



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

July 16, 2015

Ms. Elizabeth Poole  
NEPA Implementation Section  
US EPA - Region 5  
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Chicago, IL 60604

**SUBJECT: NOTICE OF AVAILABILITY OF THE FINAL PLANT-SPECIFIC  
SUPPLEMENT 54 TO THE GENERIC ENVIRONMENTAL IMPACT  
STATEMENT FOR LICENSE RENEWAL OF NUCLEAR PLANTS REGARDING  
BYRON STATION, UNITS 1 AND 2 (TAC NOS. MF1790 AND MF1791)**

Dear Ms. Poole:

Enclosed are one bound copy and one electronic copy of final Supplement 54 to NUREG-1437, "Generic Environmental Impact Statement for License Renewal of Nuclear Plants," regarding the license renewal of Byron Station, Units 1 and 2 (Byron).

The final Supplement 54 to NUREG-1437 will be submitted to the U.S. Environmental Protection Agency (EPA) via e-NEPA no later than August 15, 2015. In addition, a copy of final Supplement 54 is being mailed or e-mailed to interested Federal and State agencies, industry organizations, interest groups, and members of the public. A copy of this document has also been placed in the U.S. Nuclear Regulatory Commission's (NRC) Public Document Room, One White Flint North, 11555 Rockville Pike, Rockville, Maryland 20852, and in the NRC Agencywide Documents Access and Management System (ADAMS). ADAMS is accessible on the NRC's website at <http://www.nrc.gov/reading-rm/adams.html>. The ADAMS accession number for final Supplement 54 to NUREG-1437 is ML15196A263.

Additionally, enclosed are NRC's responses to EPA's recommendations that were provided by letter dated February 12, 2015, during the public comment period on the draft Supplement 54 to NUREG-1437. These responses can also be found in Appendix A of Supplement 54.

E. Poole

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If further information is required, please contact Ms. Lois James, Senior Project Manager, for the review of the Byron license renewal application, by telephone at 301-415-3306 or by e-mail at [lois.james@nrc.gov](mailto:lois.james@nrc.gov).

Sincerely,

**/RA/**

James G. Danna, Chief  
Projects Branch 2  
Division of License Renewal  
Office of Nuclear Reactor Regulation

Docket Nos. 50-454 and 50-455

Enclosure:  
As stated

cc w/o encl: Listserv

E. Poole

- 2-

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ADAMS Accession Nos.

1. Package: ML15077A311
2. Letter: ML15077A306
3. GEIS Supplement 54: ML15196A263

\*concurrence via e-mail

<b>OFFICE</b>	PM:RPB2:DLR*	LA:DLR*	BC:RPB2:DLR
<b>NAME</b>	LJames	IBetts	JDanna
<b>DATE</b>	7/15/2015	6/30/15	7/16/15

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Letter to E. Poole from JDanna dated July 17, 2015

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BYRON STATION, UNITS 1 AND 2 (TAC NOS. MF1790 AND MF1791)

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## **NRC's Responses to EPA Recommendations on the Supplement 54 to the GEIS**

*Editorial comments that are accepted as recommended (004-8) are not considered substantive and therefore not included in the list below. All changes to the Supplemental Environmental Impact Statement (SEIS) text can be identified by change bars in the margin of each page.*

**Comment 004-1-Human Health:** EPA [U.S. Environmental Protection Agency] is encouraged by the inclusion of National Institute of Environmental Safety and Health's (NIESH) conclusion regarding the risks of living near extremely low-frequency electromagnetic fields (ELF [extremely low frequency]-EMF [electromagnetic field]). However, EPA notes that NRC continues to view assignment of this issue as generically "UNCERTAIN," and therefore a category 1 issue.

**Recommendation:** We recommend categorizing this issue as a Category 2, given that chronic effects continue to be viewed as "UNCERTAIN" by the NRC, and include site-specific analysis in the Final Supplemental EIS.

**Response:** *The NRC staff does not agree with the comment. The issue, Chronic effects of EMFs, was evaluated in the Generic Environmental Impact Statement for License Renewal of Nuclear Power Plants (GEIS) (NUREG-1437) and classified as an uncategorized issue (i.e., neither Category 1 or 2) with an impact level of uncertain because there is currently no national scientific consensus on the potential impacts from chronic exposure to EMFs. As discussed in the GEIS, biological and physical studies of 60-hertz EMFs have not found consistent evidence linking harmful effects from chronic EMF exposures. Therefore, based on the current state of the science in this area, no generic conclusion on human health impacts is possible at this time.*

*Although there is no conclusion in the GEIS as to the impact level, this issue is treated consistently in each plant-specific SEIS by providing a discussion of the scientific information that is known about this issue. Until a national scientific consensus is reached, the NRC will continue to list this issue as uncategorized with an impact level of uncertain.*

*No change was made in the SEIS text as a result of this comment.*

**Comment 004-2-Aquatic Resources:** The Draft Supplemental EIS does not include a discussion of the recently finalized rule requirements for cooling water intake systems. The Illinois Environmental Protection Agency (IEPA) is the National Pollution Discharge Elimination System (NPDES) permitting authority in Illinois and will be making Best Technology Available determinations for cooling water intake structures, if any, consistent with the Existing Facility Rule for Section 316(b) in 40 CFR [Code of Federal Regulation] Part 125, as finalized in October 2014. This determination will be effective in the first NPDES permit reissued after July 14, 2018.

**Recommendation:** The Final EIS should include a discussion of the revised Section 316(b) regulations and potential cooling water intake technologies that may be available to the facility and whether modifications to the existing cooling water intake structure are anticipated, to the best of NRC's and the applicant's knowledge.

**Response:** *The NRC recognizes that on August 15, 2014, EPA published final regulations to establish requirements for cooling water intake structures at existing facilities under section 316(b) of the Clean Water Act (CWA) for the purpose of reducing impingement and entrainment of fish and other aquatic organisms. The EPA's final regulations were effective on October 14, 2014.*

ENCLOSURE

*In the case of Byron, the NRC has generically determined in the GEIS that impingement and entrainment of aquatic organisms during the license renewal term is a Category 1 issue with a significance level of SMALL for plants with cooling towers. During its review of the Byron license renewal application, the staff found no new and significant information that would call into question the GEIS's conclusion of SMALL for Byron. Accordingly, the NRC staff did not perform a site-specific analysis of this issue.*

*Regarding potential cooling water intake technologies that may be available to Byron, the NRC does not consider mitigation associated with Category 1 issues with a significance level of SMALL, because the NRC staff has previously determined in the GEIS that additional plant-specific mitigation of adverse impacts associated with such issues are not likely to be sufficiently beneficial to warrant implementation. Regarding whether modifications to the existing cooling water intake structure are anticipated, the NRC staff cannot reasonably predict whether the EPA or the State will require Exelon to modify Byron's cooling water intake structure to comply with the new 316(b) regulations during future NPDES permit renewal processes. Accordingly, the NRC staff does not address such modifications in the SEIS.*

*In response to this comment, the NRC staff added language in Section 4.7.1.1 acknowledging that the EPA published a final rule establishing requirements under section 316(b) of the CWA for cooling water intake structures at existing facilities (79 FR 48300).*

**Comment 004-3-Special Status Species and Habitats:** EPA notes that no State-listed bird species have been observed at the Byron site during the development of the wildlife management plan. We also understand that surveys conducted to develop the wildlife management plan occurred in 2006. However, surveys conducted in 2006 may no longer be relevant.

**Recommendation:** Even though actions proposed under license renewal and possible refurbishment do not appear to impact species or undisturbed habitat, EPA recommends NRC verify with U.S. Fish and Wildlife Service and Illinois Department of Natural Resource that the data used to make the determinations of no effect to state- and federally-listed species is still relevant. Results of coordination with the two agencies concerning NRC's determination of no effect should be included in the Final Supplemental EIS.

**Response:** *The commenter recommends that the NRC staff coordinate with the U.S. Fish and Wildlife Service (FWS) and Illinois Department of Natural Resources (IDNR) regarding the effects of license renewal on Federally and State-listed species.*

*The NRC staff coordinated with the FWS pursuant to section 7 of the Endangered Species Act (ESA). In a letter dated December 24, 2014, the NRC transmitted a copy of the draft SEIS to the FWS for its review. The FWS responded in a letter dated January 29, 2015, that it concurs with the NRC's effect determinations regarding Federally listed species and that no further action is required under ESA section 7. The NRC staff has updated Appendix C of the SEIS to reflect this correspondence and to document that the NRC has fulfilled its obligations under ESA section 7 for the proposed license renewal.*

*Regarding State-listed birds and other State-listed species, the commenter notes that no State-listed birds were observed at the Byron site during the development of the site's Wildlife Management Plan. However, the NRC staff states in Section 3.6.2.3 of the SEIS that the bald eagle (*Haliaeetus leucocephalus*) has been observed on and near the Byron site. The*

*commenter also characterizes the NRC's impact determination concerning State-listed species as "no effect." In Section 4.6 of the SEIS, the NRC staff concludes that all terrestrial resources issues would have a SMALL impact on terrestrial species and habitats, including State-listed species. The NRC did not coordinate with the IDNR beyond the normal NEPA process, and the IDNR did not submit specific comments on the draft SEIS. Additionally, the NRC staff did not identify any information during its consideration of this comment that would call into question its conclusion of SMALL for any of the seven terrestrial resource issues identified in Table 4-7. Accordingly, the NRC staff did not revise the SEIS as a result of this comment.*

**Comment 004-4-Greenhouse Gas Emissions and Climate Change:** On December 18, 2014, the Council on Environmental Quality released revised draft guidance for public comment that describes how Federal departments and agencies should consider the effects of greenhouse gas (GHG) emissions and climate change in their NEPA reviews. The revised draft guidance supersedes the draft GHG and climate change guidance released by CEQ in February 2010. This guidance explains that agencies should consider both the potential effects of a proposed action on climate change, as indicated by its estimated GHG emissions, and the implications of climate change for the environmental effects of a proposed action.

Section 4.15.3 details potential GHG emissions and impacts related to climate change, concluding that GHG emissions would be lower for activities associated with license renewal than for fossil-fuel based energy production, as analyzed in the Draft Supplemental EIS.

**Recommendation:** We recommend that the Final Supplemental EIS examine opportunities to minimize GHG emissions associated with operation of the facility to the extent feasible during the license renewal period. For example, clean energy options, such as energy efficiency and renewable energy, can be considered in the purchase of maintenance equipment, new equipment and vehicles. See also, EPA's diesel emission reduction strategies, below, for options to consider. In addition, EPA recommends that the applicant consider the need to develop adaptation measures to address impacts from climate change on the facility, such as increased intensity and frequency of storm and flood events.

**Response:** *The commenter recommends that the SEIS (1) examine energy efficiency and renewable energy in the purchase of maintenance equipment and vehicles to minimize GHG emissions during the license renewal period and (2) address climate change adaptation measures to address impacts from climate change on the facility.*

*Opportunities to minimize GHG emissions associated with operation of the facility during the license renewal period were not examined in the SEIS for the following reasons. Section 4.15.3 of the SEIS identifies that annual GHG emissions from continued operation from Byron are several orders of magnitude lower than GHG emissions from the IGCC, NGCC, Combination, and Purchased Power Alternatives. GHG emissions from Byron are below EPA's threshold of 25,000 metric tons of carbon dioxide equivalents (CO<sub>2</sub>e), which requires facilities to report GHG emissions to the EPA annually in accordance with 40 CFR Part 98. Furthermore, GHG emissions from Byron are minor relative to various GHG inventories presented in Section 4.16.11. Section 4.16.11 concludes that the incremental impacts from the contribution of GHG emissions from continued operation of Byron on climate change would be SMALL.*

*Additionally, the NRC staff did not examine potential mitigation strategies to reduce GHG emissions since the licensee, not the NRC, is responsible for the purchase of maintenance equipment and vehicles. Based on its limited statutory authority under the Atomic Energy Act,*

*NRC cannot impose measures or standards on its nuclear power plant licensees that are not related to public health and safety from radiological hazards or common defense and security, such as clean energy options of maintenance equipment and vehicles. Nevertheless, licensees are required to comply with all applicable Federal, State, and local permit requirements relevant to their activities. Byron operates combustion sources in accordance with the Federally Enforceable State Operating Permit issued by the IEPA.*

*Climate change impacts on the facility and adaptation measures of the facility are considered out of scope for the environmental review, which documents the impacts of continued operation on the environment (not on the facility), and were not evaluated in the development of this SEIS. The NRC staff evaluates nuclear plant operating conditions and physical infrastructure to ensure continued safe operations through its ongoing inspection and oversight process throughout the license term or a renewed term. Operating nuclear power plants are located in consideration of site-specific environmental conditions. This siting analysis included consideration of meteorologic and hydrologic siting criteria set forth in 10 CFR 100, as applicable, and Byron was designed and constructed in accordance with 10 CFR Part 50, Appendix A, General Design Criteria (GDC). These regulations require that plant structures, systems, and components important to safety be designed to withstand the effects of natural phenomena such as flooding from severe storms, without loss of capability to perform safety functions. Furthermore, plants are required to operate within NRC-issued operating license technical specifications which ensure that plants operate safely at all times. Technical specifications and operating procedures exist to ensure safe operation of the facility. Any proposed change in operating conditions contrary to operating license and technical specifications requires the NRC to conduct safety reviews of the proposed change prior to the licensee implementing the change. Based on the discussion above, the NRC staff did not make changes to the SEIS text as a result of this comment.*

**Comment 004-5-Air Quality and Noise:** The Draft Supplemental EIS concludes that the new build alternatives would result in any range of SMALL to LARGE impacts, based on both construction and operation impacts to air quality. EPA agrees with this methodology and conclusion; however, we recommend location be incorporated in that conclusion. We note that a new build alternative could result in siting of a facility in an area with existing air quality concerns, such as non-attainment or maintenance status with the National Ambient Air Quality Standards (NAAQS) criteria pollutants.

**Recommendation:** The Final Supplemental EIS should clarify that based on the location of the alternative (excluding the preferred alternative of license renewal), the new build alternatives could have greater than SMALL impacts based on their locations. Siting could result in selection of alternatives that have existing air quality concerns, such as non-attainment or maintenance of NAAQS criteria pollutants. This is inclusive of the magnitude of construction-related air quality impacts.

While EPA recognizes that Ogle County is an attainment area for all criteria pollutants, we expect construction equipment used during refurbishment and other onsite activities to emit diesel emissions. The National Institute for Occupational Safety and Health (NIOSH) has determined that diesel exhaust is a potential occupational carcinogen, based on a combination of chemical, genotoxicity, and carcinogenicity data. In addition, acute exposures to diesel exhaust have been linked to health problems such as eye and nose irritation, headaches, nausea, asthma, and other respiratory system issues.



**Recommendations:** Although every construction site is unique, common actions can reduce exposure to diesel exhaust. EPA recommends that the applicant commit to the following actions during construction in the Final Supplemental EIS:

- Using low-sulfur diesel fuel (15 parts per million sulfur maximum) in construction vehicles and equipment.
- Retrofitting engines with an exhaust filtration device to capture diesel particulate matter before it enters the construction site.
- Positioning the exhaust pipe so that diesel fumes are directed away from the operator and nearby workers, thereby reducing the fume concentration to which personnel are exposed.
- Using catalytic converters to reduce carbon monoxide, aldehydes, and hydrocarbons in diesel fumes. These devices must be used with low sulfur fuels.
- Ventilating wherever diesel equipment operates indoors. Roof vents, open doors and windows, roof fans, or other mechanical systems help move fresh air through work areas. As buildings under construction are gradually enclosed, remember that fumes from diesel equipment operating indoors can build up to dangerous levels without adequate ventilation.
- Attaching a hose to the tailpipe of diesel vehicles running indoors and exhaust the fumes outside, where they cannot re-enter the workplace. Inspect hoses regularly for defects and damage.
- Using enclosed, climate-controlled cabs pressurized and equipped with high efficiency particulate air (HEPA) filters to reduce the operators' exposure to diesel fumes. Pressurization ensures that air moves from inside to outside. HEPA filters ensure that any incoming air is filtered first.
- Regularly maintaining diesel engines, which is essential to keep exhaust emissions low. Follow the manufacturer's recommended maintenance schedule and procedures. Smoke color can signal the need for maintenance. For example, blue/black smoke indicates that an engine requires servicing or tuning.
- Reducing exposure through work practices and training, such as turning off engines when vehicles are stopped for more than a few minutes, training diesel-equipment operators to perform routine inspection, and maintaining filtration devices.
- Purchasing new vehicles that are equipped with the most advanced emission control systems available.
- Using electric starting aids such as block heaters with older vehicles to warm the engine reduces diesel emissions.
- Using respirators, which are only an interim measure to control exposure to diesel emissions. In most cases, an N95 respirator is adequate. Workers must be trained and fit-tested before they wear respirators. Depending on work being conducted, and if oil is present, concentrations of particulates present will determine the efficiency and type of mask and respirator. Personnel familiar with the selection, care, and use of respirators

must perform the fit testing. Respirators must bear a NIOSH approval number. Paper masks or surgical masks should never be used without NIOSH approval numbers.

**Response:** *The commenter recommends that the impacts from construction and operation on air quality from the new build alternatives in the SEIS clarify why a range of impacts is concluded. Furthermore, the commenter recommends that the applicant commit to specific actions to minimize diesel emissions during refurbishment activities.*

*The NRC staff would like to clarify as provided in Table 2–2 of the SEIS that the impacts for air quality ranged from SMALL to MODERATE (not SMALL to LARGE). Specifically, the SEIS concludes that the combination alternative and purchased power alternative have an air quality impact conclusion of SMALL to MODERATE and agrees with the comment that additional clarification is needed discussing why a range of impacts was concluded. Sections 4.3.6.1 and 4.3.7.1 of the SEIS have been revised to address why a range of impacts is concluded for the combination and purchased power alternative.*

*Based on its limited statutory authority under the Atomic Energy Act, the NRC cannot impose mitigation measures or standards on its nuclear power plant licensees that are not related to public health and safety from radiological hazards or common defense and security. Nonetheless, Section 4.16.1 of the SEIS addresses the potential impacts on air quality from refurbishment. As discussed in Section 4.16.1, emissions from refurbishment activities will be temporary and are expected to be minor.*

*In response to this comment, the NRC staff added language to Section 4.16.1 restating that licensees are required to comply with all applicable Federal, State, and local permit requirements and mitigation action related to their activities.*

**Comment 004-6-General:** EPA continues to recommend metrics or thresholds be included in Supplemental EISs so that differences among SMALL, MODERATE, and LARGE can be better understood; EPA is particularly interested when impacts are assigned a range (such as SMALL to MODERATE, see Table 2-2 on pages 2-26 and 2-27 for examples), what magnitude of impact or metric would move an impact from SMALL to MODERATE, and whether mitigation could be a factor to assigning a lower impact category. Without such objective thresholds or metrics, relative risks cannot be understood among the alternatives. For example, impacts to land use or visual resources from the integrated gasification combined cycle (IGCC), natural gas combined cycle (NGCC), or combined alternative (NGCC, wind, and solar) could have SMALL to MODERATE or SMALL to LARGE impacts. There is little indication of how impacts move from one impact category to the next.

**Recommendation:** The Final Supplemental EIS should include an explanation of the threshold or metric at which an impact will increase from SMALL to MODERATE to LARGE, and whether mitigation is a factor in assigning a lower impact or range of impact categories.

**Response:** *This comment recommends providing a better explanation of thresholds or metrics at which an impact will increase from SMALL TO MODERATE and MODERATE TO LARGE and to indicate whether mitigation is a factor in assigning a lower impact level. Impacts to resources affected by license renewal and the various alternatives are defined in GEIS Section 1.5.2.3, “Determining Significance Levels for Issues.” The GEIS established a standard of significance for each license renewal environmental impact issue based on the Council on Environmental Quality (CEQ) terminology for “significantly” (see 40 CFR 1508.27). Since the*

significance and severity of an impact can vary with the setting of the proposed action, both “context” and “intensity,” as defined in CEQ regulations 40 CFR 1508.27, were considered. Context is the geographic, biophysical, and social context in which the effects will occur. In the case of license renewal, the context is the environment surrounding the nuclear power plant and intensity refers to the severity of the impact in whatever context it occurs. Based on this, the NRC established three levels of significance for potential impacts:

- **SMALL**—environmental effects are not detectable or are so minor that they will neither destabilize nor noticeably alter any important attribute of the resource. For the purposes of assessing radiological impacts, the Commission has concluded that those impacts that do not exceed permissible levels in the Commission’s regulations are considered **SMALL**.
- **MODERATE**—environmental effects are sufficient to alter noticeably, but not to destabilize, important attributes of the resource.
- **LARGE**—environmental effects are clearly noticeable and are sufficient to destabilize important attributes of the resource.

These definitions are reiterated in Section 1.4 of this SEIS, “Generic Environmental Impact Statement.” Section 1.4 includes definitions for the three key words:

- **Significance** indicates the importance of likely environmental impacts and is determined by considering two variables: **context** and **intensity**.
- **Context** is the geographic, biophysical, and social context in which the effects will occur.
- **Intensity** refers to the severity of the impact, in whatever context it occurs.

As explained in Section 1.5 of the GEIS and Section 1.4 of this SEIS, the NRC staff uses the above definitions in its evaluations of the impacts associated with the various alternatives. Ranges are provided when there are multiple options and multiple unknowns associated with the alternatives. For example, the potential impact on the land use resource as a result of the IGCC will vary greatly depending upon the location selected for the new IGCC facility. As explained in Chapter 4, the impacts would range from **SMALL** to **MODERATE** based on such factors as: the location chosen, the historical use of the location, and the amount of previously undisturbed land impacted by the construction and operation of the new facility. There are too many unknowns to better describe the range and transition from **SMALL** to **MODERATE**.

Mitigation was not a factor in determining the potential impacts of the various alternatives. Based on its limited statutory authority under the Atomic Energy Act, NRC cannot impose measures or standards on its nuclear power plant licensees that are not related to public health and safety from radiological hazards or common defense and security. In addition, the NRC staff cannot anticipate mitigation measures because there are too many variables. Again, in considering the potential impact on the land use resource as a result of the IGCC, the location of the new IGCC site cannot be predicted and, therefore, the NRC staff cannot anticipate mitigation measures that might be required by local, State, and Federal requirements associated with the construction and operation of the IGCC facility.

In summary, the NRC staff has defined the thresholds for environmental impacts on resource areas in the GEIS and reiterates these thresholds in Chapter 1 of this SEIS. More specifics regarding the range of impacts associated with many of the alternatives cannot be better defined unless more specifics were available for each alternative.

*Based on the discussion above, the NRC staff did not make changes to the SEIS text as a result of this comment.*

**Comment 004-7-Waste Management and Pollution Prevention:** EPA has identified several locations where inclusion of additional citations would improve clarity and understanding of regulatory limits. EPA is particularly interested in the sections on *Radioactive Liquid Waste Management* and *Radioactive Gaseous Waste Management*. For each of these sections, EPA recommends including 40 CFR 141, 40 CFR 142, and 40 CFR 190. In addition to Federal regulations, EPA also recommends referencing any applicable State regulatory citations.

**Recommendation:** EPA recommends the Final Supplemental EIS include the above-mentioned citations.

**Response:** *This comment recommends adding specific references as listed above. The discussion in Section 3.1.4 of Byron's radioactive gaseous and liquid waste management systems includes a discussion of the doses to members of the public from Byron's radioactive effluents compared to the dose limits in NRC regulations and EPA's 40 CFR Part 190. EPA's regulations 40\ CFR Parts 141 and 142 address drinking water regulations applicable to public water systems and the implementation and enforcement of those regulations. The NRC staff does not agree that the discussion of EPA's drinking water regulations is applicable to the discussion of Byron's radioactive waste management systems.*

*Under the Atomic Energy Act of 1954, as amended, the NRC is authorized to regulate radioactive effluents released into the environment from commercial nuclear power plants. However, there are numerous environmental issues discussed in other sections of the SEIS that specifically use state regulatory criteria as part of their assessment. These include, but are not limited to, the following issues: alternative power sources, air quality, nonradioactive waste discharges, water resources, water quality, groundwater quality, State-listed vegetation and mammal species, historic and cultural resources, and socioeconomics.*

*Based on the discussion above, the NRC staff did not make any changes in the SEIS text as a result of this comment.*