

TX0-REG-LTR-0035

*ELECTRONIC DELIVERY*

March 4, 2024

Director, Office of Nuclear Material Safety and Safeguards  
U. S. Nuclear Regulatory Commission  
ATTN: Document Control Desk  
Washington, DC 20555-0001

- References:
- 1) Docket No. 70-7027
  - 2) TRISO-X letter from Jennifer Wheeler to Director, Office of Nuclear Material Safety and Safeguards, "TRISO-X Fuel Fabrication Facility Environmental Report Submittal," dated September 23, 2022
  - 3) NRC letter from Jill Caverly, Acting Chief, Environmental Project Management Branch 2, to Jennifer Wheeler, Director, Regulatory Affairs "Request For Additional Information Part 2-2 for the Application from TRISO-X, LLC for Special Nuclear Material License for Use at a Fuel Fabrication Facility in Oak Ridge, Tennessee (Docket Number: 70-7027)," dated December 13, 2023
  - 4) Public Meeting Announcement for January 17, 2024, "TRISO-X Fuel Fabrication Facility Environmental Review – Requests for Additional Information," dated January 4, 2024
  - 5) Email from Jill Caverly to Jennifer Wheeler, "TRISO-X Environmental RAIs Part 2-2," dated January 9, 2024
  - 6) Memo from Jill Caverly, Project Manager, to Robert Sun, Chief, Environmental Project Management Branch 2, "Summary of Meeting on January 17, 2024, With TRISO-X, LLC, to Align on the TRISO-X Draft Environmental Impact Analysis Requests For Additional Information Part 2-2," dated January 25, 2024
  - 7) Email from Jennifer Wheeler to Jill Caverly, "TRISO-X FFF EIS ---Follow-up to public meeting on January 17 2024," dated February 22, 2024

Subject: **Response to Request for Additional Information Part 2-2 for the TRISO-X Environmental Report and License Application**

TRISO-X, LLC (TRISO-X) hereby submits responses to the subject Request for Additional Information (RAI) Part 2-2, regarding the review of the Environmental Report for the TRISO-X Fuel Fabrication Facility (Reference 2). The enclosed responses are for the RAI set transmitted by letter dated December 13, 2023 (Reference 3).

TRISO-X requested an RAI clarification meeting (Reference 4) and discussed a revised response date with NRC staff (Reference 5). Based on discussions with your staff during and after a meeting held January 17, 2024 (Reference 6), TRISO-X committed to providing a written response by March 5, 2024 (Reference 7).

**Requests for Withholding**

None. The enclosed submittal contains public information.

**Summary of this Submittal**

The following Enclosure and Attachment are included with this letter.

**Enclosure – RAI Part 2-2 Responses for the TRISO-X Environmental Report and License Application**

**Attachment – Correspondence from TDEC for Response to RAI 2-2 ER-GW-1**

If there are questions or if additional information is required, please contact me at (865) 850-0893 or [jwheeler@triso-x.com](mailto:jwheeler@triso-x.com).

Sincerely,



Jennifer K. Wheeler, P.E.  
Vice President, Regulatory Affairs

TRISO-X, LLC  
801 Thompson Avenue  
Rockville, MD 20852

Copy: Jill Caverly, US NRC  
TRISO-X Regulatory Records File

## Enclosure - RAI Part 2-2 Responses for the TRISO-X Environmental Report and License Application

### 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.

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.

#### **TRISO-X Response to RAI2-2 ER-GW-1**

The attachment to this enclosure provides correspondence from the Tennessee Department of Environment and Conservation (TDEC) which confirms the lack of a need for a Class V UIC permit.

Additional discussion of the broad swale that has characteristics similar to a 'karst swale' is provided in the response to Hydrology RAI-1, 'Karst Features' in Enclosure 2 to the letter dated November 8, 2023 (ADAMS Accession No. ML23312A338).

## **Enclosure - RAI Part 2-2 Responses for the TRISO-X Environmental Report and License Application**

### **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.

### **TRISO-X Response to RAI2-2 ER-GW-2**

Please see the response to Hydrology RAI-3, 'Volumetric Runoff Rate' in Enclosure 2 to the letter dated November 8, 2023 (ADAMS Accession No. ML23312A338).

### **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.

### **TRISO-X Response to RAI2-2 ER-GW-3**

The SWPPP follows the guidance of the Tennessee Erosion & Sediment Control Handbook (4<sup>th</sup> Ed., August 2012). Based on this guidance, a site description and supporting information narrative is required for the SWPPP, but a discussion of karst features on the site is not required.

## **Enclosure - RAI Part 2-2 Responses for the TRISO-X Environmental Report and License Application**

### **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.

### **TRISO-X Response to RAI2-2 ER-GW-4**

The TRISO-X site development will create impervious surfaces on the site from the buildings, equipment, and parking areas. In order to accommodate a stormwater management system that meets the City of Oak Ridge and TDEC requirements for Water Quality Volume (WQV) and the design basis 24-hour, 100-year recurrence interval rainfall event, a centralized stormwater detention basin with a forebay is the most feasible solution for the site. This stormwater management system accommodates detention of stormwater up to the design basis rainfall event and allows for a controlled release of flow to maintain discharge rates at or below pre-developed site conditions. Other stormwater BMPs that are considered best practices for only karst mitigation design are not practical given the quantity of stormwater from the design basis rainfall event.

In order to mitigate the potential for sinkhole development, the stormwater detention basin has an HDPE liner with clay backfill below the liner to prevent infiltration. Based on the preliminary geotechnical investigations of the site, there is expected to be at least six feet of native soil between the bottom of the basin excavation and the top of rock. The sediment basin will also be part of a periodic maintenance program that will inspect the basin and liner, clear debris and sediment, and maintain the stormwater basin in good working condition. The periodic basin and liner inspections will also be able to identify any subsidence which could indicate potential sinkhole formation below the basin, in the unlikely event that should occur.

## Burns Cunningham

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**From:** Joshua Frazier <Joshua.Frazier@tn.gov>  
**Sent:** Thursday, February 15, 2024 8:32 AM  
**To:** Burns Cunningham  
**Cc:** Valerie McFall; Shari Winburn  
**Subject:** RE: Question Regarding TRISO-X TNR136931

**Notice:** This email originated from outside of the organization. *Do not click links or open attachments unless you recognize the sender and know the content is safe.*

Burns,

Hope all is well. Your logic follows the criteria outlined in applicable rules and regulations. If clear separation and protection of the on-site feature is achieved, there is no need for a UIC permit.

Respectfully,



**Josh Frazier** | Environmental Consultant  
Division of Water Resources – Natural Resources  
Knoxville Environmental Field Office  
3711 Middlebrook Pike, Knoxville, TN 37921  
p. 865-364-9500  
[tn.gov/environment](http://tn.gov/environment)

Tell us how we're doing! Please take 5-10 minutes to complete [TDEC's Customer Service Survey](#)

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**From:** Burns Cunningham <rcunningham@triso-x.com>  
**Sent:** Wednesday, February 14, 2024 3:31 PM  
**To:** Joshua Frazier <Joshua.Frazier@tn.gov>  
**Subject:** [EXTERNAL] RE: Question Regarding TRISO-X TNR136931

**\*\*\* This is an EXTERNAL email. Please exercise caution. DO NOT open attachments or click links from unknown senders or unexpected email - STS-Security. \*\*\***

This is the email I was referring to.

Burns

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**From:** Burns Cunningham  
**Sent:** Monday, January 29, 2024 1:45 PM  
**To:** [joshua.frazier@TN.GOV](mailto:joshua.frazier@TN.GOV)  
**Subject:** Question Regarding TRISO-X TNR136931

Josh,

Our environmental reviewers at the NRC are still asking questions about the need for a Class V UIC permit. The NRC has requested that we provide correspondence with TDEC regarding the lack of a need for a UIC Class V permit given the presence of on-site and near-site karst features. This is referring to a karst swale (located on-site) and a sinkhole (located approximately 400 ft offsite from the west outfall). As we discussed by phone in November, a UIC permit is not required because we are not discharging directly into the off-site sinkhole. The west detention basin discharges to the same point as the existing natural drainage course (it is not released to the subsurface). This logic follows the TDEC screening guidance in G-DWR-UIC-01-120817.

Regarding the karst swale on-site, this feature is not being used as a discharge point and is not being used to discharge to the subsurface. The existing swale is being replaced with two perimeter drainage ditches that collect runoff and convey it to the detention system. In any event, this karst swale is not part of the screening process for a class V UIC permit presented in G-DWR-UIC-01-120817.

The NRC has agreed that email correspondence will be appropriate to respond to their question. So, if you agree with the above conclusions, please let me know and I can send a more formal email to document a response. Feel free to give me a call at the number below if you have any questions.

Thanks,



**Burns Cunningham**

Licensing Engineer

**Mobile:** 865.803.1352

[bcunningham@triso-x.com](mailto:bcunningham@triso-x.com)

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