2 at 24-26.

to seal itself off. The clays that we're talking about have a high percentage of montmorillonite clay in it. As those become wet, they tend to swell.<sup>407</sup>

The NRC Staff's witnesses also noted that the identified lineaments in the 2011 study had not been confirmed with the fieldwork that is required to determine whether the lineaments are in fact fractures.<sup>408</sup> Dr. LaGarry agreed that these lineaments had not been confirmed on the ground<sup>409</sup> and that "[s]uch a determination would require extensive fieldwork to check each lineament."<sup>410</sup>

In an attempt to denote these lineaments, Dr. LaGarry personally drew red lines on a water resources map (Ex. INT-043, fig. 2)<sup>411</sup> that suggest there is a "kink" in the shape of the Ore Zone within the License Area.<sup>412</sup> Referring to this annotated map, Dr. LaGarry testified that the "area marked as the potential ore body is a generally NW-SE trending lineament."<sup>413</sup> Dr. LaGarry also asserted that the presence of fractures at the License Area is supported by a 1989 letter to the NRC from an exploration geologist (Ex. INT-009) that claimed Crow Butte had recovered uranium in the License Area within formation fractures, not within a roll-front deposit (which is formed by the precipitation of dissolved uranium in groundwater as it moves through the aquifer), and that the extraction of uranium from the fractures opened up pathways through which contaminants could migrate.<sup>414</sup>

The NRC Staff's witnesses disputed Dr. LaGarry's claims that Crow Butte's Ore Zone occurs in a fracture oriented along a lineament. To the contrary, they asserted that a report entitled "Relationship Between Groundwater Flow and Uranium Mineralization in the Chadron Formation, Northwest Nebraska" (Ex. NRC-030) establishes Crow Butte's "uranium trend has been unequivocally described as a roll-front deposit."<sup>415</sup> The NRC Staff's witnesses also testified that "the orientation of the ore body is a function of its roll-front depositional history."<sup>416</sup>

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<sup>407</sup> Tr. at 1100-01.

<sup>408</sup> Ex. NRC-076-R2 at 27-28.

<sup>409</sup> Tr. at 1181.

<sup>410</sup> Ex. INT-043 at 2.

<sup>411</sup> *Id.*, fig. 2, at 5. Dr. LaGarry stated that he added the figure number, title, and red lines to an original map from Wyoming Fuels Company (Crow Butte's predecessor at the site). Tr. at 1199-1200.

<sup>412</sup> Tr. at 1199-1202.

<sup>413</sup> Ex. INT-043 at 4.

<sup>414</sup> *Id.* (citing Ex. INT-009, Letter from John Petersen to Gary Konwinski, Uranium Recovery Field Office, NRC (Apr. 4, 1989)).

<sup>415</sup> Ex. NRC-001-R at 42.

<sup>416</sup> Ex. NRC-076-R2 at 27.

Furthermore, the NRC Staff's witnesses claimed that Dr. LaGarry provided no technical support establishing that his red lines on the annotated water resources map either represent actual fractures or correspond to the lineaments identified in the License Area.<sup>417</sup> In addition, they asserted that Dr. LaGarry failed to use the available hard data provided by Crow Butte (e.g., aquifer pumping test results, borehole geophysical logs, and over 20 years of operational and monitoring data) to field-verify whether those red lines correspond to potential fractures.<sup>418</sup> To the same effect, Crow Butte's witnesses maintained that "nearly 11,000 drill holes completed across the permit area, aquifer tests, and other evidence do not support the presence of a fault or faults in the [License Area]."<sup>419</sup>

*b. Parties' Positions on Secondary Porosity/Permeability from Fracturing*

While none of the parties disputed the confining properties of the LCU,<sup>420</sup> Intervenor alleged that fractures within the UCU have the potential to transmit contaminants from the BC/CPF Aquifer to the Upper Brule Aquifer,<sup>421</sup> and, from there, to the White River alluvium.<sup>422</sup> Dr. LaGarry testified that his "concerns regarding the Crow Butte [R]esources ISL uranium mine are the lack of confinement resulting from secondary porosity in the form of faults and joints,"<sup>423</sup> adding that secondary porosity could allow constituents to migrate up from the Ore Zone into the Upper Brule Formation and, ultimately, to the land surface.<sup>424</sup> In this instance, Dr. LaGarry opined that lixiviant could be transmitted from the Ore Zone to the land surface by upward flow through areas of secondary porosity,<sup>425</sup> and that secondary porosity in the Brule Formation could transmit water up to 1500 feet per day through faults and cracks, and ultimately, toward the PRIR.<sup>426</sup>

Based on these claimed observations of outcrops of the BC/CPF and the overlying Middle Chadron (i.e., the lower unit of the UCU) more than 10 miles

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<sup>417</sup> *Id.* at 27-28.

<sup>418</sup> *Id.*

<sup>419</sup> Ex. CBR-045 at 13.

<sup>420</sup> Tr. at 1028.

<sup>421</sup> Ex. INT-013 at 3; Ex. INT-046 at 2-3; Ex. INT-047 at 2, 5; Tr. at 1120-22, 1173-74.

<sup>422</sup> Ex. INT-003 at 3.

<sup>423</sup> Ex. INT-013 at 2.

<sup>424</sup> *Id.*

<sup>425</sup> *Id.* at 6.

<sup>426</sup> *Id.* No Intervenor witness provided specific identification of fracturing in the License Area. Dr. LaGarry testified at the August 2015 hearing that this was because the License Area is privately controlled and, as a consequence, he had not been afforded access to the site to attempt such identification. Tr. at 1185.

northwest of the License Area,<sup>427</sup> Dr. LaGarry asserted that the secondary porosity of geologic strata due to fractures “is common in northwestern Nebraska,”<sup>428</sup> and that these fractures, generally oriented northwest to southeast and southwest to northeast, are a result of the uplift of the Black Hills of South Dakota.<sup>429</sup> Dr. LaGarry also opined that many of these fractures extend for tens of miles and that the alluvium deposited by rivers follows “fault zones because fractured rock erodes more easily.”<sup>430</sup> He also testified that detailed fieldwork in northwestern Nebraska and in adjacent South Dakota supports his assertions that faults and joints are ubiquitous throughout the region.<sup>431</sup>

As noted earlier,<sup>432</sup> Dr. LaGarry further opined that “the nature of the sedimentary rocks in this region is such that they may be loosely consolidated, poorly indurated [i.e., hardened], and in places one can work them with one’s hands,” resulting in these formations being described as “semi-consolidated.”<sup>433</sup> Dr. LaGarry added that it is entirely possible that the portions that were once consolidated are no longer so because, subsequent to the deposit being formed, local earthquakes could have fractured these zones.<sup>434</sup>

Dr. Kreamer, who supported Dr. LaGarry’s testimony, claimed that Crow Butte may have erred in assuming that the sand or sandstone in the ore-bearing body has no secondary porosity.<sup>435</sup> Providing additional support of Dr. LaGarry’s opinion, Mr. Wireman testified that the presence of the fracturing surrounding the License Area suggests the significant likelihood of extensive secondary porosity in the portion of the licensing area where Crow Butte conducts its mining operations.<sup>436</sup> Mr. Wireman further testified that the EA did not adequately characterize the secondary permeability of the UCU in order to quantify this value.<sup>437</sup> Mr. Wireman suggested that such a quantification of the hydraulic properties of the low-permeability UCU could be accomplished by using specialized coring techniques to assess the direction of fracturing, followed by a series of pumping tests in the UCU to measure directly the hydrologic parameters. At the same time, however, Mr. Wireman conceded that not only is oriented core

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<sup>427</sup> Ex. NRC-021 at 3; Tr. at 1076-77.

<sup>428</sup> Ex. INT-003 at 3.

<sup>429</sup> Ex. INT-013 at 2.

<sup>430</sup> *Id.* at 3.

<sup>431</sup> Ex. INT-043 at 3-4.

<sup>432</sup> *See supra* notes 52-53 and accompanying text.

<sup>433</sup> Tr. at 1035.

<sup>434</sup> Tr. at 1067.

<sup>435</sup> Ex. INT-069 at 3.

<sup>436</sup> Ex. INT-047 at 3.

<sup>437</sup> *Id.*

testing expensive, but it is unlikely to be successful in soft rock such as that which makes up the UCU at the License Area.<sup>438</sup>

According to the EA, the License Area is located within a triangular-shaped structural feature known as Crawford Basin.<sup>439</sup> The EA's only mention of secondary porosity is a reference to the fracturing of the overlying Upper Brule Aquifer — which allows it to serve as a usable water source outside the License Area.<sup>440</sup> Nevertheless, the NRC Staff's witnesses testified that they “found no evidence of faults or fractures at the [License Area] which could act as permeable pathways between the [BC/CPF Aquifer] and the White River [a]lluvium or the overlying [Upper] Brule [A]quifer,”<sup>441</sup> thereby ensuring the integrity of the UCU within the License Area. Moreover, the EA and the SER state that there is vertical hydrological confinement of the BC/CPF Aquifer in the License Area, as established by the site-specific and reproducible nature of five separate groups of physical evidence collected from this site,<sup>442</sup> which are described below.

(1) *Hydrological Characteristics of Confining Units* — EA § 3.5.2.3.2 describes the presence of thick, low-permeability clay and mudstone layers of the Upper Chadron and the lower portions of the Brule Formations that isolate the BC/CPF Aquifer from the overlying Upper Brule Aquifer.<sup>443</sup>

(2) *Aquifer Pumping Tests* — EA § 3.5.2.3.1 states that Crow Butte conducted four separate aquifer pumping tests covering the entire License Area between 1982 and 2002 in an attempt to establish the integrity of the confining layers over the BC/CPF Aquifer and that, in the estimation of the NRC Staff, these tests showed a lack of drawdown in the Upper Brule Aquifer and demonstrated that there is no hydrological connection between the overlying Upper Brule Aquifer and the BC/CPF Aquifer.<sup>444</sup>

(3) *Potentiometric Surfaces* — EA § 4.6.2.2.1 compares historical groundwater surfaces, beginning with the commencement of Crow Butte's mining activities. This comparison indicates that there has been little change in the potentiometric elevations in the Upper Brule Aquifer, while the po-

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<sup>438</sup> Tr. at 1122-24.

<sup>439</sup> EA § 3.4.2 at 40.

<sup>440</sup> *Id.* § 3.5.2.1 at 47-48.

<sup>441</sup> Ex. NRC-001-R at 22.

<sup>442</sup> *Id.* at 29-31. While reliance on the NRC Staff's groundwater modeling that had been performed to assess the confinement of the BC/CPF Aquifer within the License Area was abandoned by the NRC Staff's witnesses during the hearing, they claimed that this modeling was not essential to the EA's conclusion here. *See supra* notes 203-07 and accompanying text.

<sup>443</sup> EA § 3.5.2.3.2 at 51; Ex. NRC-001 at 29.

<sup>444</sup> EA § 3.5.2.3.1 at 50-51; LRA, fig. 2.7-8, at 2-203.

tentiometric surface of the BC/CPF Aquifer has decreased by about 47 feet.<sup>445</sup>

(4) *Aquifer Water Quality* — EA § 4.13.6.2 and SER § 2.4.3.2.2, which refer to water quality data in LRA Table 2.2-9, depict distinct differences in geochemistry between the wells screened in the Upper Brule Aquifer and those screened in the BC/CPF Aquifer, indicating that the two aquifers are hydraulically isolated.<sup>446</sup> The EA also notes that groundwater quality monitoring data from private wells in the Upper Brule and BC/CPF aquifers have consistently shown that neither aquifer exceeded background levels for radiological constituents.<sup>447</sup>

(5) *Operational and Monitoring Data* — EA § 3.5.2.3.2 and SER § 5.7.9.3.2 both state that, over the course of Crow Butte’s 20 years of mining operations, Crow Butte has monitored both groundwater and surface water and that the resulting data have not shown Crow Butte’s mining operations to have contaminated the surrounding or overlying aquifers.<sup>448</sup> They further state that, instead, these results demonstrate the continued isolation of the BC/CPF Aquifer over the period of Crow Butte’s mining operations given that (a) the only vertical excursions detected to date were associated with well installation issues, rather than from a lack of integrity of the confining layers;<sup>449</sup> and (b) monitoring results from private Upper Brule Aquifer wells, located within 1 mile of the License Area, exhibited no discernible trends and remained at preoperational levels.<sup>450</sup>

Witnesses for both Crow Butte and the NRC Staff conceded three regional studies (employing observations of surface outcrops) identified in Dr. LaGarry’s testimony indicated that fracturing and secondary porosity may be present in the Brule Formation throughout the region.<sup>451</sup> Nevertheless, they asserted such fracturing is insignificant with respect to the containment characteristics of the UCU within the License Area<sup>452</sup> because (1) none of the three studies were conducted within the License Area; and (2) there is no “measured, reproducible site data” demonstrating the existence of significant fractures that connect dif-

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<sup>445</sup> EA § 4.6.2.2.1 at 87-88; *see also* SER § 3.1.3.5.6 at 61.

<sup>446</sup> EA § 4.13.6.2 at 128; SER § 2.4.3.2.2 at 41; *see also* LRA, tbl. 2.2-9, at 2-28.

<sup>447</sup> EA § 4.6.2.2.6 at 94.

<sup>448</sup> *Id.* § 3.5.2.3.2 at 51; SER § 5.7.9.3.2 at 143.

<sup>449</sup> EA § 3.5.2.3.2 at 51; SER § 5.7.9.3.2 at 143; *see also infra* Section III.E.1.a, Parties’ Positions on Operational Groundwater Impacts from Excursions, at pp. 350-55; Section III.E.2.a, Board’s Findings on Operational Groundwater Impacts from Excursions, at pp. 356-57.

<sup>450</sup> Ex. NRC-001-R at 31; EA § 4.6.2.2.6 at 94.

<sup>451</sup> Ex. NRC-001-R at 34; Ex. CBR-045 at 7.

<sup>452</sup> Ex. NRC-001-R at 34; Ex. CBR-045 at 7.

ferent strata.<sup>453</sup> While we address in detail below the probative value of this evidence,<sup>454</sup> it is sufficient at this point to note that there is adequate evidence to support the claims of the NRC Staff and Crow Butte that fractures within the UCU (if any) in the License Area are not sufficiently transmissive to impact the water quality of the overlying Upper Brule Aquifer.

Crow Butte's witnesses agreed it is likely that secondary porosity is present in the Brule Formation throughout the region, but they maintained that the field data it has collected from within the License Area strongly suggest the License Area has both hydraulic isolation and a competent UCU.<sup>455</sup> As a result, Crow Butte's witnesses opined that fracturing of the UCU, if any, has not resulted in significant groundwater flow pathways between the BC/CPF Aquifer and any overlying aquifers.<sup>456</sup> Accordingly, they concluded that "while faults and joints may exist at a regional level, there is no evidence of the existence of faults or fractures at the [License Area] that affect confinement or transmit mining liquids."<sup>457</sup> Crow Butte's witnesses also asserted that if any minor fractures were to appear, they would close up quickly (i.e., be essentially self-sealing) as a result of overburden pressure from the weight of overlying strata.<sup>458</sup>

As previously discussed,<sup>459</sup> witnesses for both Crow Butte and the NRC Staff have characterized the UCU as containing significant swelling, low-permeability, montmorillonite clays that are not brittle and are "self-healing" so that they would not tend to undergo any permanent changes in secondary porosity under seismic ground motions.<sup>460</sup> This is based on particle size distribution analyses of the UCU (indicating mostly silt and clay-sized fractions) and on observations made during pervasive geophysical logging (indicating very thick sequences of predominantly fine-grained materials). Accordingly, Crow Butte's witnesses asserted that the UCU is significantly less permeable than the BC/CPF and, given its substantial thickness, is essentially impermeable, absent preferential flow paths (e.g., fractures).<sup>461</sup> Dr. LaGarry, however, disputed this characterization of the UCU, testifying that where the Chadron Formation portion of the UCU outcrops approximately 15 miles northwest of the License Area, he observed slickensides (i.e., a smoothly polished surface caused by frictional movement

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<sup>453</sup> Ex. NRC-001-R at 34.

<sup>454</sup> See *infra* Section IV.C.1, Hydraulic Communication between the BC/CPF Aquifer and Upper Aquifers, at pp. 392-96.

<sup>455</sup> Ex. CBR-045 at 6-7.

<sup>456</sup> *Id.* at 7.

<sup>457</sup> *Id.*

<sup>458</sup> *Id.* at 6-7.

<sup>459</sup> See *supra* Section II.B.3.b, Composition of the UCU, at pp. 292-94.

<sup>460</sup> Ex. CBR-001 at 14-15; see also Ex. NRC-001 at 111.

<sup>461</sup> Ex. CBR-001 at 14-15.

between rocks along the two sides of faults) — indicating that these fractures have not yet healed.<sup>462</sup>

Even were Dr. LaGarry correct that there are isolated faults or joints in the vicinity of the License Area, the NRC Staff's witnesses testified there is enough swelling of the UCU's 200- to 500-foot-thick saturated bentonitic and montmorillonite clays to prevent any isolated fractures from forming a continuous pathway,<sup>463</sup> and accordingly, there would be insufficient secondary porosity to allow the vertical transmission of constituents out of the Ore Zone.<sup>464</sup> In this regard, the NRC Staff's witnesses also highlighted a point made earlier<sup>465</sup> — that the UCU is continuous over the License Area, based on Crow Butte's cross-sectional survey data.<sup>466</sup>

Finally, the NRC Staff's witnesses reiterated that, even were it possible for constituents to migrate to other aquifers, Crow Butte is required to “maintain an overall inward gradient in all mine units,” until restoration is complete,<sup>467</sup> thereby creating a cone of depression in the potentiometric level that draws groundwater toward the interior of the wellfield.<sup>468</sup> This required inward gradient must have sufficient strength to prevent the movement of mined liquids outside of the License Area.<sup>469</sup> Furthermore, this inward gradient must continue to be maintained until the mine unit is restored either to background maximum contaminant levels, or to an alternative concentration limit, whichever is higher.<sup>470</sup>

To the same effect, Crow Butte's witnesses opined that “the presence of a fault or joint does not necessarily mean there is a hydraulic connection created. Faults and joints may be barriers to groundwater flow, or neutral (i.e., do not significantly affect groundwater flow), depending on the degree of offset and character of the material that fills the fault/joint.”<sup>471</sup> Along the same lines, there is no dispute among the parties that, as applied to a specific feature, the central concern is not the mere presence of cracks in the formation, but rather the transmissivity of the fractured strata.<sup>472</sup> Moreover, Dr. LaGarry conceded that, even if the UCU were fractured to some extent, the degree to which such a fracture

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<sup>462</sup> Tr. at 1076, 1180.

<sup>463</sup> Ex. NRC-001-R at 35.

<sup>464</sup> *Id.*; Ex. NRC-076-R2 at 39.

<sup>465</sup> *See supra* Section II.B.3.a, Extent of the UCU, at pp. 291-92.

<sup>466</sup> Ex. NRC-076-R2 at 39.

<sup>467</sup> Ex. NRC-012 at 8 (License Condition 10.7).

<sup>468</sup> EA § 4.6.2.2.1 at 88; Ex. NRC-001-R at 21.

<sup>469</sup> Ex. NRC-076-R2 at 72.

<sup>470</sup> Tr. at 2596.

<sup>471</sup> Ex. CBR-045 at 5.

<sup>472</sup> Ex. CBR-001 at 23-25; Ex. NRC-095 at 22; Tr. at 1187, 1192.

serves as a preferential pathway can only be confirmed by direct observation.<sup>473</sup> Meanwhile, Crow Butte's witnesses maintained their data and experience with the License Area indicate that (1) there is no continuous permeable pathway between aquifers within the License Area;<sup>474</sup> and (2) processing liquids and other mobilized constituents from Crow Butte's mining operations are confined by the UCU of the Middle and Upper Chadron Formation and by the Lower Brule Formation.<sup>475</sup>

*c. Parties' Positions on Brule Aquifer Water Levels During Mining*

Intervenors' witness Dr. Kreamer testified that there are numerous monitoring wells showing a drawdown in the Upper Brule Aquifer as a result of Crow Butte's pumping of the Ore Zone in the BC/CPF Aquifer.<sup>476</sup> There is no record evidence, however, that the water level in even one of these monitoring wells had been lowered as a direct result of Crow Butte's mining activities. Specifically, Crow Butte's witnesses disputed Dr. Kreamer's water level drawdown claim by presenting monitoring well data taken biweekly from over 200 wells during the operation and restoration of each Crow Butte mine unit.<sup>477</sup> These data, first presented in the LRA itself, indicate that the potentiometric surface of the BC/CPF Aquifer ranges from approximately 3690 to 3750 feet, while the water surface in the Upper Brule Aquifer ranges from approximately 3830 to 3970 feet, i.e., an average difference in potentiometric levels in excess of 100 feet.<sup>478</sup> Crow Butte's witnesses opined that this large difference in potentiometric levels demonstrates the two aquifers are hydraulically isolated from each other because, for significant hydrologic communication to be present, the potentiometric levels in the two aquifers would be expected to be much closer in elevation.<sup>479</sup>

Crow Butte's witnesses also maintained that the data Crow Butte collected from the License Area over the past 20-plus years established that water levels in the Upper Brule Aquifer were not lowered due to inadequate confinement of the BC/CPF Aquifer.<sup>480</sup> To support this assertion, they point to hydrographs (i.e., plots of water levels over time) for ten wells (which were set forth in Ex. CBR-063 to Ex. CBR-065) spaced across the License Area (as shown on

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<sup>473</sup> Tr. at 1179.

<sup>474</sup> Ex. CBR-045 at 6-7.

<sup>475</sup> *Id.* at 6.

<sup>476</sup> Ex. INT-079 at 10.

<sup>477</sup> Ex. CBR-001 at 15-17.

<sup>478</sup> *Id.* at 16 (citing LRA, tpls. 2.7-5 to 2.7-6, at 2-197-99; *id.*, figs. 2.7-3d to 2.7-4d, at 2-179-89).

<sup>479</sup> Ex. CBR-001 at 16.

<sup>480</sup> Ex. CBR-067 at 6; Ex. CBR-074 at 5.

Ex. CBR-066) that, according to Crow Butte's witnesses, demonstrated constant water table elevation for the Upper Brule Aquifer over Crow Butte's 20 years of operation in the License Area.<sup>481</sup>

For instance, Crow Butte offered hydrographs for SM7-17 and SM7-22<sup>482</sup> (i.e., Upper Brule Aquifer monitoring wells near to and overlying the active mining area for Mine Unit 7, which first began operating in 1999) that encompass the period from 1999 to 2015.<sup>483</sup> Crow Butte's witnesses argued these hydrographs support their opinion that little variation exists in the water levels in the Upper Brule Aquifer,<sup>484</sup> with average elevations of 3850 feet for SM7-17, and 3844 feet for SM7-22.<sup>485</sup> It was Dr. Kreamer's opinion that Crow Butte's hydrographs were not definitive because there could have been rapid declines in the potentiometric levels before 1999.<sup>486</sup> Specifically, Dr. Kreamer asserted that there is an early critical period for which Crow Butte produced no data, i.e., between 1991 (when mining activities began in Mine Unit 1) and 1999 (when Crow Butte's first hydrograph data were apparently recorded in Mine Unit 7).<sup>487</sup> Dr. Kreamer opined, as did Mr. Wireman, that there may have been a drawdown of 40 feet or more in the Upper Brule Aquifer before the period monitored by the hydrographs.<sup>488</sup>

Witnesses for both Crow Butte and the NRC Staff disputed this, asserting that operations in Mine Unit 7 did not start until 1999, and that these hydrographs do in fact date from the first time pumping was activated for this mine unit.<sup>489</sup> As such, they assert, these hydrographs demonstrate that water levels in the Upper Brule Aquifer have not been affected by Crow Butte's pumping in the Ore Zone — which commenced with the start of production and has continued for decades thereafter.<sup>490</sup> In addition, Intervenors could offer no explanation for how the large volume of water that would be required to lower the water table in the unconfined Upper Brule Aquifer by 40 feet (or more) could have moved through at least 100 feet of the UCU's low permeability aquitard and then recharged the

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<sup>481</sup> Ex. CBR-067 at 6; Ex. CBR-074 at 5.

<sup>482</sup> Ex. CBR-063-R, Cameco Resources, Inc., Crow Butte Operation, Water Level of SM 7-17 (undated); Ex. CBR-064-R, Cameco Resources, Inc., Crow Butte Operation, Water Level of SM, at 7-22 (undated).

<sup>483</sup> Ex. NRC-105, Map of Crow Butte License Boundary and Mine Units (undated); LRA, tbl. 1.7-1, at 1-13.

<sup>484</sup> See generally Ex. CBR-063-R; Ex. CBR-064-R.

<sup>485</sup> See generally Ex. CBR-063-R; Ex. CBR-064-R.

<sup>486</sup> Ex. INT-079 at 10-11.

<sup>487</sup> *Id.*

<sup>488</sup> Tr. at 1786-88; Ex. INT-081 at 2.

<sup>489</sup> Ex. NRC-103 at 4-5; Ex. CBR-074 at 6.

<sup>490</sup> Ex. NRC-103 at 4-5; Ex. CBR-074 at 6.

lowered potentiometric level of the BC/CPF during the first few years of mining — particularly in light of the apparent absence of any suggestion of drawdown during the subsequent 16 years of Crow Butte’s mining in the License Area.

Crow Butte’s witnesses further testified that, were these two aquifers hydraulically connected, additional drawdown in wells within another mine unit’s radius of influence would be expected to occur as new mining areas came on-line.<sup>491</sup> Instead, they claim, the relatively narrow band of water level readings (i.e., only a few feet of change in either direction) indicates that any variations are likely due to temporal weather patterns in the area rather than to Crow Butte’s mining operations.<sup>492</sup> In accord with this testimony of Crow Butte’s witnesses, the EA states there is no evidence that water levels in the overlying Upper Brule Aquifer have been impacted by mining activities in the BC/CPF.<sup>493</sup>

Intervenors’ witnesses also attempted to attribute the gradually rising water levels in the Upper Brule Aquifer to Crow Butte’s termination of its pumping operations in areas that are hydraulically connected to the Ore Zone within the BC/CPF Aquifer.<sup>494</sup> For instance, Mr. Wireman opined that the increase in water level in wells SM7-17 and SM7-22<sup>495</sup> (which occurred between 2008 and 2012) could be a result of stopping or reducing mining operations in the vicinity of these two wells, and thus is another indication that pumping in the Ore Zone within the BC/CPF Aquifer affects the water level in the Upper Brule Aquifer.<sup>496</sup> Dr. Kreamer supported Mr. Wireman’s opinion on this point.<sup>497</sup>

Crow Butte’s witnesses disputed this, however, testifying that, because the mine units (Mine Units 7 and 9) associated with these wells are still in operation, they could not be implicated in this apparent rise in water level.<sup>498</sup> Similarly, the NRC Staff’s witnesses asserted that if Mr. Wireman were correct that the effects of mining activities are reflected in the hydrographs, then these water level graphs would have shown an increased drawdown at the beginning of the mining activities — which, they assert, was not the case.<sup>499</sup>

Dr. Kreamer also claimed that the Upper Brule Aquifer water levels in SM08-006<sup>500</sup> showed steady or rising levels of 2 feet in the period of November 2013

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<sup>491</sup> Ex. CBR-067 at 5.

<sup>492</sup> *Id.*

<sup>493</sup> EA § 4.13.6.2.2 at 131.

<sup>494</sup> Ex. INT-082-R, Rebuttal Statement of Dr. David K. Kreamer, at 1-2 (Sept. 28, 2015).

<sup>495</sup> Ex. CBR-063-R; Ex. CBR-064-R.

<sup>496</sup> Ex. INT-081 at 3.

<sup>497</sup> Ex. INT-079 at 10-11.

<sup>498</sup> Tr. at 1091-92.

<sup>499</sup> Ex. NRC-103 at 5 (citing Ex. CBR-063-R; Ex. CBR-064-R).

<sup>500</sup> Ex. BRD-010L, Letter from Larry Teahon, Safety, Health, Environment, and Quality Manager,  
(Continued)

through March 2014, and that this rise cannot be correlated with weather conditions.<sup>501</sup> Crow Butte's witness Mr. Lewis testified that it can take months, or even years, for rainfall to percolate through the soil (much of which is clay) into the underlying aquifer, especially given the distance from the recharge area for the Upper Brule Aquifer to the License Area and the low-permeability clay content in some portions of this formation.<sup>502</sup> As such, Mr. Lewis stated that an immediate response to those precipitation events is unlikely due to the significant lag between a rainfall event and changes in the underlying water table.<sup>503</sup> Therefore, Mr. Lewis maintained that it would be incorrect to rule out the lack of correlation with weather conditions as contributing to rising water levels in the Upper Brule Aquifer.<sup>504</sup>

To indicate mining impacts on the Upper Brule Aquifer, Dr. Kreamer and Mr. Wireman compared the premining Upper Brule Aquifer water level of Well #11 (Ex. BRD-008A)<sup>505</sup> with the post-mining level of Well #11 by interpolating contour mapping of estimated 2008 water levels (Ex. BRD-008B). From this, they opined that the Upper Brule Aquifer experienced up to 40 feet of draw-down, which they attributed to a lack of confinement.<sup>506</sup> Witnesses for Crow Butte disputed this interpretation of the data, noting that (1) the premining values for the Upper Brule Aquifer are based on a limited data set from private wells surrounding the License Area; and (2) there is minimal information regarding the depth and construction of some of the subject wells.<sup>507</sup> Crow Butte's witnesses further testified that, because deeper screened private wells can have water levels that are significantly different from water levels measured in shallow wells, the differences in water levels that Intervenors noted should not be misinterpreted as representing significant changes in potentiometric head (i.e., the vertical distance that a groundwater level will rise above a selected elevation) over time when compared with more recent water levels from shallow wells screened in consistent locations.<sup>508</sup> Crow Butte's witnesses concluded that Crow

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Crow Butte, to Document Control Desk, NRC (May 23, 2014), attach., Water Level of SM08-006, at 4 (May 21, 2014).

<sup>501</sup> Ex. INT-082-R at 1-2.

<sup>502</sup> Tr. at 2482-83.

<sup>503</sup> *Id.*

<sup>504</sup> Tr. at 2482-84.

<sup>505</sup> Ex. BRD-008A is an annotated version of LRA, fig. 2.7-3a, at 2-173. See Ex. BRD-008A, Crow Butte Resources, Inc., Annotated Figure 2.7-3a, Regional Water Level Map Brule Formation 1982-1983 (undated).

<sup>506</sup> Tr. at 1786-88.

<sup>507</sup> Ex. CBR-067 at 6.

<sup>508</sup> *Id.*

Butte's biweekly readings are far more reliable for a consistent comparison of water levels at a particular point over time.<sup>509</sup>

The NRC Staff's witnesses also disputed Dr. Kreamer's and Mr. Wireman's interpretation of Well #11 water level readings by asserting that the premining data for Well #11 (set forth in Table 2.7-5 of the LRA),<sup>510</sup> consists of twelve water level measurements collected between January and December 1982, and that those measurements vary only between 3830 and 3834 feet.<sup>511</sup> From this, the NRC Staff's witnesses opined that the water level of 3883.7 feet assigned to Well #11 (shown in Figure 2.7-3a of Ex. BRD-008A) is almost certainly a transposition error (i.e., the correct value is likely 3838.7 feet, which would be an elevation consistent with water level readings throughout the 11 years of data presented in LRA Table 2.7-5).<sup>512</sup> The NRC Staff's witnesses stated that their hypothesis of a transposition error for Well #11 is further supported by the average hydrograph reading for SM7-22<sup>513</sup> (i.e., the well closest to Well #11), which is about 3844 feet (i.e., nearly identical to the likely transposed, water level of 3838.7 feet for Well #11).<sup>514</sup>

Even though there are sparse premining data, the NRC Staff's witnesses compared Crow Butte's data for two other well pairs to test whether the Upper Brule Aquifer has been impacted by mining activities.<sup>515</sup> The first well pair concerns Well #27 (water level: 3808.2 feet)<sup>516</sup> and nearby Well #5-30 (water level: 3806.3 feet), which closely matches the 2008 contour intervals in this same area.<sup>517</sup> The second well pair concerns PM-6 and PM-7. For this well pair, the NRC Staff's witnesses compared the premining water levels recorded in each well for Crow Butte's first pumping test.<sup>518</sup> They noted that these 1983 values (i.e., 3843.5 feet for PM-6 and 3845.9 feet for PM-7)<sup>519</sup> were very similar

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<sup>509</sup> *Id.*

<sup>510</sup> LRA, tbl. 2.7-5, at 2-197.

<sup>511</sup> Ex. NRC-095 at 3.

<sup>512</sup> *Id.*

<sup>513</sup> *See* Ex. CBR-064.

<sup>514</sup> Ex. NRC-095 at 3 (citing Ex. BRD-008B, Crow Butte Resources, Inc., Annotated Figure 2.7-3b, Current License Area Water Level Map — Brule Formation (2008)).

<sup>515</sup> *Id.*

<sup>516</sup> Ex. NRC-096-R, Crow Butte Resources, Inc., Annotated Figure 2.7-3a, Regional Water Level Map Brule Formation 1982-1983 (undated) & Annotated Figure 2.7-3b, Current License Area Water Level Map — Brule Formation (2008) at 1 (Well #27 is indicated by the green box on page 1 of this exhibit).

<sup>517</sup> *Id.* at 2 (Well #5-30 is indicated by the green box on page 2 of Ex. NRC-096-R).

<sup>518</sup> *See* Ex. NRC-103 at 3.

<sup>519</sup> Ex. BRD-002A at 2.7A(5).

to the 2008 elevations measured in the same area.<sup>520</sup> In addition, the NRC Staff's witnesses opined that Crow Butte's mining had not affected the Upper Brule Aquifer<sup>521</sup> because its water level measured in 2008<sup>522</sup> at the location for well BMW-1<sup>523</sup> was very similar to the premining level measured immediately before Crow Butte initiated Aquifer Test #2 in 1987.<sup>524</sup> In the opinion of the NRC Staff's witnesses, these data demonstrate that Crow Butte's mining activities have not impacted water levels in the Upper Brule Aquifer and that this aquifer is hydraulically isolated from the Ore Zone in the BC/CPF Aquifer within the License Area.<sup>525</sup>

In his testimony, Mr. Wireman claimed that groundwater levels in the Upper Brule Aquifer have not been adequately monitored to determine if there is a long-term trend of water levels declining as a result of lowering the potentiometric surface of the underlying BC/CPF Aquifer.<sup>526</sup> Crow Butte's witnesses disputed Mr. Wireman's allegations, claiming that, from the time it commenced mining operations in the License Area, Crow Butte has maintained more than 200 shallow monitoring wells in the Upper Brule Aquifer<sup>527</sup> and has collected water level data every 2 weeks from each such well.<sup>528</sup> Moreover, in accordance with its NDEQ Class III UIC permit, Crow Butte has collected groundwater monitoring data before it commenced mining, during its mining operations, and during its restoration of each mine unit.<sup>529</sup> While Mr. Wireman maintained that there have been far too few monitoring wells measured to detect long-term water level trends in the Upper Brule Aquifer,<sup>530</sup> he did not explain why Crow Butte's 200 wells have been insufficient, nor did he point to any other specific inadequacies in Crow Butte's program.

## **2. Board Findings on the Integrity of the UCU**

In regards to the integrity of the UCU, we make findings on the three major

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<sup>520</sup> See Ex. NRC-096-R at 2 (relevant area indicated by magenta circle, which is the NRC Staff's annotation of Ex. BRD-008B); see also Ex. NRC-095 at 30.

<sup>521</sup> Ex. NRC-103 at 3.

<sup>522</sup> Ex. NRC-104, Crow Butte Resources, Inc., Annotated Figure 2.7-3a, Regional Water Level Map Brule Formation 1982-1983, at 2 (undated).

<sup>523</sup> *Id.*

<sup>524</sup> See Ex. BRD-002B-R.

<sup>525</sup> Ex. NRC-095 at 5; Ex. NRC-103 at 3.

<sup>526</sup> Ex. INT-081 at 1.

<sup>527</sup> Ex. CBR-074 at 5.

<sup>528</sup> *Id.*

<sup>529</sup> Ex. CBR-001 at 34-35.

<sup>530</sup> Ex. INT-081 at 1.

topics raised by Intervenors: (1) whether lineaments are associated with the fracturing of the UCU; (2) whether secondary porosity and increased communication through the UCU are associated with fracturing; and (3) whether changes in the groundwater levels in the Upper Brule Aquifer are associated with pumping from mining operations, and concomitantly, whether this is an indicator of degraded confinement provided by the UCU.

*a. Board Findings on Lineaments*

Intervenors' evidence regarding mapped lineaments within the License Area was not contested by witnesses for Crow Butte or the NRC Staff, and we accept it as establishing that lineaments exist within the region that encompasses the License Area. The issue posed by this contention, however, is not whether these lineaments exist, but rather whether such lineaments were caused by a fracture and whether those lineaments are transmissive. In this regard, there is no credible record evidence that these mapped lineaments are transmissive — as fracturing is only one of the many potential reasons for the presence of these straight-lined features. As Dr. LaGarry agreed, his aerial photographic interpretation technique is not a conclusive indication of fracturing in the License Area because it was not accompanied either by field verification through visual observation of stratigraphic outcrops or by geologic explorations.<sup>531</sup> Accordingly, we find that whether lineaments within the License Area are a result of geologic fracturing and whether these fractures are transmissive will be inferred by the actual confinement characteristics of the UCU, which is discussed in the immediately succeeding section.

*b. Board Findings on Secondary Porosity/Permeability from Fracturing*

We find that there is no record evidence of fractures in the UCU within the License Area that are sufficiently significant to impair the confinement properties of the UCU. Intervenors offered evidence of such fracturing only in outcrops distant from the License Area. In contradistinction to this, we find that the borehole analyses by Crow Butte establish the absence of transmissive fractures in the UCU within the License Area.

In addition, we find that there is sufficient evidence to demonstrate that the UCU provides adequate confinement of the BC/CPF within the License Area. This evidence includes our evaluation of (1) the results of Crow Butte's aquifer pumping tests;<sup>532</sup> (2) geophysical data, geological descriptions, particle size dis-

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<sup>531</sup> Ex. INT-043 at 2; Tr. at 1175-79.

<sup>532</sup> *Supra* Section III.C.2, Board Findings on Aquifer Pumping Tests, at pp. 329-30.

tribution testing, soil mineralogy, and soil core permeability testing from UCU samples obtained from the boreholes made for installation of the piezometers in the UCU and LCU during pumping test #2;<sup>533</sup> and (3) geochemical data, hydraulic gradients, and operations data from the network of monitoring wells installed by Crow Butte. As a result, we find that the geochemical data indicate the groundwater in the Upper Brule Aquifer and the BC/CPF Aquifer is different. Likewise, we find that the groundwater potentiometric data indicate that there is hydraulic isolation of the BC/CPF from the Upper Brule Formation. Additionally, we find that, during Crow Butte's mining and restoration operations, vertical groundwater gradients are downward, thus preventing the migration of groundwater from the BC/CPF Aquifer upward into the Upper Brule Aquifer.<sup>534</sup> We find that this overwhelming evidence also includes (1) the presence of a thick layer of low-permeability clay/claystone within the UCU; (2) the lack of drawdown in the Upper Brule Aquifer during pumping tests; (3) historic and current differences in the potentiometric surface behaviors/responses of the BC/CPF and the Upper Brule aquifers; (4) unique stable signatures of water quality between the BC/CPF and the Upper Brule Aquifer; and (5) lack of data to suggest there has been any impact on the Upper Brule Aquifer water quality that would be associated with leakage from the BC/CPF, despite over 20 years of monitoring data from Crow Butte's excursion monitoring wells and from nearby private wells.<sup>535</sup>

We find that Intervenors' claims are largely suppositions based on regional geology with no specific indications from onsite data to support their interpretation that fracturing caused any lineaments that may be present within the License Area. We further find that Intervenors failed to counter record evidence offered by the NRC Staff and Crow Butte that demonstrated the absence of such features at the License Area. In contrast, based on the NRC Staff's and Crow Butte's description of the cuttings and geophysical surveys, which Intervenors did not dispute, we find that, even if such cracks are present, either the plastic, nonlithified strata would tend to heal by the nature of the swelling clays or any openings that briefly arose would quickly close due to the high vertical stresses from the weight of 130 to 480 feet of overburden layers.<sup>536</sup> Accordingly, we find that the geologic conditions in the License Area support the lack of transmissive fractures in the UCU there.

Intervenors' witnesses also testified that "the nature of the sedimentary rocks in this region is such that they may be loosely consolidated, poorly indurated, and in places one can work them with one's hands," and are not composed of

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<sup>533</sup> Ex. BRD-002B-R at 2.7-17, 2.7-24.

<sup>534</sup> Ex. CBR-045 at 21-22; Tr. at 1236-38.

<sup>535</sup> Ex. NRC-001-R at 28.

<sup>536</sup> EA § 3.4.1.6 at 39; Ex. CBR-001 at 21.

brittle material that is susceptible to fracturing.<sup>537</sup> Where this soil-like condition exists, the Board finds it is unlikely that the UCU is sufficiently fractured to transmit significant quantities of liquids that could produce adverse impacts to groundwater quality. In those zones where the UCU is harder, and hence sufficiently brittle to fracture, it is still unlikely that large quantities of liquid could be transmitted because, as mentioned, the applied stress from the overburden material and the high content of active clays present in the strata would help heal any such fractures.

*c. Board Findings on Brule Aquifer Water Levels During Mining*

While Crow Butte's 1983 water level contour map for the Upper Brule Aquifer was based on relatively sparse preoperational data,<sup>538</sup> we find that there now are sufficient water level data covering the mining and restoration periods in the License Area to justify the EA's conclusion that Crow Butte's mining operations within the License Area have not caused a lowering of the potentiometric levels in the Upper Brule Aquifer.<sup>539</sup>

In particular, Crow Butte has maintained over 200 monitoring wells in the Upper Brule Aquifer and has monitored them every 2 weeks while wells in each of its mine units are operating.<sup>540</sup> This plethora of available water level data shows that there has been little drawdown in the Upper Brule Aquifer from the time mining operations began at the License Area.<sup>541</sup> We find that the data from these monitoring wells demonstrate Crow Butte's mining and restoration operations are not having an effect on the water levels of the Upper Brule Aquifer because there has been no sustained downward trend in water levels in the Upper Brule Aquifer that can be correlated to Crow Butte's drawdown of the underlying BC/CPF Aquifer. While Intervenors have called for more wells, and we do not dispute that additional monitoring wells might yield useful information about long-term water level trends in the Brule Aquifer, there is no record evidence establishing that the absence of such additional monitoring wells renders the EA's water level findings deficient.

Insofar as Intervenors' witnesses presented data to suggest there had been some lowering of the Upper Brule Aquifer water levels during the past 20-plus years, none of those data is necessarily tied to Crow Butte's mining operations in the License Area. For instance, Mr. Wireman claimed that since Crow Butte

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<sup>537</sup> Tr. at 1035.

<sup>538</sup> See LRA, fig. 2.7-3a, at 2-173.

<sup>539</sup> EA § 4.6.2.2.1 at 88; *id.* § 4.13.6.2.2 at 130; *id.* § 4.13.6.2.3 at 132.

<sup>540</sup> Ex. CBR-001 at 36; Ex. CBR-074 at 5.

<sup>541</sup> Ex. CBR-067 at 6; Ex. CBR-074 at 5; *see also* EA § 3.5.2.3.1 at 50-51; LRA, fig. 2.7-8, at 2-203.

began mining operations, there had been a 40-foot drop in the Brule water levels.<sup>542</sup> Upon closer examination, however, it becomes clear that Mr. Wireman's claim was based on one data point that was almost certainly the result of a transposition error<sup>543</sup> — an explanation that Intervenors conceded was a reasonable possibility.<sup>544</sup> Similarly, while Dr. Kreamer asserted that numerous wells showed drawdown in the Upper Brule Aquifer in the period beginning with Crow Butte's preoperational levels in 1982 up through its operational levels in 2008,<sup>545</sup> Intervenors' witness did not supply any plausible analysis either that an actual drawdown exists or that Crow Butte's mining operations in the License Area have caused or contributed to any such drawdown in these wells.<sup>546</sup> We also find that Intervenors' witnesses' interpolations of contour maps presented in conjunction with their testimony are insufficiently precise for reasonably estimating drawdown by comparing water levels at selected time intervals. Instead, we find that a far more accurate method of measuring drawdown (and hence, of demonstrating upper aquifer behavior) is to use the actual levels that Crow Butte recorded in individual monitoring wells. And, we find that the actual recorded levels of the individual wells confirm the EA's assertion that there has been no drawdown in the Upper Brule Aquifer due to Crow Butte's pumping from the BC/CPF Aquifer during its mining operations.

In summary, we find there is no credible evidence that the water levels in the Upper Brule Aquifer have dropped significantly during the more than 20 years of Crow Butte's mining operations at the License Area, much less that such mining operations have impacted those water levels.

### **E. Operational Groundwater Quality Impacts**

Groundwater impacts can occur from spills and leaks seeping into the ground, from vertical and horizontal excursions of mining liquids, and from excessive consumptive use of aquifer resources.<sup>547</sup> Crow Butte's groundwater monitoring includes excursion monitoring for each mine unit. It also includes regional monitoring to ensure that Crow Butte's mining operations do not adversely impact private groundwater use surrounding the License Area.<sup>548</sup> We discuss immediately below the impacts from excursions, including the monitoring, controls, and corrective measures that Crow Butte has implemented to minimize potential im-

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<sup>542</sup> Tr. at 1798.

<sup>543</sup> Tr. at 1983-94.

<sup>544</sup> Tr. at 2437-38.

<sup>545</sup> Ex. INT-079 at 10.

<sup>546</sup> Tr. at 2557.

<sup>547</sup> EA § 4.6.2.2 at 87.

<sup>548</sup> *Id.* § 4.6.2.2.4 at 91; *id.* § 4.6.2.2.6 at 94.

pacts to private groundwater wells. In subsequent sections of this Partial Initial Decision, we address the potential impacts from spills and leaks on surface water features (in conjunction with our resolution of Contention C),<sup>549</sup> as well as the potential impacts on aquifer water levels and water quality from consumptive use (in our resolution of Contentions 6 and 9).<sup>550</sup>

### ***1. Parties' Positions on Operational Groundwater Impacts***

#### ***a. Parties' Positions on Operational Groundwater Impacts from Excursions***

##### **(i) EXCURSION CONTROL AND MONITORING**

During mining operations, excursions of lixiviant and processing liquids may occur either vertically from breaches in the UCU or horizontally from processing liquids escaping the mine unit wellfields. The EA, as well as the NRC Staff's witnesses' testimony, maintains that, because the UCU separating the BC/CPF Aquifer and the Upper Brule Aquifer is composed of a thick competent sequence of low-permeability clays, mudstones, and siltstones, the integrity of the UCU<sup>551</sup> mitigates the possibility of vertical migration up through the UCU.<sup>552</sup>

As for horizontal excursions, Crow Butte's witnesses testified that its mining operations include the development of inward gradients to help assure that all mining liquids are collected and pumped to Crow Butte's onsite processing plant.<sup>553</sup> To verify field performance during operation, Crow Butte has established a wellfield monitoring program to detect and correct an excursion, as required by License Condition 11.5.<sup>554</sup>

Based on the potential for groundwater impacts from excursions of mining liquids beyond the operating wellfield within the License Area, whether horizontally within the BC/CPF or vertically into the Upper Brule Aquifer, Crow Butte's witnesses stated that Crow Butte developed a groundwater monitoring program to identify potential impacts to groundwater resources, not only in the License Area, but also in the nineteen private wells that are within a 1-mile

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<sup>549</sup> See *infra* Section IV.B.2.a, Board Findings on Operational Surface Water Impacts and Monitoring, at pp. 387-89.

<sup>550</sup> See *infra* Section IV.E.2, Board Findings on Short-Term NEPA Impacts from Consumptive Groundwater Use During Restoration, at pp. 410-11; Section IV.F.2, Board Findings on Failure to Address Groundwater Restoration Mitigation Measures, at pp. 419-21.

<sup>551</sup> We have previously discussed the integrity of the UCU at *supra* Section III.D, Integrity of the UCU, at pp. 331-49.

<sup>552</sup> Ex. NRC-001-R at 22 (citing EA § 3.5.2.3.2 at 51).

<sup>553</sup> Ex. CBR-001 at 41-42.

<sup>554</sup> EA § 4.6.2.2.4 at 91; Ex. NRC-012 at 12 (License Condition 11.5).

radius of the perimeter of the License Area.<sup>555</sup> This groundwater monitoring program was designed to (1) establish the baseline water quality of monitoring wells prior to mining at each unit; (2) detect excursions of lixiviant either horizontally or vertically outside of the Ore Zone within the License Area; and (3) determine when the BC/CPF Aquifer (which includes the Ore Zone) has been adequately restored following mining.<sup>556</sup>

Crow Butte's witnesses testified that, in order to limit the potential for these inadvertent releases, Crow Butte monitored for several parameters: production, injection rates, injection volumes, wellhead pressure, water levels, and water quality.<sup>557</sup> They also testified that Crow Butte's mining operation employs an injection well and production well pattern that creates local flow toward the production wells with relatively little flow across the mined area or toward the ring of monitoring wells that surround the mining operation.<sup>558</sup> Specifically, they asserted that there is a greater volume of liquids (i.e., "bleed" water consisting of leach solution and native groundwater) extracted from the mine unit than the volume of leach solution that is injected into the Ore Zone.<sup>559</sup> This, in turn, they asserted, creates a typical bleed water of 0.5 to 1.5% during production, which causes an inflow of groundwater into the production area and prevents loss of the leach solution.<sup>560</sup>

Crow Butte's witnesses further testified that, in order to detect the migration of mining solutions from the production area, Crow Butte encircled each production zone with monitoring wells that are screened across the entire interval of the ore-bearing BC/CPF Aquifer and in the first overlying aquifer above each wellfield segment (i.e., the Upper Brule Aquifer).<sup>561</sup> Crow Butte's Class III UIC permit<sup>562</sup> requires that each production zone's monitoring wells that are set in the BC/CPF Aquifer must be spaced no more than 300 feet from a mine unit, and with no more than 400 feet between the wells, so as to detect horizontal excursions.<sup>563</sup> For detecting vertical excursions into the Upper Brule Aquifer, shallow monitoring wells were installed in this aquifer — one well for every

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<sup>555</sup> Ex. CBR-001 at 34; *see also* EA § 4.6.2.2.6 at 94. We note that the required radial distance for private well sampling varied from 1 kilometer (as described in Crow Butte's testimony, Ex. CBR-001 at 42; Tr. at 1685, and in SER § 5.7.9.3.3 at 147), to 1 mile (as described in the EA § 4.6.2.2.6 at 94). But, as our decision does not hinge on either distance, this discrepancy need not be resolved here.

<sup>556</sup> Ex. CBR-001 at 34-35; EA § 4.6.2.2.6 at 94.

<sup>557</sup> Ex. CBR-001 at 36.

<sup>558</sup> *Id.* at 41.

<sup>559</sup> *Id.* at 36-37.

<sup>560</sup> *Id.*

<sup>561</sup> *Id.* at 41-42; Tr. at 1030.

<sup>562</sup> Ex. CBR-001 at 35 (citing Ex. CBR-017).

<sup>563</sup> Ex. CBR-017 at 16.

4 acres of each mine unit.<sup>564</sup> Sampling of these wells is done on a biweekly basis for excursion indicators that include chloride, total alkalinity, and conductivity.<sup>565</sup> To the extent that Crow Butte's sampling indicates an increase in the concentrations of these constituents, witnesses for both Crow Butte and the NRC Staff asserted that these parameters provide an early warning of the movement of process liquids away from the wellfield and enable Crow Butte to initiate corrective actions to draw process liquids back into the wellfields prior to any leachate leaving the mine area.<sup>566</sup>

The NRC's upper control limits (UCLs) for chloride, conductivity, and total alkalinity are set at 20% above the maximum baseline concentration for each of these indicator parameters (unless the baseline average is below 50 milligrams per liter (mg/L), in which case Crow Butte can use alternative methods).<sup>567</sup> During routine sampling, if two of the three constituents exceed the UCLs in a given monitoring well, or if one constituent exceeds the UCL by more than 20%, that well must be resampled within 48 hours and analyzed again.<sup>568</sup> If the second sample does not exceed the UCLs, a third sample is taken within 48 hours, and if the limit continues to be exceeded, Crow Butte is obligated to implement corrective actions.<sup>569</sup> In conjunction with our resolution of Contention A, we address whether these three excursion indicators are adequate, or whether Crow Butte should also be required to test for uranium. For now, we simply note that Crow Butte's witnesses claimed Crow Butte's past experience at ISL mining facilities has shown that using these three excursion indicators with this monitoring system is effective in detecting leachate migration.<sup>570</sup>

(ii) EXCURSION CORRECTIVE ACTIONS

The NRC Staff's witnesses testified that, in the event one or more of Crow Butte's UCLs are exceeded, License Condition 11.5 requires Crow Butte to place that well on excursion status, to notify the NRC, to begin corrective action, and to increase the sampling frequency for the indicator parameters at the excursion well (from biweekly to once every 7 days) to ensure that the excu-

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<sup>564</sup> EA § 4.6.2.2.4 at 91-92; Ex. CBR-001 at 36; Ex. CBR-074 at 5.

<sup>565</sup> EA § 4.6.2.2.4 at 91.

<sup>566</sup> Ex. NRC-076-R2 at 5-6; Ex. CBR-001 at 37.

<sup>567</sup> Ex. CBR-001 at 37.

<sup>568</sup> *Id.* at 37-40. In their testimony, witnesses for the NRC Staff discussed in greater detail the requirements for a monitoring well ring's location (License Condition 10.4) and for Crow Butte's biweekly sampling and other excursion monitoring procedures (LRA § 5.8.8.2). *See* Ex. NRC-001-R at 5-6.

<sup>569</sup> Ex. CBR-001 at 39-40.

<sup>570</sup> *Id.* at 41.

sion is expeditiously corrected.<sup>571</sup> Crow Butte is required to take a number of additional corrective actions including (1) completing a preliminary investigation to determine the probable cause of the excursion; (2) adjusting production and/or injection rates in the vicinity of the monitoring well to increase inward groundwater flow toward the production zone; (3) pumping individual wells to enhance recovery of mining solutions; and (4) suspending injection of lixiviant into the wellfield area adjacent to the monitoring well.<sup>572</sup> The NRC Staff considers an excursion concluded when the parameters drop below the target concentration levels for three consecutive weekly samples.<sup>573</sup> It is undisputed that Crow Butte's excursion monitoring program currently consists of biweekly sampling at 333 wells and weekly sampling at any wells that are on excursion status.<sup>574</sup>

(iii) CROW BUTTE'S DOCUMENTED EXCURSIONS

The NRC Staff's witnesses testified that, between 1995 and 2010, Crow Butte reported that thirteen of its perimeter monitoring wells had been placed on excursion status (indicating horizontal excursions), and that it had experienced sixteen vertical excursion status events in twelve monitoring wells in the overlying aquifer.<sup>575</sup> The NRC Staff's witnesses stated that none of these excursions is known to have impacted the surrounding groundwater quality.<sup>576</sup>

Crow Butte attributed all but one of the sixteen vertical excursion events in the overlying aquifer to natural fluctuations in water quality coincident with precipitation events.<sup>577</sup> Crow Butte's witnesses stated that the only exception involved a spill (though not an excursion) that Crow Butte corrected and remediated, asserting that Crow Butte has never had a vertical excursion of mining solution.<sup>578</sup> The EA states that all of Crow Butte's excursion events in the Upper Brule Aquifer were resolved within 90 days and without the need for corrective actions.<sup>579</sup> The NRC Staff's witnesses testified that "[a]ll of these excursions were corrected and no long term impacts were determined to have occurred,"<sup>580</sup> and that Crow Butte's "historical record of excursions demonstrates that adjustments in pumping and injection rates have successfully corrected excursions

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<sup>571</sup> Ex. NRC-001-R at 8-9 (citing EA § 4.6.2.2.4 at 91).

<sup>572</sup> Ex. CBR-001 at 40.

<sup>573</sup> Ex. NRC-012 at 12 (License Condition 11.5).

<sup>574</sup> SER § 5.7.9.3.2 at 142-43.

<sup>575</sup> Ex. NRC-001-R at 10.

<sup>576</sup> Ex. NRC-001-R at 10-11, 13 (citing EA, tbl. 4-3, at 93; SER § 5.7.9.3.2 at 142).

<sup>577</sup> EA § 4.6.2.2.4 at 92.

<sup>578</sup> Ex. CBR-001 at 41.

<sup>579</sup> EA § 4.6.2.2.4 at 92.

<sup>580</sup> Ex. NRC-001-R at 20.

within the [License Area].”<sup>581</sup> The EA states that the NRC Staff agreed with Crow Butte that (1) excursions for monitoring wells in the Upper Brule Aquifer did not appear to result from the migration of lixiviant from the BC/CPF Aquifer; and (2) these excursions coincided with precipitation events.<sup>582</sup> To date, Crow Butte has not been required to take corrective actions for these wells.<sup>583</sup>

The NRC Staff’s witnesses testified that Crow Butte’s corrective actions for horizontal excursion monitored by the perimeter ring wells primarily consisted of adjusting extraction and injection rates near the excursion well to capture any outward flow.<sup>584</sup> These corrective actions were adequate in controlling the excursions in a timely manner for nine of the thirteen perimeter wells.<sup>585</sup> For three wells (PR-8, PR-15, and IJ-13) located in Mine Unit 1 (an inactive restored mine unit that is surrounded by subsequently activated mine units), the EA states that Crow Butte’s corrective action proved less effective.<sup>586</sup> Crow Butte attributed the lower efficacy to the combined operation of bordering mine units, which caused liquids to be drawn into Mine Unit 1.<sup>587</sup> As for a fourth well (CM5-11), Crow Butte attributed its less effective corrective actions here to inefficiencies in corrective pumping due to differences in completion intervals of the perimeter well and the nearest production wells.<sup>588</sup> The EA concludes that Crow Butte’s explanation for these well excursions is acceptable.<sup>589</sup>

Significantly, the EA states that none of these excursions impacted the surrounding groundwater quality.<sup>590</sup> Likewise, the SER states that, at the completion of operations, the groundwater in all mine units (which includes any groundwater contaminated at the mine unit monitoring wells) must be restored to applicable standards.<sup>591</sup>

With the exception of the one spill that was corrected and remediated, the EA questions whether the vertical excursion events in Mine Units 6 and 8 were caused by spills or by unintended releases of production liquids that then moved with groundwater pulses during precipitation events, thus affecting the water quality of the Upper Brule Aquifer.<sup>592</sup> The NRC Staff’s witnesses testified that,

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<sup>581</sup> *Id.* at 21.

<sup>582</sup> EA § 4.6.2.2.4 at 92.

<sup>583</sup> *Id.*

<sup>584</sup> Ex. NRC-001-R at 13.

<sup>585</sup> EA § 4.6.2.2.4 at 92.

<sup>586</sup> *Id.*; SER § 5.7.9.3.2 at 142-43.

<sup>587</sup> EA § 4.6.2.2.4 at 92; SER § 5.7.9.3.2 at 142-43.

<sup>588</sup> EA § 4.6.2.2.4 at 92; SER § 5.7.9.3.2 at 142-43.

<sup>589</sup> EA § 4.6.2.2.4 at 92; SER § 5.7.9.3.2 at 142-43.

<sup>590</sup> EA § 4.6.2.2.4 at 92.

<sup>591</sup> SER § 5.7.9.3.2 at 143.

<sup>592</sup> EA § 4.6.2.2.4 at 92 (citing SER § 5.7.9.4 at 149).

because the continued number of vertical excursions in the Upper Brule Aquifer could not conclusively be attributed to natural fluctuations, the NRC Staff added a condition in Crow Butte's renewed license requiring Crow Butte to assess whether there is any impact to groundwater quality.<sup>593</sup> That condition requires Crow Butte to sample for natural uranium (in addition to the standard three indicator parameters) in Mine Units 6 and 8 whenever an overlying monitoring well in these units is placed on excursion status for more than 60 days.<sup>594</sup>

Even though some uncertainty remains as to the precise cause of the excursions at Mine Units 6 and 8, the EA concludes that the long-term impacts on groundwater from all excursions within the License Area will be SMALL.<sup>595</sup> This conclusion is based on the analysis of groundwater quality impacts from excursions in the prior license period and Crow Butte's continued obligations for excursion monitoring to detect and take corrective action to eliminate any excursions.<sup>596</sup>

*b. Parties' Positions on Operational Groundwater Impacts to Private Wells*

The EA states that Crow Butte "is required in its license to monitor ground water quality at water supply wells located within 1 mile [1.6 km] of a wellfield as part of the environmental monitoring program" and that Crow Butte's program "monitored ground water quality at 19 water supply wells."<sup>597</sup> To establish baseline values, Crow Butte sampled these private water supply wells prior to starting its mining operations. While most of these water supply wells are placed in the Upper Brule Aquifer, one well is placed in the BC/CPF Aquifer.<sup>598</sup>

EA § 4.6.2.2.6 states that a review of groundwater monitoring data from private wells shows water quality has remained consistent with radiological background levels.<sup>599</sup> Additionally, the NRC Staff's witnesses testified that this data set did not indicate that mining liquid has migrated beyond the individual mine sites within the License Area.<sup>600</sup> The EA concludes there were no discernible trends in the monitoring data, which would indicate that there have not been any impacts from Crow Butte's mining operations.<sup>601</sup> Likewise, the EA states that these observed levels are both consistent with background levels and below

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<sup>593</sup> Ex. NRC-012 at 14 (License Condition 11.12).

<sup>594</sup> *Id.*; see also Tr. at 1638 (correcting EA by dropping the requirement for radium testing).

<sup>595</sup> EA § 4.6.2.2.4 at 92.

<sup>596</sup> *Id.*

<sup>597</sup> *Id.* § 4.6.2.2.6 at 94 (citing Ex. NRC-012 at 14 (License Condition 11.13)).

<sup>598</sup> Ex. NRC-001-R at 20; SER § 5.7.9.3.3 at 147.

<sup>599</sup> EA § 4.6.2.2.6 at 94.

<sup>600</sup> Ex. NRC-001-R at 20.

<sup>601</sup> EA § 4.6.2.2.6 at 94.

established federal groundwater quality standards.<sup>602</sup> In addition, with respect to those wells that Crow Butte screened in the Upper Brule Aquifer,<sup>603</sup> its data indicate that vertical excursions, spills, and leaks, as well as Crow Butte's facility operations, have not had an impact on the Upper Brule Aquifer.<sup>604</sup>

Intervenors' witness Mr. Wireman asserted that, because drawdown of an aquifer has the potential to affect the yield from other wells, there should be a BC/CPF monitoring well located near Chadron to monitor the extent of any lowering of the potentiometric surface and that these data should be reported in the EA.<sup>605</sup> Crow Butte's witnesses disagreed, claiming that regional monitoring data is not collected by Crow Butte, but rather by the Nebraska Water Resources District.<sup>606</sup> Moreover, they continued, the placement of BC/CPF regional monitoring wells near Chadron is not appropriate because the BC/CPF Aquifer is not present east of the License Area as it pinches out near the eastern boundary of the License Area and, as such, is not continuous from the License Area to Chadron.<sup>607</sup> The NRC Staff's witnesses agreed with this characterization, testifying that "[t]he city of Chadron is separated from the License Area by a distance of almost 20 miles. . . . [T]he [BC/CPF Aquifer] pinches out and is not present beyond about 5 miles north and east of Crawford, between the CBR [License Area] and the city of Chadron. Therefore, it is not possible or necessary to place a monitoring well in this aquifer near the city of Chadron."<sup>608</sup>

## **2. Board Findings on Operational Groundwater Impacts**

### *a. Board Findings on Operational Groundwater Impacts from Excursions*

Turning first to groundwater impacts from excursions, we find that the record evidence established that there were 333 wells monitored for excursions. Of these, thirteen perimeter monitoring wells in the BC/CPF were placed on excursion status (indicating horizontal excursions), and sixteen vertical excursion events were identified in twelve monitoring wells placed in the Upper Brule Aquifer.

We further find that, for the horizontal excursions detected by the perimeter monitoring wells in the BC/CPF, in most instances Crow Butte quickly detected each perimeter excursion and successfully controlled them by increasing pump-

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<sup>602</sup> *Id.*

<sup>603</sup> SER § 5.7.9.3.3 at 147.

<sup>604</sup> Ex. NRC-001-R at 20.

<sup>605</sup> Ex. INT-047 at 6.

<sup>606</sup> Ex. CBR-045 at 34.

<sup>607</sup> *Id.*

<sup>608</sup> Ex. NRC-076-R2 at 65 (citing Ex. NRC-023).

ing in the immediate vicinity of the excursion. We also find that, while there were four instances in which this process did not control the horizontal excursion in a timely manner, in no case did any excursion threaten the water quality of an underground source of drinking water. Further, Crow Butte is required to restore these wells to applicable standards during restoration.

As for the vertical excursion status events, we find that all but one were due to natural seasonal fluctuations in groundwater quality of the Upper Brule Aquifer,<sup>609</sup> and that the other vertical excursion status event was not actually an excursion, but rather was a spill that Crow Butte corrected and remediated.<sup>610</sup> Even though the NRC Staff's witnesses questioned whether natural seasonal fluctuations in groundwater quality of the Upper Brule Aquifer caused the vertical excursions, we find that there is no record evidence that the migration of lixiviant from the BC/CPF Aquifer caused these vertical excursion events. Rather, we find that these excursion events coincided with precipitation events, and that no corrective actions by Crow Butte have been required to date. We further find that Crow Butte's renewed license contains conditions (requiring additional testing for natural uranium when an overlying excursion monitoring well in Mine Unit 6 or Mine Unit 8 is placed on excursion status) that will ensure that Crow Butte addresses the cause of any such varying water quality data.<sup>611</sup>

For both vertical and horizontal excursions, we also find that the EA correctly concludes that Crow Butte satisfactorily addressed its excursions and that no long-term impacts have appeared to date. As a result, based on the EA's analysis of groundwater quality impacts from excursions in the prior license period and on Crow Butte's license condition requiring it to undertake excursion monitoring to detect and take corrective action to resolve any excursion, we find that the EA correctly concludes that the long-term impacts on groundwater from excursions will be SMALL.

Despite the fact that excursions have occurred at the Crow Butte facility, we find that there is no evidence that those excursions resulted in the transport of contaminants outside of the License Area. This finding is supported by operational monitoring data collected during Crow Butte's mining operations that span more than 20 years. The total effect of (1) the close proximity of the monitoring wells, (2) the low flow rate from the wellfield, and (3) the use of bleed water that removes more liquid from the aquifer than is reinjected make it unlikely that there will be an undetected excursion.

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<sup>609</sup> Ex. CBR-001 at 40-41.

<sup>610</sup> *Id.*

<sup>611</sup> Ex. NRC-012 at 10 (License Condition 11.1).

*b. Board Findings on Operational Groundwater Impacts to Private Wells*

In regards to overall impacts on private wells from excursions, we find that the water quality monitoring data from private wells shows the groundwater contamination has not exceeded radiological background levels.<sup>612</sup> These data, in conjunction with the fact that all but one of the private wells are placed in the Upper Brule Aquifer,<sup>613</sup> also demonstrate that vertical excursions, spills, leaks, and Crow Butte operations in general have not adversely impacted the Upper Brule Aquifer.

**F. Pathways for Contaminant Migration**

Intervenors' witnesses opined that there were several pathways by which contaminated water could migrate from the License Area and ultimately impact drinking water wells on the PRIR, which are located approximately 50 miles northeast of the License Area. In his initial testimony, Dr. LaGarry stated that the primary pathway for contaminant migration would be through fractures along the White River alluvium.<sup>614</sup> At the hearing, however, Dr. LaGarry raised the additional possibility that there is a northwest flow from the License Area to discharge points at BC/CPF outcrops in South Dakota, which could then flow southeast to the PRIR.<sup>615</sup> A third pathway, suggested in the testimony of Ms. Charmaine White Face, posits that mining contaminants could travel northeastward from the License Area to drinking water wells on the PRIR that draw from the Arikaree Formation.<sup>616</sup> Each of these three suggested pathways is analyzed below.

***1. First Pathway: License Area to White River Feature to White River Alluvium***

*a. Parties' Positions on First Pathway: License Area to White River Feature to White River Alluvium*

Dr. LaGarry testified that "the White River and its alluvium or a complex network of intersecting joints and faults were the most likely ways for contaminants to migrate from the Crow Butte Resources License Area to the [PRIR],"<sup>617</sup>

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<sup>612</sup> EA § 4.6.2.2.6 at 94.

<sup>613</sup> See SER § 5.7.9.3.3 at 147.

<sup>614</sup> Ex. INT-003 at 3.

<sup>615</sup> Tr. at 2582.

<sup>616</sup> Ex. OST-001 at 3-4.

<sup>617</sup> Ex. INT-080 at 6.

and that “faults could potentially connect the uranium-bearing [BC/CPF] to the [White River alluvium], and connect the uranium-bearing [BC/CPF] to the overlying secondary porosity of the Brule Formation.”<sup>618</sup> Based on this characterization, Dr. LaGarry maintained that Crow Butte’s mining contaminants that reach the White River could be transmitted into areas where the alluvium intersects faults downstream from the city of Crawford.<sup>619</sup> Moreover, Dr. LaGarry continued, once such mining contaminants reached the White River alluvium, every rain event thereafter would push those contaminants a little bit farther downstream.<sup>620</sup> Dr. LaGarry noted that, in the case of the White River, downstream is to the north-northeast and leads directly onto the PRIR.<sup>621</sup>

Although Dr. LaGarry posited that the White River alluvium could serve as a potential contaminant pathway, he was not able to identify instances in which uranium or other contaminants originating in individual mine sites within the License Area were actually found to be present in the White River alluvium. Crow Butte countered that its sampling of English and Spring Creeks within the License Area (both of which are tributaries of the White River), as well as offsite sampling of the White River downstream of the License Area by NDEQ and the South Dakota Department of Environment and Natural Resources (SDDENR),<sup>622</sup> supports the position of both Crow Butte and the NRC Staff that Crow Butte’s mining operations have not adversely affected the water quality of the White River.

While those data suggest the White River has not been impacted to date, Dr. LaGarry asserted that Crow Butte’s mining contaminants have the potential to reach the White River alluvium via three mechanisms: (1) surface spills at the Crow Butte facility; (2) waters transmitted through the BC/CPF Aquifer where it is exposed at the land surface; and (3) water migrating through fractures in the UCU. And as noted above, Dr. LaGarry opined that if contaminants originating in the License Area were to enter the White River alluvium, they could migrate downstream in a north-northeast direction with every rain event and ultimately reach the PRIR.<sup>623</sup> We discuss each of these potential sources for alluvium contamination below.

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<sup>618</sup> Ex. INT-003 at 3.

<sup>619</sup> *Id.*

<sup>620</sup> *Id.*

<sup>621</sup> *Id.* at 3-4.

<sup>622</sup> Ex. NRC-001-R at 25 (citing Ex. NRC-022, South Dakota Department of Environment and Natural Resources, The 2014 South Dakota Integrated Report for Surface Water Quality Assessment, at 143 (Mar. 2014)); Ex. NRC-095 at 24; Ex. CBR-001 at 46.

<sup>623</sup> Ex. INT-003 at 3.

(i) PARTIES' POSITIONS ON MIGRATION OF SURFACE SPILLS AND LEAKS ALONG THE FIRST PATHWAY

Initially, we note that witnesses for Intervenors, Crow Butte, and the NRC Staff all agreed that the groundwater flow in the Upper Brule Aquifer is to the northwest, toward the White River and its alluvium.<sup>624</sup> Moreover, Intervenors' and the NRC Staff's witnesses also agreed it is at least theoretically possible that uncontained spills and leaks could be transported through surface waters or could migrate over a distance of 2 miles through the shallow Upper Brule Aquifer.<sup>625</sup> Their agreement ends there, however. In particular, the NRC Staff's witnesses opined it is implausible that contaminants from uncontained spills and leaks could impact the White River alluvium because natural processes (e.g., dilution, sorption, precipitation) would so limit any potential impacts as to render them negligible.<sup>626</sup>

Spills and leaks from the License Area that could impact surface waters or shallow aquifers include leaks from exposed or buried piping, well casing failures, leaks or overflows from evaporation ponds, and vertical excursions. The EA states that, in order to prevent surface water impacts, Crow Butte implemented its Spill Prevention, Control, and Countermeasure (SPCC) Plan.<sup>627</sup> That SPCC Plan contains a number of controls, including dikes and berms to prevent spilled process solutions from entering surface water features.<sup>628</sup> As discussed later in this Partial Initial Decision,<sup>629</sup> Crow Butte's SPCC Plan also includes procedures for investigating and reporting spills and leaks, spill response, and cleanup measures.<sup>630</sup> Based on these measures, the EA concludes that the impact from any such spills and leaks will be SMALL.<sup>631</sup>

(ii) PARTIES' POSITIONS ON BC/CPF AQUIFER OUTCROPS FOR FIRST PATHWAY

Dr. LaGarry suggested this first pathway might have another potential source

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<sup>624</sup> Tr. at 2465-67.

<sup>625</sup> Tr. at 2582-83; Ex. NRC-001-R at 17.

<sup>626</sup> Ex. NRC-001-R at 17.

<sup>627</sup> EA § 4.6.1.2 at 83.

<sup>628</sup> *Id.*

<sup>629</sup> See *infra* Section IV.B.1.c, Parties' Position on Spill Prevention, Control, and Countermeasure Plan, at pp. 380-81; Section IV.B.2.a, Board Findings on Operational Surface Water Impacts and Monitoring, at pp. 387-89.

<sup>630</sup> EA § 4.6.1.2 at 83.

<sup>631</sup> *Id.* § 4.6.1.2 at 85; see *infra* Section IV.B.1.b, Parties' Positions on Origins of Spills and Leaks, at pp. 379-80; Section IV.B.1.e, Parties' Positions on Operational Groundwater Impacts from Spills and Leaks, at pp. 383-86; Section IV.B.2.a, Board Findings on Operational Surface Water Impacts and Monitoring, at pp. 387-89; Section IV.B.2.b, Board Findings on Operational Groundwater Impacts from Surface Spills and Leaks, at pp. 389-91.

for migration of Crow Butte's mining contaminants: excursions reaching the White River through the BC/CPF Aquifer where it is exposed at the surface.<sup>632</sup> In this scenario, production liquids would migrate away from the License Area through the BC/CPF Aquifer to areas where that aquifer outcrops approximately 12 to 15 miles north of Crawford.<sup>633</sup> But Dr. LaGarry's testimony did not identify any places where the BC/CPF is exposed at the surface in the License Area or where it connects to alluvium along White Clay Creek, Squaw Creek, English Creek, or the White River.

In disputing Dr. LaGarry's characterization, the NRC Staff's witnesses testified that "[a]s demonstrated in the cross sections provided in Figures 2.6-4 through 2.6-11 of the LRA, the [BC/CPF Aquifer] does not outcrop anywhere in the [License Area] or in the proposed NTEA site northwest of the [License Area]."<sup>634</sup> They also testified that these cross sections indicate the BC/CPF Aquifer is located 200 to 700 feet below the ground surface (Dr. LaGarry agrees that this depth is correct).<sup>635</sup> In addition, the NRC Staff's witnesses maintained that the only outcrops of the BC/CPF Aquifer are located near Horn, Nebraska, which is approximately 12 miles northwest of both the city of Crawford and of the White River alluvium.<sup>636</sup> As a result, it was the NRC Staff's witnesses' opinion that there is no plausible pathway through an outcrop of the BC/CPF Aquifer within or near the License Area to the White River alluvium.<sup>637</sup>

As another measure to help prevent processing liquids from migrating offsite through the BC/CPF Aquifer, Crow Butte's renewed license (License Condition 10.7) requires Crow Butte to maintain an inward hydraulic gradient in each mine unit until restoration of it is complete<sup>638</sup> (which as we noted earlier, draws groundwater toward the interior of each mine unit within the License Area).<sup>639</sup> In addition, its renewed license (License Condition 11.5) requires Crow Butte to monitor a ring of perimeter wells screened in the BC/CPF Aquifer to detect horizontal excursions and, if any such excursions are detected, to adjust its extraction and injection rates in the mining wellfield to draw liquids back in.<sup>640</sup> In their testimony, the NRC Staff's witnesses indicated that this procedure success-

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<sup>632</sup> Ex. INT-003 at 3.

<sup>633</sup> Tr. at 1076.

<sup>634</sup> Ex. NRC-001-R at 20-21 (citing LRA, figs. 2.6-4 to 2.6-11, at 2-111 to 2-125).

<sup>635</sup> *Id.*; Tr. at 1075.

<sup>636</sup> Ex. NRC-001-R at 20-21; Tr. at 1076.

<sup>637</sup> Ex. NRC-001-R at 21.

<sup>638</sup> Ex. NRC-012 at 8 (License Condition 10.7).

<sup>639</sup> EA § 4.6.2.2.1 at 87-88; Ex. NRC-001-R at 21.

<sup>640</sup> Ex. NRC-012 at 12 (License Condition 11.5).

fully corrected Crow Butte's excursions during its previous mining operations within the License Area.<sup>641</sup>

Crow Butte's witnesses testified that, based on the cross sections in the LRA showing potentiometric surfaces, there is currently no artesian flow in the License Area.<sup>642</sup> Dr. LaGarry did not dispute this point during the hearing.<sup>643</sup> This absence of artesian flow is also supported by the potentiometric surface of the Upper Brule Aquifer being significantly higher than that of the BC/CPF Aquifer throughout the License Area.<sup>644</sup> Thus, even were this pathway to arise, these higher water levels of the Upper Brule Aquifer would preclude upward flow from the BC/CPF Aquifer within the License Area.<sup>645</sup>

Crow Butte's witnesses estimated that "[b]ased on our experience, as well as on groundwater modeling of the site, the movement of fluids at the edges of the operating wellfields typically ranges from 5 to 15 feet per month."<sup>646</sup> Even if migration were to occur, the NRC Staff's witnesses testified that, at this rate, it would take hundreds of years for water from the Ore Zone to reach the White River Feature, and many more hundreds of years for it to reach the outcrops of the BC/CPF that are located to the north.<sup>647</sup>

(iii) PARTIES' POSITIONS ON FRACTURES IN THE UCU FOR FIRST PATHWAY

Dr. LaGarry's third potential source for contaminant migration involved fractures in the UCU that he asserted are ubiquitous in the region,<sup>648</sup> and that would permit both vertical flow up to the Upper Brule Aquifer and then horizontal flow along the groundwater gradient northeastward toward the PRIR<sup>649</sup> (in a fashion similar to the one suggested by Ms. White Face, discussed below).<sup>650</sup> In support of this characterization, Dr. LaGarry noted that, in 2007, Chadron Creek went dry for the first time in its known history.<sup>651</sup> Thereafter, a study was conducted of the creek's water flow rates, and it suggested that, even though normal amounts of water were flowing from the springs, this water was disappearing into deeper

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<sup>641</sup> Ex. NRC-001-R at 20.

<sup>642</sup> Tr. at 1047-48.

<sup>643</sup> Tr. at 1049.

<sup>644</sup> Ex. CBR-062, Crow Butte Resources, Inc., Current License Area Potentiometric Surface — Basal Chadron Sandstone, fig. 2.7-4d (2009); *see also* LRA, fig. 2.7-4d, at 2-189.

<sup>645</sup> Tr. at 1435-36, 2477.

<sup>646</sup> Ex. CBR-001 at 38-39.

<sup>647</sup> Ex. NRC-095 at 22-23.

<sup>648</sup> Ex. INT-013 at 3.

<sup>649</sup> Ex. INT-003 at 3.

<sup>650</sup> *Infra* Section III.F.2, Second Pathway: Northeasterly Flow to the PRIR, at pp. 365-71.

<sup>651</sup> Ex. INT-003 at 1.

alluviums or into fractures in the rock.<sup>652</sup> From this, Dr. LaGarry opined that faults in the License Area may be transmitting contaminated liquids between and around monitoring wells, which, in turn, would enable water containing these contaminants to enter the White River, which would then be taken directly to the PRIR.<sup>653</sup>

While the NRC Staff's witnesses did not dispute Dr. LaGarry's suggestion that there are fractures and joints in northwestern Nebraska, they noted that there are no site-specific data indicating the presence of significant faults, fractures, or joints connecting the confining layers within the License Area.<sup>654</sup>

*b. Board Findings on the First Pathway: License Area to White River Feature to White River Alluvium*

Based on the record evidence, we find there is no basis to conclude that contaminants from the License Area (from spills, leaks, discharges from BC/CPF outcrops, or migration through fractures) could reach the White River Feature or the White River alluvium through this pathway. Intervenors have not demonstrated a reasonable likelihood of a hydraulic connection between the BC/CPF Aquifer and the White River environment (i.e., the White River Feature, White River alluvium, or the White River itself). This finding is supported by record evidence demonstrating that the UCU is not sufficiently fractured in the License Area to enable such communication between the BC/CPF Aquifer and the White River alluvium.

But, even if the UCU were fractured, Crow Butte's renewed license requires it to maintain an inward hydraulic gradient and to monitor for, and correct, excursions. Given that Crow Butte has demonstrated it can timely identify and correct excursions, we also find that it is unlikely for contaminants to reach the White River environment by this pathway, especially since there is no evidence of outcrops of the BC/CPF Aquifer anywhere near the White River in the vicinity of the License Area. We further find there is no evidence that contaminants from Crow Butte's mining operations have impacted the White River water quality, based on both Crow Butte's onsite sampling of English and Spring Creeks, and the offsite monitoring of the White River by NDEQ and SDDENR.

As described in the EA, and as reflected in testimony during the hearing,<sup>655</sup> there is adequate record evidence establishing that Crow Butte has implemented

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<sup>652</sup> *Id.*

<sup>653</sup> Tr. at 2583-84.

<sup>654</sup> Ex. NRC-001-R at 34.

<sup>655</sup> Tr. at 1529-42, 1548-50, 1555-62, 1565-66, 1619-23, 1810-15; *see also infra* Section IV.B.1.c, Parties' Positions on Spill Prevention, Control, and Countermeasure Plan, at pp. 380-81; Section IV.B.2.a, Board Findings on Operational Surface Water Impacts, at pp. 387-89.

appropriate controls and procedures for investigating and responding to spills and leaks, including its SPCC Plan, and that it has satisfactorily mitigated the impacts of any spills experienced to date. The EA discusses both the comprehensive engineering and the administrative controls of Crow Butte's SPCC Plan.<sup>656</sup> Likewise, the EA states that sampling of surface waters and sediments within the License Area, as well as of the nearby offsite private water wells, yielded no evidence of contamination.<sup>657</sup>

While Dr. LaGarry claimed that artesian flow could transmit contaminated water to the land surface and then into the White River alluvium, we find that, due to Crow Butte's inward gradients maintained during mining and restoration activities, there is no evidence of any such artesian conditions in the License Area. We further find that, even if such a pathway existed, because the potentiometric surface of the Upper Brule Aquifer is significantly higher than that of the BC/CPF Aquifer throughout the License Area, there can be no upward flow.<sup>658</sup> For these reasons, we find that artesian flow from the BC/CPF is not a credible pathway for potential contaminants from the License Area to reach surface waters. Although Dr. LaGarry also noted that, in 2007, Chadron Creek went dry for the first time in history, the difficulty with this explanation is that: (1) the point at which Chadron Creek went dry lies more than 25 miles from the License Area; and (2) Dr. LaGarry could provide no meaningful support either for the presence of similar fractured flow in the License Area or for how any such fractured flow is connected to the BC/CPF Aquifer.<sup>659</sup>

In summary, we find that, other than the White River Feature,<sup>660</sup> there is no evidence of specific, field-verified fractures or folds in the License Area. We agree with Intervenors that faults are common in the region, and certainly do not rule out the presence of isolated small faults or fractures in either the Lower Brule Formation or the Upper and Middle Chadron Formations within the License Area. Nonetheless, based on the undisputed evidence of confinement of the BC/CPF Aquifer, we find it highly unlikely that the License Area contains a fault, or a connected pathway of faults in the UCU, that is capable of transmitting contaminants from the License Area to the White River Feature or its alluvium, much less to the surface waters of the White River. Although Intervenors' witnesses posited that the White River alluvium could serve as

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<sup>656</sup> EA § 4.6.1.2 at 83.

<sup>657</sup> See *id.* § 4.6.1.2 at 83-85; *id.* § 4.13.6.12 at 127; *id.* § 4.13.6.2.2 at 130-31.

<sup>658</sup> Tr. at 1435-36, 2477.

<sup>659</sup> Tr. at 2583-84; see also EA § 3.6.1 at 54; Ex. INT-013 at 3.

<sup>660</sup> We have previously found that the White River Feature is most likely a fault, and is unlikely to show any propensity to act as a permeable conduit for the transport of contaminants from the License Area to the PRIR. See *supra* Section III.B.2, Board Findings on the Structure of the White River Feature, at pp. 313-15.

a potential contaminant pathway, there is no record evidence establishing that uranium, or any other contaminant from the License Area, is in fact present in the White River alluvium.

## **2. Second Pathway: Northeasterly Flow to the PRIR**

### **a. Parties' Positions on Second Pathway: Northeasterly Flow to the PRIR**

#### (i) PARTIES' POSITIONS ON NORTHEASTERLY FLOW FOR SECOND PATHWAY

Intervenors' witness, Charmaine White Face, testified that radioactivity detected on the PRIR in wells set in the Arikaree Aquifer originated from Crow Butte's mining activities on the License Area.<sup>661</sup> She opined that contaminants from Crow Butte's mining operations traveled northeasterly through fractures in individual mine sites within the License Area as a result of the hydraulic pull of wells that are installed in the Arikaree Formation on the PRIR.<sup>662</sup> Dr. LaGarry also supported this potential pathway suggested by Ms. White Face, stating that once such contaminants reached any unspecified fractures, they could migrate with the groundwater northeastwardly toward the PRIR.<sup>663</sup> Dr. LaGarry further opined that uranium could be drawn upward into parts of the High Plains Aquifer (e.g., the Ogallala and Arikaree Aquifers) by high-capacity irrigation wells.<sup>664</sup>

In support of her position, Ms. White Face testified that "the direction of flow within the Arikaree [A]quifer, and the number of excursions from the Crow Butte Resources operation, the secondary porosity, and the physical pull from the wells" on the PRIR led her to conclude that Crow Butte is the source of the radioactive contaminants present in the Arikaree Aquifer.<sup>665</sup> The NRC Staff's witnesses disputed the plausibility of this pathway, pointing out that the PRIR wells closest to Crow Butte's mining operation are about 50 miles from the nearest boundary of the License Area.<sup>666</sup> Ms. White Face agreed that the closest well to the License Area is in Oglala, which is about 50 miles distant.<sup>667</sup> She also agreed that the other wells where radionuclides have been detected are in towns on the PRIR that lie 20 to 60 miles farther east or north of Oglala.<sup>668</sup>

Given these distances, Crow Butte's witness, Mr. Lewis, testified that it is physically implausible that uranium in the water detected beneath the PRIR

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<sup>661</sup> Ex. OST-001 at 3-4.

<sup>662</sup> *Id.*

<sup>663</sup> Ex. INT-003 at 3-4.

<sup>664</sup> *Id.*

<sup>665</sup> Ex. OST-001 at 8.

<sup>666</sup> Ex. NRC-076-R2 at 47.

<sup>667</sup> Tr. at 1515-16.

<sup>668</sup> *Id.*

could have originated at the License Area.<sup>669</sup> In his opinion, mine water cannot migrate during operations because (1) the inward gradients maintained during operations and restoration would not allow water to leave the License Area and migrate to the PRIR; and (2) after operations and restoration cease, the groundwater being mined will be restored to ensure the concentrations of contaminants do not exceed regulatory limits.<sup>670</sup> Second, Mr. Lewis testified that, because Crow Butte has only been operating for 25 years at the License Area, it is not physically possible for a release of uranium from Crow Butte's facility to reach the PRIR, given the distance involved (as noted, all parties agreed the distance between the License Area and the closest well on the PRIR is about 50 miles) with "the natural rates of flow in the groundwater system [of about] 20 feet per year."<sup>671</sup> Mr. Lewis also testified that there are physical processes at work that would retard any transmission and reduce the concentration of radioactive contaminants (i.e., dispersion, attenuation, and chemical dilution).<sup>672</sup> Additionally, the BC/CPF Aquifer must be fully restored before Crow Butte is allowed to halt its inward gradients, and so it would only be at that point in time that natural groundwater transport away from the mine could take place. As a consequence, he asserted, it is inconceivable that contamination from the License Area could have reached the PRIR by this point in time.<sup>673</sup>

Testimony from the NRC Staff's witnesses largely supported Mr. Lewis's opinion and emphasized that Crow Butte's renewed license requires it to operate and restore the subject aquifer under an inward hydraulic gradient.<sup>674</sup> They further opined that there is no continuous pathway between the BC/CPF Aquifer at the License Area and the drinking water aquifers at the PRIR.<sup>675</sup>

Witnesses for both the NRC Staff and Crow Butte maintained that the BC/CPF Aquifer pinches out a few miles northeast of Crawford, which effectively means there are at least 25 miles of aquitard (i.e., surficial Pierre Shale) between the edge of the BC/CPF Aquifer and the southwestern boundary of the PRIR.<sup>676</sup> In this regard, the parties agreed that all the geologic strata, including the BC/CPF, have been eroded down to the underlying Pierre Shale from a few miles east of the current License Area, and extending northeastward to several miles north of Nebraska's border with South Dakota. As a result of this erosion, the Pierre Shale is exposed at the ground surface between the License

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<sup>669</sup> Tr. at 1822-23.

<sup>670</sup> *Id.*

<sup>671</sup> Tr. at 1823.

<sup>672</sup> *Id.*

<sup>673</sup> Tr. at 1822-23.

<sup>674</sup> Ex. NRC-001-R at 31-33.

<sup>675</sup> *Id.*

<sup>676</sup> *Id.*; Ex. NRC-076-R2 at 65; Ex. NRC-095 at 16-17; Ex. CBR-045 at 34.

Area and the PRIR in what is called the Chadron Arch.<sup>677</sup> The NRC Staff's witnesses asserted that the presence of this aquitard at the surface effectively prevents any direct northeasterly transmission from the BC/CPF Aquifer at the License Area to the drinking water aquifers on the PRIR.<sup>678</sup> In fact, during the hearing, Dr. LaGarry conceded that he could not provide data supporting a northeasterly pathway between the License Area and the PRIR through the BC/CPF Aquifer.<sup>679</sup>

(ii) PARTIES' POSITIONS ON GROUNDWATER FLOW THROUGH THE ARIKAREE AQUIFER FOR SECOND PATHWAY

Witnesses for both Crow Butte and the NRC Staff dispute Ms. White Face's claims that the radioactivity in wells set in the Arikaree Aquifer on the PRIR comes from Crow Butte's mining activities.<sup>680</sup> The NRC Staff's witnesses testified that the Arikaree Aquifer does not exist onsite within the License Area and that the Arikaree Formation is only present in the far south end of the License Area as a dry elevated outcrop that is upgradient of Crow Butte's mining operations.<sup>681</sup> The NRC Staff's witnesses concluded that, based on the absence of either the Ogallala Aquifer or the Arikaree Aquifer (both of which serve as drinking water sources for the PRIR) within the License Area, there cannot be any hydraulic connection between the BC/CPF Aquifer and these aquifers.<sup>682</sup>

According to the NRC Staff's witnesses, this lack of a direct viable pathway through the Arikaree formation at the southeast portion of the License Area to the southern border of the PRIR is confirmed by the fact that all groundwater flow in the overlying aquifers in and around the License Area discharges to the White River.<sup>683</sup> While the NRC Staff's witnesses acknowledged that groundwater in the Arikaree Aquifer enters the PRIR from Nebraska, they maintained that the low permeability of the Chadron Arch acts as an effective barrier to groundwater flow between Crow Butte's mining operations within the License Area and the south end of the PRIR along the southern border of South Dakota.<sup>684</sup> In

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<sup>677</sup> Tr. at 1220, 2577-78; *see also* Ex. NRC-097, M. J. Ellis and D. G. Adolphson, Geologic Map Showing Water-Analysis Diagrams and Locations of Wells, Springs, and Test Holes, Hydrogeology of the Pine Ridge Indian Reservation, South Dakota, U.S. Geological Survey Hydrologic Atlas HA-357 (1971).

<sup>678</sup> Ex. NRC-095 at 17.

<sup>679</sup> Tr. at 2576.

<sup>680</sup> Ex. NRC-076-R2 at 46; Ex. CBR-067 at 13-14.

<sup>681</sup> Tr. at 1156-57; Ex. NRC-076-R2 at 46.

<sup>682</sup> Ex. NRC-001-R at 41.

<sup>683</sup> Ex. NRC-095 at 26-28 (citing to Ex. NRC-102 at 2).

<sup>684</sup> *Id.* at 27. During the hearing, an NRC Staff's witness denoted this groundwater mound on a  
(Continued)

addition, the NRC Staff's witnesses testified that, in order for Ms. White Face's suggested second pathway to exist, it would be necessary for water to travel cross-gradient for about 50 miles — not to mention crossing over a ground-water mound — just to reach the South Dakota-Nebraska border, which, in their opinion, is an engineering impossibility.<sup>685</sup> Ultimately, Dr. LaGarry agreed with the NRC Staff's witnesses' assessment, stating that "it's very unlikely that there's a direct lateral route from the License Area to the [PRIR]."<sup>686</sup>

(iii) PARTIES' POSITIONS ON RADIOLOGIC IMPACTS TO PRIR DRINKING WATER FROM SECOND PATHWAY

Ms. White Face testified that test results from five wells placed in the Arikaree Aquifer on the PRIR show elevated levels of uranium.<sup>687</sup> Ms. White Face attributes these elevated levels to Crow Butte's mining operations within the License Area.<sup>688</sup>

In their testimony, the NRC Staff's witnesses disputed this claim by pointing to a USGS publication<sup>689</sup> indicating that, while the Ogallala and Arikaree Aquifers are "the largest sources of groundwater on the [PRIR] and are used extensively for irrigation and public and domestic water supplies,"<sup>690</sup> these aquifers are wholly separate and distinct from the Middle/Upper Chadron and Lower Brule Formations of the White River Group underlying the PRIR, and these formations are generally too impermeable to serve as a source or movement of groundwater.<sup>691</sup>

In addition, the NRC Staff presented evidence that "[v]olcanic ash within the aquifers is the primary source of elevated uranium levels in the region's groundwater."<sup>692</sup> Consistent with the NRC Staff's position, and undercutting Ms.

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map of the area, Ex. BRD-004, Nebraska Department of Natural Resources, Report on Hydrologically Connected Ground Water and Surface Water in the Upper Niobrara-White Natural Resources District, figs. 29, 30 (Oct. 2004), and indicated that it lies to the immediate south of an area encompassing the Arikaree Aquifer. Tr. at 2620-22. The annotated version of Ex. BRD-004, figs. 29, 30 is Ex. NRC-102.

<sup>685</sup> Ex. NRC-095 at 27-29.

<sup>686</sup> Tr. at 2622.

<sup>687</sup> Ex. OST-001 at 3-7.

<sup>688</sup> *Id.*

<sup>689</sup> Ex. NRC-001-R at 33 (citing Ex. NRC-025; Ex. BRD-003); Ex. NRC-095 at 15-16.

<sup>690</sup> Ex. NRC-026, Kyle W. Davis, Larry D. Putnam, & Anneka R. LaBelle, U.S. Geological Survey, Conceptual and Numerical Models of Groundwater Flow in the Ogallala and Arikaree Aquifers, Pine Ridge Indian Reservation Area, South Dakota, Water Years 1980-2009, Scientific Investigations Report 2014-5241, at 2 (Feb. 2015).

<sup>691</sup> Ex. NRC-025, tbl. 1, at 7.

<sup>692</sup> Ex. NRC-098, Cathrine J. Botzum, John W. Ejnik, Kathryn Converse, Hannan E. LaGarry, (Continued)

White Face's claims, Intervenor's witnesses submitted studies (partly performed by Dr. LaGarry) stating that naturally elevated uranium levels in the BC/CPF Aquifer on the PRIR are "due to devitrified [crystallized] volcanic glass within the aquifer,"<sup>693</sup> and that outcrops of the BC/CPF are likely sources of natural uranium contamination of soils, sediments, surface waters, and groundwater in several communities on the PRIR.<sup>694</sup> The NRC Staff's witnesses' position in this regard was further buttressed by Dr. LaGarry's concession during the hearing he had no data to suggest that contaminants detected at the PRIR came from Crow Butte's mining operations within the License Area.<sup>695</sup>

As noted above, Ms. White Face claims that the PRIR's pumping of its five deep wells in the Arikaree Aquifer may have accelerated the draw of lixiviant (with dissolved radionuclides) from Crow Butte's mining operations within the License Area all the way to the aquifer underlying the PRIR.<sup>696</sup> In disputing this assertion, the NRC Staff's witnesses responded that: (1) Crow Butte does not pump lixiviant into the Arikaree Aquifer,<sup>697</sup> and (2) the Arikaree Formation is present only in the far southeast corner of the License Area, where it is dry.<sup>698</sup>

Ms. White Face also testified that five well samples showed concentration ratios of Uranium (U)-234/U-238 of approximately two to one, a much higher ratio than associated with naturally occurring concentration percentages, i.e., U-234 (0.005%) to U-238 (99.27%).<sup>699</sup> From this, Ms. White Face opined that the higher ratio of U-234 to U-238 indicates that the radioisotopes detected in the wells on the PRIR originated at the License Area. Specifically, Ms. White Face maintains that the concentrations detected in the five well samples reflect the extraction effects of Crow Butte's ISL mining operations within the License Area, i.e., dissolving U-238 and the decay products of U-238.<sup>700</sup>

In disputing this claim, the NRC Staff's witnesses testified that U-238 is transformed to U-234 only through radioactive decay — and is not influenced by chemical reactions associated with Crow Butte's ISL process.<sup>701</sup> The NRC Staff's witnesses also maintained that Ms. White Face had incorrectly compared

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& Prajukti Bhattacharyya, *Uranium Contamination in Drinking Water in Pine Ridge Reservation, Southwestern South Dakota*, 43(5) Geological Society of America Abstracts with Programs 125 at 1 (Oct. 2011).

<sup>693</sup> Ex. INT-072 at 1.

<sup>694</sup> Ex. INT-074 at 1.

<sup>695</sup> Tr. at 1489.

<sup>696</sup> Ex. OST-001 at 4.

<sup>697</sup> Ex. NRC-076-R2 at 47.

<sup>698</sup> Ex. NRC-001-R at 55.

<sup>699</sup> Ex. OST-001 at 5-6.

<sup>700</sup> *Id.*

<sup>701</sup> Ex. NRC-076-R2 at 49.

the activity ratios of U-234/U-238 rather than the natural concentration (mass) ratios of those isotopes,<sup>702</sup> and that this is inappropriate because the two isotopes have different measured levels of activity (related to their half-lives),<sup>703</sup> i.e., the half-life of U-234 is more than four orders of magnitude shorter than that of U-238.<sup>704</sup> The NRC Staff's witnesses further testified that, because the natural activity ratio of U-234/U-238 typically ranges between one and three in groundwater, the measured U-234/U-238 activity ratios in the Arikaree Aquifer well tests are within the range one would expect to find in naturally occurring groundwater.<sup>705</sup>

As an additional reason for her opinion that the radionuclides detected in the five drinking water wells on the PRIR are attributable to Crow Butte's mining activities within the License Area, Ms. White Face pointed to the presence of thorium (Th)-234 (i.e., the first decay product in the natural U-238 decay series) in the PRIR drinking water wells because the "naturally occurring thorium has been unnaturally displaced so that it is in the drinking water" on the PRIR.<sup>706</sup> To reach this conclusion, however, it was necessary for Ms. White Face to assume that Th-234 traveled from the License Area to the PRIR — but neither she nor any other witness for Intervenors could offer any data to explain how such a pathway was plausible. Moreover, the NRC Staff's witnesses testified that, "given the short half-life of Th-234 (24 days), it is highly unlikely measurable amounts of Th-234 could travel in ground water approximately 50 miles from the [License Area] to the wells at the [PRIR], even if a pathway existed."<sup>707</sup>

*b. Board Findings on Second Pathway: Northeasterly Flow to the PRIR*

Based on the testimony summarized above, we find there is no credible north-easterly underground pathway from the BC/CPF Aquifer to either the Arikaree Aquifer or the Ogallala Aquifer that underlie the PRIR. We also find that it is more likely than not that elevated levels of uranium in wells completed in the High Plains Aquifer on the PRIR are caused by naturally occurring uranium derived from outcrops of the BC/CPF near or on the PRIR, and are not the result

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<sup>702</sup> *Id.* The Board takes official notice under 10 C.F.R. § 2.337(f) that these ratios are based on different physical properties. Activity is based on measurements of decays per unit time, while natural concentration is based on measurements of mass.

<sup>703</sup> *Id.*

<sup>704</sup> Ex. NRC-082, M. C. Rhodes, K. G. Keil, W. T. Frederick, J. S. Leithner, J. M. Peterson, & M. M. MacDonell, Utilizing Isotopic Uranium Ratios in Ground-water Evaluations at [Niagara Falls Storage Site], tbl. I, at 2 (undated).

<sup>705</sup> Ex. NRC-076-R2 at 49 (citing Ex. NRC-082 at 2, 3).

<sup>706</sup> Ex. OST-001 at 6.

<sup>707</sup> Ex. NRC-076-R2 at 50.

of Crow Butte's mining operations within the License Area. In addition, based on the glacial flow of groundwater in this area, we find it is not reasonable that a release of uranium from Crow Butte's mining operations could have traversed a distance of about 50 miles from the License Area to the water wells inside the PRIR closest to the License Area, given that Crow Butte's mining operations within the License Area have only been ongoing for 25 years.<sup>708</sup> Finally, the Board finds that the activity ratios of U-234 to U-238 detected in the subject well waters on the PRIR are within the range one would expect to find in naturally occurring groundwater, and that the short half-life of Th-234 detected in the PRIR drinking water indicates the presence of naturally occurring uranium inside or at least in the immediate vicinity of the PRIR, as opposed to any uranium that might have originated on the License Area.

**3. *Third Pathway: Northwesterly Flow from License Area to BC/CPF Outcrops to the PRIR***

**a. *Parties' Positions on Third Pathway: Northwesterly Flow from License Area to BC/CPF Outcrops to the PRIR***

In conjunction with Intervenor's original petition in this proceeding, Dr. LaGarry opined that contaminated water from the License Area could migrate through fractures and then travel along the groundwater gradient northeastward toward the PRIR,<sup>709</sup> in a fashion similar to that suggested by Ms. White Face.<sup>710</sup> Seven years later, Dr. LaGarry conceded in his testimony at the hearing that the NRC Staff was correct in its assessment that: (1) there is no plausible direct lateral route northeast from the License Area to the PRIR,<sup>711</sup> and (2) it is extremely unlikely there could be any lateral migration of contaminated water from the License Area around, over, or through the Chadron Arch onto the PRIR.<sup>712</sup> At the same time, however, Dr. LaGarry continued to assert that "once contaminants through cracks, or spills, or [other pathways] found their way into the White River, then they would be flushed diagonally across the [PRIR], and in short order could get from there into people's wells, or into the sediments."<sup>713</sup>

Dr. LaGarry later refined this assertion by opining that the likely hydraulic connection between the License Area and the PRIR would be a northwest flow from the License Area into the White River alluvium and the White River itself,

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<sup>708</sup> Tr. at 1032-33, 1822-23.

<sup>709</sup> Ex. INT-003 at 3.

<sup>710</sup> Tr. at 2582-83; Ex. OST-001 at 3-4.

<sup>711</sup> Tr. at 2622.

<sup>712</sup> Tr. at 2582.

<sup>713</sup> Tr. at 2583.

which, in turn, would be followed by a northeast flow through the White River alluvium to connect either with the BC/CPF outcrops, with the BC/CPF Aquifer, and/or with the Arikaree and Ogallala Aquifers that underlie the PRIR.<sup>714</sup>

Crow Butte's witness, Mr. Spurlin, agreed that the BC/CPF is likely present in the region that encompasses the PRIR in South Dakota, but he also maintained that the BC/CPF is not connected to the same formation that exists in the License Area because of the presence of the low-permeability Pierre Shale that lies between these two regions.<sup>715</sup> As a result, there is no evidence of a hydraulic pathway connecting the BC/CPF underlying the License Area with BC/CPF that may underlie the PRIR.

While maintaining that the BC/CPF exists in some locations under the PRIR,<sup>716</sup> Dr. LaGarry agreed that the BC/CPF underlying the License Area is not contiguous with any BC/CPF that may underlie the PRIR.<sup>717</sup> He also agreed that the BC/CPF underlying the License Area could only be hydraulically connected to the PRIR aquifers by the White River alluvium because "lateral migration of contaminated water from the License Area somehow around, or over, or through the Chadron Arch onto the PRIR is extremely unlikely."<sup>718</sup> Nevertheless, for this third pathway to be a plausible one, Dr. LaGarry testified that the White River alluvium must cross the PRIR from southwest to northeast and come in contact with virtually every geological unit available at the land surface including the BC/CPF and the Arikaree Formation.<sup>719</sup>

*b. Board Findings on Third Pathway: Northwesterly Flow from License Area to BC/CPF Outcrops to the PRIR*

As with the other pathways suggested by Intervenors' witnesses, we find that there is no credible record evidence that Dr. LaGarry's proposed northwesterly flow from the License Area is a viable pathway for contaminants to migrate from the License Area to the PRIR. We are convinced of this by the record evidence for three distinct reasons: (1) migration from the License Area is unlikely because of the confining nature of the UCU and the inward gradients Crow Butte maintains as part of its mining and restoration operations within the License Area; (2) a release of uranium from Crow Butte's mining operations within the License Area could not reasonably traverse a distance of about 50 miles to the Arikaree or Ogallala Aquifers that underlie the PRIR; and (3) given

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<sup>714</sup> Tr. at 1075-76, 2582.

<sup>715</sup> Tr. at 2577.

<sup>716</sup> Ex. INT-080 at 4-6; Tr. at 2566, 2572-75.

<sup>717</sup> Tr. at 2576.

<sup>718</sup> Tr. at 2582.

<sup>719</sup> Tr. at 1487.

the obstacles preventing migration and the slow groundwater movement in the region, any such contaminants could not reasonably be detected at the PRIR because Crow Butte has only been operating its mines at the License Area for roughly 25 years.

With these various overarching issues explained and resolved, we now turn to our ruling regarding the validity of Intervenor's contentions.

#### IV. CONTENTIONS

##### A. Contention A — Well Monitoring Frequency and Excursion Indicators

As admitted, this contention was previously narrowed to challenge (1) whether Crow Butte's biweekly testing of monitoring wells is sufficient to identify the potential impacts of nonradiological contaminants, and (2) whether uranium should be routinely used as an excursion indicator.<sup>720</sup>

##### 1. Parties' Positions on Contention A: Well Monitoring Frequency and Excursion Indicators

###### a. Parties' Positions on Biweekly Testing of Monitoring Wells

Witnesses for both Crow Butte and the NRC Staff testified that Condition 11.5 of Crow Butte's renewed license requires it to sample and test all perimeter and aquifer monitoring wells at least once every 14 days.<sup>721</sup> Crow Butte's witnesses added that whenever a well goes on excursion status<sup>722</sup> Crow Butte must increase its sampling frequency to weekly until the well goes off excursion status.<sup>723</sup> In addition, Crow Butte's witnesses testified that NDEQ requires Crow Butte to demonstrate compliance with these excursion indicators for an additional 3 weeks in order to provide further assurance that subsurface conditions are stabilized.<sup>724</sup>

We note initially that there is no disagreement among the parties that Crow Butte's monitoring wells were installed within 300 feet of each individual mine unit and that Crow Butte monitors these wells on a biweekly basis. But, Intervenor asserts this system is insufficient because leaks could go undetected in

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<sup>720</sup> CLI-09-9, 69 NRC at 346-47; *see also* LBP-08-24, 68 NRC at 718.

<sup>721</sup> Ex. NRC-001-R at 10; Tr. at 1597; *see also* Ex. NRC-012 at 12 (License Condition 11.5).

<sup>722</sup> Ex. CBR-001 at 39-40.

<sup>723</sup> Tr. at 1597; *see also* Ex. NRC-012 at 12 (License Condition 11.5).

<sup>724</sup> Tr. at 1597.

the event that a scheduled test does not coincide with a leak.<sup>725</sup> Crow Butte's witnesses disputed this, arguing that biweekly testing provides enough time to detect a potential excursion and to take corrective action before any mining liquids can leave the License Area.<sup>726</sup> Additionally, they testified that Crow Butte's groundwater modeling establishes that its horizontal flow rates are approximately 5 feet to 15 feet per month at the edges of the operating wellfields.<sup>727</sup> Accordingly, Crow Butte's witnesses asserted that, with biweekly testing, there is more than sufficient time to detect a potential excursion and to take corrective action prior to any migration of mining liquids beyond the License Area.<sup>728</sup>

Crow Butte's witnesses also maintained that whenever Crow Butte experiences an increased concentration above background levels for one or more indicator parameter, this serves as a sufficient early warning for Crow Butte to take any necessary preemptive action, e.g., altering the pumping rate to reduce the rate of groundwater movement and to reverse the flow direction back toward the wellfield before UCLs are exceeded.<sup>729</sup>

The NRC Staff's witnesses testified that Crow Butte's biweekly monitoring is consistent with the Standard Review Plan for In Situ Leach Uranium Extraction License Applications (NUREG-1569), which states that "an acceptable excursion monitoring program should indicate that all monitor wells will be sampled for excursion indicators at least every 2 weeks during in situ leach operations."<sup>730</sup> They further noted that this biweekly sampling requirement has been in place since Crow Butte's initial license was granted in 1989 and that it was previously described in both the EA for that initial licensing action and the EA for the 1998 license renewal.<sup>731</sup> Moreover, the EA for the licensing action at issue here states that Crow Butte has detected excursion events at the License Area with biweekly testing and has managed those events with subsequent cor-

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<sup>725</sup> Tribe Petition at 7.

<sup>726</sup> Ex. CBR-001 at 38-39.

<sup>727</sup> See *id.* (citing Ex. CBR-020, Letter from Robert Lewis, Principal Hydrogeologist, WorleyParsons, to David Moody, Restoration Manager, Crow Butte Operations, Response to NDEQ Excursion Monitoring Issues, at 3 (Aug. 26, 2010)).

<sup>728</sup> *Id.* at 39.

<sup>729</sup> *Id.* at 38-39; see also Ex. NRC-012 at 12 (License Condition 11.5).

<sup>730</sup> Ex. NRC-001-R at 10 (quoting Ex. NRC-013, Office of Nuclear Material Safety and Safeguards, Standard Review Plan for In Situ Leach Uranium Extraction License Applications, NUREG-1569, at 5-43 (June 2003) [hereinafter Ex. NRC-013, NUREG-1569]).

<sup>731</sup> *Id.* (citing NRC-015 Final Environmental Assessment for Crow Butte ISR Project at 1-2 (1989) (excerpt); Ex. CBR-044, Office of Nuclear Material Safety and Safeguards, Division of Waste Management, Environmental Assessment for Renewal of Source Material License No. SUA-1534 § 3.7.1, at 35-36 (Feb. 1998) [hereinafter 1998 EA]).

rective actions that prevented any measurable impact to groundwater beyond the License Area.<sup>732</sup>

*b. Parties' Positions on Uranium as an Excursion Indicator*

Intervenors' witnesses opined that, in addition to testing for chloride, conductivity, and total alkalinity, Crow Butte should also be required to test for uranium during excursion monitoring.<sup>733</sup> Crow Butte's witnesses disputed whether there was any need for uranium to be added as an excursion indicator and testified that testing for chloride is preferable to testing for uranium because (1) chloride is introduced into the lixiviant from the ion exchange process (i.e., uranium is exchanged for chloride on the ion exchange resin); (2) chloride is highly mobile in groundwater and will show up quickly in a monitoring well if lixiviant escapes the wellfield; and (3) chloride is easy to detect due to its low background levels in the native groundwater.<sup>734</sup> Similarly, they asserted, conductivity is a better excursion indicator than uranium because it provides an excellent general picture of overall groundwater quality.<sup>735</sup> Finally, Crow Butte's witnesses maintain that total alkalinity is a better excursion indicator than uranium because a major constituent added to the lixiviant during mining is bicarbonate, and during an excursion event, the presence of bicarbonate in groundwater would be reflected in an increase in total alkalinity concentrations.<sup>736</sup>

While there is no dispute among the parties that uranium is mobilized during mining, Crow Butte's witnesses testified that uranium — unlike chlorides, conductivity, and total alkalinity — is a poor leading indicator of excursions because the reducing conditions (i.e., adsorption and precipitation) in the aquifer often slow the rate of uranium transport through the aquifer.<sup>737</sup> Turning to the specific onsite conditions at the License Area, Crow Butte's witnesses opined that, in a given period of time, the total distance uranium could be expected to travel would be no more than 15% (and perhaps as low as 0.5%) of the distance traveled by an excursion indicator such as chloride.<sup>738</sup>

The NRC Staff's witnesses' testimony was largely consistent with the testimony of Crow Butte's witnesses. They stated that three separate NRC guidance

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<sup>732</sup> EA § 4.6.2.2.6 at 94.

<sup>733</sup> Tr. at 1603-04; *see also* Ex. INT-070 at 2.

<sup>734</sup> Ex. CBR-001 at 37-38 (citing LRA § 5.8.8.2 at 5-123).

<sup>735</sup> *Id.*

<sup>736</sup> *Id.*

<sup>737</sup> *Id.* at 38.

<sup>738</sup> *Id.* (citing Ex. CBR-020 at 3).

documents discourage the use of uranium as an excursion indicator.<sup>739</sup> The NRC Staff's witness, Mr. Lancaster, testified that NUREG-1569 aligns with Crow Butte's experience that uranium is not a particularly effective excursion indicator because it may be retarded by the reducing conditions in the aquifer.<sup>740</sup> Another of the NRC Staff's witnesses, Mr. Fuhrmann, testified that, while in some conditions uranium could move as fast as the groundwater does in an aquifer, it is likely that other excursion indicators, such as chloride or alkalinity, would also be traveling at the same rate.<sup>741</sup> As such, he concluded, there is no added benefit from testing for uranium because the other excursion indicators would also be present.<sup>742</sup>

The NRC Staff's witnesses also emphasized that it is not as if Crow Butte does not test any of its monitoring well samples for uranium because, as a result of its previous excursions, Crow Butte is required to sample for uranium whenever a well in two mine units (Mine Units 6 and 8) is placed on excursion status.<sup>743</sup> Also, in connection with Crow Butte's effluent and environmental monitoring program,<sup>744</sup> the EA states that Crow Butte is required to conduct quarterly sampling for uranium and radium in any private water supply wells located within 1 mile of an individual mining wellfield.<sup>745</sup> Annually, Crow Butte also samples for uranium, radium-226, Th-230, and lead-210 in sediments at locations both upstream and downstream from creeks in the License Area.<sup>746</sup>

Dr. Kreamer opined that Crow Butte should introduce conservative tracers into the mining units.<sup>747</sup> He asserted that this intentional release of conservative tracers can be used to characterize flow in fractured rock settings and to identify clearly subsurface flow paths in assessing of the influence of ISL on groundwater.<sup>748</sup>

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<sup>739</sup> Ex. NRC-001-R at 12-13 (citing Ex. NRC-017, Division of Fuel Cycle Safety and Safeguards, Office of Nuclear Material Safety and Safeguards, A Baseline Risk-Informed, Performance-Based Approach for In Situ Leach Uranium Extraction Licensees, NUREG/CR-6733, at 4-38 (Sept. 2001) [hereinafter Ex. NRC-017, NUREG/CR-6733]; Ex. NRC-018, Office of Nuclear Regulatory Research, Methods of Minimizing Ground-Water Contamination from In Situ Leach Uranium Mining, NUREG/CS-3709, at 5 (Mar. 1985) [hereinafter Ex. NRC-018, NUREG/CS-3709]; Ex. NRC-013, NUREG-1569 at 5-41).

<sup>740</sup> Tr. at 1604.

<sup>741</sup> Tr. at 1607.

<sup>742</sup> *Id.*

<sup>743</sup> *See* Ex. NRC-001-R at 8-9, 14; EA § 4.6.2.2.4 at 91-92; Tr. at 1632, 1638; Ex. NRC-012 at 14 (License Condition 11.12).

<sup>744</sup> Ex. NRC-012 at 14 (License Condition 11.13).

<sup>745</sup> EA § 4.6.2.2.6 at 94.

<sup>746</sup> *Id.* § 4.6.1.2 at 83.

<sup>747</sup> Ex. INT-046 at 5.

<sup>748</sup> *Id.*

## 2. *Board Findings on Contention A: Well Monitoring Frequency and Excursion Indicators*

We find that the record evidence supports the adequacy of Crow Butte's biweekly sampling. We further find that there is no record evidence compelling Crow Butte to sample for uranium in addition to the three excursion indicators, i.e., chloride, conductivity, and total alkalinity.

Turning first to biweekly sampling frequency, we find that Intervenors presented no evidence that would necessitate Crow Butte increasing its sampling frequency for monitoring wells. In contrast, we find that Crow Butte presented convincing evidence that justified the current biweekly sampling interval based on: (1) the short travel distance of groundwater flow in the License Area during a 2-week period; (2) Crow Butte's experience with early detection using the three excursion indicators of chloride, conductivity, and total alkalinity as well as with its subsequent corrective measures, both of which have successfully limited the migration of radionuclides when excursions were detected; and (3) Crow Butte's obligation, under its renewed license, to increase its sampling frequency from biweekly to weekly after an excursion is detected.

Although Intervenors' witnesses asserted that Crow Butte should be required routinely to test its samples for uranium<sup>749</sup> (in addition to the three excursion indicators),<sup>750</sup> we find that there is no record evidence that the addition of uranium as a standard excursion indicator would provide any significant information beyond that obtained from using only chloride, conductivity, and total alkalinity. Given the retardation uranium would likely encounter in the License Area's subsurface environment, we find that it is not reasonable to require testing for uranium. Furthermore, three of the NRC Staff's guidance documents discourage using uranium as an initial excursion indicator.<sup>751</sup> And, while Intervenors' recommendation to introduce conservative tracers into the mine field could be scientifically sound, neither Dr. Kreamer nor Mr. Wireman could explain why chloride, conductivity, and total alkalinity do not already serve the same function as would these tracers.<sup>752</sup>

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<sup>749</sup> Tr. at 1603-04; *see also* Ex. INT-070 at 2.

<sup>750</sup> Ex. NRC-001-R at 10-11.

<sup>751</sup> Ex. NRC-001-R at 12-13 (citing Ex. NRC-017, NUREG/CR-6733 at 4-38; Ex. NRC-018, NUREG/CS-3709 at 5; Ex. NRC-013, NUREG-1569 at 5-41).

<sup>752</sup> While affirming the effectiveness of chloride, alkalinity, and electrical conductivity (as well as a fourth parameter, sulfate, not deemed necessary here) as effective excursion indicators relative to the proposed ISL facility at issue in the recent *Strata* proceeding, the Licensing Board in that case also noted there may be site-specific aquifer geochemical conditions that could render uranium a better excursion indicator. *See Strata Energy, Inc. (Ross In Situ Recovery Uranium Project)*, LBP-15-3, 81 NRC 65, 150 (2015), *petition for review denied*, CLI-16-13, 83 NRC 566, 601 (2016).

(Continued)

## **B. Contention C — Impacts on Surface Water**

In Contention C, Intervenors argue that the NRC Staff’s “characterization that the impact [on] surface waters from an accident is ‘minimal since there are no nearby surface water features,’ does not accurately address the potential for environmental harm to the White River.”<sup>753</sup>

This contention asserts that impacts to surface waters from Crow Butte’s mining operations (and specifically from spills and leaks) are anything but small due to the potential for the White River alluvium to receive contaminants from three distinct sources: (1) surface spills in the License Area; (2) water transmitted through the BC/CPF; and (3) fractures in the strata that make up the UCU.<sup>754</sup> As originally admitted, we found that Contention C presented a genuine dispute as to “whether these aquifers are interconnected and so could be the potential pathway for contaminant migration to surface waters.”<sup>755</sup> With the publication of the EA, Contention C migrated to encompass whether the EA took a “hard look” at potential water quality impacts to surface waters from spills and leaks, and particularly to the White River, as part of its environmental review.<sup>756</sup>

### ***1. Parties’ Positions on Potential Impacts to Surface Water Resources***

Crow Butte conducts both surface and groundwater quality monitoring at the License Area. Surface water impacts are primarily attributable to spills and leaks, which are managed by Crow Butte’s SPCC Plan, and which are monitored via surface water quality sampling. We address below the parties’ positions on the surface water resources exposed to mining impacts, the types of surface and subsurface spills and leaks, the adequacy of Crow Butte’s SPCC Plan, and the effectiveness of Crow Butte’s monitoring and control programs in protecting surface water and groundwater resources.

#### ***a. Parties’ Positions on Surface Water Resources***

As we noted earlier, the EA states that the Crow Butte facility lies within the watersheds of White Clay Creek, Squaw Creek, and English Creek, which are

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We note, however, that, as was the case in the *Strata* proceeding, no evidence was presented in this proceeding to suggest that the prevailing site-specific geochemical conditions in the License Area would make uranium a more effective excursion detector than chloride, alkalinity, and electrical conductivity.

<sup>753</sup> LBP-15-11, 81 NRC 401, 451, App. A (2015).

<sup>754</sup> Ex. INT-003 at 3.

<sup>755</sup> LBP-08-24, 68 NRC at 725.

<sup>756</sup> LBP-15-11, 81 NRC at 410, at 451, App. A.

all small southern tributaries of the White River.<sup>757</sup> Squaw Creek and English Creek flow from southeast to northwest within the License Area, while White Clay Creek, on the west side of the facility, is located outside of the License Area, but also flows to the northwest.<sup>758</sup> All three streams converge and enter the White River approximately 3 miles north of the License Area and 2 miles downstream from the city of Crawford.<sup>759</sup> There are also eight surface water impoundments within or near the License Area, which primarily are used for livestock watering.<sup>760</sup> Of these eight impoundments, four lie within the License Area on Squaw and English Creeks.<sup>761</sup> While the parties do not dispute this inventory of surface water features in the License Area, Intervenor's witnesses claimed that the drawdown of impoundment water levels (observed from a comparison of Google maps from 1993 to 2010) can be attributed to Crow Butte's mining operations within the License Area.<sup>762</sup>

*b. Parties' Positions on Origins of Spills and Leaks*

In their prefiled testimony, Intervenor's witnesses claimed that "identified spills are not well addressed by [Crow Butte],"<sup>763</sup> and that sediments in stream flows can become a possible pathway for the lateral surface movement of spills or leaks.<sup>764</sup> Dr. Kreamer opined that contaminants from Crow Butte's surface spills and leaks will be transmitted through faulted regions or discharged through surface expressions of the BC/CPF Aquifer and, as a result, have the potential to reach and infiltrate the White River alluvium.<sup>765</sup>

EA §§ 4.6.1.2 and 4.6.2.2.2 discuss the impacts of surface spills and leaks on surface waters.<sup>766</sup> In expanding on this discussion, the NRC Staff's witnesses testified that there are two primary pathways for contaminants from spills or leaks within the License Area to reach the White River alluvium.<sup>767</sup> The first pathway would involve contaminants being released from a surface spill (e.g., pond leaks, piping ruptures, transportation accidents) and then entering the streams

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<sup>757</sup> See *supra* Section II.C.1, Surface and Subsurface Water Resources, at p. 297; see also EA § 3.5.1 at 45.

<sup>758</sup> Ex. NRC-001-R at 16 (citing LRA, fig. 2.2-3, at 2-25).

<sup>759</sup> *Id.*

<sup>760</sup> *Id.* (citing EA § 3.5.1 at 45, LRA § 2.7.1.3 at 2-163).

<sup>761</sup> EA § 3.5.1 at 45; LRA § 2.7.1.3, fig. 2.7-1, at 2-159; *id.* § 2.7.1.3 at 2-163.

<sup>762</sup> Tr. at 1458.

<sup>763</sup> Ex. INT-046 at 5.

<sup>764</sup> Ex. INT-069 at 2.

<sup>765</sup> Ex. INT-046 at 3.

<sup>766</sup> EA § 4.6.1.2 at 82-85; *id.* § 4.6.2.2.2 at 88-90.

<sup>767</sup> Ex. NRC-001-R at 17.

(i.e., English and Squaw Creeks) that flow through the License Area.<sup>768</sup> If this were to occur, surface runoff during subsequent rain events would transport contaminants from the License Area downstream to the White River.<sup>769</sup> The second pathway would involve subsurface releases from spills, leaks, or excursions that could result in vertical migration (i.e., the unintended flow of process liquids into the Upper Brule Aquifer).<sup>770</sup> Thereafter, such contaminants could migrate underground until they reached one of the onsite streams (i.e., English and Squaw Creeks) or the White River alluvium.<sup>771</sup>

Crow Butte's witnesses suggested that, to the extent that such spills and leaks have occurred, they have proven to be relatively minor.<sup>772</sup> Specifically, Crow Butte's witnesses testified that "[t]he most common form of surface release from in-situ mining operations occurs from breaks, leaks, or separations within the piping that transfers mining fluids between the process plant and the wellfield," and that "[t]hese are generally small releases due to engineering controls that detect pressure changes in the piping systems and alert the plant operators through system alarms."<sup>773</sup> In addition to surficial spills of processing wastewater, the EA states that leaks can also come from abandoned boreholes and well casings, as well as from wastewater evaporation ponds.<sup>774</sup>

*c. Parties' Positions on Spill Prevention, Control, and Countermeasure Plan*

The EA states that, to prevent surface water impacts, Crow Butte has promptly investigated and mitigated the impacts from spills and leaks,<sup>775</sup> and has an SPCC Plan that prescribes procedures for reporting accidental discharges, spill response, and cleanup measures.<sup>776</sup>

In addition, Crow Butte's witnesses testified that Crow Butte's measures to protect surface water quality include the installation of protective berms and dams around Squaw Creek and English Creek to minimize the potential impact to those onsite creeks from any surface spill of the materials that Crow Butte uses in mining, processing, or restoration activities.<sup>777</sup> They further testified that "[t]hese berms and dams are routinely maintained and inspected to ensure their

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<sup>768</sup> *Id.*

<sup>769</sup> *Id.*

<sup>770</sup> *Id.*

<sup>771</sup> *See id.* at 17, 19-20.

<sup>772</sup> Ex. CBR-001 at 44.

<sup>773</sup> *Id.*

<sup>774</sup> EA § 4.6.2.2.2 at 88-89; *id.* § 4.6.2.2.3 at 90-91.

<sup>775</sup> EA § 4.6.1.2 at 83.

<sup>776</sup> *Id.*

<sup>777</sup> Ex. CBR-001 at 45.

integrity and protect the surface water in the permit area.<sup>778</sup> Crow Butte also has installed instrumentation to detect wet berms, wet valve stations, and wet wellhouses.<sup>779</sup>

The EA states that, in order to prevent pipeline leaks, Crow Butte's piping (made of PVC, high-density polyethylene with butt welded joints, or their equivalent),<sup>780</sup> is leak-tested prior to the initiation of mining operations as well as following any repairs or maintenance.<sup>781</sup> According to the SER, Crow Butte maintains continuous real-time monitoring and control of flow rates and trunk line pressures.<sup>782</sup> The SER also states that Crow Butte installed alarms, sensors, and other instrumentation to monitor the status of its ISL system and to alert its mining employees to any leaks or spills.<sup>783</sup>

Crow Butte's witnesses maintained that Crow Butte's spill control programs have been very effective at limiting surface releases from mining operations.<sup>784</sup> Specifically, they testified that, in over 20 years of mining operations on the License Area, Crow Butte has experienced 358 spills, ranging from 1 to 40,000 gallons.<sup>785</sup> Of these 358 spills, only three were reportable to NDEQ.<sup>786</sup> Moreover, Crow Butte's witnesses testified that none of these spills was reportable to the NRC Staff under 10 C.F.R. Part 20 criteria.<sup>787</sup> In addition, they maintained that Crow Butte analyzes all spills for root causes and contributing factors.<sup>788</sup>

*d. Parties' Positions on Surface Water Monitoring Program and Results*

The EA states that Crow Butte performed preoperational water quality sampling and has continuously (i.e., since it initiated mining operations on the License Area 20 years ago) conducted quarterly surface water sampling for natural uranium at upstream and downstream locations on English Creek and Squaw Creek, as well as at surface impoundments within the wellfields.<sup>789</sup> Crow Butte's

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<sup>778</sup> *Id.*

<sup>779</sup> *Id.*; see also EA § 4.6.1.2 at 83.

<sup>780</sup> LRA § 5.8.1.3 at 5-29.

<sup>781</sup> EA § 4.6.2.2.2 at 88.

<sup>782</sup> SER § 3.1.3.4 at 56; see also EA § 4.6.2.2.2 at 88.

<sup>783</sup> SER § 3.1.3.4 at 56.

<sup>784</sup> Tr. at 1558.

<sup>785</sup> *Id.*

<sup>786</sup> Tr. at 1557.

<sup>787</sup> Ex. CBR-001 at 45; Tr. at 1555.

<sup>788</sup> Ex. CBR-001 at 45; Tr. at 1555-56.

<sup>789</sup> EA § 4.6.1.2 at 83; see also LRA § 5.8.7.2 at 5-77. License Condition 11.13 governs Crow Butte's effluent and environmental monitoring program. Ex. NRC-012 at 14 (License Condition 11.13).

witnesses testified that Crow Butte's quarterly sampling of English Creek and Squaw Creek are representative of the surface water quality within the License Area.<sup>790</sup> They further testified that these sample results show Crow Butte's operations have not impacted the water quality of either stream.<sup>791</sup> Similarly, the EA states that from 1990 to 2010, not only did radionuclide concentrations in English Creek and Squaw Creek remain at or below preoperational levels,<sup>792</sup> but there was also no evidence of any contamination being transported to surface waters outside the License Area.<sup>793</sup> The NRC Staff's witnesses testified that the absence of any such contamination is attributable to Crow Butte's operational controls that are designed to prevent contaminants from reaching the White River alluvium.<sup>794</sup>

The EA notes that Crow Butte took upstream and downstream samples of the sediment in Squaw and English Creeks, as well as samples of the sediment in the surface impoundments in the License Area, at 6-month intervals for 1 year prior to construction in the area.<sup>795</sup> Following construction, Crow Butte took annual samples from locations upstream and downstream from the License Area, specifically three locations on Squaw Creek, two locations on English Creek, and three surface impoundments on English Creek.<sup>796</sup> Crow Butte analyzed sediment samples for natural uranium, radium, and lead-210.<sup>797</sup> The EA also states that the monitoring data Crow Butte collected showed no clear indication of downstream contamination from surface spills or leaks<sup>798</sup> and, "[b]ased upon minimal historical impacts, permitting and reporting requirements, the NRC Staff concludes that potential impacts to surface water from the ongoing plant operations would be SMALL."<sup>799</sup>

In addition to this sampling, Crow Butte's state-issued National Pollutant Discharge Elimination System (NPDES) Permit obligates Crow Butte to implement procedures to control runoff and the deposition of sediment in surface waters

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<sup>790</sup> Ex. CBR-001 at 45-46.

<sup>791</sup> *Id.* at 46.

<sup>792</sup> EA § 4.6.1.2 at 83.

<sup>793</sup> Ex. NRC-001-R at 19.

<sup>794</sup> *Id.* at 19-20.

<sup>795</sup> EA § 4.6.1.2 at 83.

<sup>796</sup> *Id.*

<sup>797</sup> *Id.*; *id.*, figs. 4-1 to 4-2, at 84-85; *see also* LRA, tbl. 5.8-14, at 5-129 to 5-130. All of these data are presented in semiannual effluent monitoring reports that Crow Butte submits to the NRC. *See* Ex. CBR-018, Cameco Resources, Semiannual Radiological Effluent and Environmental Monitoring Report for the Crow Butte Uranium Project (Feb. 28, 2014).

<sup>798</sup> EA § 4.6.1.2 at 83-84.

<sup>799</sup> EA § 4.6.1.2 at 85.

whenever Crow Butte undertakes any routine construction and maintenance in the License Area.<sup>800</sup>

Intervenors' witnesses asserted that Crow Butte should have sampled the White River itself, downstream of the License Area.<sup>801</sup> Crow Butte's witnesses, however, disputed the necessity of doing so, asserting that NDEQ conducts water quality sampling of the White River and has found no impacts associated with Crow Butte's operations.<sup>802</sup> Moreover, as the NRC Staff's witnesses testified, SDDENR samples the water quality of the White River farther downstream, at a monitoring station near Oglala, South Dakota (i.e., within the PRIR), and tests for uranium and other constituents associated with uranium mining.<sup>803</sup> The NRC Staff's witnesses further testified that SDDENR specifically chose to sample at the Oglala monitoring station to detect potential impacts "due to in-situ uranium mining upstream in Nebraska and the naturally occurring uranium in the highly erodible soils in the White River basin."<sup>804</sup> SDDENR reported that its sampling results indicated that Crow Butte's ISL operations are not impacting the White River in this area.<sup>805</sup>

Based on the sampling by Crow Butte of the onsite streams and on the sampling by NDEQ and SDDENR of the White River, the NRC Staff's witnesses opined that additional sampling along the White River is not needed.<sup>806</sup> Rather, they claimed that insofar as there were elevated levels of uranium in wells at the PRIR, those results should be attributed instead to natural sources<sup>807</sup> — which is reflected in several of the exhibits referenced by Intervenors' witnesses during their testimony.<sup>808</sup>

*e. Parties' Positions on Operational Groundwater Impacts from Spills and Leaks*

In his testimony, Dr. LaGarry claimed that there are three principal means "through which contaminated water could migrate away from the uranium-bearing strata through adjacent confining layers . . . : 1) secondary porosity in the form of joints and faults, 2) thinning or pinching out of confining layers, and 3)

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<sup>800</sup> *Id.*

<sup>801</sup> Ex. INT-003 at 4.

<sup>802</sup> Ex. CBR-001 at 46.

<sup>803</sup> Ex. NRC-001-R at 23-24.

<sup>804</sup> *Id.* at 23 (citing Ex. NRC-022).

<sup>805</sup> Ex. NRC-022 at 2.

<sup>806</sup> Ex. NRC-001-R at 25.

<sup>807</sup> Ex. NRC-095 at 24.

<sup>808</sup> *Id.* (citing Ex. INT-072; Ex. INT-074).

perforations made by improperly cased or capped wells.”<sup>809</sup> In any of these three instances, Dr. LaGarry opined that contaminants from a spill or leak could enter the shallow Upper Brule Aquifer and migrate to one of the onsite streams or to the White River alluvium.<sup>810</sup> Similarly, Dr. Kreamer testified that contaminants from surface spills and leaks could be transmitted through faulted regions or discharged through surface outcrops of the BC/CPF Aquifer and, as a result, would have the potential to reach and infiltrate the White River alluvium.<sup>811</sup>

But, as previously noted,<sup>812</sup> Crow Butte has implemented an SPCC Plan to prevent and control inadvertent releases of contaminated water to groundwater. Crow Butte’s SPCC Plan includes extensive controls and procedures for investigating and responding to spills and leaks, reporting accidental discharges, and implementing cleanup measures.<sup>813</sup>

The NRC Staff’s witnesses testified that Crow Butte’s SPCC Plan contains specific provisions governing how it will operate its underground piping system, including: (1) pressure-testing pipelines at operating pressures prior to use; (2) incorporating real-time monitoring and control of flow rates and trunk line pressures; and (3) installing alarms, sensors, and other instrumentation to monitor the status of the ISL injection system and to alert operators to leaks or spills.<sup>814</sup> Dr. Kreamer, however, claimed that Crow Butte’s SPCC Plan was designed to address only large leaks and so Crow Butte’s pipeline monitoring efforts would not be able to detect small, chronic leaks, which could become sizable in the long term.<sup>815</sup> Crow Butte’s witnesses disputed Dr. Kreamer’s claim, testifying that Crow Butte has yet to detect any small, chronic leaks — and added that any such leak would have been noticed within a year after it occurred because there would be an absence of frost on the ground at the spot of the leak during winter, a condition that has not to date occurred at the License Area.<sup>816</sup>

As for Crow Butte’s wastewater evaporation ponds, the EA states that Crow Butte designed them to minimize potential leaks and spills in conformance with

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<sup>809</sup> Ex. INT-013 at 2.

<sup>810</sup> *Id.* at 2-6.

<sup>811</sup> Ex. INT-046 at 3.

<sup>812</sup> See *supra* Section III.F.1.a, Parties’ Positions on First Pathway: License Area to White River Feature to White River Alluvium, at pp. 358-63; Section III.F.1.b, Board Findings on the First Pathway: License Area to White River Feature to White River Alluvium, at pp. 363-65.

<sup>813</sup> EA § 4.6.1.2 at 83; see also *supra* Section III.F.1.b, Board Findings on the First Pathway: License Area to White River Feature to White River Alluvium, at pp. 363-65.

<sup>814</sup> Ex. NRC-001-R at 17-18; see also EA § 4.6.2.2.2 at 88; SER § 3.1.3.4 at 56.

<sup>815</sup> Ex. INT-069 at 8.

<sup>816</sup> Tr. at 1532-33.

the criteria in NRC Regulatory Guide 3.11.<sup>817</sup> The EA further states that Crow Butte's evaporation ponds employ primary and secondary impermeable liners with leak detection systems installed between the liners.<sup>818</sup> The EA also notes that these ponds are subject to regular inspections, including the pond liners and the berms.<sup>819</sup> Witnesses for Crow Butte testified that Crow Butte's process buildings are constructed with secondary containment, and that a regular program of inspections and preventive maintenance is in place there as well.<sup>820</sup>

In her testimony, Intervenor's witness, Ms. McLean, testified that the plastics used in the liners for Crow Butte's evaporation ponds are easily degraded.<sup>821</sup> She also testified that the manufacturer of the liners provides a warranty of only 2 years for the polyethylene, even though Crow Butte's operations within the License Area are projected to endure for decades.<sup>822</sup> It was Ms. McLean's opinion that Crow Butte's liners contain plasticizers likely to be leached by the highly oxidative chemical wastewaters and metals found in the evaporation ponds.<sup>823</sup> Ms. McLean further opined that she would expect Crow Butte's liners to become brittle and to leak once they degrade.<sup>824</sup> Ms. McLean did concede, however, that the warranty for this product is usually a much shorter time frame than is its service life.<sup>825</sup>

The NRC Staff's witnesses testified that, in order to prevent overflow of the evaporation ponds, these ponds are designed to maintain sufficient freeboard to accommodate rain events.<sup>826</sup> The NRC Staff's witnesses also testified that monitoring wells were installed around the ponds to detect any possible leaks, and that the leaks to date had not produced any impacts on shallow groundwater.<sup>827</sup> In addition, the NRC Staff's witnesses testified that Crow Butte monitors the pond levels daily, and that dikes and berms were installed to divert runoff away from these ponds, as required by License Condition 10.16.<sup>828</sup>

With respect to the potential for leaks from abandoned boreholes and well

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<sup>817</sup> EA § 4.6.1.3 at 85; Ex. NRC-020, Office of Nuclear Regulatory Research, Design, Construction, and Inspection of Embankment Retention Systems at Uranium Recovery Facilities, Regulatory Guide 3.11 (rev. 3 Nov. 2008).

<sup>818</sup> EA § 2.2.2.2 at 22; *id.* § 4.6.2.2.3 at 90-91.

<sup>819</sup> *Id.* § 4.6.2.2.3 at 90-91.

<sup>820</sup> Ex. CBR-001 at 47; LRA § 7.4.3.3 at 7-16.

<sup>821</sup> Ex. INT-048 at 24.

<sup>822</sup> *Id.*

<sup>823</sup> *Id.*

<sup>824</sup> *Id.*

<sup>825</sup> Tr. at 1545.

<sup>826</sup> Ex. NRC-001-R at 19 (citing Ex. NRC-012 at 9 (License Condition 10.16)).

<sup>827</sup> *Id.* (citing EA § 4.6.2.2.3 at 90).

<sup>828</sup> *Id.* (citing EA § 4.6.2.2.4 at 91).

casings, Dr. Kreamer claimed that Crow Butte and the NRC Staff failed to present necessary information and data related to borehole and well abandonment (e.g., “no mathematical quantitative analysis is presented,” “[c]omplete documentation for all boreholes . . . is not given,” “the number and location of improperly abandoned boreholes . . . is not reported”) and that, had Crow Butte provided this information, regulatory agencies, the public, and other external reviewers would have been afforded a reasonable basis for evaluating Crow Butte’s conceptual model for the License Area.<sup>829</sup> Crow Butte’s witnesses testified that more than 10,000 drill holes made at the License Area have been plugged in order to prevent commingling of the Upper Brule Aquifer and the BC/CPF Aquifer, and to isolate the Ore Zone.<sup>830</sup> Crow Butte’s witnesses also claimed that the effectiveness of Crow Butte’s borehole abandonment was verified by the results of its four aquifer pumping tests that demonstrated a lack of communication between these aquifers, i.e., “[s]uccessful plugging was confirmed by four successful hydrologic tests prior to” commencing operations in an individual mine unit.<sup>831</sup>

Furthermore, Crow Butte is required to leak test all piping prior to production flow and following any repairs or maintenance<sup>832</sup> and to conduct mechanical integrity testing (MIT) of its mining wells (1) after a well is serviced and (2) at intervals of once every 5 years thereafter.<sup>833</sup> Moreover, in the event a leak in a well is detected during MIT, that well must be repaired and a new mechanical integrity test performed.<sup>834</sup> If the well cannot be repaired or if it still fails MIT after repair, it must be plugged and abandoned.<sup>835</sup> Crow Butte’s well integrity is also subject to oversight under its NDEQ Class III injection well permit, which obligates Crow Butte to ensure its wells are constructed properly and are capable of maintaining pressure without leakage.<sup>836</sup>

## **2. Board Findings on Contention C: Mining Impacts on Surface Water**

Based on the evidentiary record of this proceeding, we make findings with respect to: (1) impacts from surficial spills and leaks on surface waters within the License Area (which include potential impacts to surface water resources on or near the License Area including White Clay Creek, Squaw Creek, English

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<sup>829</sup> Ex. INT-079 at 11-12.

<sup>830</sup> Ex. CBR-045 at 17; Ex. CBR-001 at 35-36; Tr. at 1236-38.

<sup>831</sup> *Id.* at 35.

<sup>832</sup> EA § 4.6.2.2.2 at 88.

<sup>833</sup> EA § 4.6.2.2.2 at 89; Ex. NRC-012 at 8 (License Condition 10.5).

<sup>834</sup> Ex. NRC-012 at 8 (License Condition 10.5).

<sup>835</sup> *Id.*

<sup>836</sup> EA § 4.6.2.2.2 at 89; *see also* Ex. CBR-001 at 35-36.

Creek, the White River, the White River alluvium, and the eight livestock watering impoundments); (2) Crow Butte's SPCC Plan; (3) Crow Butte's surface water monitoring program; and (4) impacts from surficial spills and leaks on groundwater resources.

*a. Board Findings on Operational Surface Water Impacts and Monitoring*

We find that the EA takes the requisite hard look at potential impacts to surface waters over the license renewal period and appropriately concludes that these impacts would be SMALL. Specifically, the EA addresses potential spills and leaks from pipes, wells, evaporation ponds, and vertical excursions and it identifies Crow Butte's protective measures for preventing spills and leaks as well as for minimizing their impacts.<sup>837</sup> The EA also reviews Crow Butte's resolution of its historical spills and leaks and confirms that Crow Butte's monitoring results of these spills and leaks indicates there were negligible impacts to surface waters from Crow Butte's mining operations.<sup>838</sup>

Although Intervenors' witnesses asserted that Crow Butte may have experienced small chronic pipe leaks, there is no record evidence that such events would be likely to occur in the future or that, even were they to occur, they would have significant impacts. Moreover, as we have previously found,<sup>839</sup> there is no record evidence of specific, plausible pathways by which any such contaminants have reached, or even could reach, the White River alluvium or the PRIR. Accordingly, we find that the EA, as supplemented by testimony and evidence presented during the hearing, takes the requisite hard look at surface water impacts and so complies with NEPA with respect to this issue.

Contrary to the allegations of Intervenors' witnesses that the drawdown of impoundment water levels can be attributed to Crow Butte's mining operations within the License Area,<sup>840</sup> we find there is no record evidence to support this claim. In fact, there are no data that specifically correlate changes in the Upper Brule Aquifer water table to the observed changes in the onsite impoundments.

We also find that the EA considers all reasonably foreseeable impacts that an accident at the License Area might have on surface waters, including Squaw

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<sup>837</sup> EA § 4.6.1.2 at 82-83; *id.* § 4.6.2.2.3 at 88-90; *id.* § 4.13.6.1.2 at 125.

<sup>838</sup> EA § 4.6.1.2 at 82-83; *id.* § 4.6.2.2.3 at 88-90.

<sup>839</sup> See *supra* Section III.F.1.b, Board Findings on the First Pathway: License Area to White River Feature to White River Alluvium, at pp. 363-65; Section III.F.2.b, Board Findings on the Second Pathway: Northeasterly Flow to the PRIR, at pp. 370-71; Section III.F.3.b, Board Findings on the Third Pathway: Northwesterly Flow from License Area to BC/CPF Outcrops to the PRIR, at pp. 372-73.

<sup>840</sup> Tr. at 1458.

Creek, English Creek, and the White River.<sup>841</sup> We further find that the EA correctly concludes that Crow Butte has taken the necessary steps to minimize the potential for leaks and spills and has a comprehensive monitoring program in place to detect any such leaks or spills should they occur.<sup>842</sup> Finally, we find that the EA considers the potential for contamination of the White River, as well as the potential impacts on downstream users, from surface spills in the License Area.<sup>843</sup>

We note that EA §§ 4.6.1.2 and 4.6.2.2.2 discuss the impacts of spills and leaks on surface waters and on the Upper Brule Aquifer.<sup>844</sup> The EA concludes that, based upon Crow Butte's 20-plus years of operating history, there have been minimal surface water impacts.<sup>845</sup> Considering Crow Butte's obligations under its NRC license, its NDEQ-issued NPDES permit, and its SPCC Plan, there are sufficient monitoring, permitting, and reporting requirements in place to minimize potential impacts to surface water during the period of license renewal. Accordingly, we find the EA correctly concludes that impacts to surface waters from Crow Butte's ongoing plant operations, as well as its decommissioning and reclamation activities, will be SMALL.<sup>846</sup>

We also find that, despite the fact there have been spills, leaks, and excursion events during Crow Butte's operations at the License Area, there is no record evidence that any of these events resulted in the transport of contaminants outside of the License Area. We further find that all of the record evidence in this regard presented during the hearing (i.e., Crow Butte's quarterly sampling of surface water and its annual sampling of stream sediment in Squaw and English Creeks during more than 20 years of operation) indicates that contaminants from Crow Butte's operations have remained within the License Area.<sup>847</sup> In addition, we find that there is no justification for requiring Crow Butte to sample the White River itself because the monitoring by NDEQ and SDDENR is sufficient in this regard. We also find that, to the extent elevated levels of uranium have been detected in wells at the PRIR, such results are most likely explained by natural sources,<sup>848</sup> which is substantiated by Intervenors' own exhibits.<sup>849</sup>

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<sup>841</sup> EA § 3.5.1 at 45; *id.* § 4.6.1.2 at 82-85; *id.* § 4.13.6.1.2 at 127.

<sup>842</sup> *Id.* § 4.6.1.2 at 82-85; *id.* § 4.13.6.1.2 at 127.

<sup>843</sup> *Id.* § 4.6.1.2 at 82-85; *id.* § 4.13.6.1.2 at 127.

<sup>844</sup> *Id.* § 4.6.1.2 at 82-85; *id.* § 4.6.2.2.2 at 88-90.

<sup>845</sup> *Id.* § 4.6.1.2 at 85.

<sup>846</sup> *Id.* § 4.6.1.3 at 85-86.

<sup>847</sup> *See, e.g., id.* § 4.6.1.2 at 83.

<sup>848</sup> *See supra* Section III.F.2.b, Board Findings on Second Pathway: Northeasterly Flow to the PRIR, at pp. 370-71.

<sup>849</sup> Ex. NRC-095 at 24; *see also* Ex. INT-072; Ex. INT-074.

In regards to the control of spills and leaks, we find that the EA's discussion of the control and management of spills and leaks,<sup>850</sup> combined with testimony presented during the hearing,<sup>851</sup> is sufficient to establish that the impact of Crow Butte's excursions, spills, and daily operations on surface water is SMALL.

*b. Board Findings on Groundwater Impacts from Surface Spills and Leaks*

As discussed earlier,<sup>852</sup> Dr. LaGarry posited three principal means through which contaminated water from spills and leaks could migrate through confining layers, and reach one of the onsite creeks or to the White River alluvium,<sup>853</sup> including: (1) secondary porosity in the UCU, (2) thinning or pinching out of the UCU, and (3) leaks from improperly abandoned boreholes or from holes in the casing or caps of wells.<sup>854</sup> With respect to the extent and integrity of the UCU, we have already found that this unit is composed of low-permeability material that is continuous over the entire License Area.<sup>855</sup> As we have previously found, because of the absence of significant fractures in the UCU underlying the License Area, there is sufficient evidence to demonstrate that the UCU provides adequate confinement of the BC/CPF Aquifer within the License Area.<sup>856</sup> In regards to Intervenor's claims of improperly abandoned boreholes or well leaks, we find that the more than 10,000 drill holes made by Crow Butte have been plugged effectively to isolate the Ore Zone, as verified by the hydrologic tests they conducted prior to mining.<sup>857</sup> As required by its NRC renewed license and its NDEQ Class III injection well permit, Crow Butte must ensure that its wells are constructed properly, are capable of maintaining pressure without leakage, are leak tested, and, in the event of a leak, are properly repaired or abandoned.<sup>858</sup>

As we also explained above,<sup>859</sup> Dr. Kreamer opined that surface spills and leaks could flow through faulted regions or be discharged through outcrops of the BC/CPF Aquifer and would thereby have the potential to reach the White

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<sup>850</sup> EA § 4.6.1.2 at 69.

<sup>851</sup> Tr. at 1529-42, 1548-50, 1555-62, 1565-66, 1619-23, 1810-15.

<sup>852</sup> See *supra* Section IV.B.1.e, Parties' Positions on Operational Groundwater Impacts from Spills and Leaks, at pp. 383-86.

<sup>853</sup> Ex. INT-013 at 2; Ex. NRC-001-R at 16-17.

<sup>854</sup> Ex. INT-013 at 2.

<sup>855</sup> See *supra* Section II.B.3, Upper Confining Unit (UCU), at pp. 291-94.

<sup>856</sup> See *supra* Section III.D.2.b, Board Findings on Secondary Porosity/Permeability from Fracturing, at pp. 346-48.

<sup>857</sup> Ex. CBR-001 at 35-36; Tr. at 1236-38.

<sup>858</sup> EA § 4.6.2.2.2 at 89; Ex. NRC-012 at 8 (License Condition 10.5).

<sup>859</sup> See *supra* Section IV.B.1.e, Parties' Positions on Operational Groundwater Impacts from Spills and Leaks, at pp. 383-86.

River alluvium.<sup>860</sup> We disagree. We find that the record evidence establishes that because the BC/CPF Aquifer does not outcrop anywhere within the License Area and the integrity of the UCU is sound, there is no such mechanism present for the transmission of contaminants from surface spills. Furthermore, we find there is adequate record evidence to support the EA's conclusion that spills and leaks (the source of the contaminants of concern to Dr. Kreamer here) would only result in a SMALL impact, in part as a result of Crow Butte's SPCC Plan that prevents and controls inadvertent releases of contaminated water to groundwater through extensive processes for leak testing, investigating and responding to spills and leaks, reporting accidental discharges, and providing for cleanup measures.<sup>861</sup>

As we discussed above,<sup>862</sup> it is undisputed that: (1) Crow Butte's piping is durable PVC or high-density polyethylene with butt-welded joints; (2) most of this piping is buried to eliminate the most common accidents with vehicular traffic; (3) Crow Butte has effectively minimized the potential for major leaks by pressure testing each of its pipelines both at the time of its installation and following any repairs or maintenance on the pipeline; (4) Crow Butte maintains continuous real-time monitoring and control of flow rates and trunk line pressures, and has installed alarms, sensors, and other instrumentation to monitor the status of its injection system and to alert its operators to leaks or spills; and (5) Crow Butte's institution of mechanical integrity testing of monitoring wells upon installation, and at every 5 years thereafter, effectively aids in preventing leaks.<sup>863</sup> We find that the EA correctly concludes that these steps are sufficient to ensure that impacts to surface waters and groundwater from any leaks or spills from this piping will be SMALL.<sup>864</sup>

With respect to Intervenors' claim that Crow Butte's wastewater evaporation ponds might release contaminants that could ultimately reach the PRIR, we find no record evidence to support this claim. We find that Crow Butte has minimized potential leaks and spills from these ponds by installing primary and secondary impermeable liners with leak detection systems between the liners, as recommended in NRC Regulatory Guide 3.11,<sup>865</sup> and by conducting daily inspections of the ponds.<sup>866</sup> We further find that there is no record evidence to support Ms. McLean's claim that the liner material for Crow Butte's wastewater

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<sup>860</sup> Ex. INT-046 at 3.

<sup>861</sup> EA § 4.3.2 at 79; *id.* § 4.6.1.2 at 82-85; *id.* § 4.6.2.2.2 at 88-90.

<sup>862</sup> *See supra* Section IV.B.1.c, Parties' Positions on Spill Prevention, Control, and Countermeasure Plan, at pp. 380-81.

<sup>863</sup> EA § 4.6.2.2.2 at 88-90; SER § 3.1.3.4 at 56; Ex. CBR-001 at 44.

<sup>864</sup> EA § 4.6.2.2.2 at 89.

<sup>865</sup> *Id.* § 4.6.1.3 at 85.

<sup>866</sup> *Id.* § 2.2.2.2 at 22; *id.* § 4.6.2.2.4 at 91.

evaporation ponds will degrade soon after its 2-year warranty period, particularly after she conceded that the service life of a material far exceeds the length of the manufacturer's warranty life. We further find that Crow Butte: (1) installed berms to divert runoff away from these ponds;<sup>867</sup> and (2) installed monitoring wells around these ponds to assess impacts in the event of leaks. While Crow Butte has experienced some leakage from the ponds, such leaks had no appreciable impact on shallow groundwater due to Crow Butte's design, monitoring, and corrective actions when leaks were detected.<sup>868</sup> Accordingly we find the EA correctly concludes that Crow Butte's steps are sufficient to ensure that impacts to surface waters and groundwater from any leaks or spills from Crow Butte's wastewater evaporation ponds will be SMALL.<sup>869</sup>

### C. Contention D — Communication Between Aquifers

In Contention D, Intervenors assert:

[The NRC Staff] incorrectly states there is no communication among the aquifers, when in fact, the [BC/CPF Aquifer], where mining occurs, and the aquifer, which provides drinking water to the [PRIR], communicate with each other, resulting in the possibility of contamination of the potable water. Based on this potential communication between the aquifers, the EA's environmental justice analysis, including analysis of cumulative effects, should be expanded to consider potential impacts on the aquifer which provides drinking water to the [PRIR].<sup>870</sup>

Intervenors' witnesses opined that there is communication between the BC/CPF Aquifer and the overlying Upper Brule Aquifer that would enable contaminants to migrate from the License Area and ultimately impact drinking water wells on the PRIR.<sup>871</sup> As we have previously explained, Intervenors' witnesses base their concerns primarily on the assumptions that: (1) there are fractures in the UCU; and (2) there is sufficient porosity caused by these fractures that contaminated groundwater could migrate up into the overlying Upper Brule Aquifer and from there to the PRIR aquifers (collectively with the Upper Brule Aquifer we refer to these as "Upper Aquifers") through several potential pathways.<sup>872</sup> Given this,

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<sup>867</sup> *Id.* § 4.6.2.2.3 at 91.

<sup>868</sup> *Id.*

<sup>869</sup> *Id.* § 4.6.2.2.2 at 89.

<sup>870</sup> LBP-15-11, 81 NRC at 451, App. A.

<sup>871</sup> See *supra* Section III.F, Pathways for Contaminant Migration, at pp. 358-73; see also Ex. INT-003 at 3-4; Ex. INT-010 at 6.

<sup>872</sup> See *supra* Section II.B.3, Upper Confining Unit (UCU), at pp. 291-94; Section III.D, Integrity of the UCU, at pp. 331-49.

Intervenors' witnesses maintained that the EA should expand its analysis of Environmental Justice (including the evaluation of cumulative effects) to consider potential impacts on aquifers that provide drinking water to the PRIR.<sup>873</sup>

***1. Hydraulic Communication Between the BC/CPF Aquifer and Upper Aquifers***

Section III discussed the various means by which Intervenors' posited that contaminants could travel from the License Area to the PRIR. Consequently, we have already presented the parties' positions on the topics relating to the first part of Contention D, i.e., the alleged hydraulic communication between the BC/CPF and the Upper Aquifers, including: (1) the integrity of the UCU and the possibility of fracturing within the License Area; (2) the transmissive nature of the White River Feature; (3) the Brule Aquifer's water levels during mining; and (4) Crow Butte's aquifer pumping tests, which were designed to test the adequacy of the BC/CPF Aquifer's confinement. Accordingly, we do not reiterate the parties' positions on those topics here, but rather set forth our findings on the first part of Contention D immediately below.

***a. Board Findings on Communication Between the BC/CPF and Upper Aquifers***

We find that the characteristics and integrity of the UCU demonstrate that the UCU provides more than adequate containment of the contaminants associated with Crow Butte's mining operations within the Ore Zone of the BC/CPF.<sup>874</sup>

**(i) BOARD FINDINGS ON FRACTURING/SECONDARY POROSITY**

Although Intervenors' witnesses presented testimony (not disputed by any party) of mapped lineaments within the License Area, we have previously found that Dr. LaGarry's aerial photographic interpretation technique is not conclusive as to whether there is fracturing in the License Area.<sup>875</sup> Instead, we found that mapped lineaments resulting from aerial photographic interpretation must be confirmed with visual observations of stratigraphic outcrops of a linear feature.<sup>876</sup>

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<sup>873</sup> Consolidated Intervenors' New Contentions Based on the Final Environmental Assessment (October 2014) (Jan. 5, 2015) [hereinafter Intervenors' New Contentions].

<sup>874</sup> See *supra* Section II.B.3, Upper Confining Unit (UCU), at pp. 291-94; Section III.D, Integrity of the UCU, at pp. 331-49.

<sup>875</sup> See *supra* Section III.D.2.a, Board Findings on Lineaments, at p. 346.

<sup>876</sup> See *supra* Section III.D.2.a, Board Findings on Lineaments, at p. 346; see also *supra* Section III.D.1.a, Parties' Positions on Lineaments, at pp. 331-34.

Likewise, we have previously found that there is insufficient evidence of fractures in the UCU within the License Area<sup>877</sup> but that, even were it possible for contaminants from Crow Butte's mining operation to migrate to other aquifers because of fracturing, any such migration would be severely limited because of the inward groundwater gradients that Crow Butte maintains during mining and restoration operations.<sup>878</sup> Finally, we have previously found that, based on monitoring results of private wells near the License Area that provide drinking water from the Upper Brule Aquifer, there have been no changes in water quality during the period of Crow Butte's mining operations within the License Area.<sup>879</sup>

(ii) BOARD FINDINGS ON THE WHITE RIVER FEATURE

We have previously found that the White River Feature is more likely a fold than a fault.<sup>880</sup> Nevertheless, whether we characterize it as a fold, rather than as a fault, is not outcome determinative here because the critical issue for resolving this contention is the actual transmissivity of the White River Feature.<sup>881</sup> In this regard, both Crow Butte and the NRC Staff presented compelling evidence that: (1) the White River Feature is not sufficiently transmissive to act as a significant conduit for the migration of contaminants from Crow Butte's mining operations; and (2) to the extent there is any contaminant migration from Crow Butte's mining operation, the lengthy travel time and distance from the License Area to the White River Feature would significantly reduce the concentration of such contaminants in the groundwater.<sup>882</sup>

(iii) BOARD FINDINGS ON DIFFERENCES IN POTENTIOMETRIC SURFACES AND GEOCHEMISTRY

We have previously found that a comparison of historical groundwater levels shows there has been little change in the potentiometric elevations in the Upper Brule Aquifer since Crow Butte initiated its mining operations on the License

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<sup>877</sup> See *supra* Section III.D.2.b, Board Findings on Secondary Porosity/Permeability from Fracturing at pp. 346-48.

<sup>878</sup> See *supra* Section III.D.2.b, Board Findings on Secondary Porosity/Permeability from Fracturing, at pp. 346-48; see also Ex. NRC-001-R at 21.

<sup>879</sup> See *supra* Section III.E.2.b, Board Findings on Operational Groundwater Impacts to Private Wells, at p. 358; see also EA § 4.6.2.2.6 at 94.

<sup>880</sup> See *supra* Section III.B.2, Board Findings on the Structure of the White River Feature, at pp. 313-15.

<sup>881</sup> See *supra* Section III.B.2, Board Findings on the Structure of the White River Feature, at pp. 313-15; see also Ex. CBR-001 at 23-25; Ex. NRC-095 at 22; Tr. at 1173, 1187, 1192.

<sup>882</sup> See *supra* Section III.B.2, Board Findings on the Structure of the White River Feature, at pp. 313-15; see also Ex. NRC-001-R at 38-39.

Area.<sup>883</sup> Similarly, we have previously found that the potentiometric level of the BC/CPF Aquifer has decreased about 47 feet over the same time period.<sup>884</sup> Finally, we have previously found that, because the potentiometric level in the Upper Brule Aquifer did not decline in tandem with the BC/CPF Aquifer, the two are not likely in communication.<sup>885</sup> For these reasons, we find that the Upper Brule Aquifer and the BC/CPF Aquifer are not in significant transmissive communication.

With respect to geochemistry, we have previously found that there are distinct differences in geochemistry between the water quality in wells screened in the Upper Brule Aquifer and wells screened in the BC/CPF Aquifer.<sup>886</sup> For this reason as well, we find that the Upper Brule Aquifer and the BC/CPF Aquifer are not in significant transmissive communication.

(iv) BOARD FINDINGS ON AQUIFER PUMPING TESTS

We have previously found that because there was no groundwater response in any of the Upper Brule Aquifer observation wells, Crow Butte's four aquifer pumping tests demonstrate the impermeable nature of the UCU.<sup>887</sup> Likewise, we have previously found that, after comparing Crow Butte's actual drawdown data collected from BC/CPF Aquifer wells with the predicted values derived from Crow Butte's aquifer pumping test results, the predicted values consistently overestimate the actual drawdown.<sup>888</sup> We also previously found that, after taking these together, even though the aquifer pumping test results assume a simplified representation of the hydrogeology in and near the License Area, they do provide a conservative overestimate of the drawdowns from Crow Butte's consumptive use rates.<sup>889</sup> In regards to the small aquifer recharge observed in some aquifer pumping test data, the NRC Staff's witnesses attributed this recharge to the extensive stress applied to the confining units during these aquifer pumping tests.<sup>890</sup> We agree and find that the NRC Staff properly confirmed that all four aquifer pumping tests showed that virtually no leakage occurred through the 200-

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<sup>883</sup> See *supra* Section III.D.2.c, Board Findings on Brule Aquifer Water Levels During Mining, at pp. 348-49; see also EA § 4.13.6.2.3 at 132; SER § 3.1.3.5.6 at 61.

<sup>884</sup> See *supra* Section III.D.2.c, Board Findings on Brule Aquifer Water Levels During Mining, at pp. 348-49; see also EA § 4.13.6.2.3 at 132; SER § 3.1.3.5.6 at 61.

<sup>885</sup> See *supra* Section III.D.2.c, Board Findings on Brule Aquifer Water Levels During Mining, at pp. 348-49.

<sup>886</sup> See *supra* Section III.D.2.c, Board Findings on Brule Aquifer Water Levels During Mining, at pp. 348-49; see also EA § 4.13.6.2 at 128; SER § 2.4.3.2.2 at 41; LRA, tbl. 2.2-9, at 2-28.

<sup>887</sup> See *supra* Section III.C.2, Board's Findings on Aquifer Pumping Testing, at pp. 329-30.

<sup>888</sup> See *supra* Section III.C.2, Board's Findings on Aquifer Pumping Testing, at pp. 329-30.

<sup>889</sup> See *supra* Section III.C.2, Board's Findings on Aquifer Pumping Testing, at pp. 329-30.

<sup>890</sup> Ex. NRC-076-R2 at 38.

foot to 500-foot-thick UCU, and that the Upper Brule Aquifer and the BC/CPF Aquifer are not in any significant transmissive communication.<sup>891</sup>

(v) BOARD FINDINGS ON POTENTIAL PATHWAYS FOR COMMUNICATION BETWEEN AQUIFERS

We have previously found that it is unlikely that contaminants from the License Area would reach the White River Feature or the White River alluvium either directly through fractures in the UCU or more indirectly via the Upper Brule Aquifer because (1) there is insufficient record evidence of fractures in the UCU that could provide a significant transmissive connection between the BC/CPF Aquifer and either the White River or the Upper Brule Aquifer; and (2) Crow Butte is required to maintain an inward hydraulic gradient and to monitor for and correct excursions.<sup>892</sup> As we have previously found, other than the White River Feature (which we have found to be a nontransmissive fold), there is insufficient evidence of specific, field-verified fractures in the vicinity of the License Area that would permit contaminant migration along the pathways suggested by Intervenors' witnesses.<sup>893</sup> We have also previously found that it is unlikely contaminants could flow northeasterly through fractures in the UCU to the Arikaree Aquifer and then migrate another 50 miles or so to the nearest of the PRIR wells.<sup>894</sup> Finally, we agree with Dr. LaGarry that because of the presence of the Pierre Shale forming the Chadron Arch, it is extremely unlikely that there could be lateral migration of contaminants from the License Area, over or through the Chadron Arch, and then on to the PRIR.<sup>895</sup> For these reasons, we find that there is insufficient evidence of significant pathways for contaminants to travel from the License Area to the PRIR.

(vi) BOARD FINDINGS ON IMPACTS TO DRINKING WATER ON THE PRIR

We have previously found that, in addition to there being no credible north-

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<sup>891</sup> See *supra* Section III.C.2, Board Findings on Aquifer Pumping Testing, at pp. 329-30; see also Ex. NRC-076-R2 at 38.

<sup>892</sup> See *supra* Section III.F.1.b, Board Findings on the First Pathway: License Area to White River Feature to White River Alluvium, at pp. 363-65; Section III.F.2.b, Board Findings on Second Pathway: Northeasterly Flow to the PRIR, at pp. 370-71; Section III.F.3.b, Board Findings on Third Pathway: Northwesterly Flow from License Area to BC/CPF Outcrops to the PRIR, at pp. 372-73.

<sup>893</sup> See *supra* Section III.F.1.b, Board Findings on the First Pathway: License Area to White River Feature to White River Alluvium, at pp. 363-65; Section III.F.2.b, Board Findings on Second Pathway: Northeasterly Flow to the PRIR, at pp. 370-71; Section III.F.3.b, Board Findings on Third Pathway: Northwesterly Flow from License Area to BC/CPF Outcrops to the PRIR, at pp. 372-73.

<sup>894</sup> See *supra* Section III.F.3.b, Board Findings on Third Pathway: Northwesterly Flow from License Area to BC/CPF Outcrops to the PRIR, at pp. 372-73.

<sup>895</sup> See Tr. at 2582-83.

easterly pathway from the BC/CPF Aquifer to the drinking water aquifers on the PRIR, the elevated levels of uranium in the PRIR wells were most likely caused by naturally occurring uranium and are not the result of contaminants migrating to the PRIR from the License Area. This finding is supported by the following facts: (1) the activity ratios of U-234 to U-238 in the PRIR well water are within the range typically encountered in groundwater in that area; and (2) the Th-234 detected in the PRIR wells could not have originated in the License Area due to the long travel time that would vastly exceed its half-life.<sup>896</sup> For these reasons, we find there is insufficient evidence that uranium decay-chain radioactive constituents detected in the PRIR wells could be attributed to Crow Butte's mining operation.

*b. Summary of Board Findings on Hydraulic Communication Between the Aquifers*

Based on the preceding, we find that the EA, as supplemented by record evidence from this proceeding, is not deficient with respect to this portion of Contention D.

**2. Expansion of Environmental Justice Analysis to Consider Impacts to PRIR Drinking Water**

*a. Parties' Positions on the Expansion of Environmental Justice Analysis to Consider Impacts to PRIR Drinking Water*

The second portion of Contention D concerns Intervenors' claim that the EA's Environmental Justice analysis is inadequate because it does not consider whether contaminants from Crow Butte's operations within the License Area have the potential to impact water in the PRIR,<sup>897</sup> and, in fact, have already impacted the water quality in wells at the PRIR.<sup>898</sup> As a result, Intervenors assert that the EA is deficient because it failed to evaluate Environmental Justice from the impacts of contaminated groundwater on the minority group that resides on the PRIR. Intervenors claim that the EA erroneously limited its review area to a radius of 4 miles around the Crow Butte facility, where it did not identify any minority or low-income populations, and, as a result, they claim a more detailed analysis is required in the EA.<sup>899</sup>

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<sup>896</sup> See *supra* Section III.F.2.b, Board Findings on Second Pathway: Northeasterly Flow to the PRIR, at pp. 370-71.

<sup>897</sup> See LBP-15-11, 81 NRC at 451, App. A.

<sup>898</sup> Ex. OST-001 at 7-8.

<sup>899</sup> See Intervenors' New Contentions at 47.

Based on this limited radius of 4 miles, the NRC Staff's witnesses testified that impacts to surface and groundwater would be SMALL, and opined that there would be no significant impacts and thus no Environmental Justice impacts.<sup>900</sup> The NRC Staff relied on a guidance document ("Environmental Review Guidance for Licensing Actions Associated with NMSS Programs," NUREG-1748), which recommends a 4-mile radius for Environmental Justice considerations.<sup>901</sup> In the estimation of the NRC Staff's witnesses, there was no basis for expanding its Environmental Justice analysis beyond this 4-mile radius because of the absence of any documented impact from Crow Butte's surface and groundwater quality data (presented in semiannual effluent and environmental monitoring reports and the regulatory oversight of the License Area) during Crow Butte's over 20-year operating history.<sup>902</sup>

Crow Butte's witnesses argued that there are no impacts beyond the mining area, much less 50 miles away at the nearest PRIR wells, and that there was no resulting need for the NRC Staff to conduct an Environmental Justice analysis for the PRIR.<sup>903</sup>

*b. Board Findings on Expansion of Environmental Justice Analysis to Consider Impacts to PRIR Drinking Water*

We have previously found that there is insufficient evidence that the uranium and thorium detected in the drinking water on the PRIR is anything other than a natural constituent of the groundwater endemic to the region.<sup>904</sup> Likewise, we have previously found that there is insufficient evidence that contaminants from Crow Butte's mining operation could be the source of this radioactivity, given the confining properties of the UCU, the inward gradients maintained within the License Area, the geographical distance between the License Area and the PRIR translating into a travel time for Th-234 that far exceeds its 24-day half-life, and the lack of a plausible pathway for contaminant migration during Crow Butte's 20-plus years of mining in the License Area.<sup>905</sup> Based on these findings, we further find that the absence of radioactive elements in PRIR drinking water that can be tied to Crow Butte's mining activities precludes the need for the NRC Staff to expand its Environmental Justice analysis for impacts that are

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<sup>900</sup> Ex. NRC-001-R at 51-52.

<sup>901</sup> *Id.* at 49-50 (citing Ex. NRC-014, NUREG-1748, at C-4).

<sup>902</sup> *Id.*

<sup>903</sup> Ex. CBR-001 at 55.

<sup>904</sup> See *supra* Section III.F.2.b, Board Findings on Second Pathway: Northeasterly Flow to the PRIR, at pp. 370-71.

<sup>905</sup> See *supra* Section III.F.2.b, Board Findings on Second Pathway: Northeasterly Flow to the PRIR, at pp. 370-71.

implausible.<sup>906</sup> We therefore conclude that the EA, as supplemented by record evidence from this proceeding, is not deficient with respect to the Environmental Justice portion of Contention D and that there is no need for considerations in the EA to be expanded beyond the 4-mile radius that NUREG-1748 recommends.

#### **D. Contention F — Recent Research on Hydrogeology**

Contention F asserts that Crow Butte and the NRC Staff: (1) failed to consider recent research on geology and hydrogeology by using the antiquated “layer cake” concept in characterizing the geologic strata at the License Area;<sup>907</sup> and (2) ignored recent interpretations of the stratigraphic formations at and near the License Area by continuing to use “outdated nomenclature” when referring to the lower aquifer found onsite at the License Area as the “Basal Chadron Formation” rather than accepting Intervenors’ preferred term, the “Chamberlain Pass Formation.”<sup>908</sup> We address each below.

##### ***1. Parties’ Positions on Failure to Include Recent Research***

###### ***a. Parties’ Positions on Layer Cake Concept***

Dr. LaGarry and Dr. Kreamer testified that Crow Butte and the NRC Staff improperly applied the “layer cake concept” that was in vogue from the 1930s to the 1960s and under which geologists assumed that rock layers: (1) exhibited uniform thickness and uniform lithology and (2) spread out in all directions.<sup>909</sup> Dr. LaGarry stated that these assumptions resulted here in an overestimation of the areal extent and thickness of stratigraphic units pertinent to the License Area,<sup>910</sup> opining that “recent mapping of the geology of northwestern Nebraska has shown that the simplified, ‘layer cake’ concept that was applied by geologists before the 1990s is incorrect, and overestimates the thickness and areal

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<sup>906</sup> *Private Fuel Storage, L.L.C.* (Independent Spent Fuel Storage Installation), CLI-02-25, 56 NRC 340, 348-49 (2002) (stating that NEPA only requires a discussion of “reasonably foreseeable impacts” and that courts have excluded “remote and speculative impacts” from NEPA analysis); *see also* Nuclear Regulatory Commission, Final Policy Statement: “Policy Statement on the Treatment of Environmental Justice Matters in NRC Regulatory and Licensing Actions,” 69 Fed. Reg. 52,040, 52,047 (Aug. 24, 2004) (“The agency’s assessment of environmental justice-related matters has been limited in the context of EAs . . . . If there will be no significant impact as a result of the proposed action, it follows that an [Environmental Justice] review would not be necessary.”).

<sup>907</sup> *See* Ex. INT-003 at 3; Ex. INT-069 at 2-3; Tr. at 1068-70.

<sup>908</sup> *See* Ex. INT-003 at 3; Tr. at 1054-55.

<sup>909</sup> Ex. INT-003 at 3; Ex. INT-069 at 2-3; Tr. at 1068-70.

<sup>910</sup> Ex. INT-003 at 3; Ex. INT-069 at 2-3; Tr. at 1068-70.

extent of many formations by 40-60%.”<sup>911</sup> Dr. LaGarry further criticized Crow Butte and the NRC Staff for ignoring that, with the advent of plate tectonics and the recognition of local uplifts, geologists now view rock layers not as uniform, but as discontinuous and pinching out in lateral directions.<sup>912</sup>

To counter Dr. LaGarry’s criticism in this regard, the NRC Staff’s witnesses testified that cross sections in the LRA (Figures 2.6-4 to 2.6-11) provide the best depiction of the stratigraphy at, and in the vicinity of, the License Area.<sup>913</sup> Specifically, the NRC Staff’s witnesses (supported by Crow Butte’s witnesses) maintained that, rather than assuming a uniform thickness and lateral extent, the LRA’s estimate of the thickness of the geologic units at each mine site in the License Area was based on thousands of exploration and development boreholes that more accurately characterize the lithologic and geophysical characteristics of the subsurface strata.<sup>914</sup> As a result they (along with Crow Butte’s witnesses) asserted that, in lieu of a simple “layer cake” system, the stratification suggested in the LRA was based on direct measurements of the extent of each geologic formation from site-specific explorations.

The NRC Staff’s witnesses also claimed that Crow Butte’s well logs and other hydrogeological data characterization (e.g., aquifer pumping tests, water level measurements, core testing) justified the grouping of the regional stratigraphic units according to their similar hydrogeological properties. According to the NRC Staff’s witnesses, rather than employing the uniform hydrogeologic characterization of a “layer cake model,” Crow Butte’s approach measured and incorporated the actual properties of the geologic formations, and that this accordingly provides a far more accurate depiction of the strata’s nonuniformity.<sup>915</sup> The NRC Staff’s witnesses also asserted that “analysis of ground water flow systems typically relies on the grouping of various regional stratigraphic units that have similar hydrogeological properties” and that “[t]his grouping has been successfully used in hydrogeology and is absolutely necessary as the available measured subsurface data can never be sufficient to capture the true complexity of the geology.”<sup>916</sup>

*b. Parties’ Positions on Nomenclature for the Ore Zone Formation*

Though he did not dispute the general characterization of the geologic strata in and around the License Area, Dr. LaGarry maintained that Crow Butte and

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<sup>911</sup> Ex. INT-003 at 3.

<sup>912</sup> *Id.*; Ex. INT-069 at 2-3; Ex. INT-082-R at 5; Tr. at 1069.

<sup>913</sup> Ex. NRC-001-R at 55 (citing to LRA, figs. 2.6-3 to 2.6-11, at 2-109 to 2-124).

<sup>914</sup> *Id.*; Tr. at 1058-60.

<sup>915</sup> Ex. NRC-001-R at 55-56.

<sup>916</sup> *Id.* at 56.

the NRC Staff failed to incorporate current scientific knowledge that updates the nomenclature and thus the structure for the Ore Zone and ignores recent interpretations of stratigraphic geology of this formation.<sup>917</sup> Specifically, Dr. LaGarry stated that the NRC Staff's use of the term "Basal Chadron Formation" is erroneous and should instead be called the "Chamberlain Pass Formation," in order to acknowledge its separate depositional environment in a separate episode of earth history with different volcanos.<sup>918</sup> As such, he claimed, renaming the Basal Chadron Formation as the Chamberlain Pass Formation is not simply a nomenclatural issue, but is a conceptual issue.<sup>919</sup>

In addition to citing several studies documenting this updated nomenclature,<sup>920</sup> Dr. LaGarry noted that, in the past, when this formation was referred to as the Basal Chadron Formation,<sup>921</sup> it was assumed that the formation had lateral extent and shape equal to that of the overlying Chadron Formation.<sup>922</sup> Instead, Dr. LaGarry opined, the Chamberlain Pass Formation is 1 to 1.5 million years older than the Chadron Formation, and has a lateral extent and shape determined by the ancient topography of the Pierre Shale prior to the deposition of this sandstone layer.<sup>923</sup>

The NRC Staff's witnesses testified that they were aware of the nomenclature revisions that Dr. LaGarry was seeking for the Basal Chadron Formation.<sup>924</sup> They noted that USGS does not identify the Chamberlain Pass Formation in Nebraska, but rather states that the Basal Chadron Formation underlies the Brule Formation.<sup>925</sup> The NRC Staff's witnesses further testified that, even though a 2007 letter from NDEQ<sup>926</sup> initially questioned Crow Butte's outdated nomenclature, NDEQ later referred to this deposit in another proceeding as the "Basal member of the Chadron Formation."<sup>927</sup> Moreover, the NRC Staff's witnesses noted, NDEQ continued to allow Crow Butte to refer to its mined aquifer as the Basal Chadron Formation in order to maintain consistency with historical permitting and to prevent confusion as to where Crow Butte's mining was occurring.<sup>928</sup>

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<sup>917</sup> Tr. at 1054.

<sup>918</sup> Tr. at 1055.

<sup>919</sup> *Id.*

<sup>920</sup> Tr. at 1058; *see generally* Ex. BRD-005.

<sup>921</sup> Ex. INT-003 at 3.

<sup>922</sup> *Id.*

<sup>923</sup> *Id.*

<sup>924</sup> Ex. NRC-001-R at 57 (citing SER § 2.3.3.2 at 33-35).

<sup>925</sup> *Id.*

<sup>926</sup> *See* Ex. INT-011 at 1.

<sup>927</sup> *Id.* (citing Ex. CBR-019 at 1).

<sup>928</sup> Ex. CBR-019, attach. C, at 3.

Crow Butte's witnesses agreed that the primary difference in renaming the ore body from the Basal Chadron Formation to the Chamberlain Pass Formation relates to: (1) assumptions regarding the thickness of the Ore Zone as influenced by its depositional history, and (2) a recognition that the varying thickness of this sandstone is determined by the eroded surface of the underlying Pierre Shale.<sup>929</sup> Regardless, Crow Butte's witnesses maintained that nothing in the naming conventions for the geologic units in Nebraska (and specifically in the License Area) changes the basic interpretation of the physical or hydraulic features of the subject rock units.<sup>930</sup> According to Crow Butte's witnesses, this is because, in lieu of relying on historical assumptions assigned to the Basal Chadron Formation regarding the thickness of the Ore Zone, Crow Butte actually determined the thickness and shape of this sandstone unit at each mine site in the License Area, based on the lithologic and geophysical characteristics shown by over 10,000 boreholes in the License Area.<sup>931</sup>

Even after acknowledging the value of consistency with historic nomenclature and of Crow Butte's collection of actual data to define the thickness and shape of this sandstone layer, Dr. LaGarry still advocated for the use of current concepts in science as a means to demonstrate due diligence.<sup>932</sup> Nevertheless, Dr. LaGarry ultimately conceded that he saw no harm in combining the terms as "Basal Chadron/Chamberlain Pass Formation" (which we have abbreviated herein as "BC/CPF") when referring to this Ore Zone in order to maintain the appropriate historical context for this proceeding.<sup>933</sup> While the NRC Staff's witness, Mr. Back, agreed with Dr. LaGarry's professional opinion on the differing depositional environments between the Basal Chadron and the Chamberlain Pass Formations, he testified that such differences are immaterial with respect to the performance of the mine.<sup>934</sup> Nevertheless, Mr. Back (as well as Crow Butte's witnesses) indicated there was no harm in calling this deposit the "Chamberlain Pass Formation."<sup>935</sup>

*c. Parties' Positions on EPA Documents*

In addition to Intervenor's arguments concerning the layer cake concept and the proper nomenclature of the formation containing the Ore Zone, we stated, at the time we admitted this contention, that Intervenor "offer[ed] the comments

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<sup>929</sup> Ex. CBR-001 at 32.

<sup>930</sup> *Id.* at 10, 55-56.

<sup>931</sup> Tr. at 1059; Ex. CBR-001 at 32; *see also* LRA § 2.6.2.2 at 2-127-28.

<sup>932</sup> Tr. at 1060.

<sup>933</sup> Tr. at 2570-71.

<sup>934</sup> Tr. at 1055.

<sup>935</sup> Tr. at 1071.

and recommendations of Paul Robinson, Research Director for Southwest Research and Information Center, who notes that two of Crow Butte's references in the [LRA] were Environmental Protection Agency guidance documents for groundwater monitoring (from 1974 and 1977) that he claims are out of date and that more recent and appropriate guidance documents (from 1992 and 2000) should have been used.<sup>936</sup> These "outdated" EPA documents were initially utilized by Crow Butte in its preoperational baseline groundwater quality data submitted in conjunction with its initial 1987 license application to mine the License Area.<sup>937</sup> In disputing Intervenors' claim in this regard, the NRC Staff's witnesses testified that Crow Butte's LRA referred to these EPA documents because they were applicable at the time of Crow Butte's original baseline measurements, and, accordingly, the EA's references to them were provided only for historical context and not in support of the EA's conclusions with respect to Contention F.<sup>938</sup>

## **2. Board Findings on Failure to Include Recent Research**

### *a. Board Findings on Layer Cake Concept*

We find that neither the LRA nor the EA assumed a "layer cake concept" of onsite stratigraphy with uniform thickness and limits, as Intervenors suggest. Instead, the EA adopted the characterization of this formation that appears in the LRA,<sup>939</sup> and we find that it adequately analyzed the stratigraphy and hydrostratigraphy of the License Area. Through its actual field measurements, we find that Crow Butte illustrated a variation in thickness and areal extent of the various subsurface strata over the License Area and justified the grouping of the regional stratigraphic units according to their similar hydrogeological properties.<sup>940</sup>

### *b. Board Findings on Nomenclature for the Ore Zone Formation*

We find that there are sound scientific arguments supporting the characterization of the geologic formation overlying the Pierre Shale as having a different depositional era and formation history than that associated with what has his-

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<sup>936</sup> LBP-08-24, 68 NRC at 739 (citing Ex. INT-005, Paul Robinson, Southwest Research and Information Center, Comments and Recommendations Regarding the "Application for 2007 License Renewal USNRC Source Materials License SUA-1534 Crow Butte License Area" (July 28, 2008)).

<sup>937</sup> See LRA § 2.9.1 at 2-275; see also Ex. NRC-001-R at 59.

<sup>938</sup> Tr. at 1651-52; Ex. NRC-001 at 59; see also LRA § 2.9.1 at 2-275; Ex. NRC-037 at 4.4(80).

<sup>939</sup> LRA, figs. 2.6-4 to 2.6-11, at 2-111 to 2-119.

<sup>940</sup> EA, tbl. 3-5, at 38.

torically been called the Basal Chadron Formation. We further find that these arguments warrant the use of the updated name “Chamberlain Pass Formation” and anticipate that the geologic community will eventually accept this nomenclature to describe this sandstone deposit.

The name selected for this formation, however, has little practical impact on the resolution of the contentions in this proceeding because (1) the EA referenced the actual lithologic and geophysical characteristics measured from Crow Butte’s numerous boreholes to define the thickness and shape of the subject deposit (rather than making any assumptions based on its depositional origins), and (2) there is no evidence that the Chamberlain Pass Formation has significantly different hydrogeologic properties (as characterized by Crow Butte’s LRA for the License Area)<sup>941</sup> than those possessed by the Basal Chadron Formation (at least as they pertain to Intervenor’s arguments with respect to this contention). Furthermore, while the NRC Staff’s witnesses were not willing to change the EA’s nomenclature for this deposit, i.e., “the Basal Chadron,” unless and until the USGS officially were to adopt the name suggested by Dr. LaGarry, i.e., “the Chamberlain Pass Formation in Nebraska,”<sup>942</sup> they did acknowledge that the deposit is the result of a completely different formational process than had originally been envisioned.

In recognition of these competing interests, we have accordingly acknowledged both terms for historical context and due diligence to updated nomenclature by referring to the lower aquifer overlying the Pierre Shale as the Basal Chadron/Chamberlain Pass Formation or BC/CPF throughout in this Decision.

*c. Board Findings on EPA Documents*

We find, based on the testimony of the NRC Staff’s witnesses, that Crow Butte properly used the two relevant EPA documents in conjunction with its preoperational baseline groundwater quality data, which were provided in its initial 1987 license application, and that the EA’s subsequent references to these EPA documents were provided solely for historical context.

**E. Contention 6 — Short-Term NEPA Impacts from Consumptive Groundwater Use During Restoration**

In Contention 6, Intervenor’s assert: “The Final EA violates the National Environmental Policy Act in concluding that the short-term impacts from con-

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<sup>941</sup> See LRA § 2.6.2.2 at 2-127 to 2-128; *id.* § 2.7.2.1 at 2-171 to 2-193.

<sup>942</sup> Tr. at 1653.

sumptive ground water use during aquifer restoration are MODERATE.”<sup>943</sup> The EA predicts that overall groundwater consumption will increase once restoration activities commence,<sup>944</sup> and that the greatest depletion of groundwater will occur during the “sweep” phase of Crow Butte’s restoration because, at that time, water from the BC/CPF Aquifer will be removed and, rather than being returned to the BC/CPF Aquifer, is injected into one of two deep underground injection wells, thereby reducing the concentrations of hazardous constituents in the BC/CPF Aquifer.<sup>945</sup> This contention asserts that the impact will instead be LARGE and that the EA inadequately discusses the magnitude of both excessive consumptive use of groundwater and the resulting drawdown of the groundwater levels in destabilizing the BC/CPF Aquifer during restoration.<sup>946</sup> Each of these impacts is discussed in the following sections.

### ***1. Parties’ Positions on Short-Term NEPA Impacts from Groundwater Use During Restoration***

#### ***a. Parties’ Positions on Groundwater Impacts from Consumptive Use***

The EA defines consumptive use as groundwater that is pumped from the BC/CPF Aquifer but that is not returned to that aquifer because it is disposed of elsewhere.<sup>947</sup> During mining operations, Crow Butte’s actual pumping rate is higher than its consumptive use rate because most of its pumped water is returned to the BC/CPF Aquifer and is therefore not “consumed.”<sup>948</sup> According to the EA, Crow Butte consumes 35 to 105 gpm of groundwater during its production activities.<sup>949</sup>

To assess the impact of water consumption required for restoration activities, the NRC Staff used data provided by Crow Butte to perform both “a water-balance analysis”<sup>950</sup> and a “drawdown analysis.”<sup>951</sup> These analyses, which are discussed in the SER, state that restoration of a single mine unit will require the

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<sup>943</sup> LBP-15-11, 81 NRC at 451, App. A.

<sup>944</sup> EA § 4.6.2.3 at 96.

<sup>945</sup> *Id.*

<sup>946</sup> Intervenors’ Joint Position Statement at 109.

<sup>947</sup> See EA § 4.6.2.2.1 at 87-88; see also Office of Federal and State Materials and Environmental Management Programs, Generic Environmental Impact Statement for In-Situ Leach Uranium Milling Facilities, NUREG-1910, § 4.2.4.2.2.2 at 4.2-21 (May 2009) [hereinafter ISL Mining GEIS].

<sup>948</sup> See EA § 4.6.2.2.1 at 88.

<sup>949</sup> *Id.*

<sup>950</sup> *Id.* § 4.6.2.3 at 96 (citing SER § 5.7.9.4). Although the EA mistakenly cites to SER § 5.7.9.4, the water balance is actually found elsewhere, i.e., SER § 3.1.3.5.6.

<sup>951</sup> Ex. NRC-001-R at 86-88; see also § SER 3.1.3.5.6 at 61.

consumptive use of at least 11 pore volumes<sup>952</sup> (a pore volume is a measurement of the total volume of water residing in the voids in a given rock or sedimentary body) of groundwater, but that the ore-bearing body for that mine “should still remain saturated” (i.e., the pore spaces in the formation will remain filled with water) even during restoration.<sup>953</sup> The EA concludes that the short-term impacts from restoration are elevated to MODERATE because (1) Crow Butte may need to extract more than 11 pore volumes of water for the restoration of each mine unit, thus extending Crow Butte’s restoration schedule; and (2) Crow Butte’s greater-than-expected consumptive use rates could increase the drawdown in the potentiometric surface of the BC/CPF Aquifer.<sup>954</sup> Nonetheless, the EA goes on to state that the potentiometric levels would eventually recover after restoration of the BC/CPF Aquifer is complete, and so there would be an overall SMALL impact from long-term consumptive groundwater use.<sup>955</sup>

Intervenors’ witnesses, however, disputed this, arguing that the short-term impacts should be LARGE<sup>956</sup> because the EA significantly understates the quantity of water that will be required for restoration.<sup>957</sup> Intervenors’ witnesses assert in this regard that Crow Butte would need to use more than 11 pore volumes to restore a given mine unit because a much larger volume — more than 36 pore volumes — was required to restore Mine Unit 1.<sup>958</sup> In particular, given the challenges that Crow Butte encountered in restoring Mine Unit 1, Mr. Wireman maintained that the EA should have presented information about Crow Butte’s planned future restoration efforts for its remaining mine units, including the number of pore volumes that would be required at each restoration stage.<sup>959</sup>

In response, Crow Butte’s witnesses testified that Crow Butte learned valuable lessons from Mine Unit 1’s restoration, and that this experience has been incorporated into its Model-Based Restoration Plan (MBRP).<sup>960</sup> In particular,

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<sup>952</sup> A pore volume is a measurement of the total volume of water residing in the voids in a given rock or sedimentary body. See LRA § 6.1.4.2 at 6-22.

<sup>953</sup> EA § 4.6.2.3 at 96; see also Ex. CBR-008, Initial Written Testimony of Crow Butte Resources Witnesses Doug Pavlick, Larry Teahon, and Robert Lewis on Contentions 6 and 9 at 22-23 (May 8, 2015).

<sup>954</sup> EA § 4.6.2.3 at 96.

<sup>955</sup> *Id.*

<sup>956</sup> Intervenors’ Joint Position Statement at 109.

<sup>957</sup> Ex. INT-069 at 7-8; Ex. INT-070 at 2-4.

<sup>958</sup> Intervenors’ Joint Position Statement at 109; Ex. INT-050, Crow Butte Resources, Inc., Response to U.S. Nuclear Regulatory Commission Request for Additional Information, Mine Unit 1 Groundwater Restoration Completion, Crow Butte Uranium Project § 2.2.1, at 3 (Aug. 24, 2001).

<sup>959</sup> Ex. INT-047 at 8; Ex. INT-070 at 3-4.

<sup>960</sup> Ex. CBR-008 at 18-21. Specifically, Crow Butte’s witnesses described Crow Butte’s MBRP as a site-specific groundwater model that employs the USGS’s MODFLOW-2000 as a base algorithm

(Continued)

they claim that Crow Butte's MBRP has led to "significant improvements in restoration efficiency for Mine Units 2, 3, 4, and 5 to date," and, accordingly, that these mines will not require the number of pore volumes that were needed to restore Mine Unit 1.<sup>961</sup> Crow Butte's witnesses further testified that the MBRP "has been refined and expanded as restoration has progressed . . . [which has] greatly improved restoration efficiency [for each future mine unit] by strategically focusing on water that needs to be treated and minimizing water that is treated multiple times."<sup>962</sup>

Nonetheless, Intervenors' witnesses opined that increases in consumptive use will further reduce the available potentiometric head in the BC/CPF, which, in turn, impacts groundwater receptors (e.g., private wells, surface waters, and wetlands).<sup>963</sup> Specifically, these impacts include decreasing the yield from private wells placed in the BC/CPF and depleting the volume of discharges from the aquifer downgradient of the mine, thereby impacting surface waters and wetlands.<sup>964</sup> The NRC Staff's witnesses, on the other hand, maintained that the BC/CPF Aquifer is not crucial for maintaining surface water flow or wetlands, and asserted that the testimony of Intervenors' witnesses did not designate any private well that had been affected by Crow Butte's operational drawdown of the potentiometric levels in the BC/CPF Aquifer.<sup>965</sup>

Intervenors' witnesses also claimed that reducing the available potentiometric head may affect Crow Butte's uranium recovery operations, induce or increase downward leakage from the overlying Upper Brule Aquifer, and decrease well yields and discharges from the BC/CPF Aquifer downgradient of the mine.<sup>966</sup> Yet, Intervenors' witnesses did not identify any specific well or surface water body that was influenced by Crow Butte's increased consumptive use and its associated potentiometric drawdown during restoration.

Under examination at the hearing, Mr. Back testified that, in order for the short-term impact level to be increased from MODERATE to LARGE, Crow Butte would have to destabilize the aquifer (i.e., pumping at a rate that exceeds

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and enables Crow Butte to plan and track its restoration of individual mine units in the License Area. Tr. at 1356-58; *see also* Ex. CBR-008 at 18-20; Ex. CBR-045 at 19; Ex. CBR-041, Worley Parsons, Wellfield Restoration Modeling Crow Butte Resources Mine Units 2-5, at 1 (Feb. 2009).

<sup>961</sup> Ex. CBR-008 at 18-20.

<sup>962</sup> Ex. CBR-052, Rebuttal Testimony of Crow Butte Resources Witnesses Doug Pavlick, Larry Teahon, and Robert Lewis on Contentions 6 and 9, at 7 (June 8, 2015).

<sup>963</sup> *See* Ex. INT-081 at 4-5; Ex. INT-082 at 4; Ex. INT-083, Rebuttal Statement of Mickel Wireman, at 1-2 (Sept. 27, 2015); Tr. at 1690, 2603.

<sup>964</sup> *See* Ex. INT-081 at 4-5; Ex. INT-082 at 4; Ex. INT-083 at 1-2; Tr. at 1690.

<sup>965</sup> *See* Ex. NRC-095 at 8.

<sup>966</sup> Ex. INT-081 at 4-5; Ex. INT-082 at 4; Tr. at 1690, 2600-02.

recharge flow of the aquifer such that the water in the aquifer is depleted).<sup>967</sup> However, Mr. Back continued, while, in theory, Crow Butte could dramatically increase the pumping rate to speed up the restoration process, other factors would prevent this from occurring. Specifically, Mr. Back testified that if Crow Butte lowered the potentiometric surface below the top of the BC/CPF Aquifer, Crow Butte would need to pump significantly more water to maintain the necessary radius of influence, which would affect the entire Crow Butte mining operation within the License Area.<sup>968</sup> Simply put, Crow Butte has a strong operational incentive not to lower the potentiometric surface below the top of the BC/CPF Aquifer, a fact acknowledged by Dr. Kreamer.<sup>969</sup>

As the NRC Staff's witnesses opined, even if the BC/CPF Aquifer level dropped below the top elevation of the BC/CPF Aquifer and part of this aquifer became desaturated, the impact would not necessarily become LARGE as long as Crow Butte's consumptive use rates remained below the sustainable yield of the aquifer such that the groundwater was not being depleted.<sup>970</sup> In this instance, the groundwater resource would not become destabilized, and the impact would not be greater than MODERATE, because the primary impact of reducing the potentiometric head in the aquifer would be the increased energy costs needed to pump from the lower potentiometric levels.<sup>971</sup> Therefore, the NRC Staff's witnesses maintained that decreasing the potentiometric level below the top of the BC/CPF would be a necessary, but not sufficient, condition for a LARGE groundwater quantity impact — and that this could only occur if Crow Butte's pumping rates were sufficient to dewater (i.e., destabilize) the BC/CPF Aquifer by exceeding its sustainable yield once unconfined.<sup>972</sup>

*b. Parties' Positions on Available Potentiometric Head in the BC/CPF Aquifer During Restoration*

Intervenors' witness Mr. Wireman testified that Crow Butte's rate of consumptive use has the potential to impact the BC/CPF Aquifer by lowering its potentiometric levels which, in turn, would reduce the water pressure in this aquifer.<sup>973</sup> Specifically, he stated that Crow Butte's ISL mining, restoration, and water treatment operations have required the withdrawal of large volumes of groundwater from the BC/CPF Aquifer, which, in turn, has already lowered the

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<sup>967</sup> Tr. at 1408-09; *see also* Ex. NRC-076-R2 at 64-65.

<sup>968</sup> Tr. at 1407-08.

<sup>969</sup> Tr. at 1451-52.

<sup>970</sup> Tr. at 1408-09.

<sup>971</sup> Ex. NRC-095 at 8.

<sup>972</sup> *Id.*

<sup>973</sup> Ex. INT-081 at 1.

available potentiometric head in this aquifer.<sup>974</sup> Mr. Wireman maintained that, as a result of this, there is a difference in available potentiometric head in the BC/CPF Aquifer that ranges from 250 feet to 300 feet in the central and southeastern parts of the License Area to less than 150 feet in the northwestern part of the License Area.<sup>975</sup>

Crow Butte's witnesses presented evidence that, even after the more than 20 years of Crow Butte's continuous pumping of the BC/CPF Aquifer in the License Area, the available head within various mine units ranges from 147 feet in the northwest part of the License Area to 435 feet in the southeast part of the License Area (based on August 2015 data).<sup>976</sup> In the LRA, Crow Butte also predicted potential impacts on the potentiometric surface in the BC/CPF Aquifer for private water wells outside of the License Area, using an expected consumptive use rate of 105 gpm,<sup>977</sup> and calculated that the highest percentage that the available water level would be reduced due to consumptive water use is 16.7%, with an average drawdown in the surrounding wells of 9%.<sup>978</sup> As part of their response to a 2009 Request for Additional Information from the NRC, Crow Butte compared actual drawdown data collected from surrounding wells in the BC/CPF Aquifer with its predicted values, and in every instance the predictive values overestimated the actual measured drawdown.<sup>979</sup>

With respect to Mr. Wireman's concern about the lower potentiometric head measured in the northern portion of the License Area,<sup>980</sup> Crow Butte's witnesses asserted that this lower head results from the natural decrease in the thickness of the geologic strata caused by the orientation of surface topography and the underlying geologic surfaces of the Pierre Shale and the BC/CPF Aquifer.<sup>981</sup> To illustrate this point, Crow Butte presented an exhibit that depicts a cross section through the License Area.<sup>982</sup> Crow Butte's witnesses claimed that this exhibit illustrated that the decrease in the available drawdown in the northern portion of the License Area is caused by the fact that: (1) the surface topography drops several hundred feet in elevation from the south end to the north end of the License Area; (2) the Pierre Shale surface rises from south to north by about

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<sup>974</sup> *Id.* at 1, 4-5.

<sup>975</sup> *Id.*

<sup>976</sup> Ex. CBR-062.

<sup>977</sup> Ex. NRC-059, Crow Butte Resources, Inc., LRA Responses to NRC Request for Additional Information, Technical Review, License Renewal Amendment Request, Source Material License SUA-1534 at 2-13 (May 2009).

<sup>978</sup> *Id.* at 10.

<sup>979</sup> *Id.* at 11-13; *id.*, tbl. 2A, at 13; *see also* Ex. NRC-087.

<sup>980</sup> Ex. INT-081 at 1-4.

<sup>981</sup> Ex. CBR-074 at 8-9.

<sup>982</sup> *Id.* at 9.

100 feet; and (3) the potentiometric level of the BC/CPF Aquifer drops only minimally from south to north.<sup>983</sup>

We have previously discussed the NRC Staff's "water-balance" and "draw-down" analyses,<sup>984</sup> referenced in its EA,<sup>985</sup> performed to determine whether the BC/CPF Aquifer would remain saturated during restoration.<sup>986</sup> Using its water balance analysis as described in both the EA and SER,<sup>987</sup> the NRC Staff's witnesses estimated that its historical average consumptive use rate of 105 gpm decreased the potentiometric levels within the BC/CPF Aquifer by approximately 47 feet between 2002 and 2010,<sup>988</sup> or about 10% of the available potentiometric head above the top of the BC/CPF.<sup>989</sup> For an estimated consumptive use rate of 210 gpm, the NRC Staff calculated a drawdown of approximately 108 feet.<sup>990</sup> To lower the head an additional 147 feet (i.e., the lowest potentiometric head currently available in the BC/CPF Aquifer),<sup>991</sup> the NRC Staff estimated it would require a consumptive use rate of 495 gpm.<sup>992</sup> Witnesses for both the NRC Staff and Crow Butte asserted that this use rate is not realistic for two reasons: (1) Crow Butte's historic consumptive use rates are significantly less than this rate; and (2) the limitations on waste disposal capacity (whether by deep well in-

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<sup>983</sup> *Id.*

<sup>984</sup> See *supra* Section IV.E.1.a, Parties' Positions on Groundwater Impacts from Consumptive Use, at pp. 404-07.

<sup>985</sup> EA § 4.6.2.2.1 at 87-88; *id.* § 4.6.2.3 at 96; *id.* § 4.13.6.2.2 at 130-32.

<sup>986</sup> Ex. CBR-008 at 8, 22-23.

<sup>987</sup> EA § 4.6.2.3 at 96 (NRC Staff noted that the section reference to the SER in its EA is inaccurate with the correct cite being SER § 3.1.3.5.4 at 59); SER § 3.1.3.5.4 at 59-60.

<sup>988</sup> Ex. NRC-001-R at 86-87.

<sup>989</sup> SER § 3.1.3.5.6 at 61.

<sup>990</sup> Ex. NRC-095 at 7.

<sup>991</sup> Ex. CBR-062; *see also* Ex. NRC-095 at 8.

<sup>992</sup> Ex. NRC-095 at 7-8. In regards to estimating the consumptive pumping rate required to drop the potentiometric levels below the top of the BC/CPF Aquifer, the lowest available head in the License Area existing in the northern part of the Ore Zone as of 2015 was 147 feet. *See* Ex. CBR-062. At the time this available head was estimated, the aquifer potentiometric level had been drawn down 108 feet from premining levels due to about 210 gpm of consumptive use. This value was calculated by comparing the measured head nearest this location in 1983 to the measured head in 2015. In 1983, the measured head was 3746 feet. *See* Ex. NRC-058, Crow Butte Resources, Inc., Regional Water Level Map Basal Chadron Sandstone 1982-1983, Figure 2.7-4a, at 1 (2009) (selecting the value for RC4). The measured head was 3638 feet in 2015. *See* Ex. CBR-062 (using average of the 2015 water levels in CM10-26 of 3639 feet and CM10-1 of 3637 feet). This drawdown for the pumping rate means that 1.944 gpm of pumping will result in 1 foot of head drop in the potentiometric level. Using this linear relationship between drawdown and pumping rates for the confined BC/CPF Aquifer, *see* Ex. NRC-001-R at 88, pumping the potentiometric level down to the top of the BC/CPF Aquifer (i.e., a total of 255 feet from the sum of the available head, 147 feet, and measured drawdown, 108 feet at this location), would require a consumptive use rate of close to 495 gpm. *See* Ex. NRC-095 at 7-8.

jection or by surface water evaporation from existing ponds)<sup>993</sup> preclude higher consumptive use.<sup>994</sup> Crow Butte’s witnesses emphasized that no new mine units are to be commissioned in the License Area, and, as such, not only are pumping rates at or near their projected maximum, but, in addition, those pumping rates will decline as production concludes in each mine unit and restoration is completed.<sup>995</sup> Crow Butte’s witnesses added that “[l]icensed flow rates for operations are insufficient to lower the water level to that point. There is more than ample available head to accommodate the remaining wellfield production and restoration activities, particularly since consumption/pumping will only be reduced going forward as mine unit operations are sequentially shut down.”<sup>996</sup>

In summary, Crow Butte’s witnesses opined that the EA correctly concludes that the environmental impacts of increased consumptive use during restoration would not rise above MODERATE for four separate reasons: (1) the peak rate of 495 gpm needed to drop the potentiometric level below the top of the BC/CPF Aquifer is not realistic given onsite conditions, licensed flow rates, and disposal capacity;<sup>997</sup> (2) the current 210-gpm consumptive use flow rate is insufficient to lower the potentiometric level of the BC/CPF Aquifer to the critical levels envisioned in Mr. Wireman’s opinion; (3) there currently is sufficient available potentiometric head in the BC/CPF Aquifer to accommodate all of Crow Butte’s production and restoration activities; and (4) consumptive use will continue to be reduced going forward as Crow Butte shuts down each mine unit operation and completes its restoration in a sequential fashion.<sup>998</sup>

## ***2. Board Findings on Short-Term NEPA Impacts from Consumptive Groundwater Use During Restoration***

Our findings on the groundwater impacts from consumptive use and on the available head in the BC/CPF are set forth below.

### ***a. Board Findings on Groundwater Impacts from Consumptive Use***

Regarding Intervenors’ witnesses’ assertion that the EA does not address the impacts of Crow Butte’s mining operation on either public use of the BC/CPF Aquifer or on other groundwater receptors,<sup>999</sup> we find there is insufficient record

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<sup>993</sup> Ex. NRC-001-R at 86-87, 100.

<sup>994</sup> Ex. NRC-095 at 8; Ex. CBR-074 at 8; Tr. at 2499.

<sup>995</sup> Ex. CBR-067 at 7.

<sup>996</sup> *Id.*

<sup>997</sup> Ex. CBR-074 at 8; Tr. at 2499.

<sup>998</sup> Ex. CBR-067 at 7.

<sup>999</sup> Tr. at 1687-88.

evidence to establish widespread public use of the BC/CPF Aquifer. Of the nineteen private wells within a mile of the License Area, only one is placed in the BC/CPF Aquifer.<sup>1000</sup> Although Intervenor were afforded the opportunity to present evidence that other private wells rely on this formation and have been impacted by Crow Butte operations, they offered none. Mr. Back testified that the NRC Staff had “never received any correspondence from any individual indicating that their well is no longer pumping water at the same rate.”<sup>1001</sup> At the same time, we find that the evidence presented during the hearing clarifies and augments the EA’s consideration of public use.

In a similar vein, we find there is insufficient record evidence to establish that the drawdown of the BC/CPF Aquifer has impacted any surface water or wetlands receptors. Intervenor did not identify any specific receptors (e.g., wetlands, streams, etc.) in the area of outcrops where the BC/CPF Aquifer discharges to the ground surface that had been, or would be, impacted as a result of any reduction in the available potentiometric head of the BC/CPF Aquifer due to Crow Butte’s increased consumptive use.

*b. Board Findings on Available Potentiometric Head in the BC/CPF and Destabilizing the BC/CPF Aquifer During Restoration*

We also find there is insufficient evidence to support Intervenor’s claim that the NRC Staff’s current estimated consumptive rate of 210 gpm<sup>1002</sup> would lower the potentiometric level below the top of the BC/CPF Aquifer. Furthermore, we find that, even were the potentiometric level to drop below the top of the BC/CPF Aquifer, the aquifer would not necessarily be destabilized. In addition, we find it is unrealistic that Crow Butte would employ the estimated consumptive rate of 495 gpm needed to draw down the aquifer level to the top of the BC/CPF Aquifer, given the consumptive use rates historically used by Crow Butte within the License Area and the limitations on disposal capacity.

We find that Intervenor’s concerns about reducing the available potentiometric head in the BC/CPF (i.e., adversely affecting Crow Butte’s uranium recovery operations, potentially inducing or increasing downward leakage from the overlying Upper Brule Aquifer and decreasing well yields and discharge from the BC/CPF Aquifer downgradient of the mine) are unsupported by record evidence. First, we find it unlikely that Crow Butte’s mining operations will lower the potentiometric head below the top of the BC/CPF Aquifer and turn this confined aquifer into an unconfined one. As Intervenor’s witnesses them-

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<sup>1000</sup> See Tr. at 1685.

<sup>1001</sup> Tr. at 1418.

<sup>1002</sup> Ex. NRC-095 at 7.

selves agreed,<sup>1003</sup> Crow Butte has a strong operational incentive not to lower the potentiometric surface below the top of the BC/CPF Aquifer because doing so would require Crow Butte to pump significantly more water to maintain the necessary radius of influence, which would adversely affect Crow Butte's entire mining operations.<sup>1004</sup> Second, we find it unlikely that Crow Butte would employ an estimated pumping rate of 495 gpm (required to draw down the level to the top of the sandstone), given Crow Butte's historic consumptive use rates and its limitations in treatment capacity.<sup>1005</sup> But, even if this were to occur, we find that lowering the potentiometric head below the top of the BC/CPF Aquifer and rendering this confined aquifer into an unconfined aquifer would not, in and of itself, destabilize the BC/CPF Aquifer. The NRC Staff's testimony demonstrated that it is unlikely Crow Butte's consumptive use rate will ever exceed the sustainable yield of the BC/CPF Aquifer.<sup>1006</sup>

With regard to increasing the downward leakage from the overlying Upper Brule Aquifer into the BC/CPF Aquifer, we previously have found that there is no record evidence pointing to a permeable connection between these two aquifers due to the integrity of the thick UCU.<sup>1007</sup> And, regarding the impacts on well yields and discharges to surface water, we find that there is no record evidence that Crow Butte's mining operations on the License Area, ongoing for more than 20 years, have affected existing wells and surface water features. We further find that there is no record evidence that Crow Butte's mining operations on the License Area will affect existing wells and surface water features in the future, given that Crow Butte's consumptive use rates are at or near their projected maximum, with no new mine units to be commissioned.

We find that, based on historical flow rates, Crow Butte may have to extract more than 11 restoration pore volumes for each mine unit and thus the EA reasonably concludes that Crow Butte's restoration schedule may extend beyond the dates Crow Butte anticipates needing for restoration.<sup>1008</sup> We further find that while the BC/CPF Aquifer should remain saturated during this time, the EA properly concludes that such an extension of the restoration periods, as well as greater than expected consumptive use rates, could significantly increase the drawdown in the potentiometric level in this aquifer.<sup>1009</sup>

We find that the EA, as supplemented by record evidence in this proceeding, did not err in concluding that the short-term environmental effects from

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<sup>1003</sup> Tr. at 1451-52.

<sup>1004</sup> Tr. at 1407-08.

<sup>1005</sup> See SER § 3.1.3.5.4 at 59.

<sup>1006</sup> Tr. at 1408-09; Ex. NRC-095 at 7-8.

<sup>1007</sup> See *supra* Section III.D.2, Board Findings on the Integrity of the UCU, at pp. 345-49.

<sup>1008</sup> EA § 4.6.2.3 at 96.

<sup>1009</sup> *Id.*

consumptive water use rise to the level of MODERATE because the restoration schedule may be extended, should Crow Butte need to process more than 11 pore volumes of water for the restoration of each mine unit. We further find that the EA correctly concludes that there would not be a LARGE impact in the short term, as there is no evidence Crow Butte's consumptive use rate would be sufficient to destabilize the BC/CPF Aquifer. We also find that the EA, as supplemented by the record evidence, correctly concludes that the long-term effects are SMALL because the water levels in the BC/CPF Aquifer will eventually recover after Crow Butte's aquifer restoration is complete.<sup>1010</sup> In sum, we find that there is sufficient record evidence to support the EA's conclusions that the short-term environmental effects from restoration are MODERATE, and that the long-term effects are SMALL.<sup>1011</sup>

### **3. *Discrepancies in the NRC Staff's Understanding of Restoration Activities***

We find nothing in the evidence and testimony proffered in this proceeding to contradict the testimony of witnesses for both Crow Butte and the NRC Staff that Crow Butte's consumptive use of the groundwater for more than 20 years at the License Area has not significantly changed the hydrogeological conditions at the License Area, based on the absence of change in wellfield operations, aquifer groundwater levels, and environmental monitoring data.

But, having said this, we also find that the EA incorrectly describes Crow Butte's restoration plans,<sup>1012</sup> and that this error was repeated in the prefiled testimony of the NRC Staff's witnesses.<sup>1013</sup> Specifically, the description of Crow Butte's restoration plans in the EA suggests that Crow Butte will employ a four-phase restoration cycle, in which the first, or transfer, phase consists of the exchange of groundwater between a new mine unit and a mine unit at the end of production, in order to lower the concentrations of total dissolved solids.<sup>1014</sup> The EA also suggests that this is followed by an independent sweep phase that consumes all of the water used in the transfer phase.<sup>1015</sup> Yet, during the hearing, Mr. Teahon testified that Crow Butte's restoration plan no longer includes a transfer phase because all mine units are in production with the last mine unit, Mine Unit 11, having gone into production in 2014.<sup>1016</sup> Additionally, Crow Butte

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<sup>1010</sup> *Id.*

<sup>1011</sup> *Id.*

<sup>1012</sup> *See id.*

<sup>1013</sup> *See* Ex. NRC-001-R at 85.

<sup>1014</sup> *Id.*; EA § 2.3.1 at 23; *id.* § 4.6.2.3 at 95-96.

<sup>1015</sup> EA § 2.3.1 at 23; *id.* § 4.6.2.3 at 95-96.

<sup>1016</sup> Tr. at 1735-36.

now operates an integrated sweep-and-treatment phase rather than these being separate phases, which results in a different water consumption profile than that described in the EA.<sup>1017</sup>

Licensing boards frequently hold hearings on contentions challenging the NRC Staff's final environmental review documents, and in such cases, "[t]he adjudicatory record and Board decision (and . . . any Commission appellate decisions) become, in effect, part of the [agency's final environmental analysis]."<sup>1018</sup> In such instances, a licensing board's primary concern is to ensure that the environmental impacts of the proposed action are adequately described in those environmental review documents. Insofar as this can be achieved with the adjudicatory record curing deficiencies in the EA, there is no need to return the EA to the NRC Staff to correct such deficiencies.<sup>1019</sup> That is the case here. While the EA incorrectly describes Crow Butte's restoration processes, additional record evidence at the hearing supplements the EA to correct this error and supports the EA's conclusion that consumptive use during Crow Butte's restoration will produce a MODERATE environmental impact. Accordingly, we hereby supplement and correct the EA to note that Crow Butte uses an integrated sweep-and-treatment phase and no longer uses a separate transfer phase in its restoration activities.<sup>1020</sup>

#### **F. Contention 9 — Failure to Address Groundwater Restoration Mitigation Measures**

Contention 9, as admitted, states: "The Final EA violates 10 C.F.R. §§ 51.10, 51.70 and 51.71, and the National Environmental Policy Act and implement-

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<sup>1017</sup> Tr. at 1731-37; cf. EA § 4.6.2.3 at 95-96.

<sup>1018</sup> *Nuclear Innovation North America LLC* (South Texas Project, Units 3 and 4), CLI-11-6, 74 NRC 203, 208-09 (2011) (quoting *Claiborne Enrichment Ctr.*, CLI-98-3, 47 NRC at 89 and *Philadelphia Electric Co.* (Limerick Generating Station, Units 1 and 2), ALAB-819, 22 NRC 681, 705-07 (1985)).

<sup>1019</sup> See *Indian Point*, CLI-15-6, 81 NRC at 388.

<sup>1020</sup> We note one final discrepancy revealed at the hearing concerning restoration activities that may require action by the NRC Staff. License Condition 10.6 requires that Crow Butte's restoration activities for Mine Units 1 through 5 meet the schedule set forth in an NRC Staff letter dated February 18, 2010. See Ex. NRC-012 at 8 (License Condition 10.6) (citing Letter from NRC Staff to Crow Butte, Regarding Request for Alternate Decommissioning (Groundwater Restoration) Schedule (Feb. 18, 2010) (ADAMS Accession No. ML092510030) [hereinafter Decommissioning Letter]). Although the NRC Staff stated in that February 18, 2010 letter that restoration for Mine Unit 4 would be completed by January 1, 2015, see Decommissioning Letter at 3, Mine Unit 4 was still in the treatment phase of restoration during the August 2015 hearing. Tr. at 1748. Consequently, Crow Butte is not in compliance with its License Condition 10.6 obligations as set forth in the NRC Staff's letter. Accordingly, we expect the NRC Staff to expeditiously address Crow Butte's noncompliance on this issue.

ing regulations by failing to include the required discussion of ground water restoration mitigation measures.”<sup>1021</sup> Intervenors primarily argue that the post-restoration water quality levels required by Crow Butte’s renewed license are unclear and insufficient to return the area to baseline (i.e., preoperation) water quality levels.<sup>1022</sup>

According to the EA, “[t]he purpose of aquifer restoration is to return the ground water quality in the production zone to compliance with the [NRC’s] ground water protection standards in 10 C.F.R. Part 40, Appendix A, Criterion 5B(5).”<sup>1023</sup> The EA explains that Crow Butte can meet these Criterion 5B(5) standards in one of three ways: (1) returning the groundwater constituents to their original premining level (i.e., “the Commission-approved background concentration”); (2) bringing those constituents below the values listed in Table 5C of 10 C.F.R. Part 40, Appendix A; or (3) meeting an “alternate concentration limit” (ACL) for those constituents that is “as low as reasonably achievable, after considering practicable corrective actions.”<sup>1024</sup> The EA does not discuss which of these three standards Crow Butte will meet, much less how it will do so. Rather, the EA merely asserts that by meeting these standards, Crow Butte’s operations will have a “negligible” environmental impact.<sup>1025</sup>

#### ***1. Parties’ Positions on Failure to Address Groundwater Restoration Mitigation Measures***

Mr. Wireman and Dr. Kreamer testified that Crow Butte cannot meet its restoration goals.<sup>1026</sup> Mr. Wireman maintained that the water quality levels required by Crow Butte’s renewed license are unclear and could be undercut if Crow Butte obtains ACLs.<sup>1027</sup> He also pointed to Mine Unit 1 as an example of how difficult restoration can be, noting that Crow Butte failed to achieve restoration standards for many groundwater constituents, including “radium 226, uranium, cadmium, chloride, manganese, sulfate and [total dissolved solids].”<sup>1028</sup> Although Crow Butte implemented its new MBRP for all subsequent

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<sup>1021</sup> LBP-15-11, 81 NRC at 451, App. A.

<sup>1022</sup> Intervenors’ Joint Position Statement at 113-19; *see also* Consolidated Intervenors’ Rebuttal Statement at 12 (June 8, 2015).

<sup>1023</sup> EA § 4.6.2.3 at 95.

<sup>1024</sup> *Id.*; 10 C.F.R. Part 40, App. A, Criterion 5B(6).

<sup>1025</sup> EA § 4.6.2.3 at 95. Crow Butte must meet these standards under its renewed license. Ex. NRC-012 at 8 (License Condition 10.6).

<sup>1026</sup> *See* Ex. INT-046 at 4; Ex. INT-047 at 7-8; Ex. INT-070 at 2-4.

<sup>1027</sup> Ex. INT-047 at 8; Ex. INT-070 at 2-4.

<sup>1028</sup> Ex. INT-047 at 7.

mine restoration projects,<sup>1029</sup> Dr. Kreamer asserted that: (1) Crow Butte's LRA did not adequately discuss that model or its updates; (2) the MBRP model is inadequate; and (3) the MBRP modeling that Crow Butte undertook is insufficient.<sup>1030</sup> In his estimation, Crow Butte's use of models and data analysis relied on assumptions of uniformity, homogeneity, and isotropy, none of which the EA adequately justifies.<sup>1031</sup>

Crow Butte's witnesses disputed Dr. Kreamer's criticism of its MBRP modeling by asserting that Crow Butte accounted for the hydrologic limitations mentioned by Dr. Kreamer, by taking into account heterogeneity, nonuniform thickness, and other measured conditions at the License Area. In particular, Crow Butte's witnesses maintained that its "groundwater flow model was calibrated to premining conditions using water level data collected prior to the mining activities in January 1983 and subsequently has been validated through observation of the sitewide aquifer response during production and restoration."<sup>1032</sup> Crow Butte's witness, Mr. Lewis, testified that, in order to develop the actual surface elevations of the geologic formations in the License Area, Crow Butte's MBRP restoration analysis model incorporated actual values of the geologic stratigraphy from about 5000 production and injection wells.<sup>1033</sup> In 2009, Crow Butte simulated the flow conditions on a sitewide basis, taking into account heterogeneity, nonuniform thickness, and other conditions from boreholes and wells that had been installed at the License Area during the entire period of Crow Butte's mining operations.<sup>1034</sup> Subsequently, Mr. Lewis stated that these data were updated to add the holes that had been drilled and the wells that had been installed after 2009.<sup>1035</sup>

Intervenors also challenged whether Crow Butte's restoration program accurately determines baseline water quality values, includes the appropriate list of hazardous groundwater constituents, and provides a sufficient monitoring timeline to assure compliance with applicable standards.<sup>1036</sup> With respect to baseline water quality values, Dr. Kreamer testified that the values used by Crow Butte "were not exclusively sampled and measured in a [true] pre-mining, pre-drilling, and unperturbed environment," but were instead sampled while other mine units

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<sup>1029</sup> See Ex. CBR-041.

<sup>1030</sup> Ex. INT-069 at 7-8.

<sup>1031</sup> Ex. INT-046 at 2-3.

<sup>1032</sup> Ex. CBR-008 at 20.

<sup>1033</sup> Tr. at 1360-61, 1373. Mr. Lewis testified that, within the License Area, a total of 4530 exploration and development holes have been completed, and an additional 6330 mining and monitoring wells have been installed. Ex. CBR-045 at 17.

<sup>1034</sup> Ex. CBR-052 at 6-7; Ex. CBR-041.

<sup>1035</sup> Tr. at 1373.

<sup>1036</sup> Intervenors' Joint Position Statement at 17-19, 22-23, 43-46.

were operating, and thus would have been influenced by the nearby mines.<sup>1037</sup> For this reason, Dr. Kreamer asserted that Crow Butte should instead have used regional baseline constituent values.<sup>1038</sup> Finally, with respect to the restoration standards themselves, Mr. Wireman asserted that the current license allows Crow Butte to rely on Nebraska's more lenient "Class of Use" standards, instead of restoring the mines to the NRC's Criterion 5B(5) standard.<sup>1039</sup>

After acknowledging that Crow Butte had difficulty restoring Mine Unit 1, the NRC Staff's witnesses maintained that the lengthy restoration process for Mine Unit 1 (and the more successful, recent restorations of Mine Units 2 and 3) demonstrated that, ultimately, Crow Butte's mitigation measures (including frequent testing, leak detection systems, and spill contingency plans)<sup>1040</sup> were successful because they brought the groundwater quality in the Ore Zone of the BC/CPF Aquifer back to baseline, or at least to safe, levels.<sup>1041</sup> The NRC Staff's witnesses also maintained that Intervenors' concerns about Nebraska's "Class of Use" standards were rendered moot when the NRC Staff issued a Regulatory Information Summary in 2009 that concluded Nebraska's "Class of Use" standards conflicted with the more stringent levels required by Criterion 5B(5).<sup>1042</sup> Further, Dr. Striz emphasized that meeting the Criterion 5B(5) standards is a condition in Crow Butte's renewed license<sup>1043</sup> that applies to all of its mine units, including those in restoration and stabilization, i.e., Mine Units 2 through 11.<sup>1044</sup>

Although Crow Butte's witnesses, Mr. Pavlick, Mr. Teahon, and Mr. Lewis, asserted that Crow Butte viewed the Criterion 5B(5) standards as applying only to Mine Units 7 through 11,<sup>1045</sup> Mr. Teahon testified at the hearing that Crow Butte will comply with the Criterion 5B(5) requirements for Mine Units 2 through 11, as stated by Dr. Striz.<sup>1046</sup> Crow Butte's witnesses further testified

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<sup>1037</sup> Ex. INT-046 at 4.

<sup>1038</sup> *Id.*

<sup>1039</sup> Ex. INT-047 at 7.

<sup>1040</sup> Ex. NRC-001-R at 93-94.

<sup>1041</sup> Ex. NRC-076-R2 at 68-69, *see* Ex. NRC-086, Letter from Larry Teahon, Manager of Safety, Health, Environment, and Quality, Crow Butte Operation, to Ronald A. Burrows, Project Manager, Decommissioning and Uranium Recovery Licensing Directorate, NRC at 7, 11 (Aug. 8, 2013).

<sup>1042</sup> Ex. NRC-001-R at 95 (citing Ex. NRC-061, Office of Federal and State Materials and Environmental Management Programs, NRC Regulatory Information 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 (Apr. 29, 2009)).

<sup>1043</sup> Ex. NRC-012 at 8 (License Condition 10.6).

<sup>1044</sup> Tr. at 1847-48.

<sup>1045</sup> Ex. CBR-052 at 14; *see also* Ex. CBR-008 at 9-10.

<sup>1046</sup> Tr. at 1878-79.

that, insofar as Crow Butte seeks ACLs, any “request for approval would be by a future license amendment application.”<sup>1047</sup> This position was confirmed at the hearing by Dr. Striz, who further stated that such an amendment request for ACLs would afford members of the public an opportunity to challenge that request.<sup>1048</sup> In regards to using regional baseline water quality, Crow Butte’s witnesses, Mr. Teahon and Mr. Pavlick, maintained that the constituent concentrations in the Ore Zone of the BC/CPF Aquifer are fundamentally different from those found elsewhere in this aquifer.<sup>1049</sup>

Crow Butte’s witnesses also presented a chart to demonstrate that there is no rising trend in baseline groundwater constituent concentrations for the subsequently opened mine units as compared to earlier mine units.<sup>1050</sup> The NRC Staff’s witnesses accepted Crow Butte’s data in this regard as support for their opinion that baseline values at these newer mine units were not affected by ongoing operations because Crow Butte maintained an inward gradient in all of its mine units that prevented mobilized groundwater constituents from migrating out of an operating mine unit into adjacent mine units.<sup>1051</sup>

The LRA states that Crow Butte’s process for developing baseline values includes sampling baseline water quality wells every 4 acres, collecting three samples per well, and taking each sample 14 days apart.<sup>1052</sup> Intervenors’ witness Dr. Kreamer asserted that this is inadequate, arguing that Crow Butte monitors too few groundwater constituents in its restoration program, and, in particular, does not sample for uranium.<sup>1053</sup> Witnesses for both the NRC Staff and Crow Butte testified that uranium is one of the groundwater constituents that must be monitored in accordance with Criterion 13 of 10 C.F.R. Part 40, Appendix A, and that it is listed as such in Crow Butte’s renewed License Conditions 10.6 and 11.3.<sup>1054</sup> Intervenors’ witnesses also asserted that Crow Butte’s post-restoration monitoring program is flawed, and that, as a consequence, the EA does not adequately evaluate whether Crow Butte has restored, or will restore, its mine units to the levels required by Criterion 5B(5).<sup>1055</sup>

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<sup>1047</sup> Ex. CBR-008 at 11.

<sup>1048</sup> Tr. at 1849-50.

<sup>1049</sup> LRA § 2.7.3 at 2-214; Ex. CBR-052 at 8.

<sup>1050</sup> Ex. CBR-052 at 10 (citing Ex. CBR-057, Mine Unit Average for Baseline (undated)).

<sup>1051</sup> Ex. NRC-076-R2 at 72-73.

<sup>1052</sup> LRA § 6.1.3.1 at 6-5.

<sup>1053</sup> See Ex. INT-069 at 6.

<sup>1054</sup> Tr. at 1875-79; see also Ex. NRC-012 at 11 (listing uranium as an element to be monitored in License Condition 11.3).

<sup>1055</sup> Ex. INT-046 at 3-4; Ex. INT-069 at 6.

**2. Board Findings on Failure to Address Groundwater Restoration Mitigation Measures**

*a. Board Findings on Crow Butte's Restoration Requirements*

Intervenors' concern that Crow Butte intended to rely on the more lenient Nebraska "Class of Use" standards for restoration of Crow Butte Mine Units 2 through 6 was not resolved until the hearing, when Dr. Striz and Mr. Teahon confirmed that Crow Butte's renewed license requires all of Crow Butte's mine units that have not completed restoration (Mine Units 2 through 11) to comply with the Criterion 5B(5) standards.<sup>1056</sup> Although the Commission did accept NDEQ's "Class of Use" standards for Mine Unit 1 under the terms of Crow Butte's 2003 license,<sup>1057</sup> the Commission abandoned this approach with its issuance in 2009 of a Regulatory Interpretation Summary document.<sup>1058</sup> Because both the NRC Staff's and Crow Butte's witnesses testified that Crow Butte's renewed license obligates it to meet the Criterion 5B(5) standards, we find that restoration of Mine Units 2 through 11 are governed by the Criterion 5B(5) requirements and not by the more lenient Nebraska "Class of Use" standards that were applied to Mine Unit 1.

*b. Board Findings on Criterion 5B(5) and Environmental Impact*

Intervenors' witness Dr. Kreamer asserted that Crow Butte lacks mine-specific baseline data for restoration and so instead should use regional baseline data.<sup>1059</sup> Contrary to Dr. Kreamer's call for the use of regional data, however, we find that the evidence presented by two of Crow Butte's witnesses, Mr. Teahon and Mr. Pavlick, demonstrated that the constituent concentrations in the Ore Zone of the BC/CPF Aquifer are fundamentally different from those found elsewhere in this aquifer, due in part to the high uranium concentrations that made the License Area appealing as a site for a uranium ISL mine.<sup>1060</sup> As a result, we find that the use of regional baseline constituent values in this instance would be inappropriate. Also, on balance, we find that data provided by Crow Butte and the NRC Staff support Crow Butte's methodology for determining baseline values, and, as such, the EA is not in error in accepting Crow Butte's approach.<sup>1061</sup>

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<sup>1056</sup> Tr. at 1848-49, 1878-79; *see also* SER § 6.1.3.1 at 154-55.

<sup>1057</sup> Tr. at 1848; LRA, tbl. 1.7-1, at 1-13.

<sup>1058</sup> Ex. NRC-001-R at 95 (citing Ex. NRC-061).

<sup>1059</sup> Ex. INT-046 at 4.

<sup>1060</sup> LRA § 2.7.3 at 2-214; Ex. CBR-052 at 8.

<sup>1061</sup> *See* EA § 3.5.2.4 at 52-53; *id.* § 4.6.2.2.4 at 91-92.

Based on the record evidence presented relating to the number of constituents the NRC Staff requires to be monitored to comply with its restoration program, the Board finds that Crow Butte's selection of parameters to test for groundwater contamination and its obligation to continue to test for those parameters in its renewed license is sufficient to detect migration of groundwater constituents, including uranium.

In regards to Intervenor's witnesses' assertion that Crow Butte's post-restoration monitoring program is flawed, we find that this assertion is belied by the renewed license (License Condition 10.6), which states that post-stabilization monitoring is required, not for a mere 6 months, but rather "until the data show the most recent four consecutive quarters indicate no statistically significant increasing trend for all constituents of concern which would lead to an exceedance above the respective Criterion 5B(5) standard."<sup>1062</sup> In effect, this license condition requires a minimum of 12 months of post-stabilization monitoring. Moreover, Mr. Teahon testified that Mine Units 2 and 3 have actually been in stabilization monitoring for more than 12 months — in fact, they have been in stabilization monitoring for nearly 2 years.<sup>1063</sup> Contrary to Intervenor's concerns, the Board finds that there is no record evidence suggesting that 12 months is an insufficient amount of time to account for rebound effects.

*c. Board Findings on Feasibility of Restoration to Criterion 5B(5) Standards*

Intervenor next argued that Crow Butte cannot meet the Criterion 5B(5) limits. In support of this claim, Intervenor pointed to Mine Unit 1 as an example of a failed restoration effort that was not discussed in the EA.<sup>1064</sup> We find that Intervenor are correct that the EA neither mentioned any of the challenges that Crow Butte faced in restoring Mine Unit 1 nor acknowledged that Crow Butte did not return the subject aquifer to levels that would be consistent with the Criterion 5B(5) standards.<sup>1065</sup> In addition, neither the EA nor the SER discuss

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<sup>1062</sup> Ex. NRC-012 at 8 (License Condition 10.6); *see also* Ex. NRC-088, Letter from Daniel Gillen, Director, NRC Office of Nuclear Material Safety and Safeguards, Division of Fuel Cycle Safety and Safeguards, Fuel Cycle Facilities Branch, to Michael Griffin, Manager of Environmental and Regulatory Affairs, Crow Butte Resources, Inc., at 5 (Feb. 12, 2003).

<sup>1063</sup> Tr. at 1745-48. Mr. Teahon indicated, however, that some of that extended monitoring period for these two mine units was due to additional requirements imposed, not by the NRC Staff, but by NDEQ. Tr. at 1746.

<sup>1064</sup> Intervenor's Joint Position Statement at 115-16; Ex. INT-047 at 6-8; Ex. INT-069 at 6-7; Ex. INT-070 at 3.

<sup>1065</sup> *See* EA § 4.6.2.3 at 94-96.

the MBRP modeling that Crow Butte instituted as a result of the difficulties it encountered with restoring Mine Units 1, 2, and 3.<sup>1066</sup>

At the hearing, however, witnesses for both the NRC Staff and Crow Butte testified that Crow Butte's MBRP modeling has achieved satisfactory restoration of the portion of the BC/CPF Aquifer affected by individual mine units and that as a consequence, this experience justifies the likely success of Crow Butte's future restoration plans.<sup>1067</sup> In particular, Mr. Teahon testified that Mine Units 2 and 3 have already achieved the Criterion 5B(5) background restoration requirements using this plan, and that Crow Butte would soon submit reports to that effect.<sup>1068</sup>

We find that the NRC Staff and Crow Butte presented sufficient evidence at the hearing to satisfactorily address intervenors' specific concerns about the difficulties Crow Butte encountered with restoring Mine Unit 1, i.e., the measures Crow Butte implemented in its restoration of Mine Units 2 and 3, based on its experience with Mine Unit 1.

### **3. Summary of Board Findings on Contention 9 — Failure to Address Groundwater Restoration Mitigation Measures**

The record evidence of this proceeding established that Crow Butte is required to restore Mine Units 2 through 11 to the Criterion 5B(5) standards under License Condition 10.6, and that while the EA's analysis of this was deficient, the NRC Staff's testimony cured such deficiencies and supported the EA's Finding of No Significant Impact.<sup>1069</sup> Appendix A of 10 C.F.R. Part 40 ensures that there will be no significant impact because affected groundwater either must be restored to its original water quality or must be returned to a level that the Commission has found "pose[s] no incremental hazards."<sup>1070</sup> We emphasize that our conclusion that the NRC Staff has met its burden of proof in showing no significant environmental impact rests on the fact that Crow Butte cannot rely

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<sup>1066</sup> See *id.*; SER § 6.1 at 154-61.

<sup>1067</sup> See, e.g., Ex. NRC-076-R2 at 63; Ex. CBR-008 at 15-16; Ex. CBR-052 at 4-7; Tr. at 1356-65, 1777, 1783-84.

<sup>1068</sup> Tr. at 1746-48.

<sup>1069</sup> EA § 4.6.2.3 at 96.

<sup>1070</sup> 10 C.F.R. Part 40, App. A, Criterion 5B(6); see also Uranium Mill Tailings Regulations; Conforming NRC Requirements to EPA Standards, Final Rule, 50 Fed. Reg. 41,852, 41,852-83 (Oct. 16, 1985).

on ACLs under the terms of its current renewed license.<sup>1071</sup> Should Crow Butte seek an ACL in the future, such a request will require a license amendment application, a NEPA review appropriate for a license amendment, and an opportunity for interested persons to challenge such an amendment through an evidentiary hearing.<sup>1072</sup>

## **G. Contention 12 — Tornadoes and Land Application of ISL Wastewater**

Contention 12 contains two topics — tornadoes and land application of ISL wastewater. We address them separately because they rely on different testimony and evidence. The first part of this contention, designated Intervenors' Contention 12A, as previously narrowed, asserts that “[t]he Final EA omits a discussion of the impact of tornadoes on the license renewal area.”<sup>1073</sup> The LRA briefly discusses tornadoes in a section on wind hazards and concludes that tornadoes are “rare in the License Area.”<sup>1074</sup> The EA does not discuss tornadoes or the possible environmental impacts of tornadoes.<sup>1075</sup>

The second part of Intervenors' Contention 12, as previously narrowed, asserts that the Final EA “inadequately discusses the potential impacts from land application of ISL mining wastewater.”<sup>1076</sup> Intervenors' primary focus in this contention is on the potential impacts of selenium on wildlife.<sup>1077</sup>

### **1. Contention 12A — Tornadoes**

#### **a. Parties' Positions on Contention 12A — Tornadoes**

Intervenors' challenge to the adequacy of the EA's discussion of tornadoes is based on the difference between the LRA, which presented a value for the

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<sup>1071</sup> Tr. at 1849-50, 1858-59; SER § 6.1.4 at 159-61; *see also Cleveland Electric Illuminating Co.* (Perry Nuclear Power Plant, Unit 1), CLI-96-13, 44 NRC 315 (1996); *cf. Strata Energy*, LBP-15-3, 81 NRC at 119-20, 133.

<sup>1072</sup> *See* Tr. at 1849-50.

<sup>1073</sup> LBP-15-11, 81 NRC 451, App. A.

<sup>1074</sup> LRA § 2.5.5 at 2-92 (citing Ex. BRD-012, Office of Nuclear Material, Final Generic Environmental Impact Statement on Uranium Milling, NUREG-0706 (Sept. 1980) [hereinafter Ex. BRD-012, NUREG-0706]). Although the LRA refers to the draft of NUREG-0706 (NUREG-0511), there is no difference between the draft and final versions of this NUREG with respect to the topic of tornadoes. Tr. at 1969-71.

<sup>1075</sup> *See* Ex. NRC-001-R at 98-99.

<sup>1076</sup> LBP-15-11, 81 NRC at 451, App. A.

<sup>1077</sup> *Id.* at 438.

risk of tornadoes, and the EA, which does not.<sup>1078</sup> While Intervenors presented no evidence in support of the tornado portion of this contention, this is not by itself fatal to Contention 12A because the NRC Staff bears the ultimate burden of proof for showing that it complied with NEPA.<sup>1079</sup>

The NRC Staff's witness Mr. Goodman confirmed that the EA does not include a discussion of wind effects related to tornadoes because the NRC Staff determined there was a low probability that tornadoes would occur in the License Area.<sup>1080</sup> Similarly, Crow Butte's witness, Mr. Teahon, testified that the probability of a tornado strike in the License Area is "very low," approximately 1 in 48,000.<sup>1081</sup> He added that Crow Butte maintains NRC-approved emergency plans onsite that could be applied if a tornado hit the License Area.<sup>1082</sup>

*b. Board Findings on Contention 12A — Tornadoes*

We find that the NRC Staff's witnesses adequately explained why the EA omits tornadoes and provided sufficient evidence that tornadoes do not pose a significant environmental impact. Although not discussed in the EA, the NRC Staff covered the probability of a tornado strike in the SER and relied on Crow Butte's estimate of an annual probability value of 1 in 48,000.<sup>1083</sup> This value comes from an NRC guidance document, "Final Generic Environmental Impact Statement on Uranium Milling, Project M-25" (NUREG-0706), and is based on the frequency of tornadoes near Rapid City, South Dakota, which is more than 100 miles from Crawford, Nebraska.<sup>1084</sup> The tornado frequency maps cited in NUREG-0706, however, suggest that tornadoes are approximately twice as likely to occur at Crawford than at Rapid City.<sup>1085</sup> Nonetheless, the Board finds that, even were the probabilities doubled, the overall chance of a tornado strike remains remote.

Furthermore, according to the NRC Staff's witnesses, in drafting this section of the SER, the NRC Staff also considered information in NUREG/CR-6733 ("A Baseline Risk-Informed, Performance-Based Approach for In Situ Leach

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<sup>1078</sup> *Id.* at 437.

<sup>1079</sup> *Duke Power Co.* (Catawba Nuclear Station, Units 1 and 2), CLI-83-19, 17 NRC 1041, 1049 (1983).

<sup>1080</sup> Ex. NRC-001-R at 98-99 (citing Ex. NRC-014, NUREG-1748 § 6.3.6 at 141-43; Ex. NRC-017, NUREG/CR-6733 § 4.6 at 4-55 to 4-56).

<sup>1081</sup> Ex. CBR-010 at 2-3 (citing LRA § 2.5.5 at 2-92).

<sup>1082</sup> *Id.* at 3-4.

<sup>1083</sup> SER § 7.3.5 at 176 (citing LRA § 2.5.5 at 2-92); Tr. at 1951; Ex. NRC-001-R at 99.

<sup>1084</sup> Ex. BRD-012, NUREG-0706 § 7.1.3.1 at 7-4; *see also* LRA § 2.5.5 at 2-92; Tr. at 1978.

<sup>1085</sup> Ex. BRD-012, NUREG-0706 § 7.1.6.3.1 at 7-13 (citing Ex. BRD-013, Herbert Conrad Schlue-ter Thom, *Tornado Probabilities*, 1963 Monthly Weather Review 730 (1963)).

Uranium Extraction Licensees”), and NUREG-1748 (“Environmental Review Guidance for Licensing Actions Associated with NMSS Programs Final Report”) in order to conclude that a site-specific discussion of tornadoes was not necessary in the EA.<sup>1086</sup> NUREG/CR-6733 identifies “the potential widespread release of radioactive material from a tornado strike” as a possible hazard for ISL mining, but nonetheless concludes that tornadoes are not a significant threat to the environment if they strike ISL facilities.<sup>1087</sup> Using data from NUREG-0706 (the Final GEIS on Uranium Milling, which discusses the risk of tornado strikes on uranium milling facilities), NUREG/CR-6733 concluded that, even though ISL facility buildings cannot themselves withstand a tornado strike, any resulting release into the air of yellowcake uranium would pose minimal radiological hazards.<sup>1088</sup>

Finally, the SER concluded that Crow Butte had established emergency protocols for natural disasters to reduce public exposure risks, and that the SER deemed these protocols adequate, which removed any need to reexamine them for the current license renewal.<sup>1089</sup> Mr. Teahon testified that Crow Butte’s emergency plans address risks posed by tornadoes; Intervenor’s witnesses presented no evidence that disputed this testimony.<sup>1090</sup>

It is well settled that NEPA “does not call for certainty or precision, but an *estimate* of anticipated (not unduly speculative) impacts.”<sup>1091</sup> In anticipating these impacts, NEPA only requires a discussion of those impacts that are “reasonably foreseeable;”<sup>1092</sup> i.e., it does not require a discussion of impacts that are “remote and speculative” or that have “a low probability of occurrence.”<sup>1093</sup> We find that the record evidence presented during this proceeding supports the NRC Staff’s position that tornadoes do not pose a significant environmental impact to the License Area, and, due to the improbability of tornadoes having an impact at the License Area, the NRC Staff did not violate NEPA by failing to discuss tornadoes in the EA. Accordingly, we find that the EA is not deficient in this regard.

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<sup>1086</sup> Ex. NRC-001-R at 97-99.

<sup>1087</sup> Ex. NRC-017, NUREG/CR-6733 § 4.6 at 4-55-56.

<sup>1088</sup> *Id.* at 4-56 (citing Ex. BRD-012, NUREG-0706).

<sup>1089</sup> SER § 7.3.5 at 176 (citing Ex. NRC-013, NUREG-1569, at 211, app. A).

<sup>1090</sup> Ex. CBR-010 at 3-4; Tr. at 1963.

<sup>1091</sup> *Louisiana Energy Services, L.P.* (National Enrichment Facility), CLI-05-20, 62 NRC 523, 536 (2005) (emphasis in original).

<sup>1092</sup> *Private Fuel Storage*, CLI-02-25, 56 NRC at 348.

<sup>1093</sup> *Id.* at 348-49 (internal quotation marks omitted).

## 2. *Contention 12B — Land Application of ISL Wastewater*

The EA states that one of Crow Butte’s options for handling its ISL wastewater stored in onsite evaporation ponds is to spread such wastewater on the grounds of the License Area, a method called “land application”<sup>1094</sup> or “land irrigation.”<sup>1095</sup> The EA, as corrected by an errata, acknowledges that Crow Butte has an NDEQ state permit authorizing land application, which allows such irrigation to occur “during and immediately after wet weather events.”<sup>1096</sup> Nevertheless, the EA excludes any discussion of the environmental impacts of land application of ISL wastewater on the grounds that Crow Butte has not used land application as a means for wastewater control in the past and “has not indicated [it] will in the future.”<sup>1097</sup>

### a. *Parties’ Positions on Contention 12B — Land Application of ISL Wastewater*

Intervenors claim that the EA “fails to properly account for impacts to wildlife resulting from land application of ISL wastes,” and that the heavy metals in ISL wastewater, particularly selenium, are highly toxic and hazardous to humans and wildlife.<sup>1098</sup> Intervenors’ witness, Ms. McLean, described the heavy metal wastes generated in ISL mining and opined that those metals have toxic human health effects.<sup>1099</sup> She further testified that these metals can become bound to organic compounds, easing their entry to and bioaccumulation in wildlife and humans.<sup>1100</sup> In support of Ms. McLean’s testimony, Intervenors provided: (1) a 2007 letter from the U.S. Fish and Wildlife Service (FWS) to the NRC concluding that waterborne selenium concentrations above 2 micrograms per liter (µg/L) are potentially hazardous to the health and long-term survival of fish and

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<sup>1094</sup> EA § 2.4.1 at 25; *id.* § 2.4.2 at 25; *id.* § 2.4.3 at 25-26; *id.* § 4.6.1.3 at 85-86.

<sup>1095</sup> *See, e.g.*, Ex. NRC-012 at 9-10 (License Condition 10.17); SER § 4.2.3.1.1 at 77.

<sup>1096</sup> EA § 2.4.1 at 25; Ex. NRC-092, Errata to the Final Environmental Assessment (July 23, 2015); *see also* EA § 4.6.1.3 at 85-86; Ex. CBR-043, Nebraska Department of Environmental Quality, Authorization to Discharge Under the National Pollutant Discharge Elimination System (NPDES) (Oct. 1, 2011).

<sup>1097</sup> EA § 4.6.1.3 at 85-86.

<sup>1098</sup> Intervenors’ Joint Position Statement at 121-22; *see also* Ex. INT-048 at 5, 19-20.

<sup>1099</sup> Ex. INT-048 at 5, 19-23; *see also* Ex. INT-049, PowerPoint Presentation of Linsey McLean (undated).

<sup>1100</sup> Ex. INT-048 at 5.

wildlife;<sup>1101</sup> and (2) a detailed report, issued in 2000, on selenium contamination in a Wyoming community as a result of ISL mining.<sup>1102</sup>

Mr. Goodman for the NRC Staff testified that, even though both Crow Butte's renewed license<sup>1103</sup> and its state-issued NPDES permit<sup>1104</sup> allow Crow Butte to perform land application, the EA's limited discussion of land application of ISL wastewater is nevertheless adequate because Crow Butte "has no current plans for treating and discharging the pond water" via land application.<sup>1105</sup> Even were Crow Butte to use land application, however, Mr. Goodman opined that all impacts to surface waters and wildlife would be SMALL because Crow Butte would still be obligated to meet the concentration limits of its NPDES permit issued by NDEQ and Condition 10.17 of its renewed NRC license, both of which limit selenium concentrations to EPA's primary drinking water standard of 50 µg/L.<sup>1106</sup>

Mr. Goodman further testified that the NRC Staff considered the information in both the 2007 FWS letter and the 2000 FWS report. Mr. Goodman stated that the 2000 FWS report was not applicable to the License Area because the sites it examined had far higher concentrations of selenium in the wastewater — approximately 340 to 450 µg/L — as compared to EPA's primary drinking water standard of 50 µg/L.<sup>1107</sup> But Mr. Goodman did not address the FWS's conclusions in its 2007 letter that waterborne selenium concentrations above 2 µg/L are potentially hazardous to fish and wildlife.

Mr. Teahon testified that Crow Butte does not currently plan to use land application.<sup>1108</sup> Nonetheless, he maintained that, in the event Crow Butte were to commence land application, its wastewater would be "passed through reverse osmosis equipment to remove metals and other contaminants, including selenium," and that the application area would be monitored periodically.<sup>1109</sup> Mr.

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<sup>1101</sup> Ex. INT-018, Letter from Mike Stempel, Assistant Regional Director, Fisheries — Ecological Services, U.S. Dep't of the Interior, to Patrice Bubar, Deputy Director, Division of Intergovernmental Liaison and Rulemaking at 1 (Sept. 5, 2007).

<sup>1102</sup> Ex. INT-019, Pedro Ramirez, Jr. & Brad Rogers, U.S. Fish & Wildlife Service Region 6, Selenium in a Wyoming Grassland Community Receiving Wastewater from an In Situ Uranium Mine (Sept. 2000).

<sup>1103</sup> Ex. NRC-012 at 9-10 (License Condition 10.17). Although Crow Butte's renewed license uses the phrase "disposal by irrigation" its meaning is essentially the same as land application of wastes.

<sup>1104</sup> Ex. CBR-043 at 5.

<sup>1105</sup> Ex. NRC-001-R at 100.

<sup>1106</sup> *Id.* at 101-02, 105; Ex. NRC-076-R2 at 76-77; *see also* Ex. CBR-043 at 3-5.

<sup>1107</sup> Ex. NRC-001-R at 103-05 (citing Ex. INT-018; Ex. INT-019).

<sup>1108</sup> Ex. CBR-010 at 4-5; Ex. CBR-054, Rebuttal Testimony of Crow Butte Resources Witness Larry Teahon on Contention 12 at 4 (June 8, 2015).

<sup>1109</sup> Ex. CBR-010 at 5-6; *see also* Ex. CBR-054.

Teahon also testified that the reverse osmosis process Crow Butte would employ is capable of reducing selenium concentrations down to 1 µg/L or even lower<sup>1110</sup> (which is less than the concentrations that FWS estimated to be potentially toxic to wildlife),<sup>1111</sup> an approach that the SER found not to pose an unacceptable level of risk.<sup>1112</sup>

*b. Board Findings on Land Application*

We find that there is sufficient record evidence to support Intervenors' claim that selenium in ISL wastewater poses potentially significant risks to wildlife and that this is not discussed in the EA. To be sure, witnesses for Crow Butte and the NRC Staff provided four separate rationales to justify their claim that the EA requires no further discussion of the land application — i.e., that: (1) there are no specific hazards onsite at the License Area; (2) Crow Butte lacks current plans to use land application; (3) land application is discussed in documents other than the EA; and (4) there is a 50-µg/L limit imposed by the renewed license. Nevertheless, we conclude that each of these four rationales is inadequate. We address each below.

(i) BOARD FINDINGS ON HEALTH IMPACTS OF SELENIUM

The presence of heavy metals in ISL wastewater is not in dispute. As part of the operations and restoration of an ISL mine, the lixiviant solution injected into the ore-bearing body mobilizes the toxic elements vanadium and radium, as well as “metals such as copper, arsenic, molybdenum, and selenium,” thus increasing the concentration of these constituents in groundwater.<sup>1113</sup> These mobilized constituents are removed from the groundwater and are set aside in wastewater, which, according to the EA, can be disposed of either by placement in an existing evaporation pond, injection into an existing deep disposal well, or by land application.<sup>1114</sup> As we have noted, of the constituents present in ISL wastewater, selenium is the primary focus of this contention.<sup>1115</sup>

As is made clear in the FWS letter and report, when ISL wastewater is applied on land, selenium from the wastewater is mobilized and can bioaccumulate in the food chain.<sup>1116</sup> According to FWS, small insects, birds, and fish

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<sup>1110</sup> Ex. CBR-010 at 5.

<sup>1111</sup> *Id.* at 10-11.

<sup>1112</sup> *Id.* at 6-7 (citing SER § 4.2.3.1.1 at 158).

<sup>1113</sup> LRA § 2.7.3 at 2-225.

<sup>1114</sup> EA § 2.2.2 at 9.

<sup>1115</sup> LBP-15-11, 81 NRC at 438.

<sup>1116</sup> Ex. INT-018 at 1; Ex. INT-019 at i, 1, 14.

are especially vulnerable to mobile selenium.<sup>1117</sup> Ms. McLean’s testimony and slide presentation at the hearing further amplified the potential health hazards of ISL wastewater by providing an expanded list of constituents mobilized by ISL mining,<sup>1118</sup> a discussion of the chemical reactivity of selenium and other metals and how they bond to organic chemicals,<sup>1119</sup> and studies on the potential harm to wildlife from selenium.<sup>1120</sup> Based on this information, Ms. McLean opined that the constituents in ISL wastewater can also be harmful to humans, either through direct absorption or through bioaccumulation in the food chain.<sup>1121</sup>

Although witnesses for both the NRC Staff and Crow Butte argued that Intervenors’ claims are generic and do not raise site-specific concerns regarding the current License Area,<sup>1122</sup> we find that there is no dispute that Crow Butte’s mining operation creates ISL wastewater that would contain the constituents discussed above<sup>1123</sup> and that none of the witnesses for the NRC Staff or Crow Butte disputed the general science on selenium toxicity as set forth in Ms. McLean’s testimony.<sup>1124</sup>

We find no legitimate reason for the EA not to have discussed the possible impacts of onsite application of ISL wastewater. Instead, the EA merely notes that land application is an option<sup>1125</sup> and that Crow Butte’s renewed license (which refers to land application as “land irrigation”)<sup>1126</sup> and its NDEQ permit allow Crow Butte to land-apply its wastewater,<sup>1127</sup> but that Crow Butte has no immediate future plans to do so.<sup>1128</sup> We find that it was error for the EA not to discuss, either generically or on a site-specific basis, the environmental impacts of land application of ISL wastewater that could contain selenium.

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<sup>1117</sup> Ex. INT-018 at 1-2; Ex. INT-019 at 1-2.

<sup>1118</sup> Ex. INT-049 at 4; Ex. INT-048 at 2.

<sup>1119</sup> Ex. INT-048 at 2-3; Ex. INT-049 at 9-10.

<sup>1120</sup> Ex. INT-049 at 23-27.

<sup>1121</sup> Ex. INT-048 at 9, 19-20; Tr. at 1564-65, 1649.

<sup>1122</sup> Ex. NRC-076-R2 at 76-78; Ex. CBR-054 at 2-3.

<sup>1123</sup> See LRA § 2.7.3 at 2-225; *id.* § 4.2.1.1 at 4-2.

<sup>1124</sup> There is no dispute as to the toxicity of selenium, as well as other metals, and the ISL Mining GEIS recognizes the potential risks of land application. See, e.g., ISL Mining GEIS § 4.2.3.2 at 4.2-12 (“Land application of the treated wastewater could also cause radiological and/or other constituents (e.g., selenium or other metals) to accumulate in the soils, thereby degrading the site potential for subsequent recreational or agricultural use.”).

<sup>1125</sup> EA § 2.2.2 at 22.

<sup>1126</sup> Ex. NRC-012 at 9-10 (License Condition 10.17).

<sup>1127</sup> EA § 4.6.1.3 at 85-86.

<sup>1128</sup> *Id.*

(ii) BOARD FINDINGS ON POTENTIAL FOR FUTURE LAND APPLICATION

NEPA requires the EA to address the “reasonably foreseeable effects of a proposed action.”<sup>1129</sup> As applied here, given that the NDEQ NPDES permit and the renewed NRC license authorize this activity, and that the EA mentions it as an alternative for waste disposal, we find the EA improperly relies on the absence of Crow Butte’s current plans for land application of ISL wastewater.

The record evidence establishes that Crow Butte sought NRC approval for land application of its mining wastewater in 1993,<sup>1130</sup> subsequently obtained the requisite federal and state permits authorizing such land application, and currently intends to renew its NDEQ NPDES permit authorizing such land application.<sup>1131</sup> Mr. Teahon testified that Crow Butte is pursuing all necessary approvals for land application so that it can be employed as a backup disposal technique.<sup>1132</sup> While it is undisputed that Crow Butte would be required to incur additional costs were it to initiate land application (including requesting a license amendment from the NRC Staff and, thereafter, installing the infrastructure necessary to land-apply wastewater),<sup>1133</sup> Mr. Teahon’s testimony demonstrated his considerable knowledge of how Crow Butte would construct such a system.<sup>1134</sup> Mr. Teahon’s testimony, when placed in the context of the EA’s statement that Crow Butte has all necessary NRC and NDEQ permits to conduct land application,<sup>1135</sup> demonstrates that land application is a reasonably foreseeable alternative. Accordingly, we find that this warrants discussion under NEPA and so must be addressed in the EA.<sup>1136</sup>

(iii) BOARD FINDINGS ON REVIEW OF LAND APPLICATION IN OTHER DOCUMENTS

Witnesses for the NRC Staff and Crow Butte claimed that, even were there to be land application, other state and federal environmental review documents conclude that there would be minimal adverse effects to soils, surface water,

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<sup>1129</sup> *Florida Power & Light Co.* (Turkey Point Nuclear Generating Plant, Units 3 and 4), CLI-15-25, 82 NRC 389, 396 n.46 (2015).

<sup>1130</sup> Ex. NRC-062, Letter from Stephen P. Collings, President, Ferret Exploration Company of Nebraska, to Ramon Hall, NRC Region IV Uranium Recovery Field Office at 1 (June 7, 1993); Tr. at 1916.

<sup>1131</sup> Tr. at 1923-24.

<sup>1132</sup> Tr. at 1928-29.

<sup>1133</sup> Tr. at 1929-30.

<sup>1134</sup> See Tr. at 1925-30.

<sup>1135</sup> EA § 2.4.1 at 25; *id.* § 4.6.1.3 at 85-86.

<sup>1136</sup> See *Turkey Point*, CLI-15-25, 82 NRC at 396 n.46.

and wildlife.<sup>1137</sup> More specifically, Mr. Teahon asserted that the NRC Staff's Environmental Assessment from the 1998 license renewal (the 1998 EA), along with the SER issued in conjunction with this current license renewal, satisfactorily discusses the impacts of land application of treated ISL wastewater and concludes that it would be acceptable.<sup>1138</sup> The NRC Staff's witnesses agreed with Mr. Teahon's assertion and claimed that the ISL Mining GEIS<sup>1139</sup> thoroughly discussed the impacts of land application of ISL wastewater.<sup>1140</sup>

Crow Butte and the NRC Staff, however, cannot rely wholesale on previous environmental review documents that have not been properly incorporated into the EA.<sup>1141</sup> While the NRC Staff may in certain circumstances incorporate by reference previous work that addresses a particular environmental issue, it may only do so where the EA provides specific citations and briefly summarizes how those external documents support the EA's conclusion.<sup>1142</sup> Similarly, to properly tier<sup>1143</sup> to the ISL Mining GEIS, the EA must reference and summarize the specific issues addressed in the GEIS that are to be discussed in the EA.<sup>1144</sup>

That was not done here. We find that none of the documents on which the NRC Staff claims it relied were properly incorporated into the EA, and that there is nothing in the EA to explain how these allegedly incorporated documents support the EA's conclusion regarding possible land application of Crow Butte's ISL mining wastewater. Neither the 1998 EA nor the SER is referenced in the EA's discussion of land application or ISL wastewater. Further, we find that the EA does not mention the ISL Mining GEIS in the context of restoration activities or land application, and is therefore not properly tiered to the EA.

But, even if these documents had been properly incorporated, we find that

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<sup>1137</sup> Ex. NRC-001-R at 100-01, 104-05; NRC Staff's Initial Statement of Position at 67-68 (May 8, 2015) [hereinafter Staff's Initial Statement of Position]; Staff Proposed Findings at 119; *see also* Ex. CBR-010 at 6-7.

<sup>1138</sup> Ex. CBR-010 at 6-7.

<sup>1139</sup> The ISL Mining GEIS assessed "the potential environmental impacts associated with the construction, operation, aquifer restoration, and decommissioning of an ISL uranium recovery facility in four specified regions in the western United States." ISL Mining GEIS at iii. Ex. NRC-045 is an excerpt from this GEIS.

<sup>1140</sup> Ex. NRC-001-R at 104-05.

<sup>1141</sup> Ex. NRC-014, NUREG-1748 § 1.6.4 at 24 ("The NEPA document must be able to stand alone and provide sufficient analysis to allow the decision maker to arrive at a conclusion.").

<sup>1142</sup> 40 C.F.R. § 1502.21; *see also* 10 C.F.R. Part 51, Subpart A, App. A, § 1(b) (adopting "[t]he techniques of tiering and incorporation by reference described respectively in 40 CFR 1502.20 and 1508.28 and 40 CFR 1502.21 of CEQ's NEPA regulations" (footnote omitted)).

<sup>1143</sup> As explained above, *see supra* Section I.A, Legal Standards, at pp. 282-84, tiering is a form of incorporation by reference whereby an agency incorporates a GEIS into a site-specific analysis. 40 C.F.R. §§ 1502.20, 1508.28.

<sup>1144</sup> 40 C.F.R. § 1502.20; *see also* Ex. NRC-014, NUREG-1748 § 1.6.2 at 1-10.

they still would not support the EA's conclusion that, based on Crow Butte's "implementation of mitigation measures in the past," the impact to soils, surface waters, and wildlife from land application of ISL wastewater will be "SMALL."<sup>1145</sup> First, the 1998 EA contains the same information as the current EA — i.e., that Crow Butte has approval for, but no current plans to implement, land application of ISL wastewater,<sup>1146</sup> and that "[t]he release limits for various ionic species, metals, and some radionuclides are established by appropriate NRC, EPA, and State of Nebraska standards."<sup>1147</sup> It contains nothing else on this subject. We find that the 1998 EA differs from the current EA in this regard only insofar as it states "[s]hould [Crow Butte] decide in the future to begin land application of treated effluents, the staff recommends that it also should implement vegetation sampling within the land-applied areas so that assumptions in the . . . modeling concerning soil and plant uptake can be verified."<sup>1148</sup> The current EA, however, makes no mention of any such biological monitoring, and Mr. Teahon testified that Crow Butte's NPDES permit does not require Crow Butte to undertake such testing.<sup>1149</sup> Likewise, the SER for the current license renewal states only that land application is an option Crow Butte does not currently plan to pursue and it does not analyze any measures that might be needed were Crow Butte to commence such land application.<sup>1150</sup>

We also note that, in its general discussion of the land application of ISL wastewater,<sup>1151</sup> the ISL Mining GEIS acknowledges that selenium concentrations are an issue at ISL mining sites and that licensees are required to monitor and control soil impacts through their environmental monitoring programs.<sup>1152</sup> According to the GEIS, "[m]onitoring includes analyzing water before it is applied to land to make sure release limits are met and soil sampling to ensure that concentrations of uranium, radium, and other metals are within allowable limits."<sup>1153</sup> The ISL Mining GEIS explains that NRC-licensed ISL facilities must monitor soils during decommissioning and that a state environmental agency

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<sup>1145</sup> See Ex. NRC-001-R at 101; Ex. CBR-010 at 12.

<sup>1146</sup> Ex. CBR-044, Office of Nuclear Material Safety and Safeguards, Division of Waste Management, Environmental Assessment for Renewal of Source Material License No. SUA-1534 § 3.6.2.2 at 33 (Feb. 1998).

<sup>1147</sup> *Id.*

<sup>1148</sup> *Id.* § 3.7.3 at 39.

<sup>1149</sup> See Tr. at 1947.

<sup>1150</sup> SER § 3.1.3.5.4 at 59.

<sup>1151</sup> See, e.g., ISL Mining GEIS § 2.7.2 at 2-37; *id.* § 4.2.3.2 at 4.2-12; *id.* § 4.2.4.2.2.1 at 4.2-20; *id.* § 4.2.5.2 at 4.2-34; *id.* § 4.2.12.2 at 4.2-61; *id.* § 4.4.3.2 at 4.4-7; *id.* § 4.4.4.2.2.1 at 4.4-12; *id.* § 4.5.3.2 at 4.5-7; *id.*, tbl. 7.4-1, at 7-3 to -6.

<sup>1152</sup> *Id.* § 4.2.3.2 at 4.2-12; *id.* § 4.2.5.2 at 4.2-34.

<sup>1153</sup> *Id.* § 4.2.3.2 at 4.2-13.

may impose additional requirements.<sup>1154</sup> It also indicates that the NRC prohibits ISL mining wastewater from entering surface waters or shallow aquifers.<sup>1155</sup>

Although the ISL Mining GEIS is certainly more instructive than either the 1998 EA or the SER, it in no way establishes that the overall effects at the License Area would be SMALL for wildlife. In fact, the ISL Mining GEIS does not even discuss the impact of land application on fauna.

The 2007 FWS letter explicitly specifies that concentrations in water as low as 2 µg/L of selenium may be harmful to wildlife as a result of bioaccumulation.<sup>1156</sup> The ISL Mining GEIS did not respond in any way to this FWS concern. It could have, for example, declared that ISL facilities should land-apply wastewater only where the concentrations of selenium were lower than 2 µg/L, or it could have demonstrated that the FWS documents are overly conservative with respect to the selenium concentration values or its bioaccumulation risks. The ISL Mining GEIS, however, is completely silent in this regard. Accordingly, we find that these generic statements in the ISL Mining GEIS do not fulfill the NRC Staff's obligations under NEPA with regard to the significant impacts that could reasonably be posed to wildlife at the License Area were Crow Butte to commence land application of ISL wastewater.<sup>1157</sup>

(iv) BOARD FINDINGS ON RELIANCE ON DRINKING WATER STANDARDS

Both Mr. Goodman and Mr. Teahon testified that Crow Butte is prohibited under both its renewed license (License Condition 10.17) and its state-issued NPDES permit from performing land application of its wastewater insofar as that wastewater contains selenium concentrations greater than 50 µg/L.<sup>1158</sup> Mr. Goodman argued that the NDEQ concentration limit of 50 µg/L is a sufficient safeguard and “[c]onsequently, there is no evidence to suggest that the environmental impacts of selenium, specifically, would be sufficiently significant or probable to require a separate discussion in the EA.”<sup>1159</sup> The NRC Staff's witnesses also argued that the 50-µg/L limit is safe for the environment, including wildlife, because the Nebraska NDEQ permit adopted that limit, and the NRC

<sup>1154</sup> *Id.* § 2.7.2 at 2-37; *id.* § 4.2.3.2 at 4.2-12 to -13; *id.* § 4.2.12.2 at 4.2-62.

<sup>1155</sup> *Id.* § 4.2.4.2.2.1 at 4.2-20; *id.* § 4.2.12.2 at 4.2-62; *id.*, tbl. 7.4-1, at 7-3 to -6.

<sup>1156</sup> Ex. INT-018 at 1.

<sup>1157</sup> 40 C.F.R. § 1500.2(b); Ex. NRC-014, NUREG-1748 § 1.2; *see also Klamath-Siskiyou Wildlands Center v. Bureau of Land Management*, 387 F.3d 989, 993-94 (9th Cir. 2004); *Neighbors of Cuddy Mountain v. U.S. Forest Service*, 137 F.3d 1372, 1380 (9th Cir. 1998).

<sup>1158</sup> Ex. NRC-001-R at 102 (citing Ex. NRC-012 at 9-10 (License Condition 10.17)); Ex. NRC-062, tbl. 2.5, at 18; Ex. CBR-010 at 5, 7-8; *see also* 40 C.F.R. § 141.62(b); 118 Neb. Admin. Code, ch. 4 § 002 (2016).

<sup>1159</sup> Ex. NRC-001-R at 102.

Staff is allowed “to give substantial weight to NDEQ’s decision that issuing the permit would be environmentally acceptable.”<sup>1160</sup>

We find that the NDEQ concentration limit for selenium reflects the safe level for humans, but not necessarily for wildlife.<sup>1161</sup> For land application to be characterized as having only a SMALL environmental impact on wildlife, it must not “noticeably alter any important attribute of” the subject wildlife.<sup>1162</sup> The 2007 FWS letter states that selenium concentrations that can be harmful to wildlife are as low as 2 µg/L,<sup>1163</sup> a level far lower than the maximum contaminant limits set for human drinking water and upon which the NRC Staff and Crow Butte seek to rely.<sup>1164</sup> Both the 2000 FWS Report and the 2007 FWS Letter indicate that selenium in land-applied ISL wastewater could seep into soils and vegetation and, through bioaccumulation, produce increased selenium concentrations in the food chain.<sup>1165</sup> Yet, in the face of the FWS concern, the NRC Staff’s witnesses could only assert the erroneous claim that because ISL wastewater does not exceed human maximum contaminant levels, there is no threat to wildlife.<sup>1166</sup>

As for the NRC Staff’s argument that it may defer to NDEQ’s judgment, certainly it is true that an EA may accord “limited reliance” to a state agency’s environmental analyses — but that is so only where it is clear that the state agency conducted a thorough review.<sup>1167</sup> We find there is no record evidence demonstrating that NDEQ ever considered impacts to wildlife in its issuance of Crow Butte’s NPDES permit for land application of ISL wastewater. In fact, just as was the case with EPA’s maximum contaminant levels from the Safe Drinking Water Act,<sup>1168</sup> the 50-µg/L selenium concentration limit imposed in NDEQ’s NPDES permit appears to be based solely on a regulation designed to protect drinking water quality for humans and does not in any way address possible ingestion and ultimate bioaccumulation in wildlife.<sup>1169</sup> Furthermore, regardless of whether NDEQ considered impacts on wildlife in granting the NPDES permit,

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<sup>1160</sup> Staff’s Initial Statement of Position at 67 (citing *Public Service Co. of New Hampshire* (Seabrook Station, Units 1 and 2), CLI-77-8, 5 NRC 503, 527 (1977)).

<sup>1161</sup> See 118 Neb. Admin. Code, ch. 1 § 003, ch. 3 § 001 (2016).

<sup>1162</sup> EA at 8.

<sup>1163</sup> Ex. INT-018 at 1; Ex. INT-019 at 1.

<sup>1164</sup> See Ex. NRC-001-R at 102; Ex. CBR-042 at 4-6.

<sup>1165</sup> Ex. INT-048 at 5.

<sup>1166</sup> Ex. NRC-001-R at 102-05; see also 40 C.F.R. § 141.1 (citing Safe Drinking Water Act, Pub. L. No. 93-523, 88 Stat. 1660 (1974) (codified at 42 U.S.C. § 300f *et seq.*)).

<sup>1167</sup> *Seabrook*, CLI-77-8, 5 NRC at 527.

<sup>1168</sup> See 40 C.F.R. § 141.1.

<sup>1169</sup> Ex. CBR-010 at 8-9; see also 118 Neb. Admin. Code, ch. 3 § 001 (2016) (Nebraska groundwater standards are designed to protect “beneficial uses” of groundwater); 118 Neb. Admin. Code, ch. 1 § 003 (2016) (defining beneficial use as protecting groundwater quality).

the NRC Staff's "limited reliance" on NDEQ's judgment cannot act as substitute for its own independent NEPA review of the potential impacts of selenium on wildlife.<sup>1170</sup>

With respect to Mr. Teahon's claim that Crow Butte's reverse osmosis process is capable of reducing selenium concentrations down to 1 µg/L or even lower, we note that Intervenors have presented no evidence that concentrations at or less than 2 µg/L pose any threat to wildlife, nor did they dispute that Crow Butte can achieve reductions in selenium concentrations to this level. Regardless, the EA fails to examine the potential environmental impacts of either the 2-µg/L or 50-µg/L selenium limit on wildlife, and such impacts should have been considered.

*c. Summary of Board Findings on Contention 12B — Land Application*

In sum, we find that the EA fails to discuss the environmental effects of land application of ISL wastewater on wildlife, now or in the future. We further find that land application is a feasible alternative for disposal of Crow Butte's ISL wastewater given that: (1) Crow Butte is authorized to use land application both in its renewed license and its state NPDES permit; (2) Crow Butte has stated it will be applying to renew its state permit for land application; (3) Crow Butte has clearly considered how it would perform land application; and (4) Crow Butte has suggested that it would consider using land application as a backup for wastewater disposal.<sup>1171</sup> The impacts of selenium on wildlife are not discussed in the EA, and insofar as such impacts may be discussed elsewhere, they are not incorporated into the EA.<sup>1172</sup> Therefore, we find that the EA, and the NRC Staff's Finding of No Significant Impact, is deficient with respect to its discussion of the land application of ISL wastewater and any potential impacts from selenium on wildlife. We do not find, at this time, that land application of ISL wastewater at selenium concentrations of 50 µg/L will cause a significant impact because that is a matter on which the NRC Staff must reach its own independent conclusion in conformance with NEPA when it cures the deficiencies in its EA.

## **H. Contention 14 — Earthquakes**

Contention 14 states:

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<sup>1170</sup> See *South Fork Band Council of Western Shoshone of Nevada v. U.S. Department of Interior*, 588 F.3d 718, 726 (9th Cir. 2009).

<sup>1171</sup> See *supra* Section IV.G.2.b(ii), Board Findings on Potential for Future Land Application, at p. 429.

<sup>1172</sup> See *supra* Section IV.G.2.b(i), Board Findings on Health Impacts of Selenium, at pp. 427-28.

The Final EA violates the National Environmental Policy Act in its failure to provide an analysis of the impacts on the project from earthquakes; especially as it concerns secondary porosity and adequate confinement. These failings violate 10 C.F.R. §§ 51.10, 51.70 and 51.71, and the National Environmental Policy Act, and implementing regulations.<sup>1173</sup>

### ***1. Parties' Positions on Failure to Analyze Complete Earthquake Record***

Through this contention, Intervenor claim EA § 3.4.3: (1) fails to identify two earthquakes that occurred in South Dakota in 2011 and that were felt in Crawford, Nebraska;<sup>1174</sup> and (2) fails to analyze impacts from earthquakes on the UCU's secondary porosity and adequate confinement.<sup>1175</sup> Although not directly stated by Intervenor, we suggested in LBP-15-11 that "[t]he EA analysis might also be incomplete because it only reviewed earthquakes recorded in Nebraska, neglecting earthquakes felt in nearby states."<sup>1176</sup>

The NRC Staff's witnesses testified that the discussion of seismology in EA § 3.4.3 includes the typical level of seismic hazards found in the vicinity of the License Area, which is located in the "Stable Interior" of the United States.<sup>1177</sup> The EA discusses historical earthquakes in Nebraska (including several that occurred within 100 miles of the License Area) and concludes that the License Area is located in seismic risk Zone 1, i.e., a zone of low seismic accelerations and hazard.<sup>1178</sup> At the same time, the NRC Staff's witnesses conceded that the EA fails to discuss earthquakes in neighboring states, such as southern South Dakota or eastern Wyoming.<sup>1179</sup> In particular, there were two recent (November 2011) seismic events in South Dakota approximately 25 miles north-northwest of the License Area that were felt in Crawford, Nebraska.<sup>1180</sup>

To attempt to address this contention, the NRC Staff's witnesses' testimony included a table compiled from data in an NRC guidance document, "Central and Eastern United States Seismic Source Characterization for Nuclear Facilities" (NUREG-2115) and in USGS earthquake catalogs that list all historical

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<sup>1173</sup> LBP 15-11, 81 NRC at 451, App. A.

<sup>1174</sup> Intervenor's New Contentions at 88.

<sup>1175</sup> *Id.*

<sup>1176</sup> LBP-15-11, 81 NRC at 448 (citing EA § 3.4.3 at 41-42).

<sup>1177</sup> Ex. NRC-001-R at 106-07.

<sup>1178</sup> EA § 3.4.3 at 41-42.

<sup>1179</sup> Ex. NRC-001-R at 108 (citing Ex. NRC-066, Historical Earthquakes Within 100 Miles of CBR Site at 1-3 (undated); Ex. NRC-068, [Central and Eastern United States] [Seismic Source Characterization] Earthquake Catalog Compilation (undated); Ex. NRC-069, USGS, Search Results — 7 Earthquakes in Map Area (undated)); *see also* EA § 3.4.3 at 41-42.

<sup>1180</sup> Ex. NRC-001-R at 107-08; Ex. NRC-066 at 2.

earthquakes within 100 miles of the License Area.<sup>1181</sup> The NRC Staff's witnesses also prepared a graph of the magnitudes of these earthquakes.<sup>1182</sup>

The NRC Staff's witnesses testified that USGS characterized the two recent South Dakota earthquakes as having magnitudes of 3.3 and 4.0.<sup>1183</sup> The NRC Staff's witnesses asserted that: (1) these two earthquakes reflect magnitudes typical of earthquakes in the vicinity of the License Area and of earthquakes that fall within the range identified in Table 3-8 of the EA, and (2) adding these two South Dakota earthquakes to the EA would not change the accuracy of the EA's description of typical seismic activity and of the level of seismic hazard that is posed at the License Area.<sup>1184</sup>

The NRC Staff's witnesses asserted that the EA appropriately omitted earthquakes outside the state of Nebraska because the vast majority of earthquakes within 100 miles of the License Area (whether in Nebraska, South Dakota, or Wyoming) have magnitudes corresponding to a low earthquake intensity<sup>1185</sup> and are very consistent in depth, i.e., nearly all occurred 3 miles below the surface.<sup>1186</sup> Based on this claimed similarity, the NRC Staff's witnesses opined that "there is no significant difference in the characteristics of earthquakes discussed in the EA and other historical earthquakes that have occurred outside of Nebraska (in South Dakota or eastern Wyoming)."<sup>1187</sup>

In addition, the NRC Staff's witnesses testified that the 1997 Uniform Building Code's Seismic Zone Map indicates that the area of South Dakota where these 2011 earthquakes occurred is in seismic risk Zone 1,<sup>1188</sup> which is characterized as having low earthquake magnitudes — and is in the very same zone in which the License Area is located.<sup>1189</sup> For these reasons, it was the NRC Staff's witnesses' opinion that the EA is not deficient in describing the "affected environment" in terms of seismic activity, even though it omitted the two South Dakota earthquakes.<sup>1190</sup> But, the NRC Staff's witnesses did concede that selecting all earthquakes within the 100-mile radius of the License Area

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<sup>1181</sup> Ex. NRC-001-R at 108 (citing Ex. NRC-066; Ex. NRC-068).

<sup>1182</sup> Ex. NRC-066 at 1-3; Ex. NRC-068; Ex. NRC-069.

<sup>1183</sup> Ex. NRC-001-R at 107-08.

<sup>1184</sup> *Id.* at 107-09 (citing EA § 3.4.3 at 41-42).

<sup>1185</sup> Ex. NRC-066 at 1-3; Ex. NRC-067, US Geological Survey, Earthquake Hazards Program, *Magnitude/Intensity Program*, [http://earthquake.usgs.gov/learn/topics/mag\\_vs\\_int.php](http://earthquake.usgs.gov/learn/topics/mag_vs_int.php) at 1 (last visited Apr. 20, 2015); Ex. NRC-068; Ex. NRC-069.

<sup>1186</sup> Ex. NRC-001-R at 108-09.

<sup>1187</sup> *Id.* at 109.

<sup>1188</sup> Ex. NRC-070, International Conference of Building Officials, Uniform Building Code, United States Seismic Zones Map (1997).

<sup>1189</sup> Ex. NRC-001-R at 108.

<sup>1190</sup> *Id.* at 108-09.

is preferable to limiting the search to only those occurring within a particular state's geographic boundaries, and that doing so would have improved the quality of the EA.<sup>1191</sup> Nevertheless, Intervenor's did not present any evidence to dispute the testimony of the NRC Staff's witnesses that adding the two South Dakota earthquakes as well as those from eastern Wyoming to the EA would have no effect on the EA's conclusions regarding this contention.

Intervenor's witness, Dr. LaGarry, did testify that the area in the vicinity of the License Area is tectonically active. He further noted that, while earthquakes there are relatively mild and will not significantly damage infrastructure, small tremors associated with these earthquakes are continuously creating, closing, and redistributing the secondary porosity of the region's rocks and so are changing groundwater flow paths in the region.<sup>1192</sup>

While acknowledging that small earthquakes do occur periodically, Crow Butte's witnesses disputed Dr. LaGarry's claim in this regard, asserting that the area near the License Area is one of the most tectonically stable in the United States<sup>1193</sup> and that there is no indication such small and infrequent earthquakes would cause a change in the groundwater flow paths or adversely impact Crow Butte's mining operations.<sup>1194</sup>

The NRC Staff's witnesses also disputed Dr. LaGarry's claim that regional earthquakes affect flow patterns at the License Area. The NRC Staff's witnesses opined that: (1) it is highly unlikely that an earthquake could create sufficient changes in the secondary porosity to impact the UCU; (2) not every earthquake, regardless of size, would affect porosity and water flow; (3) there is no evidence that the small earthquakes that have occurred within 100 miles of the License Area (whether originating in Nebraska, South Dakota, or Wyoming) during the period of Crow Butte's operations have had any effect on confinement of the BC/CPF at the License Area; (4) the 2011 earthquakes in South Dakota could have produced only limited changes in subsurface rocks and groundwater flow pathways in the vicinity of the License Area; (5) it is highly unlikely that an earthquake of sufficient magnitude would occur close enough to the License Area to cause changes in subsurface rocks and groundwater flow pathways; and (6) the historical record suggests there have been no significant environmental impacts from the small earthquakes that might occur at or near the License Area.<sup>1195</sup> Crow Butte's witnesses agreed with the NRC Staff's witnesses' testi-

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<sup>1191</sup> *Id.* at 108-09; Tr. at 1656, 1660-62.

<sup>1192</sup> Ex. INT-013 at 2-3.

<sup>1193</sup> Ex. CBR-001 at 56.

<sup>1194</sup> Ex. CBR-045 at 6.

<sup>1195</sup> Ex. NRC-001-R at 108-17 (citing Ex. NRC-066; Ex. NRC-068; Ex. NRC-069).

mony that minimized the risks posed to the confinement of the BC/CPF Aquifer by these seismic hazards.<sup>1196</sup>

As for the UCU itself, the NRC Staff's witnesses opined that, even were there to be an earthquake large enough to generate small fractures in the UCU, because its saturated clays are not brittle, the UCU's layers would "self-heal" and would not undergo any permanent changes in secondary porosity.<sup>1197</sup>

## **2. Board Findings on Failure to Analyze Complete Earthquake Record**

Given the substantial information in the evidentiary record indicating that earthquakes in and near the License Area are expected to have low magnitudes, we find there is insufficient evidence indicating that the tremors that have occurred during the 20-plus years of Crow Butte's mining operations have changed the flow patterns in and surrounding the License Area sufficiently to adversely affect the containment of contaminants within the BC/CPF Aquifer.

We also find that adding information on all historical earthquakes within 100 miles of the License Area, regardless of the state in which the earthquake occurred, would not affect the EA's description of typical seismic activity and level of seismic hazard. Specifically, we find that adding the 2011 earthquakes in South Dakota to the EA § 3.4.3 would not affect the EA's conclusions because the two 2011 South Dakota seismic events fall within the range of earthquakes that are identified in the EA.

While excluding some of the earthquakes in the region of the License Area does not change the EA's conclusions, we find that the NRC Staff was derelict in failing to include the two 2011 South Dakota earthquakes in its EA and thus limiting its analysis to only those earthquakes that occurred within the State of Nebraska, where the License Area is located. Because the EA's seismic assessment was limited to Nebraska and specifically omitted recent earthquakes in South Dakota and eastern Wyoming, we find that the EA does not provide sufficient information regarding earthquake activity and hazards near the License Area to satisfy NEPA requirements.

At the same time, however, the NRC Staff's witnesses' testimony analyzed the characteristics and hazards of all historic earthquakes in the three-state region including Nebraska, South Dakota, and Wyoming within a 100-mile radius of the License Area, and we find that this additional analysis cures this deficiency in the EA.<sup>1198</sup>

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<sup>1196</sup> Ex. CBR-045 at 6 (citing Ex. NRC-001-R at 106-15).

<sup>1197</sup> Ex. NRC-001-R at 111.

<sup>1198</sup> *Claiborne Enrichment Ctr.*, CLI-98-3, 47 NRC at 89; *see also Indian Point*, CLI-15-6, 81 NRC at 388 ("We therefore affirm the Board's ruling that the environmental record of decision may be supplemented by the hearing and relevant Board and Commission decisions.").

## V. CONCLUSIONS OF LAW AND REMEDIES

In materials licensing proceedings, licensing boards are empowered to make “findings of fact and conclusions of law on the matters put into controversy by the parties.”<sup>1199</sup> After a licensing board has issued an initial decision on those matters, the Director of the Office of Nuclear Material Safety and Safeguards (NMSS) “shall issue, deny, or appropriately condition the permit, license, or license amendment in accordance with the presiding officer’s initial decision.”<sup>1200</sup> Although the NRC’s regulations allow the NRC Staff to issue a license before an adjudicatory proceeding is concluded,<sup>1201</sup> the Director of NMSS must thereafter deny, or insert appropriate conditions, if any, in the license based on the determinations of the licensing board and the Commission.<sup>1202</sup>

With respect to Contentions A, C, D, F, 6, 12A, and 14, we conclude as a matter of law that the EA, as augmented with record evidence from this proceeding, complied with NEPA.

However, with respect to Contention 12B — Land Application of Wastewater, we have found that the NRC Staff has not satisfied NEPA’s requirement to take a hard look at the impacts of selenium on wildlife that may plausibly result from Crow Butte’s authorized land application of ISL wastewater within the License Area. This failure prevents us from determining whether renewal of the license will result in “no significant impacts,” and therefore places in doubt the NRC Staff’s Finding of No Significant Impact.<sup>1203</sup> The question we face here is what actions are possible to address this deficiency.

Where an agency fails to comply with procedural statutes such as NEPA, an injunction is sometimes the proper recourse.<sup>1204</sup> The equivalent of an injunction here would be not granting the license extension. But the Supreme Court of the United States has made clear that such injunctive relief is only warranted when the traditional test justifying it is met, i.e.:

(1) that [Intervenors have] suffered an irreparable injury; (2) that remedies available at law, such as monetary damages, are inadequate to compensate for that injury; (3) that, considering the balance of hardships between [Intervenors] and

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<sup>1199</sup> 10 C.F.R. § 2.340(e)(1); *see also id.* § 2.321(a).

<sup>1200</sup> *Id.* § 2.340(e)(2).

<sup>1201</sup> *Id.* §§ 2.340(e)(2)(ii), 2.1202(a).

<sup>1202</sup> *See id.* §§ 2.340(e)(2)(ii), 2.1210(c)(2)-(3); *see also id.* § 40.41(e).

<sup>1203</sup> *See* LBP-15-11, 81 NRC at 415.

<sup>1204</sup> *See, e.g., Monsanto Co. v. Geertson Seed Farms*, 561 U.S. 139, 156-57 (2010); *League of Wilderness Defenders/Blue Mountains Biodiversity Project v. Connaughton*, 752 F.3d 755, 761, 767 (9th Cir. 2014); *Neighborhood Association of the Back Bay, Inc. v. Federal Transit Administration*, 463 F.3d 50, 58 (1st Cir. 2006).

[Crow Butte], a remedy in equity is warranted; and (4) that the public interest would not be disserved by a permanent injunction.<sup>1205</sup>

The irreparable injury and monetary damages prongs weigh against Intervenor because land application of ISL wastewater is not likely in the immediate future. The Supreme Court in *Winter v. Natural Resources Defense Council* explained that irreparable injury must be likely, not merely possible, without an injunction.<sup>1206</sup> Here, however, Crow Butte currently lacks the infrastructure to use land application. Although Crow Butte could certainly develop the infrastructure within the next few years, Intervenor has presented no evidence that imminent harm would result from granting the license extension before the NRC Staff fulfills its NEPA obligations. Furthermore, although monetary remedies are not possible in the NRC licensing context, the lack of monetary damages is not an issue here because there is no current environmental harm.

The third prong, balance of hardships, also weighs against Intervenor because the Commission has disfavored imposing “a draconian remedy when less drastic relief will suffice.”<sup>1207</sup> Not granting the license extension here appears not only to be an undue hardship, but also unnecessary to cure the potential harms at issue. In *Dewey-Burdock*, the licensing board similarly declined to stay the effectiveness of a license upon a showing of a NEPA violation, instead expressing confidence that the NRC Staff would promptly take steps to rectify the deficiency.<sup>1208</sup> Because of our conviction that the NRC Staff will act with dispatch to cure this NEPA deficiency, we likewise conclude that it would not be appropriate under the circumstances either to lift the effectiveness of the NRC Staff’s action granting the Crow Butte license extension, in accordance with section 2.1213, or to direct that the NMSS Director deny the Crow Butte license extension, in accordance with section 2.340(e)(2).

While this Partial Initial Decision makes clear that the NRC Staff has not complied with its obligations under NEPA, we do not direct the NRC Staff regarding the specifics as to how it should achieve such compliance. In our estimation, however, the most efficient method for curing this NEPA deficiency would be for the NRC Staff to publicly supplement its EA with additional analyses and findings with respect to the plausible impacts on wildlife from the land application of ISL wastewater. We leave it to the NRC Staff to identify

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<sup>1205</sup> *Monsanto*, 561 U.S. at 156-57; *Winter v. Natural Resources Defense Council, Inc.*, 555 U.S. 7, 20 (2008).

<sup>1206</sup> *Winter*, 555 U.S. at 8.

<sup>1207</sup> *Hydro Resources, Inc.* (2929 Coors Road, Suite 101, Albuquerque, NM 87120), CLI-00-8, 51 NRC 227, 241 (2000).

<sup>1208</sup> *Powertech USA, Inc.* (Dewey-Burdock In Situ Uranium Recovery Facility), LBP-15-16, 81 NRC at 618, 657-58 (2015).

how it wishes to proceed in light of our rulings herein. We will convene a conference call at a time and date to be determined to discuss with the NRC Staff and the other parties the next steps in addressing the concerns we outline in this Decision.

Whenever the NRC Staff makes public its curative actions relating to Contention 12B, including any revised EA (or EA supplement), it shall notify the Board and parties by letter through the Electronic Hearing Docket. Intervenor will be afforded an opportunity to file new contentions to contest the adequacy of the NRC Staff's chosen actions, including any revised EA (or EA supplement), and any new information that may result from the NRC Staff's actions. Any new contentions must comply with applicable timeliness and contention admissibility requirements set forth in 10 C.F.R. § 2.309. We retain jurisdiction for this limited purpose, until the Commission "orders otherwise," or "when the period within which the Commission may direct that the record be certified to it for final decision expires, [or] when the Commission renders a final decision."<sup>1209</sup> And, until its curative actions regarding Contention 12B are completed, the NRC Staff shall provide bimonthly status reports on the first day of every even-numbered month updating the Board and the parties as to its activities, including the status of any revised EA (or EA supplement).

## VI. ORDER

For Contention A, Contention C, Contention D, Contention F, Contention 6, Contention 9, the tornado section of Contention 12 (Contention 12A), and Contention 14, we conclude that the EA, as supplemented (where noted) by the record evidence, satisfies the NRC Staff's obligation to conduct a thorough environmental review. But we find, in part, for Intervenor on Contention 12 (Contention 12B) and conclude that the EA is deficient as to its discussion of Crow Butte's possible land application of ISL wastewater. The NRC Staff must reach its own independent conclusion, based on technical support in conformance with NEPA as to any potential impacts of selenium on wildlife from Crow Butte's possible land application of ISL wastewater.

Any party may petition for review of this Partial Initial Decision pursuant to 10 C.F.R. § 2.341(b)(4). Any such petition must be filed within 25 days from service of this Partial Initial Decision. Unless otherwise authorized by law, the filing of a petition for review is mandatory for a party to have exhausted its administrative remedies before seeking judicial review.<sup>1210</sup> This Partial Initial

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<sup>1209</sup> 10 C.F.R. § 2.318; *see also Dewey-Burdock*, LBP-15-16, 81 NRC at 710 (taking a similar approach).

<sup>1210</sup> 10 C.F.R. §§ 2.341(b)(1), 2.1212.

Decision will constitute a final decision of the Commission 120 days from the date of issuance unless a petition is filed or the Commission directs otherwise.<sup>1211</sup>

It is so ORDERED.

THE ATOMIC SAFETY AND  
LICENSING BOARD

Michael M. Gibson, Chairman  
ADMINISTRATIVE JUDGE

Dr. Richard E. Wardwell  
ADMINISTRATIVE JUDGE

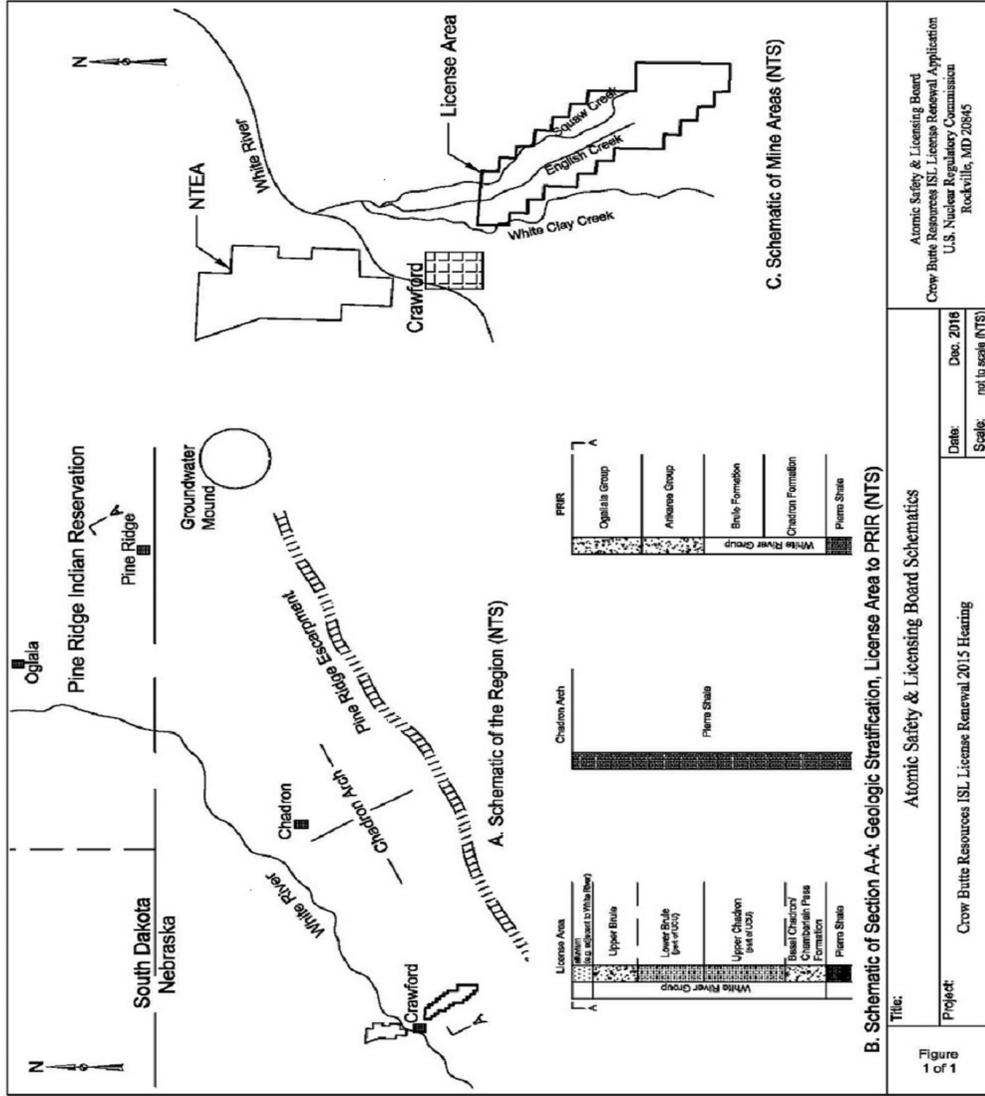
Brian K. Hajek  
ADMINISTRATIVE JUDGE

Rockville, Maryland  
December 6, 2016

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<sup>1211</sup> 10 C.F.R. § 2.1210(a).

APPENDIX



UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

**ATOMIC SAFETY AND LICENSING BOARD**

**Before Administrative Judges:**

**Paul S. Ryerson, Chairman**  
**Ronald M. Spritzer**  
**Dr. Michael F. Kennedy**

**In the Matter of**

**Docket Nos. 50-286**  
**50-333**

**(ASLBP No. 16-950-01-LA-BD01)**

**ENTERGY NUCLEAR OPERATIONS, INC.**  
**(Indian Point Nuclear Generating**  
**Unit No. 3 and James A. Fitzpatrick**  
**Nuclear Plant)**

**December 13, 2016**

In this Memorandum and Order, the Atomic Safety and Licensing Board concluded that Petitioners, Indian Point Safe Energy Coalition, Hudson River Sloop Clearwater, Council on Intelligent Energy and Conservation Policy, Sierra Club Hudson Valley, Nuclear Information and Resource Service, Alliance for Green Economy, and Radiation and Public Health Project, failed to demonstrate standing to intervene regarding the application by Entergy Nuclear Operations, Inc. to transfer to itself the beneficial interest in the Master Decommissioning Trust for Indian Point Nuclear Generating Unit No. 3 and James A. FitzPatrick Nuclear Power Plant held by the Power Authority of the State of New York.

**RULES OF PRACTICE: GENERAL REQUIREMENTS TO OBTAIN  
A HEARING**

To obtain a hearing, a petitioner must establish standing and propose at least one admissible contention.

**RULES OF PRACTICE: STANDING (PRIOR PROCEEDING)**

A petitioner must demonstrate standing in each proceeding in which it seeks to intervene, even if granted standing in another case concerning the same or a nearby facility.

**RULES OF PRACTICE: STANDING TO INTERVENE**

The Commission must grant a hearing upon the request of any person whose interest may be affected by the proceeding.

**RULES OF PRACTICE: STANDING (ORGANIZATIONS)**

An organization may base its standing on either immediate or threatened injury to its organizational interests, or to the interests of identified members.

**RULES OF PRACTICE: STANDING (REPRESENTATIONAL)**

An organization may establish representational standing by showing that at least one member has standing to intervene in his or her own right and has authorized the organization to request a hearing on his or her behalf.

**RULES OF PRACTICE: STANDING (ORGANIZATIONAL)**

An organization may establish organizational standing if it demonstrates a risk of discrete institutional injury to itself.

**RULES OF PRACTICE: STANDING (ORGANIZATIONS)**

The Commission has stated that organizations seeking to intervene in their own right must satisfy the same standing requirements as individuals seeking to intervene, including the requirements outlined in 10 C.F.R. § 2.309(d)(1)(i)-(iv).

**RULES OF PRACTICE: INTERVENTION (STANDING)**

When petitioners fail to establish standing, by demonstrating that they have an interest that may be affected by the proceeding, there is arguably no statutory or regulatory basis for a licensing board to proceed further in the matter. Standing is an essential element in determining whether there is any legitimate role for a court or an agency adjudicatory body in dealing with a particular grievance.

## **RULES OF PRACTICE: RESPONSIBILITIES OF PARTIES**

Petitioners, or their counsel, have the responsibility to develop contentions, not the Board.

### **MEMORANDUM AND ORDER (Ruling on Petition to Intervene and Request for a Hearing)**

Before the Board is a Petition filed on behalf of Indian Point Safe Energy Coalition, Hudson River Sloop Clearwater, Council on Intelligent Energy and Conservation Policy, Sierra Club Hudson Valley, Nuclear Information and Resource Service, Alliance for Green Economy, and Radiation and Public Health Project (collectively Petitioners).<sup>1</sup> Petitioners seek a hearing on an application by Entergy Nuclear Operations, Inc. (Entergy) to transfer the beneficial interest in the Master Decommissioning Trust for Indian Point Nuclear Generating Unit No. 3 (Indian Point) and James A. FitzPatrick Nuclear Power Plant (FitzPatrick).

Because Petitioners have failed to demonstrate that they have standing, we deny the request for a hearing and dismiss the Petition.

#### **I. BACKGROUND**

On August 16, 2016, Entergy submitted an application to transfer to itself the beneficial interest in the Master Decommissioning Trust for Indian Point and FitzPatrick held by the Power Authority of the State of New York (PASNY).<sup>2</sup> To facilitate the transfer, Entergy requested the approval of amendments to the Master Decommissioning Trust Agreement.<sup>3</sup> Entergy also requested license amendments to modify existing trust-related license conditions to reflect the proposed transfer and to adopt the regulatory requirements of 10 C.F.R. § 50.75(h)(1).<sup>4</sup>

On September 15, 2016, Susan Shapiro, acting as attorney for Petitioners,<sup>5</sup>

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<sup>1</sup> Request for Public Hearing on Indian Point 2 License Amendment: Docket ID NRC-2015-0038 (Sept. 15, 2016) [hereinafter Petition].

<sup>2</sup> 81 Fed. Reg. 66,301, 66,305-06 (Sept. 27, 2016). The proposed transfer requires Entergy to assume PASNY's responsibilities and obligations. Application for Order to Transfer Master Decommissioning Trust from PASNY to [Entergy], Consenting to Amendments to Trust Agreement, and Approving Proposed License Amendments to Modify and Delete Decommissioning Trust License Conditions upon the Transfer of Trust Funds (Aug. 16, 2016) at 2 (ADAMS Accession No. ML16230A308). PASNY agrees to the transfer and joins in Entergy's approval request. *Id.*

<sup>3</sup> 81 Fed. Reg. at 66,306.

<sup>4</sup> *Id.*

<sup>5</sup> Petition at 3.

e-mailed a letter to the NRC's Office of the Secretary requesting a hearing regarding Entergy's application.<sup>6</sup> Pursuant to a standing order of the Commission, directing the Secretary to reject summarily any nonconforming pleadings submitted by Ms. Shapiro,<sup>7</sup> her filing was rejected by the Secretary because it did not comply with the NRC's E-filing requirements.<sup>8</sup>

In rejecting Ms. Shapiro's pleading, the Secretary referenced the intervening *Federal Register* notice of an opportunity to request a hearing regarding Entergy's application,<sup>9</sup> and advised of the opportunity to refile.<sup>10</sup> Ms. Shapiro refiled her letter through the NRC's E-filing system on November 1, 2016.<sup>11</sup> Finding the document responsive to the *Federal Register* notice, the Secretary referred the matter to the Atomic Safety and Licensing Board Panel<sup>12</sup> and this Board was established to preside over the proceeding on November 18, 2016.<sup>13</sup>

The NRC Staff and Entergy oppose Petitioners' request for a hearing.<sup>14</sup> Petitioners have not exercised their right to reply.<sup>15</sup>

## II. DISCUSSION

To obtain a hearing, a petitioner must establish standing and propose at least

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<sup>6</sup> See Secretary of the Commission Order (Oct. 3, 2016) at 1 (unpublished) [hereinafter Secretary Order].

<sup>7</sup> *Entergy Nuclear Operations, Inc.* (Indian Point, Units 2 and 3), CLI-08-29, 68 NRC 899, 903 (2008). The Commission issued this Order because, in an earlier proceeding, Ms. Shapiro was repeatedly unable or unwilling to comply with the Licensing Board's instructions or NRC rules. *Id.* at 901-03.

<sup>8</sup> Secretary Order at 1-2.

<sup>9</sup> 81 Fed. Reg. at 66,302-03.

<sup>10</sup> Secretary Order at 2.

<sup>11</sup> Memorandum from Annette Vietti-Cook, NRC Secretary, to E. Roy Hawkens, ASLBP Chief Administrative Judge (Nov. 15, 2016), at 1 (ADAMS Accession No. ML16320A205).

<sup>12</sup> *Id.*

<sup>13</sup> Establishment of Atomic Safety and Licensing Board (Nov. 18, 2016); see also 81 Fed. Reg. 85,645 (Nov. 28, 2016).

<sup>14</sup> NRC Staff Answer to Hearing Request (Nov. 28, 2016) [hereinafter NRC Staff Answer]; Entergy's Answer Opposing Request for Hearing (Nov. 28, 2016) [hereinafter Entergy Answer]. In its Answer, Entergy argues, *inter alia*, that, under the Commission's Standing Order regarding filings by Ms. Shapiro, the Petition should be summarily rejected because of her failure to comply with numerous procedural regulations, including failure to provide a certificate of service and a written notice of appearance. See Entergy Answer at 8-9. The Commission's Order, however, was directed to the Secretary, not to the Atomic Safety and Licensing Board Panel. *Indian Point*, CLI-08-29, 68 NRC at 903. The Board therefore relies for its decision on its analysis of standing and contention admissibility, and not on Ms. Shapiro's failure to comply with other, more technical procedural regulations.

<sup>15</sup> 10 C.F.R. § 2.309(i)(2).

one admissible contention.<sup>16</sup> A petitioner must demonstrate standing in each proceeding in which it seeks to intervene, even if granted standing in another case concerning the same or a nearby facility.<sup>17</sup>

### A. Standing

The Commission must grant “a hearing upon the request of any person whose interest may be affected by the proceeding.”<sup>18</sup> “An organization may base its standing on either immediate or threatened injury to its organizational interests, or to the interests of identified members.”<sup>19</sup> An organization may establish representational standing by showing that at least one member has standing to intervene in their own right and has authorized the organization to request a hearing on their behalf.<sup>20</sup> Alternatively, an organization may establish organizational standing if it demonstrates a risk of “discrete institutional injury to itself.”<sup>21</sup>

The Petition identifies seven organizations as “reactor community Stakeholders.”<sup>22</sup> These “Stakeholders” are described as “residents of the Indian Point and FitzPatrick Reactor Communities residing within 50 miles of Indian Point 3 or Fitzpatrick.”<sup>23</sup> The Petition, however, does not provide further detail regarding the specific locations or organizational interests of the listed organizations. Nor do Petitioners clarify whether they claim organizational or representational standing. Because the Petition defines the listed organizations as stakeholders and residents for purposes of this proceeding (and does not identify any organizational members), the Board assumes that they are asserting organizational standing.<sup>24</sup>

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<sup>16</sup> *Id.* § 2.309(a); *see also id.* § 2.309(d) (listing standing requirements); *id.* § 2.309(f)(1) (listing contention admissibility requirements).

<sup>17</sup> *PPL Bell Bend, LLC* (Bell Bend Nuclear Power Plant), CLI-10-7, 71 NRC 133, 138 (2010).

<sup>18</sup> 42 U.S.C. § 2239(a)(1)(A).

<sup>19</sup> *Georgia Institute of Technology* (Georgia Tech Research Reactor, Atlanta, Georgia), CLI-95-12, 42 NRC 111, 115 (1995).

<sup>20</sup> *Id.*

<sup>21</sup> *Consumers Energy Co.* (Palisades Nuclear Plant), CLI-07-18, 65 NRC 399, 411-12 (2007) (quoting *International Uranium (USA) Corp.* (White Mesa Uranium Mill), CLI-01-21, 54 NRC 247, 252 (2001)) (emphasis omitted).

<sup>22</sup> Petition at 3.

<sup>23</sup> *Id.* at 2.

<sup>24</sup> In any event, Petitioners have not established representational standing because they do not identify any organizational member, show that any member authorized representation, or state how any member is affected by the proposed action. *See Ga. Tech.*, CLI-95-12, 42 NRC at 115; *Palisades*, CLI-07-18, 65 NRC at 409-10.

The Commission has stated that “[o]rganizations seeking to intervene in their own right must satisfy the same ‘standing’ requirements as individuals seeking to intervene.”<sup>25</sup> Pursuant to 10 C.F.R. § 2.309(d)(1), a petition must state:

- (i) The name, address and telephone number of the requestor or petitioner;
- (ii) The nature of the requestor’s/petitioner’s right under the Act to be made a party to the proceeding;
- (iii) The nature and extent of the requestor’s/petitioner’s property, financial or other interest in the proceeding; and
- (iv) The possible effect of any decision or order that may be issued in the proceeding on the requestor’s/petitioner’s interest.<sup>26</sup>

The Petition fails to address these threshold requirements for any of the seven listed organizations.

Petitioners’ failure to satisfy the procedural requirements of section 2.309(d)(1) also creates substantive challenges for the Board in evaluating Petitioners’ standing.<sup>27</sup> For example, if Petitioners’ brief reference to residency within 50 miles of Indian Point or FitzPatrick is intended to trigger the proximity presumption,<sup>28</sup> then Petitioners’ failure to provide physical addresses precludes the Board from evaluating the proximity presumption’s potential applicability.<sup>29</sup>

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<sup>25</sup> *Palisades*, CLI-07-18, 65 NRC at 411.

<sup>26</sup> 10 C.F.R. § 2.309(d)(1)(i)-(iv).

<sup>27</sup> *Id.* § 2.309(d)(2) (“In ruling on a request for hearing or petition for leave to intervene, . . . the Atomic Safety and Licensing Board designated to rule on such requests must determine, among other things, whether the petitioner has an interest affected by the proceeding considering the factors enumerated in paragraph (d)(1) of this section.”).

<sup>28</sup> In license amendment proceedings, a petitioner may claim standing based on the proximity presumption, if the proposed action “quite ‘obvious[ly]’ entails an increased potential for offsite consequences.” *Commonwealth Edison Co.* (Zion Nuclear Power Station, Units 1 and 2), CLI-99-4, 49 NRC 185, 191 (1999) (quoting *Florida Power & Light Co.* (St. Lucie Nuclear Power Plant, Units 1 and 2), CLI-89-21, 30 NRC 325, 329-30 (1989)). There are limits to proximity standing, however, when there are no changes to “the physical plant itself, its operating procedures, design basis accident analysis, management, or personnel.” See *Exelon Generation Co., LLC* (Peach Bottom Atomic Power Station, Units 2 and 3), CLI-05-26, 62 NRC 577, 582 (2005) (stating that the license transfer did not implicate these concerns). Therefore, “the Commission has rejected proximity standing for license transfers, license amendments associated with shutdown and defueled reactors, and certain changes to worker-protection requirements.” *Southern Nuclear Operating Co., Inc.* (Vogtle Electric Generating Plant, Units 3 and 4), LBP-16-5, 83 NRC 259, 274-75 (2016) (footnotes omitted). In this case, Petitioners arguably have not satisfied their burden to show that the presumption should apply in the context of a decommissioning trust transfer. See *Peach Bottom*, CLI-05-26, 62 NRC at 581. Because of other deficiencies in Petitioners’ attempt to demonstrate standing, however, the Board need not decide this issue.

<sup>29</sup> See *Palisades*, CLI-07-18, 65 NRC at 413 (noting that “[a]lthough [local school and hospital

*(Continued)*

Similarly, Petitioners' failure to identify their interests in this proceeding or the possible effect of any decision on their interests prevents the Board from evaluating any possible "discrete institutional injury" to the listed organizations.<sup>30</sup> Petitioners therefore fail to demonstrate how any of their interests may be affected and redressed by this proceeding.

For these reasons, Petitioners have not demonstrated standing.

## B. Contention Admissibility

Initially, there is some question whether we should address the admissibility of Petitioners' contentions, given our ruling that they fail to demonstrate standing. Both the Atomic Energy Act and the Commission's regulations permit intervention only by a "person whose interest may be affected by the proceeding."<sup>31</sup> The Commission applies judicial concepts of standing to determine whether petitioners have such an interest,<sup>32</sup> and when petitioners fail to establish that they have an interest that may be affected by the proceeding there is arguably no statutory or regulatory basis for a licensing board to proceed further in the matter. As the Commission has stated, standing is "an essential element in determining whether there is any legitimate role for a court or an agency adjudicatory body in dealing with a particular grievance."<sup>33</sup> Thus, given our ruling that the Petitioners fail to demonstrate standing, our legitimate role in adjudicating their grievance arguably has come to an end.<sup>34</sup>

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organizations] suggest geographic proximity as a basis for a presumption of harm in support of standing, they fail to provide any individual addresses as required by 10 C.F.R. § 2.309(d)(1) and do not specify their respective distances to the . . . facility" (footnote omitted)). To demonstrate an interest based on proximity, a petitioner must provide more than general assertions of proximity. *See id.* at 410. For example, the Commission has stated that "[i]n ruling on claims of 'proximity standing,' we decide the appropriate radius on a case-by-case basis." *Peach Bottom*, CLI-05-26, 62 NRC at 580. In this proceeding, the Petition does not contain the information needed to make this determination.

<sup>30</sup> *See Entergy Nuclear Operations, Inc.* (Palisades Nuclear Plant), CLI-08-19, 68 NRC 251, 270 (2008) (noting that general environment and policy interests have been repeatedly found insufficient).

<sup>31</sup> 42 U.S.C. § 2239(a)(1)(A); 10 C.F.R. § 2.309(a), (d).

<sup>32</sup> *Calvert Cliffs 3 Nuclear Project, LLC* (Calvert Cliffs Nuclear Power Plant, Unit 3), CLI-09-20, 70 NRC 911, 915 (2009) ("In assessing whether a petitioner has standing, we have long applied contemporaneous 'judicial concepts of standing.'").

<sup>33</sup> *Westinghouse Electric Corp.* (Nuclear Fuel Export License for Czech Republic — Temelin Nuclear Power Plants), CLI-94-7, 39 NRC 322, 331-32 (1994).

<sup>34</sup> This interpretation is analogous to the longstanding rule of federal court jurisdiction that, absent standing, a federal court "cannot proceed at all in any cause. Jurisdiction is power to declare the law, and when it ceases to exist, the only function remaining to the court is that of announcing the fact and dismissing the cause." *See Steel Co. v. Citizens for a Better Environment*, 523 U.S. 83,

(Continued)

In any event, even assuming we have the discretion to rule on the admissibility of Petitioners' contentions, we decline to do so in this instance.<sup>35</sup> Just as they have failed to attempt to satisfy standing requirements, Petitioners do not even acknowledge the Commission's contention admissibility requirements.<sup>36</sup> They do not identify, much less "set forth with particularity," any contention.<sup>37</sup> Tellingly, Entergy and the NRC Staff do not even agree on the number of proffered "contentions" to which they are responding.<sup>38</sup> That is not surprising. Absent any guidance from Petitioners, reasonable persons might struggle to identify any number of "contentions" among Petitioners' various objections.

We decline to undertake the task of creating "contentions" out of Petitioners' various conclusory and unsupported objections, and then determining whether the "contentions" we have created satisfy the contention admissibility requirements. If we were to create contentions for Petitioners, we would be taking on a task that properly belongs to them or to their counsel, not to the Board.<sup>39</sup> The Commission has explained that it does not wish to "expend resources to support the hearing process unless there is an issue that is appropriate for, and susceptible to, resolution in an NRC hearing"—as demonstrated by compliance with all six contention admissibility requirements.<sup>40</sup> Here, given Petitioners' failure to even attempt to demonstrate compliance with those requirements, we need do no more than dismiss the Petition for lack of standing.

### III. CONCLUSION

Petitioners have not demonstrated standing to intervene. Therefore, the Petition is *denied*. Petitioners may appeal this decision to the Commission, pursuant to 10 C.F.R. § 2.311, within twenty-five (25) days of service of this Order.

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94 (1998) (quoting *Ex parte McCardle*, 7 Wall. 506, 514, 19 L. Ed. 264 (1868)). This rule is not directly applicable to NRC adjudications, because the NRC is not strictly bound by federal judicial standing doctrines. *Calvert Cliffs*, CLI-09-20, 70 NRC at 915.

<sup>35</sup> In cases where the failure to establish standing is less clear than it is here, it might be appropriate for a licensing board to rule on the admissibility of the petitioner's contentions in order to present the Commission with a complete board ruling on appeal. If the Commission were to reverse the board's ruling on standing, it could review the board's ruling on contention admissibility at the same time, thereby avoiding a potential second appeal on contention admissibility.

<sup>36</sup> 10 C.F.R. § 2.309(f)(1).

<sup>37</sup> *Id.*

<sup>38</sup> Compare Entergy Answer at 17-22 (identifying six arguments), with NRC Staff Answer at 17-25 (identifying five arguments).

<sup>39</sup> See *Crow Butte Resources, Inc.* (North Trend Expansion Project), CLI-09-12, 69 NRC 535, 553 (2009).

<sup>40</sup> Changes to Adjudicatory Process, 69 Fed. Reg. 2182, 2202 (Jan. 14, 2004).

It is so ORDERED.

THE ATOMIC SAFETY AND  
LICENSING BOARD

Paul S. Ryerson, Chairman  
ADMINISTRATIVE JUDGE

Ronald M. Spritzer  
ADMINISTRATIVE JUDGE

Dr. Michael F. Kennedy  
ADMINISTRATIVE JUDGE

Rockville, Maryland  
December 13, 2016

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- Calvert Cliffs 3 Nuclear Project, LLC, and UniStar Nuclear Operating Services, LLC* (Calvert Cliffs Nuclear Power Plant, Unit 3), LBP-09-4, 69 NRC 170, 183 (2009)  
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- Commonwealth Edison Co.* (Zion Nuclear Power Station, Units 1 and 2), CLI-99-4, 49 NRC 185, 192 (1999)  
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- Commonwealth Edison Co.* (Zion Nuclear Power Station, Units 1 and 2), LBP-98-27, 48 NRC 271, 276 (1998), *aff'd*, CLI-99-4, 49 NRC 185, 191 (1999)  
proximity presumption for standing has been rejected for license amendments associated with shutdown and defueled reactors; LBP-16-10, 84 NRC 33 (2016)
- Consumers Energy Co.* (Big Rock Point Independent Spent Fuel Storage Installation), CLI-07-19, 65 NRC 423, 426 (2007)  
proposed license transfer that does not involve transfer of ownership or operating rights to subject facilities or entail changes in the facilities themselves or in their operation offer no obvious potential for offsite consequences; LBP-16-12, 84 NRC 160 (2016)
- Consumers Energy Co.* (Palisades Nuclear Plant), CLI-07-18, 65 NRC 399, 409-10 (2007)  
petitioners have not established representational standing if they do not identify any organizational member, show that any member authorized representation, or state how any member is affected by the proposed action; LBP-16-14, 84 NRC 448 n.24 (2016)
- Consumers Energy Co.* (Palisades Nuclear Plant), CLI-07-18, 65 NRC 399, 410 (2007)  
to demonstrate interest based on proximity, petitioner must provide more than general assertions of proximity; LBP-16-14, 84 NRC 450 n.29 (2016)
- Consumers Energy Co.* (Palisades Nuclear Plant), CLI-07-18, 65 NRC 399, 411 (2007)  
organizations seeking to intervene in their own right must satisfy the same standing requirements as individuals seeking to intervene; LBP-16-14, 84 NRC 449 (2016)
- Consumers Energy Co.* (Palisades Nuclear Plant), CLI-07-18, 65 NRC 399, 411-12 (2007)  
organization may establish organizational standing if it demonstrates a risk of discrete institutional injury to itself; LBP-16-14, 84 NRC 448 (2016)
- Consumers Energy Co.* (Palisades Nuclear Plant), CLI-07-18, 65 NRC 399, 413 (2007)  
petitioners' failure to provide physical addresses precludes the board from evaluating the proximity presumption's potential applicability; LBP-16-14, 84 NRC 449-50 (2016)
- Consumers Power Co.* (Palisades Nuclear Plant), LBP-79-20, 10 NRC 108, 115 (1979)  
petitioner's showing of an obvious potential for offsite consequences, while sufficient for standing, was insufficient to support an admissible contention; LBP-16-10, 84 NRC 35 (2016)
- Covington v. Jefferson Cty.*, 358 F.3d 626, 638-41 (9th Cir. 2004)  
allegation that defendant's actions caused reasonable concern of injury to the plaintiff is sufficient to demonstrate injury in fact for standing; LBP-16-10, 84 NRC 32 n.80 (2016)
- Crow Butte Resources, Inc.* (Marsland Expansion Area), CLI-14-2, 79 NRC 11, 19 n.45 (2014)  
licensing boards follow a longstanding principle that, in the standing analysis, petition is to be construed in favor of petitioner; LBP-16-10, 84 NRC 27 (2016)

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- Crow Butte Resources, Inc.* (Marsland Expansion Area), CLI-14-2, 79 NRC 11, 23 n.70 (2014)  
Standard Review Plan is guidance for NRC Staff in reviewing an application, not a regulation, and it provides one way to comply with NRC regulations; CLI-16-20, 84 NRC 231 (2016)
- Crow Butte Resources, Inc.* (North Trend Expansion Project), CLI-09-12, 69 NRC 535, 545-46 (2009)  
petitioner's standing is not required to be supported by expert affidavits regarding petitioner's plausible scenario for injury; LBP-16-10, 84 NRC 35 n.105 (2016)
- Crow Butte Resources, Inc.* (North Trend Expansion Project), CLI-09-12, 69 NRC 535, 553 (2009)  
if boards were to create contentions out of petitioners' various conclusory and unsupported objections, they would be taking on a task that properly belongs to petitioners or to their counsel, not to the board; LBP-16-14, 84 NRC 451 (2016)
- City of Del Norte v. United States*, 732 F.2d 1462, 1467 (9th Cir. 1984)  
parties challenging an agency's NEPA process are not entitled to relief unless they demonstrate harm or prejudice; CLI-16-20, 84 NRC 236, 245 (2016)  
violation of NEPA, by itself, is not always sufficient to justify suspending or revoking a licensing action; CLI-16-18, 84 NRC 178 (2016)
- Curators of the University of Missouri*, (TRUMP-S Project), CLI-95-1, 41 NRC 71, 98 (1995)  
Standard Review Plan is guidance for NRC Staff in reviewing an application, not a regulation, and it provides one way to comply with NRC regulations; CLI-16-20, 84 NRC 231 (2016)
- Curators of the University of Missouri* (TRUMP-S Project), CLI-95-8, 41 NRC 386, 400 (1995)  
absent evidence to the contrary, Commission assumes at the licensing stage that licensee will comply with its obligations; CLI-16-20, 84 NRC 256 (2016)
- David Geisen*, CLI-10-23, 72 NRC 210, 224-25 (2010)  
Commission will take review of a board's factual findings when those findings are clearly erroneous or in conflict with a finding regarding the same fact in a different proceeding; CLI-16-20, 84 NRC 239, 248 (2016)  
to show clear error, petitioners must demonstrate that the board's determination is not even plausible in light of the record as a whole; CLI-16-20, 84 NRC 228 (2016)
- David Geisen*, CLI-10-23, 72 NRC 210, 224-25, 242 (2010)  
Commission reviews questions of law de novo, but defers to the board's findings with respect to underlying facts unless they are clearly erroneous; CLI-16-20, 84 NRC 228, 255 (2016)
- David Geisen*, CLI-10-23, 72 NRC 210, 245 (2010)  
to prevail on appeal, a party must show not only that the majority erred but also that the error had a prejudicial effect on the party's case; CLI-16-20, 84 NRC 232 n.72 (2016)
- Detroit Edison Co.* (Fermi Nuclear Power Plant, Unit 3), LBP-10-9, 71 NRC 493, 525 (2010)  
contention that challenges matters addressed in the AP1000 design certification rule is inadmissible because it is an impermissible challenge to the rule, fails to comply with the requirements of section 2.335, and contravenes provisions of section 52.63(a)(1); LBP-16-10, 84 NRC 41 (2016)
- Detroit Edison Co.* (Fermi Nuclear Power Plant, Unit 3), LBP-10-9, 71 NRC 493, 525 & n.146 (2010)  
participant in an adjudicatory proceeding may not challenge a standard design such as the AP1000 that has been approved by regulation; LBP-16-10, 84 NRC 41 (2016)
- Dominion Nuclear Connecticut, Inc.* (Millstone Nuclear Power Station, Unit 2), CLI-03-14, 58 NRC 207, 215-18 (2003)  
standing and contention admissibility are distinct issues, and a licensing board need not rule on contention admissibility to decide standing; LBP-16-10, 84 NRC 34-35 (2016)
- Dominion Nuclear Connecticut, Inc.* (Millstone Nuclear Power Station, Unit 2), LBP-03-12, 58 NRC 75, 92-93 (2003), *aff'd*, CLI-03-14, 58 NRC 207 (2003)  
allegations that are sufficient to establish standing may be insufficient to support a valid contention; LBP-16-10, 84 NRC 35 n.99 (2016)  
petitioner's showing of an obvious potential for offsite consequences, while sufficient for standing, was insufficient to support an admissible contention; LBP-16-10, 84 NRC 35 n.99 (2016)
- Dominion Nuclear Connecticut, Inc.* (Millstone Nuclear Power Station, Unit 2), LBP-03-12, 58 NRC 75, 93 (2003), *aff'd*, CLI-03-14, 58 NRC 207 (2003)  
requirements for contention admissibility are considerably more stringent than those for standing; LBP-16-10, 84 NRC 35 (2016)

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- DTE Electric Co.* (Fermi Nuclear Power Plant, Unit 3), CLI-14-7, 80 NRC 1 (2014)  
suspension of reactor licensing decisions pending resolution of a petition for rulemaking concerning environmental impacts of the expedited transfer of spent fuel from the spent fuel pool to dry cask storage was denied; CLI-16-16, 84 NRC 74 (2016)
- DTE Electric Co.* (Fermi Nuclear Power Plant, Unit 3), CLI-14-10, 80 NRC 157, 162-63 (2014)  
review is seldom granted where petitioner relies primarily on claims that the board erred in weighing the evidence in a merits decision; CLI-16-20, 84 NRC 228 (2016)
- DTE Electric Co.* (Fermi Nuclear Power Plant, Unit 3), CLI-15-4, 81 NRC 221 (2015)  
Commission is not required, under the Atomic Energy Act, to make predictive findings regarding the technical feasibility of spent fuel disposal as part of its reactor licensing decisions; CLI-16-16, 84 NRC 75 n.40 (2016)
- DTE Electric Co.* (Fermi Nuclear Power Plant, Unit 3), CLI-15-4, 81 NRC 221, 242 (2015)  
contentions challenging continued storage rule are inadmissible; CLI-16-19, 84 NRC 189 (2016)
- DTE Electric Co.* (Fermi Nuclear Power Plant, Unit 3), CLI-15-10, 81 NRC 535 (2015)  
Commission declined to order supplementation of final EISs to reference the Continued Storage GEIS; CLI-16-16, 84 NRC 75 n.40 (2016)
- DTE Electric Co.* (Fermi Nuclear Power Plant, Unit 3), CLI-15-10, 81 NRC 535, 544 (2015)  
contentions challenging continued storage rule are inadmissible; CLI-16-19, 84 NRC 189 (2016)
- DTE Electric Co.* (Fermi Nuclear Power Plant, Unit 3), CLI-15-13, 81 NRC 555, 560-61 (2015)  
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inquiry in mandatory combined license proceeding is whether NRC Staff's review was sufficient to support safety and environmental findings; CLI-16-19, 84 NRC 185 (2016)
- DTE Electric Co.* (Fermi Nuclear Power Plant, Unit 3), CLI-15-13, 81 NRC 555, 564-65 (2015)  
all safety and environmental matters relevant to a combined license application, except those resolved in the contested proceeding, are subject to review in the uncontested proceeding; CLI-16-16, 84 NRC 75-76 (2016); CLI-16-19, 84 NRC 189 (2016)
- Duke Energy Carolinas, LLC* (William States Lee III Nuclear Station, Units 1 and 2), CLI-09-21, 70 NRC 927, 930 (2009)  
Commission declined review of referred ruling on dismissal of a contention pertaining to consideration of greenhouse gas emissions from construction and operation of the new units; CLI-16-19, 84 NRC 186 (2016)
- Duke Energy Carolinas, LLC* (William States Lee III Nuclear Station, Units 1 and 2), CLI-15-15, 81 NRC 803 (2015)  
Commission declined to admit placeholder contention in anticipation that the court of appeals would overturn the 2014 Continued Storage Rule; CLI-16-16, 84 NRC 75 (2016)
- Duke Energy Carolinas, LLC* (William States Lee III Nuclear Station, Units 1 and 2), CLI-15-15, 81 NRC 803, 804-05 (2015)  
contentions challenging continued storage rule are inadmissible; CLI-16-19, 84 NRC 189 (2016)
- Duke Energy Carolinas, LLC* (William States Lee III Nuclear Station, Units 1 and 2), LBP-08-17, 68 NRC 431, 438-39, 442-43 (2008)  
although petitioner had standing, its contentions related to the AP1000 design were inadmissible; LBP-16-10, 84 NRC 35 (2016)
- Duke Energy Carolinas, LLC* (William States Lee III Nuclear Station, Units 1 and 2), LBP-08-17, 68 NRC 431, 439 (2008)  
licensing boards follow a longstanding principle that, in the standing analysis, petition is to be construed in favor of petitioner; LBP-16-10, 84 NRC 27 (2016)
- Duke Energy Corp.* (Catawba Nuclear Station, Units 1 and 2), CLI-04-6, 59 NRC 62, 74 (2004)  
NRC Staff reviews, which frequently proceed in parallel to adjudicatory proceedings, fall under the direction of NRC Staff management and the Commission itself, not the licensing boards; CLI-16-20, 84 NRC 250 n.195 (2016)
- Duke Energy Corp.* (Oconee Nuclear Station, Units 1, 2, and 3), CLI-99-11, 49 NRC 328, 345 (1999)  
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- when an issue is resolved generically, a petitioner's remedy lies in the rulemaking process, not through adjudication; LBP-16-10, 84 NRC 47 n.194 (2016)
- Duke Energy Florida, LLC* (Levy County Nuclear Power Plant, Units 1 and 2), CLI-16-16, 84 NRC 66, 79-82 (2016)
- five common regulatory departures and exemptions are acceptable based on a reference combined license application; CLI-16-19, 84 NRC 199 (2016)
- Duke Energy Florida, LLC* (Levy County Nuclear Power Plant, Units 1 and 2), CLI-16-16, 84 NRC 66, 93-94 (2016)
- non-concurrence related to whether additional steps are warranted under NEPA, the NHPA, and the Endangered Species Act, in view of the possibility that an independent spent fuel storage installation could be constructed on the site at some future time is discussed; CLI-16-19, 84 NRC 212 n.238 (2016)
- Duke Power Co.* (Catawba Nuclear Station, Units 1 and 2), CLI-83-19, 17 NRC 1041, 1049 (1983)
- although intervenors presented no evidence in support of the tornado portion of their contention, this is not by itself fatal to the contention because NRC Staff bears the ultimate burden of proof for showing that it complied with NEPA; LBP-16-13, 84 NRC 423 (2016)
- NRC Staff bears the ultimate burden of showing that it satisfied NEPA's information-disclosure mandate by meaningfully considering significant impacts and addressing those impacts in the environmental assessment; LBP-16-13, 84 NRC 283 (2016)
- Duke Power Co.* (Catawba Nuclear Station, Units 1 and 2), LBP-83-24A, 17 NRC 674, 680 (1983)
- boards have broad and strong discretionary authority to conduct their functions with efficiency and economy, but they must exercise it with fairness to all the parties; CLI-16-20, 84 NRC 251 n.198 (2016)
- Duke Power Co.* (Cherokee Nuclear Station, Units 1, 2, and 3), ALAB-745, 18 NRC 746, 747 & n.1 (1983)
- considerable site preparation work has been done on the site under a construction permit for a project that was subsequently terminated; CLI-16-19, 84 NRC 193 (2016)
- Duke Power Co.* (Perkins Nuclear Station, Units 1, 2, and 3), ALAB-668, 15 NRC 450, 451-52 (1982)
- potential of site previously characterized for a proposed nuclear project that was cancelled before a decision was made on the construction permit is discussed; CLI-16-19, 84 NRC 211 n.228 (2016)
- Eagle Broadcasting Group, Ltd. v. FCC*, 563 F.3d 543, 551, 554 (D.C. Cir. 2009)
- agency may not treat like cases differently; CLI-16-17, 84 NRC 121 n.99 (2016)
- EnergySolutions, LLC* (Radioactive Waste Import/Export Licenses), CLI-11-3, 73 NRC 613, 623 (2011)
- where petitioners' written views are on the record, Commission need not devote adjudicatory resources on providing an oral hearing on petitioners' grievances when they have been unable to articulate material issues that require litigation at a hearing; CLI-16-15, 84 NRC 59 (2016)
- Entergy Nuclear Generation Co. and Entergy Nuclear Operations, Inc.* (Pilgrim Nuclear Power Station), CLI-10-11, 71 NRC 287 (2010)
- agencies need not consider remote and speculative impacts in an environmental impact statement; CLI-16-20, 84 NRC 265 (2016)
- Entergy Nuclear Generation Co. and Entergy Nuclear Operations, Inc.* (Pilgrim Nuclear Power Station), CLI-10-22, 72 NRC 202, 208 (2010)
- agencies need only undertake reasonable efforts to acquire missing information for an environmental impact statement; CLI-16-20, 84 NRC 265 (2016)
- in some instances information relevant to an environmental impact statement will not be reasonably available and the agency is directed to proceed in accord with NEPA's rule of reason in the face of such lacunae; CLI-16-20, 84 NRC 264 (2016)
- where necessary data for NEPA reviews may be unavailable, unreliable, inapplicable, or simply not adaptable, NRC Staff has been directed to provide a reasonable analysis of the available information with a disclosure of incomplete or unavailable information; CLI-16-20, 84 NRC 263 (2016)
- Entergy Nuclear Generation Co. and Entergy Nuclear Operations, Inc.* (Pilgrim Nuclear Power Station), CLI-12-1, 75 NRC 39, 46 (2012)
- where a board's decision rests on a weighing of extensive fact-specific evidence presented by technical experts, Commission generally will defer; CLI-16-20, 84 NRC 228 n.46 (2016)

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- Entergy Nuclear Operations, Inc.* (Indian Point Nuclear Generating Units 2 and 3), CLI-08-29, 68 NRC 899, 901-03 (2008)  
pursuant to a standing order of the Commission, nonconforming pleadings submitted by a specific individual were to be summarily rejected because of repeated inability or unwillingness to comply with licensing board's instructions or NRC rules; LBP-16-14, 84 NRC 447 (2016)
- Entergy Nuclear Operations, Inc.* (Indian Point Nuclear Generating Units 2 and 3), CLI-11-14, 74 NRC 801, 813 (2011)  
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- Entergy Nuclear Operations, Inc.* (Indian Point Nuclear Generating Units 2 and 3), CLI-15-6, 81 NRC 340, 354-55 (2015)  
Commission gives substantial deference to boards on issues of contention admissibility and will affirm admissibility determinations absent a showing of an error of law or abuse of discretion; CLI-16-20, 84 NRC 228 (2016)
- Entergy Nuclear Operations, Inc.* (Indian Point Nuclear Generating Units 2 and 3), CLI-15-6, 81 NRC 340, 387-88 (2015)  
licensing board's findings and conclusions are deemed to amend NRC Staff's NEPA documents and become the agency record of decision on those matters; CLI-16-18, 84 NRC 170 (2016)
- Entergy Nuclear Operations, Inc.* (Indian Point Nuclear Generating Units 2 and 3), CLI-15-6, 81 NRC 340, 388 (2015)  
board can uphold NRC Staff's proposed action despite deficiencies in its NEPA documents if sufficient evidence is developed in an adjudicatory proceeding concerning the environmental impacts of the proposed action; CLI-16-18, 84 NRC 170 (2016)  
environmental record of decision may be supplemented by the hearing and relevant board and Commission decisions; LBP-16-13, 84 NRC 314-15 & n.256 (2016)  
NRC hearing procedures allow for additional and more rigorous public scrutiny of the final supplemental environmental impact statement than does the usual circulation for comment; CLI-16-18, 84 NRC 172 (2016)  
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with the adjudicatory record curing deficiencies in the environmental assessment, there is no need to return the EA to NRC Staff to correct deficiencies; LBP-16-13, 84 NRC 414 (2016)
- Entergy Nuclear Operations, Inc.* (Indian Point Nuclear Generating Units 2 and 3), CLI-15-6, 81 NRC 340, 388 n.258 (2015)  
where there is an evidentiary dispute, licensing board decision makes any necessary factual findings based on a preponderance of the evidence; LBP-16-13, 84 NRC 286 (2016)
- Entergy Nuclear Operations, Inc.* (Indian Point Nuclear Generating Units 2 and 3), CLI-16-7, 83 NRC 293, 306-07 (2016)  
NRC Staff bears the ultimate burden of showing that it satisfied NEPA's information-disclosure mandate by meaningfully considering significant impacts and addressing those impacts in the environmental assessment; LBP-16-13, 84 NRC 283 (2016)
- Entergy Nuclear Operations, Inc.* (Indian Point Nuclear Generating Units 2 and 3), CLI-16-7, 83 NRC 293, 323 (2016)  
NEPA requires that an agency conduct its environmental review with the best information available today; CLI-16-18, 84 NRC 173 n.31 (2016)
- Entergy Nuclear Operations, Inc.* (Indian Point Nuclear Generating Units 2 and 3), CLI-16-7, 83 NRC 293, 328 (2016)  
NEPA, as a procedural statute, does not require any particular substantive result; CLI-16-18, 84 NRC 174 (2016)
- Entergy Nuclear Operations, Inc.* (Indian Point Nuclear Generating Units 2 and 3), CLI-16-10, 83 NRC 494, 510 (2016)  
NEPA serves the purpose of environmental protection through action-forcing procedures that require agencies to take a hard look at environmental impacts and that provide for broad dissemination of relevant environmental information; CLI-16-18, 84 NRC 174 (2016)

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- Entergy Nuclear Operations, Inc.* (Palisades Nuclear Plant), CLI-15-22, 82 NRC 310, 316 & n.44 (2015)  
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- Entergy Nuclear Operations, Inc. and Entergy Nuclear Palisades, LLC* (Palisades Nuclear Plant), CLI-08-19, 68 NRC 251, 255 n.3 (2008)  
direct license transfer entails a change to operating and/or possession authority; LBP-16-12, 84 NRC 153 n.7 (2016)
- Entergy Nuclear Operations, Inc. and Entergy Nuclear Palisades, LLC* (Palisades Nuclear Plant), CLI-08-19, 68 NRC 251, 269 (2008)  
proximity-based standing has never been granted to a petitioner in an indirect license transfer adjudication but the possibility has not been ruled out; LBP-16-12, 84 NRC 159 (2016)
- Entergy Nuclear Operations, Inc. and Entergy Nuclear Palisades, LLC* (Palisades Nuclear Plant), CLI-08-19, 68 NRC 251, 270 (2008)  
general environmental and policy interests are insufficient to confer standing; LBP-16-14, 84 NRC 450 (2016)
- Entergy Nuclear Vermont Yankee, LLC, and Entergy Nuclear Operations, Inc.* (Vermont Yankee Nuclear Power Station), CLI-07-3, 65 NRC 13, 22 n.37 (2007)  
Commission, not the board, has authority to stay a license amendment proceeding in light of pending rulemaking; LBP-16-11, 84 NRC 146 (2016)
- Entergy Nuclear Vermont Yankee, LLC, and Entergy Nuclear Operations, Inc.* (Vermont Yankee Nuclear Power Station), CLI-10-17, 72 NRC 1, 4-9 (2010)  
board ruled in favor of intervenor after a merits hearing but directed parties to undertake additional action to cure identified deficiencies; CLI-16-20, 84 NRC 245 n.158 (2016)  
where board's resolution of contentions is final, consideration of petitions for review of these contentions is appropriate; CLI-16-20, 84 NRC 243 n.143 (2016)
- Entergy Nuclear Vermont Yankee, LLC, and Entergy Nuclear Operations, Inc.* (Vermont Yankee Nuclear Power Station), CLI-10-17, 72 NRC 1, 30 (2010)  
Commission is generally disinclined to upset fact-driven licensing board decisions; CLI-16-20, 84 NRC 228 n.46 (2016)
- Entergy Nuclear Vermont Yankee, LLC, and Entergy Nuclear Operations, Inc.* (Vermont Yankee Nuclear Power Station), CLI-10-17, 72 NRC 1, 45 n.246 (2010)  
NRC treats pro se litigants more leniently than litigants with counsel; LBP-16-11, 84 NRC 142 n.5 (2016)
- Entergy Nuclear Vermont Yankee, LLC, and Entergy Nuclear Operations, Inc.* (Vermont Yankee Nuclear Power Station), CLI-10-17, 72 NRC 1, 45 n.246 (2010)  
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- Entergy Nuclear Vermont Yankee, LLC, and Entergy Nuclear Operations, Inc.* (Vermont Yankee Nuclear Power Station), LBP-04-28, 60 NRC 548, 553 (2004)  
extended power uprate proceedings involve an obvious potential for offsite consequences; LBP-16-11, 84 NRC 144 n.26 (2016)
- Entergy Nuclear Vermont Yankee, LLC, and Entergy Nuclear Operations, Inc.* (Vermont Yankee Nuclear Power Station), LBP-04-28, 60 NRC 548, 553-54 (2004)  
representational standing has been granted to an organization whose members lived within 15 miles of the subject plant; LBP-16-10, 84 NRC 36 (2016)
- Entergy Nuclear Vermont Yankee, LLC, and Entergy Nuclear Operations, Inc.* (Vermont Yankee Nuclear Power Station), LBP-15-24, 82 NRC 68, 100 (2015)  
license condition requiring 30-day notices of withdrawals from the decommissioning trust fund for nonadministrative expenses remained in effect because NRC Staff had not yet granted the license amendment request subjecting licensee to 10 C.F.R. 50.75(h)(1)(iv); CLI-16-17, 84 NRC 107 (2016)
- Entergy Nuclear Vermont Yankee, LLC, and Entergy Nuclear Operations, Inc.* (Vermont Yankee Nuclear Power Station), LBP-15-28, 82 NRC 233, 244 (2015)  
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- licensee motion to withdraw license amendment request for exemption from 30-day notices of withdrawals from the decommissioning trust fund and to dismiss the proceeding was subject to two conditions; CLI-16-17, 84 NRC 107-08 (2016)
- withdrawal of license amendment request was conditioned on the withdrawal requiring that licensee specify in its notification to NRC that it is reimbursing itself from the decommissioning trust fund for certain expenses; CLI-16-17, 84 NRC 122 n.105 (2016)
- Env'tl. Def. Fund, Inc. v. Gorsuch*, 713 F.2d 802, 816-17 (D.C. Cir. 1983)
- scrutiny of a claimed exemption should be exacting where an agency seeks to undo all it accomplished through its rulemaking without giving all parties an opportunity to comment on the wisdom of repeal; CLI-16-17, 84 NRC 137 n.7 (2016)
- Ex parte McCardle*, 7 Wall. 506, 514, 19 L. Ed. 264 (1868)
- jurisdiction is power to declare the law, and when it ceases to exist, the only function remaining to the court is that of announcing the fact and dismissing the cause; LBP-16-14, 84 NRC 450-51 n.34 (2016)
- Exelon Generation Co., LLC* (Peach Bottom Atomic Power Station, Units 2 and 3), CLI-05-26, 62 NRC 577, 580 (2005)
- appropriate radius for proximity standing is decided on a case-by-case basis; LBP-16-10, 84 NRC 36 (2016); LBP-16-14, 84 NRC 450 n.29 (2016)
- Exelon Generation Co., LLC* (Peach Bottom Atomic Power Station, Units 2 and 3), CLI-05-26, 62 NRC 577, 580-81 (2005)
- proposed license transfer that does not involve transfer of ownership or operating rights to subject facilities or entail changes in the facilities themselves or in their operation offers no obvious potential for offsite consequences; LBP-16-12, 84 NRC 160 (2016)
- Exelon Generation Co., LLC* (Peach Bottom Atomic Power Station, Units 2 and 3), CLI-05-26, 62 NRC 577, 581 (2005)
- petitioner has the burden to show that the proximity presumption should apply; LBP-16-10, 84 NRC 26 (2016)
- proximity presumption allows a petitioner living, having frequent contacts, or having a significant property interest within 50 miles of a nuclear power reactor to establish standing without the need to make an individualized showing of injury, causation, and redressability; LBP-16-10, 84 NRC 26 (2016)
- proximity presumption does not apply in the context of a decommissioning trust transfer; LBP-16-14, 84 NRC 449 n.28 (2016)
- Exelon Generation Co., LLC* (Peach Bottom Atomic Power Station, Units 2 and 3), CLI-05-26, 62 NRC 577, 582 (2005)
- proximity presumption does not apply in license transfer cases; LBP-16-10, 84 NRC 33 (2016)
- proximity presumption does not apply where there is no obvious potential for offsite consequences because there have been no changes to the physical plant itself, its operating procedures, design basis accident analysis, management, or personnel; LBP-16-10, 84 NRC 33 (2016)
- there are limits to proximity standing when there are no changes to the physical plant itself, its operating procedures, design basis accident analysis, management, or personnel; LBP-16-14, 84 NRC 449 n.28 (2016)
- Florida Power & Light Co.* (St. Lucie Nuclear Power Plant, Unit 1), LBP-11-29, 74 NRC 612, 619 (2011)
- extended power uprate proceedings involve an obvious potential for offsite consequences; LBP-16-11, 84 NRC 144 n.26 (2016)
- Florida Power & Light Co.* (St. Lucie Nuclear Power Plant, Unit 2), CLI-14-11, 80 NRC 167, 173 (2014)
- unilateral licensee action without NRC approval of an increase in authority or alteration of the terms of the license does not constitute a de facto amendment; CLI-16-17, 84 NRC 111 (2016)
- Florida Power & Light Co.* (St. Lucie Nuclear Power Plant, Units 1 and 2), CLI-89-21, 30 NRC 325, 329 (1989)
- living within a specific distance from a nuclear plant is enough to confer standing on an individual or group in proceedings for construction permits, operating licenses, or significant amendments thereto; LBP-16-10, 84 NRC 25 n.28 (2016)

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- Florida Power & Light Co.* (St. Lucie Nuclear Power Plant, Units 1 and 2), CLI-89-21, 30 NRC 325, 329-30 (1989)  
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in license amendment proceedings, petitioner may claim standing based upon a residence or visits near the plant, if the proposed action quite obviously entails an increased potential for offsite consequences; LBP-16-11, 84 NRC 144 n.26 (2016)  
proximity presumption for standing has been rejected for certain changes to worker-protection requirements; LBP-16-10, 84 NRC 33 (2016)
- Florida Power & Light Co.* (Turkey Point Nuclear Generating Units 3 and 4), CLI-01-17, 54 NRC 3, 15 (2001)  
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- Florida Power & Light Co.* (Turkey Point Nuclear Generating Units 3 and 4), CLI-15-25, 82 NRC 389, 396 n.46 (2015)  
land application of wastewater from in situ uranium mining is a reasonably foreseeable alternative and warrants discussion under NEPA and so must be addressed in the environmental assessment; LBP-16-13, 84 NRC 429 (2016)  
NEPA requires the environmental assessment to address the reasonably foreseeable effects of a proposed action; LBP-16-13, 84 NRC 429 (2016)
- Florida Power & Light Co.* (Turkey Point Nuclear Generating Units 3 and 4), CLI-16-18, 84 NRC 167 (2016)  
agency decisionmaker must consider an adequate environmental review before making a decision on a licensing action; CLI-16-20, 84 NRC 269 (2016)
- Florida Power & Light Co.* (Turkey Point Nuclear Generating Units 3 and 4), LBP-01-6, 53 NRC 138, 148 (2001), *aff'd on other grounds*, CLI-01-17, 54 NRC 3 (2001)  
proximity presumption is intended to be applied across the board to all proceedings regardless of type because the underlying rationale is not based on type of proceeding per se but on whether the proposed action involves a significant source of radioactivity producing an obvious potential for offsite consequences; LBP-16-10, 84 NRC 26 n.34 (2016)
- Florida Power & Light Co.* (Turkey Point Nuclear Generating Units 3 and 4), LBP-08-18, 68 NRC 533, 539 (2008)  
for proximity presumption to apply in license amendment proceedings, the proposed amendment must obviously entail an increased potential for offsite consequences; LBP-16-10, 84 NRC 26 (2016)
- Friends of the Earth v. Laidlaw Envtl. Servs., Inc.*, 528 U.S. 167, 182-84 (2000)  
plaintiffs' demonstration of injury-in-fact for standing did not have to show that pollutant discharges actually harmed the environment; LBP-16-10, 84 NRC 32 (2016)
- Friends of the River v. FERC*, 720 F.2d 93, 106 (D.C. Cir. 1983)  
licensing board's findings and conclusions are deemed to amend NRC Staff's NEPA documents and become the agency record of decision on those matters; CLI-16-18, 84 NRC 170 (2016)
- Georgia Institute of Technology* (Georgia Tech Research Reactor, Atlanta, Georgia), CLI-95-12, 42 NRC 111, 115 (1995)  
Commission applies contemporaneous judicial concepts of standing, under which petitioner must allege a concrete and particularized injury that is fairly traceable to the challenged action and is likely to be redressed by a favorable decision; LBP-16-10, 84 NRC 25 (2016)  
licensing boards follow a longstanding principle that, in the standing analysis, petition is to be construed in favor of petitioner; LBP-16-10, 84 NRC 27 (2016)  
organization may base its standing on immediate or threatened injury to either its organizational interests or to the interests of identified members; LBP-16-14, 84 NRC 448 (2016)  
organization may establish representational standing by showing that at least one member has standing to intervene in his/her own right and has authorized the organization to request a hearing on his/her behalf; LBP-16-11, 84 NRC 144 (2016); LBP-16-14, 84 NRC 448 (2016)

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- petitioners have not established representational standing if they do not identify any organizational member, show that any member authorized representation, or state how any member is affected by the proposed action; LBP-16-14, 84 NRC 448 n.24 (2016)
- Georgia Institute of Technology* (Georgia Tech Research Reactor, Atlanta, Georgia), CLI-95-12, 42 NRC 111, 116 (1995)
- proximity presumption is intended to be applied across the board to all proceedings regardless of type because the underlying rationale is not based on type of proceeding per se but on whether the proposed action involves a significant source of radioactivity producing an obvious potential for offsite consequences; LBP-16-10, 84 NRC 26 n.34 (2016)
- Georgia Institute of Technology* (Georgia Tech Research Reactor, Atlanta, Georgia), CLI-95-12, 42 NRC 111, 117 (1995)
- standing argument that would first require three independent safety systems to fail was upheld; LBP-16-10, 84 NRC 32-33 (2016)
- Georgia Institute of Technology* (Georgia Tech Research Reactor, Atlanta, Georgia), LBP-95-6, 41 NRC 281, 286, *aff'd*, CLI-95-12, 42 NRC 111 (1995)
- at the pleading stage, board must accept as true all material allegations of the petition; LBP-16-10, 84 NRC 27 (2016)
- Georgia Institute of Technology* (Georgia Tech Research Reactor, Atlanta, Georgia), LBP-95-6, 41 NRC 281, 287, *aff'd*, CLI-95-12, 42 NRC 111 (1995)
- petitioner's showing of an obvious potential for offsite consequences, while sufficient for standing, was insufficient to support an admissible contention; LBP-16-10, 84 NRC 35 n.99 (2016)
- GPU Nuclear, Inc.* (Oyster Creek Nuclear Generating Station), CLI-00-6, 51 NRC 193, 211 (2000)
- proper forum for an argument regarding rate regulation is the Federal Energy Regulatory Commission or a state board of public utilities; CLI-16-17, 84 NRC 109 n.35 (2016)
- Ground Zero Ctr. for Non-Violent Action v. U.S. Dep't of the Navy*, 383 F.3d 1082 (9th Cir. 2004)
- agencies need not consider remote and speculative impacts in an environmental impact statement; CLI-16-20, 84 NRC 265 (2016)
- Gulf States Utilities Co.* (River Bend Station, Unit 1), CLI-94-10, 40 NRC 43, 49 (1994)
- standing determination is not the appropriate juncture at which to make findings on the underlying dispute because doing so would require reaching beyond the minimum threshold for standing; LBP-16-10, 84 NRC 34 (2016)
- Honeywell International, Inc.* (Metropolis Works Uranium Conversion Facility), CLI-13-1, 77 NRC 1, 9 (2013)
- although NRC's regulations authorize exemptions, they are considered to be an extraordinary equitable remedy to be used only sparingly; CLI-16-17, 84 NRC 120, 135 (2016)
- Honeywell International, Inc.* (Metropolis Works Uranium Conversion Facility), CLI-13-1, 77 NRC 1, 18 n.102 (2013)
- to show clear error, petitioners must demonstrate that the board's determination is not even plausible in light of the record as a whole; CLI-16-20, 84 NRC 228 (2016)
- Honeywell International, Inc.* (Metropolis Works Uranium Conversion Facility), CLI-13-1, 77 NRC 1, 18-19 (2013)
- Commission will review a board's factual findings when those findings are clearly erroneous or in conflict with a finding regarding the same fact in a different proceeding; CLI-16-20, 84 NRC 239, 248, 255 (2016)
- Hydro Resources, Inc.* (2929 Coors Road, Suite 101, Albuquerque, NM 87120), CLI-99-22, 50 NRC 3, 8 (1999)
- section 40.31(h) and Part 40, Appendix A were designed to address the problems related to mill tailings and not problems related to in situ mining; CLI-16-20, 84 NRC 229 n.54, 230-31 (2016)
- Hydro Resources, Inc.* (2929 Coors Road, Suite 101, Albuquerque, NM 87120), CLI-99-22, 50 NRC 3, 14 (1999)
- information that is not materially different from previously available information does not paint a seriously different picture of the environmental landscape; CLI-16-20, 84 NRC 240 n.125 (2016)

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- Hydro Resources, Inc.* (2929 Coors Road, Suite 101, Albuquerque, NM 87120), CLI-00-8, 51 NRC 227, 241 (2000)  
Commission has disfavored imposing a draconian remedy, such as not granting a license extension, when less drastic relief will suffice; LBP-16-13, 84 NRC 440 (2016)
- Hydro Resources, Inc.* (2929 Coors Road, Suite 101, Albuquerque, NM 87120), LBP-98-9, 47 NRC 261, 280 (1998)  
issues of disorganization in an application cannot be said to be germane to the licensing process; CLI-16-20, 84 NRC 238 (2016)
- Hydro Resources, Inc.* (P.O. Box 777, Crownpoint, New Mexico 87313), CLI-06-1, 63 NRC 1, 6 (2006)  
industry practice of definitively establishing groundwater quality baselines after licensing but before operation is supported by NRC case law; CLI-16-20, 84 NRC 252 (2016)
- Hydro Resources, Inc.* (P.O. Box 777, Crownpoint, New Mexico 87313), CLI-06-11, 63 NRC 483, 493 (2006)  
NRC Staff bears the ultimate burden of showing that it satisfied NEPA's information-disclosure mandate by meaningfully considering significant impacts and addressing those impacts in the environmental assessment; LBP-16-13, 84 NRC 283 (2016)
- Hydro Resources, Inc.* (P.O. Box 777, Crownpoint, New Mexico 87313), CLI-06-29, 64 NRC 417, 426-27 (2006)  
mitigation and monitoring plans in the final supplemental environmental impact statement, although not final, complies with NEPA; CLI-16-20, 84 NRC 260 (2016)
- Hydro Resources, Inc.* (P.O. Box 777, Crownpoint, New Mexico 87313), LBP-05-26, 62 NRC 442, 472 (2005)  
National Environmental Policy Act compliance does not necessarily follow from National Historic Preservation Act compliance; CLI-16-20, 84 NRC 248 (2016)
- In re Aiken County*, 725 F.3d 255, 267 (D.C. Cir. 2013)  
claim of unreasonable delay should be raised directly with the Commission, or possibly before the courts; LBP-16-11, 84 NRC 146 (2016)
- International Uranium (USA) Corp.* (White Mesa Uranium Mill), CLI-01-21, 54 NRC 247, 252 (2001)  
organization may establish organizational standing if it demonstrates a risk of discrete institutional injury to itself; LBP-16-14, 84 NRC 448 (2016)
- International Uranium (USA) Corp.* (White Mesa Uranium Mill), CLI-02-10, 55 NRC 251, 255-56 (2002)  
distinction is made between the ultimate merits and the threshold issue of standing; LBP-16-10, 84 NRC 34 (2016)
- Kansas Gas and Electric Co.* (Wolf Creek Generating Station, Unit 1), CLI-99-19, 49 NRC 441, 459-60 n.14 (1999)  
indirect transfers involve corporate restructuring or reorganizations that leave licensee itself intact as a corporate entity; LBP-16-12, 84 NRC 153 n.7 (2016)
- Kelly v. Selin*, 42 F.3d 1501, 1507-08 (6th Cir. 1995)  
at the pleading stage, board must accept as true all material allegations of the petition; LBP-16-10, 84 NRC 27 (2016)
- Klamath-Siskiyou Wildlands Ctr. v. Bureau of Land Mgmt.*, 387 F.3d 989, 993-94 (9th Cir. 2004)  
generic statements in the in situ leach mining generic environmental impact statement do not fulfill NRC Staff's obligations under NEPA with regard to significant impacts that could reasonably be posed to wildlife at the license area were licensee to commence land application of wastewater; LBP-16-13, 84 NRC 432 (2016)
- Kleppe v. Sierra Club*, 427 U.S. 390, 410 n.21 (1976)  
NEPA serves the purpose of environmental protection through action-forcing procedures that require agencies to take a hard look at environmental impacts and that provide for broad dissemination of relevant environmental information; CLI-16-18, 84 NRC 174 (2016)
- Kootenai Tribe of Idaho v. Veneman*, 313 F.3d 1094, 1116 (9th Cir. 2002), *abrogated on other grounds by Wilderness Soc'y v. U.S. Forest Serv.*, 630 F.3d 1173 (9th Cir. 2011)  
EIS scoping process is intended to provide notice to individuals potentially affected by the proposed federal action; CLI-16-20, 84 NRC 237 n.108 (2016)

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- League of Wilderness Defenders/Blue Mountains Biodiversity Project v. Connaughton*, 752 F.3d 755, 761, 767 (9th Cir. 2014)  
where an agency fails to comply with procedural statutes such as NEPA, an injunction is sometimes the proper recourse; LBP-16-13, 84 NRC 439 (2016)
- Lee v. U.S. Air Force*, 354 F.3d 1229, 1244 (10th Cir. 2004)  
NEPA requires that an agency conduct its environmental review with the best information available today; CLI-16-18, 84 NRC 173 n.31 (2016)
- Limerick Ecology Action, Inc. v. NRC*, 869 F.2d 719, 738 (3d Cir. 1989)  
risk equals likelihood of an occurrence times severity of the consequences; LBP-16-10, 84 NRC 32 (2016)
- Louisiana Energy Services, L.P.* (Claiborne Enrichment Center), CLI-98-3, 47 NRC 77, 89 (1998)  
adjudicatory record and board decision and any Commission appellate decisions become, in effect, part of the agency's final environmental analysis; LBP-16-13, 84 NRC 414 (2016)  
NRC Staff's witnesses' testimony on characteristics and hazards of all historic earthquakes within a 100-mile radius of the license area cures the deficiency in the environmental assessment; LBP-16-13, 84 NRC 438 (2016)  
where an adjudicatory hearing tests the adequacy of NRC Staff's environmental review, a licensing board decision, as the final record of decision under NEPA, can amend Staff's NEPA documents to become, in effect, part of the final NEPA document; LBP-16-13, 84 NRC 314-15 (2016)
- Louisiana Energy Services, L.P.* (National Enrichment Facility), CLI-04-25, 60 NRC 223, 225 (2004)  
arguments that are raised for the first time in a reply will not be considered; LBP-16-11, 84 NRC 146 (2016)  
efforts to rehabilitate an unsupported contention by providing additional detail and arguments in a reply brief contravene NRC's longstanding procedural rules; CLI-16-17, 84 NRC 133 (2016)
- Louisiana Energy Services, L.P.* (National Enrichment Facility), CLI-05-20, 62 NRC 523, 536 (2005)  
NEPA does not call for certainty or precision, but an estimate of anticipated (not unduly speculative) impacts; LBP-16-13, 84 NRC 424 (2016)
- Lujan v. Def. of Wildlife*, 504 U.S. 555, 561 (1992)  
at the pleading stage, general factual allegations of injury resulting from defendant's conduct may suffice, and the court presumes that general allegations embrace the specific facts that are necessary to support the claim; LBP-16-10, 84 NRC 27 n.39 (2016)  
at the pleading stage, it is generally sufficient if petitioner provides plausible factual allegations that satisfy each element of standing; LBP-16-10, 84 NRC 26-27 (2016)
- Luminant Generation Co., LLC* (Comanche Peak Nuclear Power Plant, Units 3 and 4), CLI-12-7, 75 NRC 379, 389, 392 (2012)  
petitioner must raise a substantial question to warrant Commission review; CLI-16-19, 84 NRC 188 (2016)
- Luminant Generation Co., LLC* (Comanche Peak Nuclear Power Plant, Units 3 and 4), CLI-12-7, 75 NRC 379, 391-92 (2012)  
NEPA does not mandate that an agency undertake studies to obtain information that is not already available; CLI-16-18, 84 NRC 173 n.31 (2016)
- Luminant Generation Co., LLC* (Comanche Peak Nuclear Power Plant, Units 3 and 4), LBP-11-36, 74 NRC 768, 772-73 (2011)  
motions to reinstate Fukushima-related contentions were denied for lack of jurisdiction; CLI-16-19, 84 NRC 188 n.32 (2016)
- Massachusetts v. NRC*, 708 F.3d 63, 78 (1st Cir. 2013)  
NEPA, as a procedural statute, does not require any particular substantive result; CLI-16-18, 84 NRC 174 (2016)
- Massachusetts v. NRC*, 878 F.2d 1516, 1516 (1st Cir. 1989)  
agency actions that are not among those listed in AEA § 189a do not give rise to a hearing right for interested persons; CLI-16-17, 84 NRC 116 (2016)
- Massachusetts v. NRC*, 878 F.2d 1516, 1521 (1st Cir. 1989)  
issuance of an exemption from NRC regulations does not mean that NRC Staff has approved an amendment to the license; CLI-16-17, 84 NRC 111 (2016)

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- Monsanto Co. v. Geertson Seed Farms*, 561 U.S. 139, 156-57 (2010)  
injunctive relief is only warranted when the traditional test justifying it is met; LBP-16-13, 84 NRC 439-40 (2016)  
where an agency fails to comply with procedural statutes such as NEPA, an injunction is sometimes the proper recourse; LBP-16-13, 84 NRC 439 (2016)
- Monsanto Co. v. Geertson Seed Farms*, 561 U.S. 139, 157-58 (2010)  
injunction is not an automatic or default remedy to cure NEPA violation; CLI-16-18, 84 NRC 178 (2016)
- Montana Wilderness Ass'n v. Connell*, 725 F.3d 988, 1009 (9th Cir. 2013)  
even if a party's involvement in consultation about historic properties is limited, if that limited involvement is by choice, the agency has provided the party with a reasonable opportunity to participate; CLI-16-20, 84 NRC 266 (2016)
- Muhly v. Espy*, 877 F. Supp. 294, 300 (W.D. Va. 1995)  
violation of NEPA, by itself, is not always sufficient to justify suspending or revoking a licensing action; CLI-16-18, 84 NRC 178 (2016)
- Muhly v. Espy*, 877 F. Supp. 294, 300-01 (W.D. Va. 1995)  
parties challenging an agency's NEPA process are not entitled to relief unless they demonstrate harm or prejudice; CLI-16-20, 84 NRC 236, 245 (2016)
- Narragansett Indian Tribe v. Warwick Sewer Authority*, 334 F.3d 161, 168 (1st Cir. 2003)  
consultation with Indian tribes is not the same thing as control over a project; CLI-16-20, 84 NRC 266 (2016)  
reasonable opportunity to consult does not guarantee any specific results; CLI-16-20, 84 NRC 267 (2016)
- Nat'l Wildlife Fed'n v. Hodel*, 839 F.2d 694, 713 (D.C. Cir. 1988)  
standing of organization representing petitioner claiming injury from soil disturbance caused by mining, despite industry's argument that the alleged injury could only occur upon chance occurrence of eight events, one of which only had a 0.8% chance of occurring was upheld; LBP-16-10, 84 NRC 33 n.84 (2016)
- Neighborhood Ass'n of the Back Bay, Inc. v. Fed. Transit Admin.*, 463 F.3d 50, 58 (1st Cir. 2006)  
where an agency fails to comply with procedural statutes such as NEPA, an injunction is sometimes the proper recourse; LBP-16-13, 84 NRC 439 (2016)
- Neighbors of Cuddy Mountain v. U.S. Forest Serv.*, 137 F.3d 1372, 1380 (9th Cir. 1998)  
generic statements in the in situ leach mining generic environmental impact statement do not fulfill NRC Staff's obligations under NEPA with regard to significant impacts that could reasonably be posed to wildlife at the license area were licensee to commence land application of wastewater; LBP-16-13, 84 NRC 432 (2016)
- New York v. NRC*, 681 F.3d 471 (D.C. Cir. 2012)  
Waste Confidence Decision and Temporary Storage Rule was vacated and remanded; CLI-16-16, 84 NRC 74 (2016)
- New York v. NRC*, 681 F.3d 471, 471 (D.C. Cir. 2012)  
proper remedy on a finding of a violation of NEPA is to vacate the decision and remand back to the agency for further proceedings necessary to achieve compliance; CLI-16-20, 84 NRC 245 (2016)
- New York v. NRC*, 824 F.3d 1012 (D.C. Cir. 2016), *reh'g denied*, 2016 U.S. App. LEXIS 14584 (D.C. Cir. Aug. 8, 2016)  
petitions for review challenging NRC's updated continued storage rule were denied; CLI-16-20, 84 NRC 233 n.86 (2016)
- Northeast Nuclear Energy Co. (Millstone Nuclear Power Station, Units 1, 2, and 3)*, CLI-00-18, 52 NRC 129, 132-33 (2000)  
proposed license transfer that does not involve transfer of ownership or operating rights to subject facilities or entail changes in the facilities themselves or in their operation offer no obvious potential for offsite consequences; LBP-16-12, 84 NRC 159-60 n.50 (2016)
- Northern Indiana Public Service Co. (Bailly Generating Station, Nuclear 1)*, ALAB-303, 2 NRC 858, 867 (1975)  
Commission normally hesitates to wade through a detailed factual record, particularly when it has not had the advantage of observing testimony first hand; CLI-16-20, 84 NRC 264 (2016)

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- Northern States Power Co.* (Prairie Island Nuclear Generating Plant, Units 1 and 2), ALAB-455, 7 NRC 41, 44 (1978)  
applicant must satisfy requirements of 10 C.F.R. 50.90 and demonstrate that the requested amendment meets all applicable regulatory requirements and acceptance criteria and does not otherwise harm the public health and safety or the common defense and security; LBP-16-10, 84 NRC 37-38 (2016)
- Nuclear Innovation North America LLC* (South Texas Project, Units 3 and 4), CLI-11-6, 74 NRC 203, 208-09 (2011)  
adjudicatory record and board decision and any Commission appellate decisions become, in effect, part of the agency's final environmental analysis; LBP-16-13, 84 NRC 414 (2016)
- Nuclear Management Co., LLC* (Palisades Nuclear Plant), LBP-06-10, 63 NRC 314, 338, *aff'd*, CLI-06-17, 63 NRC 727 (2006)  
protestant does not become entitled to an evidentiary hearing merely on request, or on a bald or conclusory allegation that a dispute exists; LBP-16-10, 84 NRC 42 (2016)  
protestant must make a minimal showing that material facts are in dispute, thereby demonstrating that an inquiry in depth is appropriate; LBP-16-10, 84 NRC 42 (2016)
- Nw. Coal. for Alts. to Pesticides v. Lyng*, 844 F.2d 588, 594-95 (9th Cir. 1988)  
although agency had not properly notified plaintiff during the EIS scoping process, court's determination that plaintiff was unable to demonstrate prejudice after having participated in the development of the EIS was upheld; CLI-16-20, 84 NRC 237 (2016)  
notice requirement ensures that interested parties are aware of and therefore are able to participate meaningfully in the entire EIS process, from start to finish; CLI-16-20, 84 NRC 237 n.108 (2016)  
parties challenging an agency's NEPA process are not entitled to relief unless they demonstrate harm or prejudice; CLI-16-20, 84 NRC 236, 245 (2016)  
primary purpose of the scoping period is to notify those who may be affected by a proposed government action governed by NEPA that the relevant entity is beginning the EIS process; CLI-16-20, 84 NRC 237 n.108 (2016)
- Nw. Coal. for Alts. to Pesticides v. Lyng*, 844 F.2d 588, 595 (9th Cir. 1988)  
individuals not given notice of public hearings on a proposed wastewater treatment plant did not suffer prejudice, even though they were not provided the opportunity to participate until the eleventh hour of the NEPA process; CLI-16-20, 84 NRC 237 (2016)  
procedural violations of NEPA do not automatically void an agency's ultimate decision; CLI-16-20, 84 NRC 236 (2016)  
violation of NEPA, by itself, is not always sufficient to justify suspending or revoking a licensing action; CLI-16-18, 84 NRC 178 (2016)
- Offshore Power Systems* (Floating Nuclear Power Plants), ALAB-489, 8 NRC 194, 206 (1978)  
boards have broad and strong discretionary authority to conduct their functions with efficiency and economy, but they must exercise it with fairness to all the parties; CLI-16-20, 84 NRC 251 n.198 (2016)
- Pacific Gas & Electric Co.* (Diablo Canyon Nuclear Power Plant, Units 1 and 2), CLI-03-2, 57 NRC 19, 29 (2003)  
absent evidence to the contrary, Commission assumes at the licensing stage that licensee will comply with its obligations; CLI-16-20, 84 NRC 256 (2016)
- Pacific Gas & Electric Co.* (Diablo Canyon Nuclear Power Plant, Units 1 and 2), CLI-11-11, 74 NRC 427, 443-44 (2011)  
NRC is not bound by Council on Environmental Quality regulations but looks to them for guidance; CLI-16-20, 84 NRC 263-64 & n.7 (2016)
- Pacific Gas & Electric Co.* (Diablo Canyon Nuclear Power Plant, Units 1 and 2), CLI-15-14, 81 NRC 729, 735 (2015)  
unilateral licensee action without NRC approval of an increase in authority or alteration of the terms of the license does not constitute a de facto amendment; CLI-16-17, 84 NRC 111 (2016)
- Pacific Gas & Electric Co.* (Diablo Canyon Nuclear Power Plant, Units 1 and 2), CLI-15-21, 82 NRC 295, 302 (2015)  
to show special circumstances to obtain a waiver of a regulation, petitioner must meet a four-factor test; LBP-16-11, 84 NRC 145 (2016)

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- Pacific Gas & Electric Co.* (Diablo Canyon Power Plant Independent Spent Fuel Storage Installation), CLI-08-26, 68 NRC 509, 521 (2008)  
where there is an evidentiary dispute, licensing board decision makes any necessary factual findings based on a preponderance of the evidence; LBP-16-13, 84 NRC 286 (2016)
- Pacific Gas & Electric Co.* (Diablo Canyon Power Plant Independent Spent Fuel Storage Installation), CLI-08-26, 68 NRC 509, 526 (2008)  
allowing the adjudicatory proceeding to supplement an environmental assessment, in the same manner as is done for environmental impact statements, is appropriate; CLI-16-18, 84 NRC 172 n.25 (2016)
- Pa'ina Hawaii, LLC*, CLI-10-18, 72 NRC 56, 69-74 (2010)  
board ruled in favor of intervenor after a merits hearing but directed parties to undertake additional action to cure identified deficiencies; CLI-16-20, 84 NRC 245 n.158 (2016)  
where board's resolution of contentions is final, consideration of petitions for review of these contentions is appropriate; CLI-16-20, 84 NRC 243 n.143 (2016)
- Pa'ina Hawaii, LLC*, CLI-10-18, 72 NRC 56, 72-73 (2010)  
although Commission has discretion to review all underlying factual issues de novo, it is disinclined to do so where a board has weighed arguments presented by experts and rendered reasonable, record-based factual findings; CLI-16-20, 84 NRC 228 (2016)  
Commission defers to a board's factual findings, correcting only findings not even plausible in light of the record viewed in its entirety where there is strong reason to believe that a board has overlooked or misunderstood important evidence; CLI-16-20, 84 NRC 228 (2016)  
standard of clear error for overturning a board's factual findings is quite high; CLI-16-20, 84 NRC 228 (2016)
- Pa'ina Hawaii, LLC*, CLI-10-18, 72 NRC 56, 74-75 (2010)  
NEPA requires NRC Staff to take a hard look at any significant environmental consequences of a proposed licensing action; LBP-16-13, 84 NRC 282 (2016)
- Pa'ina Hawaii, LLC*, CLI-10-18, 72 NRC 56, 96 (2010)  
boards have latitude to fashion appropriate remedies regarding issues properly before them; CLI-16-20, 84 NRC 250-51 (2016)
- Philadelphia Electric Co.* (Limerick Generating Station, Units 1 and 2), ALAB-262, 1 NRC 163, 197 n.54 (1975)  
when the environmental record of decision is supplemented by the adjudicatory process, the disclosure purpose of NEPA is satisfied through the public vetting of environmental issues at an evidentiary hearing and issuance of a decision, and consequently, NRC Staff is not required to otherwise supplement or amend its NEPA documents; CLI-16-18, 84 NRC 172 (2016)
- Philadelphia Electric Co.* (Limerick Generating Station, Units 1 and 2), ALAB-819, 22 NRC 681, 705-07 (1985)  
adjudicatory record and board decision and any Commission appellate decisions become, in effect, part of the agency's final environmental analysis; LBP-16-13, 84 NRC 414 (2016)
- Philadelphia Electric Co.* (Limerick Generating Station, Units 1 and 2), ALAB-819, 22 NRC 681, 707 (1985), *aff'd in part*, CLI-86-5, 23 NRC 125 (1986), *remanded in part on other grounds sub nom. Limerick Ecology Action, Inc. v. NRC*, 869 F.2d 719 (3d Cir. 1989)  
NRC hearing procedures allow for additional and more rigorous public scrutiny of the final supplemental environmental impact statement than does the usual circulation for comment; CLI-16-18, 84 NRC 172 (2016)
- Powertech USA, Inc.* (Dewey-Burdock In Situ Uranium Recovery Facility), LBP-13-9, 78 NRC 37, 67 (2013)  
mere existence of a generic environmental impact statement is not sufficient to tier its contents into a site-specific environmental impact statement or environmental assessment; LBP-16-13, 84 NRC 284 (2016)
- Powertech USA, Inc.* (Dewey-Burdock In Situ Uranium Recovery Facility), LBP-15-16, 81 NRC at 618, 657-58 (2015)  
licensing board declined to stay effectiveness of a license upon a showing of a NEPA violation, instead expressing confidence that NRC Staff would promptly take steps to rectify the deficiency; LBP-16-13, 84 NRC 440 (2016)

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- Powertech USA, Inc.* (Dewey-Burdock In Situ Uranium Recovery Facility), LBP-15-16, 81 NRC at 618, 719 (2015)  
licensing board retains jurisdiction for a limited purpose, until the Commission orders otherwise, or when the period within which the Commission may direct that the record be certified to it for final decision expires, or when the Commission renders a final decision; LBP-16-13, 84 NRC 441 (2016)
- PPL Bell Bend, LLC* (Bell Bend Nuclear Power Plant), CLI-10-7, 71 NRC 133, 138 (2010)  
petitioner must demonstrate standing in each proceeding in which it seeks to intervene, even if granted standing in another case concerning the same or a nearby facility; LBP-16-14, 84 NRC 448 (2016)
- PPL Bell Bend, LLC* (Bell Bend Nuclear Power Plant), LBP-11-27, 74 NRC 591, 595, 603 (2011)  
contentions were denied on the basis of prematurity; CLI-16-19, 84 NRC 187-88 (2016)
- PPL Susquehanna LLC* (Susquehanna Steam Electric Station, Units 1 and 2), CLI-07-25, 66 NRC 101, 107 (2007)  
Commission lacks jurisdiction over matters within the jurisdiction of other state and federal agencies and therefore declines to consider them; CLI-16-17, 84 NRC 109 n.35 (2016)
- PPL Susquehanna LLC* (Susquehanna Steam Electric Station, Units 1 and 2), LBP-07-10, 66 NRC 1, 18, *aff'd on other grounds*, CLI-07-25, 66 NRC 101 (2007)  
extended power uprate proceedings involve an obvious potential for offsite consequences; LBP-16-11, 84 NRC 144 n.26 (2016)
- Private Fuel Storage, L.L.C.* (Independent Spent Fuel Storage Installation), CLI-01-12, 53 NRC 459, 466 (2001)  
agency actions that are not among those listed in AEA § 189a do not give rise to a hearing right for interested persons; CLI-16-17, 84 NRC 116 (2016)
- Private Fuel Storage, L.L.C.* (Independent Spent Fuel Storage Installation), CLI-01-12, 53 NRC 459, 476 (2001)  
stand-alone exemption requests generally do not create hearing rights, but hearings on exemption requests that are directly related to a license amendment request are excepted from that general rule; CLI-16-17, 84 NRC 116 (2016)
- Private Fuel Storage, L.L.C.* (Independent Spent Fuel Storage Installation), CLI-02-25, 56 NRC 340, 348 (2002)  
in anticipating impacts, NEPA only requires a discussion of those impacts that are reasonably foreseeable; LBP-16-13, 84 NRC 424 (2016)
- Private Fuel Storage, L.L.C.* (Independent Spent Fuel Storage Installation), CLI-02-25, 56 NRC 340, 348-49 (2002)  
NEPA does not require a discussion of impacts that are remote and speculative or that have a low probability of occurrence; LBP-16-13, 84 NRC 424 (2016)  
NEPA only requires a discussion of reasonably foreseeable impacts and courts have excluded remote and speculative impacts from NEPA analysis; LBP-16-13, 84 NRC 397-98 & n.906 (2016)
- Private Fuel Storage, L.L.C.* (Independent Spent Fuel Storage Installation), CLI-03-8, 58 NRC 11, 26 (2003)  
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- Progress Energy Carolinas, Inc.* (Shearon Harris Nuclear Power Plant, Units 2 and 3), CLI-10-9, 71 NRC 245, 260 (2010)  
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- Progress Energy Carolinas, Inc.* (Shearon Harris Nuclear Power Plant, Units 2 and 3), LBP-08-21, 68 NRC 554, 559 (2008)  
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- Progress Energy Carolinas, Inc.* (Shearon Harris Nuclear Power Plant, Units 2 and 3), LBP-08-21, 68 NRC 554, 571 (2008)  
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- Providence Rd. Cmty. Ass'n v. EPA*, 683 F.2d 80, 82 (4th Cir. 1982)  
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- Pub. Citizen v. Liggett Group, Inc.*, 858 F.2d 775, 781-83 (1st Cir. 1988)  
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- Pueblo of Sandia v. United States*, 50 F.3d 856, 856 (10th Cir. 1995)  
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- Pueblo of Sandia v. United States*, 50 F.3d 856, 860-62 (10th Cir. 1995)  
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- Quechan Indian Tribe of Fort Yuma Indian Reservation v. DOI*, 755 F. Supp. 2d 1104, 1119 (D. Ariz. 2008)  
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- Ramsey v. Kantor*, 96 F.3d 434, 445 (9th Cir. 1996)  
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- Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 349 (1989), *appeal docketed*, No. 16-1298 (D.C. Cir. Aug. 24, 2016)  
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- Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 350 (1989)  
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NEPA serves the purpose of environmental protection through action-forcing procedures that require agencies to take a hard look at environmental impacts and that provide for broad dissemination of relevant environmental information; CLI-16-18, 84 NRC 174 (2016)
- S. Fork Band Council of W. Shoshone of Nevada v. DOI*, 588 F.3d 718, 726 (9th Cir. 2009)  
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- Sequoyah Fuels Corp. and General Atomics* (Gore, Oklahoma Site), CLI-94-12, 40 NRC 64, 72 (1994)  
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- Sequoyah Fuels Corp. and General Atomics* (Gore, Oklahoma Site), CLI-94-12, 40 NRC 64, 74 n.19 (1994)  
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- Sequoyah Fuels Corp. and General Atomics* (Gore, Oklahoma Site), CLI-94-12, 40 NRC 64, 75 (1994)  
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- Sequoyah Fuels Corp. and General Atomics* (Gore, Oklahoma Site Decontamination and Decommissioning Funding), LBP-94-5, 39 NRC 54, 68 (1994), *aff'd*, CLI-94-12, 40 NRC 64 (1994)  
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- Shaw AREVA MOX Services, LLC* (Mixed Oxide Fuel Fabrication Facility), CLI-09-2, 69 NRC 55, 63 (2009)  
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- Shaw AREVA MOX Services, LLC* (Mixed Oxide Fuel Fabrication Facility), CLI-15-9, 81 NRC 512, 519 (2015)  
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- Shaw AREVA MOX Services, LLC* (Mixed Oxide Fuel Fabrication Facility), LBP-07-14, 66 NRC 169, 187-88 (2007)  
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- Shaw AREVA MOX Services, LLC* (Mixed Oxide Fuel Fabrication Facility), LBP-07-14, 66 NRC 169, 188 (2007)  
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- Sierra Club v. EPA*, 292 F.3d 895, 898-99 (D.C. Cir. 2002)  
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- Sierra Club v. Froehke*, 816 F.2d 205, 210 (5th Cir. 1987)  
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- Sierra Club v. Marsh*, 976 F.2d 763, 770 (1st Cir. 1992)  
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- Sierra Club, Lone Star Chapter v. Cedar Point Oil Co. Inc.*, 73 F.3d 546, 556 (5th Cir. 1996)  
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- South Texas Project Nuclear Operating Co.* (South Texas Project, Units 3 and 4), LBP-09-5, 69 NRC 303, 310 (2009)  
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- Southern Nuclear Operating Co.* (Early Site Permit for Vogtle ESP Site), LBP-07-3, 65 NRC 237, 252 (2007)  
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- Southern Nuclear Operating Co.* (Vogtle Electric Generating Plant, Units 3 and 4), CLI-09-16, 70 NRC 33, 35 (2009)  
Commission gives substantial deference to boards on issues of contention admissibility and will affirm admissibility determinations absent a showing of an error of law or abuse of discretion; CLI-16-20, 84 NRC 228 (2016)
- Southern Nuclear Operating Co.* (Vogtle Electric Generating Plant, Units 3 and 4), CLI-11-8, 74 NRC 214, 228-30 (2011)  
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- Southern Nuclear Operating Co.* (Vogtle Electric Generating Plant, Units 3 and 4), CLI-12-2, 75 NRC 63, 82, 84 (2012)  
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- Southern Nuclear Operating Co.* (Vogtle Electric Generating Plant, Units 3 and 4), LBP-16-5, 83 NRC 259, 274-75 (2016)  
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- Steel Co. v. Citizens for a Better Environment*, 523 U.S. 83, 94 (1998)  
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- Strata Energy, Inc.* (Ross In Situ Uranium Recovery Project), CLI-16-13, 83 NRC 566, 583-84 (2016)  
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- Strata Energy, Inc.* (Ross In Situ Uranium Recovery Project), CLI-16-13, 83 NRC 566, 604 (2016), *appeal docketed*, No. 16-1298 (D.C. Cir. Aug. 24, 2016)  
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- Strata Energy, Inc.* (Ross In Situ Uranium Recovery Project), LBP-12-3, 75 NRC 164, 177 (2012)  
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- Strata Energy, Inc.* (Ross In Situ Uranium Recovery Project), LBP-12-3, 75 NRC 164, 190 n.28, *aff'd*, CLI-12-12, 75 NRC 603 (2012)  
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- Strata Energy, Inc.* (Ross In Situ Uranium Recovery Project), LBP-15-3, 81 NRC 65, 91-92 (2015)  
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- Strata Energy, Inc.* (Ross In Situ Uranium Recovery Project), LBP-15-3, 81 NRC 65, 119-20, 133 (2015), *petition for review denied*, CLI-16-13, 83 NRC 566 (2016)  
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- Strata Energy, Inc.* (Ross In Situ Uranium Recovery Project), LBP-15-3, 81 NRC 65, 150 (2015), *petition for review denied*, CLI-16-13, 83 NRC 566, 601 (2016)  
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- Telecomm. Research & Action Ctr. v. FCC*, 750 F.2d 70, 75-77 (D.C. Cir. 1984)  
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- Te-Moak Tribe of W. Shoshone of Nevada v. DOI*, 608 F.3d 592, 606, 610 (9th Cir. 2010)  
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- Te-Moak Tribe of W. Shoshone of Nevada v. DOI*, 608 F.3d 592, 606-07, 610 (9th Cir. 2010)  
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- Tennessee Valley Authority* (Bellefonte Nuclear Power Plant, Units 3 and 4), LBP-08-16, 68 NRC 361, 419-20 (2008)  
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- Tennessee Valley Authority* (Sequoyah Nuclear Plant, Units 1 and 2; Watts Bar Nuclear Plant, Unit 1), LBP-02-14, 56 NRC 15, 35 (2002)  
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- Town of Winthrop v. FAA*, 535 F.3d 1, 13 (1st Cir. 2008)  
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- Transnuclear, Inc.* (Export of 93.15% Enriched Uranium), CLI-94-1, 39 NRC 1, 5 (1994)  
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- Transnuclear, Inc.* (Export of 93.3% Enriched Uranium), CLI-00-16, 52 NRC 68, 72 (2000)  
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- Transnuclear, Inc.* (Export of 93.3% Enriched Uranium), CLI-00-16, 52 NRC 68, 76 (2000)  
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- U.S. Army Installation Command* (Schofield Barracks, Oahu, Hawaii, and Pohakuloa Training Area, Island of Hawaii, Hawaii), LBP-10-4, 71 NRC 216, 229-30 (2010), *aff'd*, CLI-10-20, 72 NRC 185 (2010) at the pleading stage, it is generally sufficient if petitioner provides plausible factual allegations that satisfy each element of standing; LBP-16-10, 84 NRC 26-27 (2016)
- U.S. Department of Energy* (Plutonium Export License), CLI-04-17, 59 NRC 357, 367 (2004) persons without an affected interest are not as likely as persons with an affected interest to contribute to Commission decision making and show that a hearing would be in the public interest and assist it in making the statutory determinations; CLI-16-15, 84 NRC 57 n.18 (2016)
- U.S. Department of Energy* (Plutonium Export License), CLI-04-17, 59 NRC 357, 369 (2004) petitioner seeking a hearing on an export license must specifically identify how a hearing would bring new information to light; CLI-16-15, 84 NRC 58 n.25 (2016)
- Union Electric Co. d/b/a Ameren Missouri* (Callaway Plant, Unit 2), CLI-11-5, 74 NRC 141 (2011) even when the Commission has considered petitions not contemplated by its regulations, it has still applied normal rules for adjudication; CLI-16-17, 84 NRC 133 (2016)
- Union Electric Co. d/b/a Ameren Missouri* (Callaway Plant, Unit 2), CLI-11-5, 74 NRC 141, 158 (2011) where petitioners have not established a right to an adjudicatory hearing, Commission considers the petition and all related filings as a discretionary exercise of its inherent supervisory authority over agency proceedings; CLI-16-17, 84 NRC 108-09 (2016)
- Union Electric Co. d/b/a Ameren Missouri* (Callaway Plant, Unit 2), CLI-11-5, 74 NRC 141, 175-76 (2011) Commission declined to suspend proceedings, but granted request for safety analysis of the Fukushima accident based on the agency's plans for a short-term and long-term lessons-learned review, and referred portions of the petition relating to pending certified design applications, including the AP1000 amendment, to NRC Staff as comments on the then-pending design certification rulemaking; CLI-16-19, 84 NRC 187 (2016)
- United States v. Morgan*, 313 U.S. 409, 422 (1941) administrative agencies and courts have long been accepted as collaborative instrumentalities of justice; CLI-16-20, 84 NRC 251 n.198 (2016)
- USEC Inc.* (American Centrifuge Plant), CLI-05-11, 61 NRC 309, 314 (2005) proximity presumption allows a petitioner having a significant property interest within 50 miles of a nuclear power reactor to establish standing without the need to make an individualized showing of injury, causation, and redressability; LBP-16-10, 84 NRC 25-26 (2016)
- USEC Inc.* (American Centrifuge Plant), CLI-06-10, 63 NRC 451, 455-57, 472 (2006) petitioners must raise specific challenges, both to fairly notify other parties of the claims against them and to ensure that agency adjudications remain focused; CLI-16-17, 84 NRC 133 (2016)
- USEC Inc.* (American Centrifuge Plant), CLI-06-10, 63 NRC 451, 457 (2006) at the contention admissibility stage, boards are expected to examine cited materials to verify that they do, in fact, support a contention; LBP-16-10, 84 NRC 50 (2016)
- Vermont Yankee Nuclear Power Corp. and AmerGen Vermont, LLC* (Vermont Yankee Nuclear Power Station), CLI-00-20, 52 NRC 151, 165-66 (2000) challenges the NRC's NEPA process generally present an impermissible challenge to the agency's generally applicable rules and are not cognizable in individual licensing proceedings; CLI-16-18, 84 NRC 172 n.27 (2016)
- Vermont Yankee Nuclear Power Corp. v. Nat. Res. Def. Council*, 435 U.S. 519, 558 (1978) NEPA, as a procedural statute, does not require any particular substantive result; CLI-16-18, 84 NRC 174, 175 (2016)
- Virginia Electric and Power Co.* (North Anna Power Station, Units 1 and 2), ALAB-146, 6 AEC 631, 633 & n.4 (1973) pro se petitioner is not held to the same standards of clarity and precision as a lawyer; LBP-16-10, 84 NRC 27 n.41 (2016)
- Warm Springs Dam Task Force v. Gribble*, 621 F.2d 1017 (9th Cir. 1980) agencies need not consider remote and speculative impacts in an environmental impact statement; CLI-16-20, 84 NRC 265 (2016)
- Warth v. Seldin*, 422 U.S. 490, 501 (1975) at the pleading stage, board must accept as true all material allegations of the petition; LBP-16-10, 84 NRC 27 (2016)

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- Westinghouse Electric Corp.* (Nuclear Fuel Export License for Czech Republic — Temelin Nuclear Power Plants), CLI-94-7, 39 NRC 322, 331-32 (1994)  
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- Winter v. Nat. Res. Def. Council, Inc.*, 555 U.S. 7, 8 (2008)  
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- Winter v. Nat. Res. Def. Council, Inc.*, 555 U.S. 7, 20 (2008)  
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- Wisconsin Electric Power Co.* (Point Beach, Unit 2), ALAB-82, 5 AEC 350, 351 (1972)  
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- Yankee Atomic Electric Co.* (Yankee Nuclear Power Station), CLI-98-21, 48 NRC 185, 201 (1998)  
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- 10 C.F.R. 1.13  
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- 10 C.F.R. 2.105(a)(4)  
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- 10 C.F.R. 2.206  
argument that a specific disbursement from the decommissioning fund is inconsistent with an approved exemption is appropriately raised via a request for enforcement action; CLI-16-17, 84 NRC 112-13 (2016)  
concerns that have already been reviewed, evaluated, and resolved by NRC Staff will not be accepted for review; DD-16-2, 84 NRC 3 (2016)  
proper avenue for challenge seeking greater specificity in a license condition is to pursue an enforcement action; CLI-16-17, 84 NRC 122 (2016)  
request that NRC revoke de facto license amendment and stay restart from refueling outage pending resolution of the hearing request is denied; DD-16-2, 84 NRC 2-9 (2016)
- 10 C.F.R. 2.206(b)  
director of NRC office with responsibility for the subject matter shall either institute a requested proceeding or advise petitioner in writing that no proceeding will be instituted, in whole or in part, with respect to the request, and the reason for the decision; DD-16-2, 84 NRC 5 (2016)
- 10 C.F.R. 2.309  
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- 10 C.F.R. 2.309(a)  
intervention is permitted only by a person whose interest may be affected by the proceeding; LBP-16-14, 84 NRC 450 (2016)  
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- 10 C.F.R. 2.309(c)(1)(i)-(iii)  
new contention that spot-check methodology used by NRC Staff to evaluate well logs was unacceptable was inadmissible because information in the well logs was not materially different from information already in the record; CLI-16-20, 84 NRC 240 n.123 (2016)
- 10 C.F.R. 2.309(c)(1)(ii), (vi)  
challenge does not raise a substantial question for review, because new contention did not meet admission requirements; CLI-16-20, 84 NRC 240 (2016)
- 10 C.F.R. 2.309(d)  
intervention is permitted only by a person whose interest may be affected by the proceeding; LBP-16-14, 84 NRC 450 (2016)  
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- 10 C.F.R. 2.309(d)(1)(i)-(iv)  
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- 10 C.F.R. 2.309(d)(2)  
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- 10 C.F.R. 2.309(f)  
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- 10 C.F.R. 2.309(f)(1)  
contentions must be set forth with particularity; LBP-16-14, 84 NRC 450-51 n.34 (2016)  
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- 10 C.F.R. 2.309(f)(1)(i)-(vi)  
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- 10 C.F.R. 2.309(f)(1)(iii)  
contention that seeks to impose requirements that are outside the scope of a proceeding is inadmissible; LBP-16-10, 84 NRC 44 (2016)  
petitioner is prohibited from challenging the certified design through adjudication, and its allegations regarding Fukushima are also outside of the scope of the proceeding because the Commission is handling that issue through rulemaking; LBP-16-10, 84 NRC 47 (2016)
- 10 C.F.R. 2.309(f)(1)(v)  
to satisfy contention admissibility requirements, petitioner must identify facts or expert opinions on which it relies and show that they present a genuine dispute of material fact with the application; LBP-16-10, 84 NRC 35 (2016)
- 10 C.F.R. 2.309(f)(1)(vi)  
contention is inadmissible if it fails to present sufficient information to show a genuine dispute exists on a material issue of law or fact; CLI-16-20, 84 NRC 234, 241 (2016); LBP-16-10, 84 NRC 42 (2016)  
contention that neither substantively disputes analysis of impacts related to disposal of byproduct material in relevant sections of the DSEIS and the GEIS nor addresses license condition related to disposal of byproduct material is inadmissible; CLI-16-20, 84 NRC 229 (2016)  
contentions are inadmissible if petition fails to demonstrate a genuine dispute with the license amendment application; LBP-16-11, 84 NRC 145 (2016)  
petition does not raise a substantial question regarding board's finding that information in the preliminary assessment about unreclaimed mines was insufficient to meet admissibility requirements; CLI-16-20, 84 NRC 241 (2016)  
to satisfy contention admissibility requirements, petitioner must identify facts or expert opinions on which it relies and show that they present a genuine dispute of material fact with the application; LBP-16-10, 84 NRC 35 (2016)
- 10 C.F.R. 2.309(f)(2)  
ultimate burden with respect to NEPA lies with NRC Staff, but NRC regulations require that intervenors file environmental contentions on the applicant's environmental report; CLI-16-20, 84 NRC 231 (2016)
- 10 C.F.R. 2.309(i)(2)  
reply must be filed within 7 days of any answer; LBP-16-11, 84 NRC 142 n.5 (2016)
- 10 C.F.R. 2.318  
licensing board retains jurisdiction for a limited purpose, until the Commission orders otherwise, or when the period within which the Commission may direct that the record be certified to it for final decision expires, or when the Commission renders a final decision; LBP-16-13, 84 NRC 441 (2016)

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- 10 C.F.R. 2.319  
board has authority to take appropriate action to control the hearing process, regulate the course of the hearing and the conduct of the participants, and issue orders necessary to carry out the presiding officer's duties and responsibilities under 10 C.F.R. Part 2; CLI-16-20, 84 NRC 250 (2016)
- 10 C.F.R. 2.321(a)  
in materials licensing proceedings, licensing boards are empowered to make findings of fact and conclusions of law on the matters put into controversy by the parties; LBP-16-13, 84 NRC 439 (2016)
- 10 C.F.R. 2.335  
attack on NRC regulations is impermissible; CLI-16-20, 84 NRC 234 n.88 (2016)  
challenges to NRC's NEPA process generally present an impermissible challenge to the agency's generally applicable rules and are not cognizable in individual licensing proceedings; CLI-16-18, 84 NRC 172 n.27 (2016)  
regulatory history demonstrates that petitioner's hydrogen source arguments are, in effect, an impermissible challenge to a regulation that has evolved on the issue of hydrogen sources; LBP-16-10, 84 NRC 45 (2016)
- 10 C.F.R. 2.335(a)  
no rule or regulation of the Commission, or any provision thereof, concerning the licensing of production and utilization facilities is subject to attack by way of discovery, proof, argument, or other means in any adjudicatory proceeding subject to Part 2 procedural rules; LBP-16-10, 84 NRC 40 (2016); LBP-16-11, 84 NRC 145 (2016)
- 10 C.F.R. 2.335(b)  
petitioner may not challenge a regulatory requirement, unless it petitions for a waiver; LBP-16-11, 84 NRC 145 (2016)  
to obtain a waiver of a regulation, petitioner must demonstrate special circumstances; LBP-16-11, 84 NRC 145 (2016)
- 10 C.F.R. 2.340(e)(1)  
in materials licensing proceedings, licensing boards are empowered to make findings of fact and conclusions of law on the matters put into controversy by the parties; LBP-16-13, 84 NRC 439 (2016)
- 10 C.F.R. 2.340(e)(2)  
after a licensing board has issued an initial decision, the Director of the Office of Nuclear Material Safety and Safeguards shall issue, deny, or appropriately condition the permit, license, or license amendment in accordance with the presiding officer's initial decision; LBP-16-13, 84 NRC 439 (2016)
- 10 C.F.R. 2.340(e)(2)(ii)  
although NRC Staff may issue a license before an adjudicatory proceeding is concluded, the Director of NMSS must thereafter deny, or insert appropriate conditions, if any, in the license based on the determinations of the licensing board and the Commission; LBP-16-13, 84 NRC 439 (2016)  
NRC Staff may issue a license before an adjudicatory proceeding is concluded; LBP-16-13, 84 NRC 439 (2016)
- 10 C.F.R. 2.341(b)(1)  
filing of a petition for review is mandatory for a party to have exhausted its administrative remedies before seeking judicial review; LBP-16-13, 84 NRC 441 (2016)
- 10 C.F.R. 2.341(b)(4)  
petition for review will be granted at the Commission's discretion if one of the factors of this section applies; CLI-16-18, 84 NRC 171 (2016)  
showing necessary for discretionary grant of petition for review is discussed; CLI-16-20, 84 NRC 227 (2016)  
where board's resolution of contentions is final, consideration of petitions for review of these contentions is appropriate; CLI-16-20, 84 NRC 243 n.143 (2016)
- 10 C.F.R. 2.341(b)(4)(i)  
Commission will take review of a board's factual findings when those findings are clearly erroneous or in conflict with a finding regarding the same fact in a different proceeding; CLI-16-20, 84 NRC 239, 247 (2016)

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- 10 C.F.R. 2.341(b)(4)(ii)  
because the board focused its attention on apportioning culpability for what became an impasse, instead of determining whether the opportunity for consultation itself was a reasonable one, the board's decision constituted legal error; CLI-16-20, 84 NRC 264, 266 (2016)
- 10 C.F.R. 2.341(c)(2)  
Commission decides matters on the basis of petitions for review, and therefore denies request to establish a briefing schedule; CLI-16-20, 84 NRC 225 n.20 (2016)
- 10 C.F.R. 2.345  
clear and material error standard is applied to petition for reconsideration; CLI-16-17, 84 NRC 115 (2016)
- 10 C.F.R. 2.390  
portions of an application that contain confidential commercial and financial information are subject to protection from public disclosure; LBP-16-12, 84 NRC 153-54 (2016)
- 10 C.F.R. 2.802(e)  
Commission, not the board, has authority to stay a license amendment proceeding in light of pending rulemaking; LBP-16-11, 84 NRC 146 (2016)
- 10 C.F.R. 2.1202(a)  
NRC Staff may issue a license before an adjudicatory proceeding is concluded; LBP-16-13, 84 NRC 439 (2016)
- 10 C.F.R. 2.1210(c)(2)-(3)  
although NRC Staff may issue a license before an adjudicatory proceeding is concluded, the Director of NMSS must thereafter deny, or insert appropriate conditions, if any, in the license based on the determinations of the licensing board and the Commission; LBP-16-13, 84 NRC 439 (2016)
- 10 C.F.R. 2.1212  
filing of a petition for review is mandatory for a party to have exhausted its administrative remedies before seeking judicial review; LBP-16-13, 84 NRC 441 (2016)
- 10 C.F.R. 40.9  
applications must be incomprehensible and useless to the public to be deficient; CLI-16-20, 84 NRC 238-39 (2016)
- 10 C.F.R. 40.31(h)  
provisions of this regulation apply to uranium mills, not in situ recovery sites; CLI-16-20, 84 NRC 229, 230-31 (2016)
- 10 C.F.R. 40.41(e)  
although NRC Staff may issue a license before an adjudicatory proceeding is concluded, the Director of NMSS must thereafter deny, or insert appropriate conditions, if any, in the license based on the determinations of the licensing board and the Commission; LBP-16-13, 84 NRC 439 (2016)
- 10 C.F.R. pt. 40, app. A, Criterion 1  
provisions of this regulation apply to uranium mills, not in situ recovery sites; CLI-16-20, 84 NRC 229, 230-31 (2016)
- 10 C.F.R. pt. 40, app. A, Criterion 2  
provision requires that disposal of byproduct material take place at an existing disposal site, but does not require that the application include a waste disposal plan or designate which waste disposal site will be used; CLI-16-20, 84 NRC 231 (2016)
- 10 C.F.R. pt. 40, app. A, Criterion 5B(5)  
purpose of aquifer restoration is to return groundwater quality in the production zone to compliance with NRC's groundwater protection standards; LBP-16-13, 84 NRC 415 (2016)
- 10 C.F.R. pt. 40, app. A, Criterion 5B(6)  
affected groundwater either must be restored to its original water quality or must be returned to a level that the Commission has found poses no incremental hazards; LBP-16-13, 84 NRC 421 (2016)  
licensee can meet standards in one of three ways; LBP-16-13, 84 NRC 415 (2016)
- 10 C.F.R. pt. 40, app. A, Criterion 13  
uranium is one of the groundwater constituents that must be monitored for restoration of in situ mining site; LBP-16-13, 84 NRC 418 (2016)
- 10 C.F.R. 50.2  
NRC Staff, when reviewing notifications for withdrawal of funds to be used for decommissioning purposes, must look to whether the activity or expense is directly related to the radiological

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- decontamination of the facility or qualifies as an administrative expense consistent with NRC regulations and to the applicable license conditions; CLI-16-17, 84 NRC 112 (2016)
- 10 C.F.R. 50.12  
Commission will exercise its discretion to limit exemptions in any particular area if the exceptions to the rule threaten to erode the rule itself; CLI-16-17, 84 NRC 136 n.6 (2016)
- 10 C.F.R. 50.12(a)  
NRC Staff may approve an exemption from a certified design where it finds that the exemption is authorized by law, will not present an undue risk to the public health and safety, is consistent with the common defense and security, and special circumstances exist that warrant the exemption; CLI-16-16, 84 NRC 79 (2016) 10 C.F.R. 52.63(b)(1)
- NRC Staff must determine that special circumstances outweigh any decrease in safety resulting from the reduction in standardization that may result from an exemption from a certified design; CLI-16-16, 84 NRC 79 (2016)
- 10 C.F.R. 50.12(a)(1)  
exemption from regulation will be approved if the exemption is authorized by law, will not present an undue risk to the public health and safety, and is consistent with the common defense and security; CLI-16-17, 84 NRC 117 (2016)
- 10 C.F.R. 50.12(a)(2)  
demonstration of special circumstances is necessary to justify an exemption from regulations; CLI-16-17, 84 NRC 115 n.58 (2016)
- 10 C.F.R. 50.12(a)(2)(i)-(vi)  
special circumstances, as defined in this section, must be present before an exemption from a regulation may be granted; CLI-16-17, 84 NRC 117 (2016)
- 10 C.F.R. 50.12(a)(2)(ii)  
special circumstances for an exemption exist where application of the regulation in question would not serve the underlying purpose of the rule or is not necessary to achieve the underlying purpose of the rule; CLI-16-17, 84 NRC 119 (2016)
- 10 C.F.R. 50.12(a)(2)(iii)  
special circumstances for an exemption exist where compliance with a rule would result in undue hardship or other costs that are significantly in excess of those contemplated when the regulation was adopted, or that are significantly in excess of those incurred by others similarly situated; CLI-16-17, 84 NRC 121 (2016)
- 10 C.F.R. 50.33(f)  
direct or indirect transfer-of-control application must include information sufficient to demonstrate to the Commission the financial qualifications of applicant to carry out activities for which the permit or license is sought; LBP-16-12, 84 NRC 161 n.60 (2016)
- 10 C.F.R. 50.34(a)(3)(i)  
design certification applicant must include the principal design criteria identified in the General Design Criteria in 10 C.F.R. pt. 50, app. A in its preliminary safety analysis report; LBP-16-10, 84 NRC 38 (2016)
- 10 C.F.R. 50.43(a)(3)  
NRC Staff must publish notices of a combined license application in the Federal Register; CLI-16-16, 84 NRC 94 n.192 (2016)
- 10 C.F.R. 50.44  
during the API000 design certification process, NRC reviewed placement of hydrogen igniters and concluded that adequate coverage existed to satisfy the requirements of this regulation; LBP-16-10, 84 NRC 39 (2016)
- 10 C.F.R. 50.44(a)(1)-(3)  
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- 10 C.F.R. 50.44(c)(1)-(5)  
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- 10 C.F.R. 50.44(c)(2)-(3), (5)  
applicable hydrogen source is limited by requiring a reactor design to address and control a 100% fuel clad-coolant reaction; LBP-16-10, 84 NRC 44 (2016)  
zirconium and water source of hydrogen is the only hydrogen source new reactor applicants are required to analyze; LBP-16-10, 84 NRC 44 (2016)
- 10 C.F.R. 50.46(b)(1)  
extended power uprate applicant must scientifically demonstrate that peak cladding temperature will not exceed regulatory limits; LBP-16-11, 84 NRC 143 (2016)
- 10 C.F.R. 50.54(bb)  
plan for fuel management following cessation of reactor operations, including funding, is required; CLI-16-17, 84 NRC 117 n.70 (2016)
- 10 C.F.R. 50.59  
circumstances under which licensee can make changes to a facility or procedures described in its UFSAR without obtaining a license amendment are discussed; DD-16-2, 84 NRC 2-3 n.2 (2016)  
“evaluation” typically refers to a licensee’s documented evaluation against the eight criteria in section 50.59(c)(2) to determine if a proposed change, test, or experiment requires prior NRC approval through a license amendment; DD-16-2, 84 NRC 5 (2016)  
following submission of the post-shutdown decommissioning activities report, licensee must notify NRC in writing and provide a copy to the affected state, before performing any activity inconsistent with, or making any significant schedule change from, activities and schedules described in the PSDAR, including changes that significantly increase the decommissioning cost; CLI-16-17, 84 NRC 124 n.118 (2016)  
licensees must determine if any changes to their facilities or procedures described in the UFSAR, or tests or experiments not described in the UFSAR, will need prior NRC approval through a license amendment; DD-16-2, 84 NRC 5 (2016)  
request that NRC revoke de facto license amendment and stay restart from refueling outage pending resolution of the hearing request is denied; DD-16-2, 84 NRC 2-9 (2016)
- 10 C.F.R. 50.59(c)(2)  
NRC-approved license amendment is required if changes, tests, or experiments involve a change to the technical specifications or if they meet any one of the eight criteria; DD-16-2, 84 NRC 5 (2016)
- 10 C.F.R. 50.59(c)(2)(viii)  
computer programs described in the UFSAR are methods of evaluation subject to the provisions of this section and thus any changes to these methods would require a written evaluation; DD-16-2, 84 NRC 7 (2016)
- 10 C.F.R. 50.75(b)(1)  
amount of decommissioning funds may be more, but not less, than the amount required by the formula established in the regulation; CLI-16-17, 84 NRC 136 (2016)
- 10 C.F.R. 50.75(c)  
NRC Staff should not allow withdrawal of funds that have been deposited to meet NRC decommissioning objectives to satisfy generic formula amounts set forth in this section; CLI-16-17, 84 NRC 112 n.48 (2016)
- 10 C.F.R. 50.75(c) n.1  
minimum amounts required to demonstrate reasonable assurance of funds for decommissioning are based on activities related to the definition of decommission in 10 C.F.R. 50.2 and do not include the cost of removal and disposal of spent fuel or of nonradioactive structures and materials beyond that necessary to terminate the license; CLI-16-17, 84 NRC 116-17 (2016)
- 10 C.F.R. 50.75(e)(1)(i)  
decommissioning trust funds are prepaid pursuant to monetary levels required by 10 C.F.R. 50.75(b) and (c), and are segregated from licensee’s assets and outside its administrative control; LBP-16-12, 84 NRC 163 n.70 (2016)
- 10 C.F.R. 50.75(e)(1)(ii)  
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- 10 C.F.R. 50.75(h)(1)  
licensee requested license amendments to modify existing trust-related license conditions to reflect proposed transfer and to adopt the regulatory requirements of this regulation; LBP-16-14, 84 NRC 446 (2016)
- 10 C.F.R. 50.75(h)(1)(iv)  
exemption would permit licensee to use decommissioning funds for spent fuel management without providing notice to the NRC; CLI-16-17, 84 NRC 115 n.56 (2016)  
NRC Staff has granted exemptions from the 30-day notification requirement for intended disbursements from the decommissioning trust fund; CLI-16-17, 84 NRC 137 n.8 (2016)  
special circumstances for an exemption exist where application of the regulation in question would not serve the underlying purpose of the rule or is not necessary to achieve the underlying purpose of the rule; CLI-16-17, 84 NRC 119 (2016)
- 10 C.F.R. 50.80(b)(1)(i)  
direct or indirect transfer-of-control application must include information sufficient to demonstrate to the Commission the financial qualifications of applicant to carry out activities for which the permit or license is sought; LBP-16-12, 84 NRC 161 n.60 (2016)
- 10 C.F.R. 50.82(a)(4)(i)  
post-shutdown decommissioning activities report does not amend the license and thus licensee is not required to submit a corresponding environmental report; CLI-16-17, 84 NRC 124 (2016)  
post-shutdown decommissioning activities report must include a discussion of reasons for concluding that the environmental impacts associated with site-specific decommissioning activities will be bounded by appropriate previously issued environmental impact statements; CLI-16-17, 84 NRC 124 (2016)
- 10 C.F.R. 50.82(a)(4)(ii)  
although NRC Staff solicited comments on a post-shutdown decommissioning activities report, NRC regulations do not provide a hearing opportunity on it; CLI-16-17, 84 NRC 116 n.68 (2016)
- 10 C.F.R. 50.82(a)(5)  
licensees are prohibited from performing major decommissioning activities until 90 days after the Staff has received the post-shutdown decommissioning activities report; CLI-16-17, 84 NRC 126 n.130 (2016)
- 10 C.F.R. 50.82(a)(6)(ii)  
scope of permissible actions that a licensee who has entered the decommissioning process may take are defined in the generic environmental impact statement; CLI-16-17, 84 NRC 123 (2016)
- 10 C.F.R. 50.82(a)(7)  
following submission of the post-shutdown decommissioning activities report, licensee must notify NRC in writing and provide a copy to the affected State, before performing any activity inconsistent with, or making any significant schedule change from, activities and schedules described in the PSDAR, including changes that significantly increase the decommissioning cost; CLI-16-17, 84 NRC 124 n.118 (2016)
- 10 C.F.R. 50.82(a)(8)  
minimum amounts required to demonstrate reasonable assurance of funds for decommissioning are based on activities related to the definition of decommission in 10 C.F.R. 50.2 and do not include the cost of removal and disposal of spent fuel or of nonradioactive structures and materials beyond that necessary to terminate the license; CLI-16-17, 84 NRC 116-17 (2016)
- 10 C.F.R. 50.82(a)(8)(i)(A)  
licensee was permitted to make withdrawals from the decommissioning trust fund for spent fuel management expenses because it was exempted from the regulation but it was still required to provide 30-day notices of withdrawals for nonadministrative expenses because NRC Staff had not yet granted the license amendment request subjecting licensee to section 50.75(h)(1)(iv); CLI-16-17, 84 NRC 107 (2016)  
licensees may use decommissioning trust funds only for legitimate decommissioning activities consistent with the definition of decommissioning in 10 C.F.R. 50.2; CLI-16-17, 84 NRC 111 (2016)  
NRC's grant of an exemption approving use of trust funds for a purpose other than decommissioning does not amount to endorsement of conduct inconsistent with any provision of the license; CLI-16-17, 84 NRC 111 (2016)  
requirement in this section is not administrative, managerial, or organizational in nature; CLI-16-17, 84 NRC 130 (2016)

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- special circumstances for an exemption exist where application of the regulation in question would not serve the underlying purpose of the rule or is not necessary to achieve the underlying purpose of the rule; CLI-16-17, 84 NRC 119 (2016)
- 10 C.F.R. 50.82(a)(8)(i)(C)  
licensee is prohibited from making a withdrawal from decommissioning funds that would inhibit its ability to complete funding of any shortfalls in the decommissioning trust; CLI-16-17, 84 NRC 118 (2016)
- 10 C.F.R. 50.82(a)(8)(v)  
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licensee must submit an annual financial assurance report; CLI-16-17, 84 NRC 118 (2016)
- 10 C.F.R. 50.82(a)(8)(v)-(vii)  
if NRC determines, as the result of annual review, that costs of decommissioning exceed remaining decommissioning funds, then licensee must provide additional financial assurance to cover the estimated cost of completion; CLI-16-17, 84 NRC 121 (2016)
- 10 C.F.R. 50.82(a)(8)(vi)  
licensee must provide additional funds if the annual financial assurance report reveals insufficient funds to complete decommissioning; CLI-16-17, 84 NRC 118 (2016)
- 10 C.F.R. 50.82(a)(9)(ii)(G)  
license termination plan must include a supplement to the previous environmental analysis describing any new information or significant environmental change associated with the proposed termination activities; CLI-16-17, 84 NRC 125 (2016)
- 10 C.F.R. 50.91(a)(5)  
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- 10 C.F.R. 50.91(a)(6)  
hearing may be held after NRC Staff's issuance of the license amendments if there are exigent circumstances; CLI-16-18, 84 NRC 177 (2016)  
notice and comment process is provided for circumstances involving a license amendment where NRC finds that exigent circumstances exist in that licensee and NRC must act quickly and that time does not permit 30 days' notice for prior public comment and the amendment involves no significant hazards considerations; CLI-16-18, 84 NRC 169 n.9 (2016)
- 10 C.F.R. 50.92(a)  
scope of review of a license amendment application is guided by considerations that govern issuance of initial licenses, construction permits, or early site permits to the extent applicable and appropriate; LBP-16-10, 84 NRC 37 (2016)
- 10 C.F.R. pt. 50, app. A, GDC 34  
nuclear power plant designs must include a system capable of removing residual heat, defined such that the decay heat does not exceed design limits for the fuel and pressure boundary in the event of an accident unrelated to the loss of coolant; CLI-16-16, 84 NRC 85 (2016)
- 10 C.F.R. pt. 50, app. A, GDC 41  
control of hydrogen, oxygen, and other substances in the containment atmosphere is necessary to ensure that containment integrity is maintained; LBP-16-10, 84 NRC 28 (2016)  
criteria to be met by systems to control fission products, hydrogen, oxygen, and other substances that may be released into the reactor containment are discussed; LBP-16-10, 84 NRC 38 (2016)
- 10 C.F.R. pt. 50, app. A, GDC 44  
PRHR heat exchanger 72-hour safety-related period of operation and a 14-day non-safety-related design requirement are consistent with NRC's approach to compliance; CLI-16-16, 84 NRC 87 n.135 (2016)
- 10 C.F.R. pt. 50, app. B, Criterion III  
licensee's failure to perform primary stress analyses for SL-2 replacement steam generator tube-to-tubesheet welds was a violation of quality assurance requirements for design control; DD-16-2, 84 NRC 5-6 (2016)
- 10 C.F.R. pt. 50, app. E, ¶IV.E.8  
request to consolidate emergency operations facility for proposed nuclear station with existing EOF for nearby plants has satisfied regulatory requirements; CLI-16-19, 84 NRC 213 (2016)

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- 10 C.F.R. pt. 50, app. E, ¶IV.E.8.a(i)  
combined license applicant's emergency plan must make provisions for an emergency operations facility from which effective direction can be given and effective control can be exercised during an emergency; CLI-16-19, 84 NRC 201-02 (2016)  
effective direction can be given and effective control can be exercised during an emergency at consolidated emergency operations facility for multiple sites; CLI-16-19, 84 NRC 213 (2016)
- 10 C.F.R. pt. 50, app. E, ¶IV.E.8.b  
combined license applicant has made provision for a near-site facility that will provide adequate space, supplies, and data and communications capability to support the NRC and other emergency responders so that they may interact face-to-face with emergency response personnel entering and leaving the proposed site; CLI-16-19, 84 NRC 213 (2016)  
Commission approval is required where applicant or licensee proposes to locate the emergency operations facility more than 25 miles from the nuclear power plant site; CLI-16-19, 84 NRC 202 (2016)  
emergency operations facility may serve more than one nuclear power plant site; CLI-16-19, 84 NRC 201-02 (2016)
- 10 C.F.R. pt. 50, app. E, ¶IV.F.2.a(ii)  
NRC Staff's finding that Operations Support Centers would serve their intended emergency functions is subject to a demonstration of their adequacy during the full participation exercise that would be required before fuel load, as reflected in the inspections, tests, analyses, and acceptance criteria in the draft combined licenses; CLI-16-19, 84 NRC 200-01 (2016)
- 10 C.F.R. pt. 50, app. K, ¶I.A.5  
Baker-Just equation is to be used to calculate rate of energy release, hydrogen generation, and fuel cladding oxidation during a loss-of-coolant accident; LBP-16-11, 84 NRC 142, 143 (2016)
- 10 C.F.R. 51.20  
environmental review is required before NRC acts on matters affecting the quality of the human environment; CLI-16-17, 84 NRC 125 (2016)
- 10 C.F.R. 51.22(c)(25)  
"administrative," "managerial," and "organizational" refer to exemptions associated with ministerial changes rather than to exemptions with substantive effects; CLI-16-17, 84 NRC 129 (2016)  
issuance of an exemption to licensee allowing use of the decommissioning trust fund for spent fuel management is eligible for a categorical exclusion; CLI-16-17, 84 NRC 128 (2016)
- 10 C.F.R. 51.22(c)(25)(vi)  
certain types of exemptions may be categorically excluded from environmental review; CLI-16-17, 84 NRC 128 (2016)  
NRC Staff must recite the relevant factors and explain why the exemption meets each factor for a categorical exclusion; CLI-16-17, 84 NRC 133 (2016)  
requirements for using decommissioning trust funds for decommissioning activities involve other requirements of an administrative, managerial, or organizational nature; CLI-16-17, 84 NRC 128-29 n.151 (2016)
- 10 C.F.R. 51.23  
under Continued Storage Rule, spent fuel could remain onsite indefinitely; CLI-16-17, 84 NRC 118 (2016)  
waste confidence rule and the continued storage rule apply only to environmental impacts of spent fuel storage at power reactors and spent fuel storage facilities after the end of a reactor's license term and before disposal in a deep geologic repository, not to 11e(2) byproduct material; CLI-16-20, 84 NRC 233 (2016)
- 10 C.F.R. 51.26(d)  
NRC Staff is exempt from conducting a scoping process for a supplemental EIS based on a plain-language reading of the regulation; CLI-16-20, 84 NRC 234 (2016)
- 10 C.F.R. 51.53(d)  
license termination plan must include a supplement to the previous environmental analysis describing any new information or significant environmental change associated with the proposed termination activities; CLI-16-17, 84 NRC 125 (2016)  
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- 10 C.F.R. 51.92(d)  
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NRC Staff is exempt from conducting a scoping process for a supplemental EIS based on a plain language reading of the regulation; CLI-16-20, 84 NRC 234 (2016)  
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- 10 C.F.R. 51.95(d)  
license termination plan must include a supplement to the previous environmental analysis describing any new information or significant environmental change associated with the proposed termination activities; CLI-16-17, 84 NRC 125 (2016)
- 10 C.F.R. 51.107(a)  
determinations on environmental matters that the Commission must make are listed; CLI-16-19, 84 NRC 185 (2016)  
in mandatory combined license proceeding, Commission considers whether the review of the application by the NRC Staff has been adequate to support the findings set forth in this regulation; CLI-16-16, 84 NRC 68 (2016)  
in this uncontested proceeding, Commission considers whether NRC Staff review of the application has been adequate to support the findings set forth in the regulation; CLI-16-19, 84 NRC 182 (2016)  
NRC must weigh unavoidable adverse environmental impacts and resource commitments (environmental costs) of the project against the project's benefits; CLI-16-16, 84 NRC 97 (2016); CLI-16-19, 84 NRC 217 (2016)  
regulation refers to issuance of a combined license for a nuclear power reactor and has no applicability to in situ leach facilities; CLI-16-20, 84 NRC 232 n.73 (2016)
- 10 C.F.R. pt. 51, subpt. A, app. A, § 1(b)  
NRC has adopted techniques of tiering and incorporation by reference described respectively in 40 C.F.R. 1502.20 and 1508.28 and 40 C.F.R. 1502.21 of CEQ's NEPA regulations; LBP-16-13, 84 NRC 283-84, 430 (2016)  
to incorporate outside documents into a NEPA document, Council on Environmental Quality regulations provide that incorporated material shall be cited in the statement and its content briefly described; LBP-16-13, 84 NRC 283 (2016)
- 10 C.F.R. pt. 51, subpt. A, app. A, § 5  
alternatives analysis is the heart of the environmental impact statement; CLI-16-16, 84 NRC 95 (2016); CLI-16-19, 84 NRC 215 (2016)
- 10 C.F.R. 52.7  
NRC Staff may approve an exemption from a certified design when it finds that the exemption is authorized by law, will not present an undue risk to public health and safety, is consistent with the common defense and security, and special circumstances exist that warrant the exemption; CLI-16-16, 84 NRC 79 (2016)
- 10 C.F.R. pt. 52, subpt. A  
if a combined license application does not reference an early site permit, all site characteristics as well as the potential environmental impacts of the project are considered during review of the application; CLI-16-19, 84 NRC 184 (2016)
- 10 C.F.R. 52.63(a)(1)  
API1000 certified design applicable to Vogtle Units 3 and 4 is not subject to additional hydrogen source requirements through this proceeding; LBP-16-10, 84 NRC 44 (2016)  
certified reactor design is final and the NRC may not impose new requirements absent special circumstances; LBP-16-10, 84 NRC 40, 43 (2016)  
petitioner is prohibited from challenging the certified design through adjudication, and its allegations regarding Fukushima are also outside of the scope of the proceeding because the Commission is handling that issue through rulemaking; LBP-16-10, 84 NRC 47 (2016)  
reactor operator license application may be denied for failure to meet minimum standards for general medical condition; LBP-16-9, 84 NRC 15 (2016)

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- 10 C.F.R. 52.63(b)(1)  
NRC Staff may approve an exemption from a certified design when it finds that the exemption is authorized by law, will not present an undue risk to the public health and safety, is consistent with the common defense and security, and special circumstances exist that warrant the exemption; CLI-16-16, 84 NRC 79 (2016)
- 10 C.F.R. 52.79(a)(1)(iii)  
proposed reactor site must meet geologic and seismic criteria; CLI-16-19, 84 NRC 197 n.94 (2016)
- 10 C.F.R. 52.79(a)(21)  
combined license applicants must provide an emergency plan that complies with 10 C.F.R. 50.47 and 10 C.F.R. pt. 50, app. E; CLI-16-19, 84 NRC 201-02 (2016)
- 10 C.F.R. 52.87  
Advisory Committee on Reactor Safeguards, a committee of technical experts advising the Commission, provides an independent assessment of the safety aspects of a combined license application; CLI-16-16, 84 NRC 70 (2016); CLI-16-19, 84 NRC 184 (2016)
- 10 C.F.R. 52.93  
requirements that combined license applicants must meet when seeking an exemption from the Commission's regulations are found in this regulation; CLI-16-16, 84 NRC 79 n.66 (2016)
- 10 C.F.R. 52.97(a)  
determinations on safety matters that the Commission must make are listed; CLI-16-19, 84 NRC 184-85 (2016)  
in mandatory combined license proceeding, Commission considers whether the NRC Staff review of the application has been adequate to support the findings set forth in this regulation; CLI-16-16, 84 NRC 68 (2016); CLI-16-19, 84 NRC 182 (2016)
- 10 C.F.R. 52.97(a)(1)  
safety issues that must be considered in a mandatory combined license proceeding are outlined; CLI-16-16, 84 NRC 71 (2016)
- 10 C.F.R. 52.103(g)  
NRC Staff will verify adequacy of combined license applicant's training program by inspecting applicant's ability to adequately perform designated emergency response organization functions during the required exercise described in the emergency preparedness ITAAC and subsequent biennial exercises if NRC later makes the finding required; CLI-16-19, 84 NRC 205 (2016)  
operation of the facility is not permitted until the Commission finds that the acceptance criteria in the combined licenses are met; CLI-16-19, 84 NRC 205 n.170 (2016)
- 10 C.F.R. pt. 52, app. D, § III.A  
AP1000 design control document is incorporated by reference in the design certification rule and sets forth location criteria, implementation requirements, and in-containment elevations of hydrogen igniters; LBP-16-10, 84 NRC 39 (2016)
- 10 C.F.R. pt. 52, app. D, § VI.A  
additional or alternative structures, systems, components, design features, design criteria, testing, analyses, acceptance criteria, or justifications are not necessary for the AP1000 design; LBP-16-10, 84 NRC 40 (2016)
- 10 C.F.R. pt. 52, app. D, § VI.B.1  
finality in license amendment proceeding applies to all Tier 1 and 2 issues, including the hydrogen control system and hydrogen igniters that were part of the certified design; LBP-16-10, 84 NRC 40 (2016)
- 10 C.F.R. pt. 52, app. D, § VIII.A.4  
departures from a certified design that involve a change to the design as described in the rule certifying the design require an exemption from NRC regulations; CLI-16-16, 84 NRC 79 (2016)
- 10 C.F.R. pt. 52, app. D, § VIII.B.5  
NRC approval is not required for departures from the AP1000 design control document that have no safety significance; CLI-16-19, 84 NRC 200 (2016)
- 10 C.F.R. pt. 52, app. D, § VIII.B.5.a  
where a combined license applicant references a certified design, changes to the design may be made in the combined license if proposed as a departure from the certified design, and some departures from the certified design may be made without prior Commission approval; CLI-16-16, 84 NRC 79 (2016)

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- 10 C.F.R. 72.210  
NRC Staff nonconcurrences associated with general license to construct an independent spent fuel storage installation centered on the concern that consultations on the project did not include a specific discussion that an ISFSI could be constructed; CLI-16-16, 84 NRC 93 n.186 (2016)
- 10 C.F.R. 100.23  
proposed reactor site must meet geologic and seismic criteria; CLI-16-19, 84 NRC 197 n.94 (2016)
- 10 C.F.R. 100.23(d)(2)  
if excavations reveal potentially detrimental geologic features, combined license applicant may be required to conduct additional site investigations; CLI-16-16, 84 NRC 83 (2016)
- 10 C.F.R. 110.42(a)(1)-(5)  
before grant of an export license for HEU to a nuclear weapon state, NRC must determine that the proposed export satisfies nonproliferation criteria of this regulation; CLI-16-15, 84 NRC 58, 60 (2016)  
factors considered in determining whether to grant a hearing on an export license are described; CLI-16-15, 84 NRC 58 (2016)  
five nonproliferation criteria govern exports of special nuclear material; CLI-16-15, 84 NRC 60-61 n.39 (2016)
- 10 C.F.R. 110.42(a)(7)  
proposed export of more than 0.003 effective kilograms of special nuclear material must be under the term of the U.S.–Euratom Agreement for Cooperation in the Peaceful Uses of Nuclear Energy; CLI-16-15, 84 NRC 60 n.38 (2016)
- 10 C.F.R. 110.42(a)(7)-(9)  
factors considered in determining whether to grant a hearing on an export license are described; CLI-16-15, 84 NRC 58 (2016)
- 10 C.F.R. 110.42(a)(8)  
proposed export must not be inimical to the common defense and security of the United States; CLI-16-15, 84 NRC 60, 62 (2016)
- 10 C.F.R. 110.42(a)(9)  
NRC must make additional findings before authorizing an applicant to export HEU; CLI-16-15, 84 NRC 61 (2016)  
proposed export must satisfy the Schumer Amendment; CLI-16-15, 84 NRC 60 (2016)
- 10 C.F.R. 110.45  
factors considered in determining whether to grant a hearing on an export license are described; CLI-16-15, 84 NRC 58 (2016)
- 10 C.F.R. 110.80  
procedures that govern hearing requests and petitions to intervene on an export license application are contained in 10 C.F.R. Part 110, Subpart H and constitute the exclusive basis for hearings in nuclear export licensing proceedings; CLI-16-15, 84 NRC 56 (2016)
- 10 C.F.R. 110.81  
request for hearing on export is denied but Commission responds to petitioner’s views, treating them as written comments; CLI-16-15, 84 NRC 56 (2016)
- 10 C.F.R. 110.81(a)  
public is encouraged to provide written comments on export license applications, which the Commission considers and responds to as appropriate; CLI-16-15, 84 NRC 57 (2016)  
where petitioner has not met the threshold for obtaining a hearing on an export license, Commission still considers his views as written comments on the application; CLI-16-15, 84 NRC 59-60 (2016)
- 10 C.F.R. 110.82(b)(3)  
hearing requests in export cases must explain why a hearing or an intervention would be in the public interest and how a hearing or intervention would assist the Commission in making the statutory determinations; CLI-16-15, 84 NRC 57 (2016)
- 10 C.F.R. 110.82(b)(4)  
hearing request on an export license must specify, when a person asserts that his interest may be affected, both the facts pertaining to his interest and how it may be affected; CLI-16-15, 84 NRC 57 (2016)
- 10 C.F.R. 110.84(a)  
factors considered in determining whether to grant a hearing on an export license are described; CLI-16-15, 84 NRC 58 (2016)

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- 10 C.F.R. 110.84(b)  
items considered in determining whether to grant a hearing on an export license are listed; CLI-16-15, 84 NRC 57 (2016)  
merely asserting an institutional interest in providing information to the public is insufficient to show an affected interest in issuance of an export license; CLI-16-15, 84 NRC 58 (2016)
- 10 C.F.R. 110.84(d)  
Commission must review the Executive Branch's views on export applications before reaching a decision on the hearing request or petition to intervene; CLI-16-15, 84 NRC 56 (2016)
- 10 C.F.R. 110.84(g)  
if the Commission determines that a hearing should be granted on an export license, it may order either an oral hearing or a hearing consisting of written comments; CLI-16-15, 84 NRC 56 (2016)
- 10 C.F.R. 1017.26  
documents may be shredded by using a cross-cut shredder that produces pieces no larger than 1/4 inch wide by 2 inches long; CLI-16-14, 84 NRC 13 n.13 (2016)
- 18 C.F.R. 35.32(a)(3)  
anyone directing investments made in the decommissioning trust shall adhere to the prudent investor standard of the Federal Energy Regulatory Commission; CLI-16-17, 84 NRC 132 (2016)
- 36 C.F.R. 60.4  
criteria for inclusion in the National Register of Historic Places are provided; CLI-16-20, 84 NRC 248 n.181 (2016)
- 36 C.F.R. 800.2(c)(2)  
consulting parties include Indian tribes and certain individuals and organizations with a demonstrated interest in the undertaking due to their legal or economic relation to the undertaking or affected properties; CLI-16-20, 84 NRC 266 (2016)
- 36 C.F.R. 800.2(c)(2)(ii)(A)  
after it identifies eligible sites that might be affected by the project, an agency must assess and resolve potential adverse effects in consultation with tribes that attach religious and cultural significance to those sites; CLI-16-20, 84 NRC 249 (2016)  
correct legal standard is whether NRC Staff provided a reasonable opportunity for consultation; CLI-16-20, 84 NRC 266 (2016)  
NRC must provide tribes a reasonable opportunity to identify its concerns about historic properties, advise on identification and evaluation of historic properties, articulate its view on the undertaking's effects on such properties, and participate in the resolution of such adverse effects; CLI-16-20, 84 NRC 266 (2016)
- 36 C.F.R. 800.2(c)(5)  
consulting parties include Indian tribes and certain individuals and organizations with a demonstrated interest in the undertaking due to their legal or economic relation to the undertaking or affected properties; CLI-16-20, 84 NRC 266 (2016)
- 36 C.F.R. 800.4  
first step in the consultation requirement is identifying any historic properties that might be affected by the federal undertaking and, in doing so, making a reasonable and good-faith effort to seek information from consulting parties, including Native American Tribes, to aid in that identification; CLI-16-20, 84 NRC 249 (2016)  
National Environmental Policy Act requires analysis of effects on all cultural resources present at the site, not only those properties eligible for listing on the National Register of Historic Places, which is the standard for further analysis under the National Historic Preservation Act; CLI-16-20, 84 NRC 248 & n.181 (2016)
- 36 C.F.R. 800.5  
after it identifies eligible sites that might be affected by the project, an agency must assess and resolve potential adverse effects in consultation with tribes that attach religious and cultural significance to those sites; CLI-16-20, 84 NRC 249 (2016)
- 36 C.F.R. 800.6  
after it identifies eligible sites that might be affected by the project, an agency must assess and resolve potential adverse effects in consultation with tribes that attach religious and cultural significance to those sites; CLI-16-20, 84 NRC 249 (2016)

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- 36 C.F.R. 800.16  
historic properties are districts, sites, buildings, structures, or objects included in or eligible for inclusion in, the National Register of Historic Places; CLI-16-20, 84 NRC 248 & n.181 (2016)
- 40 C.F.R. 141.1  
claim that because in situ leach wastewater does not exceed human maximum contaminant levels, there is no threat to wildlife is erroneous; LBP-16-13, 84 NRC 433 (2016)
- 40 C.F.R. 1500.2(b)  
generic statements in the in situ leach mining generic environmental impact statement do not fulfill NRC Staff's obligations under NEPA with regard to significant impacts that could reasonably be posed to wildlife at the license area were licensee to commence land application of wastewater; LBP-16-13, 84 NRC 432 (2016)
- 40 C.F.R. 1502.20  
agency must reference and summarize the specific issues addressed in the generic environmental impact statement that are to be tiered into a site-specific environmental impact statement or environmental assessment; LBP-16-13, 84 NRC 283-84, 430 (2016)  
tiering is a form of incorporation by reference whereby an agency incorporates a generic environmental impact statement into a site-specific analysis; LBP-16-13, 84 NRC 283, 430 n.1143 (2016)
- 40 C.F.R. 1502.21  
NRC Staff may in certain circumstances incorporate by reference previous work that addresses a particular environmental issue, but only where the environmental assessment provides specific citations and briefly summarizes how those external documents support the EA's conclusion; LBP-16-13, 84 NRC 430 (2016)  
to incorporate outside documents into a NEPA document, Council on Environmental Quality regulations provide that incorporated material shall be cited in the statement and its content briefly described; LBP-16-13, 84 NRC 283 (2016)
- 40 C.F.R. 1502.22  
agencies need only undertake reasonable efforts to acquire missing information for an environmental impact statement; CLI-16-20, 84 NRC 265 (2016)  
NRC looks for guidance to Council on Environmental Quality's implementing regulations for NEPA, which specify that an agency need not include relevant information if the overall costs of obtaining it are exorbitant; CLI-16-20, 84 NRC 263-64 (2016)  
some information relevant to an environmental impact statement will not be reasonably available and the agency is directed to proceed in accord with NEPA's rule of reason in the face of such lacunae; CLI-16-20, 84 NRC 264 (2016)
- 40 C.F.R. 1508.28  
tiering is a form of incorporation by reference whereby an agency incorporates a generic environmental impact statement into a site-specific analysis; LBP-16-13, 84 NRC 283, 430 n.1143 (2016)
- 50 C.F.R. 402.14(a)  
consultation with Fish and Wildlife or the National Marine Fisheries Service or both is required for actions that may affect listed species; CLI-16-16, 84 NRC 88 (2016)

## LEGAL CITATIONS INDEX STATUTES

- Administrative Procedure Act, 5 U.S.C. § 706  
board does not have authority to review a claim of unreasonable delay regarding a petition for rulemaking that is before the Commission; LBP-16-11, 84 NRC 146 (2016)  
reviewing court shall compel agency action unlawfully withheld or unreasonably delayed; LBP-16-11, 84 NRC 146 (2016)
- Atomic Energy Act, 11e(2), 42 U.S.C. § 2014(e)(2)  
“byproduct material” is tailings or wastes produced by the extraction or concentration of uranium or thorium from any ore processed primarily for its source material content; CLI-16-20, 84 NRC 229 n.49 (2016)
- Atomic Energy Act, 57c, 42 U.S.C. § 2077(c)  
statutory determinations for grant of an export license are described; CLI-16-15, 84 NRC 58 (2016)
- Atomic Energy Act, 57c(2), 42 U.S.C. § 2077(c)(2)  
proposed export must not be inimical to the common defense and security of the United States; CLI-16-15, 84 NRC 60, 62 (2016)
- Atomic Energy Act, 127, 42 U.S.C. § 2156  
before grant of an export license for HEU to a nuclear weapon state, NRC must determine that the proposed export satisfies nonproliferation criteria of this section; CLI-16-15, 84 NRC 58, 60 (2016)  
five nonproliferation criteria govern exports of special nuclear material; CLI-16-15, 84 NRC 60-61 n.39 (2016)  
sixth criterion applies only to exports of nuclear technology and is not applicable to an export of nuclear material; CLI-16-15, 84 NRC 60 n.39 (2016)
- Atomic Energy Act, 134, 42 U.S.C. § 2160d  
proposed export must satisfy the Schumer Amendment; CLI-16-15, 84 NRC 60 (2016)
- Atomic Energy Act, 134a, 42 U.S.C. § 2160d(a)  
NRC must make additional findings before authorizing an applicant to export HEU; CLI-16-15, 84 NRC 61 (2016)  
statutory determinations for grant of an export license are described; CLI-16-15, 84 NRC 58 (2016)
- Atomic Energy Act, 182b, 42 U.S.C. § 2232(b)  
Advisory Committee on Reactor Safeguards, a committee of technical experts advising the Commission, provides an independent assessment of the safety aspects of a combined license application; CLI-16-16, 84 NRC 70 (2016); CLI-16-19, 84 NRC 184 (2016)
- Atomic Energy Act, 189, 42 U.S.C. § 2239  
although NRC Staff solicited comments on a post-shutdown decommissioning activities report, NRC regulations do not provide a hearing opportunity on it; CLI-16-17, 84 NRC 116 n.68 (2016)
- Atomic Energy Act, 189a, 42 U.S.C. § 2239(a)  
exemption requests are not subject to a hearing opportunity; CLI-16-17, 84 NRC 116 (2016)  
NRC must hold a hearing on each application to construct a nuclear power plant, regardless of whether an interested member of the public requests a hearing on the application; CLI-16-16, 84 NRC 71 (2016) ; CLI-16-19, 84 NRC 184 (2016)
- Atomic Energy Act, 189a(1)(A), 42 U.S.C. § 2239(a)(1)(A)  
Commission must grant a hearing upon the request of any person whose interest may be affected by the proceeding; LBP-16-14, 84 NRC 448 (2016)  
intervention is permitted only by a person whose interest may be affected by the proceeding; LBP-16-14, 84 NRC 450 (2016)

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### STATUTES

- NRC must provide a hearing upon the request of any person whose interest may be affected by the proceeding; LBP-16-10, 84 NRC 25 (2016)
- Endangered Species Act, 7, 16 U.S.C. § 1536
- federal agencies must ensure that any action authorized, funded, or carried out by the agency is not likely to jeopardize the continued existence of any listed endangered or threatened species or designated critical habitat; CLI-16-16, 84 NRC 88 (2016)
- National Environmental Policy Act, 102, 42 U.S.C. § 4332
- environmental review is required before NRC acts on matters affecting the quality of the human environment; CLI-16-17, 84 NRC 125 (2016)
- National Environmental Policy Act, 102(2)(A), 42 U.S.C. § 4332(2)(A)
- agencies must use a systematic, interdisciplinary approach that will insure the integrated use of the natural and social sciences and the environmental design arts in decision making that may impact the environment; CLI-16-16, 84 NRC 95 (2016); CLI-16-19, 84 NRC 214 (2016)
- National Environmental Policy Act, 102(2)(C), 42 U.S.C. § 4332(2)(C)(ii)-(v)
- NRC must assess the relationship between short-term uses and long-term productivity of the environment, consider alternatives, and describe the unavoidable adverse environmental impacts and the irreversible and irretrievable commitments of resources associated with the proposed action; CLI-16-16, 84 NRC 95 (2016); CLI-16-19, 84 NRC 214 (2016)
- National Environmental Policy Act, 102(2)(E), 42 U.S.C. § 4332(2)(E)
- agencies must study, develop, and describe appropriate alternatives to the proposed action; CLI-16-16, 84 NRC 95 (2016); CLI-16-19, 84 NRC 215 (2016)
- Nuclear Non-Proliferation Act, 304(b), 42 U.S.C. § 2155a
- hearing requests in export cases must explain why a hearing or an intervention would be in the public interest and how a hearing or intervention would assist the Commission in making the statutory determinations; CLI-16-15, 84 NRC 57 (2016)
- public participation in nuclear export licensing proceedings is allowed when NRC finds that such participation will be in the public interest and will assist in making the statutory determinations required by the Atomic Energy Act, including such public hearings and access to information as the Commission deems appropriate; CLI-16-15, 84 NRC 56 (2016)
- Safe Drinking Water Act, Pub. L. No. 93-523, 88 Stat. 1660 (1974), codified at 42 U.S.C. § 300f *et seq.*
- claim that because in situ leach wastewater does not exceed human maximum contaminant levels, there is no threat to wildlife is erroneous; LBP-16-13, 84 NRC 433 (2016)

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**OTHERS**

- Attorney General's Manual on the Administrative Procedure Act (1947) at 13  
"rule" in the Administrative Procedure Act includes agency statements not only of general applicability  
but also those of particular applicability to either a class or a single person; CLI-16-17, 84 NRC 137  
(2016)
- 118 Neb. Admin. Code, ch. 1 §003 (2016)  
beneficial use is defined as protecting groundwater quality; LBP-16-13, 84 NRC 433 n.1169 (2016)
- 118 Neb. Admin. Code, ch. 3 §001 (2016)  
selenium concentration limit imposed in state environmental agency's NPDES permit is based solely on a  
regulation designed to protect drinking water quality for humans and does not in any way address  
possible ingestion and ultimate bioaccumulation in wildlife; LBP-16-13, 84 NRC 433 (2016)



## SUBJECT INDEX

### ABEYANCE OF CONTENTION

final licensing decisions were suspended and any related contentions were held in abeyance until the court's remand on spent fuel storage was appropriately addressed; CLI-16-19, 84 NRC 180 (2016)

### ACCIDENTS, LOSS-OF-COOLANT

amendment to 10 C.F.R. 50.44(a)(1)-(3) eliminated hydrogen generation controls associated with a design-basis loss-of-coolant accident; LBP-16-10, 84 NRC 17 (2016)

Baker-Just equation is to be used to calculate rate of energy release, hydrogen generation, and fuel cladding oxidation during a loss of coolant accident; LBP-16-11, 84 NRC 139 (2016)

See also Design Basis Accident; Fukushima Accident

### ADJUDICATORY HEARINGS

factors to be considered in determining whether to grant a hearing on an export license are described in 10 C.F.R. 110.45, 110.42(a)(1)-(5), (7)-(9), 110.84(a); CLI-16-15, 84 NRC 53 (2016)

hearing may be held after NRC Staff's issuance of the license amendments if there are exigent circumstances; CLI-16-18, 84 NRC 167 (2016)

See also Evidentiary Hearings; Hearing Procedures; Hearing Requests; Hearing Rights; Mandatory Hearings; Public Hearings

### ADJUDICATORY PROCEEDINGS

adjudication is not the proper forum for challenging applicable statutory requirements or the basic structure of the agency's regulatory process; LBP-16-10, 84 NRC 17 (2016)

allowing the adjudicatory proceeding to supplement an environmental assessment, in the same manner as is done for environmental impact statements, is appropriate; CLI-16-18, 84 NRC 167 (2016)

NRC Staff may issue a license before an adjudicatory proceeding is concluded; LBP-16-13, 84 NRC 271 (2016)

See also Combined License Proceedings; Export License Proceedings; License Amendment Proceedings; License Transfer Proceedings; Materials License Proceedings; Operating License Amendment Proceedings; Suspension of Proceeding

### ADMINISTRATIVE PROCEDURE ACT

reviewing court shall compel agency action unlawfully withheld or unreasonably delayed; LBP-16-11, 84 NRC 139 (2016)

"rule" in the APA includes agency statements not only of general applicability but also those of particular applicability to either a class or a single person; CLI-16-17, 84 NRC 99 (2016)

### ADVISORY COMMITTEE ON REACTOR SAFEGUARDS

committee of technical experts provides the Commission with an independent assessment of the safety aspects of a combined license application; CLI-16-16, 84 NRC 66 (2016); CLI-16-19, 84 NRC 180 (2016)

### ADVISORY COUNCIL ON HISTORIC PRESERVATION

Council's agreement is not binding on the Commission, but its findings are entitled to considerable weight; CLI-16-20, 84 NRC 219 (2016)

### AFFIDAVITS

petitioner's standing is not required to be supported by expert affidavits regarding petitioner's plausible scenario for injury; LBP-16-10, 84 NRC 17 (2016)

## SUBJECT INDEX

### AGREEMENTS

Advisory Council on Historic Preservation's agreement is not binding on the Commission, but its findings are entitled to considerable weight; CLI-16-20, 84 NRC 219 (2016)  
proposed export of more than 0.003 effective kilograms of special nuclear material must be under the terms of the U.S.-Euratom Agreement for Cooperation in the Peaceful Uses of Nuclear Energy; CLI-16-15, 84 NRC 53 (2016)

### ALTERNATE CONCENTRATION LIMITS

in situ leach mining licensee cannot rely on ACLs under the terms of its current renewed license; LBP-16-13, 84 NRC 271 (2016)

### AMENDMENT

petitioners seek to amend the protective order and nondisclosure declaration to dispose of documents in a way not specified by the protective order and nondisclosure declaration; CLI-16-14, 84 NRC 11 (2016)  
See also License Amendment Proceedings; License Amendments; Operating License Amendments

### AMENDMENT OF REGULATIONS

amendment to 10 C.F.R. 50.44(a)(1)-(3) eliminated hydrogen generation controls associated with a design-basis loss-of-coolant accident; LBP-16-10, 84 NRC 17 (2016)

### APPEALS

filing of a petition for review is mandatory for a party to have exhausted its administrative remedies before seeking judicial review; LBP-16-13, 84 NRC 271 (2016)  
petitions for review challenging NRC's updated continued storage rule were denied; CLI-16-20, 84 NRC 219 (2016)  
to prevail on appeal, a party must show not only that the majority erred but also that the error had a prejudicial effect on the party's case; CLI-16-20, 84 NRC 219 (2016)  
where board's resolution of contentions is final, consideration of petitions for review of these contentions is appropriate; CLI-16-20, 84 NRC 219 (2016)

See also Briefs, Appellate

### APPELLATE REVIEW

Commission decides matters on the basis of petitions for review, and therefore denies request to establish a briefing schedule; CLI-16-20, 84 NRC 219 (2016)  
Commission gives substantial deference to boards on issues of contention admissibility and will affirm admissibility determinations absent a showing of an error of law or abuse of discretion; CLI-16-20, 84 NRC 219 (2016)  
Commission normally hesitates to wade through a detailed factual record, particularly when it has not had the advantage of observing testimony first hand; CLI-16-20, 84 NRC 219 (2016)  
Commission reviews questions of law de novo, but defers to board findings with respect to underlying facts unless the findings are clearly erroneous; CLI-16-18, 84 NRC 167 (2016); CLI-16-20, 84 NRC 219 (2016)  
Commission standard of review is de novo; LBP-16-12, 84 NRC 148 (2016)  
Commission will take review of a board's factual findings when those findings are clearly erroneous or in conflict with a finding regarding the same fact in a different proceeding; CLI-16-20, 84 NRC 219 (2016)  
review is seldom granted where petitioner relies primarily on claims that the board erred in weighing the evidence in a merits decision; CLI-16-20, 84 NRC 219 (2016)  
showing necessary for discretionary grant of petition for review is discussed; CLI-16-20, 84 NRC 219 (2016)  
to show clear error, petitioners must demonstrate that the board's determination is not even plausible in light of the record as a whole; CLI-16-20, 84 NRC 219 (2016)  
where a board's decision rests on a weighing of extensive fact-specific evidence presented by technical experts, Commission generally will defer; CLI-16-20, 84 NRC 219 (2016)

### APPROVAL OF LICENSE

after a licensing board has issued an initial decision, the Director of the Office of Nuclear Material Safety and Safeguards shall issue, deny, or appropriately condition the permit, license, or license amendment in accordance with the presiding officer's initial decision; LBP-16-13, 84 NRC 271 (2016)  
NRC Staff may issue a license before an adjudicatory proceeding is concluded; LBP-16-13, 84 NRC 271 (2016)

## SUBJECT INDEX

### ATOMIC ENERGY ACT

agency actions that are not among those listed in section 189a do not give rise to a hearing right for interested persons; CLI-16-17, 84 NRC 99 (2016)

“byproduct material” is tailings or wastes produced by the extraction or concentration of uranium or thorium from any ore processed primarily for its source material content; CLI-16-20, 84 NRC 219 (2016)

Commission is not required, under the Atomic Energy Act, to make predictive findings regarding the technical feasibility of spent fuel disposal as part of its reactor licensing decisions; CLI-16-16, 84 NRC 66 (2016)

exemption requests are not subject to a hearing opportunity; CLI-16-17, 84 NRC 99 (2016)

NRC must hold a hearing on each application to construct a nuclear power plant, regardless of whether an interested member of the public requests a hearing on the application; CLI-16-16, 84 NRC 66 (2016) ; CLI-16-19, 84 NRC 180 (2016)

NRC must provide a hearing upon the request of any person whose interest may be affected by the proceeding; LBP-16-10, 84 NRC 17 (2016); LBP-16-14, 84 NRC 444 (2016)

public participation in nuclear export licensing proceedings is allowed when NRC finds that such participation will be in the public interest and will assist in making the statutory determinations required by the AEA, including such public hearings and access to information as the Commission deems appropriate; CLI-16-15, 84 NRC 53 (2016)

statutory determinations for grant of an export license are described in sections 57c and 134a; CLI-16-15, 84 NRC 53 (2016)

### BENEFIT-COST ANALYSIS

NRC must assess the relationship between short-term uses and long-term productivity of the environment, consider alternatives, and describe the unavoidable adverse environmental impacts and the irreversible and irretrievable commitments of resources associated with the proposed action; CLI-16-19, 84 NRC 180 (2016)

NRC must weigh unavoidable adverse environmental impacts and resource commitments (environmental costs) of the project against the project’s benefits; CLI-16-16, 84 NRC 66 (2016); CLI-16-19, 84 NRC 180 (2016)

### BRIEFS, APPELLATE

Commission decides matters on the basis of petitions for review, and therefore denies request to establish a briefing schedule; CLI-16-20, 84 NRC 219 (2016)

### BURDEN OF PROOF

although intervenors presented no evidence in support of the tornado portion of their contention, this is not by itself fatal to the contention because NRC Staff bears the ultimate burden of proof for showing that it complied with NEPA; LBP-16-13, 84 NRC 271 (2016)

NRC Staff bears the ultimate burden of showing that it satisfied NEPA’s information-disclosure mandate by meaningfully considering significant impacts and addressing those impacts in the environmental assessment; LBP-16-13, 84 NRC 271 (2016)

petitioner has the burden to show that the proximity presumption should apply; LBP-16-10, 84 NRC 17 (2016)

ultimate burden with respect to NEPA lies with NRC Staff, but NRC regulations require that intervenors file environmental contentions on the basis of applicant’s environmental report; CLI-16-20, 84 NRC 219 (2016)

### BYPRODUCT MATERIALS

contention that neither substantively disputes analysis of impacts related to disposal of byproduct material in relevant sections of the DSEIS and the GEIS nor addresses license condition related to disposal of byproduct material is inadmissible; CLI-16-20, 84 NRC 219 (2016)

disposal of byproduct material must take place at an existing disposal site, but the application is not required to include a waste disposal plan or designate which waste disposal site will be used; CLI-16-20, 84 NRC 219 (2016)

tailings or wastes produced by the extraction or concentration of uranium or thorium from any ore processed primarily for its source material content are byproduct material; CLI-16-20, 84 NRC 219 (2016)

## SUBJECT INDEX

waste confidence rule and continued storage rule apply only to environmental impacts of spent fuel storage at power reactors and spent fuel storage facilities after the end of a reactor's license term and before disposal in a deep geologic repository, not to 11e(2) byproduct material; CLI-16-20, 84 NRC 219 (2016)

### CASE MANAGEMENT

board has authority to take appropriate action to control the hearing process, regulate the course of the hearing and the conduct of the participants, and issue orders necessary to carry out the presiding officer's duties and responsibilities under 10 C.F.R. Part 2; CLI-16-20, 84 NRC 219 (2016)

boards have broad and strong discretionary authority to conduct their functions with efficiency and economy, but they must exercise it with fairness to all the parties; CLI-16-20, 84 NRC 219 (2016)

boards have relative latitude to fashion appropriate remedies regarding issues properly before it; CLI-16-20, 84 NRC 219 (2016)

### CATEGORICAL EXCLUSION

certain types of exemptions may be categorically excluded from environmental review; CLI-16-17, 84 NRC 99 (2016)

exemption eligible for a categorical exclusion requires neither an environmental assessment nor an environmental impact statement to comply with NEPA; CLI-16-17, 84 NRC 99 (2016)

### CERTIFICATION

decommissioning process begins when licensee certifies to NRC Staff that it has permanently ceased operations and has permanently removed fuel from the reactor vessel; CLI-16-17, 84 NRC 99 (2016)

See also Design Certification

### CHANGE REQUESTS

circumstances under which licensee can make changes to a facility or procedures described in its UFSAR without obtaining a license amendment are discussed; DD-16-2, 84 NRC 1 (2016)

NRC-approved license amendment is required if changes, tests, or experiments involve a change to the technical specifications or if they meet any one of the eight criteria of 10 C.F.R. 50.59(c)(2); DD-16-2, 84 NRC 1 (2016)

### COMBINED LICENSE APPLICATION

Advisory Committee on Reactor Safeguards is a committee of technical experts advising the Commission that provides an independent assessment of the safety aspects of a combined license application; CLI-16-16, 84 NRC 66 (2016); CLI-16-19, 84 NRC 180 (2016)

exemption requests relating to organization and numbering of application and material control and accounting requirements for special nuclear material that apply to both Part 52 and Part 50 licensees are acceptable; CLI-16-19, 84 NRC 180 (2016)

five common regulatory departures and exemptions are acceptable based on a reference application; CLI-16-19, 84 NRC 180 (2016)

if the application does not reference an early site permit, all site characteristics as well as the potential environmental impacts of the project are considered during review of the application; CLI-16-19, 84 NRC 180 (2016)

NRC must hold a hearing on each application to construct a nuclear power plant, regardless of whether an interested member of the public requests a hearing on the application; CLI-16-16, 84 NRC 66 (2016)

NRC Staff must publish notices of a COL application in the Federal Register; CLI-16-16, 84 NRC 66 (2016)

requirements that applicants must meet when seeking an exemption from the Commission's regulations are found in 10 C.F.R. 52.93; CLI-16-16, 84 NRC 66 (2016)

where applicant references a certified design, changes to the design may be made in the combined license if proposed as a departure from the certified design, and some departures from the certified design may be made without prior Commission approval; CLI-16-16, 84 NRC 66 (2016)

### COMBINED LICENSE PROCEEDINGS

all safety and environmental matters relevant to a combined license application, except those resolved in the contested proceeding, are subject to review in the uncontested proceeding; CLI-16-16, 84 NRC 66 (2016); CLI-16-19, 84 NRC 180 (2016)

Commission does not review the application de novo, but rather it considers whether NRC Staff's review was sufficient to support the required findings; CLI-16-16, 84 NRC 66 (2016)

## SUBJECT INDEX

- determinations on environmental matters that the Commission must make for authorization of a combined license are listed in 10 C.F.R. 51.107(a); CLI-16-19, 84 NRC 180 (2016)
- environmental matters that must be considered in a mandatory combined license proceeding are discussed; CLI-16-16, 84 NRC 66 (2016)
- inquiry in mandatory combined license proceeding is whether NRC Staff's review was sufficient to support safety and environmental findings; CLI-16-16, 84 NRC 66 (2016); CLI-16-19, 84 NRC 180 (2016)
- issues resolved in the AP1000 design certification rulemaking are closed and will not be revisited in a mandatory combined license proceeding, unless they are the subject of a departure or exemption; CLI-16-19, 84 NRC 180 (2016)
- safety issues that must be considered in a mandatory combined license proceeding are discussed; CLI-16-16, 84 NRC 66 (2016)
- COMBINED LICENSES**
- applicant's emergency plan must make provisions for an emergency operations facility from which effective direction can be given and effective control can be exercised during an emergency; CLI-16-19, 84 NRC 180 (2016)
- applicants must provide an emergency plan that complies with 10 C.F.R. 50.47 and 10 C.F.R. pt. 50, app. E; CLI-16-19, 84 NRC 180 (2016)
- if excavations reveal potentially detrimental geologic features, applicant may be required to conduct additional site investigations; CLI-16-16, 84 NRC 66 (2016)
- license holder may receive an exemption from certain requirements pertaining to material control and accounting for special nuclear materials, such that the same requirements apply to both Part 52 and Part 50 licensees; CLI-16-16, 84 NRC 66 (2016)
- NRC Staff will verify adequacy of applicant's training program by inspecting applicant's ability to adequately perform designated emergency response organization functions during the required exercise described in the emergency preparedness ITAAC and subsequent biennial exercises if the NRC later makes the finding required; CLI-16-19, 84 NRC 180 (2016)
- NRC Staff's finding that Operations Support Centers would serve their intended emergency functions is subject to a demonstration of their adequacy during the full-participation exercise that would be required before fuel load, as reflected in the inspections, tests, analyses, and acceptance criteria in the draft licenses; CLI-16-19, 84 NRC 180 (2016)
- operation of the facility is not permitted until the Commission finds that the acceptance criteria in the licenses are met; CLI-16-19, 84 NRC 180 (2016)
- provisions of 10 C.F.R. 51.107(a) refer to issuance of a combined license for a nuclear power reactor and has no applicability to in situ leach facilities; CLI-16-20, 84 NRC 219 (2016)
- COMMON DEFENSE AND SECURITY**
- proposed export must satisfy the Schumer Amendment and not be inimical to the common defense and security of the United States; CLI-16-15, 84 NRC 53 (2016)
- COMPLIANCE**
- National Environmental Policy Act compliance does not necessarily follow from National Historic Preservation Act compliance; CLI-16-20, 84 NRC 219 (2016)
- See also Presumption of Compliance
- COMPUTER CODE**
- computer programs described in the updated final safety analysis report are methods of evaluation subject to the provisions of 10 C.F.R. 50.59(c)(2)(viii) and thus any changes to these methods would require a written evaluation; DD-16-2, 84 NRC 1 (2016)
- CONFIDENTIAL INFORMATION**
- portions of an application that contain confidential commercial and financial information are subject to protection from public disclosure; LBP-16-12, 84 NRC 148 (2016)
- See also Sensitive Unclassified Nonsafeguards Information
- CONSIDERATION OF ALTERNATIVES**
- agencies must study, develop, and describe appropriate alternatives to the proposed action; CLI-16-16, 84 NRC 66 (2016); CLI-16-19, 84 NRC 180 (2016)
- alternatives analysis is the heart of the environmental impact statement; CLI-16-16, 84 NRC 66 (2016); CLI-16-19, 84 NRC 180 (2016)

## SUBJECT INDEX

land application of wastewater from in situ uranium mining is a reasonably foreseeable alternative and warrants discussion under NEPA and so must be addressed in the environmental assessment; LBP-16-13, 84 NRC 271 (2016)

### CONSTRUCTION OF MEANING

licensing boards follow a longstanding principle that, in the standing analysis, petition is to be construed in favor of petitioner; LBP-16-10, 84 NRC 17 (2016)

### CONSULTATION DUTY

after it identifies eligible sites that might be affected by the project, an agency must assess and resolve potential adverse effects in consultation with tribes that attach religious and cultural significance to those sites; CLI-16-20, 84 NRC 219 (2016)

agency shortcomings, such as misrepresenting important facts or only relying on written communications, may render an opportunity to consult unreasonable; CLI-16-20, 84 NRC 219 (2016)

because the board focused its attention on apportioning culpability for what became an impasse, instead of determining whether the opportunity for consultation itself was a reasonable one, the board's decision constituted legal error; CLI-16-20, 84 NRC 219 (2016)

consultation with Fish and Wildlife or the National Marine Fisheries Service or both is required for actions that may affect listed species; CLI-16-16, 84 NRC 66 (2016)

consultation with Indian tribes is not the same thing as control over a project; CLI-16-20, 84 NRC 219 (2016)

consulting parties include Indian tribes and certain individuals and organizations with a demonstrated interest in the undertaking due to their legal or economic relation to the undertaking or affected properties; CLI-16-20, 84 NRC 219 (2016)

correct legal standard is whether NRC Staff provided a reasonable opportunity for consultation; CLI-16-20, 84 NRC 219 (2016)

even if a party's involvement in consultation about historic properties is limited, if that limited involvement is by choice, the agency has provided the party with a reasonable opportunity to participate; CLI-16-20, 84 NRC 219 (2016)

federal agencies need not acquiesce to every tribal request; CLI-16-20, 84 NRC 219 (2016)

first step in the consultation requirement is identifying any historic properties that might be affected by the federal undertaking and, in doing so, making a reasonable and good-faith effort to seek information from consulting parties, including Native American Tribes, to aid in that identification; CLI-16-20, 84 NRC 219 (2016)

NRC Staff nonconcurrences associated with general license to construct an independent spent fuel storage installation centered on the concern that consultations on the project did not include a specific discussion that an ISFSI could be constructed; CLI-16-16, 84 NRC 66 (2016)

reasonable opportunity to consult does not guarantee any specific results; CLI-16-20, 84 NRC 219 (2016)

tribe must be provided with adequate information or time; CLI-16-20, 84 NRC 219 (2016)

### CONTAINMENT

control of hydrogen, oxygen, and other substances in the containment atmosphere is necessary to ensure that containment integrity is maintained; LBP-16-10, 84 NRC 17 (2016)

### CONTAINMENT DESIGN

criteria to be met by systems to control fission products, hydrogen, oxygen, and other substances that may be released into the reactor containment are provided in 10 C.F.R. pt. 50, app. A, GDC 41; LBP-16-10, 84 NRC 17 (2016)

### CONTENTIONS

ultimate burden with respect to NEPA lies with NRC Staff, but NRC regulations require that intervenors file environmental contentions on the applicant's environmental report; CLI-16-20, 84 NRC 219 (2016)

See also Abeyance of Contention

### CONTENTIONS, ADMISSIBILITY

admissible contention must meet the six criteria of 10 C.F.R. 2.309(f)(1)(i)-(vi); LBP-16-10, 84 NRC 17 (2016)

allegations that are sufficient to establish standing may be insufficient to support a valid contention; LBP-16-10, 84 NRC 17 (2016)

## SUBJECT INDEX

although intervenors presented no evidence in support of the tornado portion of their contention, this is not by itself fatal to the contention because NRC Staff bears the ultimate burden of proof for showing that it complied with NEPA; LBP-16-13, 84 NRC 271 (2016)

arguments that are raised for the first time in a reply will not be considered; LBP-16-11, 84 NRC 139 (2016)

at the contention admissibility stage, boards are expected to examine cited materials to verify that they do, in fact, support a contention; LBP-16-10, 84 NRC 17 (2016)

attack on NRC regulations is impermissible; CLI-16-20, 84 NRC 219 (2016)

challenge does not raise a substantial question for review because new contention did not meet admission requirements; CLI-16-20, 84 NRC 219 (2016)

challenges to NRC's NEPA process generally present an impermissible challenge to the agency's generally applicable rules and are not cognizable in individual licensing proceedings; CLI-16-18, 84 NRC 167 (2016)

challenges to the AP1000 design certified in Part 52, Appendix D is an impermissible challenge to NRC regulations; LBP-16-10, 84 NRC 17 (2016)

Commission gives substantial deference to boards on issues of contention admissibility and will affirm admissibility determinations absent a showing of an error of law or abuse of discretion; CLI-16-20, 84 NRC 219 (2016)

Commission ruling that petitioners had standing based on the proximity presumption did not signify any opinion on admissibility or merits of petitioners' contention; LBP-16-10, 84 NRC 17 (2016)

contention is inadmissible if it fails to present sufficient information to show a genuine dispute exists on a material issue of law or fact; CLI-16-20, 84 NRC 219 (2016); LBP-16-10, 84 NRC 17 (2016)

contention that attacks a Commission rule or that seeks to litigate a matter that is, or clearly is about to become, the subject of a rulemaking, is inadmissible; LBP-16-10, 84 NRC 17 (2016)

contention that neither substantively disputes analysis of impacts related to disposal of byproduct material in relevant sections of the DSEIS and the GEIS nor addresses license condition related to disposal of byproduct material is inadmissible; CLI-16-20, 84 NRC 219 (2016)

contention that seeks to impose requirements that are outside the scope of a proceeding is inadmissible; LBP-16-10, 84 NRC 17 (2016)

contentions are inadmissible if petition fails to demonstrate a genuine dispute with the license amendment application; LBP-16-11, 84 NRC 139 (2016)

contentions have been denied on the basis of prematurity; CLI-16-19, 84 NRC 180 (2016)

contentions challenging continued storage rule are inadmissible; CLI-16-19, 84 NRC 180 (2016)

contentions must be set forth with particularity; LBP-16-14, 84 NRC 444 (2016)

efforts to rehabilitate an unsupported contention by providing additional detail and arguments in a reply brief contravene NRC procedural rules; CLI-16-17, 84 NRC 99 (2016)

if boards were to create contentions out of petitioners' various conclusory and unsupported objections, they would be taking on a task that properly belongs to petitioners or to their counsel, not to the board; LBP-16-14, 84 NRC 444 (2016)

information that is not materially different from previously available information does not paint a seriously different picture of the environmental landscape; CLI-16-20, 84 NRC 219 (2016)

licensing boards should not accept in individual license proceedings contentions that are the subject of rulemaking by the Commission; LBP-16-11, 84 NRC 139 (2016)

motions to reinstate Fukushima-related contentions have been denied for lack of jurisdiction; CLI-16-19, 84 NRC 180 (2016)

new contention that spot-check methodology used by NRC Staff to evaluate well logs was unacceptable was inadmissible because information in the well logs was not materially different from information already in the record; CLI-16-20, 84 NRC 219 (2016)

new contentions must comply with applicable timeliness and contention admissibility requirements; LBP-16-13, 84 NRC 271 (2016)

no rule or regulation of the Commission, or any provision thereof, concerning the licensing of production and utilization facilities is subject to attack by way of discovery, proof, argument, or other means in any adjudicatory proceeding subject to Part 2 procedural rules; LBP-16-10, 84 NRC 17 (2016); LBP-16-11, 84 NRC 139 (2016)

## SUBJECT INDEX

participant in an adjudicatory proceeding may not challenge a standard design such as the AP1000 that has been approved by regulation; LBP-16-10, 84 NRC 17 (2016)

parties challenging an agency's NEPA process are not entitled to relief unless they demonstrate harm or prejudice; CLI-16-20, 84 NRC 219 (2016)

petition does not raise a substantial question regarding board's finding that information in the preliminary assessment about unreclaimed mines was insufficient to meet admissibility requirements; CLI-16-20, 84 NRC 219 (2016)

petitioner in a license amendment proceeding must identify some plausible chain of causation or some scenario suggesting how the particular license amendments would result in a distinct new harm or threat to petitioner or its members; LBP-16-10, 84 NRC 17 (2016)

petitioner is prohibited from challenging the certified design through adjudication, and its allegations regarding Fukushima are also outside the scope of the proceeding because the Commission is handling that issue through rulemaking; LBP-16-10, 84 NRC 17 (2016)

petitioner may not challenge a regulatory requirement unless it petitions for a waiver; LBP-16-11, 84 NRC 139 (2016)

petitioner must meet contention admissibility requirements of 10 C.F.R. 2.309(f)(1); LBP-16-11, 84 NRC 139 (2016)

petitioners must raise specific challenges, both to fairly notify other parties of the claims against them and to ensure that agency adjudications remain focused; CLI-16-17, 84 NRC 99 (2016)

placeholder contentions are inadmissible; CLI-16-16, 84 NRC 66 (2016)

protestant must make a minimal showing that material facts are in dispute, thereby demonstrating that an inquiry in depth is appropriate; LBP-16-10, 84 NRC 17 (2016)

regulatory history demonstrates that petitioner's hydrogen source arguments are, in effect, an impermissible challenge to a regulation that has evolved on the issue of hydrogen sources; LBP-16-10, 84 NRC 17 (2016)

requirements for contention admissibility are considerably more stringent than those for standing; LBP-16-10, 84 NRC 17 (2016)

standing and contention admissibility are distinct issues, and a licensing board need not rule on contention admissibility to decide standing; LBP-16-10, 84 NRC 17 (2016)

to satisfy contention admissibility requirements, petitioner must identify facts or expert opinions on which it relies and show that they present a genuine dispute of material fact with the application; LBP-16-10, 84 NRC 17 (2016)

when an issue is resolved generically, petitioner's remedy lies in the rulemaking process, not through adjudication; LBP-16-10, 84 NRC 17 (2016)

**CONTENTIONS, LATE-FILED**

information that is not materially different from previously available information does not paint a seriously different picture of the environmental landscape; CLI-16-20, 84 NRC 219 (2016)

new contentions must comply with applicable timeliness and contention admissibility requirements; LBP-16-13, 84 NRC 271 (2016)

**CONTINUED STORAGE RULE**

Commission declined to order supplementation of final environmental impact statements to reference the Continued Storage generic EIS; CLI-16-16, 84 NRC 66 (2016)

contentions challenging continued storage rule are inadmissible; CLI-16-19, 84 NRC 180 (2016)

final licensing decisions were suspended and any related contentions were held in abeyance until the court's remand on spent fuel storage was appropriately addressed; CLI-16-19, 84 NRC 180 (2016)

petitions for review challenging NRC's updated continued storage rule were denied; CLI-16-20, 84 NRC 219 (2016)

spent fuel can remain onsite indefinitely; CLI-16-17, 84 NRC 99 (2016)

suspension on final licensing decisions was removed after NRC approved a generic environmental impact statement and final Continued Storage Rule that addressed the issues in the D.C. Circuit's remand; CLI-16-19, 84 NRC 180 (2016)

waste confidence rule and the continued storage rule apply only to environmental impacts of spent fuel storage at power reactors and spent fuel storage facilities after the end of a reactor's license term and before disposal in a deep geologic repository, not to 11e(2) byproduct material; CLI-16-20, 84 NRC 219 (2016)

## SUBJECT INDEX

### COST-BENEFIT ANALYSIS

See Benefit-Cost Analysis

### COSTS

NRC looks for guidance to Council on Environmental Quality's implementing regulations for NEPA, which specify that an agency need not include relevant information if the overall costs of obtaining it are exorbitant; CLI-16-20, 84 NRC 219 (2016)

See also Decommissioning Costs

### COUNCIL ON ENVIRONMENTAL QUALITY GUIDELINES

NRC looks for guidance to CEQ's implementing regulations for NEPA, which specify that an agency need not include relevant information if the overall costs of obtaining it are exorbitant; CLI-16-20, 84 NRC 219 (2016)

techniques of tiering and incorporation by reference described in CEQ's NEPA regulations are adopted in 10 C.F.R. pt. 51, app. A, § 1(b); LBP-16-13, 84 NRC 271 (2016)

to incorporate outside documents into a NEPA document, CEQ regulations provide that incorporated material shall be cited in the statement and its content briefly described; LBP-16-13, 84 NRC 271 (2016)

while NRC is not bound by CEQ regulations, it looks to them for guidance; CLI-16-20, 84 NRC 219 (2016)

### CREDIBILITY

Commission deference to the board is particularly great when it comes to weighing the credibility of witnesses; CLI-16-20, 84 NRC 219 (2016)

### CULTURAL RESOURCES

first step in the consultation requirement is identifying any historic properties that might be affected by the federal undertaking and, in doing so, making a reasonable and good-faith effort to seek information from consulting parties, including Native American tribes, to aid in that identification; CLI-16-20, 84 NRC 219 (2016)

historic properties are districts, sites, buildings, structures, or objects included in or eligible for inclusion in, the National Register of Historic Places; CLI-16-20, 84 NRC 219 (2016)

National Environmental Policy Act requires analysis of effects on all cultural resources present at the site, not only those properties eligible for listing on the National Register of Historic Places, which is the standard for further analysis under the National Historic Preservation Act; CLI-16-20, 84 NRC 219 (2016)

See also Historic Sites

### DEADLINES

although NRC treats pro se litigants more leniently than litigants with counsel, pro se parties are still expected to comply with basic procedural rules, especially ones as simple to understand as those establishing filing deadlines; LBP-16-11, 84 NRC 139 (2016)

reply must be filed within 7 days of any answer; LBP-16-11, 84 NRC 139 (2016)

### DECISION ON THE MERITS

board ruled in favor of intervenor after a merits hearing but directed parties to undertake additional action to cure identified deficiencies; CLI-16-20, 84 NRC 219 (2016)

review is seldom granted where petitioner relies primarily on claims that the board erred in weighing the evidence in a merits decision; CLI-16-20, 84 NRC 219 (2016)

standing determination is not the appropriate juncture at which to make findings on the underlying dispute because doing so would require reaching beyond the minimum threshold for standing; LBP-16-10, 84 NRC 17 (2016)

standing is a threshold legal question that does not require assessment of petitioner's case on the merits; LBP-16-10, 84 NRC 17 (2016)

### DECISIONS

See Licensing Board Decisions; Record of Decision; Vacation of Decision

### DECOMMISSIONING

activities require NEPA compliance; CLI-16-17, 84 NRC 99 (2016)

although NRC Staff solicited comments on a post-shutdown decommissioning activities report, NRC regulations do not provide a hearing opportunity on it; CLI-16-17, 84 NRC 99 (2016)

## SUBJECT INDEX

“decommission” means removal of a facility or site safely from service and reduction of residual radioactivity to a level that permits release of the property for unrestricted use and termination of the license or release of the property under restricted conditions and termination of the license; CLI-16-17, 84 NRC 99 (2016)

following submission of the post-shutdown decommissioning activities report, licensee must notify NRC in writing and provide a copy to the affected state, before performing any activity inconsistent with, or making any significant schedule change from, activities and schedules described in the PSDAR, including changes that significantly increase the decommissioning cost; CLI-16-17, 84 NRC 99 (2016)

licensee may begin major activities 90 days after NRC Staff receives the post-shutdown decommissioning activities report; CLI-16-17, 84 NRC 99 (2016)

licensee may not perform activities that would foreclose release of the site for possible unrestricted use, result in significant environmental impacts not previously reviewed, or result in lack of reasonable assurance that adequate funds will be available for decommissioning; CLI-16-17, 84 NRC 99 (2016)

licensee must submit a post-shutdown decommissioning activities report prior to or within 2 years following permanent cessation of operations; CLI-16-17, 84 NRC 99 (2016)

licensees are prohibited from performing major decommissioning activities until 90 days after the Staff has received the post-shutdown decommissioning activities report; CLI-16-17, 84 NRC 99 (2016)

“major decommissioning activity” for a nuclear power plant is any activity that results in permanent removal of major radioactive components, permanently modifies the structure of the containment, or results in dismantling components for shipment containing greater than class C waste in accordance with 10 C.F.R. 61.55; CLI-16-17, 84 NRC 99 (2016)

NRC Staff will notice receipt of the post-shutdown decommissioning activities report, make it available for public comment, and hold a public meeting on its contents; CLI-16-17, 84 NRC 99 (2016)

NRC Staff’s failure to find that licensee’s post-shutdown decommissioning activities report was deficient does not result in the PSDAR attaining the force of law; CLI-16-17, 84 NRC 99 (2016)

post-shutdown decommissioning activities report does not amend the license and thus licensee is not required to submit a corresponding environmental report; CLI-16-17, 84 NRC 99 (2016)

post-shutdown decommissioning activities report must include a discussion of reasons for concluding that the environmental impacts associated with site-specific decommissioning activities will be bounded by appropriate previously issued environmental impact statements; CLI-16-17, 84 NRC 99 (2016)

process begins when licensee certifies to NRC Staff that it has permanently ceased operations and has permanently removed fuel from the reactor vessel; CLI-16-17, 84 NRC 99 (2016)

scope of permissible actions that a licensee who has entered the decommissioning process may take are defined in the generic environmental impact statement; CLI-16-17, 84 NRC 99 (2016)

### DECOMMISSIONING COSTS

annual review of decommissioning expenses and funding by both NRC Staff and licensee is required through license termination; CLI-16-17, 84 NRC 99 (2016)

if there is a shortfall between remaining decommissioning funds and the updated cost to complete decommissioning, licensee must provide additional financial assurance; CLI-16-17, 84 NRC 99 (2016)

licensee’s annual financial assurance status reports include the amount spent on decommissioning activities, the amount remaining in the fund, and an updated estimate of the costs required to complete decommissioning; CLI-16-17, 84 NRC 99 (2016)

post-shutdown decommissioning activities report must include a site-specific decommissioning cost estimate; CLI-16-17, 84 NRC 99 (2016)

### DECOMMISSIONING FUND DISBURSEMENTS

argument that a specific disbursement from the decommissioning fund is inconsistent with an approved exemption is appropriately raised via a request for enforcement action; CLI-16-17, 84 NRC 99 (2016)

concerns about use of decommissioning trust funds largely raise oversight matters that are appropriately addressed via requests for enforcement action; CLI-16-17, 84 NRC 99 (2016)

if there is a shortfall between remaining decommissioning funds and the updated cost to complete decommissioning, licensee must provide additional financial assurance; CLI-16-17, 84 NRC 99 (2016)

licensee is prohibited from making a withdrawal from decommissioning funds that would inhibit its ability to complete funding of any shortfalls in the decommissioning trust; CLI-16-17, 84 NRC 99 (2016)

licensee request for exemption from regulation to allow it to make withdrawals from decommissioning trust fund for certain irradiated fuel management costs was approved; CLI-16-17, 84 NRC 99 (2016)

## SUBJECT INDEX

- licensee request for exemption from requirement that it provide 30 working days' advance notice to NRC of intended disbursements was approved; CLI-16-17, 84 NRC 99 (2016)
- licensee requested license amendments to modify existing trust-related license conditions to reflect proposed transfer and to adopt the regulatory requirements of 10 C.F.R. 50.75(h)(1); LBP-16-14, 84 NRC 444 (2016)
- licensee was permitted to make withdrawals from the decommissioning trust fund for spent fuel management expenses because it was exempted from the regulation but it was still required to provide 30-day notices of withdrawals for nonadministrative expenses because NRC Staff had not yet granted the license amendment request subjecting licensee to section 50.75(h)(1)(iv); CLI-16-17, 84 NRC 99 (2016)
- licensee's annual financial assurance status reports include the amount spent on decommissioning activities, the amount remaining in the fund, and an updated estimate of the costs required to complete decommissioning; CLI-16-17, 84 NRC 99 (2016)
- licensees may use decommissioning trust funds only for legitimate decommissioning activities consistent with the definition of decommissioning in 10 C.F.R. 50.2; CLI-16-17, 84 NRC 99 (2016)
- limits on use of a decommissioning trust fund are provided in 10 C.F.R. 50.82(a)(8)(i); CLI-16-17, 84 NRC 99 (2016)
- NRC Staff has granted exemptions from the 30-day notification requirement for intended disbursements from the decommissioning trust fund; CLI-16-17, 84 NRC 99 (2016)
- NRC Staff should not allow withdrawal of funds that have been deposited to meet NRC decommissioning objectives to satisfy generic formula amounts set forth in 10 C.F.R. 50.75(c); CLI-16-17, 84 NRC 99 (2016)
- NRC Staff, when reviewing notifications for withdrawal of funds to be used for decommissioning purposes, must look to whether the activity or expense is directly related to the radiological decontamination of the facility or qualifies as an administrative expense consistent with NRC regulations and to the applicable license conditions; CLI-16-17, 84 NRC 99 (2016)
- NRC's grant of an exemption approving use of trust funds for a purpose other than decommissioning does not amount to endorsement of conduct inconsistent with any provision of the license; CLI-16-17, 84 NRC 99 (2016)
- requirements for using decommissioning trust funds for decommissioning activities involve other requirements of an administrative, managerial, or organizational nature; CLI-16-17, 84 NRC 99 (2016)
- withdrawal of license amendment request was conditioned on the requirement that licensee specify in its notification to NRC that it is reimbursing itself from the decommissioning trust fund for certain expenses; CLI-16-17, 84 NRC 99 (2016)
- DECOMMISSIONING FUNDING**
- amount of funds may be more, but not less, than the amount required by the formula established in 10 C.F.R. 50.75(b)(1); CLI-16-17, 84 NRC 99 (2016)
- anyone directing investments made in the decommissioning trust shall adhere to the prudent investor standard of the Federal Energy Regulatory Commission; CLI-16-17, 84 NRC 99 (2016)
- applicants and licensees must provide reasonable assurance that decommissioning funds will be available for the decommissioning process; CLI-16-17, 84 NRC 99 (2016)
- licensee must provide additional funds if the annual financial assurance report reveals insufficient funds to complete decommissioning; CLI-16-17, 84 NRC 99 (2016)
- licensee must submit an annual financial assurance report; CLI-16-17, 84 NRC 99 (2016)
- licensee must submit annual reports to NRC Staff regarding status of its funding for irradiated fuel management, including a plan to obtain additional funds to cover any expected shortfalls; CLI-16-17, 84 NRC 99 (2016)
- limit on the interest rate licensees may use in decommissioning funding projections is 2%; CLI-16-17, 84 NRC 99 (2016)
- minimum amounts required to demonstrate reasonable assurance of funds for decommissioning are based on activities related to the definition of decommission in 10 C.F.R. 50.2 and do not include the cost of removal and disposal of spent fuel or of nonradioactive structures and materials beyond that necessary to terminate the license; CLI-16-17, 84 NRC 99 (2016)
- proximity presumption does not apply in the context of a decommissioning trust transfer; LBP-16-14, 84 NRC 444 (2016)

## SUBJECT INDEX

- trust funds are prepaid pursuant to monetary levels required by 10 C.F.R. 50.75(b) and (c), and are segregated from licensee's assets and outside its administrative control; LBP-16-12, 84 NRC 148 (2016)
- DECOMMISSIONING FUNDING PLANS
- if licensee with existing license conditions relating to decommissioning trust agreements elects to amend those conditions, the license amendment shall be in accordance with the provisions of 10 C.F.R. 50.75(h); CLI-16-17, 84 NRC 99 (2016)
- license amendment application that does no more than delete specific license conditions relating to the terms and conditions of decommissioning trust agreements involves no significant hazards consideration; CLI-16-17, 84 NRC 99 (2016)
- licensee may demonstrate reasonable assurance by setting up a decommissioning trust fund that is segregated from licensee assets and in which the total amount of funds would be sufficient to pay decommissioning costs at the time permanent termination of operations is expected; CLI-16-17, 84 NRC 99 (2016)
- licensees have the option of maintaining existing license conditions relating to decommissioning trust agreements or following the new requirements for decommissioning as long as licensee does not elect to amend those license conditions; CLI-16-17, 84 NRC 99 (2016)
- non-rate-regulated reactor licensee with decommissioning trust fund license conditions may elect either to maintain those conditions or to seek a license amendment to remove those conditions, in which case it would be subject to 10 C.F.R. 50.75(h)(1)-(3); CLI-16-17, 84 NRC 99 (2016)
- DECOMMISSIONING PLANS
- plan for fuel management following cessation of reactor operations, including funding, is required; CLI-16-17, 84 NRC 99 (2016)
- DEFICIENCIES
- applications must be incomprehensible and useless to the public to be deficient; CLI-16-20, 84 NRC 219 (2016)
- board can uphold NRC Staff's proposed action despite deficiencies in its NEPA documents if sufficient evidence is developed in an adjudicatory proceeding concerning the environmental impacts of the proposed action; CLI-16-18, 84 NRC 167 (2016)
- NRC Staff witnesses' testimony on characteristics and hazards of all historic earthquakes within a 100-mile radius of the license area cures the deficiency in the environmental assessment; LBP-16-13, 84 NRC 271 (2016)
- with the adjudicatory record curing deficiencies in the environmental assessment, there is no need to return the EA to NRC Staff to correct deficiencies; LBP-16-13, 84 NRC 271 (2016)
- DEFINITIONS
- "administrative," "managerial," and "organizational" refer to exemptions associated with ministerial changes rather than to exemptions with substantive effects; CLI-16-17, 84 NRC 99 (2016)
- "byproduct material" is tailings or wastes produced by the extraction or concentration of uranium or thorium from any ore processed primarily for its source material content; CLI-16-20, 84 NRC 219 (2016)
- consulting parties include Indian tribes and certain individuals and organizations with a demonstrated interest in the undertaking due to their legal or economic relation to the undertaking or affected properties; CLI-16-20, 84 NRC 219 (2016)
- "decommission" is removal of a facility or site safely from service and reduction of residual radioactivity to a level that permits release of the property for unrestricted use and termination of the license or release of the property under restricted conditions and termination of the license; CLI-16-17, 84 NRC 99 (2016)
- direct license transfer entails a change to operating and/or possession authority; LBP-16-12, 84 NRC 148 (2016)
- historic properties are districts, sites, buildings, structures, or objects included in or eligible for inclusion in, the National Register of Historic Places; CLI-16-20, 84 NRC 219 (2016)
- indirect license transfer involves corporate restructuring or reorganizations that leave licensee itself intact as a corporate entity; LBP-16-12, 84 NRC 148 (2016)
- jurisdiction is power to declare the law, and when it ceases to exist, the only function remaining to the court is that of announcing the fact and dismissing the cause; LBP-16-14, 84 NRC 444 (2016)

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“major decommissioning activity” for a nuclear power plant is any activity that results in permanent removal of major radioactive components, permanently modifies the structure of the containment, or results in dismantling components for shipment containing greater than class C waste in accordance with 10 C.F.R. 61.55; CLI-16-17, 84 NRC 99 (2016)

tiering is a form of incorporation by reference whereby an agency incorporates a generic environmental impact statement into a site-specific analysis; LBP-16-13, 84 NRC 271 (2016)

### DELAY

board does not have authority to review a claim of unreasonable delay regarding a petition for rulemaking that is before the Commission; LBP-16-11, 84 NRC 139 (2016)

claim of unreasonable delay should be raised directly with the Commission, or possibly before the courts; LBP-16-11, 84 NRC 139 (2016)

reviewing court shall compel agency action unlawfully withheld or unreasonably delayed; LBP-16-11, 84 NRC 139 (2016)

### DESIGN

nuclear power plant designs must include a system capable of removing residual heat, defined such that the decay heat does not exceed design limits for the fuel and pressure boundary in the event of an accident unrelated to the loss of coolant; CLI-16-16, 84 NRC 66 (2016)

PRHR heat exchanger 72-hour safety-related period of operation and a 14-day non-safety-related design requirement are consistent with NRC’s approach to compliance; CLI-16-16, 84 NRC 66 (2016)

See Containment Design; Reactor Design

### DESIGN BASIS ACCIDENT

amendment to 10 C.F.R. 50.44(a)(1)-(3) eliminated hydrogen generation controls associated with a design-basis loss-of-coolant accident; LBP-16-10, 84 NRC 17 (2016)

### DESIGN CERTIFICATION

additional or alternative structures, systems, components, design features, design criteria, testing, analyses, acceptance criteria, or justifications are not necessary for the AP1000 design; LBP-16-10, 84 NRC 17 (2016)

AP1000 design control document is incorporated by reference in the design certification rule and sets forth location criteria, implementation requirements, and in-containment elevations of hydrogen igniters; LBP-16-10, 84 NRC 17 (2016)

applicant must include the principal design criteria identified in the General Design Criteria in 10 C.F.R. pt. 50, app. A in its preliminary safety analysis report; LBP-16-10, 84 NRC 17 (2016)

certified reactor design is final and NRC may not impose new requirements absent special circumstances; LBP-16-10, 84 NRC 17 (2016)

departures from a certified design that involve a change to the design as described in the rule certifying the design require an exemption from NRC regulations; CLI-16-16, 84 NRC 66 (2016)

during the AP1000 design certification process, NRC reviewed placement of hydrogen igniters and concluded that adequate coverage existed to satisfy the requirements of 10 C.F.R. 50.44; LBP-16-10, 84 NRC 17 (2016)

finality in license amendment proceeding applies to all Tier 1 and 2 issues, including the hydrogen control system and hydrogen igniters that were part of the certified design; LBP-16-10, 84 NRC 17 (2016)

issues resolved in the AP1000 design certification rulemaking are closed and will not be revisited in a mandatory combined license proceeding unless they are the subject of a departure or exemption; CLI-16-19, 84 NRC 180 (2016)

NRC approval is not required for departures from the AP1000 design control document that have no safety significance; CLI-16-19, 84 NRC 180 (2016)

NRC Staff may approve an exemption from a certified design where it finds that the exemption is authorized by law, will not present an undue risk to the public health and safety, is consistent with the common defense and security, and special circumstances exist that warrant the exemption; CLI-16-16, 84 NRC 66 (2016)

NRC Staff must determine that special circumstances outweigh any decrease in safety resulting from the reduction in standardization that may result from an exemption from a certified design; CLI-16-16, 84 NRC 66 (2016)

## SUBJECT INDEX

where a combined license applicant references a certified design, changes to the design may be made in the combined license if proposed as a departure from the certified design, and some departures from the certified design may be made without prior Commission approval; CLI-16-16, 84 NRC 66 (2016)

### DESIGN CONTROL PROGRAMS

licensee's failure to perform primary stress analyses for SL-2 replacement steam generator tube-to-tubesheet welds was a violation of quality assurance requirements for design control; DD-16-2, 84 NRC 1 (2016)

### DISCLOSURE

portions of an application that contain confidential commercial and financial information are subject to protection from public disclosure; LBP-16-12, 84 NRC 148 (2016)

when the environmental record of decision is supplemented by the adjudicatory process, the disclosure purpose of NEPA is satisfied through the public vetting of environmental issues at an evidentiary hearing and issuance of a decision, and consequently, NRC Staff is not required to otherwise supplement or amend its NEPA documents; CLI-16-18, 84 NRC 167 (2016)

where necessary data for NEPA reviews may be unavailable, unreliable, inapplicable, or simply not adaptable, NRC Staff has been directed to provide a reasonable analysis of the available information with a disclosure of incomplete or unavailable information; CLI-16-20, 84 NRC 219 (2016)

### EARLY SITE PERMITS

if a combined license application does not reference an early site permit, all site characteristics as well as the potential environmental impacts of the project are considered during review of the application; CLI-16-19, 84 NRC 180 (2016)

### EARTHQUAKES

NRC Staff's witnesses' testimony on characteristics and hazards of all historic earthquakes within a 100-mile radius of the license area cures the deficiency in the environmental assessment; LBP-16-13, 84 NRC 271 (2016)

See also Seismic Risk

### EMERGENCY EXERCISES

NRC Staff will verify adequacy of combined license applicant's training program by inspecting applicant's ability to adequately perform designated emergency response organization functions during the required exercise described in the emergency preparedness ITAAC and subsequent biennial exercises if NRC later makes the finding required; CLI-16-19, 84 NRC 180 (2016)

NRC Staff's finding that Operations Support Centers would serve their intended emergency functions is subject to a demonstration of their adequacy during the full-participation exercise that would be required before fuel load, as reflected in the inspections, tests, analyses, and acceptance criteria in the draft combined licenses; CLI-16-19, 84 NRC 180 (2016)

### EMERGENCY OPERATIONS FACILITY

combined license applicant's emergency plan must make provisions for an EOF from which effective direction can be given and effective control can be exercised during an emergency; CLI-16-19, 84 NRC 180 (2016)

effective direction can be given and effective control can be exercised during an emergency at a single EOF for multiple sites; CLI-16-19, 84 NRC 180 (2016)

facility may serve more than one nuclear power plant site, but Commission approval is required where applicant or licensee proposes to locate the EOF more than 25 miles from the site; CLI-16-19, 84 NRC 180 (2016)

NRC Staff's finding that Operations Support Centers would serve their intended emergency functions is subject to a demonstration of their adequacy during the full-participation exercise that would be required before fuel load, as reflected in the inspections, tests, analyses, and acceptance criteria in the draft combined licenses; CLI-16-19, 84 NRC 180 (2016)

### EMERGENCY PLANS

combined license applicant's emergency plan must provide for an emergency operations facility from which effective direction can be given and effective control can be exercised during an emergency; CLI-16-19, 84 NRC 180 (2016)

combined license applicants must provide an emergency plan that complies with 10 C.F.R. 50.47 and 10 C.F.R. pt. 50, app. E; CLI-16-19, 84 NRC 180 (2016)

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### EMERGENCY RESPONSE PERSONNEL

NRC Staff will verify adequacy of combined license applicant's training program by inspecting applicant's ability to adequately perform designated emergency response organization functions during the required exercise described in the emergency preparedness ITAAC and subsequent biennial exercises if the NRC later makes the finding required; CLI-16-19, 84 NRC 180 (2016)

### EMPLOYEE PROTECTION

proximity presumption for standing has been rejected for certain changes to worker-protection requirements; LBP-16-10, 84 NRC 17 (2016)

### ENDANGERED SPECIES

consultation with Fish and Wildlife or the National Marine Fisheries Service or both is required for actions that may affect listed species; CLI-16-16, 84 NRC 66 (2016)

federal agencies must ensure that any action authorized, funded, or carried out by the agency is not likely to jeopardize the continued existence of any listed endangered or threatened species or designated critical habitat; CLI-16-16, 84 NRC 66 (2016)

### ENDANGERED SPECIES ACT

nonconcurrence related to whether additional steps are warranted under NEPA, the NHPA, and the Endangered Species Act, in view of the possibility that an independent spent fuel storage installation could be constructed on the site at some future time is discussed; CLI-16-19, 84 NRC 180 (2016)

### ENFORCEMENT ACTIONS

concerns about the use of decommissioning trust funds largely raise oversight matters that are appropriately addressed via requests for enforcement action; CLI-16-17, 84 NRC 99 (2016)

director of NRC office with responsibility for the subject matter shall either institute a requested proceeding or advise petitioner in writing that no proceeding will be instituted, in whole or in part, with respect to the request, and the reason for the decision; DD-16-2, 84 NRC 1 (2016)

proper avenue for challenge seeking greater specificity in a license condition is to pursue an enforcement action; CLI-16-17, 84 NRC 99 (2016)

### ENVIRONMENTAL ANALYSIS

adjudicatory record and board decision and any Commission appellate decisions become, in effect, part of the agency's final environmental analysis; LBP-16-13, 84 NRC 271 (2016)

agencies must use a systematic, interdisciplinary approach that will ensure integrated use of natural and social sciences and the environmental design arts in decision making that may impact the environment; CLI-16-19, 84 NRC 180 (2016)

agency determinations not to analyze impacts for which there are not yet standard methods of measurement or analysis have been upheld; CLI-16-20, 84 NRC 219 (2016)

in anticipating impacts, NEPA only requires a discussion of those impacts that are reasonably foreseeable; LBP-16-13, 84 NRC 271 (2016)

license termination plan must include a supplement to the previous environmental analysis describing any new information or significant environmental change associated with the proposed termination activities; CLI-16-17, 84 NRC 99 (2016)

NEPA does not call for certainty or precision, but an estimate of anticipated (not unduly speculative) impacts; LBP-16-13, 84 NRC 271 (2016)

NEPA only requires a discussion of reasonably foreseeable impacts and courts have excluded remote and speculative impacts from NEPA analysis; LBP-16-13, 84 NRC 271 (2016)

### ENVIRONMENTAL ASSESSMENT

agency must reference and summarize the specific issues addressed in the generic environmental impact statement that are to be tiered into a site-specific environmental impact statement or EA; LBP-16-13, 84 NRC 271 (2016)

allowing the adjudicatory proceeding to supplement an EA, in the same manner as is done for environmental impact statements, is appropriate; CLI-16-18, 84 NRC 167 (2016)

board can uphold NRC Staff's proposed action despite deficiencies in its NEPA documents if sufficient evidence is developed in an adjudicatory proceeding concerning the environmental impacts of the proposed action; CLI-16-18, 84 NRC 167 (2016)

exemption eligible for a categorical exclusion requires neither an EA nor an environmental impact statement to comply with NEPA; CLI-16-17, 84 NRC 99 (2016)

## SUBJECT INDEX

- in situ leach mining EA must reference and summarize specific issues addressed in the generic environmental impact statement that are to be discussed in the EA; LBP-16-13, 84 NRC 271 (2016)
- land application of wastewater from in situ uranium mining is a reasonably foreseeable alternative and warrants discussion under NEPA and so must be addressed in the environmental assessment; LBP-16-13, 84 NRC 271 (2016)
- licensing board's findings and conclusions are deemed to amend NRC Staff's NEPA documents and become the agency record of decision on those matters; CLI-16-18, 84 NRC 167 (2016)
- mere existence of a generic environmental impact statement is not sufficient to tier its contents into a site-specific environmental impact statement or EA; LBP-16-13, 84 NRC 271 (2016)
- NEPA requires the EA to address the reasonably foreseeable effects of a proposed action; LBP-16-13, 84 NRC 271 (2016)
- NRC Staff bears the ultimate burden of showing that it satisfied NEPA's information-disclosure mandate by meaningfully considering significant impacts and addressing those impacts in the EA; LBP-16-13, 84 NRC 271 (2016)
- NRC Staff may accord limited reliance to a state agency's environmental analyses where it is clear that the state agency conducted a thorough review; LBP-16-13, 84 NRC 271 (2016)
- NRC Staff may in certain circumstances incorporate by reference previous work that addresses a particular environmental issue, but only where the EA provides specific citations and briefly summarizes how those external documents support the EA's conclusion; LBP-16-13, 84 NRC 271 (2016)
- NRC Staff witnesses' testimony on characteristics and hazards of all historic earthquakes within a 100-mile radius of the license area cures the deficiency in the EA; LBP-16-13, 84 NRC 271 (2016)
- there are limits on the extent to which a licensing board can amend or cure a NEPA document; LBP-16-13, 84 NRC 271 (2016)
- to incorporate outside documents into a NEPA document, Council on Environmental Quality regulations provide that incorporated material shall be cited in the statement and its content briefly described; LBP-16-13, 84 NRC 271 (2016)
- when the environmental record of decision is supplemented by the adjudicatory process, the disclosure purpose of NEPA is satisfied through the public vetting of environmental issues at an evidentiary hearing and issuance of a decision, and consequently, NRC Staff is not required to otherwise supplement or amend its NEPA documents; CLI-16-18, 84 NRC 167 (2016)
- where an adjudicatory hearing tests the adequacy of NRC Staff's environmental review, a licensing board decision, as the final record of decision under NEPA, can amend NRC Staff's NEPA documents to become, in effect, part of the [final NEPA document; LBP-16-13, 84 NRC 271 (2016)
- with the adjudicatory record curing deficiencies in the environmental assessment, there is no need to return the EA to NRC Staff to correct deficiencies; LBP-16-13, 84 NRC 271 (2016)
- ENVIRONMENTAL EFFECTS**
- large environmental effects are clearly noticeable and are sufficient to destabilize important attributes of the resource; LBP-16-13, 84 NRC 271 (2016)
- licensee may not perform decommissioning activities that would foreclose release of the site for possible unrestricted use, result in significant environmental impacts not previously reviewed, or result in lack of reasonable assurance that adequate funds will be available for decommissioning; CLI-16-17, 84 NRC 99 (2016)
- when the environmental record of decision is supplemented by the adjudicatory process, the disclosure purpose of NEPA is satisfied through the public vetting of environmental issues at an evidentiary hearing and issuance of a decision, and consequently, NRC Staff is not required to otherwise supplement or amend its NEPA documents; CLI-16-18, 84 NRC 167 (2016)
- ENVIRONMENTAL FUNCTIONS**
- NEPA serves the purpose of environmental protection through action-forcing procedures that require agencies to take a hard look at environmental impacts and that provide for broad dissemination of relevant environmental information; CLI-16-18, 84 NRC 167 (2016)
- ENVIRONMENTAL IMPACT STATEMENT**
- agencies need not consider remote and speculative impacts; CLI-16-20, 84 NRC 219 (2016)
- agencies need only undertake reasonable efforts to acquire missing information; CLI-16-20, 84 NRC 219 (2016)

## SUBJECT INDEX

agency must reference and summarize the specific issues addressed in the generic EIS that are to be tiered into a site-specific EIS or environmental assessment; LBP-16-13, 84 NRC 271 (2016)

alternatives analysis is the heart of the EIS; CLI-16-16, 84 NRC 66 (2016); CLI-16-19, 84 NRC 180 (2016)

although agency had not properly notified plaintiff during the EIS scoping process, court's determination that plaintiff was unable to demonstrate prejudice after having participated in the development of the EIS was upheld; CLI-16-20, 84 NRC 219 (2016)

exemption eligible for a categorical exclusion requires neither an environmental assessment nor an EIS to comply with NEPA; CLI-16-17, 84 NRC 99 (2016)

in some instances, information relevant to an EIS will not be reasonably available and the agency is directed to proceed in accord with NEPA's rule of reason in the face of such lacunae; CLI-16-20, 84 NRC 219 (2016)

mere existence of a generic EIS is not sufficient to tier its contents into a site-specific EIS or environmental assessment; LBP-16-13, 84 NRC 271 (2016)

notice requirement ensures that interested parties are aware of and therefore able to participate meaningfully in the entire EIS process from start to finish; CLI-16-20, 84 NRC 219 (2016)

NRC looks for guidance to Council on Environmental Quality's implementing regulations for NEPA, which specify that an agency need not include relevant information if the overall costs of obtaining it are exorbitant; CLI-16-20, 84 NRC 219 (2016)

primary purpose of the scoping period is to notify those who may be affected by a proposed government action governed by NEPA that the relevant entity is beginning the EIS process; CLI-16-20, 84 NRC 219 (2016)

statutory requirement that a federal agency contemplating a major action prepare an EIS serves NEPA's action-forcing purpose; CLI-16-17, 84 NRC 99 (2016)

there are limits on the extent to which a licensing board can amend or cure a NEPA document; LBP-16-13, 84 NRC 271 (2016)

where an adjudicatory hearing tests the adequacy of NRC Staff's environmental review, a licensing board decision, as the final record of decision under NEPA, can amend Staff's NEPA documents to become, in effect, part of the [final NEPA document; LBP-16-13, 84 NRC 271 (2016)

where necessary data for NEPA reviews may be unavailable, unreliable, inapplicable, or simply not adaptable, NRC Staff has been directed to provide a reasonable analysis of the available information with a disclosure of incomplete or unavailable information; CLI-16-20, 84 NRC 219 (2016)

See also Final Environmental Impact Statement; Generic Environmental Impact Statement; Supplemental Environmental Impact Statement

**ENVIRONMENTAL ISSUES**

all safety and environmental matters relevant to a combined license application, except those resolved in the contested proceeding, are subject to review in the uncontested proceeding; CLI-16-16, 84 NRC 66 (2016)

determinations on environmental matters that the Commission must make for authorization of a combined license are listed in 10 C.F.R. 51.107(a); CLI-16-19, 84 NRC 180 (2016)

matters that must be considered in a mandatory combined license proceeding are discussed; CLI-16-16, 84 NRC 66 (2016)

**ENVIRONMENTAL REPORT**

post-shutdown decommissioning activities report does not amend the license and thus licensee is not required to submit a corresponding ER; CLI-16-17, 84 NRC 99 (2016)

**ENVIRONMENTAL REVIEW**

agencies must study, develop, and describe appropriate alternatives to the proposed action; CLI-16-16, 84 NRC 66 (2016)

agencies must use a systematic, interdisciplinary approach that will ensure the integrated use of the natural and social sciences and the environmental design arts in decision making that may impact the environment; CLI-16-16, 84 NRC 66 (2016)

agency decisionmaker must consider an adequate environmental review before making a decision on a licensing action; CLI-16-20, 84 NRC 219 (2016)

agency's failure to disapprove of plans when it has a mandatory obligation to review those plans renders its review a major federal action; CLI-16-17, 84 NRC 99 (2016)

## SUBJECT INDEX

certain types of exemptions may be categorically excluded from environmental review; CLI-16-17, 84 NRC 99 (2016)

challenges to NRC's NEPA process generally present an impermissible challenge to the agency's generally applicable rules and are not cognizable in individual licensing proceedings; CLI-16-18, 84 NRC 167 (2016)

core requirement of NEPA is that an agency decisionmaker must consider an adequate environmental review before making a decision on a licensing action; CLI-16-18, 84 NRC 167 (2016)

generic statements in the in situ leach mining generic environmental impact statement do not fulfill NRC Staff's obligations under NEPA with regard to significant impacts that could reasonably be posed to wildlife at the license area were licensee to commence land application of wastewater; LBP-16-13, 84 NRC 271 (2016)

if a combined license application does not reference an early site permit, all site characteristics as well as the potential environmental impacts of the project are considered during review of the application; CLI-16-19, 84 NRC 180 (2016)

major licensing actions are to consider carbon dioxide and other greenhouse gas emissions which should encompass emissions from construction, operation, and the uranium fuel cycle; CLI-16-19, 84 NRC 180 (2016)

NEPA does not mandate that an agency undertake studies to obtain information that is not already available; CLI-16-18, 84 NRC 167 (2016)

NEPA requires NRC Staff to take a hard look at any significant environmental consequences of a proposed licensing action; LBP-16-13, 84 NRC 271 (2016)

NEPA requires that an agency conduct its environmental review with the best information available today; CLI-16-18, 84 NRC 167 (2016)

new contention that spot-check methodology used by NRC Staff to evaluate well logs was unacceptable is inadmissible because information in the well logs is not materially different from information already in the record; CLI-16-20, 84 NRC 219 (2016)

NRC must assess the relationship between short-term uses and long-term productivity of the environment, consider alternatives, and describe the unavoidable adverse environmental impacts and the irreversible and irretrievable commitments of resources associated with the proposed action; CLI-16-16, 84 NRC 66 (2016)

NRC must weigh unavoidable adverse environmental impacts and resource commitments (environmental costs) of the project against the project's benefits; CLI-16-16, 84 NRC 66 (2016)

parties challenging an agency's NEPA process are not entitled to relief unless they demonstrate harm or prejudice; CLI-16-20, 84 NRC 219 (2016)

procedural violations of NEPA do not automatically void an agency's ultimate decision; CLI-16-20, 84 NRC 219 (2016)

review is required before NRC acts on matters affecting the quality of the human environment; CLI-16-17, 84 NRC 99 (2016)

**ERROR**

because the board focused its attention on apportioning culpability for what became an impasse instead of determining whether the opportunity for consultation itself was a reasonable one the board's decision constituted legal error; CLI-16-20, 84 NRC 219 (2016)

Commission gives substantial deference to boards on issues of contention admissibility and will affirm admissibility determinations absent a showing of an error of law or abuse of discretion; CLI-16-20, 84 NRC 219 (2016)

Commission reviews questions of law de novo, but defers to the board's findings with respect to underlying facts unless they are clearly erroneous; CLI-16-20, 84 NRC 219 (2016)

review is seldom granted where petitioner relies primarily on claims that the board erred in weighing the evidence in a merits decision; CLI-16-20, 84 NRC 219 (2016)

standard of clear error for overturning a board's factual findings is quite high; CLI-16-20, 84 NRC 219 (2016)

to prevail on appeal, a party must show not only that the majority erred but also that the error had a prejudicial effect on the party's case; CLI-16-20, 84 NRC 219 (2016)

to show clear error, petitioner must demonstrate that the board's determination is not even plausible in light of the record as a whole; CLI-16-18, 84 NRC 167 (2016); CLI-16-20, 84 NRC 219 (2016)

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### EVIDENTIARY HEARINGS

- NRC Staff witnesses' testimony on characteristics and hazards of all historic earthquakes within a 100-mile radius of the license area cures the deficiency in the environmental assessment; LBP-16-13, 84 NRC 271 (2016)
- protestant does not become entitled to an evidentiary hearing merely on request, or on a bald or conclusory allegation that a dispute exists; LBP-16-10, 84 NRC 17 (2016)
- when the environmental record of decision is supplemented by the adjudicatory process, the disclosure purpose of NEPA is satisfied through the public vetting of environmental issues at an evidentiary hearing and issuance of a decision, and consequently, NRC Staff is not required to otherwise supplement or amend its NEPA documents; CLI-16-18, 84 NRC 167 (2016)
- where there is an evidentiary dispute, licensing board decision makes any necessary factual findings based on a preponderance of the evidence; LBP-16-13, 84 NRC 271 (2016)

### EXCEPTIONS

- exception in 10 C.F.R. 51.92(d) does not apply to a supplemental, site-specific environmental impact statement that tiers off a generic EIS; CLI-16-20, 84 NRC 219 (2016)
- where applicant has withdrawn its license amendment request and the board has approved that withdrawal, the exception does not apply; CLI-16-17, 84 NRC 99 (2016)

### EXCLUSIONS

- See Categorical Exclusion

### EXEMPTIONS

- "administrative," "managerial," and "organizational" refer to exemptions associated with ministerial changes rather than to exemptions with substantive effects; CLI-16-17, 84 NRC 99 (2016)
- combined license holder may receive an exemption from certain requirements pertaining to material control and accounting for special nuclear materials, such that the same requirements apply to both Part 52 and Part 50 licensees; CLI-16-16, 84 NRC 66 (2016)
- Commission will exercise its discretion to limit exemptions in any particular area if the exceptions to the rule threaten to erode the rule itself; CLI-16-17, 84 NRC 99 (2016)
- demonstration of special circumstances is necessary to justify an exemption from regulations; CLI-16-17, 84 NRC 99 (2016)
- departures from a certified design that involve a change to the design as described in the rule certifying the design require an exemption from NRC regulations; CLI-16-16, 84 NRC 66 (2016)
- exemption eligible for a categorical exclusion requires neither an environmental assessment nor an environmental impact statement to comply with NEPA; CLI-16-17, 84 NRC 99 (2016)
- exemption from regulation will be approved if it is authorized by law, will not present an undue risk to the public health and safety, and is consistent with the common defense and security; CLI-16-17, 84 NRC 99 (2016)
- exemption requests are not subject to a hearing opportunity; CLI-16-17, 84 NRC 99 (2016)
- exemption requests relating to organization and numbering of combined license application and material control and accounting requirements for special nuclear material that apply to both Part 52 and Part 50 licensees are acceptable; CLI-16-19, 84 NRC 180 (2016)
- five common regulatory departures and exemptions are acceptable based on a reference combined license application; CLI-16-19, 84 NRC 180 (2016)
- issuance of an exemption from NRC regulations does not mean that NRC Staff has approved an amendment to the license; CLI-16-17, 84 NRC 99 (2016)
- licensee request for exemption from regulation to allow it to make withdrawals from decommissioning trust fund for certain irradiated fuel management costs was approved; CLI-16-17, 84 NRC 99 (2016)
- licensee request for exemption from requirement that it provide 30 working days' advance notice to NRC of intended disbursements was approved; CLI-16-17, 84 NRC 99 (2016)
- licensee was permitted to make withdrawals from the decommissioning trust fund for spent fuel management expenses because it was exempted from the regulation but it was still required to provide 30-day notices of withdrawals for nonadministrative expenses because NRC Staff had not yet granted the license amendment request subjecting licensee to section 50.75(h)(1)(iv); CLI-16-17, 84 NRC 99 (2016)
- NRC Staff has granted exemptions from the 30-day notification requirement for intended disbursements from the decommissioning trust fund; CLI-16-17, 84 NRC 99 (2016)

## SUBJECT INDEX

- NRC Staff is exempt from conducting a scoping process for a supplemental EIS based on a plain-language reading of 10 C.F.R. 51.26(d) and 51.92(d); CLI-16-20, 84 NRC 219 (2016)
- NRC Staff may approve an exemption from a certified design where it finds that the exemption is authorized by law, will not present an undue risk to the public health and safety, is consistent with the common defense and security, and special circumstances exist that warrant the exemption; CLI-16-16, 84 NRC 66 (2016)
- NRC Staff must determine that special circumstances outweigh any decrease in safety resulting from the reduction in standardization that may result from an exemption from a certified design; CLI-16-16, 84 NRC 66 (2016)
- NRC's grant of an exemption approving use of trust funds for a purpose other than decommissioning does not amount to endorsement of conduct inconsistent with any provision of the license; CLI-16-17, 84 NRC 99 (2016)
- requirement in 10 C.F.R. 50.82(a)(8)(i)(A) is not administrative, managerial, or organizational in nature; CLI-16-17, 84 NRC 99 (2016)
- requirements that combined license applicants must meet when seeking an exemption from the Commission's regulations are found in 10 C.F.R. 52.93; CLI-16-16, 84 NRC 66 (2016)
- scrutiny of a claimed exemption should be exacting where an agency seeks to undo all it accomplished through its rulemaking without giving all parties an opportunity to comment on the wisdom of repeal; CLI-16-17, 84 NRC 99 (2016)
- special circumstances as defined in 10 C.F.R. 50.12(a)(2)(i)-(vi) must be present before an exemption from a regulation may be granted; CLI-16-17, 84 NRC 99 (2016)
- special circumstances for an exemption exist where application of the regulation in question would not serve the underlying purpose of the rule or is not necessary to achieve that purpose; CLI-16-17, 84 NRC 99 (2016)
- special circumstances for an exemption exist where compliance with a rule would result in undue hardship or other costs that are significantly in excess of those contemplated when the regulation was adopted, or that are significantly in excess of those incurred by others similarly situated; CLI-16-17, 84 NRC 99 (2016)
- stand-alone exemption requests generally do not create hearing rights, but hearings on exemption requests that are directly related to a license amendment request are excepted from that general rule; CLI-16-17, 84 NRC 99 (2016)
- this extraordinary equitable remedy is to be used sparingly in light of NRC's robust rulemaking process; CLI-16-17, 84 NRC 99 (2016)
- EXIGENT CIRCUMSTANCES**
- emergency approval is requested on application to revise ultimate heat sink temperature limit to avoid dual-unit shutdown that would impact grid reliability; CLI-16-18, 84 NRC 167 (2016)
- hearing may be held after NRC Staff's issuance of the license amendments if there are exigent circumstances; CLI-16-18, 84 NRC 167 (2016)
- notice and comment process is provided for circumstances involving a license amendment where NRC finds that exigent circumstances exist in that licensee and NRC must act quickly and that time does not permit 30 days' notice for prior public comment and the amendment involves no significant hazards considerations; CLI-16-18, 84 NRC 167 (2016)
- EXPORT APPLICATION**
- Commission must review the Executive Branch's views on export applications before reaching a decision on the hearing request or petition to intervene; CLI-16-15, 84 NRC 53 (2016)
- hearing requests in export cases must explain why a hearing or an intervention would be in the public interest and how a hearing or intervention would assist the Commission in making the statutory determinations; CLI-16-15, 84 NRC 53 (2016)
- public is encouraged to provide written comments on export license applications, which the Commission considers and responds to as appropriate; CLI-16-15, 84 NRC 53 (2016)
- EXPORT LICENSE PROCEEDINGS**
- if the Commission determines that a hearing should be granted on an export license, it may order either an oral hearing or a hearing consisting of written comments; CLI-16-15, 84 NRC 53 (2016)
- merely asserting an institutional interest in providing information to the public is insufficient to show an affected interest in issuance of an export license; CLI-16-15, 84 NRC 53 (2016)

## SUBJECT INDEX

procedures that govern hearing requests and petitions to intervene on an export license application are contained in 10 C.F.R. Part 110, Subpart H and constitute the exclusive basis for hearings; CLI-16-15, 84 NRC 53 (2016)

public participation in nuclear export licensing proceedings is allowed when NRC finds that such participation will be in the public interest and will assist in making the statutory determinations required by the Atomic Energy Act, including such public hearings and access to information as the Commission deems appropriate; CLI-16-15, 84 NRC 53 (2016)

### EXPORT LICENSES

before grant of an export license for HEU to a nuclear weapon state, NRC must determine that the proposed export satisfies nonproliferation criteria; CLI-16-15, 84 NRC 53 (2016)

factors to be considered in determining whether to grant a hearing on an export license are described in 10 C.F.R. 110.42(a)(1)-(5), (7)-(9), 110.45, 110.84(a); CLI-16-15, 84 NRC 53 (2016)

five nonproliferation criteria govern exports of special nuclear material; CLI-16-15, 84 NRC 53 (2016)

HEU exports in excess of the end user's actual needs are discouraged; CLI-16-15, 84 NRC 53 (2016)

petitioner seeking a hearing on an export license must specifically identify how a hearing would bring new information to light; CLI-16-15, 84 NRC 53 (2016)

proposed export must satisfy the Schumer Amendment and not be inimical to the common defense and security of the United States; CLI-16-15, 84 NRC 53 (2016)

proposed export of more than 0.003 effective kilograms of special nuclear material must be under the term of the U.S.-Euratom Agreement for Cooperation in the Peaceful Uses of Nuclear Energy; CLI-16-15, 84 NRC 53 (2016)

request for hearing on export is denied but Commission responds to petitioner's views, treating them as written comments; CLI-16-15, 84 NRC 53 (2016)

statutory determinations for grant of an export license are described in Atomic Energy Act §§ 57c and 134a; CLI-16-15, 84 NRC 53 (2016)

where petitioner has not met the threshold for obtaining a hearing on an export license, Commission still considers his views as written comments on the application; CLI-16-15, 84 NRC 53 (2016)

### FAIRNESS

boards have broad and strong discretionary authority to conduct their functions with efficiency and economy, but they must exercise it with fairness to all the parties; CLI-16-20, 84 NRC 219 (2016)

### FEDERAL ENERGY REGULATORY COMMISSION

proper forum for an argument regarding rate regulation is FERC or a state board of public utilities; CLI-16-17, 84 NRC 99 (2016)

### FEDERAL REGISTER

NRC Staff must publish notices of a combined license application; CLI-16-16, 84 NRC 66 (2016)

### FINAL ENVIRONMENTAL IMPACT STATEMENT

mitigation and monitoring plans in the FSEIS, although not final, comply with NEPA; CLI-16-20, 84 NRC 219 (2016)

NRC hearing procedures allow for additional and more rigorous public scrutiny of the supplemental FEIS than does the usual circulation for comment; CLI-16-18, 84 NRC 167 (2016)

supplement to FEIS will be prepared in the same manner as the FEIS except that a scoping process need not be used; CLI-16-20, 84 NRC 219 (2016)

### FINAL SAFETY ANALYSIS REPORT

circumstances under which licensee can make changes to a facility or procedures described in its Updated FSAR without obtaining a license amendment are discussed; DD-16-2, 84 NRC 1 (2016)

licensees must determine if any changes to their facilities or procedures described in the UFSAR, or tests or experiments not described in the UFSAR, will need prior NRC approval through a license amendment; DD-16-2, 84 NRC 1 (2016)

### FINALITY

all Tier 1 and 2 issues, including the hydrogen control system and hydrogen igniters that were part of the certified design, are considered resolved in license amendment proceeding; LBP-16-10, 84 NRC 17 (2016)

where board's resolution of contentions is final, consideration of petitions for review of these contentions is appropriate; CLI-16-20, 84 NRC 219 (2016)

## SUBJECT INDEX

### FINANCIAL ASSURANCE

applicants and licensees must provide reasonable assurance that decommissioning funds will be available for the decommissioning process; CLI-16-17, 84 NRC 99 (2016)

if there is a shortfall between remaining decommissioning funds and the updated cost to complete decommissioning, licensee must provide additional financial assurance; CLI-16-17, 84 NRC 99 (2016)

licensee may demonstrate reasonable assurance by setting up a decommissioning trust fund that is segregated from licensee assets and in which the total amount of funds would be sufficient to pay decommissioning costs at the time permanent termination of operations is expected; CLI-16-17, 84 NRC 99 (2016)

licensee may not perform decommissioning activities that would foreclose release of the site for possible unrestricted use, result in significant environmental impacts not previously reviewed, or result in lack of reasonable assurance that adequate funds will be available for decommissioning; CLI-16-17, 84 NRC 99 (2016)

licensee must submit an annual financial assurance report; CLI-16-17, 84 NRC 99 (2016)

licensee must submit annual reports to NRC Staff regarding status of its funding for irradiated fuel management, including a plan to obtain additional funds to cover any expected shortfalls; CLI-16-17, 84 NRC 99 (2016)

licensee's annual financial assurance status reports include the amount spent on decommissioning activities, the amount remaining in the fund, and an updated estimate of the costs required to complete decommissioning; CLI-16-17, 84 NRC 99 (2016)

limit on the interest rate licensees may use in decommissioning funding projections is 2%; CLI-16-17, 84 NRC 99 (2016)

minimum amounts required to demonstrate reasonable assurance of funds for decommissioning are based on activities related to the definition of decommission in 10 C.F.R. 50.2 and do not include the cost of removal and disposal of spent fuel or of nonradioactive structures and materials beyond that necessary to terminate the license; CLI-16-17, 84 NRC 99 (2016)

### FINANCIAL QUALIFICATIONS

direct or indirect transfer-of-control application must include information sufficient to demonstrate to the Commission the financial qualifications of the applicant to carry out activities for which the permit or license is sought; LBP-16-12, 84 NRC 148 (2016)

### FINDINGS OF FACT

although Commission has discretion to review all underlying factual issues de novo, it is disinclined to do so where a board has weighed arguments presented by experts and rendered reasonable, record-based factual findings; CLI-16-20, 84 NRC 219 (2016)

Commission normally hesitates to wade through a detailed factual record, particularly when it has not had the advantage of observing testimony first hand; CLI-16-20, 84 NRC 219 (2016)

Commission reviews questions of law de novo, but defers to the board's findings with respect to underlying facts unless they are clearly erroneous; CLI-16-20, 84 NRC 219 (2016)

Commission will take review of a board's factual findings when those findings are clearly erroneous or in conflict with a finding regarding the same fact in a different proceeding; CLI-16-20, 84 NRC 219 (2016)

standard of clear error for overturning a board's factual findings is quite high; CLI-16-20, 84 NRC 219 (2016)

where a board's decision rests on a weighing of extensive fact-specific evidence presented by technical experts, Commission generally will defer; CLI-16-20, 84 NRC 219 (2016)

### FISH AND WILDLIFE SERVICE

consultation with FWS or the National Marine Fisheries Service or both is required for actions that may affect listed species; CLI-16-16, 84 NRC 66 (2016)

### FUEL CLADDING

extended power uprate applicant must scientifically demonstrate that peak cladding temperature will not exceed regulatory limits; LBP-16-11, 84 NRC 139 (2016)

### FUEL REMOVAL

decommissioning process begins when licensee certifies to NRC Staff that it has permanently ceased operations and has permanently removed fuel from the reactor vessel; CLI-16-17, 84 NRC 99 (2016)

## SUBJECT INDEX

### FUKUSHIMA ACCIDENT

Commission declined to suspend proceedings but granted request for safety analysis of the Fukushima accident based on the agency's plans for a short-term and long-term lessons-learned review, and referred portions of the petition relating to pending certified design applications, including the AP1000 amendment, to NRC Staff as comments on the then-pending design certification rulemaking; CLI-16-19, 84 NRC 180 (2016)

motions to reinstate Fukushima-related contentions were denied for lack of jurisdiction; CLI-16-19, 84 NRC 180 (2016)

petitioner is prohibited from challenging the certified design through adjudication, and its allegations regarding Fukushima are also outside of the scope of the proceeding because the Commission is handling that issue through rulemaking; LBP-16-10, 84 NRC 17 (2016)

### GENERIC ENVIRONMENTAL IMPACT STATEMENT

agency must reference and summarize the specific issues addressed in the GEIS that are to be tiered into a site-specific environmental impact statement or environmental assessment; LBP-16-13, 84 NRC 271 (2016)

Commission declined to order supplementation of final EISs to reference the Continued Storage GEIS; CLI-16-16, 84 NRC 66 (2016)

environmental assessment for in situ leach mining must reference and summarize specific issues addressed in the GEIS that are to be discussed in the EA; LBP-16-13, 84 NRC 271 (2016)

exception in 10 C.F.R. 51.92(d) does not apply to a supplemental, site-specific environmental impact statement that tiers off a GEIS; CLI-16-20, 84 NRC 219 (2016)

generic statements in the in situ leach mining GEIS do not fulfill NRC Staff's obligations under NEPA with regard to significant impacts that could reasonably be posed to wildlife at the license area were licensee to commence land application of wastewater; LBP-16-13, 84 NRC 271 (2016)

mere existence of GEIS is not sufficient to tier its contents into a site-specific environmental impact statement or environmental assessment; LBP-16-13, 84 NRC 271 (2016)

scope of permissible actions that a licensee who has entered the decommissioning process may take are defined in the GEIS; CLI-16-17, 84 NRC 99 (2016)

suspension on final licensing decisions was removed after NRC approved a GEIS and final Continued Storage Rule that addressed the issues in the D.C. Circuit's remand; CLI-16-19, 84 NRC 180 (2016)

tiering form of incorporation by reference occurs when an agency incorporates a GEIS into a site-specific analysis; LBP-16-13, 84 NRC 271 (2016)

### GENERIC ISSUES

when an issue is resolved generically, petitioner's remedy lies in the rulemaking process, not through adjudication; LBP-16-10, 84 NRC 17 (2016)

### GEOLOGIC CONDITIONS

hydrology and geology of in situ leach mining site are discussed; LBP-16-13, 84 NRC 271 (2016)

proposed reactor site must meet geologic and seismic criteria; CLI-16-19, 84 NRC 180 (2016)

### GREENHOUSE GAS EMISSIONS

environmental reviews for major licensing actions are to include consideration of carbon dioxide and other greenhouse gas emissions from construction, operation, and the uranium fuel cycle; CLI-16-19, 84 NRC 180 (2016)

### GROUNDWATER

industry practice of definitively establishing groundwater quality baselines after licensing but before operation is supported by NRC case law; CLI-16-20, 84 NRC 219 (2016)

pre-licensing groundwater monitoring used to describe the site for NEPA purposes need not conform to the post-licensing, pre-operation groundwater monitoring requirements applicable to a licensed facility because the monitoring activities at these two stages serve different purposes; CLI-16-20, 84 NRC 219 (2016)

### GROUNDWATER CONTAMINATION

affected groundwater either must be restored to its original water quality or must be returned to a level that the Commission has found poses no incremental hazards; LBP-16-13, 84 NRC 271 (2016)

in situ leach mining licensee cannot rely on alternate concentration limits under the terms of its current renewed license; LBP-16-13, 84 NRC 271 (2016)

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licensee can meet standards for groundwater constituents in one of three ways; LBP-16-13, 84 NRC 271 (2016)

new contention that spot-check methodology used by NRC Staff to evaluate well logs was unacceptable was inadmissible because information in the well logs was not materially different from information already in the record; CLI-16-20, 84 NRC 219 (2016)

purpose of aquifer restoration is to return groundwater quality in the production zone to compliance with NRC's groundwater protection standards; LBP-16-13, 84 NRC 271 (2016)

there may be site-specific aquifer geochemical conditions that could render uranium a better excursion indicator for groundwater than chloride, alkalinity, electrical conductivity, or sulfate; LBP-16-13, 84 NRC 271 (2016)

### HAZARDOUS WASTE

claim that because in situ leach wastewater does not exceed human maximum contaminant levels, there is no threat to wildlife is erroneous; LBP-16-13, 84 NRC 271 (2016)

### HEALTH AND SAFETY

reactor operator license application may be denied for failure to meet minimum standards for general medical condition; LBP-16-9, 84 NRC 15 (2016)

### HEARING PROCEDURES

NRC hearing procedures allow for additional and more rigorous public scrutiny of the final supplemental environmental impact statement than does the usual circulation for comment; CLI-16-18, 84 NRC 167 (2016)

See also Rules of Practice

### HEARING REQUESTS

petitioner seeking a hearing on an export license must specifically identify how a hearing would bring new information to light; CLI-16-15, 84 NRC 53 (2016)

petitioners in export cases must explain why a hearing or an intervention would be in the public interest and how a hearing or intervention would assist the Commission in making the statutory determinations; CLI-16-15, 84 NRC 53 (2016)

request for hearing on export license is denied but Commission responds to petitioner's views, treating them as written comments; CLI-16-15, 84 NRC 53 (2016)

### HEARING RIGHTS

agency actions that are not among those listed in AEA § 189a do not give rise to a hearing right for interested persons; CLI-16-17, 84 NRC 99 (2016)

although NRC Staff solicited comments on a post-shutdown decommissioning activities report, NRC regulations do not provide a hearing opportunity on it; CLI-16-17, 84 NRC 99 (2016)

Commission must grant a hearing upon the request of any person whose interest may be affected by the proceeding; LBP-16-14, 84 NRC 444 (2016)

exemption requests are not subject to a hearing opportunity; CLI-16-17, 84 NRC 99 (2016)

interested persons may request a hearing when licensee submits a license amendment request to terminate its operating license; CLI-16-17, 84 NRC 99 (2016)

NRC must provide a hearing upon the request of any person whose interest may be affected by the proceeding; LBP-16-10, 84 NRC 17 (2016)

opportunity for a hearing must be provided for an amendment to an operating license, combined license, or manufacturing license; LBP-16-10, 84 NRC 17 (2016)

protestant does not become entitled to an evidentiary hearing merely on request, or on a bald or conclusory allegation that a dispute exists; LBP-16-10, 84 NRC 17 (2016)

public participation in nuclear export licensing proceedings is allowed when NRC finds that such participation will be in the public interest and will assist in making the statutory determinations required by the Atomic Energy Act, including such public hearings and access to information as the Commission deems appropriate; CLI-16-15, 84 NRC 53 (2016)

stand-alone exemption requests generally do not create hearing rights, but hearings on exemption requests that are directly related to a license amendment request are excepted from that general rule; CLI-16-17, 84 NRC 99 (2016)

where petitioners have not established a right to an adjudicatory hearing, Commission considers the petition and all related filings as a discretionary exercise of its inherent supervisory authority over agency proceedings; CLI-16-17, 84 NRC 99 (2016)

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### HEAT SINK

emergency approval is requested on application to revise ultimate heat sink temperature limit to avoid dual-unit shutdown that would impact grid reliability; CLI-16-18, 84 NRC 167 (2016)

### HIGH-ENRICHED URANIUM

before grant of an export license for HEU to a nuclear weapon state, NRC must determine that the proposed export satisfies nonproliferation criteria; CLI-16-15, 84 NRC 53 (2016)

exports in excess of the end user's actual needs are discouraged; CLI-16-15, 84 NRC 53 (2016)

### HISTORIC SITES

after it identifies eligible sites that might be affected by the project, an agency must assess and resolve potential adverse effects in consultation with tribes that attach religious and cultural significance to those sites; CLI-16-20, 84 NRC 219 (2016)

criteria for inclusion in the National Register of Historic Places are provided in 36 C.F.R. 60.4; CLI-16-20, 84 NRC 219 (2016)

historic properties are districts, sites, buildings, structures, or objects included in or eligible for inclusion in, the National Register of Historic Places; CLI-16-20, 84 NRC 219 (2016)

### HYDROGEN CONTROL

amendment to 10 C.F.R. 50.44(a)(1)-(3) eliminated hydrogen generation controls associated with a design-basis loss-of-coolant accident; LBP-16-10, 84 NRC 17 (2016)

applicable hydrogen source is limited by requiring a reactor design to address and control a 100% fuel cladding-coolant reaction; LBP-16-10, 84 NRC 17 (2016)

control of hydrogen, oxygen, and other substances in the containment atmosphere is necessary to ensure that containment integrity is maintained; LBP-16-10, 84 NRC 17 (2016)

criteria to be met by systems to control fission products, hydrogen, oxygen, and other substances that may be released into the reactor containment are provided in 10 C.F.R. pt. 50, app. A, GDC 41; LBP-16-10, 84 NRC 17 (2016)

during the AP1000 design certification process, NRC reviewed placement of hydrogen igniters and concluded that adequate coverage existed to satisfy the requirements of 10 C.F.R. 50.44; LBP-16-10, 84 NRC 17 (2016)

finality in license amendment proceeding applies to all Tier 1 and 2 issues, including the hydrogen control system and hydrogen igniters that were part of the certified design; LBP-16-10, 84 NRC 17 (2016)

hydrogen control system requirements for water-cooled reactors licensed after October 16, 2003, are described in 10 C.F.R. 50.44(c)(1)-(5); LBP-16-10, 84 NRC 17 (2016)

regulatory history demonstrates that petitioner's hydrogen source arguments are, in effect, an impermissible challenge to a regulation that has evolved on the issue of hydrogen sources; LBP-16-10, 84 NRC 17 (2016)

zirconium and water source of hydrogen is the only hydrogen source new reactor applicants are required to analyze; LBP-16-10, 84 NRC 17 (2016)

### HYDROGEOLOGY

hydrology and geology of in situ leach mining site are discussed; LBP-16-13, 84 NRC 271 (2016)

### IN SITU LEACH MINING

affected groundwater either must be restored to its original water quality or must be returned to a level that the Commission has found poses no incremental hazards; LBP-16-13, 84 NRC 271 (2016)

environmental assessment must reference and summarize specific issues addressed in the generic environmental impact statement that are to be discussed in the EA; LBP-16-13, 84 NRC 271 (2016)

hydrology and geology of ISL mining site are discussed; LBP-16-13, 84 NRC 271 (2016)

land application of wastewater from ISL mining is a reasonably foreseeable alternative and warrants discussion under NEPA and so must be addressed in the environmental assessment; LBP-16-13, 84 NRC 271 (2016)

licensee can meet standards for groundwater constituents in one of three ways; LBP-16-13, 84 NRC 271 (2016)

licensee cannot rely on alternate concentration limits under the terms of its current renewed license; LBP-16-13, 84 NRC 271 (2016)

pre-licensing groundwater monitoring used to describe the site for NEPA purposes need not conform to the post-licensing, pre-operation groundwater monitoring requirements applicable to a licensed facility

## SUBJECT INDEX

because the monitoring activities at these two stages serve different purposes; CLI-16-20, 84 NRC 219 (2016)

provisions of 10 C.F.R. 40.31(h) apply to uranium mills, not in situ uranium recovery sites; CLI-16-20, 84 NRC 219 (2016)

provisions of 10 C.F.R. 51.107(a) refer to issuance of a combined license for a nuclear power reactor and has no applicability to ISL facilities; CLI-16-20, 84 NRC 219 (2016)

provisions of 10 C.F.R. Part 40, app. A, Criterion 1 apply to uranium mills, not in situ uranium recovery sites; CLI-16-20, 84 NRC 219 (2016)

purpose of aquifer restoration is to return groundwater quality in the production zone to compliance with NRC's groundwater protection standards; LBP-16-13, 84 NRC 271 (2016)

### INCORPORATION BY REFERENCE

agency must reference and summarize the specific issues addressed in the generic environmental impact statement that are to be tiered into a site-specific environmental impact statement or environmental assessment; LBP-16-13, 84 NRC 271 (2016)

API1000 design control document is incorporated by reference in the design certification rule and sets forth location criteria, implementation requirements, and in-containment elevations of hydrogen igniters; LBP-16-10, 84 NRC 17 (2016)

Commission declined to order supplementation of final EISs to reference the Continued Storage GEIS; CLI-16-16, 84 NRC 66 (2016)

mere existence of a generic environmental impact statement is not sufficient to tier its contents into a site-specific environmental impact statement or environmental assessment; LBP-16-13, 84 NRC 271 (2016)

NRC Staff may in certain circumstances incorporate by reference previous work that addresses a particular environmental issue, but only where the environmental assessment provides specific citations and briefly summarizes how those external documents support the EA's conclusion; LBP-16-13, 84 NRC 271 (2016)

techniques of tiering and incorporation by reference described in Council on Environmental Quality's NEPA regulations are adopted in 10 C.F.R. pt. 51, app. A, § 1(b); LBP-16-13, 84 NRC 271 (2016)

tiering form of incorporation by reference occurs when an agency incorporates a generic environmental impact statement into a site-specific analysis; LBP-16-13, 84 NRC 271 (2016)

to incorporate outside documents into a NEPA document, Council on Environmental Quality regulations provide that incorporated material shall be cited in the statement and its content briefly described; LBP-16-13, 84 NRC 271 (2016)

### INDEPENDENT SPENT FUEL STORAGE INSTALLATION

nonconcurrence related to whether additional steps are warranted under NEPA, the NHPA, and the Endangered Species Act, in view of the possibility that an ISFSI could be constructed on the site at some future time is discussed; CLI-16-19, 84 NRC 180 (2016)

NRC Staff nonconcurrences associated with general license to construct an ISFSI centered on the concern that consultations on the project did not include a specific discussion that an ISFSI could be constructed; CLI-16-16, 84 NRC 66 (2016)

### INJUNCTIVE RELIEF

Commission has disfavored imposing a draconian remedy, such as not granting a license extension, when less drastic relief will suffice; LBP-16-13, 84 NRC 271 (2016)

injunction is not automatic or default remedy to cure NEPA violation; CLI-16-18, 84 NRC 167 (2016)  
irreparable injury must be likely, not merely possible, without an injunction; LBP-16-13, 84 NRC 271 (2016)

relief is only warranted when the traditional test justifying it is met; LBP-16-13, 84 NRC 271 (2016)

where an agency fails to comply with procedural statutes such as NEPA, an injunction is sometimes the proper recourse; LBP-16-13, 84 NRC 271 (2016)

See also Stay

### INJURY IN FACT

affiants' concern that discharges would impair water quality is sufficient to demonstrate injury in fact for standing; LBP-16-10, 84 NRC 17 (2016)

allegation that defendant's actions caused reasonable concern of injury to the plaintiff is sufficient to demonstrate injury in fact for standing; LBP-16-10, 84 NRC 17 (2016)

## SUBJECT INDEX

at the pleading stage, general factual allegations of injury resulting from defendant's conduct may suffice, and the court presumes that general allegations embrace the specific facts that are necessary to support the claim; LBP-16-10, 84 NRC 17 (2016)

contemporaneous standing decisions have found the injury-in-fact requirement satisfied without quantitative proof of harm; LBP-16-10, 84 NRC 17 (2016)

federal courts have not generally imposed a minimum quantitative threshold on the probability of future injury alleged as the basis of standing; LBP-16-10, 84 NRC 17 (2016)

organization may establish organizational standing if it demonstrates a risk of discrete institutional injury to itself; LBP-16-14, 84 NRC 444 (2016)

organization seeking representational standing on behalf of its members may meet the injury-in-fact requirement by demonstrating that at least one of its members, who has authorized the organization to represent his or her interest, will be injured by the possible outcome of the proceeding; LBP-16-10, 84 NRC 17 (2016)

plaintiffs' demonstration of injury-in-fact for standing did not have to show that pollutant discharges actually harmed the environment; LBP-16-10, 84 NRC 17 (2016)

proximity presumption applied even though the challenged license amendment affected only the petitioner's right to request a hearing on any changes to the material specimen testing schedule that might be proposed at some future date; LBP-16-10, 84 NRC 17 (2016)

standing of organization representing petitioner claiming injury from soil disturbance caused by mining, despite industry's argument that the alleged injury could only occur upon chance occurrence of eight events, one of which only had a 0.8% chance of occurring was upheld; LBP-16-10, 84 NRC 17 (2016)

See also Irreparable Injury

### INSPECTION

See NRC Inspection

### INTEREST

merely asserting an institutional interest in providing information to the public is insufficient for showing an affected interest in issuance of an export license; CLI-16-15, 84 NRC 53 (2016)

### INTERVENTION

merely asserting an institutional interest in providing information to the public is insufficient for showing an affected interest in issuance of an export license; CLI-16-15, 84 NRC 53 (2016)

procedures that govern hearing requests and petitions to intervene on an export license application are contained in 10 C.F.R. Part 110, Subpart H and constitute the exclusive basis for hearings in nuclear export licensing proceedings; CLI-16-15, 84 NRC 53 (2016)

to obtain a hearing, petitioner must establish standing and propose at least one admissible contention; LBP-16-11, 84 NRC 139 (2016); LBP-16-14, 84 NRC 444 (2016)

### INTERVENTION PETITIONS

at the pleading stage, board must accept as true all material allegations of the petition; LBP-16-10, 84 NRC 17 (2016)

at the pleading stage, it is generally sufficient if petitioner provides plausible factual allegations that satisfy each element of standing; LBP-16-10, 84 NRC 17 (2016)

licensing boards follow a longstanding principle that, in the standing analysis, petition is to be construed in favor of petitioner; LBP-16-10, 84 NRC 17 (2016)

petitioner must not only establish standing, but also proffer at least one admissible contention that meets the requirements of 10 C.F.R. 2.309(f)(1); LBP-16-10, 84 NRC 17 (2016)

petitioner must state name, address, and telephone number of the requestor or petitioner, nature of right to be made a party, nature and extent of property, financial, or other interest in the proceeding, and possible effect of any decision or order that may be issued in the proceeding on petitioner's interest; LBP-16-14, 84 NRC 444 (2016)

petitioners are not required to demonstrate their asserted injury with certainty or to provide extensive technical studies in support of their standing argument; LBP-16-10, 84 NRC 17 (2016)

pleadings submitted by a pro se petitioner are afforded greater leniency than petitions drafted with the assistance of counsel; LBP-16-10, 84 NRC 17 (2016)

### INTERVENTION RULINGS

at the pleading stage, board must accept as true all material allegations of the petition; LBP-16-10, 84 NRC 17 (2016)

## SUBJECT INDEX

resolving standing questions is an entirely different matter than adjudicating the ultimate merits of a contention; LBP-16-10, 84 NRC 17 (2016)

ruling that petitioners have standing based on the proximity presumption does not signify any opinion on admissibility or merits of the petitioners' contention; LBP-16-10, 84 NRC 17 (2016)

rulings on claims of proximity standing are decided on the appropriate radius on a case-by-case basis; LBP-16-14, 84 NRC 444 (2016)

standing and contention admissibility are distinct issues, and a licensing board need not rule on contention admissibility to decide standing; LBP-16-10, 84 NRC 17 (2016)

standing is a threshold legal question that does not require assessment of petitioner's case on the merits; LBP-16-10, 84 NRC 17 (2016)

where board's resolution of contentions is final, consideration of petitions for review of the contentions is appropriate; CLI-16-20, 84 NRC 219 (2016)

### IRREPARABLE INJURY

injury must be likely, not merely possible, without an injunction; LBP-16-13, 84 NRC 271 (2016)

See also Injury in Fact

### JURISDICTION

jurisdiction is power to declare the law, and when it ceases to exist, the only function remaining to the court is that of announcing the fact and dismissing the cause; LBP-16-14, 84 NRC 444 (2016)

motions to reinstate Fukushima-related contentions were denied for lack of jurisdiction; CLI-16-19, 84 NRC 180 (2016)

proper forum for an argument regarding rate regulation is the Federal Energy Regulatory Commission or a state board of public utilities; CLI-16-17, 84 NRC 99 (2016)

See also Licensing Boards, Jurisdiction; Nuclear Regulatory Commission, Jurisdiction

### LENIENCY

pleadings submitted by a pro se petitioner are afforded greater leniency than petitions drafted with the assistance of counsel; LBP-16-10, 84 NRC 17 (2016)

### LICENSE AMENDMENT PROCEEDINGS

Commission has rejected proximity standing for license transfers, license amendments associated with shutdown and defueled reactors, and certain changes to worker-protection requirements; LBP-16-14, 84 NRC 444 (2016)

petitioner may claim standing based on the proximity presumption if the proposed action quite obviously entails an increased potential for offsite consequences; LBP-16-14, 84 NRC 444 (2016)

### LICENSE AMENDMENTS

application that does no more than delete specific license conditions relating to the terms and conditions of decommissioning trust agreements involves no significant hazards consideration; CLI-16-17, 84 NRC 99 (2016)

if licensee with existing license conditions relating to decommissioning trust agreements elects to amend those conditions, the license amendment shall be in accordance with the provisions of 10 C.F.R. 50.75(h); CLI-16-17, 84 NRC 99 (2016)

licensee requested license amendments to modify existing trust-related license conditions to reflect proposed transfer and to adopt the regulatory requirements of 10 C.F.R. 50.75(h)(1); LBP-16-14, 84 NRC 444 (2016)

non-rate-regulated reactor licensee with decommissioning trust fund license conditions may elect either to maintain those conditions or to seek a license amendment to remove those conditions, in which case it would be subject to 10 C.F.R. 50.75(h)(1)-(3); CLI-16-17, 84 NRC 99 (2016)

See also Operating License Amendments

### LICENSE APPLICATIONS

applications must be incomprehensible and useless to the public to be deficient; CLI-16-20, 84 NRC 219 (2016)

issues of disorganization in an application cannot be said to be germane to the licensing process; CLI-16-20, 84 NRC 219 (2016)

See also Combined License Application; Export Application; License Transfer Applications; Operating License Amendment Applications

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### LICENSE CONDITIONS

- after a licensing board has issued an initial decision, the Director of the Office of Nuclear Material Safety and Safeguards shall issue, deny, or appropriately condition the permit, license, or license amendment in accordance with the presiding officer's initial decision; LBP-16-13, 84 NRC 271 (2016)
- if licensee with existing license conditions relating to decommissioning trust agreements elects to amend those conditions, the license amendment shall be in accordance with the provisions of 10 C.F.R. 50.75(h); CLI-16-17, 84 NRC 99 (2016)
- license amendment application that does no more than delete specific license conditions relating to the terms and conditions of decommissioning trust agreements involves no significant hazards consideration; CLI-16-17, 84 NRC 99 (2016)
- licensee requested license amendments to modify existing trust-related license conditions to reflect proposed transfer and to adopt the regulatory requirements of 10 C.F.R. 50.75(h)(1); LBP-16-14, 84 NRC 444 (2016)
- licensees have the option of maintaining existing license conditions relating to decommissioning trust agreements or following the new requirements for decommissioning as long as licensee does not elect to amend those license conditions; CLI-16-17, 84 NRC 99 (2016)
- non-rate-regulated reactor licensee with decommissioning trust fund license conditions may elect either to maintain those conditions or to seek a license amendment to remove those conditions, in which case it would be subject to 10 C.F.R. 50.75(h)(1)-(3); CLI-16-17, 84 NRC 99 (2016)
- proper avenue for challenge seeking greater specificity in a license condition is to pursue an enforcement action; CLI-16-17, 84 NRC 99 (2016)

### LICENSE RENEWALS

- Commission has disfavored imposing a draconian remedy, such as not granting a license extension, when less drastic relief will suffice; LBP-16-13, 84 NRC 271 (2016)

### LICENSE TERMINATION PLANS

- licensee must include a supplement to the previous environmental analysis describing any new information or significant environmental change associated with the proposed termination activities; CLI-16-17, 84 NRC 99 (2016)

### LICENSE TRANSFER APPLICATIONS

- direct or indirect transfer-of-control application must include information sufficient to demonstrate to the Commission the financial qualifications of applicant to carry out activities for which the permit or license is sought; LBP-16-12, 84 NRC 148 (2016)
- portions of an application that contain confidential commercial and financial information are subject to protection from public disclosure; LBP-16-12, 84 NRC 148 (2016)

### LICENSE TRANSFER PROCEEDINGS

- Commission has rejected proximity standing for license transfers, license amendments associated with shutdown and defueled reactors, and certain changes to worker-protection requirements; LBP-16-14, 84 NRC 444 (2016)
- proximity presumption does not apply in license transfer cases; LBP-16-10, 84 NRC 17 (2016)
- proximity-based standing has never been granted to a petitioner in an indirect license transfer adjudication but the possibility has not been ruled out; LBP-16-12, 84 NRC 148 (2016)

### LICENSE TRANSFERS

- direct transfer entails a change to operating and/or possession authority; LBP-16-12, 84 NRC 148 (2016)
- indirect transfer involves corporate restructuring or reorganizations that leave licensee itself intact as a corporate entity; LBP-16-12, 84 NRC 148 (2016)
- licensee requested license amendments to modify existing trust-related license conditions to reflect proposed transfer and to adopt the regulatory requirements of 10 C.F.R. 50.75(h)(1); LBP-16-14, 84 NRC 444 (2016)
- proposed license transfer that does not involve transfer of ownership or operating rights to subject facilities or entail changes in the facilities themselves or in their operation offer no obvious potential for offsite consequences; LBP-16-12, 84 NRC 148 (2016)

### LICENSING BOARD DECISIONS

- board can uphold NRC Staff's proposed action despite deficiencies in its NEPA documents if sufficient evidence is developed in an adjudicatory proceeding concerning the environmental impacts of the proposed action; CLI-16-18, 84 NRC 167 (2016)

## SUBJECT INDEX

### LICENSING BOARDS, AUTHORITY

at the contention admissibility stage, boards are expected to examine cited materials to verify that they do, in fact, support a contention; LBP-16-10, 84 NRC 17 (2016)

board does not have authority to review a claim of unreasonable delay regarding a petition for rulemaking that is before the Commission; LBP-16-11, 84 NRC 139 (2016)

board has authority to take appropriate action to control the hearing process, regulate the course of the hearing and the conduct of the participants, and issue orders necessary to carry out the presiding officer's duties and responsibilities under 10 C.F.R. Part 2; CLI-16-20, 84 NRC 219 (2016)

boards have broad and strong discretionary authority to conduct their functions with efficiency and economy, but they must exercise it with fairness to all parties; CLI-16-20, 84 NRC 219 (2016)

boards have relative latitude to fashion appropriate remedies regarding issues properly before them; CLI-16-20, 84 NRC 219 (2016)

Commission, not the board, has authority to stay a license amendment proceeding in light of pending rulemaking; LBP-16-11, 84 NRC 139 (2016)

in materials licensing proceedings, boards are empowered to make findings of fact and conclusions of law on matters put into controversy by the parties; LBP-16-13, 84 NRC 271 (2016)

licensing boards lack authority to direct NRC Staff's nonadjudicatory actions, and therefore such a remedy is beyond the scope of an adjudicatory proceeding; CLI-16-18, 84 NRC 167 (2016)

NRC Staff reviews, which frequently proceed in parallel to adjudicatory proceedings, fall under the direction of Staff management and the Commission itself, not licensing boards; CLI-16-20, 84 NRC 219 (2016)

### LICENSING BOARDS, JURISDICTION

board retains jurisdiction for a limited purpose, until the Commission orders otherwise, or when the period within which the Commission may direct that the record be certified to it for final decision expires, or when the Commission renders a final decision; LBP-16-13, 84 NRC 271 (2016)

### MAINTENANCE

inspection scope for steam generator replacement is described; DD-16-2, 84 NRC 1 (2016)

### MANDATORY HEARINGS

all safety and environmental matters relevant to a combined license application, except those resolved in the contested proceeding, are subject to review in the uncontested proceeding; CLI-16-16, 84 NRC 66 (2016); CLI-16-19, 84 NRC 180 (2016)

Commission does not review Duke's application de novo, but rather considers whether NRC Staff's review was sufficient to support the required findings; CLI-16-16, 84 NRC 66 (2016)

determinations on environmental matters that the Commission must make for authorization of a combined license are listed in 10 C.F.R. 51.107(a) and 52.97(a); CLI-16-19, 84 NRC 180 (2016)

environmental matters that must be considered in a mandatory combined license proceeding are discussed; CLI-16-16, 84 NRC 66 (2016)

hearing must be held on each application to construct a nuclear power plant, regardless of whether an interested member of the public requests a hearing on the application; CLI-16-19, 84 NRC 180 (2016)

inquiry in mandatory combined license proceeding is whether NRC Staff's review was sufficient to support safety and environmental findings; CLI-16-19, 84 NRC 180 (2016)

issues resolved in the AP1000 design certification rulemaking are closed and will not be revisited in a mandatory combined license proceeding unless they are the subject of a departure or exemption; CLI-16-19, 84 NRC 180 (2016)

NRC must hold a hearing on each application to construct a nuclear power plant, regardless of whether an interested member of the public requests a hearing on the application; CLI-16-16, 84 NRC 66 (2016)

safety issues that must be considered in a mandatory combined license proceeding are discussed; CLI-16-16, 84 NRC 66 (2016)

### MATERIAL CONTROL AND ACCOUNTING

combined license holder may receive an exemption from certain requirements pertaining to MC&A for special nuclear materials, such that the same requirements apply to both Part 52 and Part 50 licensees; CLI-16-16, 84 NRC 66 (2016)

## SUBJECT INDEX

exemption requests relating to organization and numbering of combined license application and MC&A requirements for special nuclear material that apply to both Part 52 and Part 50 licensees are acceptable; CLI-16-19, 84 NRC 180 (2016)

### MATERIALS LICENSE PROCEEDINGS

licensing boards are empowered to make findings of fact and conclusions of law on the matters put into controversy by the parties; LBP-16-13, 84 NRC 271 (2016)

### MAXIMUM CONTAMINANT LEVELS

claim that because in situ leach wastewater does not exceed human maximum contaminant levels, there is no threat to wildlife is erroneous; LBP-16-13, 84 NRC 271 (2016)

### MITIGATION PLANS

mitigation and monitoring plans in the final supplemental environmental impact statement, although not final, complies with NEPA; CLI-16-20, 84 NRC 219 (2016)

### MODELS/MODELING

Baker-Just equation is to be used to calculate rate of energy release, hydrogen generation, and fuel cladding oxidation during a loss of coolant accident; LBP-16-11, 84 NRC 139 (2016)

when performing modeling to establish safety of extended power uprate during a loss of coolant accident, certain variables shall be calculated using the Baker-Just equation; LBP-16-11, 84 NRC 139 (2016)

### MONITORING

industry practice of definitively establishing groundwater quality baselines after licensing but before operation is supported by NRC case law; CLI-16-20, 84 NRC 219 (2016)

mitigation and monitoring plans in the final supplemental environmental impact statement, although not final, complies with NEPA; CLI-16-20, 84 NRC 219 (2016)

pre-licensing groundwater monitoring used to describe the site for NEPA purposes need not conform to the post-licensing, pre-operation groundwater monitoring requirements applicable to a licensed facility because the monitoring activities at these two stages serve different purposes; CLI-16-20, 84 NRC 219 (2016)

there may be site-specific aquifer geochemical conditions that could render uranium a better excursion indicator for groundwater than chloride, alkalinity, electrical conductivity, or sulfate; LBP-16-13, 84 NRC 271 (2016)

### MOTIONS FOR RECONSIDERATION

clear and material error standard is applied to petition for reconsideration; CLI-16-17, 84 NRC 99 (2016)

### NATIONAL ENVIRONMENTAL POLICY ACT

agencies must study, develop, and describe appropriate alternatives to the proposed action; CLI-16-16, 84 NRC 66 (2016); CLI-16-19, 84 NRC 180 (2016)

agencies must use a systematic, interdisciplinary approach that will insure the integrated use of the natural and social sciences and the environmental design arts in decision making that may impact the environment; CLI-16-16, 84 NRC 66 (2016); CLI-16-19, 84 NRC 180 (2016)

agency must conduct its environmental review with the best information available today; CLI-16-18, 84 NRC 167 (2016)

agency need not undertake studies to obtain information that is not already available; CLI-16-18, 84 NRC 167 (2016)

as a procedural statute, NEPA does not require any particular substantive result; CLI-16-18, 84 NRC 167 (2016)

core requirement of NEPA is that an agency decisionmaker must consider an adequate environmental review before making a decision on a licensing action; CLI-16-18, 84 NRC 167 (2016)

decommissioning activities require NEPA compliance; CLI-16-17, 84 NRC 99 (2016)

environmental review is required before NRC acts on matters affecting the quality of the human environment; CLI-16-17, 84 NRC 99 (2016)

in anticipating impacts, NEPA only requires a discussion of impacts that are reasonably foreseeable; LBP-16-13, 84 NRC 271 (2016)

individuals not given notice of public hearings on a proposed wastewater treatment plant did not suffer prejudice even though they were not provided the opportunity to participate until the eleventh hour of the NEPA process; CLI-16-20, 84 NRC 219 (2016)

injunction is not an automatic or default remedy to cure NEPA violation; CLI-16-18, 84 NRC 167 (2016)

## SUBJECT INDEX

- land application of wastewater from in situ uranium mining is a reasonably foreseeable alternative and warrants discussion under NEPA and so must be addressed in the environmental assessment; LBP-16-13, 84 NRC 271 (2016)
- licensing board declined to stay effectiveness of a license upon a showing of a NEPA violation, instead expressing confidence that NRC Staff would promptly take steps to rectify the deficiency; LBP-16-13, 84 NRC 271 (2016)
- NEPA compliance does not necessarily follow from National Historic Preservation Act compliance; CLI-16-20, 84 NRC 219 (2016)
- NEPA does not call for certainty or precision, but an estimate of anticipated (not unduly speculative) impacts; LBP-16-13, 84 NRC 271 (2016)
- NEPA serves the purpose of environmental protection through action-forcing procedures that require agencies to take a hard look at environmental impacts and that provide for broad dissemination of relevant environmental information; CLI-16-18, 84 NRC 167 (2016)
- nonconcurrence related to whether additional steps are warranted under NEPA, the NHPA, and the Endangered Species Act, in view of the possibility that an independent spent fuel storage installation could be constructed on the site at some future time is discussed; CLI-16-19, 84 NRC 180 (2016)
- NRC must assess the relationship between short-term uses and long-term productivity of the environment, consider alternatives, and describe the unavoidable adverse environmental impacts and the irreversible and irretrievable commitments of resources associated with the proposed action; CLI-16-19, 84 NRC 180 (2016)
- NRC Staff bears the ultimate burden of showing that it satisfied NEPA's information-disclosure mandate by meaningfully considering significant impacts and addressing those impacts in the environmental assessment; LBP-16-13, 84 NRC 271 (2016)
- NRC Staff is required to take a hard look at any significant environmental consequences of a proposed licensing action; LBP-16-13, 84 NRC 271 (2016)
- only a discussion of reasonably foreseeable impacts is required and courts have excluded remote and speculative impacts from environmental analysis; LBP-16-13, 84 NRC 271 (2016)
- primary purpose of the scoping period is to notify those who may be affected by a proposed government action governed by NEPA that the relevant entity is beginning the EIS process; CLI-16-20, 84 NRC 219 (2016)
- procedural violations of NEPA do not automatically void an agency's ultimate decision; CLI-16-20, 84 NRC 219 (2016)
- proper remedy on a finding of a violation of NEPA is to vacate the decision and remand back to the agency for further proceedings necessary to achieve compliance; CLI-16-20, 84 NRC 219 (2016)
- some information relevant to an environmental impact statement will not be reasonably available and the agency is directed to proceed in accord with NEPA's rule of reason in the face of such lacunae; CLI-16-20, 84 NRC 219 (2016)
- statutory requirement that a federal agency contemplating a major action prepare an environmental impact statement serves NEPA's action-forcing purpose; CLI-16-17, 84 NRC 99 (2016)
- to incorporate outside documents into a NEPA document, Council on Environmental Quality regulations provide that incorporated material shall be cited in the statement and its content briefly described; LBP-16-13, 84 NRC 271 (2016)
- ultimate burden with respect to NEPA lies with NRC Staff, but NRC regulations require that intervenors file environmental contentions on the applicant's environmental report; CLI-16-20, 84 NRC 219 (2016)
- violation of NEPA, by itself, is not always sufficient to justify suspending or revoking a licensing action; CLI-16-18, 84 NRC 167 (2016)
- when the environmental record of decision is supplemented by the adjudicatory process, the disclosure purpose of NEPA is satisfied through the public vetting of environmental issues at an evidentiary hearing and issuance of a decision, and consequently, NRC Staff is not required to otherwise supplement or amend its NEPA documents; CLI-16-18, 84 NRC 167 (2016)
- NATIONAL HISTORIC PRESERVATION ACT**
- historic properties are districts, sites, buildings, structures, or objects included in or eligible for inclusion in, the National Register of Historic Places; CLI-16-20, 84 NRC 219 (2016)
- in deciding whether the NHPA claim was moot, the court must begin by assuming that defendants have violated the Act; CLI-16-20, 84 NRC 219 (2016)

## SUBJECT INDEX

- National Environmental Policy Act compliance does not necessarily follow from NHPA compliance; CLI-16-20, 84 NRC 219 (2016)
- National Environmental Policy Act requires analysis of effects on all cultural resources present at the site, not only those properties eligible for listing on the National Register of Historic Places, which is the standard for further analysis under the NHPA; CLI-16-20, 84 NRC 219 (2016)
- nonconcurrence related to whether additional steps are warranted under NEPA, the NHPA, and the Endangered Species Act, in view of the possibility that an independent spent fuel storage installation could be constructed on the site at some future time is discussed; CLI-16-19, 84 NRC 180 (2016)
- NATIONAL MARINE FISHERIES SERVICE**
- consultation with Fish and Wildlife or the NMFS or both is required for actions that may affect listed species; CLI-16-16, 84 NRC 66 (2016)
- NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM PERMIT**
- selenium concentration limit imposed in state environmental agency's permit is based solely on a regulation designed to protect drinking water quality for humans and does not in any way address possible ingestion and ultimate bioaccumulation in wildlife; LBP-16-13, 84 NRC 271 (2016)
- NATIONAL REGISTER OF HISTORIC PLACES**
- criteria for inclusion in the National Register are provided in 36 C.F.R. 60.4; CLI-16-20, 84 NRC 219 (2016)
- NATIVE AMERICANS**
- after it identifies eligible sites that might be affected by the project, an agency must assess and resolve potential adverse effects in consultation with tribes that attach religious and cultural significance to those sites; CLI-16-20, 84 NRC 219 (2016)
- consultation with Indian tribes is not the same thing as control over a project; CLI-16-20, 84 NRC 219 (2016)
- correct legal standard is whether NRC Staff provided a reasonable opportunity for consultation; CLI-16-20, 84 NRC 219 (2016)
- even if a party's involvement in consultation about historic properties is limited, if that limited involvement is by choice, the agency has provided the party with a reasonable opportunity to participate; CLI-16-20, 84 NRC 219 (2016)
- federal agencies need not acquiesce to every tribal request; CLI-16-20, 84 NRC 219 (2016)
- first step in the consultation requirement is identifying any historic properties that might be affected by the federal undertaking and, in doing so, making a reasonable and good-faith effort to seek information from consulting parties, including Native American Tribes, to aid in that identification; CLI-16-20, 84 NRC 219 (2016)
- reasonable opportunity to consult does not guarantee any specific results; CLI-16-20, 84 NRC 219 (2016)
- tribe must be provided with adequate information or time; CLI-16-20, 84 NRC 219 (2016)
- NO SIGNIFICANT HAZARDS DETERMINATION**
- license amendment application that does no more than delete specific license conditions relating to the terms and conditions of decommissioning trust agreements involves no significant hazards consideration; CLI-16-17, 84 NRC 99 (2016)
- NONCONCURRENCE**
- whether additional steps are warranted under NEPA, the NHPA, and the Endangered Species Act, in view of the possibility that an independent spent fuel storage installation could be constructed on the site at some future time is discussed; CLI-16-19, 84 NRC 180 (2016)
- NONDISCLOSURE AGREEMENTS**
- petitioners seek to amend the protective order and nondisclosure declaration to dispose of documents in a way not specified by the order and declaration; CLI-16-14, 84 NRC 11 (2016)
- NONSAFETY-RELATED**
- NRC approval is not required for departures from the AP1000 design control document that have no safety significance; CLI-16-19, 84 NRC 180 (2016)
- NOTICE**
- NRC Staff must publish notices of a combined license application in the Federal Register; CLI-16-16, 84 NRC 66 (2016)

## SUBJECT INDEX

### NOTICE AND COMMENT

although NRC Staff solicited comments on a post-shutdown decommissioning activities report, NRC regulations do not provide a hearing opportunity on it; CLI-16-17, 84 NRC 99 (2016)  
notice requirement ensures that interested parties are aware of and therefore able to participate meaningfully in the entire EIS process, from start to finish; CLI-16-20, 84 NRC 219 (2016)  
See also Public Comments

### NOTICE AND COMMENT PROCEDURES

although agency had not properly notified plaintiff during the EIS scoping process, court's determination that plaintiff was unable to demonstrate prejudice after having participated in the development of the EIS was upheld; CLI-16-20, 84 NRC 219 (2016)  
NRC hearing procedures allow for additional and more rigorous public scrutiny of the final supplemental environmental impact statement than does the usual circulation for comment; CLI-16-18, 84 NRC 167 (2016)  
NRC Staff will notice receipt of the post-shutdown decommissioning activities report, make it available for public comment, and hold a public meeting on its contents; CLI-16-17, 84 NRC 99 (2016)  
process is provided for circumstances involving a license amendment where NRC finds that exigent circumstances exist in that licensee and NRC must act quickly and that time does not permit 30 days' notice for prior public comment and the amendment involves no significant hazards considerations; CLI-16-18, 84 NRC 167 (2016)

### NOTIFICATION

individuals not given notice of public hearings on a proposed wastewater treatment plant did not suffer prejudice, even though they were not provided the opportunity to participate until the eleventh hour of the NEPA process; CLI-16-20, 84 NRC 219 (2016)  
licensee request for exemption from requirement that it provide 30 working days' advance notice to the NRC of intended disbursements was approved; CLI-16-17, 84 NRC 99 (2016)  
licensee was permitted to make withdrawals from the decommissioning trust fund for spent fuel management expenses because it was exempted from the regulation but it was still required to provide 30-day notices of withdrawals for nonadministrative expenses because NRC Staff had not yet granted the license amendment request subjecting licensee to section 50.75(h)(1)(iv); CLI-16-17, 84 NRC 99 (2016)  
NRC Staff has granted exemptions from the 30-day notification requirement for intended disbursements from the decommissioning trust fund; CLI-16-17, 84 NRC 99 (2016)  
NRC Staff, when reviewing notifications for withdrawal of funds to be used for decommissioning purposes, must look to whether the activity or expense is directly related to the radiological decontamination of the facility or qualifies as an administrative expense consistent with NRC regulations and to the applicable license conditions; CLI-16-17, 84 NRC 99 (2016)

### NRC GUIDANCE DOCUMENTS

Standard Review Plan is guidance for NRC Staff in reviewing an application, not a regulation, and it provides one way to comply with NRC regulations; CLI-16-20, 84 NRC 219 (2016)

### NRC INSPECTION

scope for steam generator replacement is described; DD-16-2, 84 NRC 1 (2016)

### NRC POLICY

NRC treats pro se litigants more leniently than litigants with counsel; LBP-16-11, 84 NRC 139 (2016)

### NRC REVIEW

Commission must review the Executive Branch's views on export applications before reaching a decision on the hearing request or petition to intervene; CLI-16-15, 84 NRC 53 (2016)

### NRC STAFF REVIEW

Commission does not review Duke's application de novo, but rather it considers whether NRC Staff's review was sufficient to support the required findings; CLI-16-16, 84 NRC 66 (2016)  
generic statements in the in situ leach mining generic environmental impact statement do not fulfill NRC Staff's obligations under NEPA with regard to significant impacts that could reasonably be posed to wildlife at the license area were licensee to commence land application of wastewater; LBP-16-13, 84 NRC 271 (2016)

## SUBJECT INDEX

- inquiry in mandatory combined license proceeding is whether NRC Staff's review was sufficient to support safety and environmental findings; CLI-16-16, 84 NRC 66 (2016); CLI-16-19, 84 NRC 180 (2016)
- licensing boards lack authority to direct NRC Staff's nonadjudicatory actions, and therefore such a remedy is beyond the scope of an adjudicatory proceeding; CLI-16-18, 84 NRC 167 (2016)
- NEPA requires NRC Staff to take a hard look at any significant environmental consequences of a proposed licensing action; LBP-16-13, 84 NRC 271 (2016)
- new contention that spot-check methodology used by NRC Staff to evaluate well logs was unacceptable was inadmissible because information in the well logs was not materially different from information already in the record; CLI-16-20, 84 NRC 219 (2016)
- NRC must assess the relationship between short-term uses and long-term productivity of the environment, consider alternatives, and describe the unavoidable adverse environmental impacts and the irreversible and irretrievable commitments of resources associated with the proposed action; CLI-16-16, 84 NRC 66 (2016)
- NRC must weigh unavoidable adverse environmental impacts and resource commitments (environmental costs) of the project against the project's benefits; CLI-16-16, 84 NRC 66 (2016)
- NRC Staff bears the ultimate burden of showing that it satisfied NEPA's information-disclosure mandate by meaningfully considering significant impacts and addressing those impacts in the environmental assessment; LBP-16-13, 84 NRC 271 (2016)
- NRC Staff is allowed to give substantial weight to state department of environmental quality's decision that issuing a permit would be environmentally acceptable; LBP-16-13, 84 NRC 271 (2016)
- NRC Staff is exempt from conducting a scoping process for a supplemental EIS based on a plain language reading of 10 C.F.R. 51.26(d) and 51.92(d); CLI-16-20, 84 NRC 219 (2016)
- NRC Staff reviews, which frequently proceed in parallel to adjudicatory proceedings, fall under the direction of Staff management and the Commission itself, not the licensing boards; CLI-16-20, 84 NRC 219 (2016)
- NRC Staff's failure to find that licensee's post-shutdown decommissioning activities report was deficient does not result in the PSDAR attaining the force of law; CLI-16-17, 84 NRC 99 (2016)
- scope of review of a license amendment application is guided by considerations that govern issuance of initial licenses, construction permits, or early site permits to the extent applicable and appropriate; LBP-16-10, 84 NRC 17 (2016)
- when reviewing notifications for withdrawal of funds to be used for decommissioning purposes, Staff must look to whether the activity or expense is directly related to the radiological decontamination of the facility or qualifies as an administrative expense consistent with NRC regulations and to the applicable license conditions; CLI-16-17, 84 NRC 99 (2016)
- NUCLEAR NON-PROLIFERATION ACT**
- before grant of an export license for HEU to a nuclear weapon state, NRC must determine that the proposed export satisfies nonproliferation criteria of Atomic Energy Act § 127; CLI-16-15, 84 NRC 53 (2016)
- five nonproliferation criteria govern exports of special nuclear material; CLI-16-15, 84 NRC 53 (2016)
- public participation in nuclear export licensing proceedings is allowed when NRC finds that such participation will be in the public interest and will assist in making the statutory determinations required by the Atomic Energy Act, including such public hearings and access to information as the Commission deems appropriate; CLI-16-15, 84 NRC 53 (2016)
- NUCLEAR POWER PLANT OPERATIONS**
- operation of the facility is not permitted until the Commission finds that the acceptance criteria in the combined licenses are met; CLI-16-19, 84 NRC 180 (2016)
- NUCLEAR REGULATORY COMMISSION, AUTHORITY**
- although Commission has discretion to review all underlying factual issues de novo, it is disinclined to do so where a board has weighed arguments presented by experts and rendered reasonable, record-based factual findings; CLI-16-20, 84 NRC 219 (2016)
- Commission will exercise its discretion to limit exemptions in any particular area if the exceptions to the rule threaten to erode the rule itself; CLI-16-17, 84 NRC 99 (2016)
- Commission, not the board, has authority to stay a license amendment proceeding in light of pending rulemaking; LBP-16-11, 84 NRC 139 (2016)

## SUBJECT INDEX

NRC Staff reviews, which frequently proceed in parallel to adjudicatory proceedings, fall under the direction of Staff management and the Commission itself, not the licensing boards; CLI-16-20, 84 NRC 219 (2016)

where petitioners have not established a right to an adjudicatory hearing, Commission considers the petition and all related filings as a discretionary exercise of its inherent supervisory authority over agency proceedings; CLI-16-17, 84 NRC 99 (2016)

### NUCLEAR REGULATORY COMMISSION, JURISDICTION

Commission lacks jurisdiction over matters within the jurisdiction of other state and federal agencies and therefore declines to consider them; CLI-16-17, 84 NRC 99 (2016)

### OPERATING LICENSE AMENDMENT APPLICATIONS

exception does not apply where applicant has withdrawn its license amendment request and the Board has approved that withdrawal; CLI-16-17, 84 NRC 99 (2016)

notice and comment process is provided for circumstances involving a license amendment where NRC finds that exigent circumstances exist in that licensee and NRC must act quickly and that time does not permit 30 days' notice for prior public comment and the amendment involves no significant hazards considerations; CLI-16-18, 84 NRC 167 (2016)

scope of review of a license amendment application is guided by considerations that govern issuance of initial licenses, construction permits, or early site permits to the extent applicable and appropriate; LBP-16-10, 84 NRC 17 (2016)

withdrawal of license amendment request was conditioned on the withdrawal requiring that licensee specify in its notification to NRC that it is reimbursing itself from the decommissioning trust fund for certain expenses; CLI-16-17, 84 NRC 99 (2016)

### OPERATING LICENSE AMENDMENT PROCEEDINGS

Commission, not the board, has authority to stay a license amendment proceeding in light of pending rulemaking; LBP-16-11, 84 NRC 139 (2016)

finality in proceeding applies to all Tier 1 and 2 issues, including the hydrogen control system and hydrogen igniters that were part of the certified design; LBP-16-10, 84 NRC 17 (2016)

for proximity presumption to apply, the proposed amendment must obviously entail an increased potential for offsite consequences; LBP-16-10, 84 NRC 17 (2016)

petitioner in a license amendment proceeding must identify some plausible chain of causation or some scenario suggesting how the particular license amendments would result in a distinct new harm or threat to petitioner or its members; LBP-16-10, 84 NRC 17 (2016)

petitioner may claim standing based upon a residence or visits near the plant if the proposed action quite obviously entails an increased potential for offsite consequences; LBP-16-11, 84 NRC 139 (2016)

proximity presumption for standing has been rejected for license amendments associated with shutdown and defueled reactors; LBP-16-10, 84 NRC 17 (2016)

### OPERATING LICENSE AMENDMENTS

applicant must satisfy requirements of 10 C.F.R. 50.90 and demonstrate that the requested amendment meets all applicable regulatory requirements and acceptance criteria and does not otherwise harm the public health and safety or the common defense and security; LBP-16-10, 84 NRC 17 (2016)

circumstances under which licensee can make changes to a facility or procedures described in its UFSAR without obtaining a license amendment are discussed; DD-16-2, 84 NRC 1 (2016)

"evaluation" typically refers to a licensee's documented evaluation against the eight criteria in section 50.59(c)(2) to determine if a proposed change, test, or experiment requires prior NRC approval through a license amendment; DD-16-2, 84 NRC 1 (2016)

hearing may be held after NRC Staff's issuance of the license amendments if there are exigent circumstances; CLI-16-18, 84 NRC 167 (2016)

interested persons may request a hearing when licensee submits a license amendment request to terminate its operating license; CLI-16-17, 84 NRC 99 (2016)

issuance of an exemption from NRC regulations does not mean that NRC Staff has approved an amendment to the license; CLI-16-17, 84 NRC 99 (2016)

licensees must determine if any changes to their facilities or procedures described in the UFSAR, or tests or experiments not described in the UFSAR, will need prior NRC approval through a license amendment; DD-16-2, 84 NRC 1 (2016)

## SUBJECT INDEX

NRC-approved license amendment is required if changes, tests, or experiments involve a change to the technical specifications or if they meet any one of the eight criteria of 10 C.F.R. 50.59(c)(2); DD-16-2, 84 NRC 1 (2016)

opportunity for a hearing must be provided for an amendment to an operating license, combined license, or manufacturing license; LBP-16-10, 84 NRC 17 (2016)

unilateral licensee action without NRC approval of an increase in authority or alteration of the terms of the license does not constitute a de facto amendment; CLI-16-17, 84 NRC 99 (2016)

### ORAL ARGUMENT

if the Commission determines that a hearing should be granted on an export license, it may order either an oral hearing or a hearing consisting of written comments; CLI-16-15, 84 NRC 53 (2016)

where petitioners' written views are on the record, Commission need not devote adjudicatory resources to provide an oral hearing on petitioners' grievances when they have been unable to articulate material issues that require litigation at a hearing; CLI-16-15, 84 NRC 53 (2016)

### PERMITS

NRC Staff is allowed to give substantial weight to state department of environmental quality's decision that issuing a permit would be environmentally acceptable; LBP-16-13, 84 NRC 271 (2016)

See also Early Site Permits; National Pollutant Discharge Elimination System Permit

### PLEADINGS

general factual allegations of injury resulting from defendant's conduct may suffice, and the court presumes that general allegations embrace the specific facts that are necessary to support the claim; LBP-16-10, 84 NRC 17 (2016)

nonconforming pleadings submitted by a specific individual may be summarily rejected because of repeated inability or unwillingness to comply with licensing board's instructions or NRC rules; LBP-16-14, 84 NRC 444 (2016)

pro se intervenors generally are given some leniency in pleading; LBP-16-12, 84 NRC 148 (2016)

pro se petitioner is not held to the same standards of clarity and precision as a lawyer; LBP-16-10, 84 NRC 17 (2016)

### POLICY

general environmental and policy interests have been repeatedly found insufficient to confer standing; LBP-16-14, 84 NRC 444 (2016)

See also NRC Policy

### POWER UPRATE

extended power uprate applicant must scientifically demonstrate that peak cladding temperature will not exceed regulatory limits; LBP-16-11, 84 NRC 139 (2016)

extended power uprate proceedings involve an obvious potential for offsite consequences; LBP-16-11, 84 NRC 139 (2016)

when performing modeling to establish safety of extended power uprate during a loss-of-coolant accident, certain variables shall be calculated using the Baker-Just equation; LBP-16-11, 84 NRC 139 (2016)

### PRECEDENTIAL EFFECT

agency may not treat like cases differently; CLI-16-17, 84 NRC 99 (2016)

### PREJUDICE

although agency had not properly notified plaintiff during the EIS scoping process, court's determination that plaintiff was unable to demonstrate prejudice after having participated in the development of the EIS was upheld; CLI-16-20, 84 NRC 219 (2016)

parties challenging an agency's NEPA process are not entitled to relief unless they demonstrate harm or prejudice; CLI-16-20, 84 NRC 219 (2016)

to prevail on appeal, a party must show not only that the majority erred but also that the error had a prejudicial effect on the party's case; CLI-16-20, 84 NRC 219 (2016)

### PRESUMPTION OF COMPLIANCE

absent evidence to the contrary, Commission assumes at the licensing stage that licensee will comply with its obligations; CLI-16-20, 84 NRC 219 (2016)

### PRO SE LITIGANTS

although NRC treats pro se litigants more leniently than litigants with counsel, pro se parties are still expected to comply with basic procedural rules, especially ones as simple to understand as those establishing filing deadlines; LBP-16-11, 84 NRC 139 (2016)

## SUBJECT INDEX

pleadings submitted by a pro se petitioner are afforded greater leniency than petitions drafted with the assistance of counsel; LBP-16-10, 84 NRC 17 (2016); LBP-16-11, 84 NRC 139 (2016); LBP-16-12, 84 NRC 148 (2016)

### PROOF

See Burden of Proof; Standard of Proof

### PROTECTIVE ORDERS

courts retain the power to modify protective orders even after the underlying proceeding closes;

CLI-16-14, 84 NRC 11 (2016)

petitioners seek to amend the protective order and nondisclosure declaration to dispose of documents in a way not specified by the protective order and nondisclosure declaration; CLI-16-14, 84 NRC 11 (2016)

### PROXIMITY PRESUMPTION

appropriate radius for proximity standing is decided on a case-by-case basis; LBP-16-10, 84 NRC 17 (2016)

Commission has rejected proximity standing for license transfers, license amendments associated with shutdown and defueled reactors, and certain changes to worker-protection requirements; LBP-16-14, 84 NRC 444 (2016)

extended power uprate proceedings involve an obvious potential for offsite consequences; LBP-16-11, 84 NRC 139 (2016)

in license amendment proceedings, petitioner may claim standing based upon a residence or visits near the plant if the proposed action quite obviously entails an increased potential for offsite consequences; LBP-16-11, 84 NRC 139 (2016); LBP-16-14, 84 NRC 444 (2016)

living within a specific distance from a nuclear plant is enough to confer standing on an individual or group in proceedings for construction permits, operating licenses, or significant amendments thereto; LBP-16-10, 84 NRC 17 (2016)

petitioner has the burden to show that the proximity presumption should apply; LBP-16-10, 84 NRC 17 (2016)

petitioner having frequent contacts within 50 miles of a nuclear power reactor may establish standing without the need to make an individualized showing of injury, causation, and redressability; LBP-16-10, 84 NRC 17 (2016)

petitioners' failure to provide physical addresses precludes the board from evaluating the proximity presumption's potential applicability; LBP-16-14, 84 NRC 444 (2016)

presumption applied even though the challenged license amendment affected only the petitioner's right to request a hearing on any changes to the material specimen testing schedule that might be proposed at some future date; LBP-16-10, 84 NRC 17 (2016)

presumption applied where petitioner identified an unlikely, yet plausible, scenario in which an accident of some sort could damage an armored pool containing cobalt-60 at a food processing irradiator facility; LBP-16-10, 84 NRC 17 (2016)

presumption does not apply in license transfer cases; LBP-16-10, 84 NRC 17 (2016)

presumption does not apply where there is no obvious potential for offsite consequences because there have been no changes to the physical plant itself, its operating procedures, design-basis accident analysis, management, or personnel; LBP-16-10, 84 NRC 17 (2016)

presumption is intended to be applied across the board to all proceedings regardless of type because the underlying rationale is not based on type of proceeding per se but on whether the proposed action involves a significant source of radioactivity producing an obvious potential for offsite consequences; LBP-16-10, 84 NRC 17 (2016)

presumption of standing has been rejected for certain changes to worker-protection requirements; LBP-16-10, 84 NRC 17 (2016)

presumption rests on NRC finding, in construction permit and operating license cases, that persons living within the roughly 50-mile radius of the facility face a realistic threat of harm if a release from the facility of radioactive material were to occur; LBP-16-10, 84 NRC 17 (2016)

proximity presumption does not apply in the context of a decommissioning trust transfer; LBP-16-14, 84 NRC 444 (2016)

proximity-based standing has never been granted to a petitioner in an indirect license transfer adjudication but the possibility has not been ruled out; LBP-16-12, 84 NRC 148 (2016)

## SUBJECT INDEX

representational standing has been granted to an organization whose members live within 15 miles of the subject plant; LBP-16-10, 84 NRC 17 (2016)

rulings on claims of proximity standing are decided on the appropriate radius on a case-by-case basis; LBP-16-14, 84 NRC 444 (2016)

standing has been rejected for license amendments associated with shutdown and defueled reactors; LBP-16-10, 84 NRC 17 (2016)

there are limits to proximity standing when there are no changes to the physical plant itself, its operating procedures, design-basis accident analysis, management, or personnel; LBP-16-14, 84 NRC 444 (2016)

to demonstrate interest based on proximity, petitioner must provide more than general assertions of proximity; LBP-16-14, 84 NRC 444 (2016)

### PUBLIC COMMENTS

public is encouraged to provide written comments on export license applications, which the Commission considers and responds to as appropriate; CLI-16-15, 84 NRC 53 (2016)

where petitioner has not met the threshold for obtaining a hearing on an export license, Commission still considers his views as written comments on the application; CLI-16-15, 84 NRC 53 (2016)

### PUBLIC HEARINGS

individuals not given notice of public hearings on a proposed wastewater treatment plant did not suffer prejudice even though they were not provided the opportunity to participate until the eleventh hour of the NEPA process; CLI-16-20, 84 NRC 219 (2016)

### QUALIFICATIONS

See FINANCIAL QUALIFICATIONS

### QUALITY ASSURANCE

licensee's failure to perform primary stress analyses for SL-2 replacement steam generator tube-to-tubesheet welds was a violation of quality assurance requirements for design control; DD-16-2, 84 NRC 1 (2016)

### QUANTITATIVE DATA

contemporaneous standing decisions have found the injury-in-fact requirement satisfied without quantitative proof of harm; LBP-16-10, 84 NRC 17 (2016)

### RADIOACTIVE RELEASES

argument against standing based on low estimate of probability of accidental release of radioactivity from a proposed new reactor has been rejected; LBP-16-10, 84 NRC 17 (2016)

### RADIOACTIVE WASTE DISPOSAL

contention that neither substantively disputes analysis of impacts related to disposal of byproduct material in relevant sections of the DSEIS and the GEIS nor addresses license condition related to disposal of byproduct material is inadmissible; CLI-16-20, 84 NRC 219 (2016)

disposal of byproduct material must take place at an existing disposal site, but the application is not required to include a waste disposal plan or designate which waste disposal site will be used; CLI-16-20, 84 NRC 219 (2016)

### RATEMAKING PROCESS

proper forum for an argument regarding rate regulation is the Federal Energy Regulatory Commission or a state board of public utilities; CLI-16-17, 84 NRC 99 (2016)

### REACTOR DESIGN

additional or alternative structures, systems, components, design features, design criteria, testing, analyses, acceptance criteria, or justifications are not necessary for the AP1000 design; LBP-16-10, 84 NRC 17 (2016)

AP1000 design control document is incorporated by reference in the design certification rule and sets forth location criteria, implementation requirements, and in-containment elevations of hydrogen igniters; LBP-16-10, 84 NRC 17 (2016)

applicable hydrogen source is limited by requiring a reactor design to address and control a 100% fuel cladding-coolant reaction; LBP-16-10, 84 NRC 17 (2016)

challenges to the AP1000 design certified in Part 52, Appendix D is an impermissible challenge to NRC regulations; LBP-16-10, 84 NRC 17 (2016)

departures from a certified design that involve a change to the design as described in the rule certifying the design require an exemption from NRC regulations; CLI-16-16, 84 NRC 66 (2016)

## SUBJECT INDEX

- design certification applicant must include the principal design criteria identified in the General Design Criteria in 10 C.F.R. pt. 50, app. A in its preliminary safety analysis report; LBP-16-10, 84 NRC 17 (2016)
- issues resolved in the AP1000 design certification rulemaking are closed and will not be revisited in a mandatory combined license proceeding, unless they are the subject of a departure or exemption; CLI-16-19, 84 NRC 180 (2016)
- NRC approval is not required for departures from the AP1000 design control document that have no safety significance; CLI-16-19, 84 NRC 180 (2016)
- NRC Staff may approve an exemption from a certified design where it finds that the exemption is authorized by law, will not present an undue risk to the public health and safety, is consistent with the common defense and security, and special circumstances exist that warrant the exemption; CLI-16-16, 84 NRC 66 (2016)
- NRC Staff must determine that special circumstances outweigh any decrease in safety resulting from the reduction in standardization that may result from an exemption from a certified design; CLI-16-16, 84 NRC 66 (2016)
- where a combined license applicant references a certified design, changes to the design may be made in the combined license if proposed as a departure from the certified design, and some departures from the certified design may be made without prior Commission approval; CLI-16-16, 84 NRC 66 (2016)
- REACTOR OPERATOR LICENSING**
- license application may be denied for failure to meet minimum standards for general medical condition; LBP-16-9, 84 NRC 15 (2016)
- REASONABLE ASSURANCE**
- applicants and licensees must provide reasonable assurance that decommissioning funds will be available for the decommissioning process; CLI-16-17, 84 NRC 99 (2016)
- minimum amounts required to demonstrate reasonable assurance of funds for decommissioning are based on activities related to the definition of decommission in 10 C.F.R. 50.2 and do not include the cost of removal and disposal of spent fuel or of nonradioactive structures and materials beyond that necessary to terminate the license; CLI-16-17, 84 NRC 99 (2016)
- REBUTTABLE PRESUMPTION**
- at the pleading stage, general factual allegations of injury resulting from defendant's conduct may suffice, and the court presumes that general allegations embrace the specific facts that are necessary to support the claim; LBP-16-10, 84 NRC 17 (2016)
- RECONSIDERATION**
- See Motions for Reconsideration
- RECORD OF DECISION**
- licensing board's findings and conclusions are deemed to amend NRC Staff's NEPA documents and become the agency record of decision on those matters; CLI-16-18, 84 NRC 167 (2016)
- there are limits on the extent to which a licensing board can amend or cure a NEPA document; LBP-16-13, 84 NRC 271 (2016)
- when the environmental record of decision is supplemented by the adjudicatory process, the disclosure purpose of NEPA is satisfied through the public vetting of environmental issues at an evidentiary hearing and issuance of a decision, and consequently, NRC Staff is not required to otherwise supplement or amend its NEPA documents; CLI-16-18, 84 NRC 167 (2016)
- where an adjudicatory hearing tests the adequacy of NRC Staff's environmental review, a licensing board decision, as the final record of decision under NEPA, can amend NRC Staff's NEPA documents to become, in effect, part of the [final NEPA document; LBP-16-13, 84 NRC 271 (2016)
- REGULATIONS**
- exemption from regulation will be approved if the exemption is authorized by law, will not present an undue risk to the public health and safety, and is consistent with the common defense and security; CLI-16-17, 84 NRC 99 (2016)
- no rule or regulation of the Commission, or any provision thereof, concerning the licensing of production and utilization facilities is subject to attack by way of discovery, proof, argument, or other means in any adjudicatory proceeding subject to Part 2 procedural rules; LBP-16-10, 84 NRC 17 (2016); LBP-16-11, 84 NRC 139 (2016)

## SUBJECT INDEX

NRC looks for guidance to Council on Environmental Quality's implementing regulations for NEPA, which specify that an agency need not include relevant information if the overall costs of obtaining it are exorbitant; CLI-16-20, 84 NRC 219 (2016)  
while NRC is not bound by Council on Environmental Quality regulations, it looks to them for guidance; CLI-16-20, 84 NRC 219 (2016)

See also Amendment of Regulations; State Regulatory Requirements

### REGULATIONS, INTERPRETATION

"evaluation" typically refers to a licensee's documented evaluation against the eight criteria in section 50.59(c)(2) to determine if a proposed change, test, or experiment requires prior NRC approval through a license amendment; DD-16-2, 84 NRC 1 (2016)

exception in 10 C.F.R. 51.92(d) does not apply to a supplemental, site-specific environmental impact statement that tiers off a generic EIS; CLI-16-20, 84 NRC 219 (2016)

NRC Staff is exempt from conducting a scoping process for a supplemental EIS based on a plain-language reading of 10 C.F.R. 51.26(d) and 51.92(d); CLI-16-20, 84 NRC 219 (2016)

provisions of 10 C.F.R. 40.31(h) apply to uranium mills, not in situ recovery sites; CLI-16-20, 84 NRC 219 (2016)

provisions of 10 C.F.R. 51.107(a) refer to issuance of a combined license for a nuclear power reactor and has no applicability to in situ leach facilities; CLI-16-20, 84 NRC 219 (2016)

provisions of 10 C.F.R. Part 40, app. A, Criterion 1 apply to uranium mills, not in situ recovery sites; CLI-16-20, 84 NRC 219 (2016)

requirement in 10 C.F.R. 50.82(a)(8)(i)(A) is not administrative, managerial, or organizational in nature; CLI-16-17, 84 NRC 99 (2016)

waste confidence rule and the continued storage rule apply only to environmental impacts of spent fuel storage at power reactors and spent fuel storage facilities after the end of a reactor's license term and before disposal in a deep geologic repository, not to 11e(2) byproduct material; CLI-16-20, 84 NRC 219 (2016)

### REGULATORY GUIDES

Standard Review Plan is guidance for NRC Staff in reviewing an application, not a regulation, and it provides one way to comply with NRC regulations; CLI-16-20, 84 NRC 219 (2016)

### REGULATORY OVERSIGHT PROCESS

concerns that have already been reviewed, evaluated, and resolved by NRC Staff will not be accepted for review; DD-16-2, 84 NRC 1 (2016)

noncited violation is of very low safety significance for which NRC lacks a basis for expanding its current level of regulatory oversight; DD-16-2, 84 NRC 1 (2016)

### REMAND

proper remedy on a finding of a violation of NEPA is to vacate the decision and remand back to the agency for further proceedings necessary to achieve compliance; CLI-16-20, 84 NRC 219 (2016)

### REPLY BRIEFS

arguments that are raised for the first time in a reply will not be considered; LBP-16-11, 84 NRC 139 (2016)

efforts to rehabilitate an unsupported contention by providing additional detail and arguments in a reply brief contravene NRC longstanding procedural rules; CLI-16-17, 84 NRC 99 (2016)

reply must be filed within 7 days of any answer; LBP-16-11, 84 NRC 139 (2016)

### REPORTING REQUIREMENTS

following submission of the post-shutdown decommissioning activities report, licensee must notify NRC in writing and provide a copy to the affected state, before performing any activity inconsistent with, or making any significant schedule change from, activities and schedules described in the PSDAR, including changes that significantly increase the decommissioning cost; CLI-16-17, 84 NRC 99 (2016)

licensee must submit a post-shutdown decommissioning activities report prior to or within 2 years following permanent cessation of operations; CLI-16-17, 84 NRC 99 (2016)

licensee must submit an annual financial assurance report; CLI-16-17, 84 NRC 99 (2016)

post-shutdown decommissioning activities report must include a discussion of reasons for concluding that the environmental impacts associated with site-specific decommissioning activities will be bounded by appropriate previously issued environmental impact statements; CLI-16-17, 84 NRC 99 (2016)

## SUBJECT INDEX

- post-shutdown decommissioning activities report must include a site-specific decommissioning cost estimate; CLI-16-17, 84 NRC 99 (2016)
- REQUEST FOR ACTION**
- argument that a specific disbursement from the decommissioning fund is inconsistent with an approved exemption is appropriately raised via a request for enforcement action; CLI-16-17, 84 NRC 99 (2016)
- concerns that have already been reviewed, evaluated, and resolved by NRC Staff will not be accepted for review; DD-16-2, 84 NRC 1 (2016)
- director of NRC office with responsibility for the subject matter shall either institute a requested proceeding or advise petitioner in writing that no proceeding will be instituted, in whole or in part, with respect to the request, and the reason for the decision; DD-16-2, 84 NRC 1 (2016)
- request that NRC revoke de facto license amendment and stay restart from refueling outage pending resolution of the hearing request is denied; DD-16-2, 84 NRC 1 (2016)
- RESIDUAL HEAT REMOVAL SYSTEM**
- heat exchanger 72-hour safety-related period of operation and a 14-day non-safety-related design requirement are consistent with NRC's approach to compliance; CLI-16-16, 84 NRC 66 (2016)
- nuclear power plant designs must include a system capable of removing residual heat, defined such that the decay heat does not exceed design limits for the fuel and pressure boundary in the event of an accident unrelated to the loss of coolant; CLI-16-16, 84 NRC 66 (2016)
- RESTART**
- request that NRC revoke de facto license amendment and stay restart from refueling outage pending resolution of the hearing request is denied; DD-16-2, 84 NRC 1 (2016)
- REVIEW**
- annual review of decommissioning expenses and funding by both NRC Staff and licensee is required through license termination; CLI-16-17, 84 NRC 99 (2016)
- See also Appellate Review; Environmental Review; NRC Review; NRC Staff Review; Safety Review; Standard of Review; Standard Review Plans
- REVIEW, DISCRETIONARY**
- although Commission has discretion to review all underlying factual issues de novo, it is disinclined to do so where a board has weighed arguments presented by experts and rendered reasonable, record-based factual findings; CLI-16-20, 84 NRC 219 (2016)
- showing necessary for discretionary grant of petition for review is discussed; CLI-16-20, 84 NRC 219 (2016)
- where petitioners have not established a right to an adjudicatory hearing, Commission considers the petition and all related filings as a discretionary exercise of its inherent supervisory authority over agency proceedings; CLI-16-17, 84 NRC 99 (2016)
- REVOCATION OF LICENSES**
- violation of NEPA, by itself, is not always sufficient to justify suspending or revoking a licensing action; CLI-16-18, 84 NRC 167 (2016)
- RISKS**
- argument against standing based on low estimate of probability of accidental release of radioactivity from a proposed new reactor has been rejected; LBP-16-10, 84 NRC 17 (2016)
- proposed license transfer that does not involve transfer of ownership or operating rights to subject facilities or entail changes in the facilities themselves or in their operation offer no obvious potential for offsite consequences; LBP-16-12, 84 NRC 148 (2016)
- risk equals likelihood of an occurrence times severity of the consequences; LBP-16-10, 84 NRC 17 (2016)
- See also Seismic Risk
- RULE OF REASON**
- some information relevant to an environmental impact statement will not be reasonably available and the agency is directed to proceed in accord with NEPA's rule of reason in the face of such lacunae; CLI-16-20, 84 NRC 219 (2016)
- RULEMAKING**
- board does not have authority to review a claim of unreasonable delay regarding a petition for rulemaking that is before the Commission; LBP-16-11, 84 NRC 139 (2016)

## SUBJECT INDEX

Commission, not the board, has authority to stay a license amendment proceeding in light of pending rulemaking; LBP-16-11, 84 NRC 139 (2016)

contention that attacks a Commission rule or that seeks to litigate a matter that is, or clearly is about to become, the subject of a rulemaking, is inadmissible; LBP-16-10, 84 NRC 17 (2016)

licensing boards should not accept in individual license proceedings contentions that are the subject of rulemaking by the Commission; LBP-16-11, 84 NRC 139 (2016)

when an issue is resolved generically, a petitioner's remedy lies in the rulemaking process, not through adjudication; LBP-16-10, 84 NRC 17 (2016)

### RULES

"rule" in the Administrative Procedure Act includes agency statements not only of general applicability but also those of particular applicability to either a class or a single person; CLI-16-17, 84 NRC 99 (2016)

See also Waiver of Rule

### RULES OF PRACTICE

admissible contention must meet the six criteria of 10 C.F.R. 2.309(f)(1)(i)-(vi); LBP-16-10, 84 NRC 17 (2016); LBP-16-11, 84 NRC 139 (2016)

attack on NRC regulations is impermissible; CLI-16-20, 84 NRC 219 (2016)

board has authority to take appropriate action to control the hearing process, regulate the course of the hearing and the conduct of participants, and issue orders necessary to carry out the presiding officer's duties and responsibilities under 10 C.F.R. Part 2; CLI-16-20, 84 NRC 219 (2016)

challenge does not raise a substantial question for review, because new contention did not meet admission requirements; CLI-16-20, 84 NRC 219 (2016)

contention is inadmissible if it fails to present sufficient information to show a genuine dispute exists on a material issue of law or fact; CLI-16-20, 84 NRC 219 (2016); LBP-16-10, 84 NRC 17 (2016)

contentions are inadmissible if petition fails to demonstrate a genuine dispute with the license amendment application; LBP-16-11, 84 NRC 139 (2016)

even when the Commission has considered petitions not contemplated by its regulations, it has still applied normal rules for adjudication; CLI-16-17, 84 NRC 99 (2016)

no rule or regulation of the Commission, or any provision thereof, concerning the licensing of production and utilization facilities is subject to attack by way of discovery, proof, argument, or other means in any adjudicatory proceeding subject to Part 2 procedural rules; LBP-16-10, 84 NRC 17 (2016)

NRC is not strictly bound by federal judicial standing doctrines; LBP-16-14, 84 NRC 444 (2016)

petitioners' failure to satisfy procedural requirements of section 2.309(d)(1) creates substantive challenges for the board in evaluating petitioners' standing; LBP-16-14, 84 NRC 444 (2016)

reply must be filed within 7 days of any answer; LBP-16-11, 84 NRC 139 (2016)

to obtain a hearing, petitioner must establish standing and propose at least one admissible contention; LBP-16-11, 84 NRC 139 (2016); LBP-16-14, 84 NRC 444 (2016)

to obtain a hearing, petitioner must meet requirements for standing in 10 C.F.R. 2.309(d); LBP-16-11, 84 NRC 139 (2016)

to obtain a waiver of a regulation, petitioner must demonstrate special circumstances; LBP-16-11, 84 NRC 139 (2016)

to satisfy contention admissibility requirements, petitioner must identify facts or expert opinions on which it relies and show that they present a genuine dispute of material fact with the application; LBP-16-10, 84 NRC 17 (2016)

to show special circumstances to obtain a waiver of a regulation, petitioner must meet a four-factor test; LBP-16-11, 84 NRC 139 (2016)

### SAFETY ANALYSIS

Advisory Committee on Reactor Safeguards is a committee of technical experts advising the Commission that provides an independent assessment of the safety aspects of a combined license application; CLI-16-16, 84 NRC 66 (2016)

Commission declined to suspend proceedings, but granted request for safety analysis of the Fukushima accident based on the agency's plans for a short-term and long-term lessons-learned review, and referred portions of the petition relating to pending certified design applications, including the AP1000 amendment, to NRC Staff as comments on the then-pending design certification rulemaking; CLI-16-19, 84 NRC 180 (2016)

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### SAFETY ANALYSIS REPORT

computer programs described in the UFSAR are methods of evaluation subject to the provisions of 10 C.F.R. 50.59(c)(2)(viii) and thus any changes to these methods would require a written evaluation; DD-16-2, 84 NRC 1 (2016)

design certification applicant must include the principal design criteria identified in the General Design Criteria in 10 C.F.R. pt. 50, app. A in its preliminary SAR; LBP-16-10, 84 NRC 17 (2016)

See also Final Safety Analysis Report

### SAFETY ISSUES

all safety and environmental matters relevant to a combined license application, except those resolved in the contested proceeding, are subject to review in the uncontested proceeding; CLI-16-16, 84 NRC 66 (2016)

determinations on safety matters that the Commission must make for authorization of a combined license are listed in 10 C.F.R. 52.97(a); CLI-16-19, 84 NRC 180 (2016)

issues that must be considered in a mandatory combined license proceeding are discussed; CLI-16-16, 84 NRC 66 (2016)

### SAFETY REVIEW

ACRS is a committee of technical experts advising the Commission, which provides an independent assessment of the safety aspects of a combined license application; CLI-16-19, 84 NRC 180 (2016)

### SAFETY-RELATED

noncited violation is of very low safety significance for which NRC lacks a basis for expanding its current level of regulatory oversight; DD-16-2, 84 NRC 1 (2016)

### SANCTIONS

nonconforming pleadings submitted by a specific individual may be summarily rejected because of repeated inability or unwillingness to comply with licensing board's instructions or NRC rules; LBP-16-14, 84 NRC 444 (2016)

### SCHEDULE, BRIEFING

Commission decides matters on the basis of petitions for review, and therefore denies request to establish a briefing schedule; CLI-16-20, 84 NRC 219 (2016)

### SECURITY

See Common Defense and Security; Confidential Information; Sensitive Unclassified Nonsafeguards Information

### SEISMIC RISK

proposed reactor site must meet geologic and seismic criteria; CLI-16-19, 84 NRC 180 (2016)

See also Earthquakes

### SENSITIVE UNCLASSIFIED NONSAFEGUARDS INFORMATION

documents may be shredded by using a cross-cut shredder that produces pieces no larger than 1/4 inch wide by 2 inches long; CLI-16-14, 84 NRC 11 (2016)

documents should be destroyed by a method that will prevent reconstruction of the information in whole or in part and includes shredding as an option; CLI-16-14, 84 NRC 11 (2016)

### SHUTDOWN

proximity presumption for standing has been rejected for license amendments associated with shutdown and defueled reactors; LBP-16-10, 84 NRC 17 (2016)

### SITE CHARACTERIZATION

if a combined license application does not reference an early site permit, all site characteristics as well as the potential environmental impacts of the project are considered during review of the application; CLI-16-19, 84 NRC 180 (2016)

if excavations reveal potentially detrimental geologic features, combined license applicant may be required to conduct additional site investigations; CLI-16-16, 84 NRC 66 (2016)

potential of site previously characterized for a proposed nuclear project that was cancelled before a decision was made on the construction permit is discussed; CLI-16-19, 84 NRC 180 (2016)

### SITE RESTORATION

affected groundwater either must be restored to its original water quality or must be returned to a level that the Commission has found poses no incremental hazards; LBP-16-13, 84 NRC 271 (2016)

in situ leach mining licensee cannot rely on alternate concentration limits under the terms of its current renewed license; LBP-16-13, 84 NRC 271 (2016)

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licensee can meet standards for groundwater constituents in one of three ways; LBP-16-13, 84 NRC 271 (2016)

purpose of aquifer restoration is to return groundwater quality in the production zone to compliance with NRC's groundwater protection standards; LBP-16-13, 84 NRC 271 (2016)

### SITE SUITABILITY

emergency operations facility may serve more than one nuclear power plant site, but Commission approval is required where applicant or licensee proposes to locate the EOF more than 25 miles from the nuclear power plant site; CLI-16-19, 84 NRC 180 (2016)

potential of site previously characterized for a proposed nuclear project that was cancelled before a decision was made on the construction permit is discussed; CLI-16-19, 84 NRC 180 (2016)

proposed reactor site must meet geologic and seismic criteria; CLI-16-19, 84 NRC 180 (2016)

### SPECIAL CIRCUMSTANCES

before an exemption from a regulation may be granted, special circumstances, as defined in 10 C.F.R. 50.12(a)(2)(i)-(vi), must be present; CLI-16-17, 84 NRC 99 (2016)

demonstration of special circumstances is necessary to justify an exemption from regulations; CLI-16-17, 84 NRC 99 (2016)

exemption may be granted if compliance with a rule would result in undue hardship or other costs that are significantly in excess of those contemplated when the regulation was adopted, or that are significantly in excess of those incurred by others similarly situated; CLI-16-17, 84 NRC 99 (2016)

if application of the regulation in question would not serve the underlying purpose of the rule or is not necessary to achieve the underlying purpose of the rule, then special circumstances for an exemption exist; CLI-16-17, 84 NRC 99 (2016)

NRC Staff must determine that special circumstances outweigh any decrease in safety resulting from the reduction in standardization that may result from an exemption from a certified design; CLI-16-16, 84 NRC 66 (2016)

to obtain a waiver of a regulation, petitioner must demonstrate special circumstances; LBP-16-11, 84 NRC 139 (2016)

to show special circumstances to obtain a waiver of a regulation, petitioner must meet a four-factor test; LBP-16-11, 84 NRC 139 (2016)

### SPECIAL NUCLEAR MATERIALS

combined license holder may receive an exemption from certain requirements pertaining to material control and accounting for special nuclear materials, such that the same requirements apply to both Part 52 and Part 50 licensees; CLI-16-16, 84 NRC 66 (2016)

five nonproliferation criteria govern exports of special nuclear material; CLI-16-15, 84 NRC 53 (2016)

proposed export of more than 0.003 effective kilograms of special nuclear material must be under the term of the U.S.-Euratom Agreement for Cooperation in the Peaceful Uses of Nuclear Energy; CLI-16-15, 84 NRC 53 (2016)

### SPENT FUEL MANAGEMENT

licensee must submit annual reports to NRC Staff regarding status of its funding for irradiated fuel management, including a plan to obtain additional funds to cover any expected shortfalls; CLI-16-17, 84 NRC 99 (2016)

licensee was permitted to make withdrawals from the decommissioning trust fund for spent fuel management expenses because it was exempted from the regulation but it was still required to provide 30-day notices of withdrawals for nonadministrative expenses because NRC Staff had not yet granted the license amendment request subjecting licensee to section 50.75(h)(1)(iv); CLI-16-17, 84 NRC 99 (2016)

plan for fuel management following cessation of reactor operations, including funding, is required; CLI-16-17, 84 NRC 99 (2016)

### SPENT FUEL STORAGE

Commission is not required, under the Atomic Energy Act, to make predictive findings regarding the technical feasibility of spent fuel disposal as part of its reactor licensing decisions; CLI-16-16, 84 NRC 66 (2016)

under Continued Storage Rule, spent fuel could remain onsite indefinitely; CLI-16-17, 84 NRC 99 (2016)

waste confidence rule and the continued storage rule apply only to environmental impacts of spent fuel storage at power reactors and spent fuel storage facilities after the end of a reactor's license term and

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before disposal in a deep geologic repository, not to 11e(2) byproduct material; CLI-16-20, 84 NRC 219 (2016)

See also Continued Storage Rule; Independent Spent Fuel Storage Installation

### STANDARD OF PROOF

where there is an evidentiary dispute, licensing board decision makes any necessary factual findings based on a preponderance of the evidence; LBP-16-13, 84 NRC 271 (2016)

### STANDARD OF REVIEW

clear and material error standard is applied to petition for reconsideration; CLI-16-17, 84 NRC 99 (2016)

Commission does not review an application de novo but rather it considers whether NRC Staff's review was sufficient to support the required findings; CLI-16-16, 84 NRC 66 (2016)

Commission gives substantial deference to boards on issues of contention admissibility and will affirm admissibility determinations absent a showing of an error of law or abuse of discretion; CLI-16-20, 84 NRC 219 (2016)

Commission reviews questions of law de novo, but defers to board findings with respect to underlying facts unless the findings are clearly erroneous; CLI-16-18, 84 NRC 167 (2016); CLI-16-20, 84 NRC 219 (2016)

Commission standard of review is de novo; LBP-16-12, 84 NRC 148 (2016)

Commission will take review of a board's factual findings when those findings are clearly erroneous or in conflict with a finding regarding the same fact in a different proceeding; CLI-16-20, 84 NRC 219 (2016)

petitioner must raise a substantial question to warrant Commission review; CLI-16-19, 84 NRC 180 (2016)

review is seldom granted where petitioner relies primarily on claims that the board erred in weighing the evidence in a merits decision; CLI-16-20, 84 NRC 219 (2016)

to prevail on appeal, a party must show not only that the majority erred but also that the error had a prejudicial effect on the party's case; CLI-16-20, 84 NRC 219 (2016)

to show clear error, petitioner must demonstrate that the board's determination is not even plausible in light of the record as a whole; CLI-16-18, 84 NRC 167 (2016); CLI-16-20, 84 NRC 219 (2016)

### STANDARD REVIEW PLANS

this guidance for NRC Staff in reviewing an application is not a regulation, but rather provides one way to comply with NRC regulations; CLI-16-20, 84 NRC 219 (2016)

### STANDING TO INTERVENE

affiants' concern that discharges would impair water quality is sufficient to demonstrate injury in fact for standing; LBP-16-10, 84 NRC 17 (2016)

allegation that defendant's actions caused reasonable concern of injury to the plaintiff is sufficient to demonstrate injury in fact for standing; LBP-16-10, 84 NRC 17 (2016)

allegations that are sufficient to establish standing may be insufficient to support a valid contention; LBP-16-10, 84 NRC 17 (2016)

appropriate radius for proximity standing is decided on a case-by-case basis; LBP-16-10, 84 NRC 17 (2016)

argument against standing based on low estimate of probability of accidental release of radioactivity from a proposed new reactor has been rejected; LBP-16-10, 84 NRC 17 (2016)

argument that would first require three independent safety systems to fail was upheld; LBP-16-10, 84 NRC 17 (2016)

at the pleading stage, it is generally sufficient if petitioner provides plausible factual allegations that satisfy each element of standing; LBP-16-10, 84 NRC 17 (2016)

Commission applies contemporaneous judicial concepts of standing, under which petitioner must allege a concrete and particularized injury that is fairly traceable to the challenged action and is likely to be redressed by a favorable decision; LBP-16-10, 84 NRC 17 (2016)

Commission applies judicial concepts of standing to determine whether petitioners have an interest that confers standing; LBP-16-14, 84 NRC 444 (2016)

Commission has rejected proximity standing for license transfers, license amendments associated with shutdown and defueled reactors, and certain changes to worker-protection requirements; LBP-16-14, 84 NRC 444 (2016)

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Commission ruling that petitioners had standing based on the proximity presumption did not signify any opinion on the admissibility or the merits of petitioners' contention; LBP-16-10, 84 NRC 17 (2016)

contemporaneous standing decisions have found the injury-in-fact requirement satisfied without quantitative proof of harm; LBP-16-10, 84 NRC 17 (2016)

distinction is made between the ultimate merits and the threshold issue of standing; LBP-16-10, 84 NRC 17 (2016)

extended power uprate proceedings involve an obvious potential for offsite consequences; LBP-16-11, 84 NRC 139 (2016)

federal courts have not generally imposed a minimum quantitative threshold on the probability of future injury alleged as the basis of standing; LBP-16-10, 84 NRC 17 (2016)

general environmental and policy interests have been repeatedly found insufficient to confer standing; LBP-16-14, 84 NRC 444 (2016)

in license amendment proceedings, petitioner may claim standing based upon a residence or visits near the plant if the proposed action quite obviously entails an increased potential for offsite consequences; LBP-16-11, 84 NRC 139 (2016); LBP-16-14, 84 NRC 444 (2016)

licensing boards follow a longstanding principle that, in the standing analysis, petition is to be construed in favor of petitioner; LBP-16-10, 84 NRC 17 (2016)

licensing boards have found standing in cases where the proximity presumption was based on unlikely but plausible risk scenarios; LBP-16-10, 84 NRC 17 (2016)

living within a specific distance from a nuclear plant is enough to confer standing on an individual or group in proceedings for construction permits, operating licenses, or significant amendments thereto; LBP-16-10, 84 NRC 17 (2016)

NRC is not strictly bound by federal judicial standing doctrines; LBP-16-14, 84 NRC 444 (2016)

petitioner does not have to establish a link between the interests/injury it asserts establish its standing and the issues that it wishes to litigate relative to an application; LBP-16-12, 84 NRC 148 (2016)

petitioner has the burden to show that the proximity presumption should apply; LBP-16-10, 84 NRC 17 (2016)

petitioner must demonstrate standing in each proceeding in which it seeks to intervene, even if granted standing in another case concerning the same or a nearby facility; LBP-16-14, 84 NRC 444 (2016)

petitioner's standing is not required to be supported by expert affidavits regarding petitioner's plausible scenario for injury; LBP-16-10, 84 NRC 17 (2016)

petitioners are not required to demonstrate their asserted injury with certainty or to provide extensive technical studies in support of their standing argument; LBP-16-10, 84 NRC 17 (2016)

petitioners' failure to provide physical addresses precludes the board from evaluating the proximity presumption's potential applicability; LBP-16-14, 84 NRC 444 (2016)

petitioners' failure to satisfy procedural requirements of section 2.309(d)(1) creates substantive challenges for the board in evaluating petitioners' standing; LBP-16-14, 84 NRC 444 (2016)

plaintiffs' demonstration of injury-in-fact for standing did not have to show that pollutant discharges actually harmed the environment; LBP-16-10, 84 NRC 17 (2016)

proximity presumption allows a petitioner having frequent contacts within 50 miles of a nuclear power reactor to establish standing without the need to make an individualized showing of injury, causation, and redressability; LBP-16-10, 84 NRC 17 (2016)

proximity presumption applied even though the challenged license amendment affected only petitioner's right to request a hearing on any changes to the material specimen testing schedule that might be proposed at some future date; LBP-16-10, 84 NRC 17 (2016)

proximity presumption applied where petitioner identified an unlikely, yet plausible, scenario in which an accident of some sort could damage an armored pool containing cobalt-60 at a food processing irradiator facility; LBP-16-10, 84 NRC 17 (2016)

proximity presumption does not apply in license transfer cases; LBP-16-10, 84 NRC 17 (2016)

proximity presumption does not apply in the context of a decommissioning trust transfer; LBP-16-14, 84 NRC 444 (2016)

proximity presumption does not apply where there is no obvious potential for offsite consequences because there have been no changes to the physical plant itself, its operating procedures, design basis accident analysis, management, or personnel; LBP-16-10, 84 NRC 17 (2016)

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- proximity presumption has been rejected for certain changes to worker-protection requirements; LBP-16-10, 84 NRC 17 (2016)
- proximity presumption has been rejected for license amendments associated with shutdown and defueled reactors; LBP-16-10, 84 NRC 17 (2016)
- proximity presumption is intended to be applied across the board to all proceedings regardless of type because the underlying rationale is not based on type of proceeding per se but on whether the proposed action involves a significant source of radioactivity producing an obvious potential for offsite consequences; LBP-16-10, 84 NRC 17 (2016)
- proximity presumption rests on NRC finding, in construction permit and operating license cases, that persons living within the roughly 50-mile radius of the facility face a realistic threat of harm if a release from the facility of radioactive material were to occur; LBP-16-10, 84 NRC 17 (2016)
- proximity-based standing has never been granted to a petitioner in an indirect license transfer adjudication but the possibility has not been ruled out; LBP-16-12, 84 NRC 148 (2016)
- rulings on claims of 'proximity standing are decided on the appropriate radius on a case-by-case basis; LBP-16-14, 84 NRC 444 (2016)
- standing and contention admissibility are distinct issues, and a licensing board need not rule on contention admissibility to decide standing; LBP-16-10, 84 NRC 17 (2016)
- standing determination is not the appropriate juncture at which to make findings on the underlying dispute because doing so would require reaching beyond the minimum threshold for standing; LBP-16-10, 84 NRC 17 (2016)
- standing is a threshold legal question that does not require assessment of petitioner's case on the merits; LBP-16-10, 84 NRC 17 (2016)
- standing is an essential element in determining whether there is any legitimate role for a court or an agency adjudicatory body in dealing with a particular grievance; LBP-16-14, 84 NRC 444 (2016)
- there are limits to proximity standing when there are no changes to the physical plant itself, its operating procedures, design-basis accident analysis, management, or personnel; LBP-16-14, 84 NRC 444 (2016)
- to demonstrate interest based on proximity, petitioner must provide more than general assertions of proximity; LBP-16-14, 84 NRC 444 (2016)
- to obtain a hearing, petitioner must meet requirements for standing in 10 C.F.R. 2.309(d); LBP-16-11, 84 NRC 139 (2016)
- STANDING TO INTERVENE, ORGANIZATIONAL**
- organization may base its standing on immediate or threatened injury to either its organizational interests or to the interests of identified members; LBP-16-14, 84 NRC 444 (2016)
- organization may establish organizational standing if it demonstrates a risk of discrete institutional injury to itself; LBP-16-14, 84 NRC 444 (2016)
- organization may establish representational standing by showing that at least one member has standing to intervene in his/her own right and has authorized the organization to request a hearing on his/her behalf; LBP-16-11, 84 NRC 139 (2016); LBP-16-14, 84 NRC 444 (2016)
- organizations seeking to intervene in their own right must satisfy the same standing requirements as individuals seeking to intervene; LBP-16-14, 84 NRC 444 (2016)
- standing of organization representing petitioner claiming injury from soil disturbance caused by mining, despite industry's argument that the alleged injury could only occur upon chance occurrence of eight events, one of which only had a 0.8% chance of occurring was upheld; LBP-16-10, 84 NRC 17 (2016)
- STANDING TO INTERVENE, REPRESENTATIONAL**
- organization may base its standing on immediate or threatened injury to either its organizational interests or to the interests of identified members; LBP-16-14, 84 NRC 444 (2016)
- organization may establish representational standing by showing that at least one member has standing to intervene in his/her own right and has authorized the organization to request a hearing on his/her behalf; LBP-16-10, 84 NRC 17 (2016); LBP-16-11, 84 NRC 139 (2016); LBP-16-14, 84 NRC 444 (2016)
- petitioners have not established representational standing if they do not identify any organizational member, show that any member authorized representation, or state how any member is affected by the proposed action; LBP-16-14, 84 NRC 444 (2016)
- representational standing has been granted to an organization whose members lived within 15 miles of the subject plant; LBP-16-10, 84 NRC 17 (2016)

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### STATE REGULATORY REQUIREMENTS

NRC Staff is allowed to give substantial weight to state department of environmental quality's decision that issuing a permit would be environmentally acceptable; LBP-16-13, 84 NRC 271 (2016)

### STATUTORY CONSTRUCTION

"rule" in the Administrative Procedure Act includes agency statements not only of general applicability but also those of particular applicability to either a class or a single person; CLI-16-17, 84 NRC 99 (2016)

### STAY

Commission, not the board, has authority to stay a license amendment proceeding in light of pending rulemaking; LBP-16-11, 84 NRC 139 (2016)

request that NRC revoke de facto license amendment and stay restart from refueling outage pending resolution of the hearing request is denied; DD-16-2, 84 NRC 1 (2016)

See also Injunctive Relief

### STAY OF EFFECTIVENESS

licensing board declined to stay effectiveness of a license upon a showing of a NEPA violation, instead expressing confidence that NRC Staff would promptly take steps to rectify the deficiency; LBP-16-13, 84 NRC 271 (2016)

### STEAM GENERATOR TUBES

licensee's failure to perform primary stress analyses for SL-2 replacement steam generator tube-to-tubesheet welds was a violation of quality assurance requirements for design control; DD-16-2, 84 NRC 1 (2016)

### STEAM GENERATORS

inspection scope for steam generator replacement is described; DD-16-2, 84 NRC 1 (2016)

### STRUCTURAL INTEGRITY

control of hydrogen, oxygen, and other substances in the containment atmosphere is necessary to ensure that containment integrity is maintained; LBP-16-10, 84 NRC 17 (2016)

### SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT

allowing the adjudicatory proceeding to supplement an environmental assessment, in the same manner as is done for environmental impact statements, is appropriate; CLI-16-18, 84 NRC 167 (2016)

Commission declined to order supplementation of final EISs to reference the Continued Storage GEIS; CLI-16-16, 84 NRC 66 (2016)

exception in 10 C.F.R. 51.92(d) does not apply to a supplemental, site-specific environmental impact statement that tiers off a generic EIS; CLI-16-20, 84 NRC 219 (2016)

mitigation and monitoring plans in the FSEIS, although not final, complies with NEPA; CLI-16-20, 84 NRC 219 (2016)

NRC Staff is exempt from conducting a scoping process for a supplemental EIS based on a plain language reading of 10 C.F.R. 51.26(d) and 51.92(d); CLI-16-20, 84 NRC 219 (2016)

supplement to a final environmental impact statement will be prepared in the same manner as the FEIS except that a scoping process need not be used; CLI-16-20, 84 NRC 219 (2016)

### SUPPLEMENTS

allowing the adjudicatory proceeding to supplement an environmental assessment, in the same manner as is done for environmental impact statements, is appropriate; CLI-16-18, 84 NRC 167 (2016)

when the environmental record of decision is supplemented by the adjudicatory process, the disclosure purpose of NEPA is satisfied through the public vetting of environmental issues at an evidentiary hearing and issuance of a decision, and consequently, NRC Staff is not required to otherwise supplement or amend its NEPA documents; CLI-16-18, 84 NRC 167 (2016)

### SUSPENSION OF LICENSE

violation of NEPA, by itself, is not always sufficient to justify suspending or revoking a licensing action; CLI-16-18, 84 NRC 178 (2016); CLI-16-18, 84 NRC 167 (2016)

### SUSPENSION OF PROCEEDING

Commission declined to suspend proceedings but granted request for safety analysis of Fukushima accident based on agency's plans for a short-term and long-term lessons-learned review, and referred portions of the petition relating to pending certified design applications, including the AP1000 amendment, to NRC Staff as comments on then-pending design certification rulemaking; CLI-16-19, 84 NRC 180 (2016)

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- final licensing decisions were suspended and any related contentions were held in abeyance until the court's remand on spent fuel storage was appropriately addressed; CLI-16-19, 84 NRC 180 (2016)
- TECHNICAL SPECIFICATIONS**  
NRC-approved license amendment is required if changes, tests, or experiments involve a change to the technical specifications or if they meet any one of the eight criteria of 10 C.F.R. 50.59(c)(2); DD-16-2, 84 NRC 1 (2016)
- TEMPERATURE LIMITS**  
emergency approval is requested on application to revise ultimate heat sink temperature limit to avoid dual-unit shutdown that would impact grid reliability; CLI-16-18, 84 NRC 167 (2016)  
extended power uprate applicant must scientifically demonstrate that peak cladding temperature will not exceed regulatory limits; LBP-16-11, 84 NRC 139 (2016)
- TERMINATION OF LICENSE**  
interested persons may request a hearing when licensee submits a license amendment request to terminate its operating license; CLI-16-17, 84 NRC 99 (2016)
- TESTIMONY**  
NRC Staff witnesses' testimony on characteristics and hazards of all historic earthquakes within a 100-mile radius of the license area cures the deficiency in the environmental assessment; LBP-16-13, 84 NRC 271 (2016)
- TORNADOES**  
although intervenors presented no evidence in support of the tornado portion of their contention, this is not by itself fatal to the contention because NRC Staff bears the ultimate burden of proof for showing that it complied with NEPA; LBP-16-13, 84 NRC 271 (2016)
- TRAINING**  
NRC Staff will verify adequacy of combined license applicant's training program by inspecting applicant's ability to adequately perform designated emergency response organization functions during the required exercise described in the emergency preparedness ITAAC and subsequent biennial exercises if the NRC later makes the finding required; CLI-16-19, 84 NRC 180 (2016)
- UNCERTAINTIES**  
NEPA does not call for certainty or precision, but an estimate of anticipated (not unduly speculative) impacts; LBP-16-13, 84 NRC 271 (2016)
- UNRESTRICTED RELEASE**  
licensee may not perform decommissioning activities that would foreclose release of the site for possible unrestricted use, result in significant environmental impacts not previously reviewed, or result in lack of reasonable assurance that adequate funds will be available for decommissioning; CLI-16-17, 84 NRC 99 (2016)
- URANIUM**  
there may be site-specific aquifer geochemical conditions that could render uranium a better excursion indicator for groundwater than chloride, alkalinity, electrical conductivity, or sulfate; LBP-16-13, 84 NRC 271 (2016)  
See also High-Enriched Uranium
- URANIUM MINING AND MILLING**  
petition does not raise a substantial question regarding board's finding that information in the preliminary assessment about unreclaimed mines was insufficient to meet admissibility requirements; CLI-16-20, 84 NRC 219 (2016)  
provisions of 10 C.F.R. 40.31(h) apply to uranium mills, not in situ recovery sites; CLI-16-20, 84 NRC 219 (2016)  
provisions of 10 C.F.R. Part 40, app. A, Criterion 1 apply to uranium mills, not in situ recovery sites; CLI-16-20, 84 NRC 219 (2016)  
See also In Situ Leach Mining
- VACATION OF DECISION**  
proper remedy on a finding of a violation of NEPA is to vacate the decision and remand back to the agency for further proceedings necessary to achieve compliance; CLI-16-20, 84 NRC 219 (2016)
- VIOLATIONS**  
injunction is not automatic or default remedy to cure NEPA violation; CLI-16-18, 84 NRC 167 (2016)

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licensee's failure to perform primary stress analyses for SL-2 replacement steam generator tube-to-tubesheet welds was a violation of quality assurance requirements for design control; DD-16-2, 84 NRC 1 (2016)

licensing board declined to stay effectiveness of a license upon a showing of a NEPA violation, instead expressing confidence that NRC Staff would promptly take steps to rectify the deficiency; LBP-16-13, 84 NRC 271 (2016)

noncited violation is of very low safety significance for which NRC lacks a basis for expanding its current level of regulatory oversight; DD-16-2, 84 NRC 1 (2016)

procedural violations of NEPA do not automatically void an agency's ultimate decision; CLI-16-20, 84 NRC 219 (2016)

proper remedy on a finding of a violation of NEPA is to vacate the decision and remand back to the agency for further proceedings necessary to achieve compliance; CLI-16-20, 84 NRC 219 (2016)

violation of NEPA, by itself, is not always sufficient to justify suspending or revoking a licensing action; CLI-16-18, 84 NRC 167 (2016)

### WAIVER OF RULE

petitioner may not challenge a regulatory requirement unless it petitions for a waiver; LBP-16-11, 84 NRC 139 (2016)

to obtain waiver of a regulation, petitioner must demonstrate special circumstances; LBP-16-11, 84 NRC 139 (2016)

to show special circumstances to obtain waiver of a regulation, petitioner must meet a four-factor test; LBP-16-11, 84 NRC 139 (2016)

### WASTE CONFIDENCE RULE

waste confidence rule and continued storage rule apply only to environmental impacts of spent fuel storage at power reactors and spent fuel storage facilities after the end of a reactor's license term and before disposal in a deep geologic repository, not to 11e(2) byproduct material; CLI-16-20, 84 NRC 219 (2016)

### WASTE DISPOSAL

See Radioactive Waste Disposal

### WASTEWATER

claim that because in situ leach wastewater does not exceed human maximum contaminant levels, there is no threat to wildlife is erroneous; LBP-16-13, 84 NRC 271 (2016)

generic statements in the in situ leach mining generic environmental impact statement do not fulfill NRC Staff's obligations under NEPA with regard to significant impacts that could reasonably be posed to wildlife at the license area were licensee to commence land application of wastewater; LBP-16-13, 84 NRC 271 (2016)

land application of wastewater from in situ uranium mining is a reasonably foreseeable alternative and warrants discussion under NEPA and so must be addressed in the environmental assessment; LBP-16-13, 84 NRC 271 (2016)

### WATER QUALITY

affected groundwater either must be restored to its original quality or must be returned to a level that the Commission has found poses no incremental hazards; LBP-16-13, 84 NRC 271 (2016)

in situ leach mining licensee cannot rely on alternate concentration limits under the terms of its current renewed license; LBP-16-13, 84 NRC 271 (2016)

industry practice of definitively establishing groundwater quality baselines after licensing but before operation is supported by NRC case law; CLI-16-20, 84 NRC 219 (2016)

licensee can meet standards for groundwater constituents in one of three ways; LBP-16-13, 84 NRC 271 (2016)

purpose of aquifer restoration is to return groundwater quality in the production zone to compliance with NRC's groundwater protection standards; LBP-16-13, 84 NRC 271 (2016)

selenium concentration limit imposed in state environmental agency's NPDES permit is based solely on a regulation designed to protect drinking water quality for humans and does not in any way address possible ingestion and ultimate bioaccumulation in wildlife; LBP-16-13, 84 NRC 271 (2016)

## SUBJECT INDEX

### WELDS

licensee's failure to perform primary stress analyses for SL-2 replacement steam generator tube-to-tubesheet welds was a violation of quality assurance requirements for design control; DD-16-2, 84 NRC 1 (2016)

### WILDLIFE

claim that because in situ leach wastewater does not exceed human maximum contaminant levels, there is no threat to wildlife is erroneous; LBP-16-13, 84 NRC 271 (2016)

generic statements in the in situ leach mining generic environmental impact statement do not fulfill NRC Staff's obligations under NEPA with regard to significant impacts that could reasonably be posed to wildlife at the license area were licensee to commence land application of wastewater; LBP-16-13, 84 NRC 271 (2016)

selenium concentration limit imposed in state environmental agency's NPDES permit is based solely on a regulation designed to protect drinking water quality for humans and does not in any way address possible ingestion and ultimate bioaccumulation in wildlife; LBP-16-13, 84 NRC 271 (2016)

### WITHDRAWAL

exception does not apply where applicant has withdrawn its license amendment request and the board has approved that withdrawal; CLI-16-17, 84 NRC 99 (2016)

withdrawal of license amendment request was conditioned on the withdrawal requiring that licensee specify in its notification to NRC that it is reimbursing itself from the decommissioning trust fund for certain expenses; CLI-16-17, 84 NRC 99 (2016)

### WITNESSES

Commission deference to the board is particularly great when it comes to weighing the credibility of witnesses; CLI-16-20, 84 NRC 219 (2016)

### WITNESSES, EXPERT

petitioner's standing is not required to be supported by expert affidavits regarding petitioner's plausible scenario for injury; LBP-16-10, 84 NRC 17 (2016)

### ZIRCONIUM CLADDING

zirconium and water source of hydrogen is the only hydrogen source new reactor applicants are required to analyze; LBP-16-10, 84 NRC 17 (2016)

## FACILITY INDEX

BROWNS FERRY NUCLEAR PLANT, Units 1, 2, and 3; Docket Nos. 50-259, 50-260, 50-296-LA  
OPERATING LICENSE AMENDMENT; November 2, 2016; ORDER (Ruling on Petition to Intervene  
and Request for a Hearing); LBP-16-11, 84 NRC 139 (2016)

DEWEY-BURDOCK IN SITU URANIUM RECOVERY FACILITY; Docket No. 40-9075-MLA  
MATERIALS LICENSE; December 23, 2016; MEMORANDUM AND ORDER; CLI-16-20, 84 NRC 219  
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MATERIALS LICENSE AMENDMENT; December 6, 2016; SECOND PARTIAL INITIAL DECISION;  
LBP-16-13, 84 NRC 271 (2016)

INDIAN POINT NUCLEAR GENERATING Unit No. 3; Docket No. 50-286  
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on Petition to Intervene and Request for a Hearing); LBP-16-14, 84 NRC 444 (2016)

LEVY COUNTY NUCLEAR POWER PLANT, Units 1 and 2; Docket Nos. 52-029-COL, 52-030-COL  
COMBINED LICENSE; October 20, 2016; MEMORANDUM AND ORDER; CLI-16-16, 84 NRC 66  
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MIXED OXIDE FUEL FABRICATION FACILITY; Docket No. 70-3098-MLA  
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(2016)

ST. LUCIE NUCLEAR POWER PLANT, Unit 2; Docket No. 50-389  
REQUEST FOR ACTION; July 8, 2016; DIRECTOR'S DECISION UNDER 10 C.F.R. § 2.206; DD-16-2,  
84 NRC 1 (2016)

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CLI-16-18, 84 NRC 167 (2016)

VERMONT YANKEE NUCLEAR POWER STATION; Docket No. 50-271  
DECOMMISSIONING; October 27, 2016; MEMORANDUM AND ORDER; CLI-16-17, 84 NRC 99  
(2016)

VOGTLE ELECTRIC GENERATING PLANT, Units 3 and 4; Docket Nos. 52-025-LA-2, 52-026-LA-2  
OPERATING LICENSE AMENDMENT; September 15, 2016; ORDER (Ruling on Petition to Intervene  
and Request for a Hearing); LBP-16-10, 84 NRC 17 (2016)

WILLIAM STATES LEE III NUCLEAR STATION, Units 1 and 2; Docket Nos. 52-018-COL, 52-019-COL  
COMBINED LICENSE; December 15, 2016; MEMORANDUM AND ORDER; CLI-16-19, 84 NRC 180  
(2016)