

**REQUESTS FOR ADDITIONAL INFORMATION ON THE
TRISO-X, LLC, ENVIRONMENTAL REPORT AND APPLICATION
FOR A PROPOSED FUEL FABRICATION FACILITY**

PART 2-1

The purpose of these Part 2 requests for additional information (RAIs) presented below is to obtain additional data and information from TRISO-X, LLC (TRISO-X), for the U.S. Nuclear Regulatory Commission (NRC) staff to complete the environmental review and Environmental Impact Statement (EIS) in support of the NRC's evaluation of the TRISO-X license application to construct, operate, and decommission a Fuel Fabrication Facility (FFF) in Oak Ridge, Tennessee, to manufacture high-assay low-enriched uranium fuel (HALEU) up to 19.75 percent weight Uranium-235. The FFF would produce TRistructural ISOtropic (TRISO) uranium fuel for use in both existing and advanced commercial nuclear reactors. The fuel is designed to seal uranium particles in a protective coating that resists meltdowns and prevents release of fission products (TRISO-X, 2022a). The TRISO-X license application included an Environmental Report (ER) (TRISO-X, 2022a), and these RAIs were developed by the NRC staff based on its ongoing review of the ER and other documentation independently obtained by the staff. The NRC's EIS is being prepared to fulfill the requirements of the *National Environmental Policy Act of 1969*, as amended (NEPA), and the NRC's NEPA implementing regulations in Title 10 of the *Code of Federal Regulations* (CFR) Part 51. The staff used the guidance in NUREG-1748, *Environmental Review Guidance for Licensing Actions Associated with NMSS Programs*, for its review of the application.

The Part 2 RAIs or observations are presented in the following categories:

- Introduction (INT)
- Proposed Action (PA)
- Alternatives (ALT)
- Land Use (LU)
- Meteorology and Air Quality (AIR)
- Geological and Soils (GS)
- Public and Occupational Health and Safety (POH)
- Transportation (TR)
- Accident Impacts (ACC)

PART 2 - 1 REQUESTS FOR ADDITIONAL INFORMATION

Introduction – Applicable Regulatory Requirements, Permits, and Required Consultations

RAI2-1 ER-INT-1

Provide an assessment of whether a Department of Energy (DOE) Excavation/Penetration Permit (EPP) would be required prior to initiating construction at the Horizon Center Site (HCS). Additionally, provide revised and updated versions of tables 1.4-1, “Permits and Approvals Required for Construction and Operation,” and 1.4-2 “Consultations Required,” including the status of the EPP permit application, should it be required.

During the public scoping process, the Tennessee Department of Environment and Conservation (TDEC) commented that coordination with the DOE’s EPP program may be required for development of the HCS, since the EPP program is in place for many sites in the vicinity of the HCS as a land use control for excavations at a depth greater than two feet below ground surface. Revised and updated versions of tables 1.4-1 and 1.4-2 are necessary to provide the most up-to-date status of required permits and consultations in the draft EIS.

RAI2-1 ER-INT-2

Provide a detailed description of the pre-construction activities TRISO-X LLC (TRISO-X) has completed to-date at the HCS and any further pre-construction activities that TRISO-X anticipates completing at the HCS in 2023 through 2024.

Up-to-date Information regarding TRISO-X’s pre-construction activities at the HCS is required to accurately describe the current disposition of the HCS when describing the potential environmental impacts the project may have on the site.

Proposed Action

RAI2-1 ER-PA-1

Provide a description of the existing utilities in the vicinity of the FFF site and what would be required to extend them to the site to provide service to the FFF including any potential impacts on the surrounding environment. Additionally, discuss whether hazards associated with natural gas explosions have been assessed for the FFF, including engineered and administrative controls to prevent or mitigate such natural gas hazards.

Section 2.1.2.1.1 of the ER, “Facility Description,” TRISO-X discusses municipal water supply, sanitary sewer, natural gas, and overhead electrical transmission lines that would service the TRISO-X fuel fabrication facility (FFF) as though the FFF is already constructed, and the lines are already in place. The ER does not describe whether these lines are currently in place or would need to be constructed/extended to reach the FFF site. If new lines would be required, provide a discussion of the associated impacts on the existing environment that would occur as a result of the construction.

Alternatives

RAI2-1 ER-ALT-1

Provide a description of the rationales for the rankings of the five candidate alternative FFF site locations “based on the further evaluation results,” as described in section 2.2.1 of the ER, and why the HCS was selected as the preferred alternative if the Centrus American Centrifuge Plant (ACP) site in Piketon, Ohio was ranked higher in the TRISO-X assessment.

A more detailed explanation of the alternative site assessment process is required to sufficiently describe the process in the EIS. In Section 2.2.1 of the ER, “Facility Location,” TRISO-X discusses the site study performed to evaluate potentially suitable sites for the siting of the FFF. The ER notes that the five candidate sites that were selected based on the Electric Power and Research Institute (EPRI) Siting Guide were subsequently examined in more detail and ranked from highest to lowest based on further evaluation results. However, the ER does not specify what specific parameters of each site led to their respective placements in the 1 to 5 ranking or provide a rationale as to why the HCS was chosen as the preferred alternative if the Centrus ACP, site in Piketon, Ohio was ranked higher.

Land Use

RAI2-1 ER-LU-1

Provide a rationale for TRISO-X’s use of a 5.38-mile radius land use study area and explain the land use resource area limits.

Section 3.1.2 of the ER, “Region,” defines the region in which the FFF is located as the area within a 5.38-mile (8.66-kilometer) radius. However, the ER does not provide a rationale for choosing the specific 5.38-mile radius and nor does it describe the boundary of the land use resource.

This is required under 10 CFR 51.45. Staff developed this RAI with consideration of NUREG-1748 Section 5.4.1. An applicant is encouraged, but not required to use the NUREG-1748 when preparing a response. The procedures in NUREG-1748 represent one method to demonstrate compliance with requirements established by legislation and regulations.

Meteorology and Air Quality

RAI2-1 ER-AIR-1

Provide estimates of CO₂e emissions in metric tons per year for peak years for each phase of the project (construction, operation, transportation of radiological and non-radiological materials, and decommissioning). Compare the estimated emissions to the EPA established thresholds for greenhouse gas emissions in the Tailoring Rule and assess impacts and compare the project’s estimated emissions of CO₂e by each phase to projected greenhouse gas emissions in Tennessee and the United States. Suggested

guidance can be found in NRC’s “Interim Staff Guidance on Environmental Issues Associated with New Reactors,” COL/ESP-ISG-026.

The requested information is required to enable NRC staff to evaluate greenhouse gas (GHG) emissions and climate change impacts in the EIS following the guidance provided in COL/ESP-ISG-026.

Geology and Soils

RAI2-1 ER-GS-1

Provide a revised version of figure 3.3.3-1, “Geologic Map in the Vicinity of the Horizon Center Site,” from the ER that includes the geology west of the proposed FFF Site near the west outfall.

ER figure 3.3.3-1, “Geologic Map in the Vicinity of the Horizon Center Site,” does not show the geology on the west side of the proposed FFF Site. Therefore, the Elverton Quadrangle Geology map is not shown. A complete picture of the geology at the FFF Site and vicinity is germane to effectively evaluating stratigraphic and geologic conditions.

This is required under 10 CFR 51.45. Staff developed this RAI with consideration of NUREG-1748 Section 5.4.3. An applicant is encouraged, but not required to use the NUREG-1748 when preparing a response. The procedures in NUREG-1748 represent one method to demonstrate compliance with requirements established by legislation and regulations.

RAI2-1 ER-GS-2

Provide a supplemental figure to figure 3.3.3-2, “Physiography in the Vicinity of the Horizon Center Site,” from the ER that includes the site boundary and current USGS topographic mapping details for the proposed FFF Site and vicinity.

The scale within ER Figure 3.3.3-2, “Physiography in the Vicinity of the Horizon Center Site,” does is not a large enough for the NRC staff to effectively evaluate of pertinent topographic features in and around the site. For example, it is not clear whether USGS topographic mapping is illustrated on the figure.

This is required under 10 CFR 51.45. Staff developed this RAI with consideration of NUREG-1748 Section 5.4.3. An applicant is encouraged, but not required to use the NUREG-1748 when preparing a response. The procedures in NUREG-1748 represent one method to demonstrate compliance with requirements established by legislation and regulations.

Public and Occupational Health and Safety

RAI2-1 ER-POH-1

Provide a map and description of the monitoring locations and methods that would be used to monitoring gaseous effluents to validate compliance with the As Low as Reasonably Achievable (ALARA) goal or 10 millirem per year (mrem/yr) at the restricted area boundary.

TRISO-X has committed in its application to limiting radiation dose to a member of the public at the restricted area boundary by monitoring gaseous effluents prior to discharge and calculating the dose at the restricted area boundary. Because the effluents are released from elevated release points, the restricted area boundary for the purpose of compliance is at the effective release height (i.e., 100 feet). In order to provide accurate reports as required by 10 CFR 70.59, monitoring programs must be designed to provide an independent check of the environmental concentrations to validate that the environmental concentrations are consistent with the calculations.

The ER explains how compliance with radiological effluent controls will be demonstrated with stack monitoring. The ER does not indicate how TRISO-X plans to provide an independent check of the environmental concentrations to satisfy 10 CFR 20 requirements for radiological environmental monitoring. The routine gaseous effluents and some potential accident-related effluents are planned to be released at a 100-foot elevation. Ground level monitoring at the restricted area boundary does not provide representative sampling of environmental concentrations at the location of the maximum exposed individual, and therefore, cannot provide an independent check of environmental concentrations.”

Transportation

RAI2-1 ER-TR-1

Provide a description of the traffic study that TRISO-X is conducting as required by the City of Oak Ridge and what results and recommendations might come from the study that TRISO-X would be required to follow.

Section 3.2.2 of the ER, “Transportation Routes,” discusses TRISO-X’s assessment of transportation routes associated with the FFF. Within this section TRISO-X notes they are conducting a traffic study for the project, as required by the City of Oak Ridge. The ER further notes that TRISO-X would abide by the results and any recommendations from the City of Oak Ridge governing body. However, the ER does not discuss what the traffic study would entail, what type of activities the City of Oak Ridge may recommend, and whether TRISO-X would be required to abide by the recommendations, and if so, how that could change the potential impacts from the proposed project.

Accident Impacts

RAI2-1 ER-ACC-1

Provide concise summary with the results for high or intermediate consequence radiological and chemical accidents. The information should include results for unmitigated and mitigated total effective dose equivalent (TEDE) doses (in rems) and chemical concentrations (mg/cc and soluble U in mg) at the following locations: site boundary, the Maximally Exposed Offsite Individual (MEOI) location, and the location of maximum concentration for the effective release height of the proposed facility (e. g., 100-foot stack plus plume rise). Results should be provided for releases at both ground level and the elevated release, according to the accident scenario. Comparison to the dose consequences (TEDEs) and CHEMs (acute exposure guideline levels [AEGL], emergency response planning guidelines [ERPG], or temporary emergency exposure levels [TEEL]) consequences to the Public/Environment and Worker presented in accordance with 10 CFR 70.61 (“Radiological and Chemical Consequence Exposure Levels”) should also be provided. Additionally, for the mitigated results, provide the associated preventative and mitigative controls (items relied on for safety [IROFS]) that were credited to reduce either the frequency or the consequence of each design basis accident (DBA).

Section 4.12.2.3 of the ER, “Environmental Effects of Accidents,” provides a limited description of the environmental impacts associated with postulated (or design basis) radiological and hazardous chemical accidents that might occur at the proposed TRISO-X FFF and lacks specificity of credited controls and design detail for IROFS that would be implemented to prevent or mitigate such accidents.

This information is required under 10 CFR 70.61 and 10 CFR 51.45 and is needed by staff to make an environmental impact determination.

REFERENCES

10 CFR Part 51. *Code of Federal Regulations*, Title 10, Energy, Part 51, "Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions."

City of Oak Ridge Municipal Code 14-505. Stormwater system design: construction and permanent stormwater management. (1) MS4 stormwater design or BMP manuals, (a) Adoption. (ii) TDEC Manual for Permanent Stormwater Management and Design Guidance manual, December 2014.

City of Oak Ridge Municipal Code 14-505 (5) Development near karst features.

City of Oak Ridge Municipal Code CHAPTER 5 STORMWATER MANAGEMENT.

City Of Oak Ridge Stormwater Management Program MS4 Stormwater Design Manual, Section 2, Item 4) Presence of sinkholes or other karst features on the site or in close proximity.

NRC (U.S. Nuclear Regulatory Commission). 2021. "*Guidance for Electronic Submissions to the NRC.*" ADAMS Accession No. ML13031A056. Washington, DC: U.S. Nuclear Regulatory Commission.

NRC. 2022. Letter from M.A. Bartlett to J.K. Wheeler TRISO-X, LLC, dated August 9, 2022, regarding "Request for Supplemental Information for the Acceptance Review of the License Application for a Fuel Fabrication Facility (Docket Number: 70-7027)." Washington, D.C. ADAMS Package Accession No. ML22166A042. NRC. 2021. "*Guidance for Electronic Submissions to the NRC.*" (ADAMS ML13031A056. Washington, DC: U.S. Nuclear Regulatory Commission.

NRC. NUREG-1748, "Environmental Review Guidance for Licensing Actions Associated With NMSS Programs." ADAMS Accession No. ML032450279. Washington, DC: U.S. Nuclear Regulatory Commission. 2003.

TDEC (Tennessee Department of Environmental and Conservation). 2014. "*Tennessee Permanent Stormwater Management and Design Guidance Manual.*" First Edition. Prepared by Tennessee Department of Environment and Conservation, Division of Water Resources; University of Tennessee, Department of Biosystems Engineering and Soil Science; Tennessee Water Resources Research Center; and Stormwater Management, Assistance, Research and Training (SMART) Center. December 2014.

TRISO-X, LLC. 2022a. "*Environmental Report Submittal for the TRISO-X Fuel Fabrication Facility.*" TRISO-X, LLC, Rockville, MD.

TRISO-X, LLC. 2022b. "*Notice of Intent (NOI) For General NPDES Permit For Stormwater Discharges From Construction Activities (TNR100000) and associated Stormwater Pollution Prevention Plan (SWPPP) for the TRISO-X Fuel Fabrication Facility.*" August 21, 2022.

TRISO-X, LLC. 2023. Response to Requests for Additional Information on the TRISO-X, LLC, Environmental Report for the Proposed Fuel Fabrication Facility. April 14, 2023.