LB 3706

AIR 13-807
NOC 898
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STATE OF WASHINGTON
DEPARTMENT OF HEALTH
OFFICE OF RADIATION PROTECTION
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August 29, 2013

Mr. Kevin W. Smith, Manager
United States Department of Energy
Office of River Protection
P.O. Box 450, MSIN: H6-60
Richland, Washington 99352

Dear Mr. Smith:

Pursuant to Chapter 246-247 of the Washington Administrative Code (WAC), the modification of Emission Unit (EU) 486, with negotiated changes, was approved August 13, 2013, according to the enclosed License for:

Sidewall Coring of Single Shell Tanks (NOC 898; EU 486)

The conditions, controls, monitoring requirements, and limitations of this License must be observed in order for you to be in compliance with WAC 246-247. Failure to meet any provision of this License may result in the revocation of approval, the issuance of Notices of Violation, or other enforcement actions under WAC 246-247-100.

If you have any questions regarding this approval, please contact Ernest McCormick at (509) 946-0624.

Sincerely,

John Martell, Manager
Radioactive Air Emissions Section

Enclosure: Applicable Portion of License

cc: (see next page)

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Environmental Portal
RAES Tracking: Line 592; Resp. to IM# 7,825; NOC 898; EU 486

Project Title	Approval #	Date Approved	NOC_ID
Sidewall Coring of Single Shell Tanks	AIR 13-807	8/13/2013	898

Conditions (state only enforceable: WAC 246-247-040(5), 060(5) if not specified)

1) The total abated emission limit for this Notice of Construction is limited to 9.80E-04 mrem/year to the Maximally Exposed Individual (WAC 246-247-040(5)).

2) This NOC is for the installation and operation of a core drilling system to obtain a vertical concrete core sample from the sidewall of any of the 149 Single Shell Tanks (SSTs) on the Hanford Site. Tank 241-A-106 is the initial SST selected for the core drilling with two tanks (241-A-101 and 241-SX-101) as contingency selections. The proposed action will be implemented in two phases. The first phase will prepare the tank for the coring, and the second phase will include coring and demobilization. In general the following steps will be performed:
   - Remove soil covering from the SST.
   - Install a caisson for access to the haunch area of the SST.
   - Clean the SST haunch surface area.
   - Install alignment bases to the haunch.
   - Pour a drill pad at the bottom of the caisson.
   - Set up and operate the core drill unit.
   - Obtain core samples from the sidewall and transport to a lab for analysis.
   - Demobilize the core drill equipment and grout the core hole.
   - Backfill the caisson and stabilize the affected areas with gravel.

   CAISSON AND DRILL PAD INSTALLATION
   Prior to coring the tank sidewall, surface soil will be excavated to expose the tank haunch (i.e., dome and sidewall intersection) and an 8-foot diameter caisson will be installed in sections to an estimated depth of 17 feet below grade. Once the caisson is in place, a drilling pad will be poured at the bottom of the caisson. The pad is designed to provide a seal between the core hole entry point on the haunch and the alignment base to allow for total core fluid containment. The drilling pad will also serve as containment for any core fluid leaks that may occur. Health Physics Technician (HPT) monitoring will be conducted throughout the caisson and drill pad installation.

   SIDEWALL CORING
   All SST sidewall core drilling equipment will be located and operated from the ground surface. This approach will enhance safety, reduce potential personnel exposure to radiation, and maintain ALARA principles. A standard double-tube, conventional coring method will be used for drilling the concrete sidewall. The core barrel design will have an inner liner that does not spin with the barrel as it rotates. This design will reduce core breakage and maximize the ability for core hole cleaning; thereby minimizing the potential for sticking coring equipment. A guide tube will be installed in the caisson to facilitate operation of the core equipment from the surface.
   Once the guide tube is in place and secured, a cover will be placed over the caisson with an access hatch and opening for the guide tube. The drill rig work platform will extend out over the caisson. All drilling and support equipment will be staged on the surface, minimizing the need to access the caisson during coring operations.
   Sidewall coring will be performed down the full height of the sidewall and into, but not through the tank base. After initiation of coring, the core bit will be advanced through the haunch and down into the sidewall between layers of horizontal rebar. Vertical deviations will be maintained to prevent damage of the tank steel liner or external concrete sides of the tank. A sidewall core of approximately 4-inch diameter by 38-feet length will be taken in about 5 feet increments. The concrete core sample will be transported to a testing laboratory for evaluation, after being surveyed by an HPT, in accordance with an approved radiological work plan.
   The sidewall coring process will require clean water to cool the core bit and remove concrete cuttings from the

cored hole. Due to the remote potential for encountering radiological contamination that could have migrated into the concrete sidewall and then to the coring area, the cooling water will be maintained in a closed-loop system. A pump will circulate the core fluid down the core tubing, up the core hole and into a recirculation tank. An optional filtering system may be included between the core fluid return line and the recirculation tank. The recirculation tank will be fitted with baffles to allow for settling of the drill cuttings from the fluid before being recirculated back down the hole. The recirculating cooling water will be monitored by drill rig operations for adequate circulation rates to allow for proper core hole cleaning. The water will also be monitored by HTPs. Core cuttings will be collected and dried for survey by HPTs. The entire circulating cooling and cleaning system will be located on the surface.
The core hole will be filled with non-shrink grout after the coring operations are completed. The coring equipment will be surveyed by HPTs in accordance with an approved radiological work permit. Surveyed equipment will be surveyed by HPTs in accordance with an approved radiological work permit. Surveyed equipment and materials that are released for future sidewall coring activities will be removed from the tank farm to another SST or placed in storage. All equipment and materials not released for future use will be disposed of in accordance with an approved Waste Management Plan.

3) The PTE for this project as determined under WAC 246-247-030(21)(a-e) [as specified in the application] is 9.80E-04 mrem/year. Approved are the associated potential release rates (Curies/year) of:

Am - 241 4.61E-05
All Alpha radioactivity was attributed to Am-241. Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Sr - 90 8.08E-03
All Beta radioactivity was attributed to SR-90. Contributes less than 0.1 mrem/yr to the MEI

The radioactive isotopes identified for this emission unit are (no quantities specified):

Ac - 227	Am - 241	Am - 243	Ba - 137 m	C - 14
Cd - 113 m	Cm - 242	Cm - 243	Cm - 244	Co - 60
Cs - 134	Cs - 137	Eu - 152	Eu - 154	Eu - 155
H - 3	I - 129	Nb - 93 m	Ni - 59	Ni - 63
Np - 237	Pa - 231	Pu - 238	Pu - 239	Pu - 240
Pu - 241	Pu - 242	Ra - 226	Ra - 228	Ru - 106
Sb - 125	Se - 79	Sm - 151	Sn - 126	Sr - 90
Tc - 99	Th - 229	Th - 232	U - 232	U - 233
U - 234	U - 235	U - 236	U - 238	Y - 90
Zr - 93				

The potential release rates described in this Condition were used to determine control technologies and monitoring requirements for this approval. DOE must notify the Department of a "modification" to the emission unit, as defined in WAC 246-247-030(16). DOE must notify the Department of any changes to a NESHAP major emission unit when a specific isotope is newly identified as contributing greater than 10% of the potential TEDE to the MEI, or greater than 25% of the TEDE to the MEI after controls. (WAC 246-247-110(9)) DOE must notify the Department of any changes to potential release rates as required by state or federal regulations including changes that would constitute a significant modification to the Air Operating Permit under WAC 173-401-725(4). Notice will be provided according to the particular regulation under which notification is required. If the applicable regulation(s) does not address manner and type of notification, DOE will provide the Department with advance written notice by letter or electronic mail but not solely by copies of documents.

4) RELEASE RATES - WDOH Log

The Annual Possession Quantity for soil excavation, filter vacuum truck operation, and backhoe excavation shall be tracked on a WDOH approved Log.

5) ABATEMENT CONTROLS-Abatement Control During Soil Excavation-Manual Soil Excavation/Guzzler™ Use
Manual soil excavation activities will be performed in accordance with As Low as Reasonably Achievable Control Technology (ALARACT) Demonstration 5.1, Tank Farm ALARACT Demonstration For Soil Excavation (Using Hand Tools), and will follow the radiological control specified in this ALARACT. Clean soil may be moved from place-to-place within the tank farm with heavy equipment (i.e., backhoe, front loader, etc.) for backfilling purposes. If the regulated Guzzler™ is needed or chosen for use during soil excavation for the caisson installation, the radiological controls will follow all license conditions and limitations of the latest WDOH approved Site-Wide Guzzler™ (EU 476) using (NOC ID 774) Operation of the Guzzler™ in Tank Farm Facilities.

6) ABATEMENT CONTROLS-Abatement Control During Soil Excavation
Soil may be excavated by hand, using the Guzzler™ , and/or use of a backhoe.
- Cease excavation of radioactive material if sustained wind speed exceeds 20 mph.
- Use suppressants such as water, fixatives, covers, or windscreens to minimize dust and spread of contamination as necessary, including at the end of each shift or when sustained or predicted winds are greater than 20 mph.
- Perform and document pre- and post-job rad surveys.
- A beta-gamma survey of the ground surface is required prior to excavation in CAs, HCAs, SCAs, and URMAs. An alpha survey may be required prior to excavation per the latest revision of RPP 52322, TOC Technical Basis for Dual Survey Exemption."
- For excavation in CAs, HCAs, SCAs, and URMAs, if beta-gamma activity greater than 1000 dpm/probe area (5000 dpm/100cm2) is identified, alpha surveys will also be performed.
- To the extent practicable, using hand held instrument field survey techniques; clean soil is separated from the soil identified as contaminated.

7) ABATEMENT CONTROLS-Abatement Control During Soil Excavation-General Area Contamination
IF the net contamination for the general area is greater than 200 dpm/probe area alpha or greater than 500,000 dpm/probe area beta-gamma, PERFORM the following:
- STOP work in the area exceeding this criteria.
- NOTIFY Environmental and Radiological Controls.
- IF not already damp, WET the soil.
- INSTALL air monitoring equipment.
- COVER excavation and contaminated soil with plastic or APPLY fixative at the end of each shift and or as necessary, to prevent airborne dust particles.
- IF contaminated soil greater than200 dpm/probe area alpha or greater than 500,000 dpm/probe area beta-gamma) i to be left for greater than 48 hours, CONTAIN soil or COVER with clean fill.
- CONTINUE excavations after notifications have been made and the listed controls have been implemented.

8) ABATEMENT CONTROLS-WDOH notification-Abatement Control During Soil Excavation-High Exposure Readings
IF soil contamination (not to include hot specks) exceeds 20 mrad/hr (open window reading):
- STOP work in the area exceeding this criterion.
- NOTIFY Environmental and Radiological Controls. Adequacy of controls will be reassessed.
- Field Work Supervisor (FWS) VERIFY approvals have been obtained by Environmental and RadCon, with concurrence from WDOH prior to resuming work.

9) ABATEMENT CONTROLS-WDOH notification-Abatement Control During Soil Excavation-Hot Speck
IF a very small amount (less than or equal to 100cm2, defined as a "Hot Speck") of contamination is reading greater than or equal to 1,000,000 dpm/probe area beta-gamma and/or greater than or equal to 490 dpm/probe area alpha, REMOVE and CONTAIN the hot speck before activity is allowed to continue. Work may continue when approved by Environmental and Radcon.

10) ABATEMENT CONTROLS-Abatement Control During Core Drilling-ALARACT Used
Controls established in the following ALARACT demonstrations will be implemented during sidewall coring

activities and demobilization:

- ALARACT 4.1 – Tank Farm ALARACT Demonstration For Packaging and Transportation of Waste
- ALARACT 15.1 Tank Farm ALARACT Demonstration For Size Reduction of Waste Equipment For Disposal
- ALARACT 12.1 Tank Farm ALARACT Demonstration for Packaging and Transportation of Equipment and Vehicles

11) ABATEMENT CONTROLS-Abatement Control During Core Drilling-Continous Monitoring
The solids collection container will be monitored continuously during drilling and DOH will be notified if the beta/gamma exceeds 10,000 counts/minute above an initial baseline with a GM probe, taken prior to the start of the first day of drilling.

12) ABATEMENT CONTROLS-Abatement Control During Core Drilling-Core Cuttings Surveyed
Core cuttings will be collected and dried for survey by HPT as soon as practical.

13) CONTAMINATION CONTROL-Core Segments Sleeved
Each core segment will be sleeved or contained before it is transported.

14) ABATEMENT CONTROLS-WDOH Notification- Core Segment Survey Following Core Drilling
After each core segment is extracted, it will be scanned for radiological contamination. DOH will be notified if the beta/gamma readings exceed 100,000 dpm/100 cm2 or if the alpha counts exceed 2,000 dpm/100 cm2.