618-10 Vertical Pipe Unit Remediation

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Overview – 618-10 Burial Ground

- Operated from 1954 to 1963
- 500 x 600-ft., rectangle-oriented
- Approximately 5.2 acres, containing:
  - 12 trenches (irregular shape and size)
  - 94 vertical pipe units (VPUs)
VERTICAL PIPE UNIT (VPU) REMEDIATION PROCESS
VPU Baseline Remediation Approach: Install Over-Casing

- Drive Over-Casing Around VPU
- Over-Casing (28.3-ft long x 4-ft diameter)
- VPU Surrounded in Over-Casing with some Adjacent Soil

Vibratory Hammer

Over-Casing

Surrounding Soil

VPU
VPU Baseline Remediation Approach: In-Situ Size-Reduction and Stabilization (Augering)
Remediation Approach for VPUs Containing Suspect-Transuranic (TRU) Waste
Remediation Approach for Low-Level Waste: Conventional Remediation/Monolith
VPU Variants

- Historical photos
  (Drum, Corrugated, Schedule 40? & different sizes)
- Potholing to determine VPU type
VPU Method Testing

618-10 Mockup Area
Method Testing

• Installation of over-casings
• Size reduce simulated waste in drum and corrugated pipe-style VPU
• Operational test for auger enclosure
• Moisture addition for dust control
• Vertical mixing
Method Testing
Method Testing Results

Results were positive on verifying remediation process

- Over-casing installed to target depth (~28 ft.) with vibratory hammer
- Size reduced and mixed with soil, producing a consistent waste matrix
- No adverse operational issues identified for the auger tool enclosure
- Moisture content was consistent throughout the waste matrix
- Vertical mixing results showed a downward trend with majority of waste within the original placement area
Tracer Distribution

![Bar graph showing tracer distribution with post-augering and pre-augering data. The graph is labeled with the x-axis as Depth (ft) and the y-axis as Tracer Concentration (counts/ft^3). Peaks are observed at depths around 16 to 20 ft for both categories.](image)
Method Testing – Lessons Learned

• 618-10 site-specified geologic conditions differ from concept testing areas (sand vs Hanford gravels), resulting in increased compaction and limited void space to displace soils and allow penetration of the over-casings and auger.

• Over-casing: Larger vibratory hammer

• Auger/Drill rig: Combination of larger drill rig and optimization of auger design
618-10 VPU Remediation – Path Forward

- Optimize equipment (e.g., Drill Rig, Auger and Retrieval Options)
- Perform second phase of equipment testing
- Train on-site personnel
- Perform mock-ups and readiness assessments
- Initiate remediation activities within the 618-10 Burial Ground
QUESTIONS?