STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
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March 10, 2020 20-NWP-052

By certified mail

Brian T. Vance, Manager
Richland Operations Office
United States Department of Energy
PO Box 550, MSIN: H5-20
Richland, Washington 99352

Ty Blackford, President and CEO
CH2M HILL Plateau Remediation Company
PO Box 1600, MSIN: A7-01
Richland, Washington 99352

Re: Dangerous Waste Compliance Inspection on November 05, 2019 at 241-CX Tank System, RCRA Site ID: WA7890008967, Nuclear Waste Program (NWP) Compliance Index No.: 19.687

Dear Brian T. Vance and Ty Blackford:

Thank you for your staff's time during the 241-CX Tank System inspection on November 5, 2019. The Department of Ecology's (Ecology) compliance report of this inspection is enclosed. The report cites one area of non-compliance and one concern.

Specific deficiencies or violations not listed in the enclosed compliance report do not relieve your facility from having to comply with all applicable regulations.

If you have questions or need further information, please contact me at (509) 372-7943 or phillip.buser@ecy.wa.gov.

Sincerely,

Phillip Buser
Dangerous Waste Compliance Inspector
Nuclear Waste Program

pb/tla

Enclosure

cc: See page 2

cc electronic w/enc:

Dave Bartus, EPA
Dave Einan, EPA
Cheryl Williams, EPA
Duane Carter, USDOE-RL
Al Farabee, USDOE-RL
Kathy Higgins, USDOE-RL
Tony McKarns, USDOE-RL
Allison Wright, USDOE-RL
Linda Petersen, CHPRC
Jon Perry, MSA
Steve Szendre, MSA
ERWM Staff, YN
Ken Niles, ODOE
Shawna Berven, WDOH
John Martell, WDOH
Deb Alexander, Ecology
Phillip Buser, Ecology
Kathy Conaway, Ecology
Tabitha Liebrecht, Ecology
Nina Menard, Ecology
Jared Mathey, Ecology
John Price, Ecology
Stephanie Schleif, Ecology
Alex Smith, Ecology
Kim Welsch, Ecology
Environmental Portal
Hanford Facility Operating Record
CHPRC Correspondence Control
MSA Correspondence Control
USDOE-RL Correspondence Control
USDOE-ORP Correspondence Control
USEPA Region 10 Hanford Field Office Correspondence Control

cc w/enc:

Ben Harp, USDOE-ORP
Susan Leckband, HAB
Administrative Record
NWP Central File
NWP Compliance Index File: 19.687

cc w/o enc:

Mason Murphy, CTUIR
Jack Bell, NPT
Laurene Contreras, YN

Washington Department of Ecology
Nuclear Waste Program
Compliance Report

Site:	241-CX Tank System
RCRA Site ID:	WA 7890008967
Inspection Date:	November 05, 2019
Site Contacts:	Kathy Higgins, United States Department of Energy – RL (USDOE-RL) Mitchell Marrott, CH2M Hill Plateau Remediation Company (CHPRC)
Site Location:	Hanford Site, 200 East Area
At This Site Since:	1943 NAICS#: 54171, 56221, and 924110
Current Site Status:	Treatment, Storage, and Disposal Facility / Large Quantity Generator

Ecology

Lead Contact: Phillip Buser Phone: (509) 372-7943

Other Representatives: Jared Mathey (Support Inspector)

Report Date: March 10, 2020

Index #: 19.687

Report By: Phillip Buser Philip Buser (Signed) 03/10/2020 (Date)

Site Location

The Hanford Site was assigned a single United States Environmental Protection Agency (EPA) identification number, and is considered a single Resource Conservation and Recovery Act (RCRA) of 1976, as amended, facility even though the Hanford Site contains numerous processing areas spread over a large geographic area. The Hanford Site is a tract of land approximately 580 square miles and is located in Benton County, Washington. This site is divided into distinct Dangerous Waste Management Units (DWMUs) which are administratively organized into "unit groups." A unit group may contain only one DWMU or many; currently, there are 30 unit groups at the Hanford Site. Individual DWMUs make up a small portion of the Hanford Site. Additional descriptive information on the individual DWMUs is contained in unit group permit applications and in Parts III, V, and VI of the Hanford Facility RCRA Permit, Dangerous Waste Portion, WA7890008967, Revision 8C (hereafter referred to as the Permit).

Owner and Operator Information

The United States Department of Energy (USDOE) is the owner and operator of the 241-CX Tank System and oversees waste management and cleanup activities ongoing at the Hanford Site. CH2M Hill Plateau Remediation Company (CHPRC) is contracted by USDOE to co-operate the 241-CX Tank System.

Facility Background

In 2018, the USDOE Hanford Site reported as a Large Quantity Generator of hazardous waste on their Dangerous Waste Annual Report.

The 241-CX Tank System is located in the 200 East Area of the Hanford Site in the now-demolished Strontium Semi-works Complex (SSC) and sometimes referred to as the Hot Semi-works, Strontium Semi-works, 201-C Area, or C-Plant. The 241-CX Tank System consists of three below-grade tanks. They are 241-CX-70, 241-CX-71, and 241-CX-72. It also includes ancillary equipment (waste feed piping). These tanks were in operation from 1952 to 1958. They supported the Reduction-Oxidation Plant (REDOX) and Plutonium Uranium Extraction Plant (PUREX) process pilot studies at the SSC, which began in 1952 and ended in 1956. The three tanks received liquid waste from the 201-C Process Building and Hot Shop of the SSC via underground piping.

Tank 241-CX-70 operated for approximately one year during 1952 and 1953. Tank 241-CX-71 operated from 1952 to 1957. Tank 241-CX-72 operated for approximately one year during 1957 and 1958. Waste streams received by the 241-CX Tank System were generated in the 201-C Process Building and/or the adjacent Hot Shop. All of the 241-CX tanks received waste from the 201-C Process Building, but only tank 241-CX-70 received liquid waste from Hot Shop sink drains. The Hot Shop supported 201-C Process Building operations and generated unspecified waste streams. The waste streams contained chemical constituents and Atomic Energy Act – (AEA) regulated material at unknown concentrations. The Redox process study waste streams included large volumes of aluminum nitrate, zirconium oxide, sodium fluoride, sodium nitrate, and potassium fluoride that were slightly acidic and contained fission products. The PUREX chemical separation process waste streams were mixed waste (comprised of aluminum and zircaloy coating removal waste, and condensates), and spent organic solvent waste (comprised of fission products and sodium nitrate, sodium carbonate, manganese oxide) that were acidic before being neutralized.

The PUREX and REDOX pilot study was completed in 1956 and the SSC was placed in standby operation mode on July 1, 1957. Even though the SSC reopened from 1961 through 1967, the 241-CX Tank System did not receive or generate any additional waste. The SSC was permanently removed from service in 1967 and placed on safe standby mode. The 241-CX tanks and waste transfer piping currently remain in place; however tanks have been physically isolated by cutting and sealing off the end of the pipes in 1985. An Ecology "Silver Letter" resolution was issued in 1996 stating that the tanks are deemed unfit-for-use. For Tank 241-CX-72, Ecology identified specific actions that must be taken until the 200-SO-1 Work Plan deems otherwise.

Tank 241-CX-70 is a round concrete vessel, 20 feet in diameter and 15 feet tall, constructed with 12-inch-thick concrete walls and top, and a bottom 2 feet thick at the edges. Lined with stainless steel, its design capacity is 30,000 gallons. Waste was removed between 1987 and 1991; currently the tank contains only waste residues. An inventory of approximately 750 gallons of radioactive waste regulated as dangerous waste under Washington Administrative Code (WAC) 173-303 and assigned the dangerous waste codes D002 and D007. This volume remained in Tank 241-CX-70 until December 20, 1991, at which time the waste was placed in containers and transferred to the 224-T Transuranic Waste Storage and Assay Facility.

Note: the containers are currently at the Central Waste Complex (CWC). As part of waste removal, access to the manway and risers was required and resulted in excavating to the top soil layer above the tank in 1991. Plywood used to shore the excavation has since collapsed and

obscured the view of the tank. Subsidence and shoring collapse has continued to be an issue. The
241-CX-70 underground tank is being managed according to the interim status standards and defined as a dangerous waste tank system until closure is completed.

Tank 241-CX-71 is a round vessel constructed of stainless steel. This tank is approximately 5 feet in diameter, approximately 7 feet high, and constructed on a reinforced concrete foundation pad. Tank 241-CX-71 is an underground tank used to neutralize 201-C Process Building condensate, coil, and condenser cooling water prior to disposal. Tank capacity is approximately 3,800 gallons. This waste was first disposed to the 216-C-1 Crib, then to the 216-C-5 Crib. Along with 201-C Process Building waste, tank 241-CX-71 also received Hot Shop sink drain waste. 241-CX-71 tank currently has a bottom of sludge containing chemical compounds, AEA – regulated materials, and limestone used as a neutralizing agent. In 1986, during semi works decommissioning, the tank was stabilized using a low-density grout. The volume of waste and limestone beneath the grout is approximately 900 gallons, which according to the Part A Form is considered state-only toxic dangerous waste, WT02. The 241-CX-71 underground tank is managed according to the interim status standards and defined as a dangerous waste tank system until closure is completed.

Tank 241-CX-72 is a below-grade storage tank. The tank is a round vessel made of carbon steel. The tank measures 40 inches in diameter and approximately 35 feet long. The tank is enclosed in a 6-foot-diameter caisson made of carbon steel placed on 12-inch-thick reinforced concrete base pad. The design capacity is 2,340 gallons. Tank 241-CX-72 stored 2,305 gallons of SSC waste generated from PUREX process pilot studies. This tank use was for an experimental study the self-concentration of PUREX process waste by the application of heat. The waste in the tank was heated until nearly dry by cylindrical heaters located above each stiffening ring. In 1986, low-density grout was injected through the 8-inch risers over approximately 9 feet of sludge, filling the tank with grout to the top of the risers. A containment structure on a reinforced concrete pad was placed over Tank 241-CX-72.

On June 10, 2003, the Washington Department of Ecology granted permission for the 241-CX Tank System Unit to decrease facility inspections from monthly and quarterly intervals down to annual inspections. On December 26, 2017, this inspection frequency was rescinded on 1) the occurrence of subsidence; and 2) their failure to notify Ecology when subsidence had occurred. For the requirements of the Hanford Dangerous Waste Permit, Revision 9, the 241-CX Tank System submitted a Dangerous Waste Part A Permit to Ecology on September 9, 2008. Ecology approved the 241-CX Tank System Closure Plan, DOE/RL-2008-51, Revision 1 on October 13, 2009. USDOE plans to clean close the 241-CX Tank System under Tri-Party Agreement (TPA) Milestone M-37-13. This Milestone has a due date of September 9, 2022.

Compliance Background

Previous inspections are summarized below:

On June 30, 2015, Ecology started a Non-Financial Records Review, Inspection #15.540. There was one area of non-compliance found for an incomplete inspection record. The area of non-compliance was corrected and the facility returned to compliance on February 8, 2016.

On March 24, 2016, Ecology initiated a Non-Financial Records Review. Inspection #16.557. This inspection found one area of non-compliance. The area of non-compliance was for an incomplete inspection record. The result of this inspection and area of non-compliance was the rescinding of the inspection schedule from annually back to quarterly.

On March 9, 2017, Ecology conducted a Compliance Evaluation, Inspection #17.586. This inspection found no areas of non-compliance.

On September 26, 2018, Ecology began a Non-Financial Records Review, Inspection #18.651. This inspection found no areas of non-compliance at the 241-CX Tank System.

On May 22, 2019, Ecology conducted a Compliance Evaluation Inspection, Inspection #19.663. This inspection found no areas of non-compliance.

Inspection Summary

At approximately 7:48 am, Jared Mathey and I arrived at Building MO 2234. We entered the building and introduced ourselves. The inspection in-briefing began at 8:00 am. An attendance roster for everyone to sign in included the following:

- Deborah Older – Nuclear Chemical Operator, CHPRC.
- Daniel Turlington – Environmental Compliance Officer, CHPRC, CPRM.
- Mitch Marrott – Inspection Coordinator, CHPRC.
- Steve Weil – General Support Services Contractor, USDOE.
- Ted Hopkins – Environmental Compliance Officer, CHPRC.
- Elis Eberlein – Permit Writer, CHPRC.
- Kathy Higgins – RL Projects, USDOE.
- Bob Cathel – Environmental Program, CHPRC.
- Linda Petersen – Inspection Coordinator, CHPRC.
- Darin Corriell – Central Plateau Risk Management Director, CHPRC.

I began the in-briefing saying this compliance inspection being so close to the previous compliance inspection is not a reflection of any concerns from Ecology. It is primarily a schedule and timing issue. We continued with a safety briefing conducted by Darin Corriell. He stated that with limited parking, carpooling is best. Before leaving the site, we are to conduct a 360-degree check of vehicles. The personal protective equipment (PPE) needed on-site includes safety glasses and substantial footwear. He continued that there are maintenance trailers nearby that may or may not be conducting work. He said that this time of year, critters (wasps, spiders, etc.) are not a concern. Dan Turlington added that everyone should be aware of uneven surfaces. Mr. Mathey asked where the nearest "take-cover" location would be. Mr. Corriell answered that there are trailers due west of the facility to take cover in, if necessary, and that the trailer we were currently in is also a take-cover location for the meeting portions of today's inspection. He added that the attendance roster would be used for accountability of persons during such an event, and that several staff have radios for communication purposes.

Next, Linda Petersen asked what my plan was for today's inspection. I said I would like to visit the three tanks and the building. I said I would like to take pictures of the signs, and asked what it would take to get pictures of the inside of the building for Tank 241-CX-72. Dan Turlington and Deborah Older both answered that there are two windows to look through to take pictures.

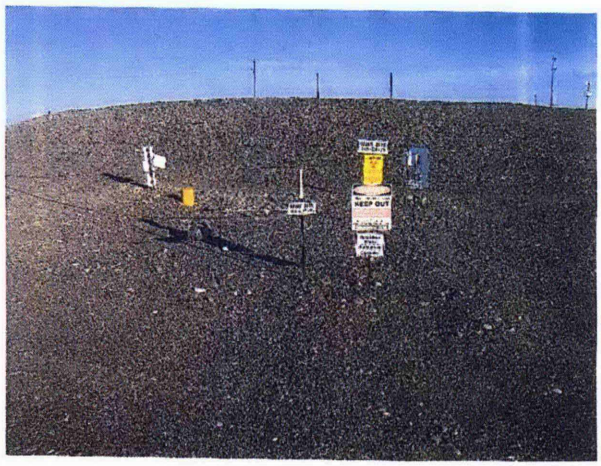
We had a brief discussion about the process of taking pictures and getting images cleared through USDOE. I said that after the site visit, we would return for records review and follow up questions.

Before departing to the 241-CX Tank System, I asked if they have a Building Emergency Plan, and if so, can I see it. Mr. Turlington said they do not have a building emergency plan, but instead have a Facility Response Plan. He continued to explain the difference between the two documents and why the facility response plan is appropriate for this location. I asked if there are any hard copies kept on site. Mr. Corriell replied that there are copies in Building MO 294, which is their Incident Command Center and their "BED (Building Emergency Director) Rig," which is a mobile response truck.

At this point we caravanned to the 241-CX Tank System. We arrived at the 241-CX Tank System at approximately 8:30 am. I asked the group if anyone was aware of any known releases of waste to the environment outside the three tanks. Everyone answered no. Mr. Corriell added that if there had been, it would have been well before anyone here was working with this system. I began taking notes on the security signs around the delineated area for Tank 241-CX-70.

For security measures, a single chain delineates the underground tank. I asked Mr. Turlington to take pictures of the signs for me. After doing so, he mentioned the previous issues with subsidence at Tank 241-CX-70. He continued to explain that there was an access shaft constructed with wood. Over time the wood would rot, allowing dirt and sand to enter the shaft, and occasionally creating subsidence issues. He further explained that the last effort to correct subsidence was to remove the shaft completely and fill all the void spaces around the tank, thus eliminating any potential for future subsidence.

Security Signs and Chains at
Tank 241-CX-70



Security Signs and Chains at
Tank 241-CX-71

Next I asked what emergency equipment is in place for this facility. I said "according to WAC 173-303-340, all facilities must be equipped with the following, unless it can be demonstrated to the department that none of the hazards posed by waste handled at the facility could require a particular kind of equipment specified below." Deborah Older answered that staff carry first aid

kits, fire extinguishers and a radio, phone or both in their vehicles. She added they only do flat surveillance at this location, so there is no need for eye-wash equipment. She then continued that there is also no handling of waste, so there is no need for spill equipment. I then asked if there is a copy of the facility response plan kept in the vehicles with the other emergency equipment. Mr. Corriell replied that they do not keep copies of the facility response plan in those vehicles, and if there were any emergency issues, the worker would respond by calling the command center and/or their supervisor to report the issue.

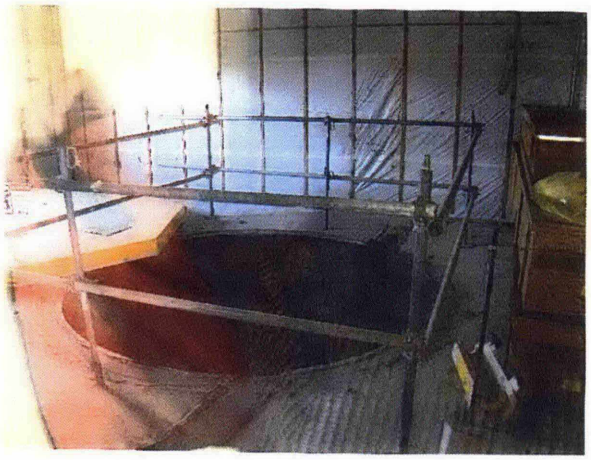
I continued my inspection with a walk around of Tank 241-CX-71. The security signs and chain were similar as Tank 241-CX-70. Again, I asked Mr. Turlington to take pictures of the signs for me, as well as a picture of the entire 241-CX Tank System.

Additional Security Signs at Tank 241-CX-71

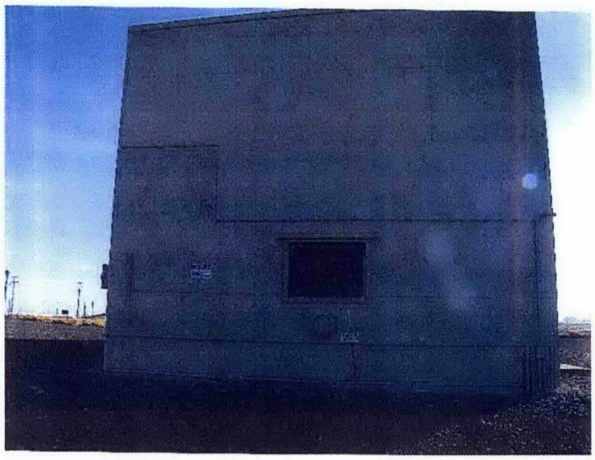
The Proximity of Tanks 241-CX-70 and 241-CX-71 to Tank 241-CX-72 Building

Next I began to inspect the Tank 241-CX-72 building. I looked through the two windows and directed Mr. Turlington to take pictures from the west and south windows. (Note: the original photographs taken through the windows were blurry and required retakes.) Then I directed him to take pictures of each side of the building. I checked the lock on the door to determine that it was secure. Then I asked if the overhead security light on the building was functional. Mr. Corriell said that light was out of service. He continued that the facility is "cold and dark." He explained that utilities to the facility are shut off, but the lines have not yet been air gapped. Whenever that is completed, the facility would be officially deactivated. At this point my site inspection was complete and we returned to Building MO 2234 for document review and follow up questioning.

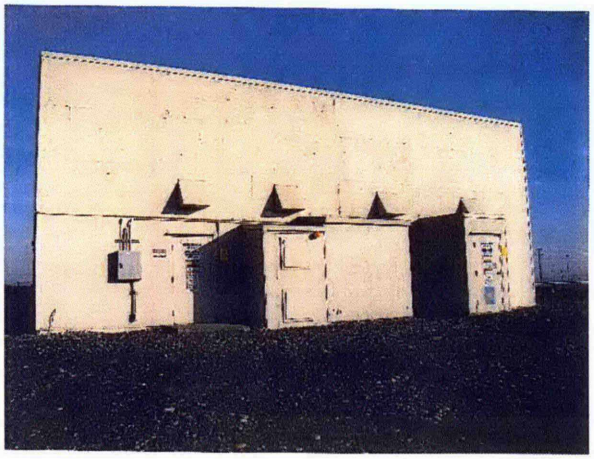
Viewing Inside Tank 241-CX-72 Building
From the West Window



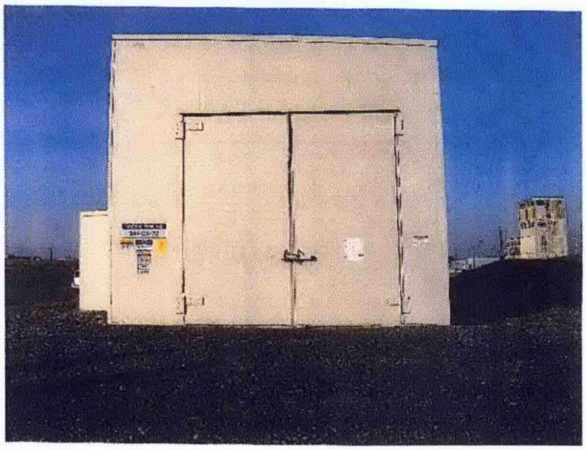
Viewing Inside Tank 241-CX-72 Building
From the South Window



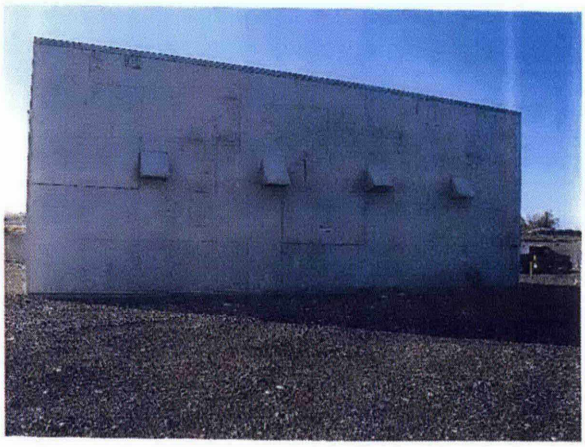
West Side of Tank 241-CX-72 Building



South Side of Tank 241-CX-72 Building



East Side of Tank 241-CX-72 Building



North Side of Tank 241-CX-72 Building

Document Review and Additional Questions

We began document review at 9:13 am. First I asked for inspection records from July 1, 2019 through the current date. Bob Cathel provided a hard copy of CPSM-PRO-EP-53098, CPRM Facility Treatment, Storage, and Disposal (TSD) Inspections, Appendix B's quarterly inspection data sheets, including photographs from 09/09/2019. He also provided CPSM-PRO-EP-53098, Revision 0, Change 6, *Central Plateau Risk Management (CPRM) Facility TSD Inspection,* dated 07/29/2018. This is the procedure that provides the details of the previously mentioned inspection. Mr. Turlington added that this inspection was conducted quarterly, but will now be conducted annually. He continued that when this inspection was previously on an annual cycle, the inspections were typically conducted in June or July.

Next I asked to see their current training plan. Mr. Cathel provided a hard copy of PRC-STD-TQ-40236, Revision 2, Change 1, *Central Plateau Risk Management Dangerous Waste Training Plan,* dated 11/01/2018. I said that I would be making a formal request for the training records of Nuclear Control Operator Noah Wilkerson, and Field Work Supervisor Justin Roberts, as they were the persons who completed the inspection report I reviewed. For my request, Mr. Cathel provided a hard copy of both individuals training records. There was a brief discussion as to whether or not the training records would clear for release to me. It was determined that the training records would not be cleared, so Mr. Mathey and I took a few minutes to compare the training records to the training plan. Our review revealed that the training plan does not properly identify the required training for a Field Work Supervisor. Review of the record also showed that Field Work Supervisor Justin Roberts was not currently qualified in his position. Course Number 290004 CPRM NCO Waste Handler Qualification expired on 10/03/2019. However, Mr. Roberts was still qualified at the time of the facility inspection and report that he signed for.

I asked to see the Work Order SM-16-06590 and all other pertinent information related to the void space stabilization of Tank 241-CX-70. Mr. Cathel provided a hard copy of SM-16-06590/Y WCN-1. I mentioned that this is the same information that was provided to Kathy Conaway during the previous Ecology inspection and they confirmed that it was. Mr. Mathey stated that work orders typically have more information than what was provided, and I said that is why I am asking again. Mr. Corriell began that this is a Repetitive Use Work Package. He explained that it is a general work order for multiple activities at multiple locations. He continued that this is used for routine activities and small projects with no extensive planning. They simply write up a description of the work to be performed, any additional notes afterward, and add it to the document. This helps streamline their operations by reducing excess paperwork. Mitch Marrott said they provided only what was relevant to Tank 241-CX-70 subsidence, not the full package.

Next I asked to see the most recent complete designation records for all tank systems, including sampling results or knowledge used. Mr. Cathel stated that he is still working on these records, along with the records related to tank waste from Tank 241-CX-70 put into containers, the Land Disposal Restriction (LDR) records, and any records showing a current waste inventory of each tank. He continued to explain that these tanks have been out of service since the 1980's. They consider these records historical and are likely in long-term storage at the National Archives and Records Facility in Seattle, WA. He added that the containers initially went to the Transuranic Waste Storage and Assay Facility for analysis, then to CWC for storage.

I stated that the current closure plan for 241-CX Tank Systems is DOE/RL-2008-51, Revision 1, and the plan contains Figure 7-3 – 241-CX Tank System Closure Schedule. I said TPA Milestone M-037-13, "Complete Unit-Specific Closure Requirement" according to the closure plan lists a due date of 09/30/2022. I then asked what tasks listed in this figure have been completed in order to stay on track with the milestone timeframe. Kathy Higgins began saying the milestones are being renegotiated and a new milestone is currently out for public review. She continued that the new timeframe is to be determined after the public comments have been assessed. Elis Eberlein added that they will be doing coordinated closure through the new Revison 9 Permit to include Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) regulations. I again asked if any of these tasks from Figure 7-3 have been completed. Everyone said no. I continued stating that according to the same closure plan, "Sufficient information is not available to specify a closure pathway for Tank 241-CX-72. Because an appropriate closure approach is yet to be identified for Tank 241-CX-72, this tank will not be closed under this plan." I said that Tank 241-CX-72 is listed for closure in the previously mentioned TPA Milestone. I then asked if this tank is scheduled for closure as described in the Milestone, or does it have a separate closure plan. Ms. Higgins said there will be a new milestone (M-037-15) coming out after the public comment period and that all three tanks will be included.

For my last closure question, I said the same closure plan states "Waste transfer piping from the tanks to the first isolation point constitutes the tank system ancillary piping within the TSD unit boundary and the scope of closure under this plan." I then asked what the identified first isolation point for each tank is. Mr. Eberlein said they are still working this out with Ecology permitting. He continued that the pipelines were not cut and capped at the tanks, but rather at Building 201-C. Mr. Turlington added that Building 201-C is now gone and the remains are under the soil mound next to the 241-CX Tank System.

At this time, Mr. Mathey and I had a brief caucus outside to discuss observed issues during the inspection. We returned inside and began sorting through records provided and records to be requested. I started by saying I would request a copy of the facility response plan that was discussed at the beginning of the inspection. Mr. Cathel said he had a hard copy for me and forgot to hand it over earlier. He then provided HNF-IP-0603-241-CX, Revision 10, *Central Plateau Surveillance and Maintenance Facility Response Plan for the 241-CX Tank System*, dated July 2017. The next items on my list were the inspection records and the corresponding inspection procedure. I said I had the copies provided and asked if I would be able to keep them. Ms. Petersen and Mr. Marrott both agreed they were properly cleared. After that, I said I had the training plan, and then asked for clarity if Noah Wilkerson is still a Nuclear Chemical Operator and that Justin Roberts is still a Field Work Supervisor. Mr. Corriell said yes, and that Mr. Roberts is also a building emergency director and shift operations manager. I asked if I would be able to keep the copies of the training plan and training records. Mr. Marrott said the training plan is cleared, but the training records will need a request. The next items on my list were the designation records, LDR records, container records and tank waste inventory records, all of which Mr. Cathel already said he is still working to provide. The last items were the inspection photographs taken by Mr. Turlington and the attendance roster. Ms. Petersen and Mr. Marrott deliberated on how to proceed. They determined that the photographs would have to be requested, but the attendance roster would be provided today. Mr. Marrott was filling out a

Receipt of Regulatory Requested Documents form by hand. He said that since there is no photocopier in the building, he would email the receipt form along with the attendance roster later that day.

At this time, I said that concluded my records review and additional questioning. Ms. Petersen proceeded to ask if I had any concerns. I said that I did have a few. I mentioned that preparedness and prevention equipment is a requirement unless it has been formally expressed to Ecology that the need no longer exists. We discussed the process involved. Mr. Mathey explained that they need to send a letter to Ecology stating that specific preparedness and prevention equipment is not needed on site, along with the reasons such as those stated earlier in the inspection. After receiving the letter, Ecology would send them a reply letter stating whether we concur. The other item I mentioned was the deficiency of identified training requirements for the Field Work Supervisor in the training plan. Mr. Mathey asked how they might be able to resolve this issue. Mr. Corriell stated that he would submit a request through their Condition Report and Resolution System (CRRS) to amend the training plan and that typically takes a few weeks to process. He continued that if it is approved, then an amended training plan would be forthcoming sometime after that. I said that I would be adding the CRRS report and the amended training plan to my official records request. Mr. Mathey said he had a couple additional concerns. He mentioned that Field Work Supervisor Justin Roberts was not current on training to be qualified as a Field Work Supervisor. Mr. Corriell looked at the training records and concurred. He continued that Mr. Roberts was current at the time when he last conducted the 241-CX Tank System quarterly inspection. He proceeded to explain that prior to anyone conducting any sort of field work, it is the responsibility of the supervisors assigning tasks to verify that everyone is currently qualified for the work that they are being assigned. He added that this is a cumbersome process, but that is how they make sure that individuals who are delinquent on training do not perform work that they are not authorized to complete. Mr. Mathey also mentioned that the designation records, LDR records, tank inventory records and container management records are fundamental operating records that any regulated facility is required to have readily accessible.

At this time I concluded my inspection. Mr. Mathey and I left at 10:40 am.

Document Review

Facility Response Plan

During the inspection, I was provided HNF-IP-0603-241-CX, Revision 10, *Central Plateau Surveillance and Maintenance Facility Response Plan for the 241-CX Tank System*, dated July 2017. I reviewed personnel organization and contact strategy, emergency equipment, implementation strategy, and response procedures. Section 3.0 details Emergency Equipment: Location, Physical Description, and Capabilities. Under 3.1: Fixed Emergency Equipment, there are no items listed, only "N/A." Under 3.2: Portable Emergency Equipment, the plan lists only "Emergency Response Kits," but it does not mention what equipment is included in the kit. The response procedures, evacuation plans, and emergency contacts appeared to be in accordance with WAC 173-303-350.

Inspection Reports

During the inspection, I was provided CPSM-PRO-EP-53098, Rev 0, *CPRM Facility TSD's Inspection, Appendix B – Inspection Data Sheets,* dated 09/09/2019. The associated technical procedure CPSM-PRO-EP-53098, Rev. 0, *Central Plateau Risk Management (CPRM) Facility TSD Inspection,* dated 07/29/2019 was also included. I observed the inspection procedure contained the scope, limitations, prerequisites, and performance standards for the 241-CX Tank System facility. I reviewed the quarterly inspection data sheets. I observed that each inspection record contained the printed name and handwritten signature of the inspector, the date and time of the inspection, and notations of the observations made. I did not observe any deficiencies noted on any of the inspection records I reviewed.

Training

During my later review of the document, I observed the plan identified the scope of coverage, purpose of the training program, identification of job titles/positions complete with descriptions of duties, and records management. The plan also contains a table identifying relevant training courses with corresponding course numbers, the requirement frequency for each course, the administration of each course, and what worker positions are required to complete each course. I said during the inspection that the training plan does not properly identify all of the necessary training required by a Field Work Supervisor. It appears that the training plan does not require the same training as required by a Nuclear Control Operator. According to the training plan, a Field Work Supervisor is only required to complete CHPRC General Employee Training and Orientation, and Facility Emergency Hazards Identification Checklist Training.

I requested the training records of Justin Roberts (Field Work Supervisor) and Noah Lee Wilkerson (Nuclear Control Operator). These are the same training records reviewed during the inspection. Upon further review and comparison of training records to the training plan, I confirmed that Mr. Roberts' training record conforms to the outlined requirements of the training plan, yet does not indicate that he has the equivalent training of a nuclear control operator.

I requested CHPRC provide a completed CRRS for revisions to PRC-STD-TQ-40236, *Central Plateau Risk Management Dangerous Waste Training Plan.* I received CR-2019-2776, *CHPRC Condition Report Form,* dated 11/06/2019. I observed that Mr. Corriell submitted the request, and the recommended corrective action was the "training plan needs to be evaluated that it is compliant to current requirements as defined in WAC 173-303."

I requested CHPRC provide a revision to PRC-STD-TQ-40236, *Central Plateau Risk Management Dangerous Waste Training Plan,* showing compliance with WAC-173-303-330(2)(b). On 12/18/2019, I received CR-2019-2776, *CHPRC Condition Report Form,* with an Analysis Completion Date of 12/06/2019. I also received PRC-STD-TQ-40236, Revision 2, Change 2, *Central Plateau Risk Management Dangerous Waste Training Plan*, dated 12/11/2019. I observed that Field Work Supervisors are now required to take either Waste Management Awareness training, or Container Waste Management training (along with previously required training).

Designation Records

I requested the most recent complete designation records for all 241-CX Tank Systems, including sampling results or knowledge used. I received a copy of the last approved closure

plan – DOE/RL-2008-51, Revision 1, *241-CX Tank System Closure Plan,* dated 08/18/2009. I observed a facility description, including a history of operations, and a description of waste inventory and waste characteristics. I observed a table identifying waste designation codes for each tank (included below).

Table 4-1. Summary of 241-CX Tank System Waste Characteristics

Waste Characteristic	241-CX-70	241-CX-71	241-CX-72
Corrosivity (D002)	X		X
Toxicity (D007)	X		
Toxic state only (WT02)	X	X	X
Toxicity (D004-D011)			X
Toxic state only (WT01)			X

Table of waste codes for each tank at the 241-CX Tank System, copied from DOE/RL-2008-51, Revision 1, *241-CX Tank System Closure Plan,* dated 08/18/2009.

I received WHC-SD-DD-TI-039, Revision 0, *Tank 241-CX-71 Preliminary Waste Characterization,* dated 06/30/1989. I observed:

- Section 2.2.1 "Tank 241-CX-71 was used for neutralizing the 201-C condensate and the coil and condenser cooling water from December 1952 through 1956. Flush wastes during decontamination also went through Tank 241-CX-71 from December 1956 through June 1957. After this dated, the tank was no longer used."
- Section 2.2.2 "241-CX-71 tank was used to neutralize waste from 201-C and the hot shop sink before routing to 216-C-1 crib. This tank is not currently in use and is considered retired."
- Section 2.3.1 "241-CX-71 is a stainless steel, underground, neutralization tank. It is 9 ft. in diameter and 9 ft. high. There is a gooseneck vent riser visible above grade."
- Section 2.3.3 "Tank 241-CX-71 A schematic of the tank is shown in Figure 5.38, which represents the best information available on this vessel. Crushed limestone was added to the vessel through the large central riser. The limestone bed reacted with any acidic material poured through the tank. As the limestone was dissolved by the acid, new limestone was periodically added to renew the bed. Tank 241-CX-71 contains 2,300 gallons of solids (primarily limestone used for waste neutralization) and 1,500 gallons of water."

I received Tank 241-CX-71 Sample Results. This comprised of excerpts from WHC-SC-DD-TI-058, Revision 0, dated 08/28/1990. I observed sample data sheets, sample summaries, WHC-SD-EN-AP-036, *241-CX-71 Tank Investigation Task Plan,* Appendix D, and tables of sludge and consolidated material sampling components. I observed that liquid and sludge in Tank 241-CX-71 were sampled on October 23-24, 1990 with a Toxicity Characteristic Leaching

Procedure (TCLP). I compared the sample results to the concentration threshold limits identified in WAC 173-303-090(8)(c). I did not observe any exceedances.

I received WHC-SD-DD-TI-040, Revision 0, *Tank 241-CX-72 Preliminary Waste Characterization,* dated 06/30/1989. I observed a narrative of historical operations involving Tank 241-CX-72 and a list of decontaminating solutions used following PUREX operations.

- Section 2.2.1 "Tank 241-CX-72 was used as an experimental tank to determine the characteristics of self-concentrating wastes during 1956."
- Section 2.2.2 "The 241-CX-72 waste self concentrator was an experimental project operated in the 1950s by Hanford Labs. It was used for PUREX waste, which was then piped to 241-C Tank Farm. It has not been used since, and is considered retired."
- Section 2.3.1 "The 241-CX-72 tank is set inside a caisson which is a carbon steel cylinder 6 feet 1 inches in diameter and 36 feet 6 inches in length, buried upright approximately 14 feet below grade. The tank is approximately 4 feet in diameter and 35 feet 8 inches in length, and is an agitator tank. Several risers extend from the top of the tank and are visible above grade."
- Section 2.3.2 "Tank 241-CX-72 is a 36 ft. deep by 3 ft. in diameter carbon steel tank located just east of tank 241-CX-70. The only inlet to this tank is from the 201-C Building, and it is cut and capped there. There is no exit from the tank, but there is an above-ground vent riser. Currently, liquid level measurements are 6 feet 2.5 inches, of which all but approximately 1 inch is sludge. This level is measured daily and is holding steady."
- Section 2.3.4 "Identification: CX-72; Capacity (Gal): 20,000; Liquid (Gal): 0; Solid (Gal): 0; Comments: Tank is empty."
- Section 2.4.2 "Tank 72 and vault have trace transuranic (TRU), fission product, uranium, and thorium contamination: no estimates are available. It is believed that Tank 72 may actually be moderately or grossly contaminated with fission products."
- Section 2.7.1 "Sampling was attempted in another location in the tank but no sludge was found. Sludge measurements and visual inspection of the tank indicate that there is no sludge in the tank. Optical equipment is being purchased which will allow us to obtain an in-tank view of tank CX-72."
- Section 2.7.2 "On May 5, 1989, the 222-S Laboratory was requested to perform a computer and hard copy record search for evidence of any sampling done on this tank. No records of sampling were located."

Waste Inventory

I requested the current inventory for Tank 241-CX-70, Tank 241-CX-71, and Tank 241-CX-72. I was referred to DOE/RL-2008-51, Revision 1, *241-CX Tank System Closure Plan,* dated 08/18/2009. I observed Section 4, "Waste Inventory and Characteristics." According to Subsection 4.1, Waste Inventory:

Tank 241-CX-70. "All waste has been removed and only residues remain."

Tank 241-CX-71. "The tank currently contains sludge and limestone overlain with a layer of low-density grout to the top of the risers added in 1986 to stabilize the tank. The volume of waste and limestone beneath the grout is approximately 3,407 L (900 Gal)."

Tank 241-CX-72. "The tank currently contains an approximate 3.4 m (9.5 foot) layer (approximately 2,498 L [660 Gal]) of sludge overlain with a layer of low-density grout to the top of the risers added in 1986 to stabilize the tank."

Container Management

I requested a description of the disposition and location of waste in containers from Tank 241-CX-70, and to provide a history of the movement of this waste at the Hanford Site. I received a Solid Waste Information and Tracking System (SWITS) SWIR200 report for Shipment Document # 20453. I observed a packing list identifying 18 containers. Each container listed had a separate SWIR310 Container Listing Report. For the 18 containers I observed the following:

Container ID	Container Type	Container Size	Dangerous Waste Codes	Accumulation Date	Current Location
201C-91-000137	DM	55 Gallon	D007, D010	12/20/1991	2403WC
201C-91-000144	DM	55 Gallon	D007, D010	12/20/1991	2403WC
201C-91-000146	DM	55 Gallon	D007, D010	12/20/1991	2403WC
201C-91-000149	DM	55 Gallon	D007, D010	12/20/1991	2403WC
201C-91-000150	DM	55 Gallon	D007, D010	12/20/1991	2403WC
201C-91-000151	DM	55 Gallon	D007, D010	12/20/1991	2403WC
201C-91-000152	DM	55 Gallon	D007, D010	12/20/1991	2403WC
201C-91-000153	DM	55 Gallon	D007, D010	12/20/1991	2403WC
201C-91-000154	DM	55 Gallon	D007, D010	12/20/1991	2403WC
201C-91-000155	DM	55 Gallon	D007, D010	12/20/1991	2403WC
201C-91-000156	DM	55 Gallon	D007, D010	12/20/1991	2403WC
201C-91-000157	DM	55 Gallon	D007, D010	12/20/1991	2403WC
201C-91-000159	DM	55 Gallon	D007, D010	12/20/1991	2403WC
201C-91-000160	DM	55 Gallon	D007, D010	12/20/1991	2403WC
HRO-92-0000203	DM	55 Gallon	D007, D010	12/20/1991	2403WC
HRO-92-0000204	DM	55 Gallon	D007, D010	12/20/1991	2403WC
HRO-92-0000205	DM	55 Gallon	D007, D010	12/20/1991	2403WC
HRO-92-0000206	DM	55 Gallon	D007, D010	12/20/1991	2403WC

I received a SWITS SWIR200 report for Shipment Document # 20545. I observed a packing list identifying another 18 containers. Each container listed had a separate SWIR310 Container Listing Report. For the 18 containers I observed the following:

Container ID	Container Type	Container Size	Dangerous Waste Codes	Accumulation Date	Current Location
201C-91-000119	DM	55 Gallon	D007, D010	12/20/1991	2403WC
201C-91-000122	DM	55 Gallon	D007, D010	12/20/1991	2403WC
201C-91-000123	DM	55 Gallon	D007, D010	12/20/1991	2403WC
201C-91-000124	DM	55 Gallon	D007, D010	12/20/1991	2403WC
201C-91-000126	DM	55 Gallon	D007, D010	12/20/1991	2403WC
201C-91-000129	DM	55 Gallon	D007, D010	12/20/1991	2403WC
201C-91-000130	DM	55 Gallon	D007, D010	12/20/1991	2403WC
201C-91-000131	DM	55 Gallon	D007, D010	12/20/1991	2403WC
201C-91-000132	DM	55 Gallon	D007, D010	12/20/1991	2403WC
201C-91-000133	DM	55 Gallon	D007, D010	12/20/1991	2403WC
201C-91-000134	DM	55 Gallon	D007, D010	05/13/1992	2403WC
201C-91-000135	DM	55 Gallon	D007, D010	12/20/1991	2403WC
201C-91-000136	DM	55 Gallon	D007, D010	12/20/1991	2403WC
201C-91-000139	DM	55 Gallon	D007, D010	12/20/1991	2403WC
201C-91-000140	DM	55 Gallon	D007, D010	12/20/1991	2403WC
201C-91-000141	DM	55 Gallon	D007, D010	12/20/1991	2403WC
201C-91-000142	DM	55 Gallon	D007, D010	12/20/1991	2403WC
201C-91-000143	DM	55 Gallon	D007, D010	12/20/1991	2403WC

I received a SWITS SWIR200 report for Shipment Document # 20546. I observed a packing list identifying another 10 containers. Each container listed had a separate SWIR310 Container Listing Report. For the 10 containers I observed the following:

Container ID	Container Type	Container Size	Dangerous Waste Codes	Accumulation Date	Current Location
201C-91-000117	DM	55 Gallon	D007, D010	12/20/1991	2403WC
201C-91-000118	DM	55 Gallon	D007, D010	12/20/1991	2403WC
201C-91-000120	DM	55 Gallon	D007, D010	12/20/1991	2403WC
201C-91-000121	DM	55 Gallon	D007, D010	12/20/1991	2403WC
201C-91-000125	DM	55 Gallon	D007, D010	12/20/1991	2403WC
201C-91-000127	DM	55 Gallon	D007, D010	12/20/1991	2403WC
201C-91-000128	DM	55 Gallon	D007, D010	12/20/1991	2403WC
HRO-92-0000207	DM	55 Gallon	D007, D010	12/20/1991	Offsite
HRO-92-0000208	DM	55 Gallon	D007, D010	12/20/1991	2403WC

Container ID	Container Type	Container Size	Dangerous Waste Codes	Accumulation Date	Current Location
HRO-92-0000209	DM	55 Gallon	D007, D010	12/20/1991	2403WC

I received a SWITS SWIR200 report for Shipment Document # 20547. I observed a packing list identifying another 10 containers. Each container listed had a separate SWIR310 Container Listing Report. For the 10 containers I observed the following:

Container ID	Container Type	Container Size	Dangerous Waste Codes	Accumulation Date	Current Location
201C-91-000138	DM	55 Gallon	D007, D010	12/20/1991	2403WC
201C-91-000145	DM	55 Gallon	D007, D010	12/20/1991	2403WC
201C-91-000147	DM	55 Gallon	D007, D010	12/20/1991	2403WC
201C-91-000148	DM	55 Gallon	D007, D010	12/20/1991	2403WC
201C-91-000158	DM	55 Gallon	D007, D010	12/20/1991	2403WC
HRO-92-0000186	DM	55 Gallon	D007, D010	12/20/1991	2403WC
HRO-92-0000187	DM	55 Gallon	D007, D010	12/20/1991	2403WC
HRO-92-0000188	DM	55 Gallon	D007, D010	12/20/1991	2403WC
HRO-92-0000189	DM	55 Gallon	D007, D010	12/20/1991	2403WC
HRO-92-0000190	DM	55 Gallon	D007, D010	12/20/1991	2403WC

I received a SWITS SWIR310 report for Package ID #MW11700245. I observed that CHPRC identified this document as "MW11700245 R310 return of HRO-92-0000207 once treated." I read that this container:

- Generated at Perma-Fix Northwest.
- Accumulation date of October 12, 2011.
- Contains macro encapsulated debris from Hanford waste.
- Dangerous Waste Codes of D004, D005, D006, D007, D008, D009, D010, D011, D018, D019, D022, D027, D028, D029, D030, D034, D035, D037, D043, F001, F002, F003, F004, and F005.
- Shipment date of October 27, 2011.
- Manifest returned on November 2, 2011.
- Management method identified is Landfill.
- Current location is 218W5, Trench 31, Hanford.

Land Disposal Restrictions

I requested LDR records in accordance with WAC 173-303-380(1)(o) for Tank 241-CX-70, Tank 241-CX-71, and Tank 241-CX-72. I received a LDR notification for Container #HRO-92-

0000207 that was sent to Perma-Fix Northwest. This container was loaded with waste from Tank 241-CX-70 on 12/20/1991 and stored at CWC until shipment. I observed:

- The name and address of the facility receiving the waste as Perma-Fix Northwest, 2025 Battelle Blvd, Richland, WA 99354.
- A description of the waste.
- Waste codes are D007 and D010.
- Underlying Hazardous Constituents (UHC) are cadmium and chromium.
- Statement of contaminated soil subject to the alternative treatment standards of 40 Code of Federal Regulations (CFR) 268.49.
- Treatability group of MLLW-02.
- Hazardous Waste Report Management code H112 – Macro-encapsulation.
- A manifest number of 008855017JJK/LC040 and receipt number MWR11-198.
- Waste is designated as non-wastewater.
- A signed certification form dated August 22, 2011.

I received a signed LDR Notification and Certification Form for Package ID #MW11700245. I observed:

- Description of waste generated at Perma-Fix Northwest.
- Waste codes are D004, D005, D006, D007, D008, D009, D010, D011, D018, D019, D022, D027, D028, D029, D030, D034, D035, D037, D043, F001, F002, F003, F004, and F005.
- A manifest number of CH152.
- Identification of alternative treatment standards.
- Waste is designated as non-wastewater.

I received a memo pertaining to LDR Notification. It stated "The following containers (listed below) were generated and shipped during May and June 1992, from the 241-CX tank system to CWC. These containers are subject to the LDR in 40 CFR 268.7(a)(2) as Non-Wastewater." It also stated "The original LDR notifications could not be found in the operating record. This notification resolves those missing documents." I observed the note was signed and dated on 11/19/2019. I also observed a list of 56 container ID numbers.

I did not observe any LDR Notification for any waste currently inside any of the tanks at the 241-CX Tank System. I contacted CHPRC on 01/07/2020. I received a document titled "Response to Washington State Department of Ecology (Ecology) 01/07/2020 Request for Documents/Information for the 241-CX Tank System Resource Conservation and Recovery Act (RCRA) Compliance Inspection dated November 5, 2019, RAID #2020-006." I observed a response as "The last waste received at the 241-CX tank system was in 1958. As such, no waste has been received at the 241-CX tank system after the effective date of RCRA at Hanford that would require LDR notification in accordance with 40 CFR 268.7."

Compliance Problems

The Dangerous Waste inspection on November 05, 2019, found the following compliance problems.

Each problem is covered in three parts:

(1) Citation from the regulations

(2) **Specific observations** from the inspection that highlight the problem

(3) **Required actions** needed to fix the problem and achieve compliance

The problems listed below must be corrected to comply with Washington Dangerous Waste Regulations (Chapter 173-303 WAC), or other environmental laws or regulations. Complete the required actions listed below and respond to Ecology at the following address within the times specified below. Include all supporting documentation such as photographs, records, and statements explaining the actions taken and dates completed to return to compliance.

Attention: Phillip Buser
Washington Department of Ecology
Nuclear Waste Program
3100 Port of Benton Blvd
Richland, WA 99354

You may request an extension of the deadlines to achieve compliance. Make the request in writing, including the reasons an extension is necessary and proposed date(s) for completion, and send it to Phillip Buser before the date specified above. Ecology will provide a written approval or denial of your request.

If you have any questions about information in this Compliance Report, please call:
Phillip Buser at (509) 372-7943

This does not relieve you of your continuing responsibility to comply with the regulations at all times.

1) **WAC 173-303-400(3), as referenced by the Hanford Facility Resource Conservation and Recovery Act Permit, Dangerous Waste Portion Revision 8C - Condition I.A Effect of Permit.**

   WAC 173-303-330 Personnel training. (2) Written training plan. The owner or operator must develop a written training plan which must be kept at the facility and which must include the following documents and records: (b) A written description of the type and amount of both introductory and continuing training required for each position;

   Observations: During the inspection, Mr. Mathey observed that the Field Work Supervisor job position did not include a requirement to take Course 02006G - Waste Management Awareness,

Course 035100 - Container Waste Management Initial, or Course 035110 - Container Waste Management Refresher. Our review revealed that the training plan did not include all of the required dangerous waste trainings for a Field Work Supervisor.

Action Required: I received a revision to CR-2019-2776, *CHPRC Condition Report Form*, with an Analysis Completion Date of December 6, 2019. I also received PRC-STD-TQ-40236, Revision 2, Change 2, *Central Plateau Risk Management Dangerous Waste Training Plan*, dated December 11, 2019, showing that along with the previously required trainings, the dangerous waste training plan was updated to include that the Field Work Supervisor is now required to take either Course 02006G - Waste Management Awareness training, or Course 035100 - Container Waste Management Initial which requires an annual refresher of Course 035110 - Container Waste Management Refresher. **No further action required**.

Concerns

WAC 173-303-090 Dangerous waste characteristics. I requested a description of the disposition and location of waste in containers from Tank 241-CX-70. I received Solid Waste Information and Tracking System (SWITS) SWIR200 reports for Shipments. Each container listed had a separate SWIR310 Container Listing Report. For each container I observed the waste codes of D007 and D010. However, the closure plan is inconsistent as it identifies the waste codes for Tank 241-CX-70 as D002, D007, and WT02.

To request ADA accommodation including materials in a format for the visually impaired, call Ecology at 509-372-7950 or visit *https://ecology.wa.gov/accessibility*. People with impaired hearing may call Washington Relay Service at 711. People with speech disability may call TTY at 877-833-6341.