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Title: LANL Flanged Tritium Waste Containers (FTWCs) Results of Independent Technical Review

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LANL Flanged Tritium Waste Containers (FTWCs)

Results of Independent Technical Review

August 20, 2025

Unclassified – LA-UR-25-28603

NMED Request for Supplemental Actions

- New Mexico Environment Department (NMED) requested the following supplemental actions be taken by LANL:
 - *Independent Technical Review. The Permittees shall obtain an independent, third-party technical review for alternative options for the depressurization of the FTWCs.*
 - *Public Meeting. The Permittees shall host a public meeting for interested stakeholders. The meeting must include a review of the independent, third-party technical review for alternative options; the preferred treatment process; and a discussion of the safety mechanisms and contingencies that will be utilized to ensure the protection of human health and the environment during operations.*
 - *Tribal Consultation. The Permittees shall host a tribal consultation with interested tribal governments related to the independent, third-party technical review for alternative options; the preferred treatment process; and a discussion of the safety mechanisms and contingencies that will be utilized to ensure the protection of human health, environment, and cultural practices.*
 - *Compliance Audit. The Permittees shall retain an independent third-party auditor to conduct a hazardous waste compliance audit of its operations.*

Independent Review Results

- An independent technical review was performed on the operation. The review concluded that the assumptions, design, and overall strategy for the operation were reasonable, met all regulatory requirements, and is the best technical solution for these containers.
- From the report:
 - *The Team recommends depressurizing the FTWCs at Area G followed by onsite transfer to WETF for processing and preparation for disposal. The Team concludes that this alternative is technically sound, well-understood, and poses no undue risk to the public, worker, or the environment.*

Overview

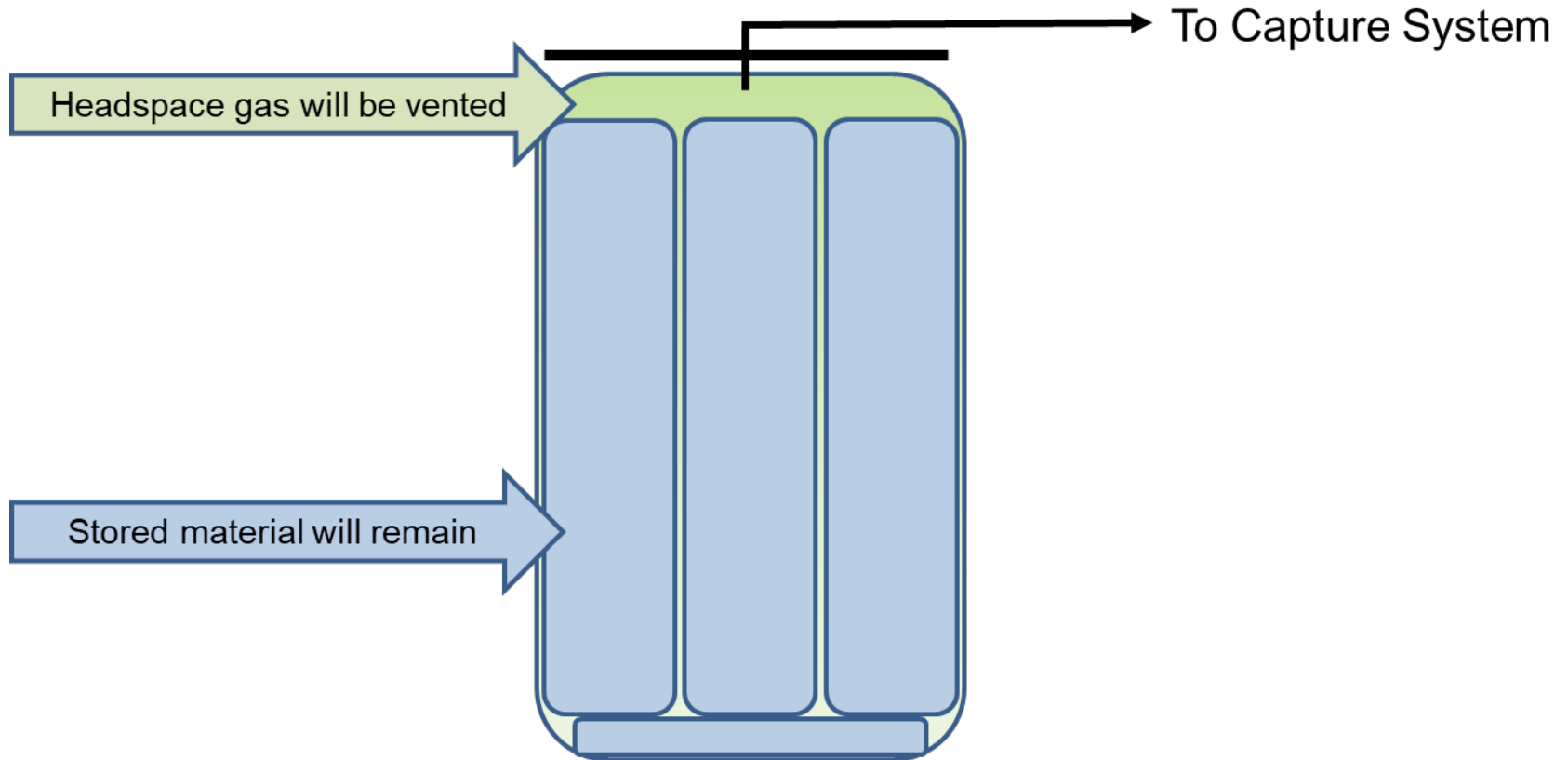
- LANL needs to perform pressure mitigation of the four Flanged Tritium Waste Containers (FTWC) stored at LANL TA-54 Area G to prepare the containers for safe processing, movement, and permanent disposal.
 - This is not an operation to intentionally vent tritium. The operation is designed to mitigate potentially flammable headspace gas – hydrogen and oxygen.
 - Stakeholder engagement, outreach, and collaboration has been extensive throughout all project phases, formally beginning in 2019.
 - Numerous alternatives were considered in the operational design, and included SME and regulator input and consultation.
 - All aspects of this operation have been specifically designed to prioritize the protection of our workers and the communities and people surrounding LANL.

Storage Location and Container

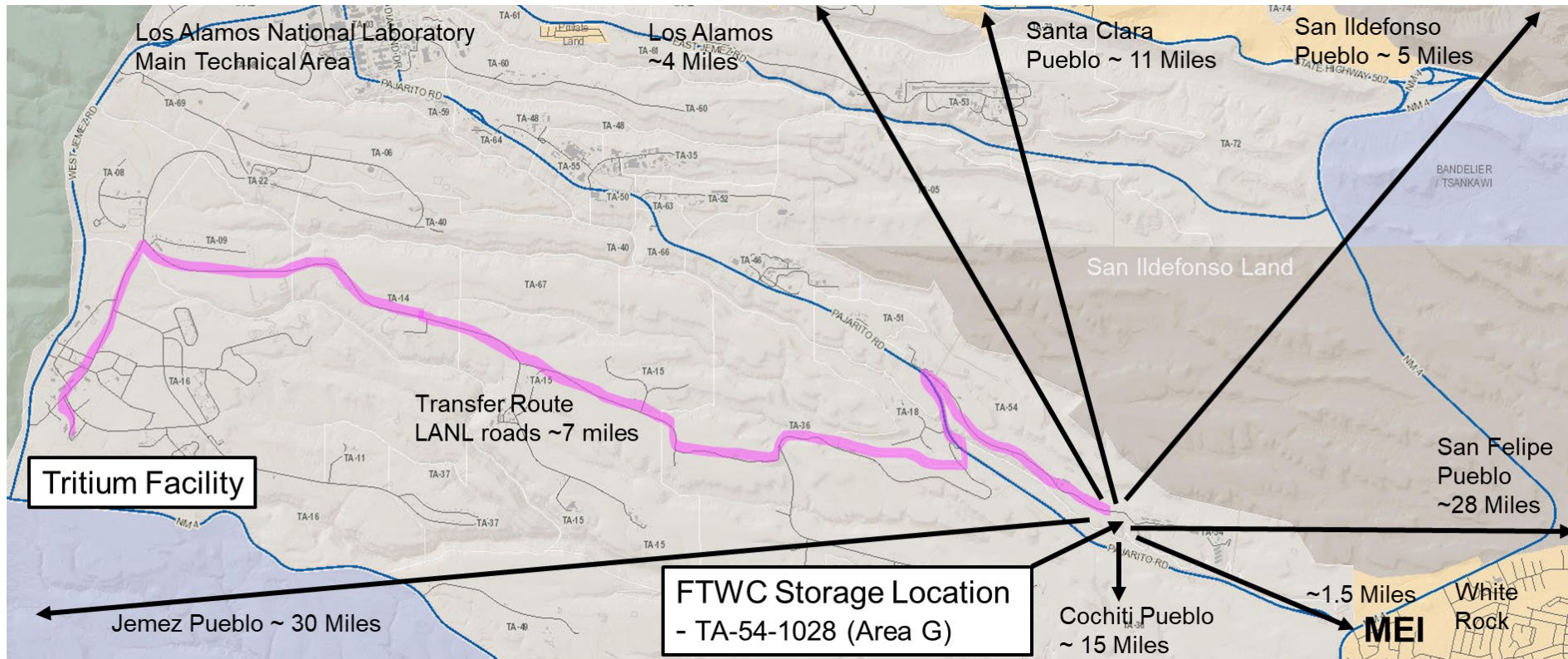


Area G FTWCs Briefing

Headspace Example



FTWCs Location



MEI –
Maximally
Exposed
Individual

ALARA Principles for Area G FTWCs (As Low As Reasonably Achievable)

- Modeling for offsite dose potential is extremely conservative, assuming multiple worst-case scenarios for both wind and gas composition, and is therefore protective of all people and the environment, including the most vulnerable populations.
- Only one drum is processed at a time to reduce the emissions potential.
- Emissions will be monitored in real time with multiple systems.
- Pause points are established throughout the operation to monitor potential releases. Dose calculations are modeled for a hypothetical person at the LANL site boundary and drops off rapidly with distance.
- After each day of operation, actual releases and potential doses based on actual wind conditions and emissions will be evaluated. The next day's pause and stop points will be recalculated based on those levels.
- Enhanced tritium monitoring at multiple downwind locations has been developed in conjunction with EPA Region 6 staff.

Area G FTWCs Briefing

Operational Sequence

Step 1 –
Unvented/Sealed
FTWC



FTWC

Step 2 – Install
Controlled
Venting Fixture
on FTWC



Controlled Venting Fixture

Step 3 – Connect
Controlled Venting
Fixture to Capture
System and Vent
FTWC



Capture System

Step 4 – Install
Pressure Monitor
Manifold Vent on
FTWC – Safe
Configuration



Pressure Manifold

Operational Requirements and Risks

- Approvals to Conduct the Operation
 - EPA R6 Rad-NESHAP Authorization per 40CFR61, Subpart H
 - NMED RCRA Temporary Authorization per LANL RCRA HWFP
 - DOE Readiness Review
- Atmospheric and Operational Conditions Required
 - Greater than 40°F (for instrumentation)
 - Worker safety considerations (ice, heat, wind, etc.)
 - ~12 days of field operations (one day per container to depressurize, one day per container to transport, plus set up and remobilization of monitoring equipment)

Conclusion

- The technology and equipment has been successfully and compliantly used for similar operations.
- Numerous alternatives were considered (including leaving in place, or moving without depressurization), and included SME and regulator input and consultation.
- Independent review concluded that the selected operation was appropriately designed to minimize the release of radiological material and protect people and the environment.
- Questions?