PUREX TANKS TK-P4 AND TK-40
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CHANGE CONTROL LOG

Change Control Logs ensure that changes to this unit are performed in a methodical, controlled, coordinated, and transparent manner. Each unit addendum will have its own change control log with a modification history table. The "**Modification Number**" represents Ecology's method for tracking the different versions of the permit. This log will serve as an up to date record of modifications and version history of the unit.

Modification History Table

Modification Date	Modification Number
09/22/2025	PCN-PUREX-TKP4-TK40-2024-01 (8C.2025.Q3)
02/14/2023	PCN-PUREX-2023-01 (8C.2023.Q1)
04/21/2022	PCN-PUREX-2022-02 (8C.2022.Q2)
01/19/2022	PCN-PUREX-2022-01 (8C.2022.Q1)
08/25/2021	8C.2021.9F

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TERMS

CERCLA	*Comprehensive Environmental Response, Compensation, and Liability Act of 1980*
D&D	Decontamination and Decommissioning
DOE	U.S. Department of Energy
DOE-RL	U.S. Department of Energy, Richland Operations Office
DWMU	Dangerous Waste Management Unit
Ecology	Washington State Department of Ecology
EPA	U.S. Environmental Protection Agency
ERDF	Environmental Restoration Disposal Facility
FWS	Field Work Supervisor
GPS	Global Positioning System
HASQARD	Hanford Analytical Services Quality Assurance Requirements Document
HEIS	Hanford Environmental Information System
IQRPE	Independent, Qualified, Registered, Professional Engineer
LDR	Land Disposal Restriction
MTCA	Model Toxics Control Act
NTCRA	Non-time-critical Removal Action
OU	Operable Unit
ppm	Parts Per Million
PUREX	Plutonium-Uranium Extraction (Plant)
QA	Quality Assurance
QC	Quality Control
RAWP	Removal Action Work Plan
RCRA	*Resource Conservation and Recovery Act of 1976*
S&M	Surveillance and Maintenance
SAP	Sampling and Analysis Plan
TSD	Treatment, Storage, and Disposal

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H.1 INTRODUCTION

The purpose of this plan is to describe the *Resource Conservation and Recovery Act of 1976* (RCRA) closure process for Tank TK-P4 and Tank TK-40 dangerous waste management units (DWMUs).

Tanks TK-P4 and TK-40 will be clean closed in coordination with a *Comprehensive Environmental Response, Compensation, and Liability Act of 1980* (CERCLA) non-time-critical removal action (NTCRA) for the remaining tanks, piping, and ancillary structures in the Plutonium-Uranium Extraction (PUREX) Complex's 203A and 211A storage areas. The removal action is needed to facilitate access to the PUREX Canyon Building in support of future remedial and site closure actions.

Closure will be performed in accordance with the schedule provided in Section H.8 of this document. This closure plan complies with Washington Administrative Code (WAC) 173-303-610(2) through (6), Dangerous Waste Regulations, *Closure and post-closure*, and represents the baseline for closure and the enforceable compliance requirements for conducting closure. Amendments to this plan will be submitted as a permit modification in accordance with WAC 173-303-610(3)(b).

H.1.1 Physical Description

The PUREX Plant is located in the 200 East Area of the U.S. Department of Energy's (DOE) Hanford Site in south-central Washington State. The PUREX facility is comprised of the PUREX Canyon Building, two storage tunnels, several support structures including Chemical Storage Areas, cribs, and retention basins. Two of the PUREX support areas, the 203A Acid Storage Area and the 211A Chemical Storage Area, housed systems of chemical storage tanks (including Tanks TK-P4 and TK-40) and associated ancillary equipment.

The 203A Acid Storage Area and the 211A Chemical Storage Area are located north of the PUREX Canyon Building. Tank TK-P4 is located in the southeastern corner of the 203A Acid Storage Area, and Tank TK-40 is located in the northeast corner of the 211A Chemical Storage Area. Tanks TK-P4 and TK-40, which stored process chemicals during PUREX facility operations, were drained, flushed, and deactivated to meet RCRA clean closure requirements. Figure H-1 shows the locations of the tanks in the PUREX Complex. Each tank is described in greater detail in the following sections.

H.1.1.1 Tank TK-P4

Tank TK-P4 is a 402,930 L (106,442 gal) stainless-steel storage tank located in the southeast quadrant of the 203A Acid Storage Area (Figure H-1). The tank is mounted in a 1.8 m (6 ft) high, compartmentalized, reinforced-concrete, diked secondary containment. The diked area of the 203A Acid Storage Area measures approximately 78.4 m^2 (844 ft^2) and was built in 1954. Other facilities and equipment in the 203A Acid Storage Area consist of a pump house building, nine non-DWMU acid storage tanks, and ancillary piping (Figure H-2).

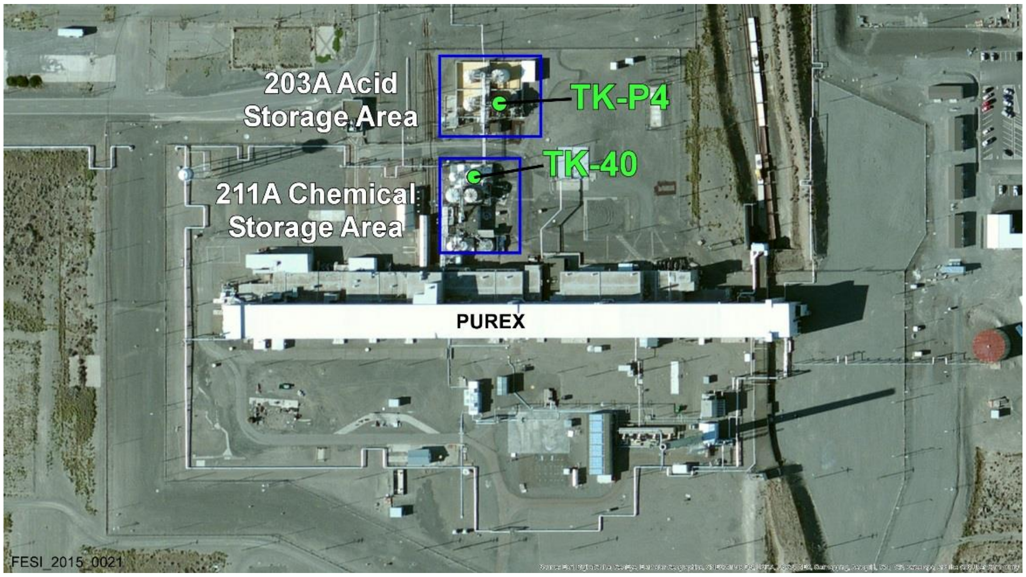


Figure H-1 Location of Tanks TK-P4 and TK-40 at the PUREX Complex

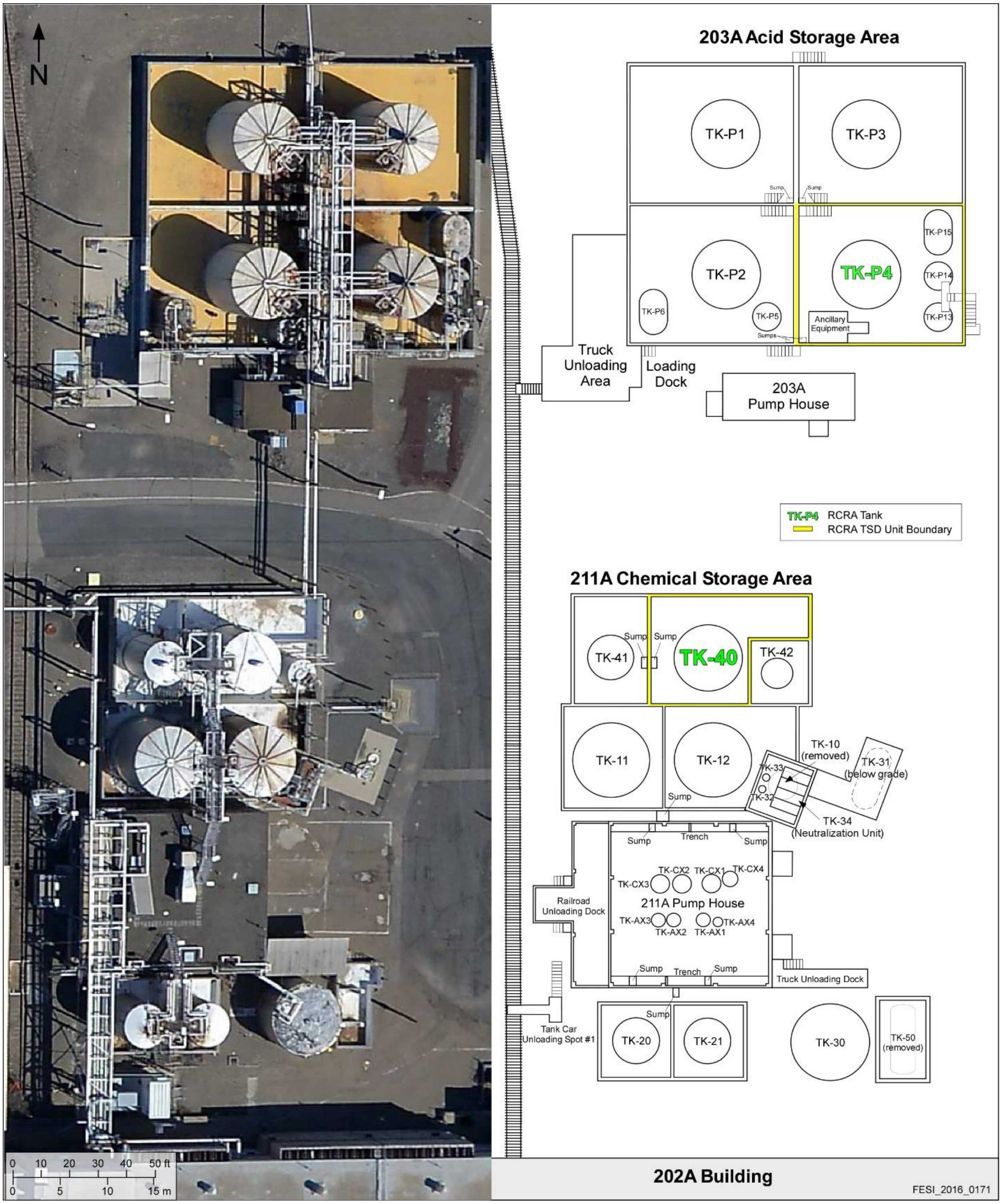
During deactivation, all of the tanks in the 203A Acid Storage Area, including Tank TK-P4, were flushed and emptied to a minimum heel and their associated piping was drained, as stated in 17530-96-028, *Completion of the PUREX Deactivation End Points Associated with Flushing/Draining of the 203-A Vessels*. Since that time, the 203A Acid Storage Area has been part of an ongoing surveillance and maintenance (S&M) program for the PUREX facility and, therefore, isolated from utilities and other structures.

H.1.1.2 Tank TK-40

Tank TK-40 is a 247,360 L (65,345 gal) carbon-steel storage tank located in the northeast quadrant of 211A Chemical Storage Area (Figure H-2). Tank TK-40 was used for diluent storage during PUREX fuel reprocessing operations (RHO-MA-116, *PUREX Technical Manual*). The 211A Chemical Storage Area consists of two separate, reinforced-concrete, diked secondary containment structures. These two areas contain chemical storage tanks, a pump house building, and ancillary piping. Tank TK-40 is mounted in a reinforced-concrete, diked structure, measuring approximately 52.4 m^2 (564 ft^2). In 1996, the tank was flushed and emptied to a minimum heel.

H.1.2 Process Information

The PUREX Plant and its support facilities were designed to recover plutonium, uranium, and neptunium from irradiated fuel elements received from the Hanford Site N Reactor and the single-pass reactors during the Cold War Era. Construction of the PUREX Plant began in 1952, and full-scale operation began in 1956. Operations were downgraded to wet standby in September 1972. In 1978, the plant progressed from wet standby through cold startup tests and resumed operations to recover plutonium from irradiated N Reactor fuel in November 1983. The PUREX Plant was operational until 1988, when it was shut down again. The plant began transitioning into cold standby in October 1990 and was placed in cold standby in September 1992. In December 1992, planning was initiated to change the status of PUREX from cold standby to deactivation (or transition to shutdown).



1 **Figure H-2 Tanks TK-P4 and TK-40**

During the PUREX transition phase in the mid-1990s, the 203A and 211A storage areas that housed Tanks TK-P4 and TK-40, respectively, stored dangerous waste solutions. These support areas were used to store flushing solutions until the solutions could be treated and transferred to the double-shell tank system.

Tank TK-P4, located in the 203A Acid Storage Area, was used to store recovered uranyl nitrate hexahydrate resulting from PUREX fuel reprocessing operations. Acid solutions were denitrated to reduce the volume of waste transferred to the double-shell tanks. Following the acid disposal activities, the 203A Acid Storage Area tanks, ancillary piping, and equipment were flushed until the tank heels no longer exhibited dangerous waste characteristics. The tanks were flushed using adequate amounts of water and caustic solutions, which consisted of sodium hydroxide and potassium hydroxide. Caustic solution amounts ranging from 208.2 to 2,271.2 L (55 to 600 gal) were added, depending on the acidity of the remaining tank heel, as determined by sample analysis.

Information from PUREX deactivation documents indicated that all tanks in the 203A Acid Storage Area were emptied or flushed, with only a minimum heel remaining at the completion of the deactivation. The sample results provided in the deactivation documents describe the tanks and headers in the 203A Acid Storage Area as flushed and/or emptied. Tank TK-P4 is described as having a volume of 402,930 L (106,442 gal), a heel of 1,136 L (300 gal), and an endpoint that no longer exhibits characteristics of dangerous waste. Screening sample results for the tank heel indicated a pH of 11.73, with total concentrations of 0.0023 parts per million (ppm) cadmium and 0.58 ppm chromium (17530-96-028, *Completion of the PUREX Deactivation End Points Associated with Flushing/Draining of the 203-A Vessels*). It is not known whether the heel in Tank TK-P4 is in solution or solid form at this time.

The 211A Chemical Storage Area stored bulk liquid chemicals used in PUREX Plant operations. Tank TK-40 in the 211A north tank area was used to store radiologically contaminated tributyl phosphate organic solvent. During the transition phase at PUREX, Tank TK-40 was drained, flushed with diesel (tetradecane) to remove any remaining tributyl phosphate, and then pumped to a minimum heel. PUREX deactivation documents estimated a tank capacity of 247,360L (65,345 gal) and a residual heel of 537.5 kg (1,185 lb) for Tank TK-40 (HNF-SD-CP-HIE-004, *PUREX Deactivated End-State Hazard Analysis*). Tank TK-40 was isolated from utilities and other structures at the end of deactivation. Deactivation was completed in 1998, and the plant has been under S&M management since that time. There are currently no operating processes in the PUREX Complex. The S&M activities are described in DOE/RL-98-35, *Surveillance and Maintenance Plan for the Plutonium-Uranium Extraction (PUREX) Facility*.

H.1.3 Waste Inventory and Characteristics

The PUREX Plant tank systems were used to treat liquid waste generated during the PUREX process for acceptance to the double-shell tank system. DOE/RL-95-78, *PUREX Facility Preclosure Work Plan*, lists uranyl nitrate hexahydrate and nitric acid as the main constituents in Tank TK-P4, which resulted from processes related to the uranium storage tanks at the 203A Acid Storage Area. Tributyl phosphate was identified as a constituent of concern in Tank TK-40, which resulted from processes related to the chemical tanks in the 211A Chemical Storage Area.

Tanks TK-P4 and TK-40 have process codes "T01" and "S02," and capacities of 402,930 L (106,442 gal) and 247,360 L (65,345 gal), respectively. Process codes "T01" and "S02" indicate that both tanks were used for treatment (T01) and storage (S02).

The waste codes for TK-P4 and TK-40 are listed in Table H-1 lists a total of 15 waste codes for PUREX Plant tanks including the following: WP01 and WP02 (persistent dangerous wastes, halogenated organic compounds), WT01 and WT02 (toxic dangerous waste), D001 (ignitable), D002 (corrosive), D003 (reactive), and D004 through D011 (toxicity characteristic for the metals arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver). These waste codes were assigned to all the tanks identified as having stored and/or treated dangerous waste solutions during the transition phase.

Tanks TK-P4 and TK-40 have been drained and flushed and are currently awaiting final disposition. The constituents associated with the waste codes are considered herein to support the development of the soil sampling plan presented in Section H.6 of this closure plan, as required for clean closure verification.

Table H-1 TK-P4 and TK-40 Waste Codes

Waste Code	Target Analyte	Chemical Abstracts Service Number
TK-P4		
D001	Ignitability	--
D002	Corrosivity	--
D004	Arsenic	7440-38-2
D005	Barium	7440-39-3
D006	Cadmium	7440-43-9
D007	Chromium	7440-47-3
D008	Lead	7439-92-1
D009	Mercury	7439-97-6
D010	Selenium	7782-49-2
D011	Silver	7440-22-4
TK-40		
WT02	Tributyl phosphate	126-73-8

H.1.4 Security Information

The entire Hanford Site is a controlled-access area, and the PUREX facility is located in the southeastern part of the 200 East Area. Attachment 3, *Security*, in WA7890008967, Hanford Facility Resource Conservation and Recovery Act Permit (hereinafter referred to as the Permit) describes the multi-tiered site-wide security system and how it applies to the requirements for signs [WAC 173-303-310(2)(a)], 24-hour surveillance [WAC 173-303-310(2)(b)], and artificial or natural barriers [WAC 173-303-310(2)(c)].

Changes to site access are expected to occur during the course of 200 East Area deactivation and decommissioning activities. Security measures that limit entry to authorized personnel and preclude unknowing access by unauthorized individuals will remain in place until closure of the DWMUs.

The PUREX Plant and Chemical Storage Areas are located in the 200 East Area; therefore, security information pertaining to the 200 Areas applies to these DWMUs.

H.1.4.1 PUREX Security

This section describes the signs [WAC 173-303-310(2)(a)], 24-hour surveillance [WAC 173-303-310(2)(b)], and additional artificial and natural barriers [WAC 173-303-310(2)(c)] that are specific to the PUREX facility including the 203A Acid Storage Area and the 211A Chemical Storage Area. These signs and barriers prevent unknowing entry and minimize the possibility for unauthorized entry onto the active portions of the PUREX facility.

H.1.4.1.1 Signs

All signs are written in English and state the following:

- "Danger - Unauthorized Personnel Keep Out."

The signs are legible from a distance of at least 7.6 m (25 ft).

Signs are placed along the perimeter fence around the PUREX facility. Some signs along the fence line are located at perimeter fence gates described in Section H.1.4.1.3. The signs are placed no more than 76.2 m (250 ft) apart along the fence line. Sign inspection frequency listed in Section H.1.5.

H.1.4.1.2 24-hour Surveillance System

The PUREX facility is located in the 200 East Area and does not maintain a separate 24-hour surveillance system. The entire Hanford Site is a controlled-access area. 24-hour surveillance information for the Hanford Site is described in Permit Attachment 3, *Security* (WA7890008967).

The 24-hour surveillance system supplies security at the PUREX facility while the gates described in Section H.1.4.1.3 are open.

H.1.4.1.3 Barriers

The PUREX facility is located inside the 200 East Area fence.

In addition, the PUREX facility is surrounded by two separate perimeter fences on the north, west, and south side. A section on the east side of the PUREX facility has a single perimeter fence. The fences are chain link and at least 1.8 m (6 ft) (nominal) in height. In sections with two separate fences, the fences are separated by an isolation zone that is 14 to 50 m (40 to 167 ft) wide.

The PUREX facility fences have the following six gates:

- North Gate (Main Gate), north side of 202A Building (gate for vehicle traffic).
- South Gate (Gate 4), south side of 202A Building (gate for vehicle traffic).
- Gate 3, East side of 202A Building.
- Gate 1, Railroad Gate.
- Gate 2, Railroad Gate.
- Decontamination and Decommissioning (D&D) Gate, north side of 202A Building (gate for vehicle traffic).

Gates 1 and 2 (the railroad gates) and Gate 3 are closed and locked when not in use. The North Gate, the South Gates and the D&D Gate are open during hours when work is performed at the PUREX facility, and these gates are closed and locked at all other hours. Only authorized personnel are issued keys to the locked gates.

H.1.4.2 203A Tank Farm

This facility consisted of an above grade tank farm with concrete secondary containment basins. Only tank TK-P4 was a DWMU. The tank farm was located north of the 202A Building and north of the 211A Tank Farm.

H.1.4.2.1 Signs

Prior to removal of Tank TK-P4, signs were posted at the following locations around the 203A Tank Farm:

- Five signs along the perimeter chain around the 203A Tank Farm and 203A Building:
- Two signs on the south side near the 203A Building.
- One sign on the west side.
- One sign on the north side near the northeast corner.
- One sign at the southeast corner.

H.1.4.2.2 Barriers

The 203A Tank Farm was located inside the PUREX perimeter fences. Metal posts with a single-chain strand surrounds the perimeter of the tank farm except at the 203A Building.

H.1.4.3 211A Tank Farm

This facility consisted of an above grade tank farm with concrete secondary containment basins. Only tank TK-40 was a DWMU. The tank farm is located north of the 202A Building and south of the 203A Tank Farm.

H.1.4.3.1 Signs

Prior to removal of Tank TK-40 signs were posted at the following locations around the 211A Tank Farm:

- Four signs along the perimeter concrete walls of the secondary containment basins around the four northernmost tanks in the 211A Tank Farm:
  - One sign on the north side.
  - One sign on the west side.
  - One sign on the south side near the southeast corner.
  - One sign on the east side.

H.1.4.3.2 Barriers

The 211A Tank Farm was located inside the perimeter fences.

H.1.5 Inspection Information

Tanks TK-P4 and TK-40 have been removed, thus inspection of the tanks is no longer required. Since final RCRA closure will be coordinated with the 200-CP-1 Operable Unit (OU), inspections are described in Table H-2.

Table H-2 TK-P4 and TK-40 Inspection Requirements

Inspection Item	Frequency*	Types of Problems and Acceptable Conditions
PUREX Facility		
203A and 211A Tank Farms Area		
Signage	Annually	Problem: “Danger - Unauthorized Personnel Keep Out” signs, or equivalent signs, are not present or not in satisfactory conditions at locations described in Section H.1.4.1.3. Acceptable condition: Signs are present, not damaged, unobstructed and readable from a distance of 25 ft, or more.

*Unless otherwise noted, inspection frequencies are defined by the following periodicities: Annually means at least once per 12-month period ±30 days

H.2 GROUNDWATER MONITORING

Tanks TK-40 and TK-P4 will be closed by removal or decontamination, and are not subject to any groundwater monitoring requirements.

H.3 CLOSURE PERFORMANCE STANDARDS

The standards for closure of PUREX Tanks TK-P4 and TK-40 will be in accordance with the requirements of WAC 173-303-610 and WAC 173-303-640, *Tank systems*. The closure performance standards of WAC l73-303-610(2)(a)(i) through (iii) require the owner or operator to close the facility in a manner that will accomplish the following objectives:

- Minimize the need for further maintenance.
- Control, minimize, or eliminate post-closure escape of dangerous waste, dangerous waste constituents, leachate, contaminated runoff, or dangerous waste decomposition products to the ground, surface water, groundwater, or the atmosphere to the extent necessary to protect human health and the environment.
- Return the land to the appearance and use of surrounding land areas.

Tanks TK-P4 and TK-40 will be clean closed by removal of the tanks and secondary containment structures, and sampling the soil beneath the containment structures. The soil will be sampled and must meet clean-closure levels. In accordance with WAC 173-303-610(2)(b)(i), clean-closure levels for soil are the numeric cleanup levels calculated using unrestricted use exposure assumptions according to WAC 173-340, *Model Toxics Control Act – Cleanup* (hereinafter called MTCA), cleanup regulations (WAC 173-340-700, *Overview of cleanup standards*, through WAC 173-340-760, *Sediment cleanup standards*, excluding WAC 173-340-745, *Soil cleanup standards for industrial properties*). These numeric cleanup levels have been calculated according to the requirements of WAC 173-303-610(2)(b)(i) as of the effective date of the permit modification. These cleanup levels consider carcinogens, noncarcinogens, groundwater protection, and ecological indicator values. The closure performance standards are provided in Table H-3. Soil sampling and analysis will be conducted in accordance with the approved sampling and analysis plan (SAP) located in Section H.6 of this plan.

Clean closure will eliminate the need for future post-closure inspections, monitoring, and maintenance resulting from contamination from DWMU constituents. After clean closure, appearance of the land will be consistent with future land-use determinations for adjacent portions of the 200 Areas as an industrial-exclusive portion of the Hanford Site. This land use is consistent with the formal determination made for this portion of the 200 Areas, as described in 64 Federal Register (FR) 61615, “Record of Decision: Hanford Comprehensive Land-Use Plan Environmental Impact Statement (HCP EIS).”

Table H-3 Performance Standards for Target Analytes

Analyte	Chemical Abstracts Service Number	Closure Performance Standard[a]	
		Value (mg/kg)	Basis
Inorganics			
Ignitability[b]	--	Not applicable	--
Corrosivity[b]	--	Not applicable	--
Arsenic	7440-38-2	2.00E+01	Hanford Site Background[c, d]
Barium	7440-39-3	1.32E+02	Hanford Site Background[d]
Cadmium	7440-43-9	6.90E-01	GW Protection
Chromium	7440-47-3	1.85E+01	Hanford Site Background[d]
Lead	7439-92-1	5.00E+01	Ecological – Plants
Mercury	7439-97-6	2.00E-01	PQL
Selenium	7782-49-2	1.00E+01	PQL
Silver	7440-22-4	2.00E+00	Ecological – Plants
Tributyl Phosphate	126-73-8	1.11E+02	Method B – Noncarcinogen

[a]Screening levels were drawn from the following viable exposure pathways:

- MTCA Cleanup Levels and Risk Calculation (CLARC) II Tables, February 1996. MTCA (WAC 173-340-740, Model Toxics Control Act—Cleanup, *Unrestricted land use soil cleanup standards*) Method B values represent both carcinogen and noncarcinogen human health risk values from direct soil contact. The most conservative value of the two Method B published values was used. Method A values were substituted when MTCA Method B values were not provided in the CLARC tables.
- MTCA (WAC 173-340-750, *Cleanup standards to protect air quality*) Method B. Values listed are for carcinogen and noncarcinogen levels that represent human health risk due to inhalation of vapors and dust.
- MTCA (WAC 173-340-747, *Deriving soil concentrations for groundwater protection*). WAC 173-340-747(4) describes the fixed parameter three-phase partitioning model. Where applicable, these values were used. Values selected were from the 13°C vadose zone. If values were not listed for 13°C, then values from 25°C vadose zone were used.
- MTCA (WAC 173-340-7493, *Site-specific terrestrial ecological evaluation procedures*). Values used were taken from Table 749-3 including plants, biota, and wildlife.

  Of the viable exposure pathways, the most conservative closure performance standard value was selected. If the selected closure performance standard value fell below than the Hanford Site background level or the laboratory PQL, then the higher of these two values (i.e., Hanford Site background level vs. PQL) was selected.

[b]The soil does not exhibit the characteristic of ignitability or corrosivity.

[c]The Hanford Site closure performance standard for arsenic is 20 mg/kg based on Ecology, 2013, "Issues Associated with Establishing Soil Cleanup Levels for Arsenic," indicating that the MTCA Method A soil performance standard of 20 mg/kg can be used to define natural background levels when developing Method B soil closure performance standards for the Hanford Site.

[d]Hanford Site background values are based upon ECF-HANFORD-11-0038, *Soil Background for Interim Use at the Hanford Site*, and DOE/RL-92-24, *Hanford Site Background: Soil Background for Nonradioactive Analytes*.

CLARC = Cleanup Levels and Risk Calculation
GW = Groundwater
MTCA = Model Toxics Control Act
PQL = Practical Quantitation Limit

H.4 CLOSURE STRATEGY

The proposed clean closure strategy is based primarily on review of the operational history, operational records, waste management records, and visual inspections of PUREX Tanks TK-P4 and TK-40. Waste was removed from both tanks in 1996, and deactivation was completed in 1998. Since that time, routine S&M inspections have been performed. Windblown debris is removed on a periodic basis from the secondary containment structures surrounding each tank.

Based on the historical process review, Tanks TK-P4 and TK-40 are candidates for clean closure under WAC 173-303, and verification sampling will be performed. Sampling and analysis activities were developed using the results of record reviews (EPA/240/R-02/005, *Guidance on Choosing a Sampling Design for Environmental Data Collection* [EPA QA/G-SS]; Ecology Publication 94-111, *Guidance for Clean Closure of Dangerous Waste Units and Facilities*) and will be conducted via a SAP (Section H.6.1). The objective of the sampling described in this closure plan is to determine if MTCA unrestricted use standards for soil will be met for the target analytes identified in Table H-3 after removal of the two tanks, demonstrating clean closure of the soil underneath the secondary containment structures.

H.4.1 Preclosure Activities

Preclosure activities are documented in DOE/RL-95-78, *PUREX Facility Preclosure Work Plan*. PUREX Tanks TK-P4 and TK-40 were flushed and emptied to a minimum heel in 1996, as described in Section H.1.2. The flushed solutions meet the definition of nondangerous waste. For additional information on the flushing solutions used in Tanks TK-P4 and TK-40, see Section H.1.2.

H.4.2 Clean Closure Strategy

Tanks TK-P4 and TK-40 are abovegrade and will be clean closed by removing the storage tanks and the concrete secondary containment structures which will meet the requirements of WAC 173-303-610(2)(b)(ii). In accordance with WAC 173-303-610(2)(b)(i), the clean closure levels for soil will be the numeric cleanup levels calculated using unrestricted use exposure assumptions in accordance with MTCA.

Once the tanks have been removed, a visual inspection will be performed of the secondary containment to identify potential additional focused sampling locations. After removal of the secondary containment structures, a visual inspection will be performed to identify stains on the remaining soil. Sampling and analysis will be performed to verify clean closure for the soil underlying Tanks TK-P4 and TK-40 (see Section H.6 in this closure plan). A focused sampling approach is proposed to collect soil samples at locations where contamination is more likely to be present. Focused sampling involves the selective sampling of areas where potential or suspected soil contamination would be expected if a release of a hazardous substance had occurred. Focused sampling is distinguished from probability-based sampling in that inferences are based on professional judgment, not statistical scientific theory. Therefore, conclusions about the target population are limited and depend entirely on the validity and accuracy of professional judgment.

The use of statistical evaluation for focused data is not possible. Any focused data must be reviewed directly against the closure performance standards as to whether they are above or below the standards.

Locations proposed for focused sampling include soil beneath containment structure sumps, beneath each tank, and at the perimeter of the respective containment structures for Tanks TK-P4 and TK-40. Focused samples also may be collected where there is evidence of cracks in the concrete, concrete joints, or degradation of coating within the secondary containment. If sampling and analysis of the soil underlying Tanks TK-P4 and TK-40 show that the closure performance standards cannot be achieved, a permit modification will be prepared in accordance with WAC 173-303-610(3)(b) and WAC 173-303-830, *Permit changes* to modify the closure plan so that RCRA closure is coordinated with the 200-CP-1 OU. The waste site will be added to the list of 200-CP-1 waste sites. The remedial decision will decide if additional closure actions will be performed and may include clean closure by removal of soil, or development of a post-closure plan for closure as a landfill.

H.5 CLOSURE ACTIVITIES

Clean closure of PUREX Tanks TK-P4 and TK-40 will include the following activities:

- Review operating and inspection records.
- Perform visual inspection of secondary containment structures to identify additional focused sampling locations.
- Removal and demolition of Tanks TK-P4 and TK-40 and associated structures (i.e., piping, secondary containment).
- Perform visual inspection of soil beneath secondary containment to identify additional focused sampling locations (i.e., staining).
- Perform focused sampling of the soil to confirm that clean-closure standards are met.
- Transmit closure certification to the Washington State Department of Ecology (Ecology).

Verification sampling will be performed to confirm that concentrations of dangerous waste are below cleanup performance standards. If sampling and analysis of the soil underlying Tanks TK-P4 and TK-40 show that the closure performance standards cannot be achieved, a permit modification will be prepared in accordance with WAC 173-303-610(3)(b) and WAC 173-303-830 to modify the closure plan so that RCRA closure is coordinated with the 200-CP-1 OU.

H.5.1 Facility Demolition and Disposal

Demolition of Tanks TK-P4 and TK-40 will include removal of the abovegrade tanks, the piping to the closest influent and effluent valves, and the secondary containment structures for each individual tank. Field activities regarding the removal of the two tanks, the demolition of the secondary containment structures, and the sampling of the underlying soil will be coordinated with the CERCLA removal action that will address the entirety of the 203A Acid Storage Area and the 211A Chemical Storage Area. The tanks, their contents, and any waste generated from stabilization and demolition activities during closure will be disposed in accordance with WAC 173-303-610(5) and applicable regulations.

Water may be used to control dust generated from demolition activities. The amount of water used will be minimized to prevent ponding and runoff. While unlikely, other controls such as portable ventilation filter units, high-efficiency particulate air (HEPA)-filtered vacuum cleaners, greenhouses, and/or fogging agents may be used. Additional stormwater run-on and runoff controls may be implemented, as needed. Based on historical records, microencapsulation is the only treatment that may be required for the dangerous waste generated from this closure activity. Treatment may be deemed necessary to provide safe transportation, or to meet disposal facility waste acceptance criteria. The waste will be treated to meet all applicable requirements in WAC 173-303-140, *Land disposal restrictions* and, by reference, 40 Code of Federal Regulations (CFR) 268, *Land Disposal Restrictions*, prior to disposal at the Hanford Site Environmental Restoration Disposal Facility (ERDF) (discussed in Section H.5.2) or an approved RCRA treatment, storage, and disposal (TSD) unit. Waste generated from this closure activity will be disposed at ERDF or an approved RCRA TSD unit in accordance with DOE/RL-2010-102, *Action Memorandum for Decontamination, Deactivation, Decommissioning, and Demolition (D4) Activities for 200 East Tier 2 Buildings/Structures* and TPA-CN-722, DOE/RL-2010-102, Rev 0., *Action Memorandum for Decontamination, Deactivation, Decommissioning, and Demolition (D4) Activities for 200 East Tier 2 Buildings/Structures*.

H.5.1.1 Mobilization and Site Preparation

Demolition mobilization and site preparation include the activities necessary for field setup and closure action implementation. This includes obtaining field crew resources, equipment, and materials; and performing field job site activities (e.g., providing worker support infrastructure, waste management areas, and other site preparation as required). Global positioning system (GPS) coordinates of the specified sample locations identified in Figures H-4 and H-5 will be determined prior to removal of the secondary containment. The GPS locations will be taken using the NAD83, *North American Datum of 1983*, State Plane Washington South coordinate system and will ensure that after removal of the secondary containment structures, the verification sampling may be laid out (Section H.6). Other prework tasks may include installing barriers and postings, performing site walk downs, completing predemolition reviews, and testing equipment.

H.5.1.2 Tank Removal

Tanks TK-P4 and TK-40 will be dismantled and demolished using standard industry or conventional demolition practices with heavy equipment. Demolition of Tanks TK-P4 and TK-40 will include removing the tank and associated piping to the closest influent and effluent valves using an excavator with a shear attachment. The tanks will be disconnected from the influent and effluent lines, and an absorbent material will be added to ensure that free liquids no longer remain. Due to the size of each of the tanks, the tanks will be cut into pieces using an excavator with a shear attachment, placed into roll-on/roll-off containers, and transported to ERDF for disposal. Demolition and removal of the tanks will be coordinated with the demolition and removal of all collocated abovegrade CERCLA-regulated tanks and structures in the 203A Acid Storage Area and 211A Chemical Storage Area. Field adjustments may be made, if necessary, and will be documented in the closure report. Waste generated from tank removal will be managed as described below.

A visual inspection will be performed of each tank to determine if there is a heel. In the event that a heel is present, it will be sampled. If the heel does not designate as dangerous waste, the heel and the tank debris will be managed as low-level waste and sent to ERDF for disposal. If the heel designates as dangerous waste, DOE will determine the treatment options and methods to characterize the tank debris.

There are the following four options to treat the heel if it designates as dangerous waste:

- Option 1: Remove the liquid heel before cutting the tank into pieces. The heel will be treated at PUREX and/or ERDF or another approved RCRA TSD facility; or
- Option 2: Treat the liquid heel inside the tank. The heel will be removed before cutting the tank into pieces; or
- Option 3: Remove a large solid heel before or during cutting the tank into pieces. The heel will be treated at PUREX and/or ERDF or another approved RCRA TSD facility; or
- Option 4: A small solid heel will be left in place when the tank is cut into pieces. The heel will be managed together with the tank debris as described below.

There are three methods to characterize the tank debris. The methods, in the following order of preference, include:

- Method 1: Visually inspect and photograph tank interior wall to determine if it meets the "clean debris standards" in 40 CFR 268.45, *Treatment standards for hazardous debris*, Table 1, footnote 3.
- Method 2: Conduct physical sampling (e.g., coupon cutting, accumulation scraping, etc.). The ability to sample is contingent on the feasibility of cutting coupons due to metal thickness and accessibility to areas of accumulation.

- Method 3: Visually inspect and photograph tank wall to allow the project to correlate the estimated amount of accumulation on the tank wall with the analytical results of the heel to perform a hazardous/mixed waste evaluation.

If Method 1 shows that the tank debris meets the "clean debris standards," or if analytical results (Method 2) or a hazardous/mixed waste evaluation (Method 3) show that the tank debris does not designate as dangerous waste, then it can be sent ERDF as low-level waste.

If Method 1 shows that the tank debris does not meet the "clean debris standards," or if analytical results (Method 2) or a hazardous/mixed waste evaluation (Method 3) show that the tank debris does designate as dangerous waste, then the project will determine treatment options:

- Rinse tank debris and treat rinsate on- or off-site, as appropriate. Send rinsed tank debris to ERDF and send the treated rinsate to an appropriate and approved disposal facility. The rinsed tank debris will be evaluated according to Method 1.
- Send tank debris as hazardous/mixed waste to ERDF for treatment.

H.5.1.3 Secondary Containment Demolition

Secondary containment demolition will be coordinated with CERCLA NTCRA activities for the 203A Acid Storage Area and 211A Chemical Storage Area in accordance with the specifications discussed in the following sections.

Demolition of the secondary containment structures will require the use of heavy equipment (e.g., excavator with various attachments). Other standard industry or conventional demolition practices may also be used (e.g., hydraulic shears with steel shear jaws, concrete pulverizer jaws, or breaker jaws). Selection of demolition methods will be based on the structural elements to be demolished, remaining contamination, location, and integrity of the structure. Field adjustments may be made, if necessary, and will be documented in the closure report.

The following steps will be taken to determine how secondary containment demolition waste will be managed:

- Take a least one core sample in areas with the highest likelihood of chemical depositions such as sumps and drains. Additional samples may be taken in areas where staining is observed.
- Core completely through the selected sample points to acquire representative samples of the slab.
- If results of a sample point show that the concrete sample designates as dangerous waste, then:
    - Perform additional sampling to better identify and isolate the area of contamination.
    - Project will determine the feasibility to remove isolated areas of contamination. Physical impediments or hazards may prevent targeted removal.
    - Remove area of contamination, if possible, or evaluate area of contamination in relation to the entire secondary containment structure to complete a hazardous/mixed waste evaluation for disposal.
    - Send hazardous/mixed waste to ERDF for treatment.
    - If sample results show that the concrete samples do not designate as dangerous waste, then send to ERDF and dispose as low-level waste.

H.5.1.3.1 Tank TK-P4 Secondary Containment

The secondary containment structure for Tank TK-P4 is a reinforced-concrete, 1.8 m (6 ft) high storage basin measuring 18.3 by 15.2 m (60 by 50 ft) (278.7 m^2 [3,000 ft^2]). It is located in the southeast quadrant of the 203A Acid Storage Area. Three additional abovegrade storage tanks and other equipment are located within this quadrant of the concrete storage basin and will be removed, treated (if required), and disposed prior to demolition of the secondary containment. The secondary containment structure for Tank TK-P4 will be removed after all of the abovegrade RCRA DWMU and CERCLA NTCRA tanks have been removed. Heavy equipment (e.g., excavator with various attachments) will be used to demolish the containment structure.

The secondary containment walls and floor will be demolished. Debris will be loaded into roll-on/roll-off containers for treatment, if required, and disposal at ERDF.

H.5.1.3.2 Tank TK-40 Secondary Containment

The secondary containment structure for Tank TK-40 is a reinforced-concrete, diked area measuring approximately 1,533 m^2 (1,650 ft^2), and it occupies the northeast quadrant of the 211A Chemical Storage Area Secondary Containment Area. Removal of the TK-40 secondary containment will be coordinated with the CERCLA removal action for the 211A Chemical Storage Area. Heavy equipment (e.g., excavator with various attachments) will be used to demolish the containment structure.

The walls and floor of the secondary containment structure will be demolished and loaded into roll-on/roll-off containers for treatment, if required, and disposal at ERDF.

H.5.1.4 Decontamination

Decontamination of Tanks TK-P4 and TK-40 is described in Section H.5.1.2. Decontamination of the secondary containment structures containment structures is not planned. Both of the storage tanks and their secondary containments will be demolished and placed in roll-on/roll-off disposal containers for transport to ERDF. If equipment is contaminated, it will be decontaminated using dry methods (e.g., brushing, wiping, and using HEPA-filtered vacuum cleaners) to the extent possible. When the use of wet methods (e.g., water wash and pressure washers) is required to achieve decontamination objectives, the associated water or cleaning solutions will be collected and work will be conducted by trained site workers in accordance with best management practices.

H.5.1.5 Stabilization

Because the closure activities at Tanks TK-P4 and TK-40 will be coordinated with the NTCRA for the 203A Acid Storage Area and the 211A Chemical Storage Area, site stabilization after RCRA closure activities will be conducted under the removal action work plan for the NTCRA. After sampling activities have been conducted, the sites will be leveled to mitigate potential industrial safety hazards and not unduly hinder any future remediation in the immediate vicinity. The areas will be used as a staging area for nearby removal activities. Equipment will not be staged permanently. Thus, if additional sampling will be necessary, the equipment can be removed.

H.5.1.6 Completion Criteria

The demolition will be considered complete after all waste has been removed, all waste generated during demolition is dispositioned, the soil beneath the secondary containment structures has been sampled, and sampling results have been documented. If sampling and analysis of the soil underlying tanks TK-P4 and TK-40 show that the closure performance standards cannot be achieved, a permit modification will be prepared in accordance with WAC 173-303-610(3)(b) and WAC 173-303-830 to modify the closure plan so that RCRA closure is coordinated with the 200-CP-1 OU.

H.5.2 Waste Management

A variety of waste streams may be generated under this closure action and will be in solid and liquid form. Nondangerous demolition and decontamination waste will also be generated, as described in Sections H.5.1.2 through H.5.1.4. The generator and storage requirements of WAC 173-303-610, will be followed for management of any dangerous or mixed waste that cannot be transported promptly to ERDF.

Waste generated through implementation of this closure action will be treated, if required, and disposed at ERDF or an approved RCRA TSD unit. ERDF is the preferred waste disposal facility. Waste is expected to meet the waste acceptance criteria of ERDF-00011, *Environmental Restoration Disposal Facility Waste Acceptance Criteria*. Waste volume-reduction practices (e.g., minimizing cross-contamination during the remedial action or segregation of clean materials from contaminated materials) will be implemented where feasible. Waste management activities include waste characterization, designation, staging, packaging, handling, marking, labeling, segregation, storage, transportation, treatment, and disposal. These waste management activities are briefly described in the following sections.

H.5.2.1 Projected Waste Streams

One or all of the following waste streams are anticipated to be generated during the closure action and may fall into any combination of these categories (mixed, hazardous, and dangerous):

- Stainless-steel and carbon-steel tanks and heel contents.
- Piping and metal support structures.
- Concrete and associated debris.
- Soil (likely waste stream due to the use of large equipment to remove the concrete).
- Miscellaneous waste (e.g., rubber, glass, paper, personal protective equipment, cloth, plastic, and metal).
- Equipment and construction materials.

H.5.2.2 Waste Management and Characterization

Dangerous and mixed wastes will be packaged, stored, and transported to prevent dispersion and public exposure. Waste specific storage and packaging requirements will comply with WAC 173-303, as applicable. Waste that designates as dangerous waste will be treated prior to disposal. Nondangerous demolition and decontamination waste will also be generated, as described in Sections H.5.1.2 through H.5.1.4.

Waste generated through implementation of this closure action will be characterized in accordance with the waste acceptance criteria of the receiving facility. Characterization is performed using a variety of information that includes, but is not limited to, process knowledge, historical analytical data, sampling and analysis, and radiological and chemical screening.

H.5.2.3 Waste Handling, Storage, and Packaging

Marking, labeling, segregating, and staging of waste containers will be performed or directed by a waste specialist. If containers of dangerous waste cannot be shipped directly to the disposal site, the containers may be stored at Hanford Site TSD units that are permitted to operate as container storage areas until the waste can be disposed. Dangerous or mixed waste may also be accumulated in accordance with the generator requirements of WAC 173-303-170, *Requirements for generators of dangerous waste*.

H.5.2.3.1 Management of Bulk Waste

All demolition waste from these closure activities is expected to be in bulk form. Bulk waste will be placed in ERDF cans for eventual disposal at ERDF or other approved RCRA TSD units. The bulk containers will be accumulated in a suitable area adjacent to the 203A or 211A storage areas or may be accumulated for up to 90 days in another suitable Hanford Site location. Bulk containers will be covered when waste is not being added or removed. Lightweight material (e.g., plastic and paper) will be bagged, if appropriate, prior to placement in the bulk container to eliminate the potential for materials blowing out of the bulk container or truck. Applicable packaging and pretransportation requirements for dangerous or mixed waste generated by the closure action will be identified and implemented before the waste is moved. A fixative will be applied to the demolition site and any loose soil as necessary to help control dust and radiological and nonradiological contaminants.

H.5.2.3.2 Management of Waste Containers

While not expected, nonbulk waste may be generated and placed in a container (usually a 208.2 L [55 gal]) drum. Nonbulk containers or packages of waste requiring tracking (e.g., hazardous and mixed) will be assigned a unique tracking number by a waste specialist. If a container is not in good condition, the contents will be transferred to a container in good condition. Waste containers are inspected before use to ensure container integrity. The containers will be stored/staged in a suitable area adjacent to the 203A and 211A storage areas or may be staged for up to 90 days in another suitable Hanford Site location. Containers awaiting analytical results will be marked and labeled, as appropriate. Weekly inspections of the containers will be performed to document the integrity, container marking/labeling, physical container placement, storage area boundaries/identification/warning signs, and evidence of any potential leakage. Containers showing signs of deterioration will be identified during container inspection and overpacked or repackaged, as necessary. Once the waste containers are staged, the containers will remain closed, except when adding or removing wastes (e.g., during packaging and waste inspection activities).

H.5.2.3.3 Waste Profile

Waste profiling for establishing values for the waste-tracking form may take place concurrently with closure action activities. Field-screening measurements may be used to obtain data to adjust the waste-tracking form. The waste profile may be adjusted (as necessary) through a combination of in-process field-screening methods and analytical laboratory analysis.

H.5.2.3.4 Final Waste Disposal

Waste that designates as dangerous waste will be treated prior to disposal. Nondangerous demolition and decontamination waste will also be generated, as described in Sections H.5.1.2 through H.5.1.4. ERDF is the preferred disposal location for waste meeting the facility's waste acceptance criteria, as it is engineered to meet appropriate RCRA technological requirements for landfills as described in EPA et al., 1995, *Record of Decision, U.S. DOE Hanford Environmental Restoration Disposal Facility, Hanford Site, Benton County, Washington*.

H.5.2.3.5 Waste Disposal Records

Original on-site waste-tracking forms will be sent to ERDF with each container shipped. Original sample reports and a copy of the original on-site waste tracking form for each ERDF container will be retained and forwarded to the assigned waste specialist for inclusion in the project file following final waste disposition.

H.5.2.4 Waste Treatment

Waste from this closure activity will treated as potential dangerous/mixed waste. Waste that is not dangerous/mixed waste will be managed as low-level waste. Based on available information, dangerous/mixed waste will be treated using microencapsulation to meet land disposal restrictions standards. If additional treatment is required to verify compliance with applicable land disposal restrictions treatment standards or disposal unit waste acceptance criteria, such treatment may be conducted at the generating site. Residuals from treatment of waste originating from activities addressed in this closure plan will be disposed at ERDF if the treatment residuals meet the facility's waste acceptance criteria.

H.5.2.5 Waste Minimization and Recycling

Waste minimization practices will be followed to the extent technically and economically feasible during waste management. Introduction of clean materials into a contamination area, as well as contamination of clean materials, will be minimized to the extent practicable. Emphasis will be placed on source reduction to eliminate or minimize the volume of waste generated. Materials released off-site for disposal/recycle must be certified.

H.5.3 Air Emissions

There is no expectation that substantial emissions of criteria and toxic air pollutants will result from demolition activities. Airborne emissions associated with closure activities will be minimized by the use of appropriate work controls. Potential radiological air emissions will be evaluated and licensed as a separate action from RCRA closure requirements under the *Clean Air Act of 1977* by following the requirements in WAC 246-247, *Radiation Protection–Air Emissions*. Airborne releases of contaminants during closure activities will be controlled in accordance with DOE radiation control and substantive air pollution control standards in order to maintain emissions of air pollutants at the Hanford Site to as low as reasonably achievable levels. Minimal operations are expected with deactivation methods (e.g., welding or laser cutting) reaching temperatures greater than 100°C (212°F).

Prior to demolition, tank contents will be inspected to determine whether residual heel material is in liquid or solid form. Absorbent material will be added to stabilize liquid heels, and fixatives may be applied to tank sidewalls and floor to prevent airborne release of particulates during demolition.

Reasonable precautions will be taken to minimize visible dust emissions from active structural demolition with standard emission control techniques. Active excavations shall use water or crusting agents (e.g., Soil-Sement®) for dust control. Water usage for dust control will be minimized to protect against contaminant migration. Crusting agents or fixatives will be applied to any disturbed portion of the contamination area that will be inactive for more than 24 hours. Material to be treated (if required) and disposed of at ERDF will also comply with the moisture content and other applicable requirements of the ERDF waste acceptance criteria (ERDF-00011). Crusting agents or fixatives are applied to the demolition and excavation site when potential concerns arise about health issues or the spread of contamination.

The applicability of WAC 173-400-110, General Regulations for Air Pollution Sources, *New source review (NSR) for sources and portable sources*; and WAC 173-460, *Controls for New Sources of Toxic Air Pollutants*, was evaluated. The scope of the proposed activity does not meet the definitions of a new source per WAC 173-400-030, *Definitions*; or a modification per WAC 173-400-030(44); or a new toxic air pollutant source per WAC 173-460. A review of the tank constituents was conducted, and none of the toxic air pollutants regulated under WAC 173-460-150, *Table of ASIL, SQER and de minimis emission values*, were potentially present above *de minimis* concentrations.

®Soil-Sement is a registered trademark of Midwest Industrial Supply, Inc., Canton, Ohio.

H.5.4 Health and Safety Requirements

Closure will be performed in a manner that ensures the safety of human health and the environment. Qualified personnel will perform any necessary closure activities in compliance with established safety and environmental procedures. Personnel will be equipped with appropriate personal protective equipment. Qualified personnel will be trained in applicable safety and environmental procedures and will have received appropriate training and experience in sampling activities (Table H-4). Field operations will be performed in accordance with applicable health and safety requirements. If an emergency would occur, the on-call building emergency director will be notified, and the requirements associated with DOE/RL-94-02, *Hanford Emergency Management Plan*, will be implemented.

Required training for field, environmental, and emergency personnel is provided in Table H-4. Soil and groundwater samplers will be trained in accordance with Permit Attachment 8, *Inspection and Training Plan for Groundwater Monitoring Wells* (WA7890008967).

Training records are maintained for each employee in an electronic training record database. The permittee training organization maintains the training records system. Training records will be kept until Ecology approves certification of closure for tanks TK-P4 and TK-40.

H.5.5 State Environmental Policy Act

Revised Code of Washington (RCW) 43.21C, *State Environmental Policy* (also known as the State Environmental Policy Act), requires the environmental effects of a proposal to be described and evaluated before decisions are made by Ecology. A State Environmental Policy Act checklist was prepared for this proposed action. The purpose of this checklist is to provide information to help identify impacts for the action (i.e., closure of Tanks TK-P4 and TK-40 and their secondary containments) and to reduce or avoid impacts from this action.

Table H-4 Personnel Training

Course Number	Course Title/Description	Frequency	Training Type[a]	Job Title/Position							
				Maintenance Craft	Waste Shipper	FWS	WMR	NCO	ECO	BED	D&D Workers
General Training											
000001/ 000019	Hanford General Employee Training (CBT) • General safety, security, radiological protection, and emergency preparedness requirements.	Annual	GHFT, CPT	X	X	X	X	X	X	X	X
Facility Health & Safety											
290200[b]	Project Orientation and FEHIC (CBT) • Hazard recognition, communication/information, waste management, and emergency response.	Annual	GHFT, CPT	X	X	X	X	X	X	X	X
Building Emergency											
02028B	BED Initial Training (Classroom) • Prepare, respond, and recover from emergency events and responsibilities as outlined in DOE/RL-94-02.	Initial	ECT							X	
037515	BED Refresher Training (CBT) • Refresher for BED performance expectations and responsibilities as outlined in DOE/RL-94-02.	Annual	ECT							X	
304451	Project BED Qualification Card Checklist (OJT) • Emergency response actions and responsibilities of the BED specific to project facilities.	Initial	ECT							X	

Table H-4 Personnel Training

Course Number	Course Title/Description	Frequency	Training Type[a]	Job Title/Position							
				Maintenance Craft	Waste Shipper	FWS	WMR	NCO	ECO	BED	D&D Workers
ECO Training											
600100	ECO Core (OJT) • Knowledge of environmental regulations, permits, regulator inspections and notifications, recordkeeping, and pollution prevention practices.	Initial	OT						X		
Waste Operations											
02006G	Waste Management Awareness (Classroom) • Waste minimization, waste generation duties and responsibilities, notification, and recordkeeping.	Initial	OT	X[c]		X[c]					X
020078	Advanced Mixed Waste Shipper Certification Training (Classroom) • Shipping techniques on hazardous waste labels, containers, packing, and manifesting.	Every 3 years	OT		X						
020159	Advanced Hazardous Waste Shipper Certification Training (Classroom) • Shipping techniques on hazardous waste labels, containers, packing, and manifesting.	Every 3 years	OT		X						

Table H-4 Personnel Training

Course Number	Course Title/Description	Frequency	Training Type[a]	Job Title/Position							
				Maintenance Craft	Waste Shipper	FWS	WMR	NCO	ECO	BED	D&D Workers
035010	Waste Designation (Classroom) • Dangerous waste designation and land disposal restrictions according to WAC 173-303.	Initial	OT				X				
035012	Waste Designation Qualification (Classroom) • Waste designation and land disposal restrictions according to WAC 173-303.	Annual	OT				X				
035100	Container Management Initial (Classroom) • Waste minimization and pollution prevention, waste designation categories, recordkeeping, and container inspection and management.	Initial	OT	X[c]		X[c]	X	X			
035110	Container Waste Management Refresher (CBT) • Waste minimization and pollution prevention, waste designation categories, recordkeeping, and container inspection and management.	Annual	OT	X		X	X	X			
153020	Waste Fundamentals Qualification Card (OJT) • Waste designation, waste management, land disposal restrictions, and recordkeeping.	Initial	OT				X				

Table H-4 Personnel Training

Course Number	Course Title/Description	Frequency	Training Type[a]	Job Title/Position							
				Maintenance Craft	Waste Shipper	FWS	WMR	NCO	ECO	BED	D&D Workers
153021	WMR Qualification Card (OJT) • Work control activities, waste planning and packaging documentation, and transportation requirements.	Initial	OT				X				
290004	Project NCO Waste Handler Qualification • Waste handling, packaging, and storage.	Every 2 years	OT					X			

[a]Training types are provided in Attachment 5 of WA7890008967, Hanford Facility Resource Conservation and Recovery Act Permit.

[b]Escorted personnel do not require training in course 290200.

[c]Maintenance Craft and FWS supervising Maintenance Craft and D&D workers may take course 02006G or 035100. FWS supervising NCOs must take courses 035100 and 035110.

BED = Building Emergency Director
CBT = Computer-based Training
CPT = Contingency Plan Training
D&D = Decontamination and Decommissioning
ECO = Environmental Compliance Officer
ECT = Emergency Coordinator Training
FEHIC = Facility Emergency and Hazard Identification Checklist
FWS = Field Work Supervisor
GHFT = General Hanford Facility training
NCO = Nuclear Chemical Operator
OJT = On-the-job Training
OT = Operations Training
WMR = Waste Management Representative

H.5.6 Confirmation of Clean Closure

Tanks TK-P4 and TK-40 will be clean closed through sampling and analysis of the soil beneath the secondary containment structures. Soil sample results from the contract analytical laboratory will be reviewed to confirm that target analytes have met closure performance standards (Section H.3 of this plan). Once clean closure has been confirmed, closure certification will be prepared in accordance with Section H.9.

If sampling and analysis of the soil underlying Tanks TK-P4 and TK-40 show that the closure performance standards cannot be achieved, a permit modification will be prepared in accordance with WAC 173-303-610(3)(b) and WAC 173-303-830 to modify the closure plan so that RCRA closure is coordinated with the 200-CP-1 OU.

H.6 SOIL VERIFICATION SAMPLING AND ANALYSIS

Sampling and analysis of soil will be conducted to confirm that clean closure levels in the soil have been achieved. The SAP summarizes the sampling design used and the associated assumptions based on historical knowledge of Tanks TK-P4 and TK-40. The sampling design includes input parameters used to determine the number and location of samples. Sampling for both tanks will be coordinated with the CERCLA removal action work plan (DOE/RL-2016-47, *Removal Action Work Plan for the PUREX Complex Tier 2 Buildings/Structures*). The data quality objectives are included within this closure plan and follow the systematic process outlined in EPA/240/B-06/001, *Guidance on Systematic Planning Using the Data Quality Objectives Process* (EPA QA/G-4).

H.6.1 Closure Sampling and Analysis Plan

All sampling and analysis will be performed in accordance with the sampling and quality standards established in the closure SAP. Sampling and analysis activities will meet applicable requirements of the most current versions of SW-846, *Test Methods for Evaluating Solid Waste: Physical/Chemical Methods*, Third Edition; Final Update V; ASTM International (formerly the American Society for Testing and Materials) standards; U.S. Environmental Protection Agency (EPA)-approved methods; and DOE/RL-96-68, *Hanford Analytical Services Quality Assurance Requirements Document* (HASQARD). This SAP also was developed using the guidance provided in Section 7.0 of Ecology Publication 94-111 and EPA/240/R-02/005 (EPA QA/G-5S).

The data obtained by SAP activities will be in compliance with the requirements of WAC 173-303 and 40 CFR 265, *Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities*, to ensure proper closure of Tanks TK-P4 and TK-40. The rationale and methodology for sample collection for the purposes of confirming compliance with WAC 173-303-610(2)(a)(ii) and waste characterization designations will be provided.

H.6.1.1 Target Analytes

The waste codes associated with TK-P4 are metals showing toxicity characteristic (D004-D011), ignitability (D001), and corrosivity (D002). TK-40 has state only dangerous waste criteria (WT02) due to the presence of tributyl phosphate. These waste codes were the basis for the list of target analytes for analysis in this SAP. Table H-1 identifies the waste codes listed for Tanks TK-P4 and TK-40, as well as the target analyte associated with that waste code.

H.6.1.2 Verification Sampling Schedule

Verification closure sampling and analysis will be performed in accordance with the closure plan schedule provided in Section H.8 of this plan.

H.6.1.3 Project Management

The permittee is responsible for planning, coordinating, sampling, preparing, packaging, and shipping samples to the laboratory. The project has the following key positions.

Regulatory Representative. Ecology will assign an Ecology employee as program manager responsible for oversight of the TK-P4 and TK-40 closure.

Project Manager and Technical Lead. The contractor Project Manager provides oversight of closure activities and coordinates with the U.S. Department of Energy, Richland Operations Office (DOE-RL), Ecology, and contract management. In addition, support is provided to the project technical lead to ensure that work is performed safely and cost effectively.

The Project Manager (or designee) for the TK-P4 and TK-40 closure sampling is responsible for direct management of sampling documents and requirements, field activities, and subcontracted tasks. The Project Manager is responsible for ensuring that project personnel are working to the approved version of the TK-P4 and TK-40 closure plan in the permit and for updating field personnel on changes.

The Project Manager works closely with Quality Assurance (QA), Health and Safety, and the Field Work Supervisor (FWS) to integrate these and other lead disciplines in planning and implementing the work scope. The Project Manager also coordinates with DOE-RL and the primary contractor management on all sampling activities. The Project Manager supports DOE-RL in coordinating sampling activities with the Regulatory Representative.

Environmental Compliance Officer. The Environmental Compliance Officer (ECO) provides technical oversight, direction, and acceptance of project and subcontracted environmental work, and develops appropriate mitigation measures with a goal of minimizing adverse environmental impacts.

Health and Safety. The Health and Safety organization is responsible for coordinating industrial safety and health support within the project, as carried out through health and safety plans, job hazard analyses, and other pertinent safety documents required by federal regulation or internal primary contractor work requirements.

Waste Management Lead. The Waste Management Lead communicates policies and protocols, and ensures project compliance for storage, transportation, disposal, and waste tracking.

Field Work Supervisor. The FWS is responsible for planning and coordinating field sampling resources. The FWS ensures that samplers are appropriately trained and available. Additional related responsibilities include ensuring that the sampling design is achievable, understood, and can be performed as specified.

The FWS must document all deviations from procedures or other problems pertaining to sample collection, chain-of-custody protocols, analytes, sample analysis, or sample transport. As appropriate, such deviations or problems will be documented in the field logbook or in nonconformance report forms in accordance with internal corrective action procedures. The FWS is responsible for communicating field corrective actions to the Project Manager and for ensuring that immediate corrective actions are applied to field activities.

Sample Management and Reporting. The Permittee's sampling organization coordinates field sampling as well as laboratory analytical work, ensuring that laboratories conform to the specifications of SW-846 analytical methodology at the time of closure. The sampling organization receives the analytical data from the laboratories, performs the data entry into the Hanford Environmental Information System (HEIS) database, and arranges for data validation. The sampling organization is responsible for informing the Project Manager of any issues reported by the contract analytical laboratory.

Contract Laboratories. The contract laboratories analyze samples in accordance with established procedures and provide necessary sample reports and explanation of results in support of data validation.

The roles described above make up the project organization structure (regarding sampling and analysis) and interact in a manner shown graphically in Figure H-3.

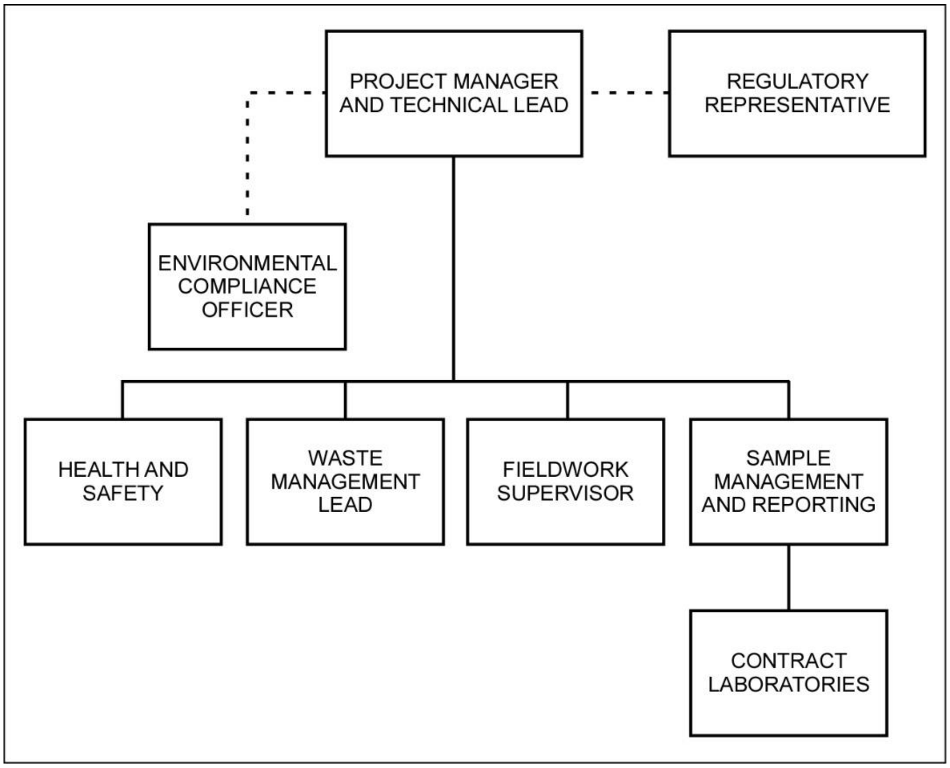


Figure H-3 Sampling and Analysis Plan Project Organization

H.6.2 Sampling Design

The objective of sampling the soil underneath the secondary containment structures of both Tanks TK-P4 and TK-40 is to obtain analytical data to confirm that the underlying soil does not contain contaminants exceeding the clean closure performance standards for the target analytes. Focused sample results will be directly compared to the closure performance standards identified in Table H-3.

This SAP used the guidance provided in Section 7.0 of Ecology Publication 94-111 to determine the type of sampling design to be used to demonstrate clean closure. When designing the sampling plan, both focused and area-wide (grid) sampling methods were considered. Section 7.2.1 of Ecology Publication 94-111 identifies area-wide sampling as appropriate when the spatial distribution of contamination at or from the closure unit is uncertain.

Based on the design of the secondary containment structures, focused sampling has been determined appropriate for Tanks TK-P4 and TK-40. The secondary containment structures are designed with a slight slope toward the floor collection sumps in the event of a spill; therefore, sample locations will be concentrated beneath the floor collection sumps. The perimeter of the secondary containment structures and beneath the edges of each tank will also be sampled. Supplementary sampling may be needed beneath the other tanks within the secondary containment.

Focused sampling involves selective sampling of areas where contamination is expected or releases have been documented. Focused sampling is typically recommended where there is evidence of leaks or spills or potential for a dangerous waste constituent to migrate. Focused sampling could involve linear sampling along a drainage way, boundary, or other linear dimension.

Twenty samples will be collected from soil underlying the secondary containment structure of both Tanks TK-P4 and TK-40. For both tank areas, two soil samples will be collected on either side of the sump, four samples will be collected beneath the edges of the tank, and the remaining samples will be collected at the perimeter of the secondary containment, concentrating on the area along the lower slope.

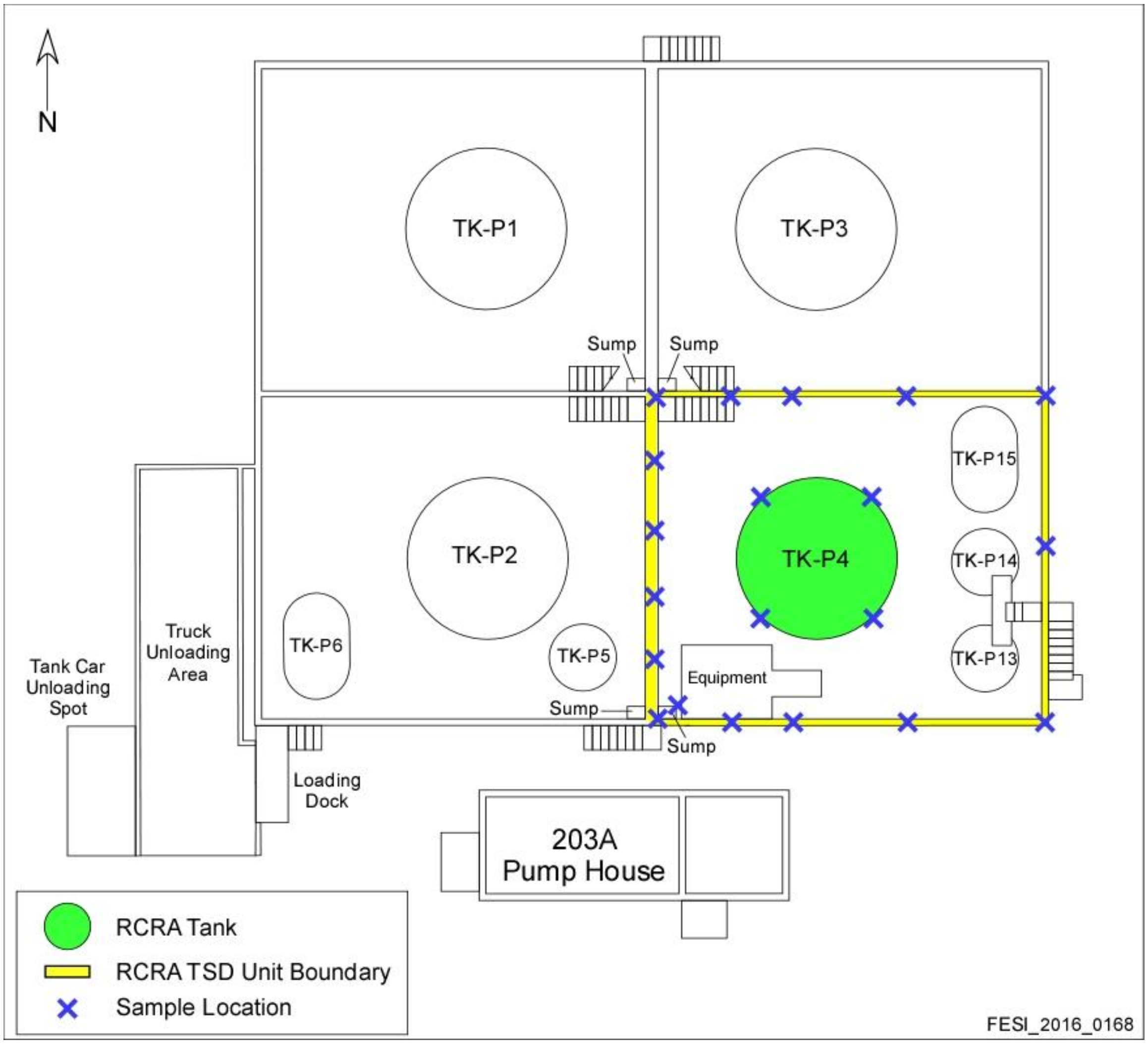
A visual inspection will be performed by the Independent, Qualified, Registered, Professional Engineer (IQRPE) or ECO to identify any cracking or staining of concrete before demolition to determine if additional focused sampling is warranted. The additional tanks within each secondary containment will also be examined by the IQRPE or ECO for evidence of leakage or staining to determine if soil sample collection is needed beneath each tank. GPS coordinates will be taken to determine the locations of these sample locations. After the concrete pads are removed, these locations will be sampled in conjunction with the sample locations. Proposed focused sampling locations are shown in Figures H-4 and H-5, respectively, for Tank TK-P4 and Tank TK-40.

H.6.2.1 Sampling Methods and Handling

The grab sample matrix will consist of soil collected in precleaned sample containers, with samples taken at a depth of 0 to 15.24 cm (0 to 6 in.) below ground surface at the focused sampling locations described above. For the purpose of this SAP, ground surface is defined as the exposed surface layer after the secondary containment has been removed. Collection of soil samples will be accomplished with tools such as shovels, trowels, pick-axes, and scoops.

After the soil is sampled, the sampled media will be screened to remove material larger than approximately 2 mm (0.08 in.) in diameter, which will allow for a larger surface area to volume ratio and would be more likely to identify any potential contamination in the sample in accordance with WAC 173-340-740(7)(a). Grab samples will be collected and placed into containers at the chosen node sample locations. To ensure sample and data usability, sampling will be performed in accordance with established sampling practices, procedures, and requirements pertaining to sample collection, collection equipment, and sample handling.

Sample container, preservation, and holding-time requirements are specified in Table H-5 for soil samples. These requirements are in accordance with the specified analytical methods. The final container type and volumes will be identified on the sampling authorization form and the chain-of-custody form.



1 **Figure H-4 Proposed Focused Sampling Locations for Tank TK-P4**

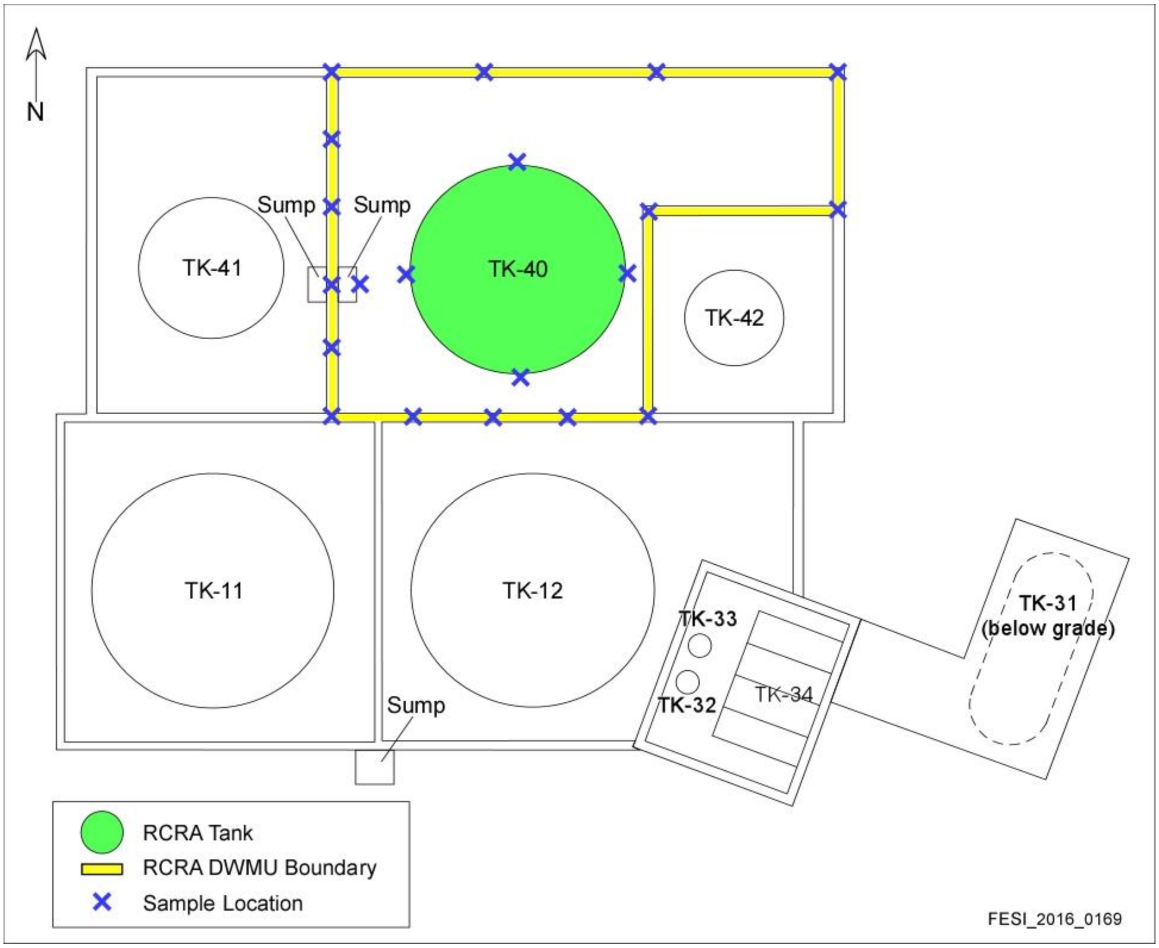


Figure H-5 Proposed Focused Sampling Locations for Tank TK-40

Table H-5 Sample Preservation, Container, and Holding Time for Soil Samples

Method	Analyte	Preservation Requirement	Holding Time	Bottle Type	Minimum Sample Size
EPA 6010	Metals	Cool ≤6°C	6 months	Glass/plastic	2 g
EPA 6020	Metals	Cool ≤6°C	6 months	Glass/plastic	2 g
EPA 7470	Mercury	None	28 days	Glass/plastic	2 g
EPA 8270	Tributyl Phosphate	Cool ≤6°C	14 days before extraction; 40 days after extraction	Amber Glass	50 g

Note: For the four-digit EPA methods, see SW-846, *Test Methods for Evaluating Solid Waste: Physical/Chemical Methods*, Third Edition; Final Update V.

EPA = U.S. Environmental Protection Agency

To prevent potential contamination of the samples, care will be taken to use decontaminated equipment for each sampling activity. EPA Level 1 precleaned sample containers will be used for samples collected for chemical analysis. Container sizes may vary depending upon laboratory specific volumes/requirements for meeting analytical detection limits.

The sample location, depth, and corresponding record numbers from the HEIS database will be documented in the sampler's field logbook. A custody seal (e.g., evidence tape) will be affixed to each sample container and/or sample collection package to provide evidence of potential tampering.

Each sample container will be labeled with the following information on firmly affixed, water-resistant labels:

- Sampling authorization form and form number.
- HEIS number.
- Sample collection date and time.
- Sampler identification.
- Analysis required.
- Preservation method (if applicable).

Sample records must include the following information:

- Analysis required.
- Sample location.
- Matrix (e.g., water or soil).

Sample custody will be maintained in accordance with existing Hanford Site protocols to ensure that sample integrity is maintained throughout the analytical process. Chain-of-custody protocols will be followed throughout sample collection, transfer, analysis, and disposal to ensure that sample integrity is maintained.

All waste (including unexpected waste) generated by sampling activities will be containerized, labeled, characterized, designated as a dangerous or nondangerous waste, stored, and treated (if necessary) to meet land disposal restrictions of 40 CFR 268 (incorporated into WAC 173-303-140(2)(a), by reference), and then ultimately disposed in an approved waste disposal facility.

H.6.2.2 Analytical Methods

All analyses and testing will be performed consistent with this closure plan, laboratory analytical procedures, and HASQARD (DOE/RL-96-68). The approved laboratory must achieve the lowest practical quantitation limit consistent with the selected analytical method for each constituent to confirm clean closure levels. If a target analyte is detected at or above clean closure level but less than the PQL of the analytical method, Ecology will be notified, and alternatives will be discussed to demonstrate clean closure level. If a target analyte is detected above the clean closure levels and the PQL, additions actions will be taken, as discussed in Section H.7 of this plan. Analytical methods and performance requirements associated with the target analytes are outlined in Table H-7.

H.6.2.3 Quality Control

Quality control (QC) procedures must be followed in the field and laboratory to ensure that decisions made using the data are within an acceptable degree of uncertainty. Field QC samples will be collected to evaluate the potential for cross-contamination and provide information pertinent to field sampling variability. Field QC will include the following samples:

- Full trip blanks.

- Field transfer blanks.
- Equipment rinsate blanks.
- Field duplicates.
- Field split samples.

Laboratory QC samples estimate the precision and bias of the analytical data. Field and laboratory QC samples are summarized in Table H-8. Data verification and data validation will include both the primary samples and the QC samples. A data quality assessment will be performed utilizing the guidance in EPA/240/B-06/002, *Data Quality Assessment: A Reviewer's Guide* (EPA QA/G-9R), and implementing the specific requirements in Section H.6.2.5.

The QA objective of this plan is to ensure the generation of analytical data of known and appropriate quality is acceptable and useful in order to meet the evaluation requirements stated in the sampling plan. Data descriptors known as data quality indicators help determine the acceptability and usefulness of data to the user. The principal data quality indicators (precision, accuracy, representativeness, comparability, completeness, bias, and sensitivity) are defined for the purposes of this document in Table H-6.

H.6.2.4 Data Verification

Analytical results will be received from the laboratory, loaded into a database (e.g., HEIS), and verified. Verification includes, but is not limited to, the following items:

- Amount of data requested matches the amount of data received (number of samples for requested methods of analytes).
- Procedures and methods are used.
- Documentation/deliverables are complete.
- Hard copy and electronic versions of the data are identical.
- Data appear to be reasonable based on analytical methodologies.
- Sample results are evaluated against QA/QC parameters.

Table H-6 Data Quality Indicators

Data Quality Indicator (QC Element)[a]	Definition	Determination Methodologies	Corrective Actions
Precision (field duplicates, laboratory sample duplicates, and matrix spike duplicates)	Precision measures the agreement among a set of replicate measurements. Field precision is assessed through the collection and analysis of field duplicates. Analytical precision is estimated by duplicate/replicate analyses, usually on laboratory control samples, spiked samples, and/or field samples. The most commonly used estimates of precision are the relative standard deviation and, when only two samples are available, the relative percent difference.	Use the same analytical instrument to make repeated analyses on the same sample. Use the same method to make repeated measurements of the same sample within a single laboratory. Acquire replicate field samples for information on sample acquisition, handling, shipping, storage, preparation, and analytical processes and measurements.	If duplicate data do not meet objective: • Evaluate apparent cause (e.g., sample heterogeneity). • Request reanalysis or remeasurement. • Qualify the data before use.

Table H-6 Data Quality Indicators

Data Quality Indicator (QC Element)[a]	Definition	Determination Methodologies	Corrective Actions
Accuracy (laboratory control samples, matrix spikes, and surrogates)	Accuracy is the closeness of a measured result to an accepted reference value. Accuracy is usually measured as a percent recovery. QC analyses used to measure accuracy include laboratory control samples, spiked samples, and surrogates.	Analyze a reference material or reanalyze a sample to which a material of known concentration or amount of pollutant has been added (a spiked sample).	If recovery does not meet objective: • Qualify the data before use. • Request reanalysis or remeasurement.
Representativeness (field duplicates)	Sample representativeness expresses the degree to which data accurately and precisely represent a characteristic of a population, parameter variations at a sampling point, a process condition, or an environmental condition. It is dependent on the proper design of the sampling program and will be satisfied by ensuring that the approved plans were followed during sampling and analysis.	Evaluate whether measurements are made and physical samples collected in such a manner that the resulting data appropriately reflect the environment or condition being measured or studied.	If results are not representative of the system sampled: • Identify the reason for results not being representative. • Flag for further review. • Review data for usability. • If data are usable, qualify the data for limited use and define the portion of the system that the data represent. • If data are not usable, flag as appropriate. • Redefine sampling and measurement requirements and protocols. • Resample and reanalyze, as appropriate.
Comparability (field duplicate, field splits, laboratory control samples, matrix spikes, and matrix spike duplicates)	Comparability expresses the degree of confidence with which one data set can be compared to another. It is dependent upon the proper design of the sampling program and will be satisfied by ensuring that the approved plans are followed and that proper sampling and analysis techniques are applied.	Use identical or similar sample collection and handling methods, sample preparation and analytical methods, holding times, and QA protocols.	If data are not comparable to other data sets: • Identify appropriate changes to data collection and/or analysis methods. • Identify quantifiable bias, if applicable. • Qualify the data as appropriate. • Resample and/or reanalyze if needed. • Revise sampling/analysis protocols to ensure future comparability.

Table H-6 Data Quality Indicators

Data Quality Indicator (QC Element)[a]	Definition	Determination Methodologies	Corrective Actions
Completeness (no QC element; addressed in data usability assessment)	Completeness is a measure of the amount of valid data collected compared to the amount planned. Measurements are considered to be valid if they are unqualified or qualified as estimated data during validation. Field completeness is a measure of the number of samples collected versus the number of samples planned. Laboratory completeness is a measure of the number of valid measurements compared to the total number of measurements planned.	Compare the number of valid measurements completed (samples collected or samples analyzed) with those established by the project's quality criteria (data quality objectives or performance/acceptance criteria).	If data sets do not meet the completeness objective: • Identify appropriate changes to data collection and/or analysis methods. • Identify quantifiable bias, if applicable. • Resample and/or reanalyze if needed. • Revise sampling/analysis protocols to ensure future completeness.
Bias (equipment blanks, field transfer blanks, full trip blanks, laboratory control samples, matrix spikes, and method blanks)	Bias is the systematic or persistent distortion of a measurement process that causes error in one direction (e.g., the sample measurement is consistently lower than the sample's true value). Bias can be introduced during sampling, analysis, and data evaluation. Analytical bias refers to deviation in one direction (i.e., high, low, or unknown) of the measured value from a known spiked amount.	Sampling bias may be revealed by analysis of replicate samples. Analytical bias may be assessed by comparing a measured value in a sample of known concentration to an accepted reference value or by determining the recovery of a known amount of contaminant spiked into a sample (matrix spike).	For sampling bias: • Properly select and use sampling tools. • Institute correct sampling and subsampling practices to limit preferential selection or loss of sample media. • Use sample handling practices, including proper sample preservation, that limit the loss or gain of constituents to the sample media. • Analytical data that are known to be affected by either sampling or analytical bias are flagged to indicate possible bias. • Laboratories that are known to generate biased data for a specific analyte are asked to correct their methods to remove the bias as best as practicable. Otherwise, samples are sent to other laboratories for analysis.

Table H-6 Data Quality Indicators

Data Quality Indicator (QC Element)[a]	Definition	Determination Methodologies	Corrective Actions
Sensitivity (method detection limit, practical quantitation limit, and relative percent difference)	Sensitivity is an instrument's or method's minimum concentration that can be reliably measured (i.e., instrument detection limit or limit of quantitation).	Determine the minimum concentration or attribute to be measured by an instrument (instrument detection limit) or by a laboratory (limit of quantitation). The lower limit of quantitation[b] is the lowest level that can be routinely quantified and reported by a laboratory.	If detection limits do not meet objective: • Request reanalysis or remeasurement using methods or analytical conditions that will meet required detection or limit of quantitation. • Qualify/reject the data before use.

Based on SW-846 Compendium (July 2014). Available at: https://www.epa.gov/hw-sw846/sw-846-compendium.

[a]Acceptance criteria for QC elements are provided in Table H-7.

[b]For purposes of this sampling plan, the lower limit of quantitation is interchangeable with the practical quantitation limit.

QA = Quality Assurance

QC = Quality Control

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Table H-7 Soil Analytical Performance Requirements

CAS Number	Analyte	Analytical Method	Closure Performance Standard[a] (mg/kg)	Practical Quantitation Limit[b] (mg/kg)	Accuracy Requirement (Percent Recovery)[c]	Precision Requirement (RPD)[c]
Performance Requirments for Laboratory Measurements (Nonradiological)						
7440-38-2	Arsenic	SW-846 Method 6010/6020	2.00E+1	0.2	±30	≤30
7440-39-3	Barium	SW-846 Method 6010/6020	1.32E+02	2.0	±30	≤30
7440-43-9	Cadmium	SW-846 Method 6010/6020	6.90E-01	0.5	±30	≤30
7440-47-3	Chromium (total)	SW-846 Method 6010/6020	1.85E+01	1.0	±30	≤ 30
7439-92-1	Lead	SW-846 Method 6010/6020	5.00E+01	5.0	±30	≤30
7439-97-6	Mercury	SW-846 Method 7470	2.00E-01	0.2	±30	≤30
7782-49-2	Selenium	SW-846 Method 6010/6020	1.00E+01	10	±30	≤30
7440-22-4	Silver	SW-846 Method 6010/6020	2.00E+00	1.0	±30	≤30
126-73-8	Tributyl phosphate	SW-846 Method 8270	1.11E+02	0.333	Statistically derived	≤30

Source: SW-846, *Test Methods for Evaluating Solid Waste: Physical/Chemical Methods*, Third Edition; Final Update V.

[a]Closure performance standards are the numeric cleanup levels calculated according to WAC 173-340, *Model Toxics Control Act–Cleanup*, Method B (unrestricted use standards). Where both carcinogen and a noncarcinogen performance standards are available, the lowest value will be used as the performance standard.

[b]For these analytical performance requirements, the required detection limit and the practical quantification limit are identical.

[c]Accuracy criteria for associated batch matrix spike percent recoveries. Evaluation based on statistical control of laboratory control samples is also performed. Precision criteria for batch laboratory replicate matrix spike analyses or replicate sample analyses.

CAS = Chemical Abstracts Service

RPD = Relative Percent Difference

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Table H-8 Project Quality Control Sampling Summary

QC Sample Type	Frequency	Characteristics Evaluated
Field QC		
Full trip blank	One per 20 samples per media sampled.	Contamination from containers or transportation
Equipment rinsate blank	As needed. If only disposable equipment is used, then an equipment blank is not required. Otherwise, one per 20 samples, per media.[a]	Adequacy of sampling equipment decontamination and contamination from nondedicated equipment
Field duplicate	One per batch,[b] 20 samples maximum of each media sampled (soil samples).[c]	Precision, including sampling and analytical variability
Field split sample	As needed. When needed, the minimum is one per analytical method, per media sampled, for analyses performed where detection limit and precision and accuracy criteria have been defined in Table H-7.	Precision, including sampling, analytical, and interlaboratory
Laboratory QC[b]		
Method blanks	One per batch[b]	Laboratory contamination
Laboratory duplicates	One per batch[b]	Laboratory reproducibility and precision
Matrix spikes	One per batch[b]	Matrix effect/laboratory accuracy
Matrix spike duplicates	One per batch[b]	Laboratory reproducibility, accuracy, and precision
Surrogates	One per batch[b]	Recovery/yield
Tracers	One per batch[b]	Recovery/yield
Laboratory control samples	One per batch[b]	Evaluate laboratory accuracy
Performance evaluation parameters	Annual	Evaluate laboratory accuracy
Double-blind standards	Quarterly[d]	Evaluate laboratory accuracy
Audit/assessment	Annually[e] or every 3 years[f]	Evaluate overall laboratory performance and operations

[a]Whenever a new type or nondedicated equipment is used, an equipment blank shall be collected every time sampling occurs until it can be shown that less frequent collection of equipment blanks is adequate to monitor the decontamination procedure or the nondedicated equipment.

[b]Batching across projects is allowing for similar matrices.

[c]Soil grab samples are exempted from duplicate sampling.

[d]Soil matrix double-blind standards are submitted by request.

[e]The DOE quality system for analytical services requires annual audit or commercial laboratories.

[f]DOE/RL-96-68, *Hanford Analytical Services Quality Assurance Requirements Document*, does not define a frequency for assessment or on-site laboratories. Three-year evaluated supplier list requirement is typically applied.

QC = Quality Control

H.6.2.5 Data Validation and Assessment

Data validation is performed by a third party. The laboratory will use program-equivalent analytical data packages that are intended to support data validation by the third party. The laboratory submits data packages that are supported by QC test results and raw data.

Controls are in place to preserve the data sent for validation in order to allow only additions to be made and not allowing changes to the raw data.

The format and requirements for data validation activities are based upon the most current version of OSWER Directive 9355.0-132, *National Functional Guidelines for Superfund Organic Methods Data Review*, and OSWER Directive 9355.0-131, *National Functional Guidelines for Inorganic Superfund Data Review*. Five percent of the results will undergo Level C validation, as defined by the validation guidelines.

A data quality assessment will be performed using the guidance in EPA/240/B-06/002, and implementing the specific requirements discussed in Sections H.6.2.1 through H.6.2.5.

H.6.2.6 Documents and Records

The Project Manager is responsible for ensuring that the current version of the SAP is being used and for providing any updates to field personnel. Version control is maintained by the administrative document control process. Changes to the SAP affecting data needs will be submitted as a RCRA Permit modification in accordance with WAC 173-303-610(3)(b) to DOE and the lead regulatory agency (Ecology).

Logbooks are required for field activities. A logbook must be identified with a unique project name and number. The individual(s) responsible for logbooks will be identified in the front of the logbook, and only authorized persons may make entries into the logbooks. Logbooks will be signed by the field manager, supervisor, cognizant scientist/engineer, or other responsible individual. Logbooks will be permanently bound, waterproof, and ruled with sequentially numbered pages. Pages will not be removed from logbooks for any reason. Entries will be made in indelible ink. Corrections will be made by marking through the erroneous data with a single line, entering the correct data, and initialing and dating the changes.

The Project Manager is responsible for ensuring that a project file is properly maintained. The project file will contain the records or references to their storage locations. The following items will be included in the project file, as appropriate:

- Field logbooks or operational records.
- Data forms.
- GPS data.
- Chain-of-custody forms.
- Sample receipt records.
- Inspection or assessment reports and corrective action reports.
- Interim progress reports.
- Final reports.
- Laboratory data packages.
- Verification and validation reports.

The laboratory is responsible for maintaining, and having available upon request, the following items:

- Analytical logbook.
- Raw data and QC sample records.
- Standard reference material and/or proficiency test sample data.
- Instrument calibration information.

Records may be stored in either electronic or hardcopy format. Documentation and records, regardless of medium or format, are controlled in accordance with internal work requirements and processes to ensure the accuracy and retrievability of stored records. Records will be kept for 5 years after Ecology approves clean closure confirmation.

H.6.2.7 Revisions to the Sampling and Analysis Plan and Constituents to Be Analyzed

If changes to the SAP are necessary due to unexpected events during closure that will affect sampling, a revision to this SAP will be submitted no later than 30 days after the unexpected event as a RCRA permit modification as required in WAC 173-303-610(3)(b)(iii) and WAC 173-303-830. An unanticipated event would be an event outside the scope of the SAP or a condition that inhibits implementation of the sampling as written.

H.7 CONTINGENT CLOSURE PLAN

A contingent closure plan is not required at this time since the expected outcome is clean closure. If sampling and analysis of the soil underlying Tanks TK-P4 and TK-40 show that the closure performance standards cannot be achieved, a permit modification will be prepared in accordance with WAC 173-303-610(3)(b) and WAC 173-303-830 to modify the closure plan so that RCRA closure is coordinated with the 200-CP-1 OU.

H.8 SCHEDULE FOR CLOSURE

Figure H-6 depicts the closure activities and the expected durations. The schedule for tank removal closure activities will be coordinated with cleanup work for the 200-CP 1 OUs as described in letter Determination on Closure Certification for Closure Unit Group 33, PUREX Tanks TK-P4 and TK-40, for the Hanford Facility Resource Conservation and Recovery Act Permit, Dangerous Waste Portion, Revision 8C, for the Treatment, Storage, and Disposal of Dangerous Waste (Site-wide Permit), Part V, WA7890008967.[1] Should unexpected circumstances arise and an extension to the 180-day closure activity expiration date be deemed necessary, a Class 1 prime Permit Modification request will be submitted to Ecology for approval at least 30 days prior to the 180-day expiration date in accordance with WAC 173-303-610(4)(c) and WAC 173-303-830, Appendix I, *Modifications*.[2] The extension request would also demonstrate that all steps to prevent threats to human health and the environment, including

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[1] Letter, E. J. Holbrook, Ecology, to B. T. Vance, DOE, and R. E. Wilkinson, CPCCo, "RE: Determination on Closure Certification for Closure Unit Group 33, PUREX Tanks TK-PK and TK-40, for the *Hanford Facility Resource Conservation and Recovery Act Permit, Dangerous Waste Portion, Revision 8C, for the Treatment, Storage, and Disposal of Dangerous Waste* (Site-wide Permit) Part V, WA7890008967, 25-NWP-051 dated March 28, 2025.

[2] The permit modification incorporating this closure plan was approved August 25, 2021 (C3-PUREX-2016-01,8C.2021.9F). The original date for closure completion was January 21, 2022. The closure timeline was extended from January 21, 2022, to February 23, 2023, through Class[1]1 Permit Modification PCN-PUREX-2022-01 (8C.2022.Q1), The closure timeline was subsequently extended from February 23, 2023, to December 21, 2023, through approval of Class[1]1 Permit Modification PCN-PUREX-2023-01 (8C.2023.Q1) The closure timeline is extended from December 21, 2023, to December 21, 2026, through approval of Class[1]1 Permit Modification PCN-PUREX-TKP4-TK40-2024-01. The extension of the closure period is being requested to allow the Permittees sufficient time to incorporate remaining soil contamination from these sites into the 200-CP-1 OU and related Tri-Party Agreement (TPA) documents. This ensures that final closure actions align with the broader site remediation strategy. While the IQRPE certification has been obtained (as noted in the schedule in Figure H-6), the extension is necessary to maintain permit compliance while the TPA-related activities are completed.

compliance with all applicable Permit requirements and criteria in WAC 173-303-610(4)(b)(i) or (ii), have and will be taken.

H.9 CERTIFICATION OF CLOSURE

Within 60 days of completion of closure of Tanks TK-P4 and TK-40, the Permittee will submit to Ecology by registered mail a certification that Tanks TK-P4 and TK-40 have been closed in accordance with the specifications in the approved closure plan. Both DOE and the co-operator will sign the certification of closure, and an IQRPE will certify that the unit has been closed in accordance with the approved closure plan.

- An IQRPE will be retained to provide certification of the closure, as required by WAC 173-303-610(6). The IQRPE will be responsible for observing field activities and reviewing documents associated with closure of PUREX Tanks TK-P4 and TK-40. Field activities and documents reviewed may include, but are not limited to the following: Review of the visual inspection for the tanks and secondary containment areas.
- Observe and/or review of sampling activities.
- Verification that sample locations are as specified in the SAP.
- Observe and/or review documentation of removal and final disposition of all dangerous wastes and waste residues, including contaminated environmental media and debris (as applicable).
- Verify that closure activities were performed in accordance with this closure plan.

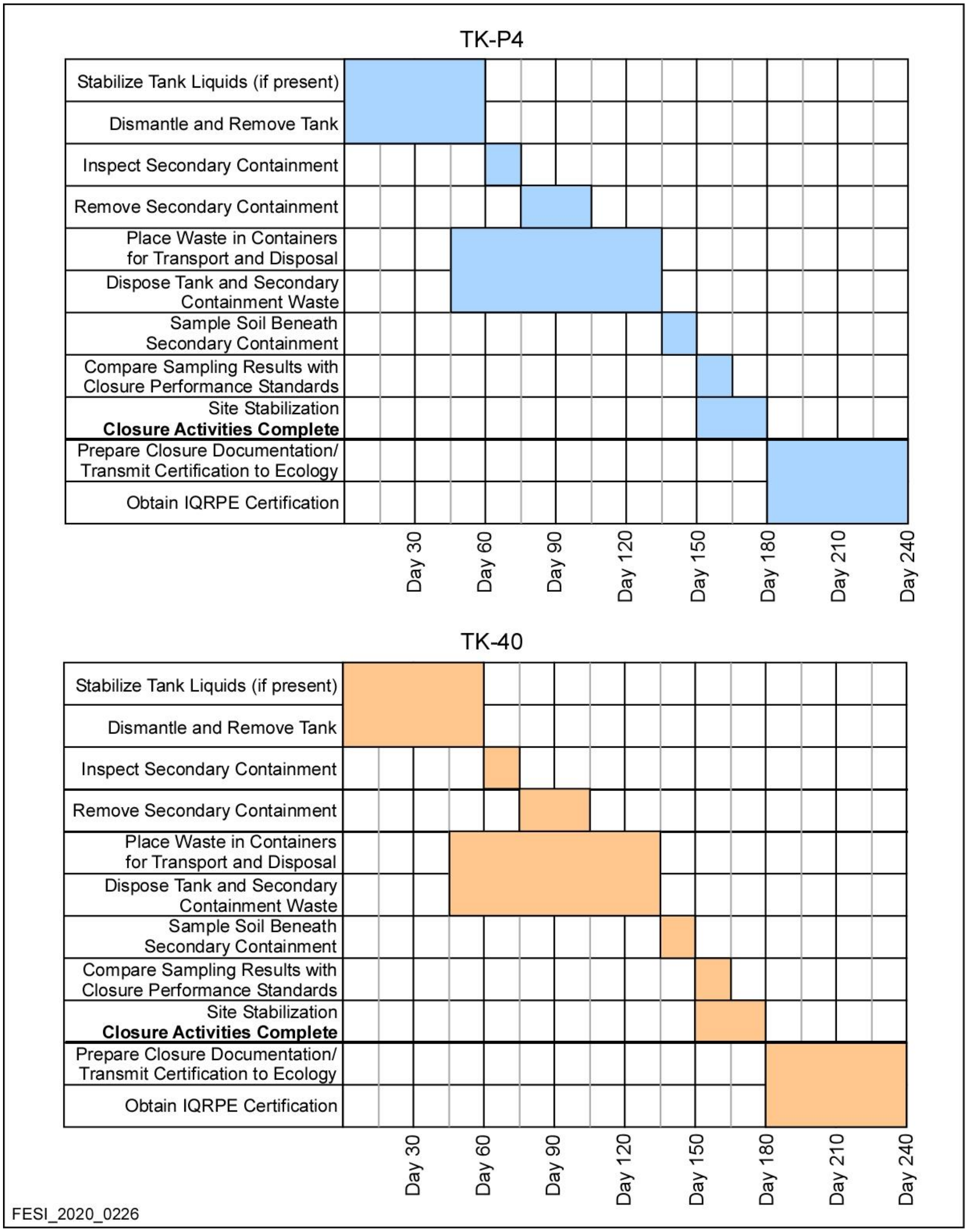

Figure H-6 TK-P4 and TK-40 Closure Schedule

The IQRPE will record observations and reviews in a written report that will be retained in the operating record. The resulting report will be used to develop the clean closure certification, which will then be provided to Ecology.

Additional documentation supporting closure certification will also be placed in the Administrative Record and will be provided to Ecology. The following documentation and information supporting closure certification will be included:

- Field notes and photographs related to closure activities.
- Description of minor deviations from approved closure plan and their justifications.
- Documentation of removal and final disposition of all dangerous wastes and waste residues, including contaminated media and debris.
- All laboratory and/or field data, including sampling procedures and locations, QA/QC samples, chain-of-custody procedures, and required sample measurements.
- Final summary report from the IQRPE, itemizing all data reviewed and including analytical results used to determine a final closure status.
- Description of the DWMUs appearance at the completion of closure.

H.10 POST-CLOSURE PLAN

The closure strategy is to attain clean closure of PUREX Tanks TK-P4 and TK-40. If the conditions for verification sampling described in Section H.6 meet the closure performance standards, then a post-closure plan will not be necessary. If sampling and analysis of the soil underlying Tanks TK-P4 and TK-40 show that the closure performance standards cannot be achieved, a permit modification will be prepared in accordance with WAC 173-303-610(3)(b) and WAC 173-303-830 to modify the closure plan so that additional RCRA closure activities are coordinated with the 200-CP-1 OU.

H.11 AMENDMENT OF CLOSURE PLAN

As required by WAC 173-303-610(3)(b), the closure plan will be amended if changes to closure activities require modification of the approved plan.

H.12 REFERENCES

17530-96-028, 1996, “Completion of the PUREX Deactivation End Points Associated with Flushing/Draining of the 203-A Vessels” (Internal Memorandum from B.G. Foreman, PUREX Ancillary Team), Westinghouse Hanford Company, Richland, Washington, September 13.

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