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Annette Vietti-Cook
Secretary
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Mail Stop: 16 OWFN-12-H08
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RE: Draft Report for Comment: Supplement to the U.S. Department of Energy's Environmental Impact Statement for a Geologic Repository for the Disposal of Spent Nuclear Fuel and High-Level Waste at Yucca Mountain, Nye County, Nevada (Docket ID: NRC-2015-0051)

Dear Secretary Vietti-Cook:

This letter provides the California Energy Commission's (Energy Commission) comments on the above-referenced Supplement. The Energy Commission is California's primary energy policy and planning agency, with core functions that include evaluating and proposing mitigation for environmental and health and safety impacts of proposed thermal powerplants, including nuclear facilities.

The Energy Commission's Interest and Subject Matter Expertise

Nuclear power generation has played an important role in California's electric generation system for several decades. California's legislature has tasked the Energy Commission to examine key questions involving nuclear power and associated facilities. In fulfilling this legislative mandate, the Energy Commission regularly evaluates – and takes appropriate responsive action regarding – possible federal decision-making that would impact California's existing nuclear facilities,[1] environmental resources, and public health and safety.[2] The Energy Commission has

[1] In 1976, the California Legislature approved an amendment to the Warren-Alquist State Energy Resources and Development Act, California Public Resources Code, section 25524.2, which conditions the certification of new nuclear power plants within the state upon the existence of federally-approved waste disposal technology for high-level nuclear waste. Assembly Bill 1632 (Blakeslee, Chapter 722, Statutes of 2006) directed the Energy Commission to assess the potential vulnerability of California's nuclear power plants to a major disruption due to seismic event or plant aging, which included assessing the costs and impacts from nuclear waste accumulating at these facilities and evaluating other major policy and planning issues affecting the future role of these plants in the state's energy portfolio.

[2] The Warren-Alquist Act designates the Energy Commission as the state's primary agency for energy policy and planning. Senate Bill 1389 (Bowen and Sher, Chapter 568, Statutes of 2002) requires that the Commission adopt and transmit to the Governor and Legislature a report of findings every two years in the Integrated Energy Policy Report.

taken a particular interest in the Department of Energy's (DOE) proposal for a geologic repository for the disposal of spent nuclear fuel and high-level waste at Yucca Mountain.

In particular, California is a party to the underlying proceeding before the Atomic Safety Licensing Board entitled, *In the Matter of the U.S. Department of Energy (High Level Waste Repository)*, Docket No. 63-001-HLW (High Level Waste Repository Proceeding). In that proceeding, the Atomic Safety Licensing Board admitted 22 contentions brought forth by the State of California, charging that DOE's 2002 "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" (2002 FEIS) and 2008 "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" (2008 FEIS; collectively, EISs) did not adequately characterize impacts from potential contaminant releases to groundwater and from surface discharge of groundwater.[3] The NRC staff's 2008 "Adoption Determination Report for the U.S. Department of Energy's Environmental Impact Statements for the Proposed Geologic Repository at Yucca Mountain" (ADR) agreed with California's position that the EISs were deficient under the National Environmental Policy Act (NEPA) for failing to adequately discuss the cumulative amounts of radiological and non-radiological contaminants that may enter the groundwater over time and how these contaminants would behave in the aquifer and surrounding environments.[4]

The Energy Commission maintains that DOE's original EISs, which the NRC staff has augmented with the Supplement, are deficient. Moreover, Energy Commission water resources and geologic specialists with extensive experience and knowledge of the Amargosa River and nearby local groundwater resources have reviewed the Supplement and conclude that it similarly fails to adequately characterize impacts from potential contaminant releases to groundwater and from surface discharge of groundwater in the Amargosa Desert.

The Supplement Does Not Comply with NEPA and Related Federal Regulations

As more fully discussed below, the proposed geologic repository for the disposal of spent nuclear fuel and high-level radioactive waste at Yucca Mountain has potential to cause significant impacts on California aquifers and groundwater resources. The Supplement fails to fully analyze and plan for mitigating these impacts as required by NEPA.

According to its Introduction, the Supplement does not reflect a change to DOE's proposed action to construct, operate, monitor, and close a repository for the disposal of spent nuclear fuel and high-level radioactive waste (HLW) at Yucca Mountain, Nevada. Nor does it reflect any change in the alternatives that DOE presented in Chapter 2 of its previously published EISs, which are the proposed action and the no action alternative of not constructing a repository. Instead, the Supplement serves to present information "about the impacts of potential repository

[3] Board Memorandum and Order, May 11, 2009; CLI-09-14, June 30, 2009.
[4] U.S. Nuclear Regulatory Commission Staff's "Adoption Determination Report for the U.S. Department of Energy's Environmental Impact Statements for the Proposed Geologic Repository at Yucca Mountain," p. 3-14.

contamination of groundwater, as well as the potential impacts associated with the discharge of contaminated groundwater to the surface. As such, the [S]upplement affects the information presented in DOE's analyses of affected environment, impacts after repository closure, and cumulative impacts in its EISs."[5]

The Supplement's focus is the potential environmental impacts on groundwater and impacts in Fortymile Wash and the Amargosa Desert, and to the Furnace Creek/Middle Basin area of Death Valley, associated with the discharge of any contaminated groundwater to the ground surface due to potential releases from a geologic repository for spent nuclear fuel and high-level radioactive waste at Yucca Mountain, Nye County, Nevada.

The United States Supreme Court has identified NEPA's twin aims as (1) obligating a federal agency to consider every significant aspect of the environmental impact of a proposed action and (2) ensuring that the federal agency will inform the public that it has indeed considered environmental concerns in its decision-making process.[6] Thus, under NEPA, an environmental impact statement must "set forth sufficient information for the general public to make an informed evaluation . . . and for the decision maker to consider fully the environmental factors involved and to make a reasoned decision after balancing the risks of harm to the environment against the benefits to be derived from the proposed action."[7] An environmental impact statement must permit those who do not participate in its preparation to understand and consider meaningfully the reasoning, premises, and data relied upon, and to permit a reasoned choice among different courses of action.[8]

NEPA requires, among other things, that an environmental impact statement contain a reasonably thorough discussion of the significant aspects of the probable consequences of an action.[9] The statement must analyze the full range of direct, indirect, and cumulative effects of the preferred alternative, if any, and of the reasonable alternatives identified in the draft EIS. This includes a detailed evaluation of applicable ecological, aesthetic, historic, cultural, economic, social, or health impacts, whether adverse or beneficial.[10] Further, under NEPA, an impact statement must identify all relevant, reasonable mitigation measures that could improve the project.[11]

In addition, according to NRC's regulations, NRC cannot authorize the proposed construction unless it determines, among other things, that there are "reasonable assurances" that the

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[5] Draft Report for Comment: Supplement to the U.S. Department of Energy's Environmental Impact Statement for a Geologic Repository for the Disposal of Spent Nuclear Fuel and High-Level Waste at Yucca Mountain, Nye County, Nevada (Docket ID: NRC-2015-0051), p. 1-5.
[6] *Baltimore Gas & Elec. Co. v. Natural Resources Defense Council*, 462 U.S. 87, 97 (1983); see also 42 U.S.C. § 4332(2)(c) (identifying requirements of an environmental impact statement).
[7] *Sierra Club v. U.S. Army Corps of Engineers*, 701 F.2d 1011, 1029 n.18 (2d Cir. 1983).
[8] *Friends of the River v. Fed. Energy Regulatory Comm'n*, 720 F.2d 93, 120 (D.C. Cir. 1983).
[9] *Oregon Natural Resources Council v. Lowe*, 109 F.3d 521, 526 (9th Cir. 1997).
[10] *32 CEQ NEPA Regulations*, 40 C.F.R. § 1502.14(e). 33 CEQ NEPA Regulations, 40 C.F.R. §§ 1508.7, 1508.8.
[11] 40 CFR § 1508.20.

repository can receive waste "without unreasonable risk to the health and safety of the public," and that DOE's proposal "will not be inimical to the common defense and security."[12]

California has demonstrated in the High Level Waste Repository Proceeding that DOE's license application failed to provide information that would allow NRC to make such findings. For the reasons set forth below, NRC's Supplement likewise fails in this regard.

I. The Death Valley Regional Flow Model Used by NRC in the Supplement Is Inadequate to Provide an Accurate Assessment of Impacts from Water-Borne Contaminants

Energy Commission staff has reviewed the groundwater modeling reference and has concluded that there is insufficient information to evaluate potential impacts from the transportation of radioactive contaminants originating at the repository site. The Supplement determined flow paths beyond the site boundary and into California based on results from the Death Valley Regional Flow Model (DVRFM). The DVRFM uses a computational grid of 1.5 km x 1.5 km. This resolution is too coarse, given that the modeled area is no more than 45 km in its longest dimension.

The results of the model used for the Supplement analysis merely describe average behavior and can only give rise to an inference of general trends in water levels and global water budgets. A finer grid would provide results that more accurately and adequately represent site conditions. Further, results obtained from the model grid cannot be interpolated for scales smaller than the computational element size. Since the contaminant of concern is a high-risk contaminant, it would be more appropriate to look at behavior at much finer scales than what the model used, especially considering that a good portion of the flow domain is characterized as being fractured media where hydrogeologic properties vary in an abrupt manner within very short distances or at fine scales.

In addition, when travel times are of interest, as is the case with radioactive contaminants, one should use travel paths with high contrast in velocity compared to the average velocity in the cell, as those paths are the most critical ones with the shortest travel times. Furthermore, hydrogeologic properties assigned to the computational cells, such as porosity and hydraulic conductivity, correspond to median properties of the different formations, whereas there is considerable contrast in those properties between fractures and the porous matrix within the same computational element. These properties are the main ones that play a critical role in how fast a contaminant is delivered to a target area, as well as the peak concentrations at the area of concern because dilution of a contaminant is time-dependent.

The grid used by the NRC staff could easily be refined within the existing model framework such that a smaller computational element size is used. In fact, the model allows for use of different resolutions to be implemented, which can be utilized to better represent the targeted

[12] 10 CFR. § 63.31(a), (c).

area of interest. The hydrogeologic properties would also need to be assigned at the finer scale used by the model. This would help resolve features at smaller scales, such as fractures, for better representation. With the computational capabilities of modern computers, it is not too difficult or costly to use grids with hundreds of thousands of elements to model such a relatively small region. In fact, there is an ongoing effort by the United States Geological Survey to develop the Southern Amargosa eMbedded Model (SAMM) based on the regional model, but using a much more refined grid to simulate groundwater flow on a local scale. This effort is expected to be completed in 2016.[13]

Until such time that the NRC staff utilizes a more refined model that would provide a more accurate assessment of impacts from water-borne contaminants, the groundwater analysis, as it applies to California, is inadequate.

II. Monitoring Wells Are Necessary for Monitoring and Remediation in the Event of Containment Failure

The discussion of mitigation and remediation measures to protect the public health and safety and other environmental impacts in DOE's original EISs, and the Supplement, is not consistent with NRC regulations for completeness and adequacy of the discussion of environmental consequences of the proposed action.[14] This incomplete and inadequate characterization of the environmental consequences constitutes a significant consideration, irrespective of the magnitude of potential impacts.

It is important to note that the deficiencies California raised in the High Level Waste Repository Proceeding remain.[15] DOE acknowledged in the 2002 FEIS that groundwater from tuff aquifers under the repository comes to the surface at Franklin Lake Playa and Alkali Flat, near Death Valley Junction, in California.[16] However, DOE did not offer any plan for remediation of those potentially contaminated sites in California. DOE has previously committed to conducting monitoring activities including monitoring groundwater quality, but no details were provided.[17]

A groundwater well monitoring program on the west side of Yucca Mountain (California side) is imperative. California has consistently recommended that monitoring wells (and high capacity extraction wells) be strategically located around the repository to detect any early "leaks" into any of the groundwater aquifers. A series of monitoring wells (with high capacity extraction capabilities) would need to be placed into the aquifers along the California border to track and

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[13] Accessed online at http://nevada.usgs.gov/water/studyareas/samm.htm.
[14] 10 CFR Part 51, Appendix A(7).
[15] *In the Matter of the U.S. Department of Energy (High Level Waste Repository)*, Docket No. 63-001-HLW.
[16] 2002 FEIS Volume I, Ch.3, p.3-41.
[17] 2002 FEIS Volume I, Ch. 9, p. 9-8 and 9-9.

extract any contamination plumes should radionuclide migration and groundwater contamination occur.[18] The Supplement does not address this issue.

III. The Supplement Impermissibly Allows Deferred Analysis of Potential Impacts and Related Mitigation

As the potential licensee, DOE is required to develop a mitigation and remediation plan for radionuclides transported by groundwater that could surface in California, for example, at Alkali Flat/Franklin Lake Playa, east of the community of Death Valley Junction. Surface water is known to flow from the site of the proposed repository to Fortymile Wash east of the site, and into the Amargosa River Drainage.[19] DOE also acknowledged that shallower aquifers follow the same flow path into the Amargosa River drainage, and come to the surface of Alkali Flat and Franklin Lake Playa.[20] The flow paths for surface water within the Amargosa River Drainage terminate in Death Valley National Park. In the 2002 FEIS, DOE acknowledged that 69,500 people could be exposed to contaminated groundwater at Franklin Lake Playa during the next 10,000 years.[21] The Supplement continues the 2002 FEIS' failure to provide a remediation plan for radionuclides transported by groundwater that could surface in California.

DOE originally suggested that it may defer its analysis of the necessary mitigation and remediation measures to protect the public health and safety and address other environmental impacts until such time that there has been "detection of any unusual conditions in the groundwater."[22] It has long been DOE's position that it is not required to develop a plan for mitigation and remediation until after the facility has been licensed, rather than during the licensing phase. Through its silence on this issue, it appears that the NRC staff has taken a similar position.

NEPA requires the analysis of all reasonably foreseeable impacts from the project: it limits the degree to which an environmental impact statement can defer analysis of impacts until a later environmental impact statement. "NEPA is not designed to postpone analysis of an environmental consequence to the last possible moment. Rather, it is designed to require such analysis as soon as it can reasonably be done."[23] Where impacts are reasonably foreseeable, it is not appropriate to defer analysis to a future date.[24]

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[18] State of California's Comments on the U.S. Department of Energy's Draft Environmental Impact Statements Related to a Proposed Geologic Repository at Yucca Mountain, Nevada, January 10, 2008, by James D. Boyd, California Energy Commission.

[19] Draft Comprehensive Impact Statement, *Potential Impacts to Inyo County, California from the proposed high-level nuclear waste repository at Yucca Mountain, Nevada*, p.15, Matt Gaffney, Project Coordinator, November 6, 2007.

[20] FEIS Chapter3, pages 3-41, 3-45, 3-64 (DOE-EIS-0250) 2002.

[21] FEIS Chapter 5, pages 5-24-25, Environmental Consequences of Long Term Repository Performance (DOE-EIS-0250) 2002.

[22] FSEIS Volume III, Comments – Response Document, 1.21.1 (84) Impacts Mitigation, p.CR-527.

[23] *Kern v. U.S. Bureau of Land Mgmt.*, 284 F. 3d 1062, 1072 (9th Cir. 2002) (citing *Save Our Ecosystems v. Clark*, 747 F.2d 1240, 1246 n. 9 (9th Cir. 1984)).

[24] *Neighbors of Cuddy Mountain v. U.S. Forest Service*, 137 F.3d. 1372, 1380 (9th Cir. 1998).

Further, while it has been DOE's position that surface water is not expected to be impacted by repository operations within the mountain, there will be numerous surface facilities present that will store waste on a temporary basis. Both DOE (in the EISs) and NRC (in the Supplement) failed to conduct specific analysis of impacts to these facilities such as in case of a flood event, where any hazardous materials or radioactive waste on the surface would be carried off by floodwaters that would subsequently enter the Amargosa River drainage.[25] If no analysis is completed to develop a mitigation or remediation plan until the facility is in the active preclosure phase, any such plan would do nothing to protect the public health and safety and avoid other environmental impacts in the event of a flood before such analysis were conducted. Until a mitigation and remediation plan for radionuclides that would surface within California at Alkali Flat/Franklin Lake Playa has been developed, the analysis in the NEPA documents with respect to public health and safety and other environmental impacts from surfacing radionuclides renders the relevant portions of those environmental documents – both in the prior EISs and in the Supplement – insufficient.

The Supplement Should Be Submitted for Independent Peer Review Prior to Adoption

California has demonstrated throughout the High Level Waste Proceeding the complete absence of any analysis by DOE in its original EISs of the impacts within California from potential radioactive contaminant releases to groundwater and from surface discharge of radioactively contaminated groundwater from the site of the proposed high level waste repository at Yucca Mountain. NRC staff agreed with California, noting that DOE's analysis did not provide adequate discussion of the cumulative amounts of radiological and non-radiological contaminants that may enter the groundwater over time and how these contaminants would behave in the aquifer and surrounding environments. DOE declined to supplement its EISs in this regard, after which NRC assumed this responsibility by preparing the Supplement.

Most federal regulatory agencies, including NRC, are required to subject certain types of scientific information to peer review before those agencies publicly disseminate that information. These requirements were published in a Peer Review Bulletin[26] issued by the White House Office of Management and Budget (OMB) which set forth the "government-wide standards concerning when peer-review is required and, if required, what type of peer review processes are appropriate."

OMB's peer review bulletin requires that each Federal regulatory agency must submit all "influential scientific information" to peer review before the information is publicly disseminated. Moreover, the Information Quality Act requires that federal agencies "ensure and maximize the quality, objectivity, utility and integrity of information including statistical information prior to dissemination." As shown above, the Information Quality Act contemplates

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[25] Draft Comprehensive Impact Statement, *Potential Impacts to Inyo County, California from the proposed high-level nuclear waste repository at Yucca Mountain, Nevada*, p.15, Matt Gaffney, Project Coordinator, November 6, 2007.

[26] Federal Register, Vol.67, No.36, Feb.22, 2002.

that a "highly influential scientific assessment" that is "scientifically and technically novel" must be the subject of a peer review by independent experts not employed by NRC. The Supplement is a "highly influential scientific assessment" that is "scientifically and technically novel." Independent review is therefore necessary prior to adoption by NRC.

As a licensing entity, NRC was originally tasked with providing an independent and objective review of the licensing application submitted by DOE, including its environmental documents. Once NRC assumed the responsibility of completing the analysis of radioactive contaminant releases to groundwater and from surface discharge of radioactively contaminated groundwater (essentially doing DOE's job for it), the NRC staff stepped out of the role of an independent and objective reviewer.

We appreciate the opportunity to comment on the Supplement and request that you consider these comments prior to taking final action. Please send any future notices, correspondence, and documents related to these comments to Justin Cochran, Senior Nuclear Policy Advisor, California Energy Commission, MS36, 1516 Ninth Street, Sacramento, CA, 95814-5512, or via e-mail at Justin.Cochran@energy.ca.gov.

Sincerely,

Robert B Weisenmiller

ROBERT B. WEISENMILLER
Chair and State Liaison Officer to NRC

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