1220219

Office of River Protection, State of Washington Department of Ecology
Tank Waste Retrieval Work Plan/Functions and Requirements Change Notice
(Per Hanford Federal Facility Agreement and Consent Order Section 9.3)

1. Document Title and Number: RPP-22520, Rev. 7, 241-C-101 and 241-C-105 Tanks Waste Retrieval Work Plan		
2. Minor Field Change: (Section 12.4 HFFACO Action Plan) ☐ Yes: (WRPS Signature Only – Attach signed form to Primary Document for record purposes) x No: Proceed to Box 3	**3.** Document Issue Date: 03/21/12 **4.** Document Modification Notice Date: 3/11/13	**5.** Notice Number: 2013-04
6. Do proposed changes require schedule changes? (Would this extend completion of retrieval beyond 12 months from date of initiation?) ☐ Yes x No	**7.** Do proposed changes include specific additions, deletions, or modification to scope and/or requirements which affect the overall intent of the plan? ☐ Yes x No	**8.** (Check only one box) ☐ Significant Modification (Check if the answer to question in either section 6 or 7 is "yes". Significant modifications require revision of the primary document.) Minor Modification x Requires modification of the document x Can be accomplished with Modification Notice.

9. Description and Justification of Change:

Change Description: A change is needed to show that the dome cut of C-105 will use olivine as the abrasive rather than garnet or that the dome cut will be made with a hole coring system. A change is also included to allow ORP, as requested by Ecology, to provide a basis and rationale for continuing retrieval operation when equipment is degraded. Further a change is included to define the time intervals for obtaining pre-retrieval gamma scans and moisture logs of drywells. Changes are also included to align this TWRWP with other recently modified TWRWPs.

Justifications:

- Section 1.0, pg 1-1, added references to other TWRWP sections.
- Section 2.4.1, pg 2-6 added an issue date for HNF-EP-0182.
- Section 3.1.1.1, pg 3-6 to 3-7, changed garnet to olivine and described to options for cutting dome.
- Section 3.1.3, pg 3-10 to 3-11—added requirement to provide basis and rationale for continued operation
- Section 3-2, pg 3-12—added allowance for equivalent triple rinse
- Section 3.8, pg 3-26—updated reference for IQRPE requirement
- Section 4.2.1.1, pg 4-8—added time intervals for pre-retrieval gamma scans and moisture logs
- Section 4.2.1.2, pg 4-11—added clarification of requirements for using Enraf for leak detection
- Section 5.0, pg 5-1—Updated air permit reference
- Section 9.0—updated references

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See the attached redline strikeout pages.

10. Impact of Change:

Allows for cutting the C-105 dome with abrasive slurry or a hole coring system.

11. Additional Requirements and/or Provisions

Approvals

Washington River Protection Solutions, LLC.	Office of River Protection	State of Wash., Dept. of Ecology
☐ Provisional Approval[2] Date	☐ Provisional Approval[2] Date	☐ Provisional Approval[2] Date
☑ Final Approval DUKS Date 4/15/13	☑ Final Approval Date 4/16/13	☑ Final Approval Date 4-17-13

Notes

1 - For use by Ecology to identify any additional information needed to make a decision regarding the request for modifications. In addition, Ecology will identify actions, if any, regarding the modification request that DOE may take pending Ecology's final decision

2 – Provisional approval allows DOE and it's contractors to take specific actions identified in section 11, prior to final approval of this modification.

1.0 INTRODUCTION

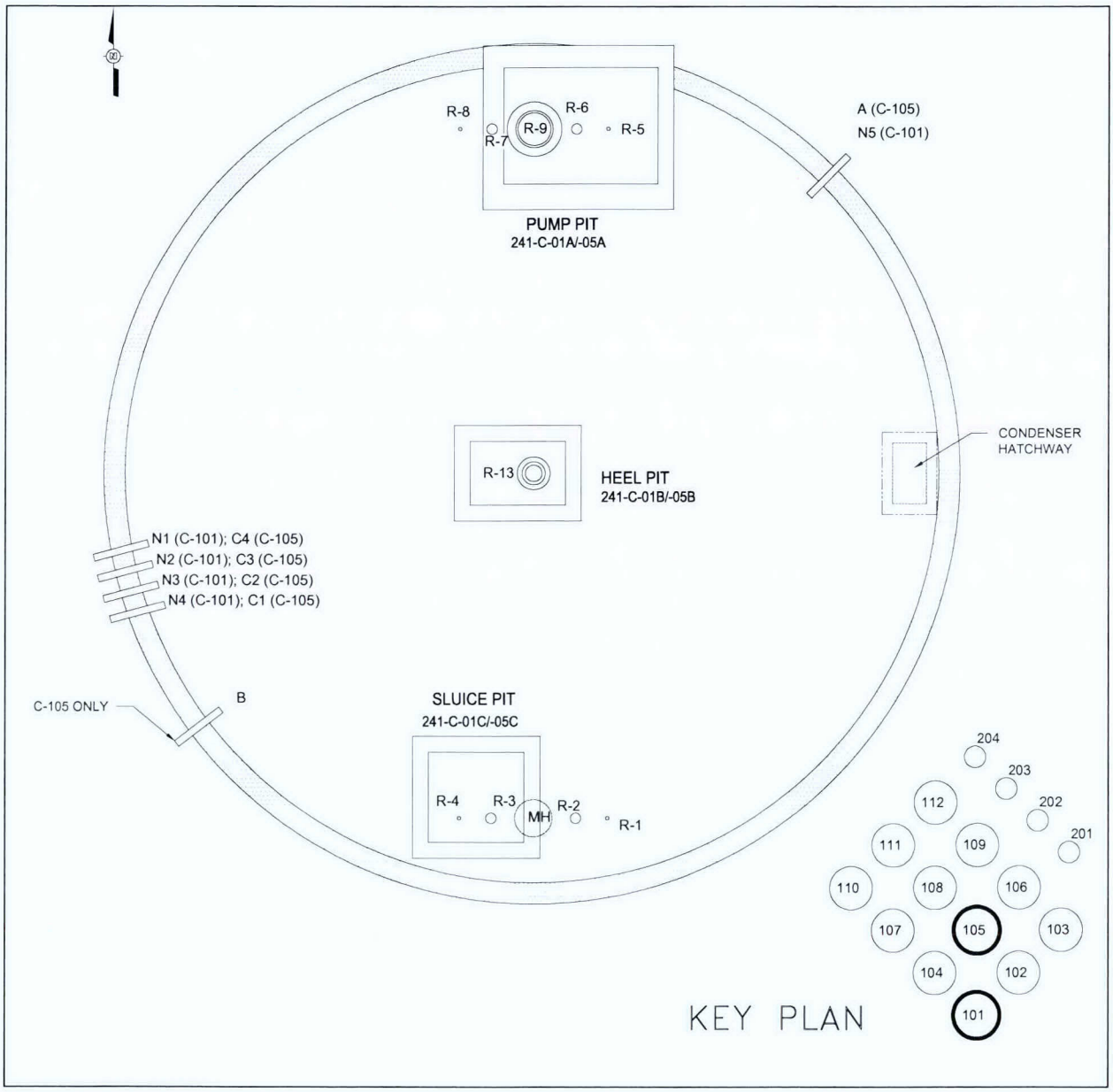
The U.S. Department of Energy (DOE), Office of River Protection (ORP) River Protection Project mission includes storage, retrieval, immobilization, and disposal of radioactive mixed waste presently stored in underground tanks located in the 200 East and 200 West Areas of the DOE Hanford Site. Tank 241-C-101 (C-101) will be retrieved with modified sluicing (MS) and tank 241-C-105 (C-105) will be retrieved using the mobile arm retrieval system vacuum (MARS-V) waste retrieval technology. The basis for the retrieval technology selected is as follows:

Tank C-101 is classified as an 'assumed leaker' in HNF-EP-0182, *Waste Tank Summary Report for Month Ending September 30, 2011*. The tank history was reevaluated as described in RPP-ENV-33418, *Hanford C-Farm Leak Assessments Report; Tanks 241-C-101, 241-C-110, 241-C-111, 241-C-105 and Unplanned Waste Releases*, Rev. 1. No conclusion was reached during the reevaluation, but subsequent analysis and new data (see section 2.4.1) allowed for qualifying the "assumed leaker" tank status. There is sufficient evidence to conclude that there were and are no tank leaks below 54". Soil contamination in the drywells was likely from near surface events such as small leaks from spare inlet nozzles.

Tank C-105 is classified as a sound tank; however, vadose zone characterization data collected around tank C-105 indicates that an unplanned release occurred near tank C-105 (see section 2.4.2.1). Because the cause or source of this unplanned release cannot be confirmed, the MARS-V was selected for retrieving the waste from tank C-105 to minimize the potential for leakage to occur. This document was originally developed to meet the requirements identified in *Hanford Federal Facility Agreement and Consent Order* (HFFACO) for Tank Waste Retrieval Work Plans (TWRWP). As of 10/25/10 Consent Decree No. 08-5085-FVS (Decree) became the regulating direction for TWRWPs for tanks retrieved as Project B-1 and Project B-4 of the Decree. The purpose of this document is to provide the Washington State Department of Ecology (Ecology) information on the planned approach for retrieving waste from tanks C-101 and C-105 to allow Ecology to approve the waste retrieval activity in Project B-1.

Where information regarding treatment, management, and disposal of the radioactive source, byproduct material and/or special nuclear components of mixed waste (as defined by the *Atomic Energy Act of 1954*) has been incorporated in this document, it is not incorporated for the purpose of regulating the radiation hazards of such components under the authority of this tank waste retrieval work plan or Chapter 70.105 RCW, "Hazardous Waste Management Act."

Figure 2-3. Tanks C-101 and C-105 Riser and Fill/Cascade Line Plan View.



2.4 TANK CLASSIFICATION

Tanks C-101 is classified as an 'assumed leaker' and tank C-105 is classified as 'sound' in HNF-EP-0182. A description of the 100-series tanks is provided in RPP-13774, *Single-Shell Tank System Closure Plan*, Appendix C, Section C2.0.

2.4.1 Tank C-101

Tank C-101 has been classified as an assumed leaker in HNF-EP-0182 since this monthly document was first issued in 1988. This document provides an estimated tank C-101 leak

may be a conductivity probe, a thermal leak detector, or another type of leak detector as appropriate.

Should a transfer leak from the primary hose occur, the leak detection system is designed to shut the pump off when liquid covers the leak detection element contacts. Secondary containment structures will not overflow as a result of the transfer line leakage, including any transfer line drainback, because either the free volume of the structure exceeds the volume of leaked waste plus drainback, or there are openings in the structure which allow free-drain to the tank.

Transfer of waste from the SSTs to the DSTs and the transfer of supernate from DSTs back to tank SSTs will be performed using transfer lines that provide secondary containment. The waste retrieval project currently plans to use overground hose-in-hose transfer lines (HIHTL) and the *Resource Conservation and Recovery Act of 1976* (RCRA)-compliant DST transfer system.

The receiver DSTs will have a supernate pumps that will be used to pump liquid back to tank SSTs. The receiver DST will also have a slurry distributor to distribute the sludge received from the SSTs.

Because the elevation of the AN tank farm is approximately 22 ft higher than the C tank farm, the slurry distributor and the supernate pump incorporate anti-siphon devices to prevent unintentional flow from the DST to the SST.

The transfer lines and DSTs are RCRA compliant.

3.1.1.1 Installation of New Large Central Riser for MARS-V in C-105

Prior to installation of the MARS-V all or portions of the central pump pit will need be removed and a hole cut in the top of the tank. Following is a description of ~~the planned~~two possible methods for installation of the new large central riser for C-105. The descriptions provided ~~is~~ are a general guide only, and the final method followed may differ somewhat from that described, depending upon final testing and work control developments. If there are to be major deviations from the methods described and approved below, Ecology will be informed prior to the changes being implemented in the field. ~~This method was previously approved by Ecology November 5, 2010 for the installation of MARS sluicing technology. Ecology approved this method for up to three C-Farm tanks; C-105 will be the second tank.~~

The new central riser for C-105 will require excavation of soil around the existing central pump pit down to the concrete dome. Excavation will be performed per the requirements developed to minimize tank structural issues while meeting personnel safety concerns. All or portions of the existing old heel pit on the tank will be removed and a new nominal 74 inch diameter ~~temporary~~ caisson to support cutting activities is installed. The area around the new caisson will be backfilled and a support pad installed. A nominal 55 inch diameter hole is then cut into the tank dome.

One method to cut ~~It is planned to cut~~ the hole ~~using~~ uses ~~garnet~~ olivine suspended in a high pressure water slurry. ~~The concrete plug formed when the hole is cut will contain the old 12 in. tank riser, if it hasn't already been removed.~~ The resulting concreted plug will be suspended during the cutting operation. When the hole cutting is complete the plug will be removed and a new nominal 47 inch central riser with a shielding plug installed to fill the opening. The new

riser is then adjusted with leveling jacks to provide correct alignment. This method, using garnet rather than olivine, was previously approved by Ecology November 5, 2010 for the installation of MARS sluicing technology. Ecology approved this method for up to three C-Farm tanks, C-105 would be the second tank.

Another possible method to cut the hole uses a rotary coring system. The rotary coring system will reduce the amount of material added to the tank during the cut compared with the high pressure water slurry. As with the abrasive slurry cut, the plug will be suspended during the cutting operation and when the hole cutting is complete the plug will be removed and a new nominal 47 inch central riser with shield plug installed to fill the opening. The new riser is then adjusted with leveling jacks to provide correct alignment.

The dome cutting and riser installation method ~~is~~will be described on drawing H-14-109478, *Pit Removal Details* (this drawing is expected to be released in the spring of ~~2012~~2013). Related information is shown on drawing H-14-109471, *241-C-105 Large Riser Site Plan*, H-14-109472, *Large Riser Details*, H-14-109473, *Pad Structural Details,* and H-14-109476, *Large Riser Shield Plug*. The backfill requirements for the riser installation process are provided in RPP-SPEC-41963, *Construction Specification for Installation of a Large Riser on a Single-Shell Tank.*

The large riser will not transmit a load to the dome by means of direct contact (i.e. ~~MARS-V equipment weight is not put on the large riser~~the riser does not impinge directly on the dome), the loads from the retrieval equipment, riser, and concrete pad are instead distributed to the soil.

Installation of the large riser will be evaluated for hazards following current tank operations contractor (TOC) hazards review procedures prior to performing the installation.

Prior to cutting the central hole, a specialized lifting device that uses an existing hole in the dome, or ~~the~~ anchor bolts that will be used to support the plug during cutting and removal, will be installed by qualified personnel following manufacturer's recommendations and checked as described in the controlling work documentation. ~~to verify the bolts have acceptable contact with the plug.~~ The method for suspending the plug during and after the cutting step is designed to be quite conservative. The concrete present in the dome is believed to have more than adequate strength to support the plug with the lifting device or anchor bolts in place. Based upon in-tank video of the tank dome, the tank thermal history, and the construction method for the dome there is no reason to suspect any concrete degradation has occurred.

Structural evaluations will be performed evaluating the tank dome loading conditions resulting from cutting the hole into C-105 and adding the large riser for support of the MARS equipment, and monitoring/evaluation will be performed during the riser installation process. The pre-cut evaluations are RPP-CALC-49671 *Calculation Package for the Installation of a Large Riser on Tank 241-C-105* and RPP-CALC-51195, *An Evaluation of Single-Shell Tank 241-C-105 for the Addition of a Large Penetration in the Tank Dome.* These pre-cut evaluations show the structural integrity of the tank dome will be maintained following the installation of the large riser.

An independent, qualified registered professional engineer (IQRPE) report will be prepared and issued for the large riser installation. This report will be separate from the IQRPE report for the MARS retrieval equipment. See Section 3.8 for clarifying words on WAC compliance.

Meeting the informational requirements for waste transfers meets the requirements of *Washington Administrative Code* (WAC) 173-303-300, "General Waste Analysis." Compliance with the following documents is required before initiating a waste transfer:

- RPP-29002, *Double-Shell Tank System Waste Analysis Plan*. Single-shell tank transfers into the DSTs for any reason must meet the waste acceptance criteria presented in this plan. This plan is written pursuant to WAC 173-303-300(5) and EPA guidance document OSWER 9938.4-03, *Waste Analysis at Facilities that Generate, Treat, Store, and Dispose of Hazardous Waste*.
- Waste Stream Profile Sheet (RPP-29002, Attachment A). The sheet addresses the applicable sections of WAC 173-303-300; Title 40, *Code of Federal Regulations*, Part 761, "Polychlorinated Biphenyls (PCB) Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions" (40 CFR 761); 40 CFR 268, "Land Disposal Restrictions"; and WAC 173-303-140, "Land Disposal Restrictions," and also requires a waste compatibility assessment pursuant to HNF-SD-WM-DQO-001, *Data Quality Objectives for Tank Farms Waste Compatibility Program*, to meet WAC 173-303-395(1).

When the level of residual solids gets low in the tank, the volume of solids removed per unit volume of sluicing fluid removed from the tank will be tracked. The units used will be selected by engineering personnel. Waste retrieval operations will continue in an effort to obtain the goal of 360 ft^3 or less of residual waste in the tank, and/or the limits of technology have been reached for this retrieval method. The project will determine when a tank retrieval is complete by following the Consent Decree requirements stating "that the recovery rate of that retrieval technology for that tank is, or has become, limited to such an extent that it extends the retrieval duration to the point at which continued operation of the retrieval technology is not practicable, with the consideration of practicability to include matters such as risk reduction, facilitating tank closures, costs, the potential for exacerbating leaks, worker safety and the overall impact on the tank waste retrieval and treatment missions."

Until a risk evaluation is available, the limit of technology for modified sluicing is defined in RPP-50910, *Single-Shell Tank Waste Retrieval Limit of Technology Definition for Modified Sluicing* as when the concentration of SST waste in the retrieved slurry sent to the DST is within, or bracketing, the range of 0 to 0.6 volume percent.

There is no limit of technology definition for an ERSS or MARS-V waste retrieval process. A limit of technology definition will not be developed until sufficient ERSS and MARS-V retrieval operations have been performed to enable development of a justifiable definition. Until an ERSS and MARS-V limit of technology definition is developed the same value used for modified sluicing in RPP-50910 is applied to ERSS and MARS-V retrieval operations. Also for ERSS and MARS-V, data for retrieval performance measurement used to show the limits of technology have been met will be used after implementation of one or both low pressure sluicing and high pressure water operations (each technology will not be evaluated separately for its limit of technology).

Experience has shown that unexpected waste forms and tank conditions may be encountered and that equipment performance can degrade with time. The ORP will inform Ecology at least every 2 weeks, through normally scheduled meetings, about unexpected waste forms behavior and tank

conditions along with retrieval equipment performance changes that would impact overall retrieval rates and retrieval volume. If a normally scheduled meeting does not occur, Ecology will initiate a meeting for this information exchange.

At these meetings, ORP will provide to Ecology the basis and rationale for continuing retrieval when it is suspected that waste form behavior, tank condition and/or equipment performance has diminished significantly or performance impacted the ability of the deployed equipment to operate in order to meet the waste residual goal of 360 ft^3.

Ecology is notified in the Tri-Party Agreement project manager's monthly meeting when it appears that the limits of technology have been reached. Status reports are continued until waste retrieval operations cease. An SST waste retrieval evaluation form and a retrieval report are then prepared and issued and in accordance with the Decree Part IV, B.5:

> "When DOE completes retrieval of waste from a tank covered by this Decree, DOE will submit to Ecology a written certification that DOE has completed retrieval of that tank. For purposes of this Consent Decree, "complete retrieval" means the retrieval of tank waste in accordance with Part 1 of Appendix C and with the retrieval technology/systems that were established by Part 1 of the TWRWP either by approval of Ecology or after dispute resolution by the Court under Section IX of the Decree."

Following completion of waste retrieval and final tank flushing, the residual waste volume will be determined using the methodology defined in RPP-23403, *Single-Shell Tank Component Closure Data Quality Objectives*, and RPP-PLAN-23827, *Sampling and Analysis Plan for Single-Shell Tanks Component Closure*.

3.2 LIQUID ADDITIONS DURING WASTE RETRIEVAL

For tank C-101, the pump adjustment features described previously should allow the tank C-101 pump to be installed with little or no water addition However, if tank conditions require water additions to successfully install the pump (e.g., debris under the pump installation riser), water additions would be controlled in accordance with OSD-T-151-00013, *Operating Specifications for Single-Shell Waste Storage Tanks*, This water would be added through one or both of the sluicers, by lancing, or by back flushing through the pump.

The MARS-V installation into tank C-105 is not anticipated to require any water addition beyond the riser cutting slurry. The waste accumulator tank will be above the waste level so it should not be necessary to move any material to install the MARS-V. However, if tank conditions require water additions to successfully install the MARS-V (e.g., debris under the pump installation riser), water additions would be controlled in accordance with OSD-T-151-00013, *Operating Specifications for Single-Shell Waste Storage Tanks*,

Water could also be added to the tank as needed to flush equipment removed from the tank or for a number of operational reasons. The use of water is minimized to avoid taking up DST storage space. Experience to date with sludge retrieval in other C-Farm tanks has shown little water use during retrieval operations.

Utilizing recycled supernate to retrieve the waste minimizes the overall volume of waste stored in the DST system as a result of the waste retrieval process.

An estimate of the retrieval time is provided in Table 3-3. A nominal 105 kgal of raw water for tank and equipment flushing is assumed consistent with planning for past tank waste retrievals.

Table 3-3. Tank C-101 and C-105 Waste Retrieval Summary Data.

Tank	Initial Tank Waste Volume prior to Retrieval (kgal)	Retrieval Flush Volume (kgal)	DST Supernate Recycle (kgal)	Estimated Operating Duration (days) [c]
C-101	88 [a]	105 [b]	2900	46
C-105	132 [a]	105 [b]	4400	70

DST = double-shell tank

[a] From Table 2-3.

[b] Flushing volume allocation from RPP-21753.

[c] Durations estimated based on the general operating assumptions of 3 shifts operating 7 days/week with 60% operating efficiency. Sluicing durations assume 3 vol% solids loading in slurry and an average transfer rate of 75 gal/min.

The use of supernatant will be limited by the following:

- The waste compatibility assessment for supernatant recycle will be completed and reported to Ecology. This compatibility assessment shall be made to determine if the solution is acceptable for use in retrieving the tank C-101 and C-105 solids. Ecology will be informed of the results of this assessment before initiation of retrieval operations. A copy of the assessment report shall be provided to Ecology.
- Ecology will be informed when the cumulative volume of supernatant liquid being recycled exceeds the estimated quantity of 1,000,000 gal, and for each incremental million gallon quantity recycled. Timely status by e-mail will be sufficient.
- Following the use of supernatant, a minimum of three tank heel rinses using a minimum volume of raw water that is three times the estimated residual waste volume will be required to ensure that residual waste is removed to the extent practical. If the TOC shows that a comparable reduction in soluble supernate constituents has been accomplished through other retrieval actions, the rinse may be omitted.
- Should tank C-101 or C-105 be shown to leak during the retrieval process, a liquid sample will be taken if needed to verify the ^{99}Tc concentration in the DST supernate used for sluicing.
- Should a DST sample be required during the C-101 or C-105 retrieval process for corrosion control or other reasons, a ^{99}Tc analysis will be requested on the sample.

When adding liquid to the SST for the sole purpose of obtaining a waste level measurement, the following conditions apply:

Following waste retrieval, it may be necessary to add small (0 to 50 gal.) volumes of water periodically to flush the ENRAF plummet before tank closure or to flush off heel sample containers. No other activities are envisioned that will purposely add liquids back to a tank once waste retrieval is complete. Should it become necessary to add liquid to a retrieved tank for any reason other than those stated above, Ecology will be notified per existing notification channels.

Post-retrieval intrusion monitoring of the tanks is addressed in Section 6.3.

3.8 INFORMATION FOR NEW ABOVE GROUND TANK SYSTEMS

While there are no new aboveground waste tanks or waste treatment systems, the ancillary and containment equipment are considered part of a tank system in accordance with WAC-173-303-040, "Definitions." The waste tank system equipment is described in Section 3.1.1.

A written integrity assessment, reviewed and certified by an independent, qualified registered professional engineer (IQRPE) attesting that the transfer related equipment and associated transfer lines are suitable for use during waste retrieval operations will be prepared in accordance with WAC 173-303-640(3), *Design and Installation of New Tank Systems or Components*, and submitted to Ecology following completion of the field installation of the WRS. This includes verification that the subject equipment meets the requirements set forth in WAC 173-303-640(3) and WAC 173-303-640(4), *Containment and Detection of Releases.* If additional systems or additional transfer line systems are used, each system will be evaluated by an IQRPE. The design provided to the IQRPE for review will include all new or existing transfer systems, structures or components, including secondary containment and leak detection equipment, used for C-101 and C-105 waste retrieval.

The IQRPE assessment and the permitting decision logic for new equipment or repairs/upgrades to equipment will be performed in compliance with TFC-ESHQ-ENV_PP-C-11, *Independent Qualified Registered Professional Engineer~~IQRPE~~ Assessment Process* (currently in draft) or successor document.

Risers were reviewed as part of the original SST System Integrity Assessment (RPP-10435). SST system components (e.g., risers, pits, etc.) that were identified as part of the SST system for the original Integrity Assessment are not part of the retrieval system (unless specifically identified as such) and do not require a separate or additional integrity assessment if the function of the equipment doesn't change from its original purpose (e.g., the original purpose of risers is to provide tank access) and changes to the component are not outside the original component design basis and specifications.

3.9 DISPOSITION OF WASTE RETRIEVAL SYSTEM FOLLOWING WASTE RETRIEVAL

3.9.1 Disposition of New Waste Retrieval System Components

Following completion of waste retrieval, the in-tank equipment may be left in place for disposition during component closure actions. The abovegrade equipment (e.g., transfer lines,

4.2.1.1. Drywell Monitoring. Drywell monitoring refers to use of moisture gauges and/or gross gamma detectors to monitor soil conditions surrounding the tank for increases in moisture content and/or gamma activity that may be evidence of tank leakage. Drywell logging will be performed as follows:

- Gamma scans will be obtained for each listed drywell prior to initiation of retrieval operations in the tank
- Moisture scans will be obtained for each listed drywell prior to initiation of retrieval operations in the tank
- After retrieval operations have been initiated drywell logging will only be performed if needed as a backup leak detection method.
- Gamma scans will be obtained for each listed drywell following completion of active retrieval operations in the tank

Should a pre-retrieval gamma scan show an unexpected presence of radioactivity in the soil adjacent to any of the listed drywells, and the unexpected reading is confirmed, the tank leak assessment process in procedure TFC-ENG-CHEM-D-42 would be implemented. Retrieval activities as described in this work plan would not commence until the unexpected reading had been evaluated and shown to not alter the leak status stated in 2.4 for the tank whose waste was to be retrieved.

Current plans include monitoring of the following drywells prior to waste retrieval:

- **Tank C-101** – 30-01-01, 30-01-06, 30-00-06, 30-01-09, 30-04-05, and 30-01-12
- **Tank C-105** – 30-05-02, 30-05-03, 30-05-04, 30-05-05, 30-05-06, 30-05-07, 30-04-02, 30-05-08, 30-05-09 and 30-05-10

There is a potential that access to some drywells may be precluded by the placement of equipment or shielding, restricted due to ALARA (as low as reasonably achievable) concerns, or alterations to the tank farm surface as a part of ongoing waste retrieval activities.

Some drywells may be double-cased with 8- and 12-in. casing, and/or have grout around them. This makes them unsuitable for moisture monitoring, (and of limited use for gross-gamma monitoring). If any of these drywells are double-cased or have grout around them they will not be moisture logged.

The pre- and post-retrieval gamma scans will be obtained from near the ground surface to near the bottom of each drywell. Pre-retrieval gamma scans will preferably be obtained within a year of retrieval start but may, with approval from Ecology, be within two years.

The pre-retrieval moisture scans will be obtained from near the ground surface to near the bottom of each drywell. Pre-retrieval moisture logging is performed to provide a baseline for comparison should moisture logging be required for backup leak detection during waste retrieval. Pre-retrieval moisture logging will be obtained between 6 months and a year of the start of retrieval.

4.2.1.2. Leak Detection Using SST Liquid Level Measurement. SST level measurement data are normally limited during periods when active retrieval operations are not being performed due to the strategy of minimizing liquid in the tank. In addition, because of the dished bottoms of the tanks and the location of the level instrumentation near the side in the C-100 series SSTs, waste levels cannot be measured below approximately 12,000 gal. However, should conditions exist where a continuous liquid surface measurement is available (e.g., a pump fail prior to removing as much liquid as practical from the tank and replacement of the pump cannot occur immediately) this measurement could provide an additional means of leak detection superior to either drywell monitoring or HRR. SST liquid level measurement can be used for leak detection during waste retrieval under the following conditions:

a) The tank level gauge must be an ENRAF level gauge of the type normally used in tank farms

b) There must be a liquid surface under the ENRAF plummet, with no part of the plummet touching any waste solids or the tank bottom

c) There are no active retrieval operations being performed

d) The tank is not being actively exhausted except as required to meet air permit requirements*

e) The measured waste level is not increasing, such as can occur if liquid is slowly draining from waste solids above the liquid surface

~~e)~~f) During periods when the Enraf is used for leak detection the Enraf level will be recorded at least once every calendar day

*If the exhaust is applied to the tank for > 7 days and causes a significant level decrease rate, moisture logging will be evaluated as an alternative leak detection method.

Material balance will not be credited for SST leak detection during the retrieval of C-101 or C-105.

4.2.1.3 High-Resolution Resistivity. HRR will be used for leak detection during the retrieval of the waste in C-101 and C-105. The equipment operates continuously except when down for repairs, calibrations, electrical outages, or similar reasons. Should a problem occur which renders the HRR leak detection system inoperable, drywell monitoring would be used as a backup means of leak detection, within the conditions specified in Figure 4-3 and 4.2.1.1.

5.0 REGULATORY REQUIREMENTS IN SUPPORT OF RETRIEVAL OPERATIONS

Retrieval of waste from the C-Farm SSTs will be performed under the requirements of the Decree, *Atomic Energy Act of 1954*, RCRA, Chapter 70.105 RCW and its implementing regulations, and WAC 173-303. The SSTs do not provide secondary containment and are not compliant with RCRA and Chapter 70.105 RCW interim facility standards of Subpart J of 40 CFR 265. The SSTs are currently authorized to continue operations under the Chapter 70.105 RCW pending closure in accordance with WAC 173-303-610, *Closure and Post Closure*, under the authority of HFFACO Milestone M-45-00, *Complete Closure of all Single-Shell Tank Farms*. Except as otherwise modified by HFFACO Milestone M-45-00, DOE conducts day-to-day operations of the SSTs in accordance with the interim status facility standards established in WAC 173-303-400(3), "Interim Status Facility Standards." WAC 173-303-400(3) incorporates by reference the interim status performance standards set forth by the EPA in 40 CFR 265. Additionally, the SSTs are governed by federal regulations promulgated under the authority of the *Atomic Energy Act of 1954* and various DOE directives incorporated into the contract between ORP and the TOC (DE-AC27-0RV14800 for current TOC). These requirements are implemented through operating plans and procedures by the TOC.

Interim status facility standards in WAC 173-303-400(3)(a) incorporate, by reference, the interim status standards set forth by the EPA in 40 CFR 265 Subpart J for tank systems. Elements of the interim status standards relevant to the WRS along with the WRS features and/or operating plans and procedures are summarized in Table 5-1.

If necessary, DOE will seek approval to retrieve waste that could contain polychlorinated biphenyls from tanks C-101 and C-105 using supernate from the receiver DST and transfer the resulting slurry to the respective receiver DST from EPA before initiating waste retrieval operations. DST supernate is classified as polychlorinated biphenyl remediation waste in accordance with Ecology et al. (2000), *Framework Agreement for Management of Polychlorinated Biphenyls (PCBs) in Hanford Tank Waste*. Because the DST supernate is polychlorinated biphenyl remediation waste, the retrieval of waste from SSTs, when using DST supernate, requires a Risk-Based Disposal Approval, approved by EPA, pursuant to the *Toxic Substances Control Act of 1976*.

Those components of the aboveground system using DST supernate to transfer SST waste to the receiving DST will be handled consistently with the current method of addressing polychlorinated biphenyl (PCB) waste in the DST system.

The ventilation system(s) used during waste retrieval operations are designed to pass air through the tank, thereby reducing condensation and fog within the tank. The ventilation systems required by Washington State Department of Health include a heater, prefilter, demister, two high-efficiency particulate air filters and test sections, exhaust fan, and stack. Details of the ventilation systems are provided in ~~AIR 09-704, *Categorical Tank Farm Facility Waste Retrieval and Closure: Phase II Waste Retrieval Operations (including as amended in updates)* and DE05NWP-002R2, *Approval of Criteria and Toxics Air Emissions Notice of Construction*~~

~~*(NOC) Application for Hanford Single-Shell Tank Waste Retrieval (as amended in updates)*~~00-05-006, *Hanford Site Air Operating Permit,* as amended and succeeded.

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