

**UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION  
ATOMIC SAFETY AND LICENSING BOARD**

In the Matter of:	)	
	)	
U.S. Department of Energy	)	January 15, 2009
	)	
(License Application for Geologic Repository at Yucca Mountain)	)	Docket No. 63-001
	)	

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**ANSWER OF THE U.S. DEPARTMENT OF ENERGY TO  
WHITE PINE COUNTY'S REQUEST FOR HEARING AND PETITION FOR LEAVE  
TO INTERVENE INCLUDING SUPPORTING CONTENTIONS ON THE  
APPLICATION BY THE U.S. DEPARTMENT OF ENERGY FOR AUTHORITY TO  
CONSTRUCT A GEOLOGIC REPOSITORY AT A GEOLOGIC REPOSITORY  
OPERATIONS AREA AT YUCCA MOUNTAIN**

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**I. INTRODUCTION**

In accordance with 10 C.F.R. Part 2 and 10 C.F.R. Part 63, and the Advisory Pre-Application Presiding Officer (PAPO) Board Order of June 17, 2008, the U.S. Department of Energy (DOE or the Department) hereby files its Answer to “White Pine County’s Request for Hearing and Petition For Leave to Intervene Including Supporting Contentions on the Application by the U.S. Department of Energy for Authority to Construct a Geologic Repository at a Geologic Repository Operations Area at Yucca Mountain” (White Pine County), pursuant to 10 C.F.R. § 2.309 and in the alternative, request for participation as an interested governmental

body (collectively, Petition) pursuant to 10 C.F.R. § 2.315(c), filed on December 22, 2008.<sup>1</sup> The Petition responds to the U.S. Nuclear Regulatory Commission's (NRC or Commission) Notice of Hearing and Opportunity to Petition for Leave to Intervene on an Application for Authority To Construct a Geologic Repository at a Geologic Repository Operations Area at Yucca Mountain, published in the *Federal Register* on October 22, 2008 (73 Fed. Reg. 63,029) (Hearing Notice). The Hearing Notice concerns DOE's License Application (Application or LA) for authorization to construct a geologic repository at Yucca Mountain, Nevada for the disposal of spent nuclear fuel (SNF) and high-level radioactive waste (HLW).

To be admitted as a party to this proceeding, under 10 C.F.R. § 2.309, White Pine County must: (1) be in substantial and timely compliance with the Licensing Support Network (LSN) requirements imposed by 10 C.F.R. § 2.1003 at the time of its request for participation in the proceeding as provided in 10 C.F.R. § 2.1012(b)(1), and be in compliance with all orders of the Pre-License Application Presiding Officer (PAPO) regarding electronic availability of documents; (2) have legal standing to intervene in the proceeding pursuant to 10 C.F.R. § 2.309; and (3) submit at least one admissible contention in accordance with 10 C.F.R. § 2.309(f)(1). In addition to the NRC's contention admissibility requirements in 10 C.F.R. § 2.309(f), environmental contentions must also meet the requirements of 10 C.F.R. § 51.109 and 10 C.F.R. § 2.326. To participate as an interested governmental body under 10 C.F.R. § 2.315(c), White Pine County need not demonstrate legal standing nor submit an admissible contention, but must be in substantial and timely compliance with its LSN obligations.

As discussed below, DOE has no reason to believe that White Pine County is not in substantial and timely compliance with its LSN obligations at this time, and does not object to its

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<sup>1</sup> DOE is filing this Answer in advance of the deadline set by the Commission in its Hearing Notice. DOE recognizes, however, that Petitioners have the full time allotted by the Hearing Notice to file their replies. DOE's early filing does not affect the deadlines set by the Commission.

legal standing as an Affected Unit of Local Government (AULG) under the Nuclear Waste Policy Act or its participation as an interested governmental body. However, DOE does not believe that White Pine County has proffered any admissible contentions.<sup>2</sup>

## **II. COMPLIANCE WITH LSN REQUIREMENTS**

DOE has no reason to believe that White Pine County is not in substantial and timely compliance with its LSN obligations at this time, and therefore this Answer does not address the detailed requirements for LSN compliance.

## **III. LEGAL STANDING**

Because the Commission has stated that “[a]ny AULG [Affected Unit of Local Government] seeking party status shall be considered a party to this proceeding, provided that it files at least one admissible contention” Hearing Notice, 73 Fed. Reg. at 63,031, DOE has no objection to White Pine County’s legal standing. Additionally, DOE has no objection to White Pine County’s participation in the proceeding, pursuant to 10 C.F.R. § 2.315(c), as an interested governmental body, and not as a formal party, on admitted contentions proffered by other parties.

## **IV. ADMISSIBILITY OF CONTENTIONS**

### **A. Applicable Legal Standards and Relevant NRC Precedent**

#### **1. Petitioner Must Submit at Least One Admissible Contention to be Admitted as a Party**

To be admitted as a party in the Yucca Mountain licensing proceeding, a petitioner must proffer at least one admissible contention. *See* 10 C.F.R. §§ 2.309(a), 2.309 (d)(2)(iii). The NRC will deny a petition to intervene from a petitioner who has complied with the LSN

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<sup>2</sup> DOE’s Answer to Nevada’s Petition contains a “Background” section summarizing the Yucca Mountain site, proposed repository operation, the applicable NRC regulatory framework, and the NRC Staff’s technical review and the hearing process. DOE has omitted that section from this Answer in the interest of brevity.

requirements and has demonstrated standing to intervene, but who has not proffered at least one admissible contention. *See generally, Fla. Power & Light Co.* (Turkey Point Nuclear Generating Plant, Units 3 and 4), CLI-01-17, 54 NRC 3, 5 (2001). As the Commission has observed, “[i]t is the responsibility of the Petitioner to provide the necessary information to satisfy the basis requirement for the admission of its contentions and demonstrate that a genuine dispute exists within the scope of this proceeding.” *Baltimore Gas & Elec. Co.* (Calvert Cliffs Nuclear Power Plant, Units 1 and 2), CLI-98-14, 48 NRC 39, 41 (1998). “A contention’s proponent, not the licensing board, is responsible for formulating the contention and providing the necessary information to satisfy the basis requirement for the admission of contentions.” *Statement of Policy on Conduct of Adjudicatory Proceedings*, CLI-98-12, 48 NRC 18, 22 (1998). Finally, “government entities seeking to litigate their own contentions are held to the same pleading rules as everyone else.” *Dominion Nuclear Conn., Inc.* (Millstone Nuclear Power Station, Units 2 and 3), CLI-05-24, 62 NRC 551, 568 (2005).

**2. Petitioner in this Proceeding Has a Heightened Obligation to Proffer Well Pled and Adequately Supported Contentions Given the Availability of the LSN**

As the Commission has noted, this proceeding involves a number of “unique facts and circumstances” – one of those being the development of the LSN as a substitute for traditional document discovery. In developing this system, the NRC sought both to streamline the discovery process *and* to facilitate submittal of well-pled contentions:

Another efficiency the [LSN] provides is reducing the effort consumed in carrying out document discovery and allowing more effort to be spent in case preparation. Because access to these documents is provided *before* the application is docketed, each party can focus on formulating meaningful contentions before the licensing hearing begins. *There should be no excuse for poorly crafted contentions, and the licensing board can reduce hearing delays by readily rejecting or otherwise disposing of unfocused or unsupported contentions.* Likewise, the [LSN] rule places tighter

restrictions on amending or adding contentions late in the hearing processes because the [LSN] affords the parties an opportunity to raise and resolve issues earlier than what traditionally has been possible.

SECY-95-153, Memorandum from James M. Taylor, Executive Director of Operations, to the Commissioners, “Licensing Support System Senior Management Team Recommendations on Direction of the Licensing Support System,” June 14, 1995, *available at* LEGACY DAMS Accession No. 9506280652 (emphasis added).

In issuing the final LSN rule nearly a decade later, the Commission noted that “the history of the LSN and its predecessor . . . makes it apparent it was the Commission’s expectation that the LSN, among other things, would provide potential participants with the opportunity to frame focused and meaningful contentions” and avoid potential discovery-related delays. Final Rule, LSN, Submissions to the Electronic Docket, 69 Fed. Reg. at 32,843. The Commission added that “[t]hese objectives are still operational.” *Id.* In fact, in a recent adjudicatory order related to this proceeding, the Commission reaffirmed these objectives:

The use of the LSN was intended, among other things, to “enabl[e] the comprehensive and early review of the millions of pages of relevant licensing material by the potential parties to the proceeding, so as to permit the earlier submission of better focused contentions resulting in a substantial saving of time during the proceeding.”

*U.S. Dep’t of Energy* (High-Level Waste Repository: Pre-Application Matters), CLI-08-12, 67 NRC \_\_ (slip op. at 8) (June 17, 2008).

And in fact, DOE’s production of documentary material on the LSN fulfilled those objectives. DOE first made documentary material available on the LSN in 2004, when it publicly released approximately 1.3 million documents. Transcript of Record at 540, *U.S. Dep’t of Energy* (High-Level Waste Repository: Pre-Application Matters), ASLBP No. 04-8239-01-

PAPO (July 12, 2005). DOE made another 2.1 million documents publicly available on the LSN in April, 2007—more than a year before it submitted the LA. Policy Issue Information Memorandum, SECY-07-0130, August 7, 2007, *available at* ADAMS No. ML071930440 at 5. DOE regularly added documents to the LSN each month thereafter, and in October, 2007, DOE certified that all its extant documentary material was available on the LSN. The Department of Energy submitted its Certification of Compliance on October 19, 2007. DOE has since then updated its LSN production each month with new documentary material that it has generated, received, or identified. *See e.g.*, The Department of Energy’s Certification of Licensing Support Network Supplementation (November 1, 2007); *see also* Revised Second Case Management Order, ASLBP No. 04-829-01-PAPO (July 6, 2007) at 21 (requiring monthly supplemental production on LSN of documentary material created or discovered after party’s initial LSN certification).

Altogether, DOE has made more than 3.5 million documents available on the LSN. *U.S. Dep’t of Energy* (High-Level Waste Repository: Pre-Application Matters), LBP-08-01, 67 NRC \_\_\_ (slip op. at 11) (January 4, 2008) (stating that “it is not disputed that DOE has made available a massive amount of documentary material—3.5 million documents, amounting to over 30 million pages, including redacted versions of some privileged documents and privilege logs for hundreds of others.”). That production includes documents that DOE cites and relies upon in the LA. It includes extensive underlying calculations, data, and other material on which those documents are based. Further, as required by regulation, it also includes documents with information that does not support the information DOE intends to cite or rely upon in the licensing proceeding. 10 C.F.R. § 2.1001 (definition of “documentary material”).

DOE's extensive production substantially heightens the White Pine County's ability—*and its corresponding obligation*—to proffer focused and adequately supported contentions in this proceeding. As the Commission observed in rejecting a challenge to DOE's initial LSN certification, "potential parties had access to millions of DOE documents upon which to begin formulating meaningful contentions" during the period following that certification, as contemplated by the Commission's regulations. *U.S. Dep't of Energy*, CLI-08-12, 67 NRC \_\_ (slip op. at 9). Indeed, because of DOE's early production of documentary material on the LSN starting 4 years before LA submittal, every potential party has had an even greater opportunity than the regulations contemplate to use those materials to develop contentions. Based on the above circumstances, White Pine County must be held to a particularly heightened burden to proffer well-pled and adequately supported contentions.

**3. Proffered Contentions Must Meet All of the Contention Admissibility Requirements of 10 C.F.R. § 2.309(f)(1) as Well as the Requirements of the Applicable June 20, 2008 and September 29, 2008 Case Management Orders**

Section 2.309(f)(1) requires a petitioner to "set forth with particularity the contentions sought to be raised," and to satisfy the following six criteria: (1) provide a specific statement of the legal or factual issue sought to be raised; (2) provide a brief explanation of the basis for the contention; (3) demonstrate that the issue raised is within the scope of the proceeding; (4) demonstrate that the issue raised is material to the findings the NRC must make to support the licensing action that is the subject of 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; and (6) provide sufficient information to show that a genuine dispute exists with regard to a material issue of law or fact. *See* 10 C.F.R. § 2.309(f)(1)(i)-(vi). *A failure to comply with any one of the six admissibility criteria is grounds for rejecting a proffered contention. See* Final Rule, Changes to

Adjudicatory Process, 69 Fed. Reg. 2182, 2221 (Jan. 14, 2004) (emphasis added); *see also Private Fuel Storage L.L.C.*, (Independent Spent Fuel Storage Installation) CLI-99-10, 49 NRC 318, 325 (1999).

The purpose of these six criteria is to “focus litigation on concrete issues and result in a clearer and more focused record for decision.” Final Rule, Changes to Adjudicatory Process, 69 Fed. Reg. at 2202. The current contention admissibility standards are “strict by design,” *Dominion Nuclear Conn., Inc.* (Millstone Nuclear Power Station, Units 2 and 3), CLI-01-24, 54 NRC 349, 358 (2001), *recons. denied*, CLI-02-1, 55 NRC 1 (2002), and were intended to “raise the threshold for the admission of contentions.” Rules of Practice for Domestic Licensing Proceedings—Procedural Changes in the Hearing Process, 54 Fed. Reg. 33,168 (Aug. 11, 1989); *see also Duke Energy Corp.* (Oconee Nuclear Station, Units 1, 2, and 3), CLI-99-11, 49 NRC 328, 334 (1999). As explained above, the availability of the LSN further raises this threshold for the admission of a contention in this proceeding. In revising its Part 2 rules in 2004, the Commission reiterated that the standards are “necessary to ensure that hearings cover only genuine and pertinent issues of concern and that the issues are framed and supported concisely enough at the outset to ensure that the proceedings are effective and focused on real, concrete issues.” Final Rule, Changes to Adjudicatory Process, 69 Fed. Reg. at 2189-90 (stating that the NRC “should not have 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”); *id.* at 2202.

Strict application of these contention admissibility criteria in this proceeding is critically important. The vast number of contentions submitted and the “rigorous schedule” imposed by the NWSA and Appendix D to Part 2 present unprecedented challenges to the conduct of a timely, effective, and focused adjudication. Recognizing these challenges, the Advisory PAPO

Board, with the Commission’s express approval, issued its Case Management Order “to help both potential parties and licensing boards address the admissibility of contentions in any HLW proceeding effectively and efficiently.” *U.S. Dep’t of Energy* (High-Level Waste Repository: Pre-Application Matters, Advisory PAPO Board), LBP-08-10, 67 NRC \_\_ (slip op. at 3) (June 20, 2008) (Case Management Order).<sup>3</sup> That Order imposes numerous format requirements for proffered contentions. Failure to adhere to these format requirements may provide an additional basis for rejection of proffered contentions should a potential party significantly and in bad faith ignore these requirements. *Id.* at 3, 5-9.

The six contention admissibility criteria set forth in § 2.309(f)(1), and the related pleading requirements contained in the Case Management Order, are discussed further below.

**a. Petitioner Must Specifically State the Issue of Law or Fact to Be Raised**

Section 2.309(f)(1)(i), the first admissibility criterion, requires that a petitioner “provide a specific statement of the issue of law or fact to be raised or controverted,” by “articulat[ing] at the outset the specific issues [it] wish[es] to litigate as a prerequisite to gaining formal admission as [a party].” *Duke Energy Corp.*, CLI-99-11, 49 NRC at 338. To be admissible, a contention “must explain, with specificity, particular safety or legal reasons requiring rejection of the contested [application].” *Dominion Nuclear Conn., Inc.*, CLI-01-24, 54 NRC at 359-60. Section 2.309(f)(1)(i) “bar[s] contentions where petitioners have only ‘what amounts to generalized suspicions, hoping to substantiate them later.’” *Duke Energy Corp.* (McGuire Nuclear Station, Units 1 and 2; Catawba Nuclear Station, Units 1 and 2), CLI-03-17, 58 NRC 419, 424 (2003) (quoting *Duke Energy Corp.*, CLI-99-11, 49 NRC at 337-39). Elaborating further on this

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<sup>3</sup> A second case management order was issued. *See U.S. Dep’t of Energy* (Regarding Contention Formatting and Tables of Contents), LBP-08-10, 67 NRC \_\_ (September 29, 2008).

requirement, the June 20, 2008, Case Management Order for this proceeding requires “narrow, *single-issue* contentions” that are “sufficiently specific as to define the relevant issues for eventual rulings on the merits, and not require” extensive narrowing or clarification by the parties or boards. *U.S. Dep’t of Energy*, LBP-08-10, 67 NRC \_\_ (slip op. at 6) (emphasis added).

**b. Petitioner Must Briefly Explain the Basis for the Contention**

Section 2.309(f)(1)(ii) requires that a petitioner provide “a brief explanation of the basis for the contention.” *See also* Rules of Practice for Domestic Licensing Proceedings—Procedural Changes in the Hearing Process, 54 Fed. Reg. at 33,170. This includes “sufficient foundation” to “warrant further exploration.” *Public Serv. Co. of N.H.* (Seabrook Station, Units 1 and 2), ALAB-942, 32 NRC 395, 428 (1990) (footnote omitted). A petitioner’s explanation serves to define the scope of a contention, as “[t]he reach of a contention necessarily hinges upon its terms coupled with its stated bases.” *Public Serv. Co. of N.H.* (Seabrook Station, Units 1 and 2), ALAB-899, 28 NRC 93, 97 (1988), *petitions denied in part, granted in part, Mass. v. U.S. Nuclear Regulatory Comm’n*, 924 F.2d 311 (D.C. Cir. 1991), *cert. denied*, 502 U.S. 899 (1991). The Board, however, must determine the admissibility of the contention itself, not the admissibility of individual “bases.” *Duke Energy Corp.* (McGuire Nuclear Station, Units 1 and 2; Catawba Nuclear Station, Units 1 and 2), CLI-02-28, 56 NRC 373, 379 n.45 (2002).

**c. Petitioner Must Demonstrate that the Issue Raised in the Contention is Within the Scope of the Proceeding**

Section 2.309(f)(1)(iii) requires that a petitioner demonstrate “that the issue raised in the contention is within the scope of the proceeding.” The scope of the proceeding is defined by the Commission’s Notice of Hearing and the NRC regulations governing review and approval of the Application. *See, e.g., Duke Power Co.* (Catawba Nuclear Station, Units 1 and 2), ALAB-825, 22 NRC 785, 790-91 (1985). Contentions are necessarily limited to issues that are germane to

the specific application pending before the Board. *Yankee Atomic Elec. Co.* (Yankee Nuclear Power Station), CLI-98-21, 48 NRC 185, 204 n.7 (1998). Any contention that falls outside the specified scope of this proceeding – as discussed further below – must be rejected. *See, e.g., Dominion Nuclear Conn., Inc.* (Millstone Nuclear Power Station, Units 2 and 3), CLI-04-36, 60 NRC 631, 639 (2004).

A contention that challenges an NRC rule is outside the scope of this proceeding because, absent a waiver, “no rule or regulation of the Commission . . . is subject to attack . . . in any adjudicatory proceeding. . . .” 10 C.F.R. § 2.335(a). 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. *See Fla. Power & Light Co.* (Turkey Point Nuclear Generating Plant, Units 3 and 4), LBP-01-6, 53 NRC 138, 159 (2001), *aff’d on other grounds*, CLI-01-17, 54 NRC 3. For instance, any direct or indirect challenge to the current EPA standard or NRC implementing rule is a collateral attack and is outside the scope of the proceeding. Moreover, Nevada challenged the EPA rule in federal court and thus this proceeding is the wrong forum to once again raise such a challenge.

In addition, any contention that collaterally attacks applicable statutory requirements or the basic structure of the NRC regulatory process must also be rejected by the Board as outside the scope of the proceeding. *Carolina Power & Light* (Shearon Harris Nuclear Power Plant Units 1), LBP-07-11, 65 NRC 41, 57-58 (citing *Philadelphia Elec. Co.* (Peach Bottom Atomic Power Station, Units 2 and 3), ALAB-216, 8 AEC 13, 20 (1974)). Accordingly, a contention that simply states the petitioner’s views about what the regulatory policy should be does not present a litigable issue. *See Philadelphia Elec. Co.*, ALAB-216, 8 AEC at 20-21, 21 n.33. Similarly, challenges to the adequacy of the NRC Staff’s safety review process, including the

contents of its SER, are outside the scope of this proceeding. “The NRC has not, and will not, litigate claims about the adequacy of the Staff’s safety review in licensing adjudications.”

*AmerGen Energy Co., LLC* (License Renewal for Oyster Creek Nuclear Generating Station), CLI-08-28, 68 NRC \_\_ (slip op. at 13-14) (Nov. 6, 2008).

Furthermore, asserting that generalized “uncertainties” exist in postclosure models or data, without showing in any way, how or why those uncertainties call into question the conclusions reached by DOE, or findings the NRC must make in its review of the LA, is not a sufficient basis for an admissible contention. To merely assert the existence of such uncertainties, without specifying their impact on a finding NRC must make in its issuance of the construction authorization, amounts to an improper challenge to Part 63, which explicitly recognizes that such uncertainties exist and cannot be eliminated. The Commission, in the Statements of Consideration accompanying Part 63, expressly rejected requests made by several commenters to define an acceptable level of uncertainty in Part 63, finding it “neither practical nor appropriate.” Final Rule, Disposal of High-Level Radioactive Wastes in a Proposed Geologic Repository at Yucca Mountain, NV, 66 Fed. Reg. 55,732, 55,747-748 (Nov. 2, 2001). The Commission “decided to adopt EPA's preferred criterion of ‘reasonable expectation’ for purposes of judging compliance with the postclosure performance objectives [since] ... a standard of ‘reasonable expectation’ allows it the necessary flexibility to account for the inherently greater uncertainties in making long-term projections of a repository's performance.” *Id.* at 55,740. This flexibility encompasses consideration of the use, as appropriate, of cautious but reasonable approaches consistent with present knowledge in lieu of bounding or more conservative approaches. *See, e.g.*, 10 C.F.R. § 63.305(c).

The following examples from 10 C.F.R. § 63.101 are illustrative of the reasonable expectation standard:

- “Proof that the geologic repository will conform with the objectives for postclosure performance is not to be had in the ordinary sense of the word because of the uncertainties inherent in the understanding of the evolution ....”
- “[W]hat is required is reasonable expectation, making allowance for the ...uncertainties involved, that the outcome will conform with the objectives for postclosure....”
- “[D]emonstration of compliance must take uncertainties and gaps in knowledge into account so that the Commission can make the specified finding....”

10 C.F.R. § 63.304 describes the characteristics of reasonable expectation by stating that reasonable expectation:

- Requires less than absolute proof because absolute proof is impossible to attain for disposal due to the uncertainty of projecting long-term performance;
- Accounts for the inherently greater uncertainties in making long-term projections of the performance of the Yucca Mountain disposal system;
- Does not exclude important parameters from assessments and analyses simply because they are difficult to precisely quantify to a high degree of confidence; and
- Focuses performance assessments and analyses on the full range of defensible and reasonable parameter distributions rather than only upon extreme physical situations and parameter values.

In addition, 10 C.F.R. § 63.305(c) makes clear that, in the context of reasonable expectation, conservative means the use of cautious but reasonable assumptions consistent with present knowledge.

Given the obligation of the Commission under section 801(b) of the Energy Policy Act of 1992 (EPACT) to modify its technical requirements and criteria under section 121(b) of the NWPA to be consistent with the radiological protection standards promulgated by the Environmental Protection Agency (EPA) under section 801(a) of EPACT, the proper application of the reasonable expectation standard must take into account the statements by EPA in

promulgating the standards required by EPACT.<sup>4</sup> These statements make clear that, while reasonable assurance and reasonable expectation are similar concepts, the evaluation of the Yucca Mountain repository requires a different level and type of technical proof than required for reactors and other situations licensed by NRC in the past.<sup>5</sup> Reasonable expectation recognizes that, in the context of the Yucca Mountain repository, “unequivocal numerical proof of compliance is neither necessary nor likely to be obtained,”<sup>6</sup> and while some “sources of uncertainty can be addressed, or at least accounted for while in other [data or model] areas our knowledge may be too limited to even characterize the uncertainty, much less explicitly account for it.”<sup>7</sup> Identifying postclosure uncertainties, without specifying their impact on whether the reasonable expectation standard is met, does not provide an adequate basis to admit a contention.

Therefore, in formulating its contentions, the initial burden is on the petitioner to explain the implications of alleged uncertainties and show why, if true, they exceed the range of acceptable (and unavoidable) uncertainties clearly reflected in the regulations, particularly the reasonable expectation standard set forth in 10 C.F.R. § 63.101. Any contention attempting to shift that burden to the applicant is an improper challenge to 10 C.F.R. § 2.309. *See Entergy Nuclear Generation Co. and Entergy Nuclear Operations, Inc.* (Pilgrim Power Station), LBP-06-

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<sup>4</sup> See Final Rule, Public Health and Environmental Radiation Protection Standards for Yucca Mountain, NV, 66 Fed. Reg. 32,074, 32,101-32,103 (June 13, 2001) (section III.B.2.c titled “What Level of Expectation Will Meet Our Standards?”); see also Proposed Rule, Public Health and Environmental Radiation Protection Standards for Yucca Mountain, NV, 70 Fed. Reg. 49,014, 49,020-49,021 (August 22, 2005) (section I.A.1.c titled “What is “Reasonable Expectation?””); Final Rule, Public Health and Environmental Radiation Protection Standards for Yucca Mountain, NV, 73 Fed. Reg. 61,256, 61,271-61,273 (October 15, 2008) (section III.A.4 titled “How Did We Consider Uncertainty and Reasonable Expectation?”).

<sup>5</sup> See Final Rule, Public Health and Environmental Radiation Protection Standards for Yucca Mountain, NV, 66 Fed. Reg. at 32,101.

<sup>6</sup> Proposed Rule, Public Health and Environmental Radiation Protection Standards for Yucca Mountain, NV, 70 Fed. Reg. at 49,021.

<sup>7</sup> Final Rule, Public Health and Environmental Radiation Protection Standards for Yucca Mountain, NV, 73 Fed. Reg. at 61,271, n.22.

23, 64 NRC 257, 358-59 (2006). DOE's responses to specific contentions identify where these pleading requirements have been violated.

**d. Petitioner Must Demonstrate That Each Contention Raises a Material Issue**

Section 2.309(f)(1)(iv) requires that a petitioner “[d]emonstrate that the issue raised in the contention is *material* to the *findings the NRC must make to support the action* that is involved in the proceeding.” Emphasis added. As the Commission has observed, “[t]he dispute at issue is ‘material’ if its resolution would ‘make a difference in the outcome of the licensing proceeding.’” *Duke Energy Corp.*, CLI-99-11, 49 NRC at 333-34; *see also* Rules of Practice for Domestic Licensing Proceedings—Procedural Changes in the Hearing Process, 54 Fed. Reg. at 33,172. Thus, each contention must be one that, if proven, would entitle the petitioner to relief. *Yankee Atomic Elec. Co. (Yankee Power Station)*, CLI-96-7, 43 NRC 235, 244 (1996). The Case Management Order states that this criterion “requires citation to a statute or regulation that, explicitly or implicitly, has not been satisfied by reason of the issue raised in the contention.” *U.S. Dep’t of Energy*, LBP-08-10, 67 NRC \_\_ (slip op. at 7).

The “findings the NRC must make to support” the issuance of a construction authorization for a geologic repository are set forth in 10 C.F.R. § 63.31. To authorize construction of the repository, the NRC must determine that:

- there is reasonable assurance that the types and amounts of radioactive materials described in the application can be received and possessed in a geologic repository operations area of the design proposed without unreasonable risk to the health and safety of the public;
- there is reasonable expectation that the materials can be disposed of without unreasonable risk to the health and safety of the public; and
- there is reasonable assurance that the activities proposed in the application will not be inimical to the common defense and security.

In short, the NRC must determine the validity of DOE's conclusions concerning the ability of the repository design to limit exposure to radioactivity, both during the construction and operation phase of the repository (*i.e.*, preclosure phase) and during the phase after the repository has been filled, closed, and sealed (*i.e.*, postclosure phase).

In making these determinations, the NRC must evaluate DOE's compliance with the applicable provisions of Part 63, including, among other things, whether DOE has described the proposed geologic repository as specified in § 63.21, and whether the site and design comply with the Part 63 performance objectives and requirements. Proposed safety contentions that fail to raise issues that are material to these findings are inadmissible. For example, Part 63 permits DOE to use probabilistic analyses to calculate potential postclosure radiation doses, 10 C.F.R. § 63.102(j), and to report those doses as *mean* doses. *See* 10 C.F.R. § 63.303. Therefore, contentions that either independently or cumulatively, fail to demonstrate an increase in the mean dose *above regulatory limits* are immaterial and inadmissible because they would not "make a difference in the outcome of the licensing proceeding." *Duke Energy Corp.*, CLI-99-11, 49 NRC at 333-34.

**e. Petitioner Must Demonstrate that Each Contention is Supported by Adequate Factual Information and/or Expert Opinion**

Section 2.309(f)(1)(v) requires a petitioner to present the factual information or expert opinions necessary to support its contention adequately, and failure to do so requires the Board to reject the contention. *See also Yankee Atomic Elec. Co.*, CLI-96-7, 43 NRC at 262 (in referencing 10 C.F.R. § 2.714, the predecessor to 10 C.F.R. § 2.309, the Commission stated that petitioners must present "claims rooted in fact, documents, or expert opinions"). A petitioner is "obligated to put forward and support contentions when seeking intervention, based on the application and information available" by examining the application and publicly available

information. *Consumers Energy Co.* (Palisades Nuclear Power Plant) CLI-07-18, 65 NRC 399, 414 n.46 (2007).

As explained above, the LSN heightens a petitioner's already "ironclad" obligation to furnish adequate support because "early access to . . . documents in an electronically searchable form [has] allow[ed] for a thorough and comprehensive technical review of the license application by all parties and potential parties to the HLW licensing proceeding." Final Rule, LSN, Submissions to the Electronic Docket, 69 Fed. Reg. at 32,837. Thus, where a petitioner neglects to provide the requisite support for its contentions, the Board may not—and in this case absolutely should not—make assumptions of fact that favor the petitioner or supply information that is lacking. *See Ariz. Pub. Serv. Co.* (Palo Verde Nuclear Generating Station, Unit Nos. 1, 2, and 3), CLI-91-12, 34 NRC 149, 155 (1991).

Vague references to documents are not permissible. A petitioner must identify specific portions of the documents on which it relies. *See Pub. Serv. Co. of N.H.* (Seabrook Station, Units 1 and 2), CLI-89-03, 29 NRC 234, 240-41 (1989). Moreover, the mere incorporation of massive documents by reference is unacceptable. *See Tenn. Valley Auth.* (Browns Ferry Nuclear Plant, Units 1 and 2), LBP-76-10, 3 NRC 209, 216 (1976). Consistent with these requirements, the Case Management Order directs petitioners to ensure that documentary references "be as specific as reasonably possible." *U.S. Dep't of Energy*, LBP-08-10, 67 NRC \_\_ (slip op. at 7). Additionally, it requires that supporting documents (with the exception of readily available legal authorities, copyright-restricted material, and LSN documentary material), be electronically attached to the petition. In citing LSN documents, petitioners must include the LSN accession number as well as the title, date, and relevant pages of the document.

A petitioner also must explain the significance of any factual information upon which it relies. *See Fansteel, Inc.* (Muskogee, Oklahoma Site), CLI-03-13, 58 NRC 195, 204-05 (2003). With respect to factual information or expert opinion proffered in support of a contention, “the Board is not to accept uncritically the assertion that a document or other factual information or an expert opinion supplies the basis for a contention.” *Private Fuel Storage* (Independent Spent Fuel Storage Installation), LBP-98-7, 47 NRC 142, 181 (1998), *aff’d on other grounds*, CLI-98-13, 48 NRC 26. Any supporting material provided by a petitioner, including those portions thereof not relied upon, is subject to Board scrutiny, “both for what it does and does not show.” *See Yankee Atomic Elec. Co.*, LBP-96-2, 43 NRC 61, 90 (1996), *rev’d in part on other grounds and remanded*, CLI-96-7, 43 NRC 235 (1996). The Board should examine documents to confirm that they support the proposed contention(s). *See Vt. Yankee Nuclear Power Corp.* (Vermont Yankee Nuclear Power Station), ALAB-919, 30 NRC 29, 48 (1989), *vacated in part on other grounds and remanded*, CLI-90-04, 31 NRC 333 (1990). A petitioner’s imprecise reading of a document cannot be the basis for a litigable contention. *See Ga. Inst. of Tech.* (Georgia Tech Research Reactor, Atlanta, Georgia), LBP-95-6, 41 NRC 281, 300 (1995).

Furthermore, “an expert opinion that merely states a conclusion (*e.g.*, the application is ‘deficient,’ ‘inadequate,’ or ‘wrong’) without providing a *reasoned basis or explanation* for that conclusion is inadequate because it deprives the Board of the ability to make the necessary, reflective assessment of the opinion” alleged to provide a basis for the contention. *See USEC, Inc.* (American Centrifuge Plant), CLI-06-10, 63 NRC 451, 472 (2006) (emphasis added) (quoting *Private Fuel Storage*, LBP-98-7, 47 NRC at 181). Conclusory statements cannot provide “sufficient” support for a contention, simply because they are proffered by an alleged expert. *See USEC*, CLI-06-10, 63 NRC at 472. In summary, a contention “will be ruled

inadmissible if the petitioner ‘has offered no tangible information, no experts, no substantive affidavits’, but instead only ‘bare assertions and speculation.’” *Fansteel*, CLI-03-13, 58 NRC at 203 (quoting *Gen. Pub. Utils. Nuclear, Inc.* (Oyster Creek Nuclear Generating Station), CLI-00-06, 51 NRC 193, 208 (2000)).

**f. Petitioner Must Demonstrate that the Contention Raises a Genuine Dispute With Respect to a Material Issue of Law or Fact**

With regard to the final requirement, that a petitioner “provide sufficient information to show . . . a genuine dispute . . . with the applicant . . . on a material issue of law or fact, 10 C.F.R. § 2.309(f)(1)(vi), the Commission has stated that the petitioner must “read the pertinent portions of the license application, . . . state the applicant’s position and the petitioner’s opposing view,” and explain why it disagrees with the applicant. Rules of Practice for Domestic Licensing Proceedings—Procedural Changes in the Hearing Process, 54 Fed. Reg. at 33,170; *Dominion Nuclear Conn., Inc.*, CLI-01-24, 54 NRC at 358.

In claiming that the Application fails to address adequately a material issue, a petitioner must “explain why the application is deficient.” Rules of Practice for Domestic Licensing Proceedings—Procedural Changes in the Hearing Process, 54 Fed. Reg. at 33,170; *Ariz. Pub. Serv. Co.*, CLI-91-12, 34 NRC at 156. An allegation that some aspect of a license application is “inadequate” or unacceptable does not give rise to a genuine dispute unless it is supported by facts and a reasoned statement of why the application is unacceptable in some material respect. See *Fla. Power & Light Co.* (Turkey Point Plant, Unit Nos. 3 and 4), LBP-90-16, 31 NRC 509, 521, 521 n.12 (1990). Put another way, a contention that does not *directly controvert a position taken by the applicant in the application* is subject to dismissal. See *Tex. Utils. Elec. Co.* (Comanche Peak Steam Electric Station, Unit 2), LBP-92-37, 36 NRC 370, 384 (1992) (emphasis added). For example, if a petitioner submits a contention of omission, but the

allegedly missing information is, in fact, contained in the license application, then the contention does not raise a genuine dispute.

**4. Environmental Contentions Addressing DOE’s Final Environmental Impact Statement and its Supplements Must Also Meet the Requirements of 10 C.F.R. § 51.109 and 10 C.F.R. § 2.326**

In its Hearing Notice, the Commission reaffirmed that proposed environmental contentions are subject to substantially heightened admissibility standards.<sup>8</sup> In addition to the NRC’s contention admissibility requirements in 10 C.F.R. § 2.309(f), environmental contentions must also meet the requirements of 10 C.F.R. § 51.109 and the requirements of 10 C.F.R. § 2.326. These two sections impose the following admissibility standards on environmental contentions:

1. Contentions must allege that it is not practicable to adopt the DOE EIS for one of two reasons:

“(1)(i) The action proposed to be taken by the Commission differs from the action proposed in the license application submitted by [DOE]; and (ii) the difference may significantly affect the quality of the human environment;<sup>9</sup> or

(2) Significant and substantial new information or new considerations render such [EIS] inadequate.” 10 C.F.R. § 51.109(c).

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<sup>8</sup> In February of 2002, DOE issued the *Final Environmental Impact Statement for a Geologic Repository for the Disposal of Spent Nuclear Fuel and High-Level Radioactive Waste at Yucca Mountain, Nye County, Nevada* (DOE/EIS-0250F, February 2002) (2002 FEIS). On April 8, 2004, DOE announced in a Record of Decision (2004 ROD) the selection of the mostly rail alternative analyzed in the 2002 FEIS for transporting spent nuclear fuel and high-level radioactive waste nationally and within Nevada. 69 Fed. Reg. 18,557. DOE also announced in the 2004 ROD that it had selected the Caliente rail corridor in which to examine possible alignments for construction of a rail line in Nevada. In July 2008, DOE issued the *Final Supplemental Environmental Impact Statement for a Geologic Repository for the Disposal of Spent Nuclear Fuel and High-Level Radioactive Waste at Yucca Mountain, Nye County, Nevada* (DOE/EIS-0250F-S1) (Repository SEIS), the *Final Supplemental Environmental Impact Statement for a Geologic Repository for the Disposal of Spent Nuclear Fuel and High-Level Radioactive Waste at Yucca Mountain, Nye County, Nevada – Nevada Rail Transportation Corridor* (DOE/EIS-0250F-S2) (Nevada Rail Corridor SEIS), and the *Final Environmental Impact Statement for a Rail Alignment for the Construction and Operation of a Railroad in Nevada to a Geologic Repository at Yucca Mountain, Nye County, Nevada* (DOE/EIS-0369) (Rail Alignment EIS). On October 10, 2008, DOE issued a Record of Decision (2008 ROD) announcing its decision to construct and operate a railroad along a rail alignment within the Caliente corridor. 73 Fed. Reg. 60,247.

<sup>9</sup> Because the action proposed to be taken by the NRC does not differ from the action proposed in DOE’s application, this first factor has no relevance to this proceeding and will not be discussed further.

2. The contention must address a “significant” environmental issue. 10 C.F.R. § 2.326(a)(2).
3. The contention must demonstrate that, if true, “a materially different result would be or would have been likely . . . .” 10 C.F.R. § 2.326(a)(3).
4. The contention must be supported by affidavits that set forth the factual and/or technical basis for the movant’s claims and must be given by competent individuals with knowledge of the facts or by experts in the appropriate disciplines. 10 C.F.R. § 2.326(b).<sup>10</sup>

These additional admissibility standards are discussed in greater detail below.

**a. The 10 C.F.R. § 51.109 Criteria**

Given the *sui generis* nature of this proceeding, neither the Commission nor its boards have applied § 51.109 in the context of an adjudication. Nevertheless, existing Commission decisions and federal caselaw under NEPA provide guidance with respect to how the criteria under § 51.109 should be applied in this proceeding.

First, the Commission has made clear that its adjudicatory boards should not “automatically assume” that a proffered environmental contention—though cognizable as a “new consideration” under the D.C. Circuit’s decision in *NEI*—contains “significant and substantial” information that, if true, would render the DOE EIS and its supplements “inadequate” under NEPA. Letter from Bradley W. Jones, Esq., Assistant Gen. Counsel, U.S. Nuclear Regulatory Comm’n, to Martin G. Malsch, Esq., “Request By Nevada For Reconsideration and Clarification of Notice of Denial,” March 20, 2008, *available at* ADAMS Accession No. ML080810175 (Jones Letter). This approach is consistent with well-established NEPA principles, as applied by the federal courts, under which reviewing courts have held that the identification of a deficiency in an EIS does not necessarily render that EIS “inadequate.” For example, the D.C. Circuit so

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<sup>10</sup> In addition, evidence in the affidavits must meet NRC admissibility standards and each criteria in 10 C.F.R. § 2.326 must be addressed separately.

held in denying Nevada’s challenge to the transportation-related portions of DOE’s 2002 FEIS. *Nevada v. Dep’t of Energy*, 457 F.3d 78, 93 (D.C. Cir. 2006) (rejecting alleged inadequacies in the FEIS relating to environmental impacts on cultural resources, floodplains and archaeological and historic impacts and stating “we do not think that the inadequacies to which Nevada points make the FEIS inadequate” or render DOE’s selection of the Caliente Corridor “arbitrary or capricious”). The D.C. Circuit in this prior proceeding emphasized that courts “will not ‘flyspeck’ an agency’s environmental analysis, looking for any deficiency no matter how minor.” *Id.* (citing *Fuel Safe Wash. v. Fed. Energy Regulatory Comm’n*, 389 F.3d 1313, 1323 (10th Cir. 2004); *Half Moon Bay Fishermans’ Mktg. Ass’n v. Carlucci*, 857 F.2d 505, 508 (9th Cir. 1988)).

The Commission, for its part, has indicated that this same standard applies in its licensing proceedings. As the Commission explained:

NEPA’s twin goals are to inform the agency and the public about the environmental effects of a project. At NRC licensing hearings, petitioners may raise contentions seeking correction of *significant inaccuracies and omissions* in the [applicant’s environmental report (“ER”) or agency’s EIS]. Our boards do not sit to “flyspeck” environmental documents or to add details or nuances. If the ER (or EIS) on its face “comes to grips with all important considerations” nothing more need be done.<sup>11</sup>

*Sys. Energy Res., Inc.* (Early Site Permit for Grand Gulf Site), CLI-05-4, 61 NRC 10, 13 (2005) (quoting *Hydro Res., Inc.* (P.O. Box 15910, Rio Rancho, NM 87174), CLI-01-4, 53 NRC 31, 71 (2009)) (emphasis added). A petitioner’s claim must “suggest *significant environmental oversights* that warrant further inquiry at an evidentiary hearing.” *Exelon Generation Co., LLC*

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<sup>11</sup> See also *Duke Energy Corp.*, (McGuire Nuclear Station, Units 1 and 2; Catawba Nuclear Station (Units 1 and 2)), CLI-03-17, 58 NRC 419, 431 (2003) (“NRC adjudicatory hearings are not EIS editing sessions. Our busy boards do not sit to parse and fine-tune EISs.”). The Commission’s admonition against the “flyspecking” and “fine-tuning” of EISs is particularly apt here, given that DOE has “primary responsibility” for consideration of environmental matters under the NWP. Final Rule, NEPA Review Procedures for Geologic Repositories for High-Level Waste, 54 Fed. Reg. 27,864, 27,865 (July 3, 1989) (codified at 10 C.F.R. § 51.109). In contrast, under the NWP, the NRC’s NEPA-related responsibility in this proceeding is limited to determining whether adoption of DOE’s EIS, as supplemented, is “practicable.” *Id.*

(Early Site Permit for Clinton ESP Site), CLI-05-29, 62 NRC 801, 811 (2005) (emphasis added). Thus, as the D.C. Circuit recognized in *Nuclear Energy Inst., Inc. v. Env'tl. Protection Agency*, there must be significant “substantive defects” in the FEIS. 373 F.3d 1251, 1314 (D.C. Cir. 2004) (*NEI*).

Under NEPA, an EIS is not inadequate merely because a reviewing court or other adjudicatory tribunal might have reached a different conclusion. As the U.S. Supreme Court has explained, “[n]either the statute nor its legislative history contemplates that a court should substitute its judgment for that of the agency as to the environmental consequences of its actions.” *Kleppe v. Sierra Club*, 427 U.S. 390, 410 n.21 (1976). The NRC has indicated that it would adhere to this same tenet in deciding whether to adopt DOE’s EIS. Specifically, in promulgating 10 C.F.R. § 51.109, the NRC stated that “the adoption of the [DOE] statement does not necessarily mean that NRC would independently have arrived at the same conclusions on matters of fact or policy.” Proposed Rule, NEPA Review Procedures for Geologic Repositories for High-Level Waste, 53 Fed. Reg. 16,131, 16,142 (May 5, 1988). Thus, in accordance with 10 C.F.R. § 51.109(d), insofar as the presiding officer determines that NRC adoption of DOE’s EIS is “practicable” under § 51.109(c), “such adoption shall be deemed to satisfy all responsibilities of the Commission under NEPA and no further consideration under NEPA or this subpart shall be required.”

In this proceeding, DOE submits that boards should apply § 51.109 consistent with the above referenced well established NEPA caselaw and decisions of the Commission.

**b. The 10 C.F.R. § 2.326 Criteria and Procedures**

Section 51.109(a)(2) directs the presiding officer, “to the extent possible,” to use the “criteria and procedures that are followed in ruling on motions to reopen under § 2.326.” In its Hearing Notice, the Commission reiterated that a presiding officer should, to the extent possible,

apply the reopening procedures and standards set forth in § 2.326. *See* Hearing Notice, 73 Fed. Reg. at 63,031.

By explicitly directing presiding officers to use the criteria and procedures contained in § 2.326, the Commission reaffirmed its longstanding intent to avoid, in accordance with the NWPA, “the wide-ranging independent examination of environmental concerns that is customary in NRC licensing proceedings.” NEPA Review Procedures for Geologic Repositories for High-Level Waste, 53 Fed. Reg. at 16,136; *see also* NEPA Review Procedures for Geologic Repositories for High-Level Waste, 54 Fed. Reg. at 27,865 (“[W]e believe it to be a fair reading of Congressional intent that NRC can adequately exercise its NEPA responsibility with respect to a repository by relying upon DOE’s environmental impact statement.”). Specifically, the Commission has noted that the test for reopening a closed record—the same test to be applied by the Board in ruling on the admissibility of environmental contentions in this proceeding—is a “stiff test” that imposes a “strict” burden. *Private Fuel Storage, L.L.C.* (Independent Spent Fuel Storage Installation), CLI-06-3, 63 NRC 19, 22, 25 (2006); *see also Fla. Power & Light Co.* (Turkey Point Plant, Units 3 and 4), LBP-87-21, 25 NRC 958, 963-64 (1987) (stating that “a party seeking to reopen the record has a ‘heavy burden’ to bear”) (quoting *Ka. Gas and Elec. Co.* (Wolf Creek Station, Unit No. 1), ALAB-462, 7 NRC 320, 338 (1978)). Parties seeking to reopen a closed record must raise a “significant” safety or environmental issue and demonstrate that “a materially different result [is] ‘likely’ as a result of the new evidence.” *Private Fuel Storage*, CLI-06-3, 63 NRC at 25. In applying this test, the Commission has further noted that “[n]ew information is not enough, *ipso facto*, to reopen a closed hearing record,” and that “the information must be significant and plausible enough to require reasonable minds to inquire

further.” *Private Fuel Storage* (Independent Spent Fuel Storage Installation), CLI-05-12, 61 NRC 345, 350 (2005).

The Commission has further noted that the supporting material required by § 2.326(b) “must be set forth with a degree of particularity *in excess of* the basis and specificity requirements contained in 10 C.F.R. [§ 2.309] for admissible contentions. Such supporting information must be more than mere allegations; it must be tantamount to evidence.” *Long Island Lighting Co.* (Seabrook Nuclear Power Station, Unit 1), CLI-89-1, 29 NRC 89, 93 (1989) (quoting *Pacific Gas and Elec. Co.* (Diablo Canyon Nuclear Power Plant, Units 1 and 2), ALAB-775, 19 NRC 1361, 1366 (1984), *aff’d sub nom. San Luis Obispo Mothers for Peace v. U.S. Nuclear Regulatory Comm’n*, 751 F.2d 1287 (D.C. Cir. 1984), *aff’d on reh’g en banc*, 789 F.2d 26 (1986), *cert. denied*, 479 U.S. 923 (1986)). An intervenor’s mere “belief” is insufficient to satisfy § 2.326(b). *Fla. Power & Light Co.*, LBP-87-21, 25 NRC at 963.

In short, “the Commission expects its adjudicatory boards to enforce the [§ 2.326] requirements rigorously—*i.e.*, to reject out-of-hand [] motions that do not meet those requirements within their four corners.” *Pub. Serv. Co. of N.H.* (Seabrook Station, Units 1 and 2), ALAB-915, 29 NRC 427, 432 (1989) (citing *La. Power & Light Co.* (Waterford Steam Electric, Unit 3), CLI-86-1, 23 NRC 1 (1986); *Cleveland Elec. Illuminating Co.* (Perry Nuclear Power Plant, Units 1 and 2), CLI-86-7, 23 NRC 233 (1986), *aff’d sub nom. Ohio v. U.S. Nuclear Regulatory Comm’n*, 814 F.2d 258 (6th Cir. 1987)).

In the *Private Fuel Storage* decision (CLI-06-3) discussed above, the Commission applied the § 2.326 standard in ruling on a motion to reopen the record (after the Commission had rendered its final adjudicatory decision and authorized license issuance) to litigate a proposed environmental contention. The Commission’s ruling is illustrative and underscores the

heavy burden imposed by § 2.326.<sup>12</sup> For example, the Commission emphasized “a high threshold” for reopening a record as established by “longstanding NRC regulations and precedent.” *Private Fuel Storage*, CLI-06-3, 63 NRC at 22. *See id.* at 25 (stating that the NRC does “not lightly reopen [its] adjudicatory proceedings”). The Commission found that the intervenor had failed to meet substantive and evidentiary requirements of § 2.326, stating that “we cannot say on the current record that a materially different result in our licensing proceeding is so ‘likely’ that we must reopen the adjudicatory proceeding for additional hearings and findings.” *Id.* at 26-27. Consequently, the Commission rejected the intervenor’s request that the entire project be placed on hold.

In the context of the Yucca Mountain proceeding, the requirement that the petitioner must demonstrate that a materially different outcome would likely result means that the contention, if true, would severely impact the EIS such that it could not be adopted unless formally supplemented by NRC or DOE.

In summary, given the considerably heightened admissibility standards applicable here, DOE submits that in this proceeding a presiding officer should admit *environmental* contentions in this proceeding only under very limited circumstances. Under 10 C.F.R. §§ 51.109(c) and 2.326, an environmental contention must present *evidence* concerning a “significant” environmental issue. Under those same provisions, that information must be so “substantial” as to demonstrate that the alleged inadequacy in the DOE EISs is “likely” to dictate a “materially different result.” As the Commission explained in *Private Fuel Storage*, this means that any “new information” proffered by a petitioner must present a “*seriously* different picture of the

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<sup>12</sup> In recently denying a motion to reopen the record, the Commission emphasized the “deliberately heavy” burden associated with § 2.326. *See AmerGen Energy Co., LLC* (License Renewal for Oyster Creek Nuclear Generating Station), CLI-08-28, 68 NRC \_\_ (slip op. at 13-14) (Nov. 6, 2008) (“The burden of satisfying the reopening requirements is a heavy one, and proponents of a reopening motion bear the burden of meeting all of [these] requirements”) (internal quotation marks and citations omitted).

environmental landscape,” such that it would “be likely to change the outcome of the proceeding or affect the licensing decision in a material way.” CLI-06-3, 63 NRC at 19, 28.

**5. Contention Subjects That Are Outside the Scope of, or Immaterial to the NRC’s Required Findings in, the Yucca Mountain Licensing Proceeding**

As discussed above, a petitioner seeking admission of a proposed contention must, among meeting other requirements, demonstrate that the issue raised in the contention is within the scope of the proceeding and material to the findings that the NRC must make to support issuance of a repository construction authorization to DOE. A non-exclusive discussion of certain categories of contentions that clearly fall outside the proper scope of this proceeding and/or lack a material nexus to the Staff’s required findings is provided below.

**a. Contentions Relating to Transportation of Spent Nuclear Fuel (SNF) and High Level Radioactive Waste (HLW) Are Beyond The Scope of This Proceeding**

**(1) The NRC has no regulatory authority over transportation of SNF or HLW.**

Under the AEA and the Energy Reorganization Act (ERA), NRC does not have regulatory authority over DOE’s facilities and activities except as specifically provided by statute. 42 U.S.C. § 5851. Section 202 of the ERA provides the NRC with licensing and related regulatory authority over certain specific facilities of the DOE, including facilities for the disposal of SNF and HLW. 42 U.S.C. § 5842. However, neither section 202 of the ERA, nor the NWPA, nor any other statute provides NRC with authority over the transportation by DOE of SNF and HLW.

DOE’s transportation of SNF or HLW therefore is not subject to NRC regulation and the NRC has recognized the limited scope of its regulatory authority. For example, in its discussion of proposed amendments to its regulations regarding GROA Security and Material Control and Accounting Requirements, the NRC explained that the rulemaking did not cover transportation

of HLW to the GROA because “the NRC’s regulatory authority is limited to the operations at a GROA.” GROA Security and Material Control and Accounting Requirements, 72 Fed. Reg. 72,522, 72,527 (Dec. 20, 2007). DOE is required by the NWPA to use NRC certified casks for shipment of SNF or HLW to the repository.<sup>13</sup> 42 U.S.C. § 10175. That certification, however, is separate and distinct from the repository licensing action being undertaken by the NRC under Part 63. The requirements for such a certification are set forth not in Part 63, but instead in 10 C.F.R. Part 71.

**(2) Contentions challenging DOE’s Records of Decision concerning transportation of materials to Yucca Mountain are outside the scope of this proceeding and are within the original and exclusive jurisdiction of the Courts of Appeals.**

In addition to the NRC’s lack of regulatory authority over transportation of SNF and HLW, under the NWPA, any challenges to DOE transportation decisions, to the extent reviewable, are within the original and exclusive jurisdiction of the federal courts of appeals. In particular, section 119 of the NWPA expressly provides that the United States Courts of Appeals shall have original and exclusive jurisdiction over any civil action for review of any final decision or action of the Secretary of Energy as well as of any civil action alleging the failure of the Secretary “to make any decision, or take any action, required under this subtitle.” 42 U.S.C.

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<sup>13</sup> Similarly, in a May 10, 2002, response to a March 22, 2002, letter from Senator Richard Durbin, asking what role the NRC would play regarding transportation of spent fuel to Yucca Mountain, NRC Chairman Richard Meserve stated:

If DOE takes custody of the spent fuel at the licensee’s site, *DOE regulations would control the actual spent fuel shipment.* Under such circumstances, the NRC’s primary role in transportation of spent fuel to a repository would be certification of the packages used for transport.

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As stated previously, if DOE takes custody to the spent fuel at the reactor site the only involvement NRC will have in the transport will be the certification of the transport cask.

Letter from Richard Meserve, former Chairman of the NRC, to Sen. Richard Durbin at 2 (May 10, 2002), *available at* ADAMS Accession No. ML 21060662 (emphasis added). DOE’s plan is to take custody of the spent fuel at the reactor site.

§ 10139(a)(1)(C). Any such action must be initiated through a petition for review filed with a court of appeals within 180 days of the decision or action or failure to act involved. 42 U.S.C. § 10139(c).

Relevant to this proceeding, on October 10, 2008, DOE issued a Record of Decision (ROD) documenting DOE's decision to construct a railroad in the State of Nevada in an alignment within the Caliente corridor along various segments together with various support facilities as detailed in the ROD. As discussed below, any challenge to the ROD accordingly must be initiated through a petition for review to a court of appeals – not through the NRC contention process.

In *Nevada v. DOE* and *NEI v. EPA*, the D.C. Circuit anticipated that DOE would in the future be issuing transportation related decisions. For example, in *NEI*, 373 F.3d at 1312, the Court stated:

Section 114(f)(4) of the NWPA provides, in relevant part, that the DOE's FEIS "shall, to the extent practicable, be adopted by [NRC] in connection with the issuance by [NRC] of a construction authorization and license for such repository." 42 U.S.C. § 10134(f)(4). To the extent NRC adopts the FEIS, NRC's responsibilities under the National Environmental Policy Act shall be deemed satisfied and "no further consideration shall be required." *Id.* In addition, DOE is expected to use the FEIS to support one or more future decisions related to Yucca Mountain, including the selection of an alternative for transporting waste to the site.

Emphasis added.

On April 8, 2004, DOE issued a ROD addressing transportation matters. Subsequently, following issuance of DOE's April 8, 2004 ROD, Nevada filed a petition for review with the D.C. Circuit pursuant to section 119 of the NWPA seeking review of the ROD and the transportation-related portions of the 2002 FEIS on which it was based. The ROD announced

DOE's selection, both nationally and in Nevada, of the mostly rail scenario analyzed in the 2002 FEIS as the primary means of transporting SNF and HLW to the repository. The ROD also selected the Caliente rail corridor from several corridors considered in the 2002 FEIS as the corridor in which to study possible alignments for a rail line connecting the Yucca Mountain site to an existing rail line in Nevada. See ROD on Mode of Transportation and Nevada Fuel and High-Level Radiation Waste at Yucca Mountain, Nye County, NV, 69 Fed. Reg. 18,557 (Apr. 8, 2004). Nevada claimed that "in selecting a national transportation mode and Nevada rail corridor for the movement of waste to Yucca, DOE violated NEPA and NEPA implementing regulations" and acted in an arbitrary and capricious manner and contrary to law. Petitioner's Final Opening Brief at 2-4.

The D.C. Circuit took jurisdiction of the State's petition for review and rejected the State's claims on their merits (with the exception of certain contingency plans which the court held were not ripe for review).<sup>14</sup> The Court held, among other things, that DOE had taken the "requisite hard look" at the potential rail corridor environmental impacts and that "DOE's analysis of the environmental impacts of rail corridor selection in its FEIS is adequate." *Nevada*, 457 F.3d at 89-93. The D.C. Circuit also held that "[w]e summarily deny any claims not specifically addressed in this opinion," which included all the issues raised in the State's briefs. *Id.* at 94 n.10.

This decision is res judicata as to Nevada and the preclusive effect of this decision applies not only to those NEPA claims decided by the court of appeals but also to those which could have been raised. *W. Radio Servs. Co. v. Glickman*, 123 F. 3d 1189 (9th Cir. 1997) (concluding that "any cognizable claims should have been raised in *Western Radio I*, and are

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<sup>14</sup> The Court of Appeals noted that "[a]lthough much of the FEIS concentrated on the Yucca site, it also analyzed alternatives for, and the 'potential environmental consequences' of, transporting nuclear waste from the many production sources throughout the country to the repository at Yucca." *Nevada*, 457 F.3d at 82.

thus barred by res judicata”). Of course, any person who failed to file a challenge within 180 days would be time barred pursuant to NWPA section 119(c) among other defenses. Further, as the Commission has recognized, a person does not have the option of postponing judicial review under section 119 of the NWPA, by instead trying to raise transportation-related environmental issues before the NRC. In particular, the NRC rejected this approach when it was raised in comments to the proposed 10 C.F.R. § 51.109 in 1989. In their comments to the Commission, certain environmental organizations stated that “affected parties may decide for reasons of litigative strategy” to raise environmental issues “in NRC licensing proceedings rather than by going to court.” Final Rule, NEPA Review Procedures for Geologic Repositories for High-Level Radioactive Waste, 54 Fed. Reg. at 27,866. The Commission responded by stating that such a “unilateral decision” would “circumvent the clear policy of the NWPA....” *Id.*

The same path of review followed in 2004 is appropriate with respect to challenges to DOE’s transportation decisions set forth in the Department’s October 10, 2008 ROD. The fact that the NRC construction authorization proceeding, which is limited to activities at the GROA, now has commenced does not alter the requirement under section 119 of the NWPA that final DOE decisions must be appealed to the courts of appeals whose jurisdiction is “original and exclusive” over such matters. 42 U.S.C. § 10139(a)(1).

In summary, challenges to the April 2004 ROD, and the transportation related portions of the 2002 FEIS on which it was based, are no longer subject to review in any forum, both as a result of the expiration of the 180 day period to challenge that ROD set forth in section 119 of the NWPA and as a result of the D.C. Circuit’s 2006 decision. Any challenges to DOE’s transportation decisions set forth in the October 10, 2008 ROD also are not appropriately a part

of this proceeding; such challenges may be pursued only through a petition for review to a federal court of appeals.

**(3) Consideration by NRC of transportation impacts under NEPA is limited.**

Under section 114 of the NWPA, the Commission must adopt DOE's FEIS to the extent practicable. In considering the environmental impacts of transportation decisions made by DOE, the role of the NRC here is similar to that adopted by the Commission in *Pub. Serv. Co. of N.H.*, (Seabrook Station, Units 1 and 2), CLI-78-1, 7 NRC 1, 25 (1978), and affirmed by the court of appeals in *New England Coalition on Nuclear Pollution v. U.S. Nuclear Regulatory Comm'n*, 582 F.2d 87 (1st Cir. 1978). In that case, the petitioners argued that NEPA did not permit the NRC to adopt EPA findings made under the Federal Water Pollution Control Act (FWPCA) without an independent inquiry of the effects a proposed nuclear power plant would have on the aquatic environment. As the Commission noted, Congress had amended the FWPCA to avoid duplicative reviews, and left to the EPA the decision as to the water pollution control criteria to which a nuclear power plant's cooling system would be held. The NRC was not free to ignore considerations of aquatic impact; "it would have to consider them, but only as part of its overall 'balancing judgment' on whether it is in the public interest to grant the requested permit." *Pub. Serv. Co. of N.H.*, CLI-78-1, 7 NRC at 25. The NRC, further, could not "go behind" the EPA's determination. *Id.* at 26.

Similarly, in this proceeding, the NRC should decide whether to issue construction authorization for the repository given the transportation impacts as determined by DOE (and potentially as reviewed by the court of appeals). Accordingly, contentions challenging the accuracy or adequacy of DOE's NEPA analysis of the impacts of transporting SNF or HLW are not proper subjects for contentions in this proceeding.

**B. DOE’s Answer Regarding the Admissibility of Petitioner’s Proposed Contentions**

**1. WHI-NEPA-1 - Title: Failure of Environmental Impact Statements to Fully Disclose Consequences of Radiation Contaminated Tephra Deposition in Areas Other Than That Directly Applicable to the Reasonably Maximally Exposed Individual**

Because the Yucca Mountain FEIS and the Repository FSEIS omit any consideration or analysis of the environmental and public health consequences of radiation contaminated tephra deposition in White Pine County and other downwind areas, NRC cannot adopt the EISs without the addition of supplementary information.

**RESPONSE**

In this contention, White Pine County claims that the 2002 FEIS and Repository SEIS are inadequate because they omit any consideration or analysis of the environmental and public health consequences of radiologically contaminated tephra deposition in White Pine County and other downwind areas, other than for the location of the reasonably maximally exposed individual (RMEI). Petition at 18.

All NEPA contentions must demonstrate that they meet the criteria of 10 C.F.R § 51.109 and 10 C.F.R. § 2.326, as well as the standards for contentions of 10 C.F.R. § 2.309. White Pine County fails to meet the express requirements of 10 C.F.R. §§ 2.326 and 51.109 in requesting that this contention be admitted in this proceeding. Specifically, as set forth in Section IV.A.4, White Pine County must (1) raise a significant environmental issue; and (2) demonstrate that its contention, if proven to be true, would or would likely result in a materially different outcome in this proceeding. Moreover, its environmental contention must be supported by the affidavit of a qualified witness that sets forth the factual and/or technical basis supporting the claim that these two criteria have been met, including a “specific explanation of why it has been met.” 10 C.F.R. § 2.326(b). As noted in Section IV.A.4 above, “the Commission expects its adjudicatory boards

to enforce the [section 2.326] requirements rigorously – *i.e.*, to reject out-of-hand reopening motions that do not meet those requirements within their four corners.” *Pub. Serv. Co. of N.H.* (Seabrook Station, Units 1 and 2) ALAB-915, 29 NRC 427, 432 (1989).

White Pine County fails to address any of the mandatory requirements of 10 C.F.R. §§ 51.109 and 2.326 in its contention or supporting expert affidavits. White Pine County relies on the affidavits of Dr. Dennis Geist and Dr. Mike Baughman in support of this contention. Both affidavits merely state that White Pine County’s contentions “relate significant and substantial new information not considered and assessed in the Environmental Impact Statements provided to the Nuclear Regulatory Commission in support of the Yucca Mountain Repository License application.” Geist Affidavit at 2; Baughman Affidavit at 2. Dr. Baughman adds that he “believes the assertion[s]” set forth in the contention. Dr. Baughman provides no basis for his beliefs. Thus, neither expert provides the analysis that is explicitly called for by the terms of § 2.326(b). This regulation requires White Pine County’s expert to “set forth the factual and/or technical bases for the movant’s claim that the criteria of paragraph (a) of this section have been satisfied.” Section 2.326(b) goes on to state that “[e]ach of the criteria must be separately addressed, with a specific explanation of why it has been met.” Here, White Pine County has failed to meet these requirements and its contention accordingly should be rejected.

Further, neither Dr. Geist nor Dr. Baughman appears qualified to offer these opinions. Dr. Geist concedes that he is “not an expert in computer models of tephra transport,” Attach. 2 at 2, yet proceeds to offer his speculation on the computer models DOE used to estimate tephra transport.

Dr. Baughman fails to present any grounds for concluding that he is an expert in the matters addressed in the contention regarding radiologically contaminated tephra or how such

material might be deposited in White Pine County. He states only that he holds a doctorate through the Environment, Technology and Society program at Clark University in Worcester, Massachusetts and “has served as a consultant on numerous National Environmental Policy Act (NEPA) compliance projects over the past 14 years.” Baughman Affidavit at 1. However, there is nothing in his academic background or this one-line statement of his experience that demonstrates that he is qualified to render opinions regarding radiated tephra deposition as a result of a volcanic explosion. His affidavit is no more valid or reliable than the rejected testimony of a mathematician who tried to provide expert opinions on engineering matters, *Fla. Power & Light Co.*, (Turkey Point Nuclear Generating Plant, Units 3 and 4) LBP-86-23, 24 NRC 108 (1986), or the environmental health expert who tried to provide expert evidence on physical security matters. *Private Fuel Storage, LLC*, (Independent Spent Fuel Storage Installation), LBP 98-13, 47 NRC 360 (1998).

**a. Statement of Issue of Law or Fact to be Controverted**

Without prejudice to other positions taken by DOE, DOE expresses no legal objection based upon this requirement.

**b. Brief Explanation of Basis**

Without prejudice to other positions taken by DOE, DOE expresses no legal objection based upon this requirement.

**c. Whether the Issue is Within the Scope of the Proceeding**

Without prejudice to other positions taken by DOE, DOE expresses no legal objection based upon this requirement.

**d. Whether the Issue is Material to the Findings that the NRC Must Make**

This contention does not raise an issue material to the findings NRC must make because White Pine County has failed to demonstrate that DOE's environmental analyses violate NEPA. As recognized in the contention, both the 2002 FEIS and the Repository SEIS evaluated the potential postclosure impacts of an eruptive modeling scenario. These impacts were reported for the RMEI at approximately 18 kilometers south of the repository location. White Pine County contends that the 2002 FEIS and Repository SEIS cannot be adopted by the NRC unless they are supplemented to include consideration of the environmental and public health consequences of radiologically contaminated tephra deposition in White Pine County. This contention is not material because, in accordance with DOE guidance for preparation of NEPA document (DOE Guidance on NEPA Document Preparation, Recommendations for Analyzing Accidents Under the National Environmental Policy Act (DOE 2002) (LSN# DN2001714520)], the probability of a volcanic eruption at Yucca Mountain that would release radiologically contaminated tephra is so low that the analysis of the event is not required under NEPA. As demonstrated below, the fact that DOE considered some impacts that are beneath the NEPA threshold (at the RMEI) does not impose an obligation to consider even smaller impacts in White Pine County, several hundred miles away from the repository. The contention and supporting affidavit rely upon an inappropriate estimate of tephra mass at the location of the RMEI, which resulted in an overestimate of the estimated dose in White Pine County of many orders of magnitude.

The Repository SEIS describes the potential for volcanism at the Yucca Mountain site in Subsection 3.1.3.1.3 (pages 3-21 and 3-22) as follows:

In 1995 and 1996, a panel of 10 recognized experts from federal agencies, national laboratories, and universities evaluated the potential for disruption of the repository by a volcanic intrusion, also known as a dike. The result of that effort was an estimate of

the average *probability* of 1 chance in 7,000 that a volcanic dike could intersect or disrupt the repository during the first 10,000 years after *repository-closure*. As the Yucca Mountain FEIS reported, DOE increased this probability to 1 chance in 6,300 to account for a slightly larger repository footprint than the expert panel considered (DIRS 155970 - DOE 2002, p. 3-27). The likelihood of an intersection increases by small amounts if the footprint size increases because the larger area presents a larger “target” for the dike to intersect, should an *event* occur.

Since DOE completed the Yucca Mountain FEIS, the size and shape of the repository footprint has changed slightly, and so has the probability of a dike intersection. DOE based the new calculation on the work in 1995 and 1996 by the panel of experts. The estimated probability of a dike intrusion is now 1 chance in 5,900 during the first 10,000 years, with 5th- and 95th-percentile values of 1 chance in 133,000 and 1 in 1,800, respectively (DIRS 169989 – BSC 2004, pp. 7-1 and 7-2, and Table 7-1).

Presented in terms of annual frequency, the estimated value of the mean annual frequency of a volcanic dike intersecting the repository footprint is  $1.7 \times 10^{-8}$ . The 5th and 95th percentiles of the uncertainty distribution are  $7.4 \times 10^{-10}$  and  $5.5 \times 10^{-8}$  (SAR at 2.3.11-22) (*see also* BSC 2004, Section 6.5.1.1 and Table 7-1 (LSN# DN2001632124)).

The probability that such a volcanic eruption would release radionuclides entrained in tephra is even lower than estimated by the above distribution because two additional conditional probabilities must also be considered: (1) the conditional probability that a conduit would form within the repository footprint; and (2) the conditional probability that the conduit intersects waste packages. The combined conditional probability that a conduit forms within the repository footprint and intersects waste packages is about 0.083 (SAR Subsection 2.3.11.4.2.1).

Consideration of these conditional probabilities reduces by more than an order of magnitude the estimated probability that a volcanic eruption would occur at the Yucca Mountain site that would result in the release of radiologically contaminated tephra.

DOE provides the following guidance for the consideration of low-probability events in NEPA documents:

- Consider scenarios with frequencies of  $10^{-6}$  to  $10^{-7}$  per year if the consequences may be very large.
- Scenarios with frequencies less than  $10^{-7}$  per year will rarely need to be examined.
- Report the probability of the accident occurring during the lifetime of the proposed action.

DOE Guidance on NEPA Document Preparation, Recommendations for Analyzing Accidents under the National Environmental Policy Act (DOE 2002, p. 9 [LSN# DN2001714520]). That guidance also states:

In determining which low frequency accident scenarios to analyze, document preparers should consider differences between natural phenomena and human-caused events with respect to the degree to which their consideration would inform decision making. It may not be useful to consider extremely low frequency accidents resulting from certain natural phenomena.

*Id.*

White Pine County's contention is addressed to such a low frequency accident resulting from a natural phenomenon. The probability that a volcanic eruption would occur at the Yucca Mountain site and result in the release of radiologically contaminated tephra is more than one order of magnitude lower than the threshold of  $10^{-7}$  suggested in the DOE guidance. Even though lower than the threshold, to evaluate whether the consequences "may be very large," DOE evaluated the consequences of a volcanic eruption at a site 18 km from the repository. DOE has provided a reasonable rationale for excluding deposition of radiologically contaminated tephra from DOE's NEPA analysis.

The low probability of a volcanic eruption is also a reasonable rationale for excluding a discussion of mitigation of radiologically contaminated tephra. As the D.C. Circuit has held, an

agency may decline to discuss mitigation measures when it believes the environmental impact of the action will be minor. *Transmission Access Policy Study Group v. Fed. Energy Regulatory Comm'n*, 225 F.3d 667, 737 (D.C. Cir. 2000) (upholding agency's decision to "decline to adopt mitigation measures to address a problem that it believed might not even develop"). NEPA requires only that possible mitigation measures "be discussed in sufficient detail to ensure that environmental consequences have been fairly evaluated." *City of Carmel-by-the-Sea v. U.S. DOT*, 123 F.3d 1142, 1150 (9th Cir. 1997). It is entirely appropriate not to evaluate potential mitigation for consequences that are extremely unlikely.

White Pine County contends that the consequences of an eruption may be orders of magnitude higher than that calculated in the TSPA for the RMEI location. The contention is based primarily on the arguments that the primary wind direction is toward White Pine County, that small particles (those that contribute to the inhalation dose) will travel long distances, and that redistribution (*i.e.* concentration) of deposited ash will increase the dose.

White Pine County is more than 230 km from Yucca Mountain. Dr. Geist presents measurements of ash deposition at similar distances downwind from seven analog volcanic eruptions. Based on those measurements, he concludes "reasonable estimates for ash deposition in White Pine County on the basis of the tabulated eruptions range from 20 to 1,000 g/m<sup>2</sup>." Petition at 22; Petition, Attach. 2 at 2. This range is based on reported ash deposition from Ruapehu and Hekla volcanoes. The Ruapehu deposition value of 20 g/m<sup>2</sup> is in error, as the reference given states that the Ruapehu eruption in 1996 deposited 0.0002 kg/m<sup>2</sup> at a distance of 200 km (Bonadonna et al. 2005, at 1, Attachment WHI-NEPA-1-1), which equates to 0.2 g/m<sup>2</sup>, not 20 g/m<sup>2</sup> as reported in Attachment 2. The upper limit of 1000 g/m<sup>2</sup> estimated for deposition in White Pine County appears to be arbitrarily chosen and not based on data. Given that the

Ruapehu eruption at the low end of the range resulted in an unusually high amount of deposition at 200 km (due to an unusually narrow plume and strong winds, Bonadonna et al. 2005, at 1, Attachment WHI-NEPA-1-1), values as large as 1000 g/m<sup>2</sup> at 230 km (5000 times greater than the unusual Ruapehu eruption) are extremely unlikely from a small-volume basaltic eruption at Yucca Mountain.

Future potential eruptions in the Yucca Mountain region are expected to be basaltic in composition, less voluminous, and less explosive than either Ruapehu or Hekla. Of the eruptions cited in Attachment 2, Paricutin is the only one remotely analogous to potential future volcanic activity near Yucca Mountain. Based on data in the Contention, Paricutin resulted in 0.0003 g/m<sup>2</sup> of ash at a distance of 320 km, which represents an extremely dilute ash deposit with a sub-micron thickness (average thickness less than individual particle sizes). Based on the examples given in the Contention, a more reasonable range of deposition based on the examples given in the Contention is 0.0003 to 0.2 g/m<sup>2</sup>, not 20 to 1000. The more reasonable deposition range derived from data in the Contention (and correcting for the incorrect Ruapehu value cited) is 2-4 orders of magnitude lower than that stated in the Contention and includes the value of 0.02 g/m<sup>2</sup> that the attachment cites as calculated for the RMEI site. The lower range of 0.0003 to 0.2 g/m<sup>2</sup> is considered conservative, because the low value is derived from an eruption more voluminous than expected for the Yucca Mountain region (Paricutin), and the high value is based on data from the Ruapehu eruption that demonstrates unusual dispersal characteristics (Bonadonna et al. 2005, at 1, Attachment WHI-NEPA-1-1).

Dr. Geist also argues that concentration of tephra is likely to increase the dosages in White Pine County, Attach. 2 at 3, but provides no scientific study or analysis in support and merely speculates as to reasons why DOE's analysis may or may not be faulty. As Dr. Geist

himself acknowledges, “[i]t is impossible for me to predict the consequences of tephra distribution in White Pine County by comparison to the RMEI calculation . . .,” so he is only able to discuss how dosages “might increase.” *Id.* This argument should therefore be disregarded.

As demonstrated above, Dr. Geist’s conclusions regarding potential impacts are based on errors in his analysis or unwarranted assumptions. And even if the Board were to conclude that this contention involved disputed expert opinion, it is well-settled law that a petitioner does not raise a material issue under NEPA simply by presenting a potential battle of experts. In *Price Road Neighborhood Ass’n, Inc. v. Dep’t of Transportation*, 113 F. 3d 1505 (9th Cir. 1997), the Court of Appeals affirmed a district court’s grant of summary judgment to the agency. The Ninth Circuit stated that the appellant had:

sought to engage in a battle of the experts with regard to several impacts, including air quality and noise, offering their own studies to contradict those of the agencies. We have consistently rejected such attempts, noting that “when specialists express conflicting views, an agency must have discretion to rely on the reasonable opinions of its own qualified experts”

*Id.* at 1511 (citing *Greenpeace Action v. Franklin*, 14 F.3d 1324, 1332 (quoting *Marsh v. Oregon Natural Resources Council*, 490 U.S. 360, 378 (1989)). *Accord Havasupai Tribe v. Robertson*, 943 F.2d 32, 34 (9th Cir. 1991) (affirming district court decision based on the administrative record that no supplementation of an EIS was required because “disagreement among experts does not invalidate an EIS.”).

As the Supreme Court stated in *Marsh*, an agency must have the discretion to rely on the reasonable opinions of its own experts “even if, as an original matter, a court might find contrary views more persuasive.” *Marsh*, 490 U.S. at 378. This is because, as the Supreme Court explained in *Kleppe v. Sierra Club*, 427 U.S. 390, 410 n.21 (1976), “[n]either the statute nor its legislative history contemplates that a court should substitute its judgment for that of the agency

as to the environmental consequences of its actions.” The NRC has indicated that it would adhere to this same tenet in deciding whether to adopt DOE’s EIS. Specifically, in promulgating 10 C.F.R. § 51.109, the NRC stated that “the adoption of the [DOE] statement does not necessarily mean that NRC would independently have arrived at the same conclusions on matters of fact or policy.” NEPA Review Procedures for Geologic Repositories for High-Level Waste, 53 Fed. Reg. 16,131, 16,142 (May 5, 1988). Accordingly, a NEPA contention such as this one that is premised on a disagreement between an intervenor’s expert and DOE’s expert analysis in an EIS, does not create a triable issue and should not be admitted.

**e. Statement of Alleged Facts or Expert Opinion Supporting Petitioner’s Position and Supporting References**

For the reasons discussed above with respect to the requirements of 10 C.F.R. §§ 51.109 and 2.326, and as addressed in Section IV.A.3 regarding the legal standards under 10 C.F.R. § 2.309(f)(1)(v), White Pine County has failed to provide the requisite supporting facts, expert opinion and references.

**f. Existence of a Genuine Dispute on a Material Issue of Law or Fact, With Supporting References to the License Application**

For the reasons discussed in Section d. above, there is no genuine dispute on any material issue of law or fact because there was no obligation under NEPA to analyze tephra deposition in White Pine County and because the (erroneous) arguments of White Pine County’s expert, even if viewed by the Board as raising disputed expert opinions, raise only a potential battle of experts which does not present a triable issue under NEPA.

**2. WHI-NEPA-2 - Title: Failure of Environmental Impact Statements to Fully Disclose the Consequences of Atmospheric Transport of Radionuclides in Volcanic Gases**

Because the Yucca Mountain FEIS and the Repository FSEIS omit any consideration or analysis of the environmental and public health consequences of atmospheric transport of radionuclides in volcanic gases for the Reasonably Maximally Exposed Individual and in White Pine County and other downwind areas, NRC cannot adopt the EISs without the addition of supplementary information.

**RESPONSE**

In this contention, White Pine County claims that the 2002 FEIS and Repository SEIS are inadequate because they omit any consideration or analysis of the environmental and public health consequences of atmospheric transport of radionuclides in volcanic gases in White Pine County and other downwind areas.

All NEPA contentions must demonstrate that they meet the criteria of 10 C.F.R § 51.109 and 10 C.F.R. § 2.326, as well as the standards for contentions of 10 C.F.R. § 2.309. White Pine County fails to meet the express requirements of 10 C.F.R. §§ 2.326 and 51.109 in requesting that this contention be admitted in this proceeding. Specifically, as set forth in Section IV.A.4, White Pine County must (1) raise a significant environmental issue; and (2) demonstrate that its contention, if proven to be true, would or would likely result in a materially different outcome in this proceeding. Moreover, its environmental contention must be supported by the affidavit of a qualified witness that sets forth the factual and/or technical basis supporting the claim that these two criteria have been met, including a “specific explanation of why it has been met.” 10 C.F.R. § 2.326(b). As noted in Section IV.A.4 above, “the Commission expects its adjudicatory boards to enforce the [section 2.326] requirements rigorously – *i.e.*, to reject out-of-hand reopening

motions that do not meet those requirements within their four corners.” *Pub. Serv. Co. of N.H.* (Seabrook Station, Units 1 and 2) ALAB-915, 29 NRC 427, 432 (1989).

White Pine County fails to address any of the mandatory requirements of §§ 51.109 and 2.326 in its contention or supporting expert affidavits. White Pine County relies on the affidavits of Dr. Dennis Geist and Dr. Mike Baughman in support of this contention. Both affidavits merely state that White Pine County’s contentions “relate significant and substantial new information not considered and assessed in the Environmental Impact Statements provided to the Nuclear Regulatory Commission in support of the Yucca Mountain Repository License application.” Geist Affidavit, ¶ 6; Baughman Affidavit, ¶ 4. Neither expert provides the analysis that is explicitly called for by the terms of § 2.326(b). This regulation requires White Pine County’s expert to “set forth the factual and/or technical bases for the movant’s claim that the criteria of paragraph (a) of this section have been satisfied.” Section 2.326(b) goes on to state that “[e]ach of the criteria must be separately addressed, with a specific explanation of why it has been met.” Here, White Pine County has failed to meet these requirements.

Further, neither Dr. Geist nor Dr. Baughman appears qualified to offer these opinions. Dr. Geist concedes that he is “not an expert in computer models of tephra transport,” Attach. 2 at 2, yet proceeds to offer his speculation on the computer models DOE used to estimate tephra transport.

Dr. Baughman also fails to present any grounds for concluding that he is an expert in the matters addressed in the contention regarding mitigation of volcanic gas transport of radionuclides. He states only that he holds a doctorate through the Environment, Technology and Society program at Clark University in Worcester, Massachusetts and “has served as a consultant on numerous National Environmental Policy Act (NEPA) compliance projects over

the past 14 years.” Baughman Affidavit at 1. However, there is nothing in his academic background or this one-line statement of his experience that demonstrates that he is qualified to render opinions regarding volcanic gas transport of radionuclides as a result of a volcanic explosion. His affidavit is no more valid or reliable than the rejected testimony of a mathematician who tried to provide expert opinions on engineering matters, *Fla. Power & Light Co.* (Turkey Point Nuclear Generating Plant, Units 3 and 4), LBP-86-23, 24 NRC 108 (1986), or the environmental health expert who tried to provide expert evidence on physical security matters. *Private Fuel Storage, LLC*, (Independent Spent Fuel Storage Installation), LBP 98-13, 47 NRC 360 (1998).

Moreover, White Pine County’s experts provide no reason to question DOE’s probabilistic assessment, discussed in detail below, that the likelihood of atmospheric transport of radionuclides in volcanic gas is extremely low. Dr. Baughman merely states that the effects of volcanic gas transport of radionuclides were not discussed in the NEPA documents. Baughman, Affidavit at 2. And Dr. Geist cites to estimates of the concentration of uranium in volcanic gas, but does not contest DOE’s assessment of probability regarding volcanic gas transport. Geist Affidavit at 3. In fact, Dr. Geist agrees that the “estimates reported in the SAR for the probability of a volcanic eruption that originates from Yucca Mountain are reasonable.” Geist Affidavit at 1. Therefore, White Pine County has failed to raise a significant environmental issue.

**a. Statement of Issue of Law or Fact to be Controverted**

Without prejudice to other positions taken by DOE, DOE expresses no legal objection based upon this requirement.

**b. Brief Explanation of Basis**

Without prejudice to other positions taken by DOE, DOE expresses no legal objection based upon this requirement.

**c. Whether the Issue is Within the Scope of the Proceeding**

Without prejudice to other positions taken by DOE, DOE expresses no legal objection based upon this requirement.

**d. Whether the Issue is Material to the Findings that the NRC Must Make**

This contention does not raise an issue material to the findings NRC must make because White Pine County has failed to demonstrate that DOE's environmental analyses violate NEPA. As recognized in the contention, both the 2002 FEIS and the Repository SEIS evaluated the potential postclosure impacts of an eruptive modeling scenario. These impacts were reported for the RMEI at approximately 18 kilometers south of the repository location. White Pine County contends that the 2002 FEIS and Repository SEIS cannot be adopted by the NRC unless they are supplemented to include consideration of the environmental and public health consequences of atmospheric transport of radionuclides in volcanic gases in White Pine County. This contention is not material because, in accordance with DOE guidance for preparation of NEPA documents [(DOE Guidance on NEPA Document Preparation, Recommendations for Analyzing Accidents under the National Environmental Policy Act (DOE 2002) LSN# DN2001714520)], the probability of a volcanic eruption at Yucca Mountain that would release radionuclides in volcanic gases is so low that the analysis of the event is not required under NEPA.

The Repository SEIS describes the potential for volcanism at the Yucca Mountain site in Section 3.1.3.1.3 (pages 3-21 and 3-22) as follows:

In 1995 and 1996, a panel of 10 recognized experts from federal agencies, national laboratories, and universities evaluated the

potential for disruption of the repository by a volcanic intrusion, also known as a dike. The result of that effort was an estimate of the average *probability* of 1 chance in 7,000 that a volcanic dike could intersect or disrupt the repository during the first 10,000 years after *repository-closure*. As the Yucca Mountain FEIS reported, DOE increased this probability to 1 chance in 6,300 to account for a slightly larger repository footprint than the expert panel considered (DIRS 155970 - DOE 2002, p. 3-27). The likelihood of an intersection increases by small amounts if the footprint size increases because the larger area presents a larger “target” for the dike to intersect, should an *event* occur.

Since DOE completed the Yucca Mountain FEIS, the size and shape of the repository footprint has changed slightly, and so has the probability of a dike intersection. DOE based the new calculation on the work in 1995 and 1996 by the panel of experts. The estimated probability of a dike intrusion is now 1 chance in 5,900 during the first 10,000 years, with 5th- and 95th-percentile values of 1 chance in 133,000 and 1 in 1,800, respectively (DIRS 169989 – BSC 2004, pp. 7-1 and 7-2, and Table 7-1).

Presented in terms of annual frequency, the estimated value of the mean annual frequency of a volcanic dike intersecting the repository footprint is  $1.7 \times 10^{-8}$ . The 5th and 95th percentiles of the uncertainty distribution are  $7.4 \times 10^{-10}$  and  $5.5 \times 10^{-8}$  (SAR at 2.3.11-22) (*see also* BSC 2004, Section 6.5.1.1 and Table 7-1 [(LSN# DN2001632124)]).

The probability that such a volcanic eruption would release radionuclides via atmospheric transport in volcanic gases is even lower than estimated by the above distribution because two additional conditional probabilities must also be considered: (1) the conditional probability that a conduit would form within the repository footprint; and (2) the conditional probability that the conduit intersects waste packages. The combined conditional probability that a conduit forms within the repository footprint and intersects waste packages is about 0.083 (SAR Subsection 2.3.11.4.2.1). Consideration of these conditional probabilities reduces by more than an order of magnitude the estimated probability that a volcanic eruption would occur at the Yucca Mountain site that would result in the release of radionuclides via volcanic gases.

DOE provides the following guidance for the consideration of low-probability events in NEPA documents:

- Consider scenarios with frequencies of  $10^{-6}$  to  $10^{-7}$  per year if the consequences may be very large.
- Scenarios with frequencies less than  $10^{-7}$  per year will rarely need to be examined.
- Report the probability of the accident occurring during the lifetime of the proposed action.

DOE Guidance on NEPA Document Preparation, Recommendations for Analyzing Accidents under the National Environmental Policy Act (DOE 2002, p. 9 [LSN# DN2001714520]). That guidance also states:

In determining which low frequency accident scenarios to analyze, document preparers should consider differences between natural phenomena and human-caused events with respect to the degree to which their consideration would inform decision making. It may not be useful to consider extremely low frequency accidents resulting from certain natural phenomena.

*Id.* The subject of White Pine County's contention is just such a low frequency event resulting from a natural phenomenon. The probability that a volcanic eruption would occur at the Yucca Mountain site that would result in the release of radionuclide-laden volcanic gases is more than one order of magnitude lower than the threshold of  $10^{-7}$  suggested in the DOE guidance.

Moreover, the impacts from atmospheric transport would be even lower than from other potential vectors. As DOE explains:

The Volcanic Eruption Modeling Case does not explicitly include the inhalation dose in the results because they would be very small in comparison with the groundwater pathway doses related to the eruption processes. For example, if the eruption occurred 1,000 years after closure, the annual inhalation dose to the RMEI at the specified location would be about 1 percent of the groundwater pathway dose. At 10,000 years, the annual inhalation dose to the RMEI at the specific location would be about 0.1 percent of the

groundwater pathway dose (LSN# DEN001574936, SNL 2008, Figure 6.5-14).

Repository SEIS, Vol. III at CR-489. This was a reasonable explanation for excluding atmospheric transport of radionuclides from DOE's NEPA analysis. Accordingly, this contention does not raise a material issue and should not be admitted.

**e. Statement of Alleged Facts or Expert Opinion Supporting Petitioner's Position and Supporting References**

For the reasons discussed above with respect to the requirements of 10 C.F.R. §§ 51.109 and 2.326, and as addressed in Section IV.A.3 regarding the legal standards under 10 C.F.R. § 2.309(f)(1)(v), White Pine County has failed to provide the requisite supporting facts, expert opinion and references.

**f. Existence of a Genuine Dispute on a Material Issue of Law or Fact, With Supporting References to the License Application**

For the reasons discussed in Section d. above, there is no genuine dispute on any material issue of law or fact because there was no obligation under NEPA to analyze radionuclides in volcanic gas in White Pine County.

**3. WHI-NEPA-3 - Title: Failure of Environmental Impact Statements to Discuss Means to Mitigate Adverse Impacts of Radiation Contaminated Tephra Deposition in Areas Other Than That Directly Applicable to the Reasonably Maximally Exposed Individual**

Because the Yucca Mountain FEIS and the Repository FSEIS omit any discussion of means to mitigate adverse the environmental and public health impacts of radiation contaminated tephra deposition in White Pine County and other downwind areas, NRC cannot adopt the EISs without the addition of supplementary information.

**RESPONSE**

In this contention, White Pine County claims that the 2002 FEIS and Repository SEIS are inadequate because they omit any discussion of means to mitigate adverse environmental and public health consequences of radiologically contaminated tephra deposition originating from a volcanic eruption through the repository in White Pine County and other downwind areas, other than for the location of the reasonably maximally exposed individual (RMEI). Petition at 30.

All NEPA contentions must demonstrate that they meet the criteria of 10 C.F.R § 51.109 and 10 C.F.R. § 2.326, as well as the standards for contentions of 10 C.F.R. § 2.309. White Pine County fails to meet the express requirements of 10 C.F.R. §§ 2.326 and 51.109 in requesting that this contention be admitted in this proceeding. Specifically, as set forth in Section IV.A.4, White Pine County must (1) raise a significant environmental issue; and (2) demonstrate that its contention, if proven to be true, would or would likely result in a materially different outcome in this proceeding. Moreover, its environmental contention must be supported by the affidavit of a qualified witness that sets forth the factual and/or technical basis supporting the claim that these two criteria have been met, including a “specific explanation of why it has been met.” 10 C.F.R. § 2.326(b). As noted in Section IV.A.4 above, “the Commission expects its adjudicatory boards to enforce the [section 2.326] requirements rigorously – *i.e.*, to reject out-of-hand motions that do

not meet those requirements within their four corners.” *Pub. Serv. Co. of N.H.* (Seabrook Station, Units 1 and 2) ALAB-915, 29 NRC 427, 432 (1989).

White Pine County fails to address any of the mandatory requirements of §§ 51.109 and 2.326 in its contention or supporting expert affidavits. White Pine County relies on the affidavits of Dr. Dennis Geist and Dr. Mike Baughman in support of this contention. Both affidavits merely state that White Pine County’s contentions “relate significant and substantial new information not considered and assessed in the Environmental Impact Statements provided to the Nuclear Regulatory Commission in support of the Yucca Mountain Repository License application.” Geist Affidavit at 2; Baughman Affidavit at 2. Dr. Baughman adds that he “believes the assertion[s]” set forth in the contention. Dr. Baughman provides no basis for his beliefs. Thus, neither expert provides the analysis that is explicitly called for by the terms of § 2.326(b). This regulation requires White Pine County’s expert to “set forth the factual and/or technical bases for the movant’s claim that the criteria of paragraph (a) of this section have been satisfied.” Section 2.326(b) goes on to state that “[e]ach of the criteria must be separately addressed, with a specific explanation of why it has been met.” Here, White Pine County has failed to meet these requirements and its contention accordingly should be rejected.

Further, neither Dr. Geist nor Dr. Baughman appears qualified to offer these opinions. Dr. Geist concedes that he is “not an expert in computer models of tephra transport,” Attach. 2 at 2, yet proceeds to offer his speculation on the computer models DOE used to estimate tephra transport.

Dr. Baughman fails to present any grounds for concluding that he is an expert in the matters addressed in the contention regarding radiologically contaminated tephra or how such material might be deposited in White Pine County. He states only that he holds a doctorate

through the Environment, Technology and Society program at Clark University in Worcester, Massachusetts and “has served as a consultant on numerous National Environmental Policy Act (NEPA) compliance projects over the past 14 years.” Baughman Affidavit at 1. However, there is nothing in his academic background or this one-line statement of his experience that demonstrates that he is qualified to render opinions regarding radiated tephra deposition as a result of a volcanic explosion, or the mitigation of such deposition. His affidavit is no more valid or reliable than the rejected testimony of a mathematician who tried to provide expert opinions on engineering matters, *Fla. Power & Light Co.*, (Turkey Point Nuclear Generating Plant, Units 3 and 4) LBP-86-23, 24 NRC 108 (1986), or the environmental health expert who tried to provide expert evidence on physical security matters. *Private Fuel Storage, LLC*, (Independent Spent Fuel Storage Installation) LBP 98-13, 47 NRC 360 (1998).

**a. Statement of Issue of Law or Fact to be Controverted**

Without prejudice to other positions taken by DOE, DOE expresses no legal objection based upon this requirement.

**b. Brief Explanation of Basis**

Without prejudice to other positions taken by DOE, DOE expresses no legal objection based upon this requirement.

**c. Whether the Issue is Within the Scope of the Proceeding**

Without prejudice to other positions taken by DOE, DOE expresses no legal objection based upon this requirement.

**d. Whether the Issue is Material to the Findings that the NRC Must Make**

This contention does not raise an issue material to the findings NRC must make because White Pine County has failed to demonstrate that DOE’s environmental analyses violate NEPA.

As recognized in the contention, both the 2002 FEIS and the Repository SEIS evaluated the potential postclosure impacts of an eruptive modeling scenario. These impacts were reported for the RMEI at approximately 18 kilometers south of the repository location. White Pine County contends that the 2002 FEIS and Repository SEIS cannot be adopted by the NRC unless they are supplemented to include consideration of the environmental and public health consequences of radiologically contaminated tephra deposition in White Pine County. This contention is not material because, in accordance with DOE guidance for preparation of NEPA documents [LSN# DN2001714520], the probability of a volcanic eruption at Yucca Mountain that would release radiologically contaminated tephra is so low that the analysis of the event is not required under NEPA. As demonstrated below, the fact that DOE considered some impacts that are beneath the NEPA threshold (at the RMEI) does not impose an obligation to consider even smaller impacts in White Pine County, several hundred miles away from the repository. The contention and supporting affidavit rely upon an inappropriate estimate of tephra mass at the location of the RMEI, which resulted in an overestimate of the estimated dose in White Pine County of many orders of magnitude.

The Repository SEIS describes the potential for volcanism at the Yucca Mountain site in Section 3.1.3.1.3 (pages 3-21 and 3-22) as follows:

In 1995 and 1996, a panel of 10 recognized experts from federal agencies, national laboratories, and universities evaluated the potential for disruption of the repository by a volcanic intrusion, also known as a dike. The result of that effort was an estimate of the average *probability* of 1 chance in 7,000 that a volcanic dike could intersect or disrupt the repository during the first 10,000 years after *repository-closure*. As the Yucca Mountain FEIS reported, DOE increased this probability to 1 chance in 6,300 to account for a slightly larger repository footprint than the expert panel considered (DIRS 155970 - DOE 2002, p. 3-27). The likelihood of an intersection increases by small amounts if the

footprint size increases because the larger area presents a larger “target” for the dike to intersect, should an *event* occur.

Since DOE completed the Yucca Mountain FEIS, the size and shape of the repository footprint has changed slightly, and so has the probability of a dike intersection. DOE based the new calculation on the work in 1995 and 1996 by the panel of experts. The estimated probability of a dike intrusion is now 1 chance in 5,900 during the first 10,000 years, with 5th- and 95th-percentile values of 1 chance in 133,000 and 1 in 1,800, respectively (DIRS 169989 – BSC 2004, pp. 7-1 and 7-2, and Table 7-1).

Presented in terms of annual frequency, the estimated value of the mean annual frequency of a volcanic dike intersecting the repository footprint is  $1.7 \times 10^{-8}$ . The 5th and 95th percentiles of the uncertainty distribution are  $7.4 \times 10^{-10}$  and  $5.5 \times 10^{-8}$  (Safety Analysis Report Section 2.3.11.2.2.2.3, page 2.3.11-22) (see also BSC 2004, Section 6.5.1.1 and Table 7-1 [LSN# DN2001632124]).

The probability that such a volcanic eruption would release radionuclides entrained in tephra is even lower than estimated by the above distribution because two additional conditional probabilities must also be considered: (1) the conditional probability that a conduit would form within the repository footprint; and (2) the conditional probability that the conduit intersects waste packages. The combined conditional probability that a conduit forms within the repository footprint and intersects waste packages is about 0.083 (SAR Section 2.3.11.4.2.1).

Consideration of these conditional probabilities reduces by more than an order of magnitude the estimated probability that a volcanic eruption would occur at the Yucca Mountain site that would result in the release of radiologically contaminated tephra.

DOE provides the following guidance for the consideration of low-probability events in NEPA documents:

- Consider scenarios with frequencies of  $10^{-6}$  to  $10^{-7}$  per year if the consequences may be very large.

- Scenarios with frequencies less than  $10^{-7}$  per year will rarely need to be examined.
- Report the probability of the accident occurring during the lifetime of the proposed action.

DOE Guidance on NEPA Document Preparation, Recommendations for Analyzing Accidents under the National Environmental Policy Act (DOE 2002, p. 9 [LSN# DN2001714520]). That guidance also states:

In determining which low frequency accident scenarios to analyze, document preparers should consider differences between natural phenomena and human-caused events with respect to the degree to which their consideration would inform decision making. It may not be useful to consider extremely low frequency accidents resulting from certain natural phenomena.

*Id.*

White Pine County's contention is addressed to such a low frequency accident resulting from a natural phenomenon. The probability that a volcanic eruption would occur at the Yucca Mountain site and result in the release of radiologically contaminated tephra is more than one order of magnitude lower than the threshold of  $10^{-7}$  suggested in the DOE guidance. Even though lower than the threshold, to evaluate whether the consequences "may be very large", DOE evaluated the consequences of a volcanic eruption at a site 18 km from the repository. DOE has provided a reasonable rationale for excluding deposition of radiologically contaminated tephra from DOE's NEPA analysis.

The low probability of a volcanic eruption is also a reasonable rationale for excluding a discussion of mitigation of radiologically contaminated tephra. As the D.C. Circuit has held, an agency may decline to discuss mitigation measures when it believes the environmental impact of the action will be minor. *Transmission Access Policy Study Group v. Fed. Energy Regulatory Comm'n*, 225 F.3d 667, 737 (D.C. Cir. 2000) (upholding agency's decision to "decline to adopt

mitigation measures to address a problem that it believed might not even develop”). NEPA requires only that possible mitigation measures “be discussed in sufficient detail to ensure that environmental consequences have been fairly evaluated.” *City of Carmel-by-the-Sea v. U.S. DOT*, 123 F.3d 1142, 1150 (9th Cir. 1997). It is entirely appropriate not to evaluate potential mitigation for consequences that are extremely unlikely.

White Pine County contends that the consequences of an eruption may be orders of magnitude higher than that calculated in the TSPA for the RMEI location. The contention is based primarily on the arguments that the primary wind direction is toward White Pine County, that small particles (those that contribute to the inhalation dose) will travel long distances, and that redistribution (*i.e.* concentration) of deposited ash will increase the dose.

White Pine County is more than 230 km from Yucca Mountain. Dr. Geist presents measurements of ash deposition at similar distances downwind from seven analog volcanic eruptions. Based on those measurements, he concludes “reasonable estimates for ash deposition in White Pine County on the basis of the tabulated eruptions range from 20 to 1,000 g/m<sup>2</sup>.” Petition at 22; Petition, Attach. 2 at 2. This range is based on reported ash deposition from Ruapehu and Hekla volcanoes. The Ruapehu deposition value of 20 g/m<sup>2</sup> is in error, as the reference given states that the Ruapehu eruption in 1996 deposited 0.0002 kg/m<sup>2</sup> at a distance of 200 km (Bonadonna et al. 2005, at 1, Attachment WHI-NEPA-1-1), which equates to 0.2 g/m<sup>2</sup>, not 20 g/m<sup>2</sup> as reported in Attachment 2. The upper limit of 1000 g/m<sup>2</sup> estimated for deposition in White Pine County appears to be arbitrarily chosen and not based on data. Given that the Ruapehu eruption at the low end of the range resulted in an unusually high amount of deposition at 200 km (due to an unusually narrow plume and strong winds, Bonadonna et al. 2005, at 1, Attachment WHI-NEPA-1-1), values as large as 1000 g/m<sup>2</sup> at 230 km (5000 times greater than

the unusual Ruapehu eruption) are extremely unlikely from a small-volume basaltic eruption at Yucca Mountain.

Future potential eruptions in the Yucca Mountain region are expected to be basaltic in composition, less voluminous, and less explosive than either Ruapehu or Hekla. Of the eruptions cited in Attachment 2, Paricutin is the only one remotely analogous to potential future volcanic activity near Yucca Mountain. Based on data in the contention, Paricutin resulted in 0.0003 g/m<sup>2</sup> of ash at a distance of 320 km, which represents an extremely dilute ash deposit with a sub-micron thickness (average thickness less than individual particle sizes). Based on the examples given in the contention, a more reasonable range of deposition based on the examples given in the contention is 0.0003 to 0.2 g/m<sup>2</sup>, not 20 to 1000. The more reasonable deposition range derived from data in the contention (and correcting for the incorrect Ruapehu value cited) is 2-4 orders of magnitude lower than that stated in the contention and includes the value of 0.02 g/m<sup>2</sup> that the attachment cites as calculated for the RMEI site. The lower range of 0.0003 to 0.2 g/m<sup>2</sup> is considered conservative, because the low value is derived from an eruption more voluminous than expected for the Yucca Mountain region (Paricutin), and the high value is based on data from the Ruapehu eruption that demonstrates unusual dispersal characteristics (Bonadonna et al. 2005, at 1, Attachment WHI-NEPA-1-1).

Dr. Geist also argues that concentration of tephra is likely to increase the dosages in White Pine County, Attach. 2 at 3, but provides no scientific study or analysis in support and merely speculates as to reasons why DOE's analysis may or may not be faulty. As Dr. Geist himself acknowledges, “[i]t is impossible for me to predict the consequences of tephra distribution in White Pine County by comparison to the RMEI calculation . . .”, so he is only able to discuss how dosages “might increase.” *Id.* This argument should therefore be disregarded.

As demonstrated above, Dr. Geist's conclusions regarding potential impacts are based on errors in his analysis or unwarranted assumptions. In any event, it is obvious that this contention involves at most a potential battle of experts. It is well-settled law that a petitioner does not raise a material issue under NEPA simply by presenting a potential battle of experts. In *Price Road Neighborhood Ass'n, Inc. v. Dep't of Transp.*, 113 F.3d 1505 (9th Cir. 1997), the Court of Appeals affirmed a district court's grant of summary judgment to the agency. The Ninth Circuit stated that the appellant had:

sought to engage in a battle of the experts with regard to several impacts, including air quality and noise, offering their own studies to contradict those of the agencies. We have consistently rejected such attempts, noting that "when specialists express conflicting views, an agency must have discretion to rely on the reasonable opinions of its own qualified experts."

*Id.* at 1511, citing *Greenpeace Action v. Franklin*, 14 F.3d 1324, 1332 (quoting *Marsh v. Or. Natural Res. Council*, 490 U.S. 360, 378 (1989); accord *Havasupai Tribe v. Robertson*, 943 F.2d 32, 34 (9th Cir. 1991) (affirming district court decision based on the administrative record that no supplementation of an EIS was required because "disagreement among experts does not invalidate an EIS").

As the Supreme Court stated in *Marsh*, an agency must have the discretion to rely on the reasonable opinions of its own experts "even if, as an original matter, a court might find contrary views more persuasive." *Marsh*, 490 U.S. at 378. This is because, as the Supreme Court explained in *Kleppe v. Sierra Club*, 427 U.S. 390, 410 n.21 (1976), "[n]either the statute nor its legislative history contemplates that a court should substitute its judgment for that of the agency as to the environmental consequences of its actions." The NRC has indicated that it would adhere to this same tenet in deciding whether to adopt DOE's EIS. Specifically, in promulgating 10 C.F.R. § 51.109, the NRC stated that "the adoption of the [DOE] statement does not

necessarily mean that NRC would independently have arrived at the same conclusions on matters of fact or policy.” Proposed Rule, NEPA Review Procedures for Geologic Repositories for High-Level Waste, 53 Fed. Reg. 16,131, 16,142 (May 5, 1988). Accordingly, a NEPA contention such as this one, that is premised on a disagreement between an intervenor’s expert and DOE’s expert analysis in an EIS, does not create a triable issue and should not be admitted.

Finally, White Pine County’s reliance on NUREG 1748 is unwarranted. First, White Pine County does not demonstrate that the types of measures discussed in the NUREG are comparable to those sought in the contention. Moreover, White Pine County ignores the requirements of 10 C.F.R. § 51.109 that the contention must raise a significant environmental issue. The portion of NUREG 1748 cited by White Pine County expressly refers to impacts that “would not be considered ‘significant.’” Any alleged non-compliance with this aspect of NUREG 1748 accordingly does not state a valid contention under 10 C.F.R. §§ 51.109 and 2.326.

White Pine County is also incorrect to cite to the requirements of a *proposed* regulation as somehow binding on DOE. Petition at 33. In any event, both the proposed and current regulations apply to performance assessments only, and set forth no requirements under NEPA. Moreover, both the current, enacted version of the regulation and the proposed rule require that DOE consider “only events that have at least one chance in 10,000 of occurring over 10,000 years.” 40 C.F.R. § 63.114(d); *see* 70 Fed. Reg. 53,313 (§ 63.114’s reference to § 63.342 provides the same standard for igneous events). This is entirely consistent with DOE’s analysis above, which demonstrates that the probability of a volcanic eruption, of which volcanic gas transport of radionuclides is a component, is lower than  $10^{-8}$ .

**e. Statement of Alleged Facts or Expert Opinion Supporting Petitioner's Position and Supporting References**

For the reasons discussed above with respect to the requirements of 10 C.F.R. §§ 51.109 and 2.326, and as addressed in Section IV.A.3 regarding the legal standards under 10 C.F.R. § 2.309(f)(1)(v), White Pine County has failed to provide the requisite supporting facts, expert opinion and references.

**f. Existence of a Genuine Dispute on a Material Issue of Law or Fact, With Supporting References to the License Application**

For the reasons discussed in section d. above, there is no genuine dispute on any material issue of law or fact because there was no obligation under NEPA to analyze tephra deposition in White Pine County and because the (erroneous) arguments of White Pine County's expert in any event raise only a potential battle of experts which does not present a triable issue under NEPA.

**4. WHI-NEPA-4 - Title: Failure of Environmental Impact Statements to Discuss Means to Mitigate Adverse Impacts of Atmospheric Transport of Radionuclides in Volcanic Gases**

Because the Yucca Mountain FEIS and the Repository FSEIS omit any discussion of means to mitigate the adverse environmental and public health consequences of atmospheric transport of radionuclides in volcanic gases originating from a volcanic eruption through the Yucca Mountain repository for the RMEI and in White Pine County and other downwind areas, NRC cannot adopt the EISs without the addition of supplementary information.

**RESPONSE**

In this contention, White Pine County claims that the 2002 FEIS and Repository SEIS are inadequate because they omit any discussion of the means to mitigate environmental and public health consequences of atmospheric transport of radionuclides in volcanic gases in White Pine County and other downwind areas.

All NEPA contentions must demonstrate that they meet the criteria of 10 C.F.R § 51.109 and 10 C.F.R. § 2.326, as well as the standards for contentions of 10 C.F.R. § 2.309. White Pine County fails to meet the express requirements of 10 C.F.R. §§ 2.326 and 51.109 in requesting that this contention be admitted in this proceeding. Specifically, as set forth in Section IV.A.4, White Pine County must (1) raise a significant environmental issue; and (2) demonstrate that its contention, if proven to be true, would or would likely result in a materially different outcome in this proceeding. Moreover, its environmental contention must be supported by the affidavit of a qualified witness that sets forth the factual and/or technical basis supporting the claim that these two criteria have been met, including a “specific explanation of why it has been met.” 10 C.F.R. § 2.326(b). As noted in Section IV.A.4 above, “the Commission expects its adjudicatory boards to enforce the [section 2.326] requirements rigorously – *i.e.*, to reject out-of-hand motions that do

not meet those requirements within their four corners.” *Pub. Serv. Co. of N.H.* (Seabrook Station, Units 1 and 2) ALAB-915, 29 NRC 427, 432 (1989).

White Pine County fails to address any of the mandatory requirements of §§ 51.109 and 2.326 in its contention or supporting expert affidavits. White Pine County relies on the affidavits of Dr. Dennis Geist and Dr. Mike Baughman in support of this contention. Both affidavits merely state that White Pine County’s contentions “relate significant and substantial new information not considered and assessed in the Environmental Impact Statements provided to the Nuclear Regulatory Commission in support of the Yucca Mountain Repository License application.” Geist Affidavit, ¶ 6; Baughman Affidavit, ¶ 4. Neither expert provides the analysis that is explicitly called for by the terms of § 2.326(b). This regulation requires White Pine County’s expert to “set forth the factual and/or technical bases for the movant’s claim that the criteria of paragraph (a) of this section have been satisfied.” Section 2.326(b) goes on to state that “[e]ach of the criteria must be separately addressed, with a specific explanation of why it has been met.” Here, White Pine County has failed to meet these requirements.

Further, neither Dr. Geist nor Dr. Baughman appears qualified to offer these opinions. Dr. Geist concedes that he is “not an expert in computer models of tephra transport,” Attach. 2 at 2, yet proceeds to offer his speculation on the computer models DOE used to estimate tephra transport.

Dr. Baughman also fails to present any grounds for concluding that he is an expert in the matters addressed in the contention regarding mitigation of volcanic gas transport of radionuclides. He states only that he holds a doctorate through the Environment, Technology and Society program at Clark University in Worcester, Massachusetts and “has served as a consultant on numerous National Environmental Policy Act (NEPA) compliance projects over

the past 14 years.” Baughman Affidavit at 1. However, there is nothing in his academic background or this one-line statement of his experience that demonstrates that he is qualified to render opinions regarding volcanic gas transport of radionuclides as a result of a volcanic explosion. His affidavit is no more valid or reliable than the rejected testimony of a mathematician who tried to provide expert opinions on engineering matters, *Fla. Power & Light Co.*, (Turkey Point Nuclear Generating Plant, Units 3 and 4), LBP-86-23, 24 NRC 108 (1986), or the environmental health expert who tried to provide expert evidence on physical security matters. *Private Fuel Storage, LLC*, (Independent Spent Fuel Storage Installation), LBP 98-13, 47 N.R.C. 360 (1998).

Moreover, White Pine County’s experts provide no reason to question that, as discussed in detail below, the likelihood of atmospheric transport of radionuclides in volcanic gas is extremely low and that mitigation of such effects therefore need not be discussed. Mr. Baughman merely states that the means to mitigate the public health and environmental consequences of a volcanic eruption was not discussed in the NEPA documents. Baughman Affidavit at 2. And Dr. Geist cites to estimates of the concentration of uranium in volcanic gas, but does not contest DOE’s assessment of probability regarding volcanic gas transport, nor does he even mention mitigation. Geist Affidavit 2 at 3. In fact, Dr. Geist agrees that the “estimates reported in the SAR for the probability of a volcanic eruption that originates from Yucca Mountain are reasonable.” Geist Affidavit 2 at 1. Therefore, White Pine County has failed to raise a significant environmental issue.

**a. Statement of Issue of Law or Fact to be Controverted**

Without prejudice to other positions taken by DOE, DOE expresses no legal objection based upon this requirement.

**b. Brief Explanation of Basis**

Without prejudice to other positions taken by DOE, DOE expresses no legal objection based upon this requirement.

**c. Whether the Issue is Within the Scope of the Proceeding**

Without prejudice to other positions taken by DOE, DOE expresses no legal objection based upon this requirement.

**d. Whether the Issue is Material to the Findings that the NRC Must Make**

This contention does not raise an issue material to the findings NRC must make because White Pine County has failed to demonstrate that DOE's environmental analyses violate NEPA. As recognized in the contention, both the 2002 FEIS and the Repository SEIS evaluated the potential postclosure impacts of an eruptive modeling scenario. These impacts were reported for RMEI at approximately 18 kilometers south of the repository location. White Pine County contends that the 2002 FEIS and Repository SEIS cannot be adopted by the NRC unless they are supplemented to include consideration of the mitigation of environmental and public health consequences of atmospheric transport of radionuclides in volcanic gases in White Pine County. This contention is not material because, in accordance with DOE guidance for preparation of NEPA document (DOE Guidance on NEPA Document Preparation, Recommendations for Analyzing Accidents under the National Environmental Policy Act (DOE 2002) (LSN# DN2001714520)), the probability of a volcanic eruption at Yucca Mountain that would release radionuclides in volcanic gases is so low that the analysis of the event is not required under NEPA, and therefore analysis of mitigation of such an event need not be considered either.

The Repository SEIS describes the potential for volcanism at the Yucca Mountain site in Subsection 3.1.3.1.3 (pages 3-21 and 3-22) as follows:

In 1995 and 1996, a panel of 10 recognized experts from federal agencies, national laboratories, and universities evaluated the potential for disruption of the repository by a volcanic intrusion, also known as a dike. The result of that effort was an estimate of the average *probability* of 1 chance in 7,000 that a volcanic dike could intersect or disrupt the repository during the first 10,000 years after *repository-closure*. As the Yucca Mountain FEIS reported, DOE increased this probability to 1 chance in 6,300 to account for a slightly larger repository footprint than the expert panel considered (DIRS 155970 - DOE 2002, p. 3-27). The likelihood of an intersection increases by small amounts if the footprint size increases because the larger area presents a larger “target” for the dike to intersect, should an *event* occur.

Since DOE completed the Yucca Mountain FEIS, the size and shape of the repository footprint has changed slightly, and so has the probability of a dike intersection. DOE based the new calculation on the work in 1995 and 1996 by the panel of experts. The estimated probability of a dike intrusion is now 1 chance in 5,900 during the first 10,000 years, with 5th- and 95th-percentile values of 1 chance in 133,000 and 1 in 1,800, respectively (DIRS 169989 – BSC 2004, pp. 7-1 and 7-2, and Table 7-1).

Presented in terms of annual frequency, the estimated value of the mean annual frequency of a volcanic dike intersecting the repository footprint is  $1.7 \times 10^{-8}$ . The 5th and 95th percentiles of the uncertainty distribution are  $7.4 \times 10^{-10}$  and  $5.5 \times 10^{-8}$  (SAR at 2.3.11-22) (*see also* BSC 2004, Section 6.5.1.1 and Table 7-1 (LSN# DN2001632124)).

The probability that such a volcanic eruption would release radionuclides via atmospheric transport in volcanic gases is even lower than estimated by the above distribution because two additional conditional probabilities must also be considered: (1) the conditional probability that a conduit would form within the repository footprint; and (2) the conditional probability that the conduit intersects waste packages. The combined conditional probability that a conduit forms within the repository footprint and intersects waste packages is about 0.083 (SAR Subsection 2.3.11.4.2.1). Consideration of these conditional probabilities reduces by more than an order of

magnitude the estimated probability that a volcanic eruption would occur at the Yucca Mountain site that would result in the release of radionuclides via volcanic gases.

DOE provides the following guidance for the consideration of low-probability events in NEPA documents:

- Consider scenarios with frequencies of  $10^{-6}$  to  $10^{-7}$  per year if the consequences may be very large.
- Scenarios with frequencies less than  $10^{-7}$  per year will rarely need to be examined.
- Report the probability of the accident occurring during the lifetime of the proposed action.

DOE Guidance on NEPA Document Preparation, Recommendations for Analyzing Accidents under the National Environmental Policy Act (DOE 2002, p. 9 [LSN# DN2001714520]). That guidance also states:

In determining which low frequency accident scenarios to analyze, document preparers should consider differences between natural phenomena and human-caused events with respect to the degree to which their consideration would inform decision making. It may not be useful to consider extremely low frequency accidents resulting from certain natural phenomena.

*Id.* The subject of White Pine County's contention is mitigation of just such a low frequency event resulting from a natural phenomenon. The probability that a volcanic eruption would occur at the Yucca Mountain site that would result in the release of radionuclide-laden volcanic gases is more than one order of magnitude lower than the threshold of  $10^{-7}$  suggested in the DOE guidance. This is a reasonable rationale for excluding atmospheric transport of radionuclides from DOE's NEPA analysis.

It is also a reasonable rationale for excluding a discussion of mitigation of volcanic gas transport of radionuclides. As the D.C. Circuit has held, an agency may decline to discuss mitigation measures when it believes the environmental impact of the action will be minor.

*Transmission Access Policy Study Group v. Fed. Energy Regulatory Comm'n*, 225 F.3d 667, 737 (D.C. Cir. 2000) (upholding agency's decision to "decline to adopt mitigation measures to address a problem that it believed might not even develop"). NEPA requires only that possible mitigation measures "be discussed in sufficient detail to ensure that environmental consequences have been fairly evaluated." *City of Carmel-by-the-Sea v. U.S. DOT*, 123 F.3d 1142, 1150 (9th Cir. 1997). It is entirely appropriate not to evaluate potential mitigation for consequences that are extremely unlikely.

White Pine County's reliance on NUREG 1748 is unwarranted. First, White Pine County does not demonstrate that the types of measures discussed in the NUREG are comparable to those sought in the contention. Moreover, White Pine County ignores the requirements of 10 C.F.R. § 51.109 that the contention must raise a significant environmental issue. The portion of NUREG 1748 cited by White Pine County expressly refers to impacts that "would not be considered 'significant'." Any alleged non-compliance with this aspect of NUREG 1748 accordingly does not state a valid contention under 10 C.F.R. §§ 51.109 and 2.326.

White Pine County is also incorrect to cite to the requirements of a *proposed* regulation as somehow binding on DOE. Petition at 41. In any event, both the proposed and current regulations apply to performance assessments only, and set forth no requirements under NEPA. Moreover, both the current, enacted version of the regulation and the proposed rule require that DOE consider "only events that have at least one chance in 10,000 of occurring over 10,000 years." 40 C.F.R. § 63.114(d); *see* 70 Fed. Reg. 53313 (§ 63.114's reference to § 63.342 provides the same standard for igneous events). This is entirely consistent with DOE's analysis above, which demonstrates that the probability of a volcanic eruption, of which volcanic gas transport of radionuclides is a component, is lower than  $10^{-8}$ .

**e. Statement of Alleged Facts or Expert Opinion Supporting Petitioner's Position and Supporting References**

For the reasons discussed above with respect to the requirements of 10 C.F.R. §§ 51.109 and 2.326, and as addressed in Section IV.A.3 regarding the legal standards under 10 C.F.R. § 2.309(f)(1)(v), White Pine County has failed to provide the requisite supporting facts, expert opinion and references.

**f. Existence of a Genuine Dispute on a Material Issue of Law or Fact, With Supporting References to the License Application**

For the reasons discussed in Section d. above, there is no genuine dispute on any material issue of law or fact because there was no obligation under NEPA to analyze radionuclides in volcanic gas in White Pine County.

## V. CONCLUSION

DOE has no reason to believe that White Pine County is not in substantial compliance with its LSN obligations at this time. DOE also does not object to its legal standing as an Affected Unit of Local Government or its participation as an interested governmental body. However, DOE does not believe that White Pine County has proffered any admissible contentions.

Respectfully submitted,

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Dated in Washington, D.C.  
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**UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION  
ATOMIC SAFETY AND LICENSING BOARD**

In the Matter of:	)	
	)	
U.S. Department of Energy	)	January 15, 2009
	)	
(License Application for Geologic Repository at Yucca Mountain)	)	Docket No. 63-001
	)	

CERTIFICATE OF SERVICE

I hereby certify that copies of the “ANSWER OF THE U.S. DEPARTMENT OF ENERGY TO WHITE PINE COUNTY’S REQUEST FOR HEARING AND PETITION FOR LEAVE TO INTERVENE INCLUDING SUPPORTING CONTENTIONS ON THE APPLICATION BY THE U.S. DEPARTMENT OF ENERGY FOR AUTHORITY TO CONSTRUCT A GEOLOGIC REPOSITORY AT A GEOLOGIC REPOSITORY OPERATIONS AREA AT YUCCA MOUNTAIN” have been served on the following persons this 15th day of January, 2009 by the Nuclear Regulatory Commission’s Electronic Information Exchange.

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