West Valley Demonstration Project

Phase 1 Decommissioning Plan Approach for the Project Premises

A Briefing for the U.S. Nuclear Regulatory Commission

Zintars Zadins

WVDP Phase 1 Decommissioning Plan

The following presentation is based upon data and analysis associated with the presumptive Preferred Alternative in the Draft Environmental Impact Statement for Decommissioning and/or Long-Term Stewardship at the West Valley Demonstration Project and Western New York Nuclear Service Center, which is still under development. To the extent the presumptive Preferred Alternative is either modified or changed during the course of the NEPA process, the information contained within this presentation may correspondingly change.

Presentation Objective

- Describe the WVDP Phase 1 Decommissioning Approach that will implement the Preferred Alternative as identified in the “EIS for Decommissioning and/or Long-Term Stewardship at the West Valley Demonstration Project and Western New York Nuclear Service Center”

WVDP Phase 1 Decommissioning Plan

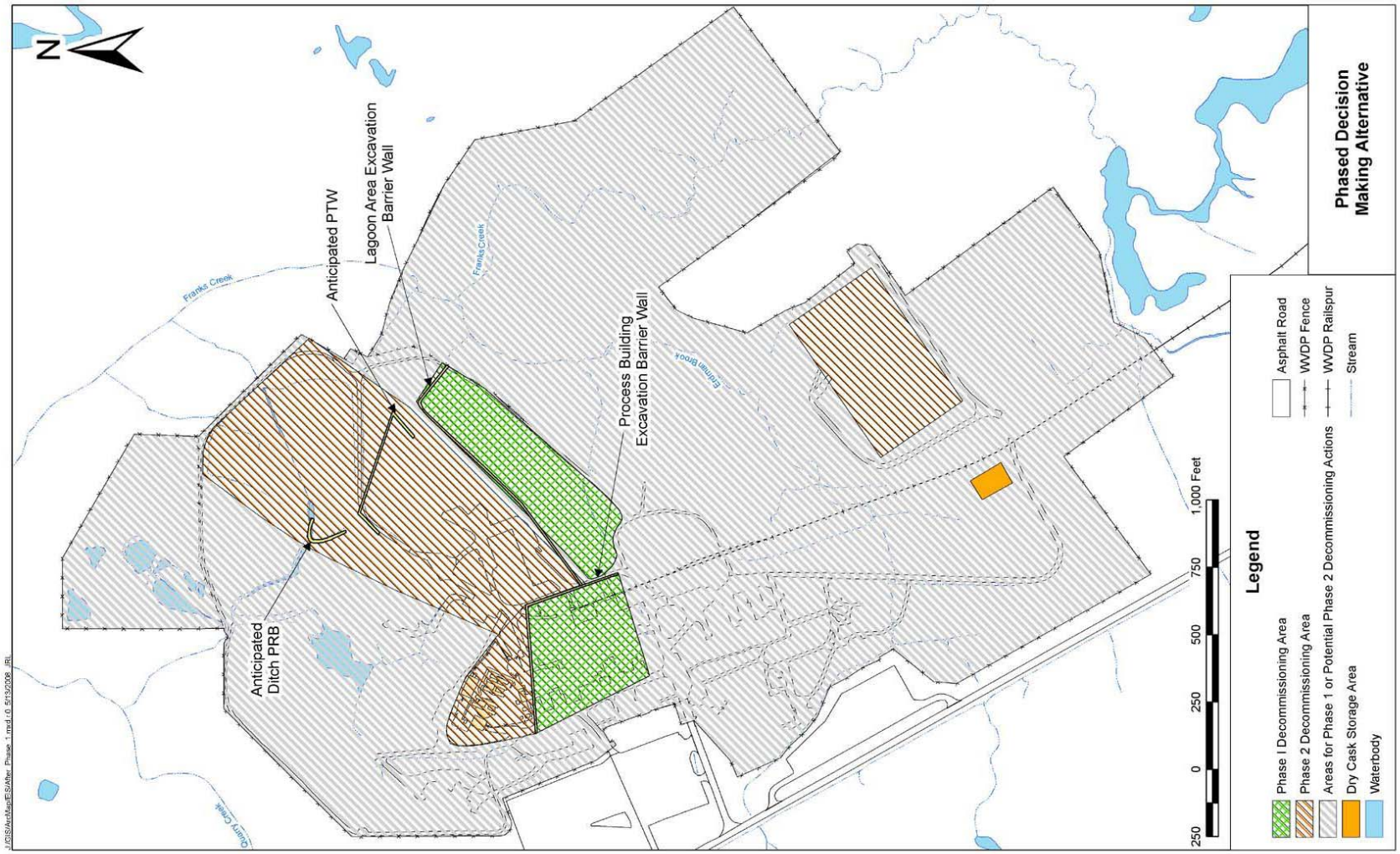
- Not a traditional Decommissioning Plan prepared for NRC license termination
- Phased Decommissioning Plan to Support the Phased Decommissioning of the WVDP
- Unrestricted release DCGLs for surface/subsurface soil
- Main Plant Process Building (MPPB) and Lagoon area removals will meet unrestricted release criteria
- Phase 1 Decommissioning will be completed in a manner that ensures that all decommissioning options (Ongoing license, Restricted Release, Unrestricted Release) are available for Phase 2 Areas

WVDP EIS Preferred Alternative

Phased Decision Making Alternative

- Decommissioning of the WVDP would be done in two phases:
  - Phase 1 Actions
    - Removal of the MPPB, Vitrification Facility and underlying source area of the North Plateau Plume (NPP)
    - Removal of Lagoons 1 – 5, Neutralization Pit and Interceptors
    - Removal of remaining WVDP facilities (RHWF, LSA 4), building slabs, and soil beneath the slabs to a prescriptive end state depth of up to two feet
    - Characterization and potential remediation of surface soils within the Project Premises outside of the Phase 2 areas [Waste Tank Farm (WTF), NRC-licensed Disposal Area (NDA), non-source area of the NPP and associated Plume-impacted areas]
    - WTF, NDA and non-source area of the NPP to be monitored and maintained in a safe condition
    - Perform studies/evaluations for Phase 2 Decommissioning approach

Phased Decision-Making Alternative



WVDP EIS Preferred Alternative

Phased Decision Making Alternative

- Decommissioning of the WVDP would be done in two phases *(cont)*
  - Phase 2 Actions
    - Complete decommissioning of the WVDP (WTF, NDA, non-source area of the Plume, remaining contaminated soils)

Objective of Phase 1 Decommissioning

- An end state in Phase 1 that is conservative and ensures that all decommissioning options for the WNYNSC in Phase 2 are achievable:
  - Ongoing Licensing (Off-site dose < 100 mrem/yr)
  - Restricted Release (Institutional Controls (IC) in Effect Off-site Dose < 25 mrem/yr)
    (IC not in Effect Intruder Dose < 100 or 500 mrem/yr)
  - Unrestricted Release (25 mrem/yr All Potential Pathways)
- An unrestricted release criteria for Phase 1 activities will achieve this objective

Phase 1 Decommissioning Actions

- WMA 1 – Main Plant Process Building and Vitrification Facility Area
  - Removal of the HLW Canisters to a new onsite Interim Waste Storage Area
  - Install up- and down-gradient barrier walls to support excavation and isolate the decommissioned area from the non-source area of the NPP
  - Removal of the above- and below-grade portions of the MPPB, 01-14 Building and Vitrification Facility
  - Removal of the source area of the NPP below the Main Plant into the Lavery till
  - Removal of underground piping and tanks
  - Removal of foundation piles to the base of the excavation
  - Backfill excavation with clean fill similar to native soils

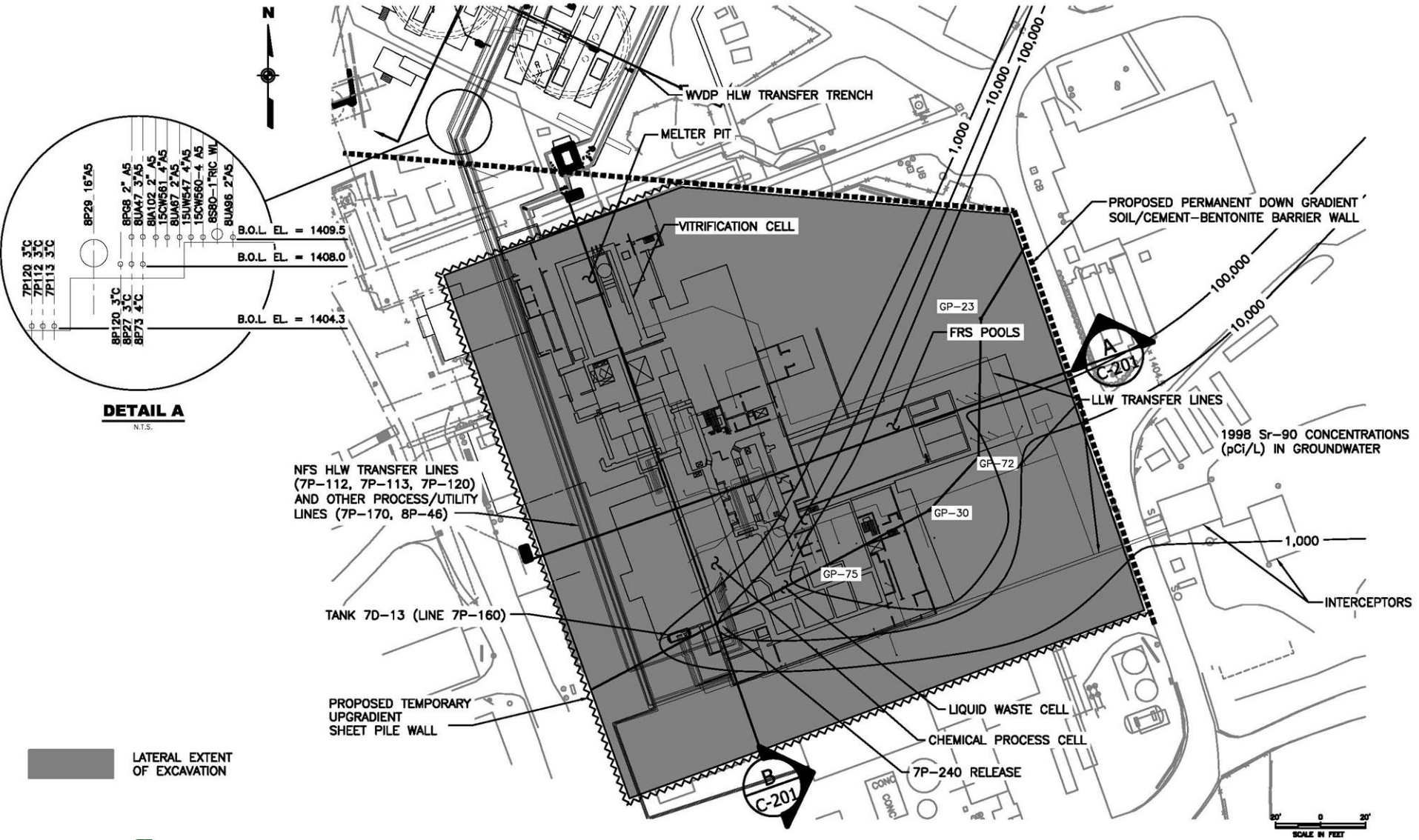
Phase 1 Decommissioning Actions

- Removal of the HLW Canisters to a new onsite Interim Waste Storage Facility
  - Requires construction of a new onsite HLW canister storage facility similar to a spent nuclear fuel storage facility
  - Requires modification of the Load-In/Load-Out Facility to support HLW canister removal, decontamination, storage cask loading, and transport

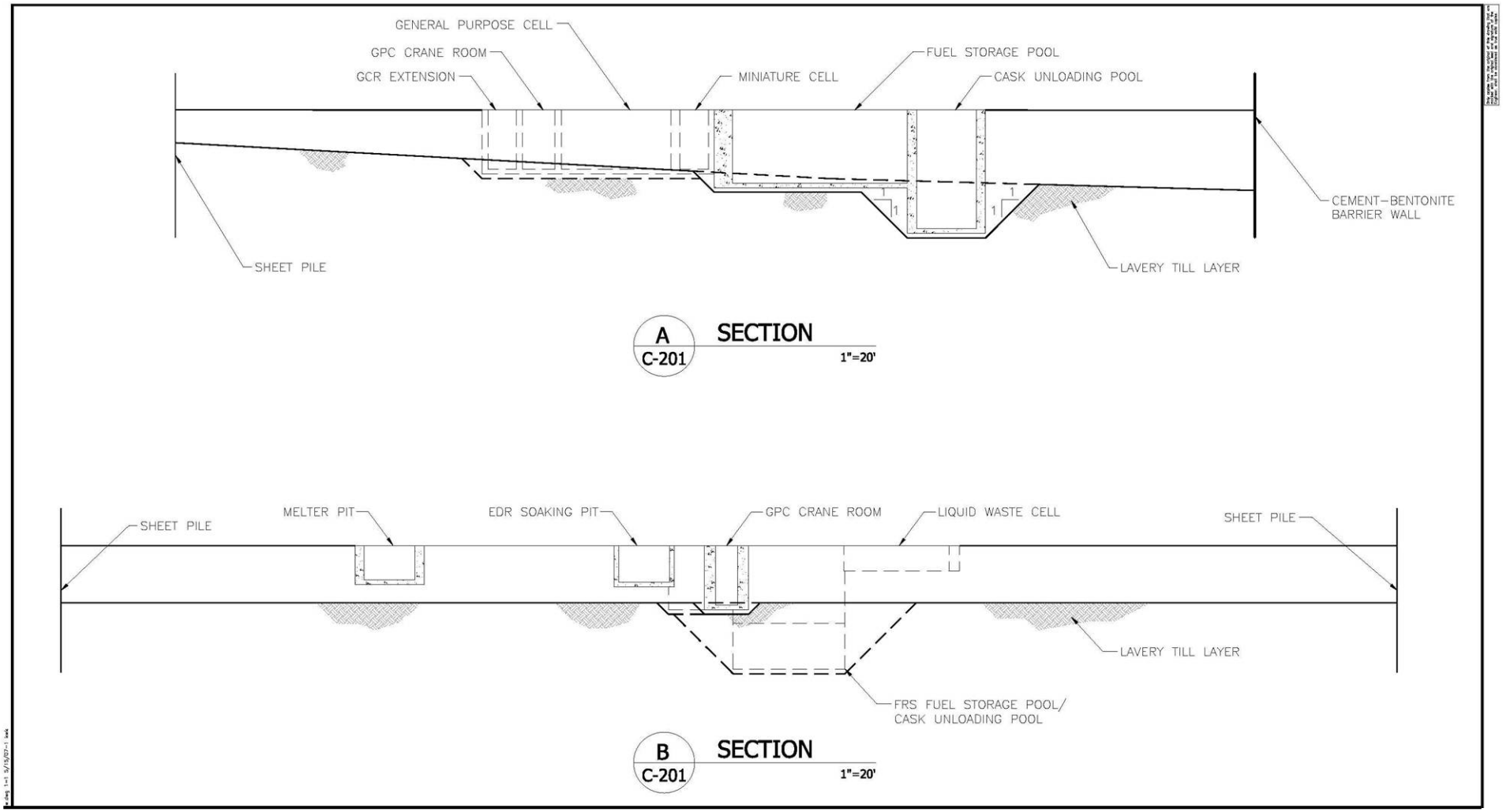
Phase 1 Decommissioning Actions

- Excavation of NPP source area soils beneath the Process Building
  - Lateral extent constrained by engineering and required excavation laybacks
  - Vertical extent is expected to extend about a foot into the Lavery till
  - Soil removal is expected to remove all significant quantities of low-mobility long-lived radionuclides and the Sr-90 source area for the NPP
  - Soil removals are expected to meet unrestricted release criteria for the MPPB

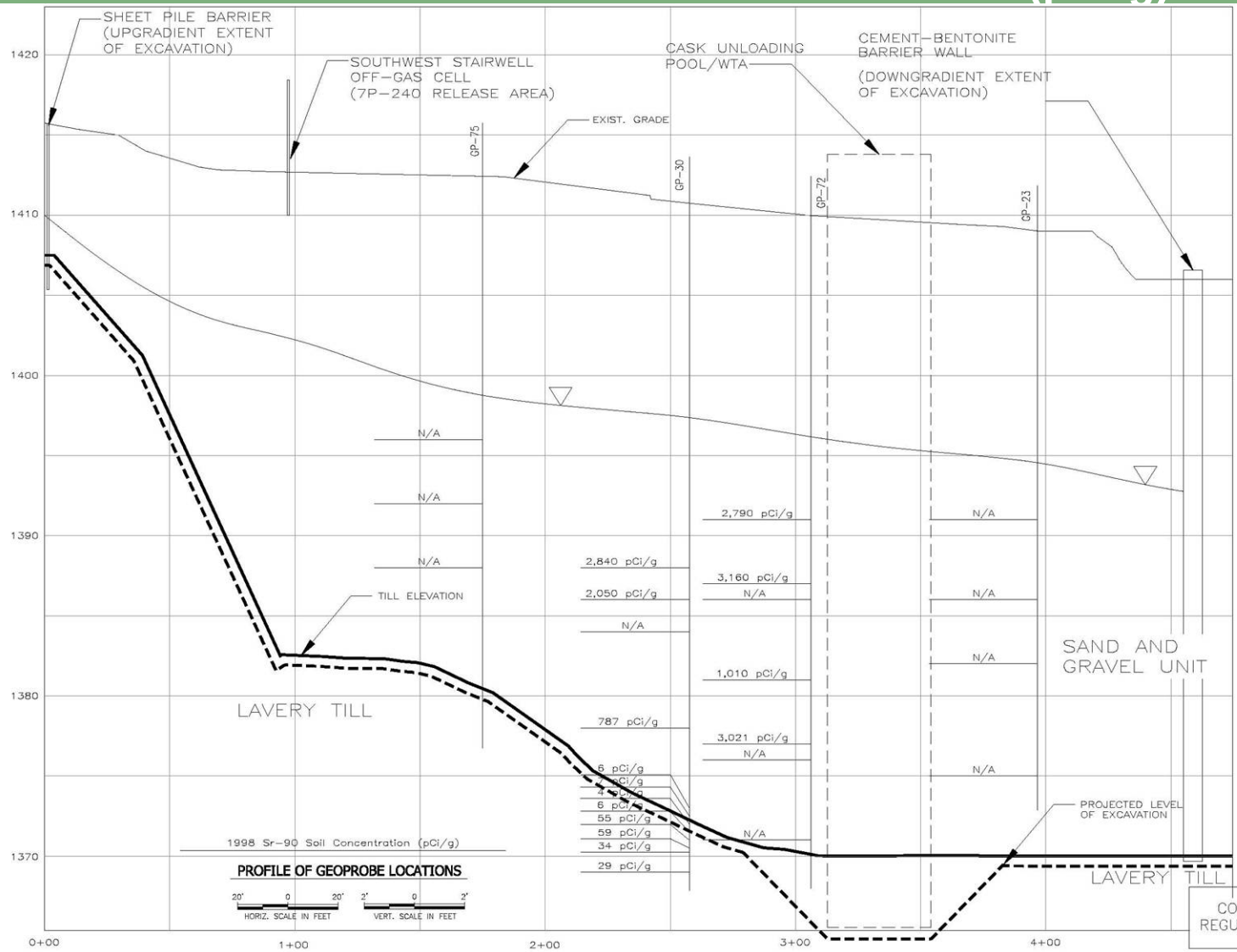
Lateral Extent of MPPB Excavation



Vertical Extent of MPPB Excavation



1998 Sr-90 Soil Concentrations beneath the MPPB (pCi/g)

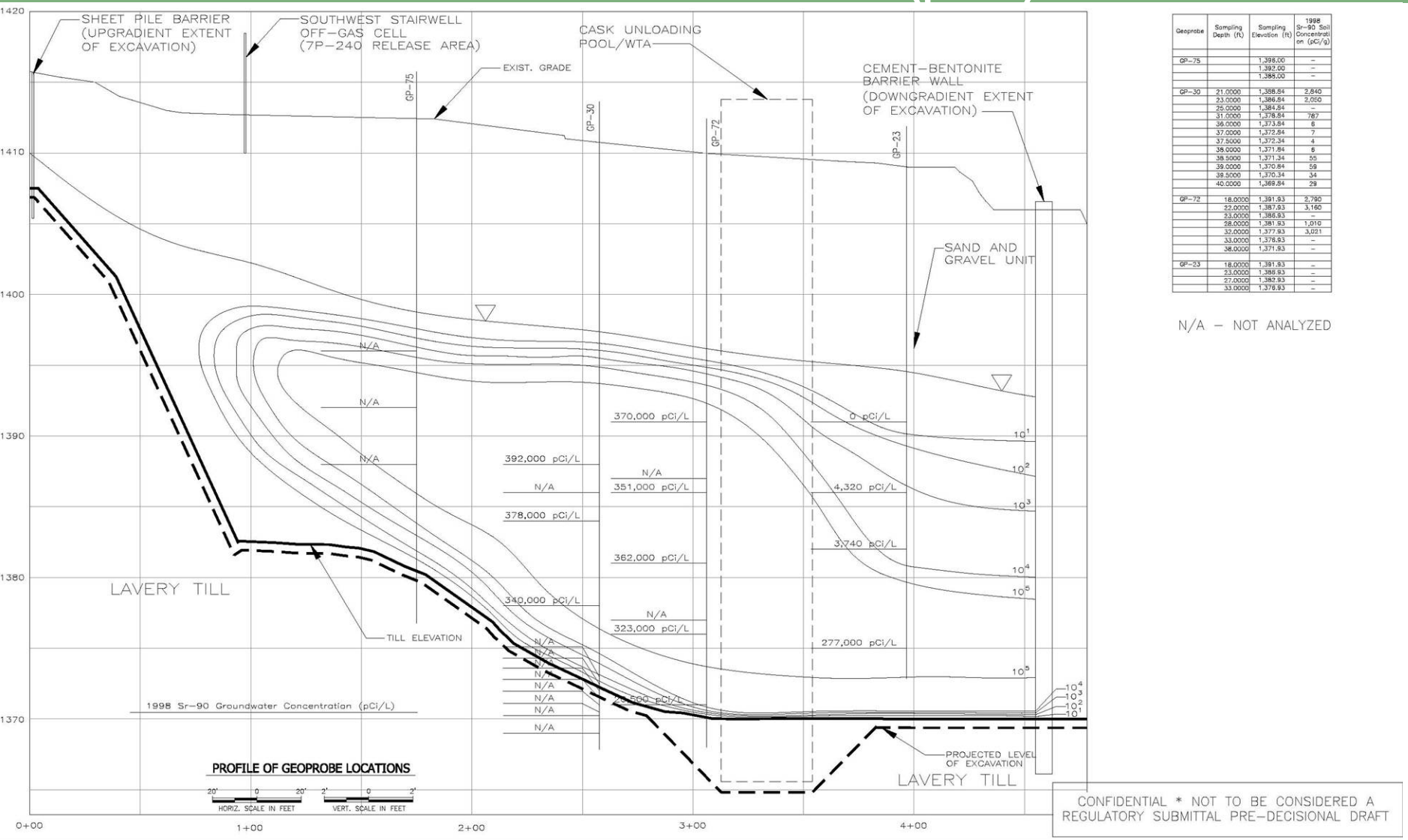


Geoprobe	Sampling Depth (ft)	Sampling Elevation (ft)	1998 Sr-90 Soil Concentration (pCi/g)
GP-75		1,398.00	–
		1,392.00	–
		1,388.00	–
GP-30	21.0000	1,388.84	2,840
	23.0000	1,386.84	2,050
	25.0000	1,384.84	–
	31.0000	1,378.84	787
	36.0000	1,373.84	6
	37.0000	1,372.84	7
	37.5000	1,372.34	4
	38.0000	1,371.84	6
	38.5000	1,371.34	55
	39.0000	1,370.84	59
	39.5000	1,370.34	34
	40.0000	1,369.84	29
GP-72	18.0000	1,391.93	2,790
	22.0000	1,387.93	3,160
	23.0000	1,386.93	–
	28.0000	1,381.93	1,010
	32.0000	1,377.93	3,021
	33.0000	1,376.93	–
	38.0000	1,371.93	–
GP-23	18.0000	1,391.93	–
	23.0000	1,386.93	–
	27.0000	1,382.93	–
	33.0000	1,376.93	–

N/A – NOT ANALYZED

CONFIDENTIAL * NOT TO BE CONSIDERED A REGULATORY SUBMITTAL PRE-DECISIONAL DRAFT

1998 Sr-90 Groundwater Concentrations beneath the MPPB (pCi/L)



Geoprobe	Sampling Depth (ft)	Sampling Elevation (ft)	1998 Sr-90 Soil Concentration (pCi/g)
GP-75		1,398.00	–
		1,392.00	–
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	33.0000	1,376.93	–

N/A – NOT ANALYZED

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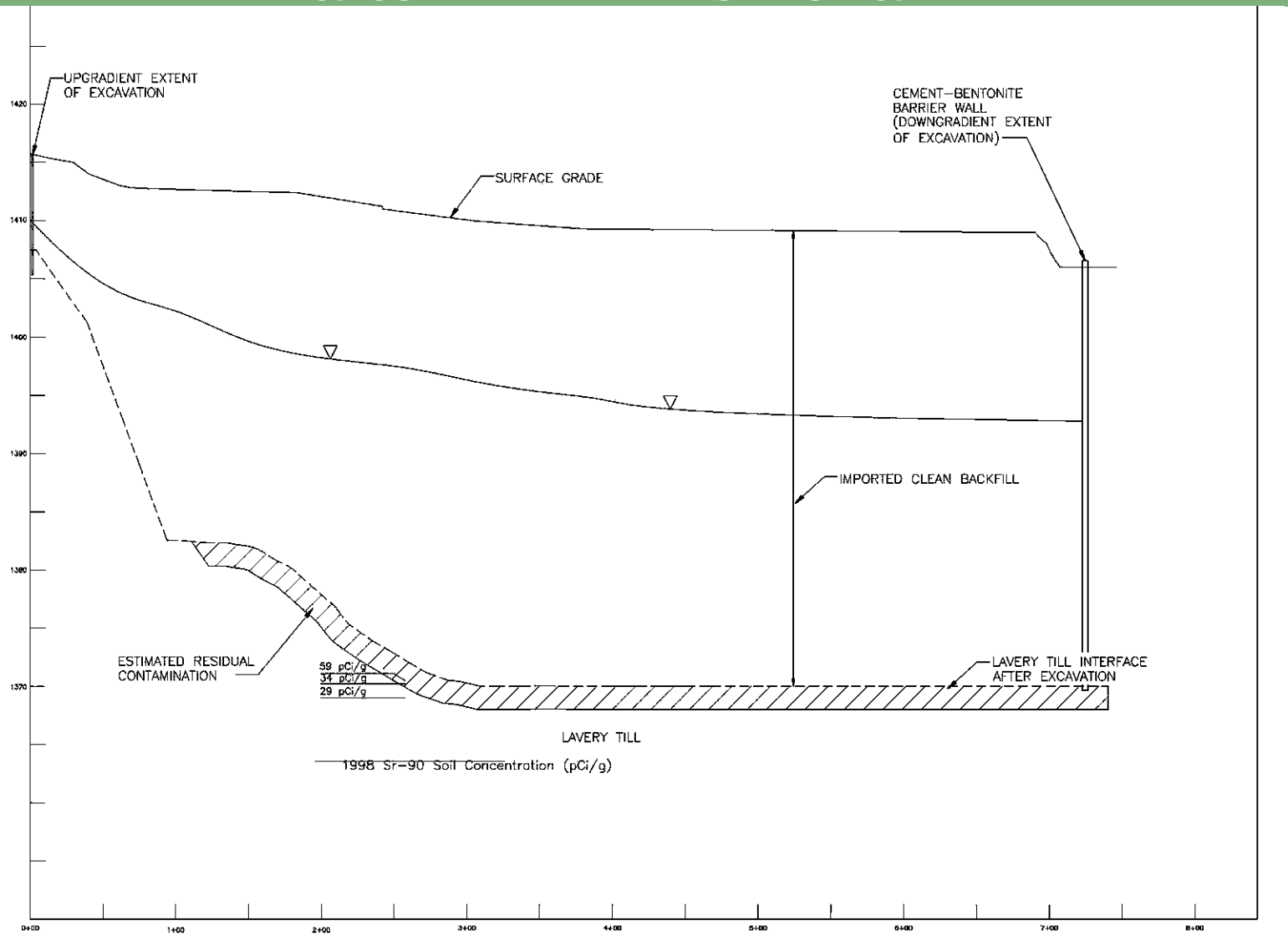
Summary – Excavation of NPP Source Area Soils beneath the MPPB

- Existing soil and groundwater sampling data beneath the MPPB suggests:
  - Long-lived, low-mobility radionuclides remain in vadose soils beneath the Off-Gas Cell near the 1968 release that is considered the principal source of the NPP (Slides 14, 15)
  - Sr-90 contamination is largely restricted to the saturated Sand and Gravel Unit beneath the MPPB and only extends into the upper few feet of the underlying Lavery till (Slides 14, 15)
- Proposed soil removals are expected to meet unrestricted release criteria
- Post-excavation confirmatory sampling will be performed at the base of the excavation including foundation piling remaining in place

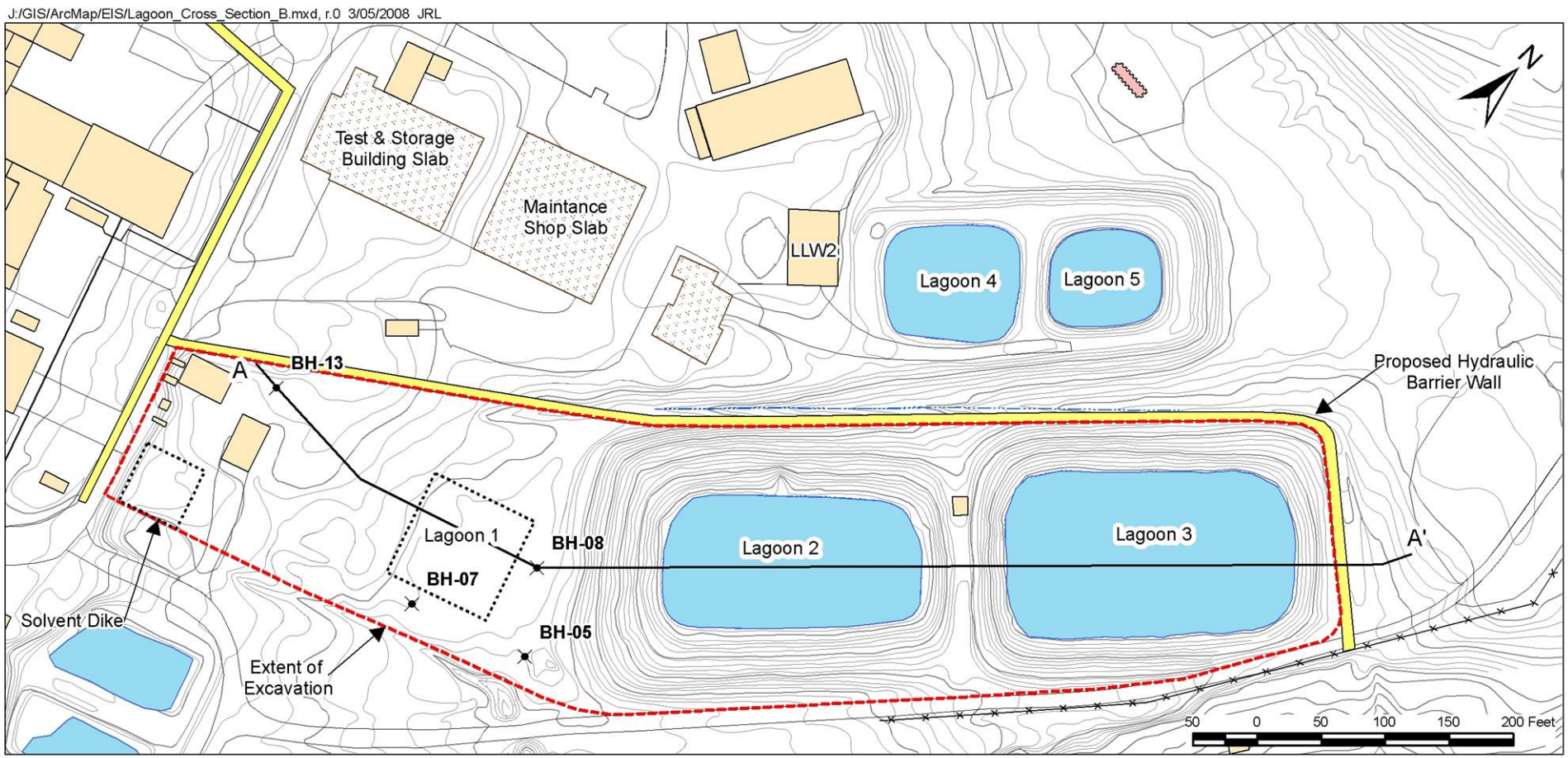
Residual Contamination Remaining after MPPB Removal



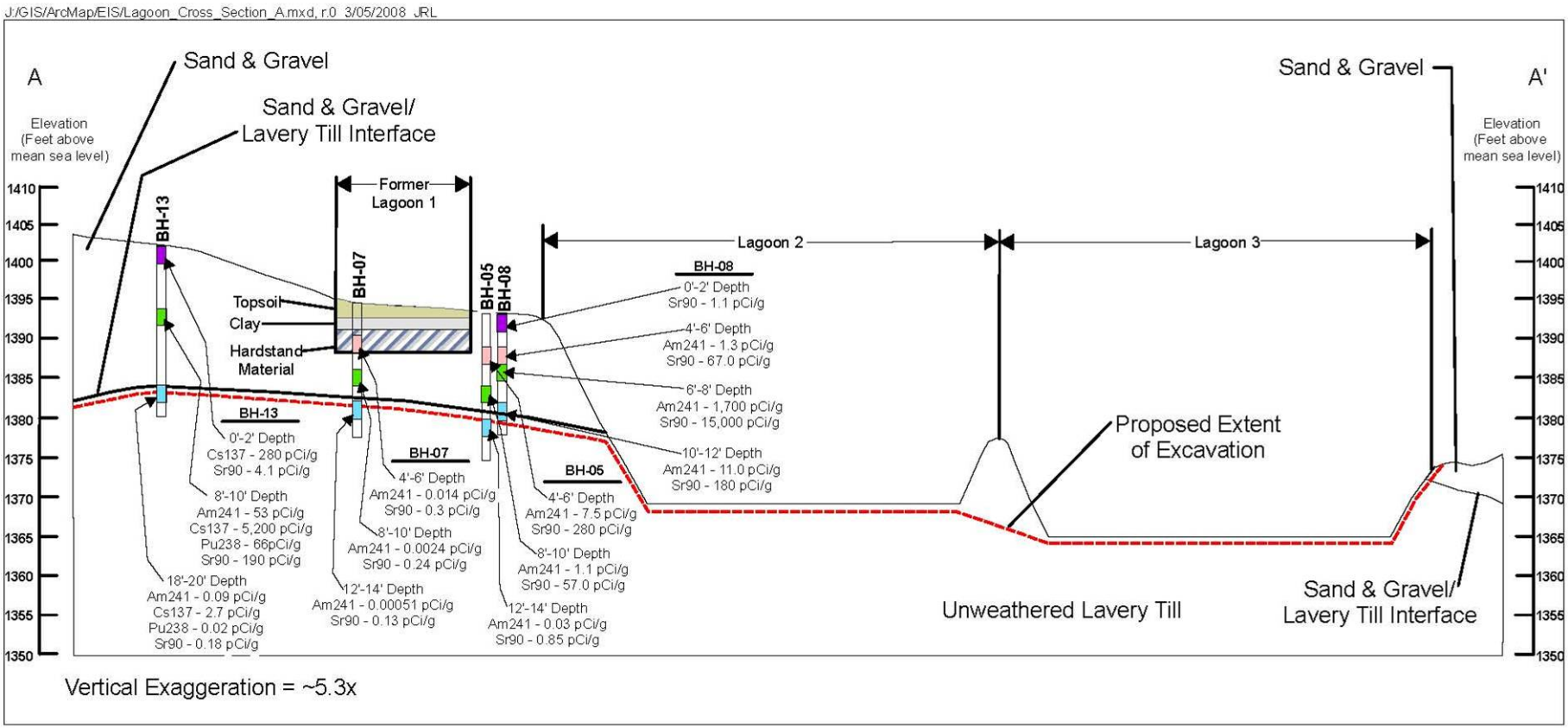
Phase 1 Decommissioning Actions

- WMA 2 – Low-Level Waste Treatment Facility Area
  - Install a barrier wall to isolate the decommissioned area from the adjacent NPP
  - Removal of waste, contaminated sediment, and contaminated soil from Lagoons 1, 2, and 3
  - Removal of geotextile and clay liners from Lagoons 4 and 5
  - Removal of Neutralization Pit and Interceptors
  - Backfill excavations with clean fill similar to native soils
  - Removal of remaining structures (LLW2) and floor slabs

Removal of Lagoons 1 – 5



Removal of Lagoons 1 – 3

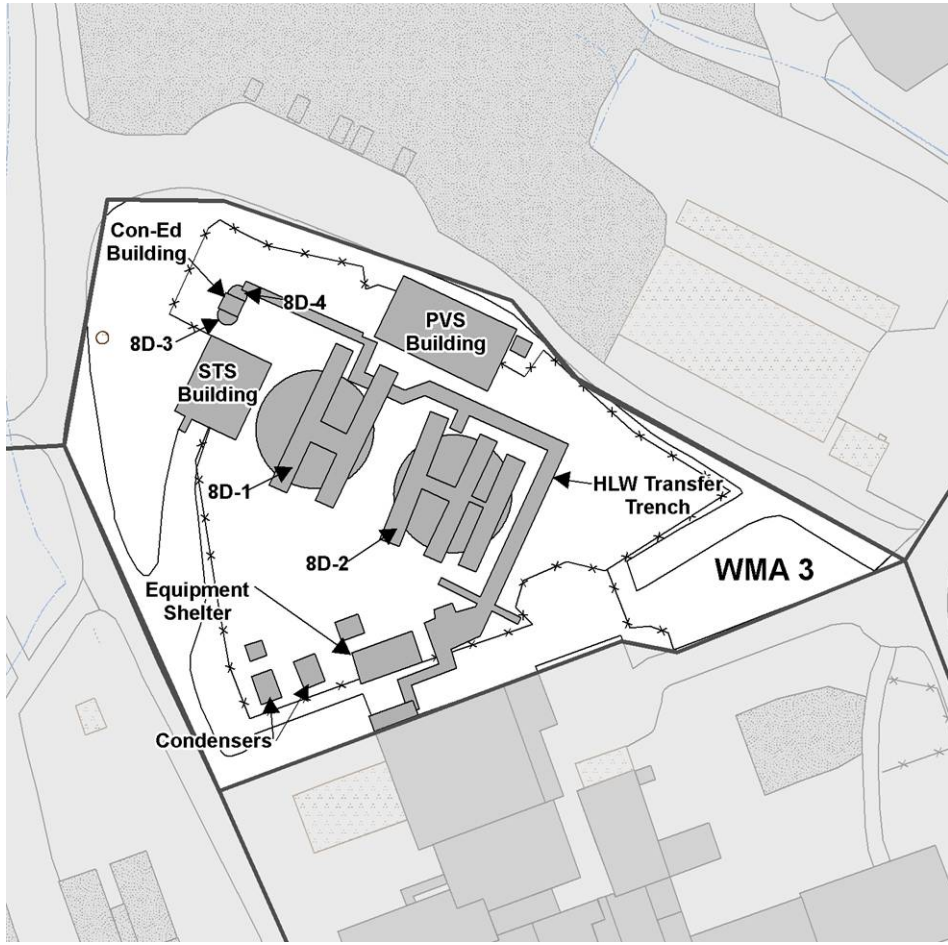


Summary – Removal of Lagoons 1 – 5, Neutralization Pit and Interceptors

- Soil and groundwater sampling in the Lagoon area suggests:
  - Long-lived, low-mobility radionuclides remain in vadose zone soil beneath Lagoon 1, a Sr-90 groundwater plume extends downgradient of Lagoon 1 in the Sand and Gravel Unit, contamination only extends into the upper few feet of the underlying Lavery Till
  - Radionuclide migration into the Lavery Till beneath Lagoons 2 and 3 is believed limited to several feet based on soil sampling data collected beneath the Process Building and the SDA

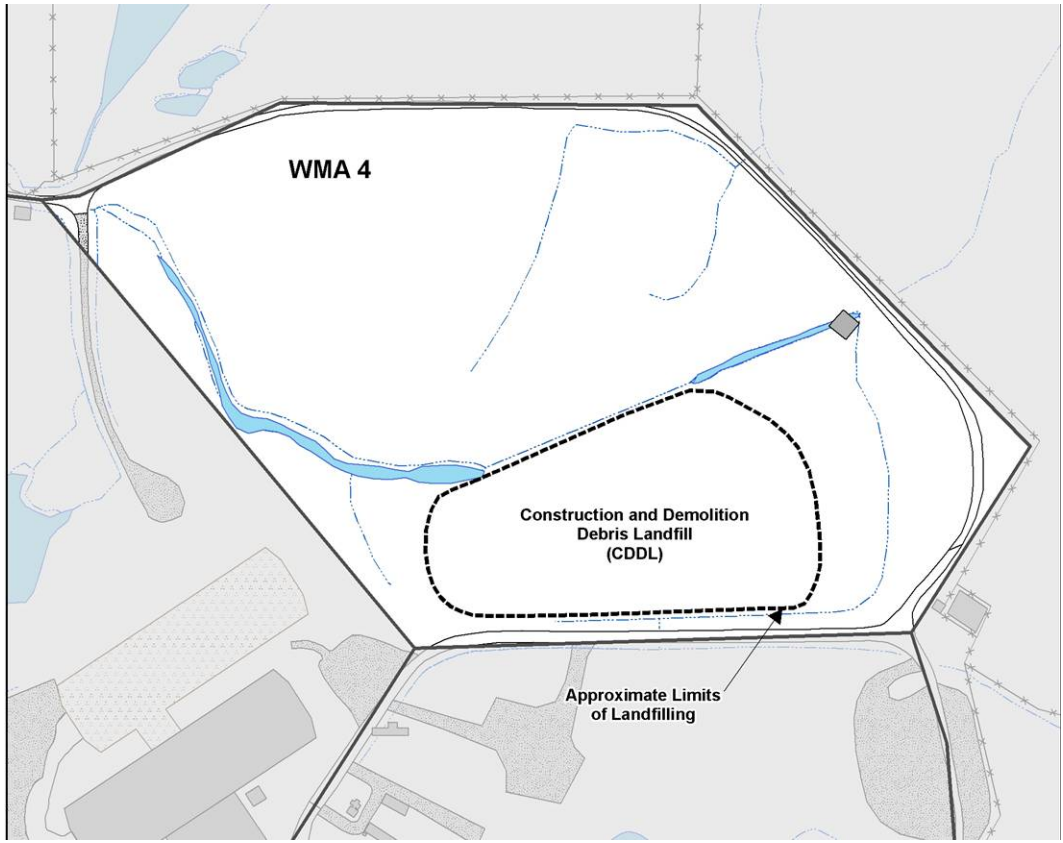
Phase 1 Decommissioning Actions

- WMA 3 – Waste Tank Farm Area
  - Removal of the HLW Transfer/Mobilization Pumps, HLW Transfer Trench Piping, Equipment Shelter/Condensers, Con-Ed Building
  - Tanks 8D-1, 8D-2, 8D-3, and 8D-4 monitored and maintained with the Tank and Vault Drying System
  - Final Decommissioning Decision on Tanks 8D-1, 8D-2, 8D-3 and 8D-4 to be made in Phase 2



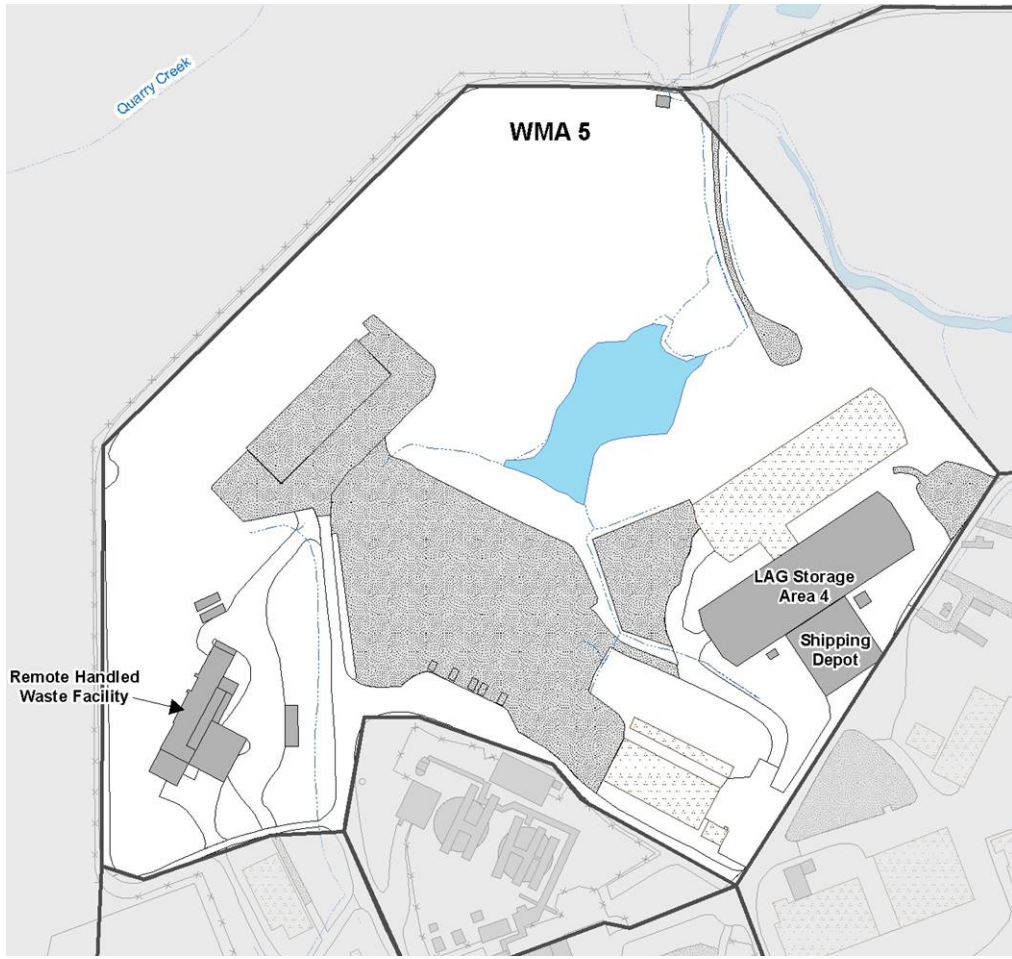
Phase 1 Decommissioning Actions

- WMA 4 – Construction and Demolition Debris Landfill Area
  - Monitor and Maintain



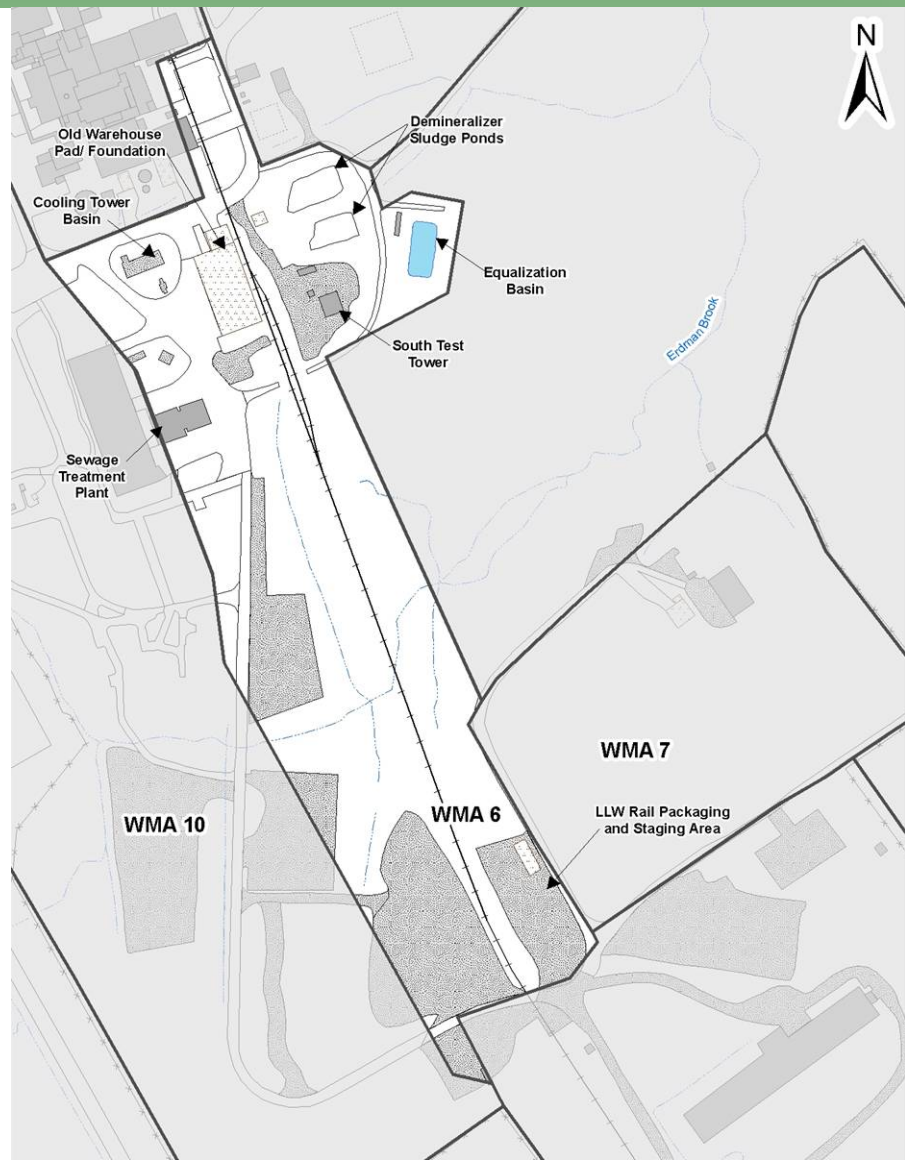
Phase 1 Decommissioning Actions

- WMA 5 – Waste Storage Area
  - Removal of the Lag Storage Addition 4/Shipping Depot and the Remote Handled Waste Facility
  - Removal of remaining slabs and foundations to the prescriptive physical end state



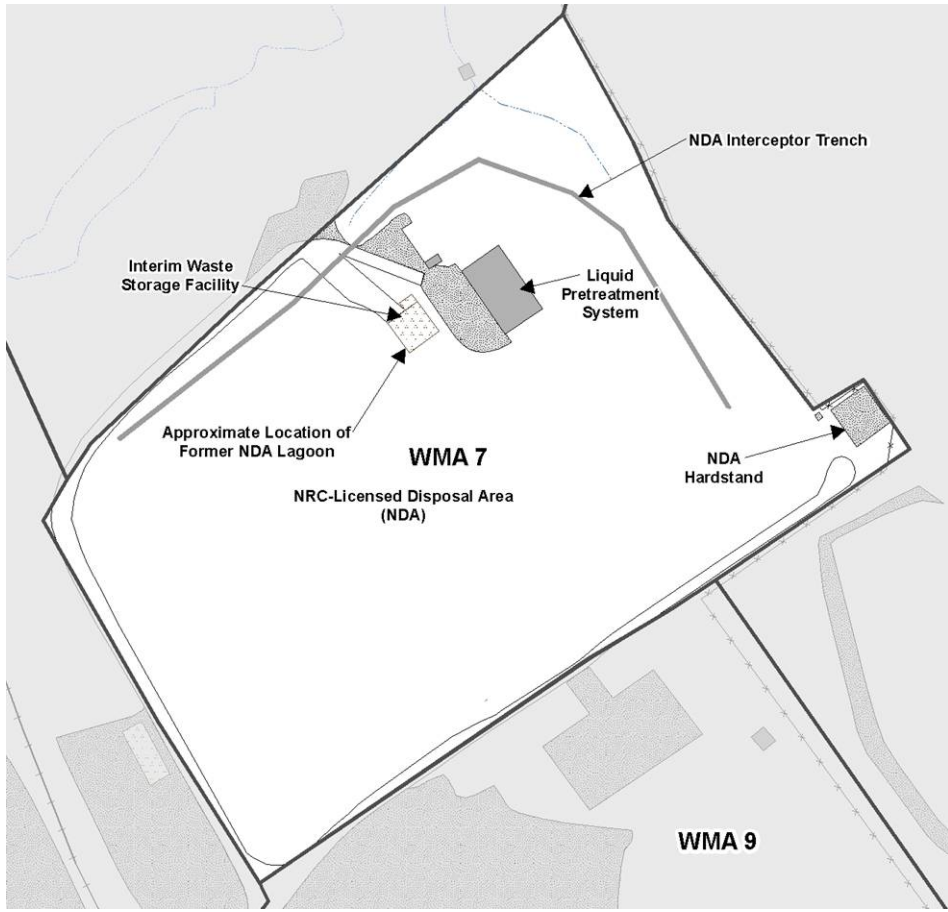
Phase 1 Decommissioning Actions

- WMA 6 – Central Project Premises Area
  - Removal of the Demineralizer Sludge Ponds, Equalization Basin and Tank, Sewage Treatment Plant and remaining slabs and foundations to the prescriptive physical end state
  - Rail Spur and LLW Rail Packaging and Staging Area will remain in place



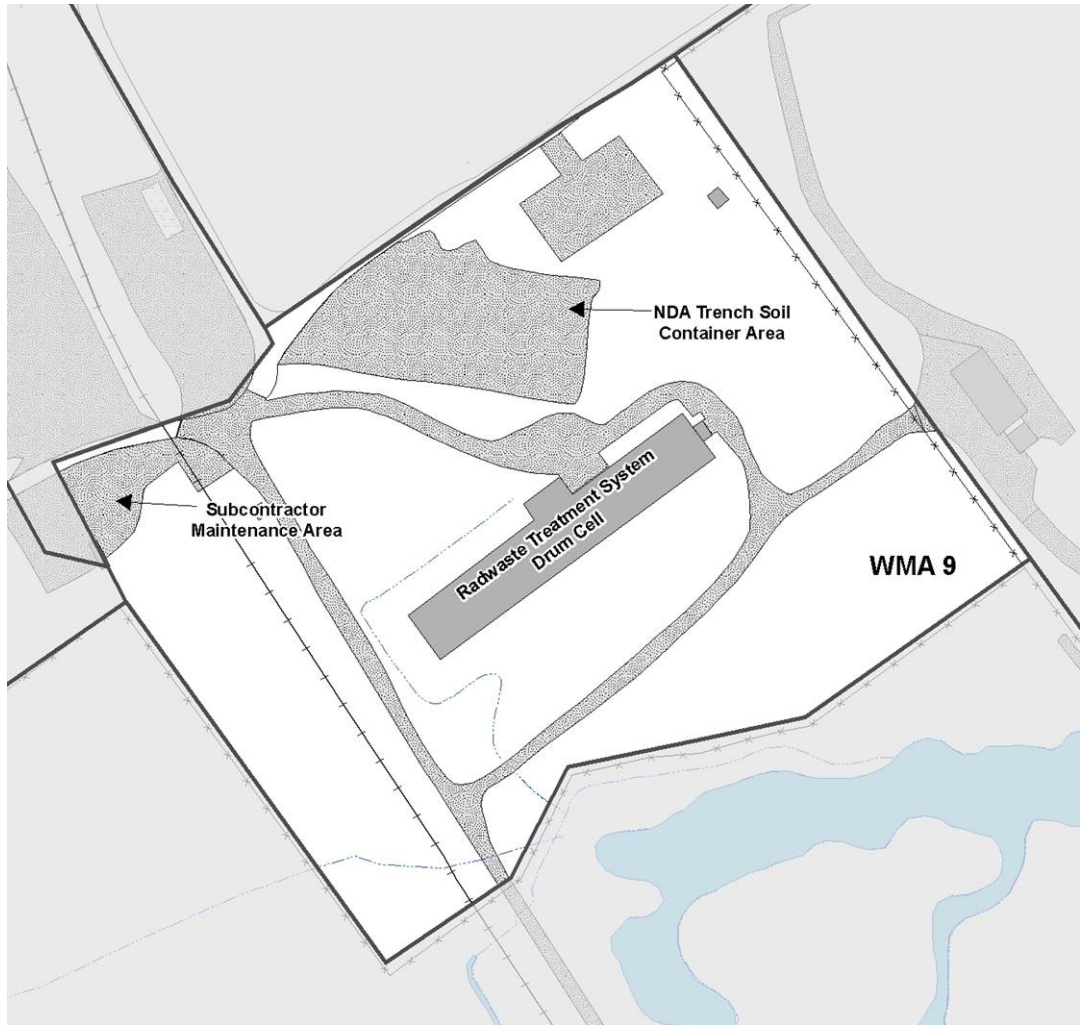
Phase 1 Decommissioning Actions

- WMA 7 – NDA and Associated Facilities
  - Removal of NDA Hardstand, slabs and gravel pads
  - Monitor and Maintain
  - Final Decommissioning Decision on the NDA will be made in Phase 2



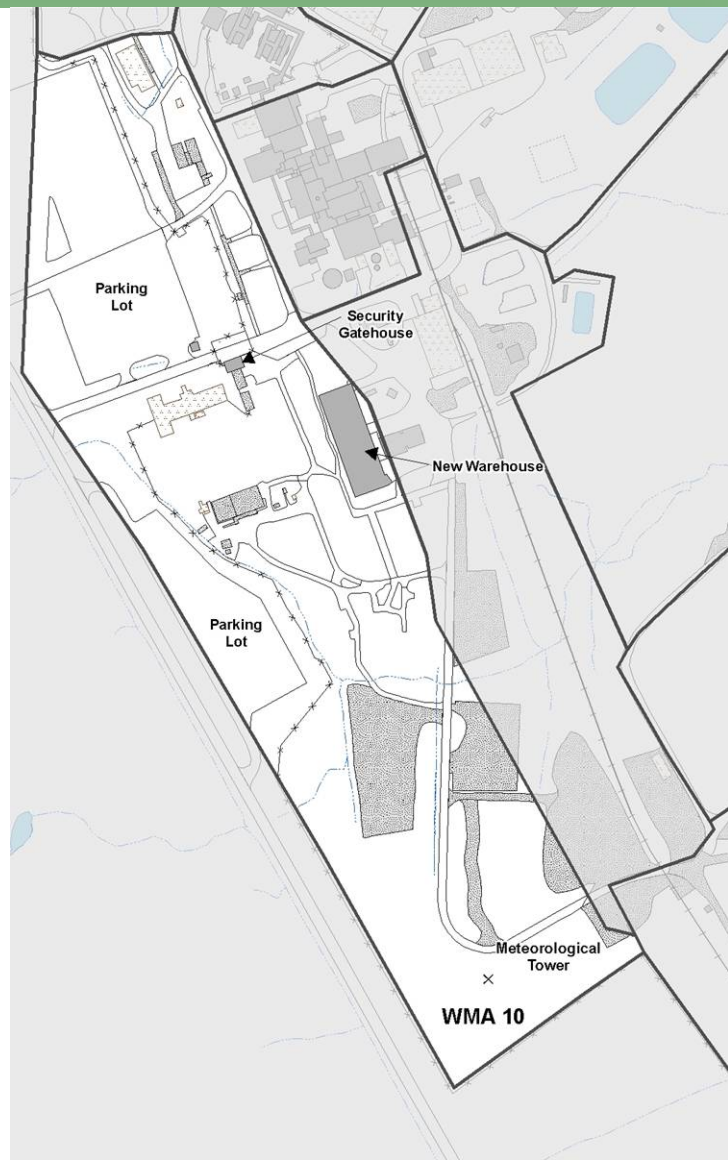
Phase 1 Decommissioning Actions

- WMA 9 – Radwaste Treatment Drum Cell
  - Removal of the Drum Cell, NDA Trench Soil Container Area, floor slabs, and gravel pads



Phase 1 Decommissioning Actions

- WMA 10 – Support and Services Area
  - Removal of New Warehouse and remaining slabs and gravel pads
  - Meteorological Tower, Security Gatehouse and Security Fences remain in place



Phase 1 Decommissioning Actions

- North Plateau Plume (non-source area)
  - Monitor and Maintain
  - Final Decommissioning Decision will be made in Phase 2

Phase 1 Decommissioning Actions

- DCGLs that meet the restricted release criteria will be calculated for surface and subsurface soils within the Project Premises using the Resident Farmer Scenario
- These DCGLs will be applicable to the Phase 1 and potential Phase 2 Decommissioning actions
- These DCGLs will also be applicable to potential surface soil remediation actions within the Project Premises during Phase 1

Phase 1 Decommissioning Actions

- Assumed Conditions after Decommissioning
  - Two-foot thick zone of contaminated Lavery Till (<100 pCi/g) is located at depths of 30 feet beneath the former Process Building and 14 feet below Lagoon area
  - Process Building and Lagoon area excavations are backfilled to present ground surface with clean backfill similar to native soils
  - Hydraulic barrier walls are in place downgradient of the Process Building and northwest of the Lagoon area excavations
  - Residual subsurface contamination lower than calculated unrestricted release DCGLs