IM # 8.067

OFFICE OF RIVER PROTECTION
P.O. Box 450, MSIN H6-60
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14-ECD-0015

Mr. John Martell, Manager
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(Hanford Mailstop: B1-42)

Mr. Martell:

U.S. DEPARTMENT OF ENERGY, OFFICE OF RIVER PROTECTION SUBMITS TO THE WASHINGTON STATE DEPARTMENT OF HEALTH AS LOW AS REASONABLY ACHIEVABLE CONTROL TECHNOLOGY 02.3, "LOW PURGE GAS CORE SAMPLING"

The U.S. Department of Energy, Office of River Protection submits the attached As Low As Reasonably Achievable Control Technology (ALARACT) 02.3, "Low Purge Gas Core Sampling," for your approval.

ALARACT 02.3 supersedes ALARACT 02.2, "Tank Farm ALARACT Demonstration for Installation/Operation/Removal of Push Mode Core Sampling Equipment," which was revised to update and clarify the "Title," "Description of Activity," and "Controls" sections to accurately reflect the operation of the new Core Sampling System.

If you have any questions, please contact Dennis W. Bowser, Environmental Compliance Division, (509) 373-2566.

Kevin W. Smith
Manager

ECD:DWB

Attachment

cc: See page 2

cc w/attach:
P.M. Gent, Ecology
R.M. Allen, WRPS
Administrative Record (H-0-8)
Environmental Portal, LMSI
WRPS Correspondence

cc w/o attach:
J. Cox, CTUIR
S. Harris, CTUIR
K.A. Conaway, Ecology
J.A. Hedges, Ecology
D. Zhen, EPA (Region 10, Seattle)
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G. Bohnee, NPT
K. Niles, Oregon Energy
D.R. Hildebrand, RL
D.E. Jackson, RL
J.W. Schmidt, WDOH
T.G. Beam, WRPS
J.A. Joyner, WRPS
J.A. Voogd, WRPS
R. Jim, YN

Attachment
14-ECD-0015
(3 Pages)

As Low As Reasonably Achievable Control Technology 02.3
Low Purge Gas Core Sampling

Dennis W. Bowser

ALARACT 02.3 Low Purge Gas Core Sampling

1. Description of Activity

The Core Sampling System is used in Single-shelled tanks (SST), Double-shelled tanks (DST), and miscellaneous tanks to obtain samples of waste for characterization purposes. The Core Sampling System operates in two drilling modes: Push Mode Core Sampling (PMCS) and Rotary Mode Core Sampling (RMCS). PMCS, the preferred mode, involves the hydraulic pushing of the bit through the tank waste without any intentional rotation of the drill bit. The RMCS mode involves the intentional rotation of the bit and is used when the waste is more difficult to penetrate. The core sampling system can use a variety of the bits for the drilling apparatus. Barrier fluids and purge gases are used to prevent the release of tank vapors. The Core Sampler has a low purge gas flow rate (<10 cfm) and a high purge gas rate (>10 cfm and <120 cfm). Core sampling under this As Low As Reasonably Achievable Control Technology (ALARACT) will be conducted at purge gas flows less than 10 cfm. The Core Sampling System consists of the sample platform, pressurized nitrogen or compressed air supply, change out assembly, cable spray washer, and other support equipment.

System set up and sampling is controlled by operating procedures. Riser access is executed in accordance with ALARACT 01.1, *Tank Farm ALARACT Demonstration for Riser Preparation/Opening*, and continuous Health Physics Technician (HPT) coverage is provided whenever the riser is open.

The operation of core sampling begins by inserting a drill string into the waste. The Core Sampling System contains a seal against the bottom of the core barrel to prevent back flow of tank waste into the drill string protecting the air pathway out of the tank. The system also has a seal at the top of the drill string to further protect against the air pathway out of the tank. Nitrogen/air (or other fluid such as water with a Lithium Bromide tracer) is used only in amounts sufficient to maintain the hydrostatic head and prevent or minimize movement of tank waste into the core barrel. The drill string section connections are sealed to prevent air leaks and the shielded receiver and sampler have cam-locks to prevent the exposure of the sample to the air.

When the segment is complete, the drill string is disconnected from the Core Sampling System platform and is capped and connected to the shielded receiving vessel while protecting the air pathway. The platform then rotates to place the shielded receiver either directly over a shipping cask or the shielded receiver may be positioned over an x-ray machine to allow the sampler to be x-rayed.

While operating the Core Sampling System in push or rotary mode, water or air is used to maintain the hydrostatic head in the drill string minimizing waste entry into the sampling system. Once a complete core has been obtained, the platform can be repositioned on the same riser or moved to a different riser on the same tank to obtain additional cores. During breakdown, the drill string is sleeved as it is removed from the tank and placed into a waste container. When sampling is complete at one tank, the Core Sampling System will be disconnected and moved to the next tank or stored for later use.

When core samples are taken without use of a purge gas (e.g., use of a barrier fluid) and during storage, an inline filter will be placed on the purge gas lines. This will help prevent contamination spread from the inside of the sample box.

2. Controls

a. When opening riser, use ALARACT demonstration controls for "Riser Preparation/Opening" (ALARACT 01.1).

b. Follow ALARACT demonstration for "Packaging and Transportation of Waste" (ALARACT 04.1).

c. HPT coverage will be performed as specified in the Radiological Work Permit.

d. If sustained wind speeds are >25 mph, then do not initiate sampling.

e. A local wind speed device may be utilized in lieu of Hanford Meteorological Station readings, if local wind speed readings are taken in an unobstructed location representative of the work area.

f. If a local wind speed device is used to measure wind speeds, then the use of the local wind speed device and the measured wind speed readings must be documented in the Work Record.

g. Valves, caps, and plugs are used to minimize open riser time.

h. Document core sampler drill string seal in place to minimize exposure pathway.

i. Secure threaded drill string section connections and/or shielded receiver and sampler cam-locks as necessary to minimize exposure pathway.

j. Document passive or active high-efficiency particulate air filtration on tanks.

k. Use approved Containment Selection Guide, Attachment A, from the latest revision of TFC-ESHQRP_RWP-C-02, Radiological Containment.

3. Monitoring

a. At a minimum, pre and post-job contamination surveys (smears) shall be taken.

b. Radiological monitoring shall be in accordance with the latest revision of HNF-5183, Tank Farms Radiological Control Manual.

4. Records/Documentation

a. Work Package

b. Radiological Work Permit

c. Radiological survey report(s)

5. Emission Pathway

a. Existing, active or passive point sources (displacement gas is used in drill string which is a closed system and has minimal/no emission impact).

6. Facility Description

a. All SSTs, DSTs, and miscellaneous tanks.