

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

PART 2 – 2

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 special nuclear material license application to be used at 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 TRISO-X license application included an Environmental Report (ER), 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 -2 RAIs are related to the groundwater resource area.

Groundwater Resources

RAI2-2 ER-GW-1

Provide additional documentation and discussion regarding TRISO-X's proposed permanent stormwater management practices for the fuel fabrication facility (FFF) regarding increased stormwater discharge and the potential need for an Underground Injection Control Permit.

The U.S. Nuclear Regulatory Commission (NRC) staff's review of the TRISO-X Stormwater Pollution Protection Plan (SWPPP) (TRISO-X, 2022b) and environmental report (ER) (TRISO-X, 2022a) documentation finds that stormwater runoff discharge volume would be permanently increased by the proposed action and may discharge to a potential sinkhole located adjacent to the facility. Increased stormwater runoff volume (not peak flow rate) discharges to a sinkhole may be subject to permitting under the Tennessee Department of Environment and Conservation (TDEC) Underground Injection Control (UIC) program. Section B.4.3 Underground Injection Control Permits of the Tennessee Permanent Stormwater Management and Design Guidance Manual (TDEC 2014) states that "The act of directing increased stormwater runoff from developed land into a sinkhole or other karst feature constitutes a 'modification' and as such, becomes a de facto improved sinkhole requiring a Class V UIC permit. This is even true if the improved sinkhole is downstream of stormwater treatment practices, either on site or off-site." Additionally, local municipal code (Oak Ridge Municipal Code 14-505 (5) (e) and TDEC 2014) identify requirements for when site modifications increase stormwater runoff to sinkholes located either on or near the proposed development.

Enclosure

The applicant notes that the general National Pollutant Discharge Elimination System (NPDES) construction permit Notice of Intent (NOI) application and SWPPP, with no references to karst, sinkholes, karst swales, disappearing streams, or similar nomenclature, were approved by both the City of Oak Ridge and TDEC. Although not identified, in figure 1, Site Location Map from the TRISO-X SWPPP, closed-depression hatching used to denote sinkholes is visible (TRISO-X, 2022b) which may indicate that one is there. Similarly, figure 3 Surface Drainage Near the Horizon Center Site, does not identify the disappearing stream or karst swale crossing the FFF site (TRISO-X, 2022a).

Please provide all correspondence with TDEC regarding verification of the need for or lack thereof for an underground injection control permit given the presence of on and near site karst features when coupled with the increased storm water discharge from the proposed action into a karst feature. If a UIC permit is needed, provide a schedule and path forward for obtaining the UIC permit.

RAI2-2 ER-GW-2

Clarify the discrepancy between the ER text and the request for additional information (RAI) response regarding the volume of storm water that will be discharged into West Outlet outfall.

The previous RAI response (TRISO-X, 2023) states that the above mentioned requirements are not applicable as there are no increases in stormwater volume discharges to the sinkhole. However, while the applicant's SWPPP does demonstrate that post-construction stormwater peak flow rates would be managed by the proposed permanent stormwater management practices, the SWPPP also states that runoff volumes will be increased to the West Outlet outfall (Section 2.4, "Stormwater Calculations of the SWPPP," page 3). SWPPP appendix D notes that impervious surface in the West Outlet outfall drainage area would be increased by an additional 30.4 acres (25.5 acres of Asphalt/Building and 4.9 acres of Detention Basin). Under such conditions, runoff volumes would be predicted to increase for any runoff-generating storm event. Furthermore, the SWPPP runoff volume calculations for the 100-year storm event identify an additional 697,962 cubic feet (5,221,104 gallons) of stormwater discharging through the West Outlet outfall which represents a 67 percent increase in post-construction stormwater runoff volume.

RAI2-2 ER-GW-3

Please confirm that the NPDES construction permit and SWPPP that were approved by the City of Oak Ridge and TDEC did not require a discussion and evaluation of onsite and in the vicinity of the site, karst features that have the potential to be impacted by the proposed project activities.

Based on the information presented in the ER Section 4.3 and research conducted by the NRC staff, karst features are present at the FFF site; however, the general NPDES construction permit coverage NOI application and SWPPP (TRISO-X, 2022b) do not identify or discuss the presence of karst features.

RAI2-2 ER-GW-4

Provide a discussion that demonstrates how karst conditions were accounted for in the proposed large stormwater detention basin design with respect to how the facility will mitigate against both developing subsurface karst features and an actual sinkhole development, should it occur. Additionally, provide a discussion on any proposed mitigation measures that may be required by the City of Oak Ridge or TDEC as well as any that would be included as part of the proposed action.

The proposed permanent stormwater best management practices (BMP) include a large, centralized stormwater basin with forebay, as presented in TRISO-X's Facility SWPPP. The stormwater infiltration/detention basin is proposed to manage stormwater from a 149.5-acre drainage area that will include at least 30 acres of additional impervious surface. As discussed in RAI2-2 ER-GW-1, the facility is located in karst terrain, with the proposed basin BMP being situated within the vicinity of a karst swale and disappearing stream.

Large, centralized stormwater management practices constructed in karst terrain (such as basins) are considered to represent an increased risk for future sinkhole development and collapse beneath the structure. Infiltration losses from the long-term operation of the proposed stormwater management basin could accelerate dissolution of subsurface carbonate rock, leading to potential environmental impacts. Given that the proposed activity could contribute to (or even exacerbate) future karst feature development, it is unclear whether the proposed stormwater management BMPs and structures were designed considering potential karst conditions.

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 Accession No. ML13031A056. Washington, DC: U.S. Nuclear Regulatory Commission.

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.