IM 7.879

OFFICE OF RIVER PROTECTION
P.O. Box 450, MSIN H6-60
Richland, Washington 99352

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Wa Dept of Health - Office of Radiation Protection

13-ECD-0081

Mr. John Martell, Manager
Radioactive Air Emissions Section
Washington State Department of Health
309 Bradley Blvd., Suite 201
Richland, Washington 99352
(Hanford Mailstop: B1-42)

Mr. Martell:

U.S. DEPARTMENT OF ENERGY, OFFICE OF RIVER PROTECTION (ORP) SUBMITS REQUEST FOR APPROVAL OF RADIOACTIVE AIR EMISSIONS NOTICE OF CONSTRUCTION (NOC) APPLICATION FOR THE AZ-301 TANKER TRUCK

ORP is requesting the Washington State Department of Health review and approve the attached "Radioactive Air Emissions Notice of Construction Application for the AZ-301 Tanker Truck." This NOC is submitted in compliance with Washington Administrative Code 246-247, "Radiation Protection – Air Emissions."

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

K. W. Smith

Kevin W. Smith
Manager

ECD:DWB

Attachment

cc: See page 2

NOC 914
En 1406

cc w/attach:
L. Bostic, BNI
B. G. Erlandson, BNI
J. Cox, CTUIR
S. Harris, CTUIR
K. A. Conaway, Ecology
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J. A. Hedges, Ecology
D. Zhen, EPA (Region 10, Seattle)
R. H. Anderson, MSA
T. G. Beam, MSA
G. Bohnee, NPT
K. Niles, Oregon Energy
D. R. Hildebrand, RL
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R. M. Allen, WRPS
S. E. Killoy, WRPS
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R. Jim, YN
Administrative Record
BNI Correspondence
Environmental Portal, LMSI
WRPS Correspondence

Attachment
13-ECD-0081
(24 Pages)

Radioactive Air Emissions Notice of Construction
Application for the AZ-301 Tanker Truck

Dennis W. Bowser

RADIOACTIVE AIR EMISSIONS NOTICE OF CONSTRUCTION APPLICATION FOR THE AZ-301 TANKER TRUCK

Prepared by Washington River Protection Solutions, LLC
Richland, WA 99352

Date Published
September 2013

United States Department of Energy
Office of River Protection
P.O. Box 450
Richland, Washington

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LIST OF ABBREVIATIONS

ALARA	As Low As Reasonably Achievable
ALARACT	As Low As Reasonably Achievable Control Technology
ANSI	American National Standards Institute
APQ	Annual Possession Quantity
ASME	American Society of Mechanical Engineers
BARCT	Best Available Radionuclide Control Technology
Ci	Curie
CFR	Code of Federal Regulations
DOE	U.S. Department of Energy
DOT	U.S. Department of Transportation
DST	Double-Shell Tank
EPA	U.S. Environmental Protection Agency
ETF	Effluent Treatment Facility
HEPA	High Efficiency Particulate Air
LERF	Liquid Effluent Retention Facility
MEI	Maximally Exposed Individual
m	Meters
mrem	Millirem
NEPA	National Environmental Policy Act
NOC	Notice of Construction
ORP	U. S. Department of Energy, Office of River Protection
PTE	Potential-To-Emit
RCW	Revised Code of Washington
RL	U. S. Department of Energy, Richland Operations Office
SEPA	State Environmental Policy Act
TEDE	Total Effective Dose Equivalent
USC	United States Code
WAC	Washington Administrative Code
yr	Year

Metric Conversion Chart, Units

Into Metric Units			Out of Metric Units		
If You Know	**Multiply By**	**To get**	**If You Know**	**Multiply by**	**To Get**
Length			**Length**		
inches	25.40	millimeters	millimeters	0.0393	inches
inches	2.54	centimeters	centimeters	0.393	inches
feet	0.3048	meters	meters	3.2808	feet
yards	0.914	meters	meters	1.09	yards
miles	1.609	kilometers	kilometers	0.62	miles
Area			**Area**		
square inches	6.4516	square centimeters	square centimeters	0.155	square inches
square feet	0.092	square meters	square meters	10.7639	square feet
square yards	0.836	square meters	square meters	1.20	square yards
square miles	2.59	square kilometers	square kilometers	0.39	square miles
acres	0.404	hectares	hectares	2.471	acres
Mass (weight)			**Mass (weight)**		
ounces	28.35	grams	grams	0.0352	ounces
pounds	0.453	kilograms	kilograms	2.2046	pounds
short ton	0.907	metric ton	metric ton	1.10	short ton
Volume			**Volume**		
fluid ounces	29.57	milliliters	milliliters	0.03	fluid ounces
quarts	0.95	liters	liters	1.057	quarts
gallons	3.79	liters	liters	0.26	gallons
cubic feet	0.03	cubic meters	cubic meters	35.3147	cubic feet
cubic yards	0.76456	cubic meters	cubic meters	1.308	cubic yards
Temperature			**Temperature**		
Fahrenheit	subtract 32 then multiply by 5/9ths	Celsius	Celsius	multiply by 9/5ths, then add 32	Fahrenheit
Energy			**Energy**		
kilowatt hour	3,412	British thermal unit	British thermal unit	0.000293	kilowatt hour
kilowatt	0.948	British thermal unit per second	British thermal unit per second	1.055	kilowatt
Force/Pressure			**Force/Pressure**		
pounds per square inch	6.895	kilopascals	kilopascals	0.14504	pounds per square inch

Source: *Engineering Unit Conversions*, M. R. Lindeburg, PE., Second Ed., 1990, Professional Publications, Inc., Belmont, California.

INTRODUCTION

This document serves as a Notice of Construction (NOC) application, in accordance with Washington Administrative Code (WAC) 246-247-060, *Applications, Registration and Licensing*, and Title 40, *Code of Federal Regulations*, Part 61.07, "Application for Approval of Construction or Modification," (40 CFR 61.07) for the AZ-301 Tanker Truck Project. The scope of the project is to construct and operate a pumping system to transport condensate from catch tank AZ-301 into a tanker truck. Present plans are to send the condensate to another permitted facility such as Liquid Effluent Retention Facility (LERF) or the Effluent Treatment Facility (ETF).

The 241-AY and 241-AZ Tank Farms are ventilated by the 296-A-42 primary exhauster. Condensate from various points in the primary exhauster are collected and routed to the AZ-301 catch tank. The AZ-301 catch tank has a nominal 1,200 gallon capacity and condensate is currently routed to either AZ-102 or AY-101. Tank capacity in the AY and AZ Farms is being approached and additional options are needed.

The AZ-301 Tanker Truck Project will involve constructing a system to pump condensate from the AZ-301 catch tank into a tanker truck. The tanker truck has an 8,000 gallon capacity. Present plans are to periodically ship the condensate to the treatment facility. The tanker truck can be filled either automatically when the AZ-301 tank level reaches an operational pumping limit or it can be filled manually.

The pumping operation will follow As Low As Reasonably Achievable (ALARA) practices. The hose from AZ-301 to the tank truck will be hose-in-hose so that any leak in the primary hose will be contained. The hose will have a connection to minimize leakage during connect and disconnect (dry-break type). The tanker truck will have a catch basin at the top where the hose is connected to the truck. The catch basin on the tanker truck will have a drain to another tank on the ground that will be used for inadvertent release containment and to prevent any condensate from reaching the ground.

The tanker truck will be equipped with a radial high efficiency particulate air (HEPA) filter to allow for venting while the tanker truck is being filled. The HEPA filter will be valved off during transport.

Potential radionuclide emissions resulting from the AZ-301 Tanker Truck Project, in conjunction with other operations on the Hanford Site, will not exceed the National Emission Standard of 10 millirem (mrem) per year (40 CFR 61, Subpart H). The potential unabated emissions from all AZ-301 Tanker Truck Project activities are 2.14E-02 mrem/yr and the abated emissions are 1.07E-05 mrem/yr.

DOE/RL-2013-12, "The Radionuclide Air Emissions Report for the Hanford Site, Calendar Year 2012," reports 0.099 mrem, or less than 1 percent of the federal and state standard of 10 mrem/yr total, as the Total Effective Dose Equivalent (TEDE) from all calendar year 2012 Hanford Site air emissions, including radon.

In addition to requesting NOC approval, this application provides notification of anticipated initial start-up, in accordance with WAC 246-247-035 (1) (iii) *National Standards Adopted by Reference for Sources of Radionuclide Emissions* and supporting reference Title 40, *Code of Federal Regulations*, Part 61.09(a)(1), "Notification of Startup."

1.0 FACILITY NAME AND LOCATION

Regulatory Requirement: *Name and address of the facility and location, (latitude and longitude), of the emission unit(s).*

The location of the Hanford Site within the state of Washington is shown in Figure 1. Table 1 shows the latitude and longitude of AY/AZ Tank Farm where the condensate tank AZ-301 is located. The AZ-301 condensate tank collects condensed water from the 241-AY/AZ Farm ventilation system.

Table 1. 241-AY/AZ Tank Farm location.

Tank Farm	Latitude	Longitude
241-AY/AZ	46° 33' 18" N	119° 31' 03" W

The address for the Hanford Site is:

U.S. Department of Energy
Office of River Protection
Hanford Site
200 East and 200 West Area
Richland, Washington 99352

Figure 1. Hanford Site

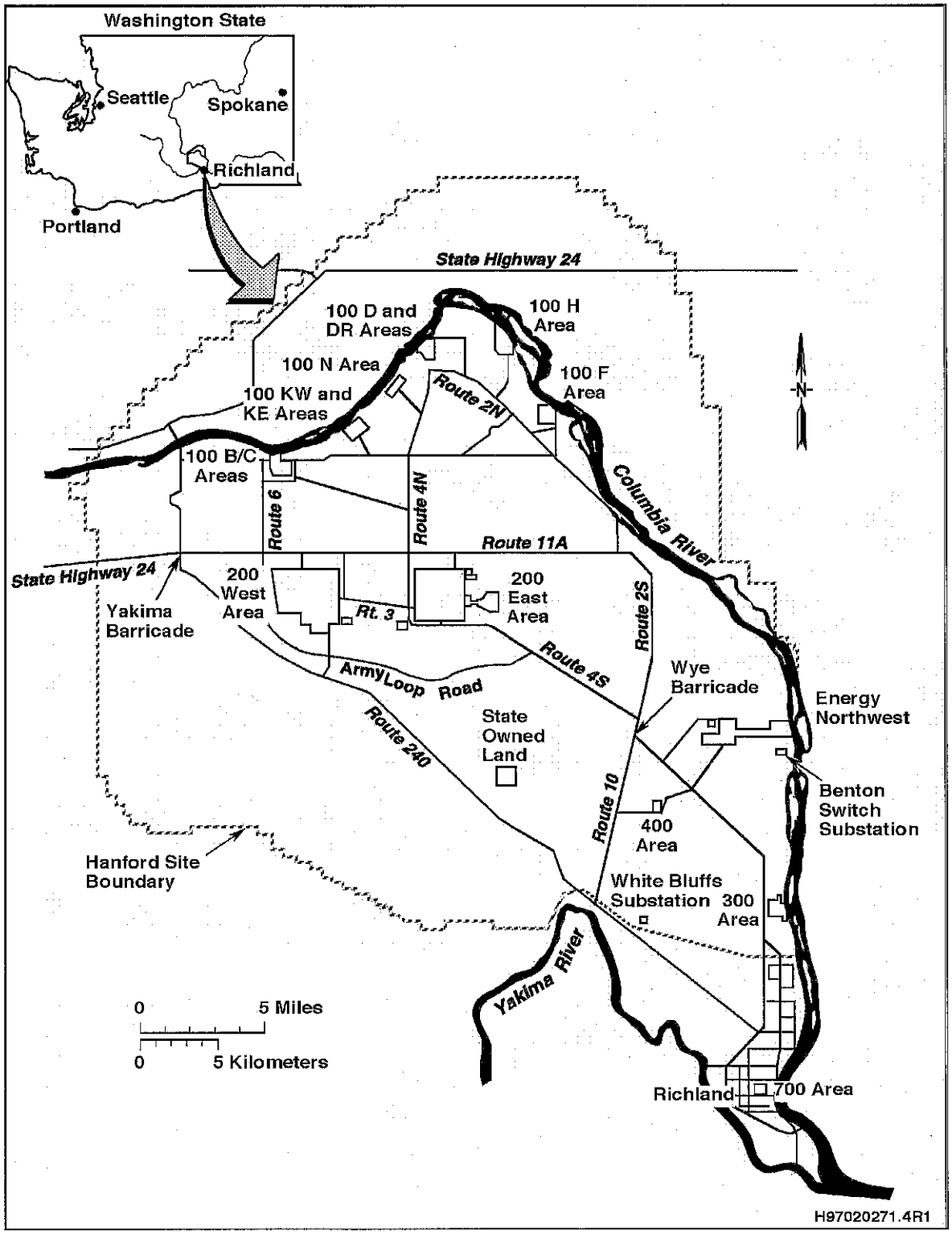
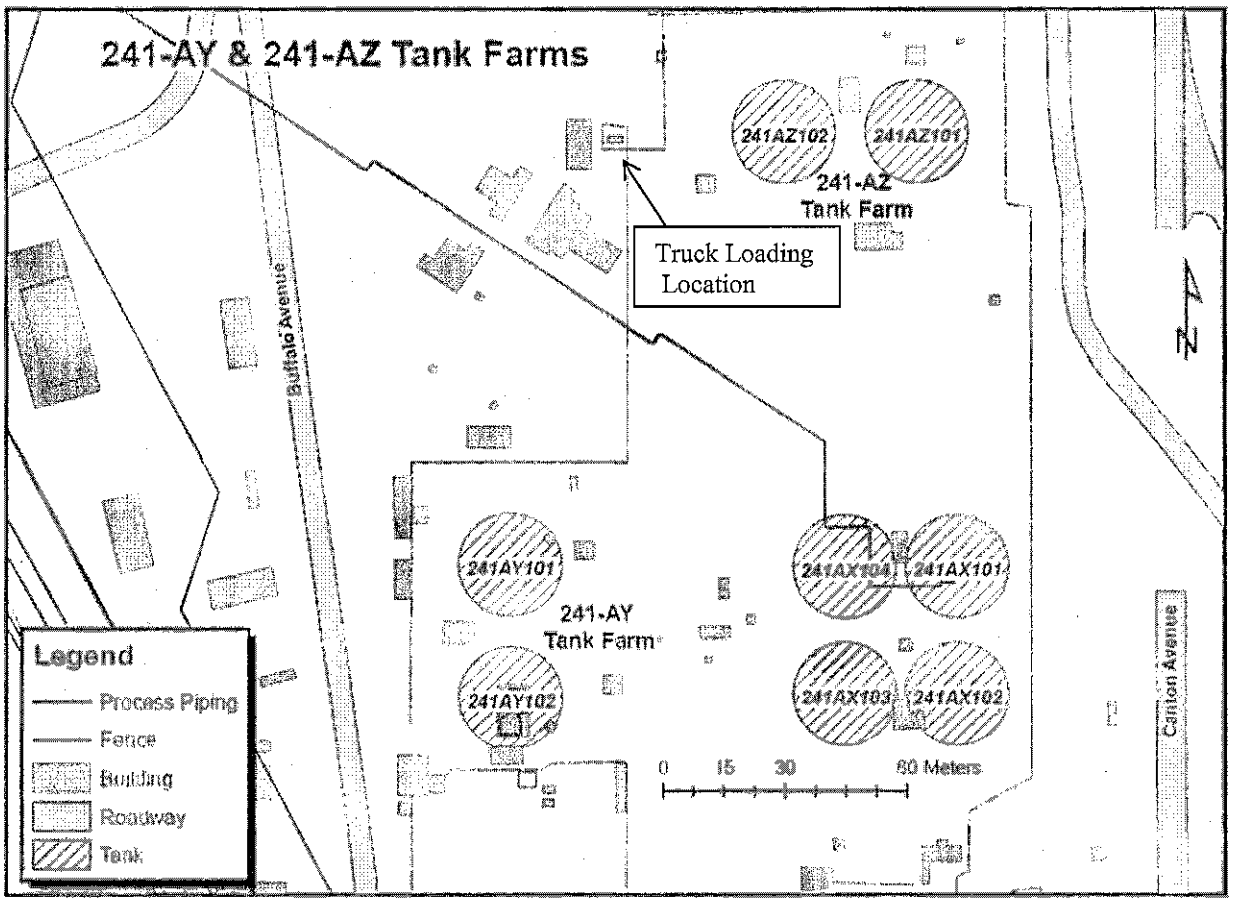


Figure 2. Location of the AY/AZ Tank Farm.



2.0 RESPONSIBLE MANAGER

Regulatory Requirement: *Name, title, address, and phone number of the responsible manager.*

The responsible facility manager is:

Kevin W. Smith, Manager
U.S. Department of Energy
Office of River Protection
P.O. Box 450
Richland, Washington 99352

Phone: (509) 372-2315

3.0 PROPOSED ACTION

Regulatory Requirement: *Identify the type of proposed action for which this application is submitted: (a) Construction of new emission unit(s); (b) Modification of existing emission unit(s); identify whether this is a significant modification – significant means the potential-to-emit airborne radioactivity at a rate that could increase the TEDE to the MEI by at least 1.0 mrem/yr as a result of the proposed modification; (c) Modification of existing unit(s), unregistered.*

This application is submitted for the construction of a new emission unit for the operation of a system to pump condensate into a tanker truck, in accordance with WAC 246-247-060(1)(a). The tanker truck will transport condensation from catch tank AZ-301 to a permitted treatment facility. This will not increase the APQ inventory for AZ-301.

The potential-to-emit (PTE) will not increase the total effective dose equivalent (TEDE) to the MEI greater than 1.0 mrem/yr as a result of this activity (see Section 14.0) and is not significant as defined by WAC 246-247-030(25).

4.0 STATE ENVIRONMENTAL POLICY ACT

Regulatory Requirement: *If this project is subject to the requirements of the State Environmental Policy Act (SEPA) contained in chapter 197-11 WAC, provide the name of the lead agency, lead agency contact person, and their phone number.*

In accordance with WAC 197-11, *State Environmental Policy Act of 1971* and *Revised Code of Washington* (RCW) 43.21C, Ecology requires all government agencies to consider the environmental impacts of a proposal before making decisions. An environmental review of the actions identified in this NOC application was conducted in the preparation of the National Environmental Policy Act (NEPA) of 1969 (Title 10, *Code of Federal Regulations*, Part 1021, "National Environmental Policy Act" [10 CFR 1021]) documentation. Existing environmental documentation can be used to meet all or part of an agency's responsibilities under the State Environmental Policy Act (SEPA) as provided in WAC 197-11-600. An agency may adopt any environmental analysis prepared under the NEPA as provided in WAC 197-11-610. The document that meets the agencies review needs for the current proposal is:

- DOE/EIS-0391, "Tank Closure and Waste Management Environmental Impact Statement for the Hanford Site," Richland, Washington

5.0 CHEMICAL AND PHYSICAL PROCESSES

Regulatory Requirement: *Describe the chemical and physical processes upstream of the emission unit(s).*

5.1 DESCRIPTION OF THE PUMPING SYSTEM AND TANKER TRUCK

Tanker truck capacity is 8,000 gallons or approximately 30,000 liters. A drawing of the tanker truck is shown in Section 7.

5.2 TANKER TRUCK LOADING ACTIVITIES

All work would be performed in accordance with approved radiological control methods and ALARA program requirements. These requirements would be carried out through work packages, operating procedures, radiological work permits, or other work instructions.

The general chemical and physical processes associated with tanker truck loading activities would consist of the following.

- A tanker truck would be deployed outside of the 241-AY/AZ Tank Farm. Appropriate hookups would be made between the source and the tanker truck (e.g., pumps, jumpers, hoses, etc.). Connections will be periodically surveyed to verify that no leaks are occurring.
- Spill prevention measures will be in place to mitigate release of condensate to the atmosphere and/or to the ground during hookup, transfer, and disconnect operations. These measures include provisions to catch and retain any inadvertent release of liquid (e.g. the catch basin and the connection to the tanker truck) and the use of "dry-break" connections to connect the transfer line to the truck.
- After filling the tanker truck, fittings would be disconnected and closed. All liquid/gas release points on the tanker would be closed. Appropriate decontamination measures will be performed to reduce residual external smearable radioactive contamination before releasing the tanker truck for overland transport.
- Periodic maintenance and inspections of the tanker truck vents and valves would be performed.

The truck loading area will have a tent like enclosure for weather protection and to retain heat in the winter.

6.0 EXISTING AND PROPOSED ABATEMENT TECHNOLOGY

Regulatory Requirement: *Describe the existing and proposed (as applicable) abatement technology. Describe the bases for the use of the proposed system. Include expected efficiency of each control device, and the annual average volumetric flow rate(s) in meters^3/sec for the emission unit(s).*

6.1 ABATEMENT CONTROL DURING FILLING AND EMPTYING

The pumping of condensate to the tanker truck can occur automatically when catch tank AZ-301 reaches a set fill limit or it can occur manually when operations determine that the tank needs to be pumped. The transfer line from AZ-301 will be hose-in-hose with any inner hose leaks draining back into AZ-301. The valves that connect the transfer hose to the tanker truck will have "dry-break" valves to minimize the amount of condensate that could potentially inadvertently released during the connecting and disconnecting operations. At the top of the tanker truck where the hose connects to tanker truck a catch basin surrounds the connection so that any inadvertently released are captured and routed to a tank on the ground. The HEPA filter on the tanker truck will operate continuously. Based upon the designed condensate pumping rate the air flow rate out of the tanker truck will be a maximum of 9 cfm when being filled and will breathe depending upon air pressure differences between the inside of the tank and the environment. The maximum exhaust velocity is 0.20 ft/sec. The exhaust temperature will be approximately 75°F. The HEPA filter will have a designed maximum flow rate of greater than the maximum pumping volumetric flow rate and the diameter will be 0.42 ft.

6.2 ABATEMENT CONTROL DURING TRANSPORT

During transport of the condensate to a treatment facility the valve on the HEPA filter will be closed to prevent the condensate from splashing up onto the filter. Prior to unloading, the valve will be opened again and the tank will be emptied. The valve is located in the center of the tanker. Due to its location and small size, it is unlikely condensate will splash up into the valve if it is inadvertently left open during transport.

6.3 ABATEMENT CONTROL DURING CONSTRUCTION ACTIVITIES

During construction activities the only source of potential radionuclide emissions will be from excavation activities. Emissions and controls during soil excavation activities will be covered under As Low As Reasonable Achievable Control Technology (ALARACT) 5.1 *Tank Farm ALARACT Demonstration for Soil Excavation* (FF-01, *Radioactive Air Emissions License for the Department of Energy Richland Office Hanford Site*).

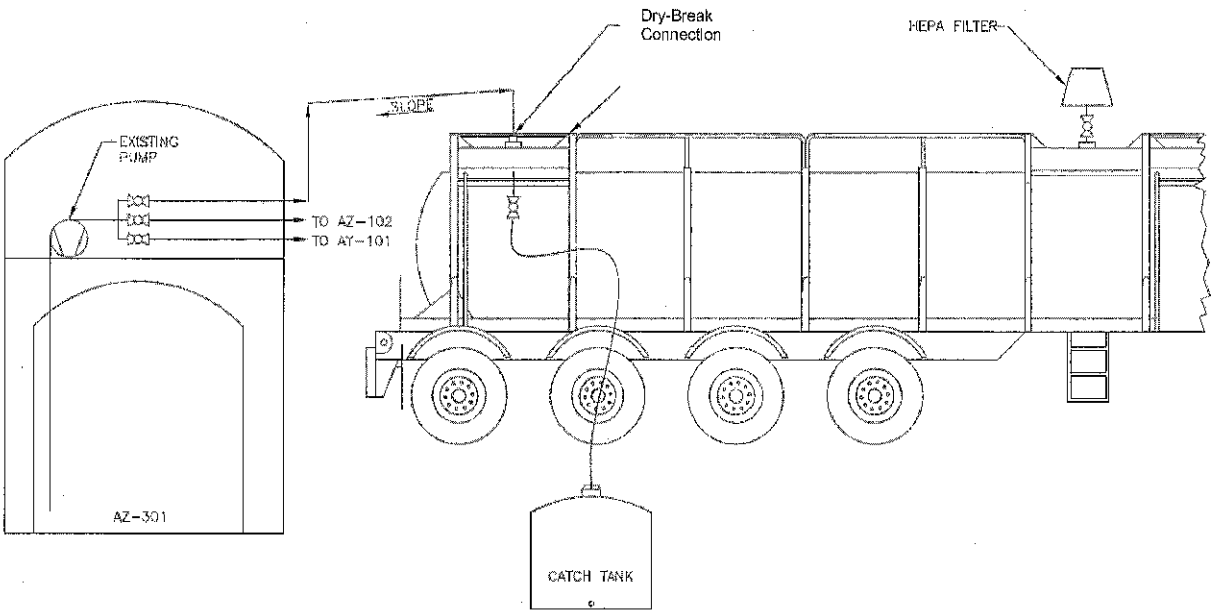
7.0 APPLICABLE CONTROL TECHNOLOGY DRAWINGS

Regulatory Requirement: *Provide conceptual drawings showing all applicable control technology components from the point of entry of radionuclides into the vapor space to release to the environment.*

The AZ-301 Tanker Truck Project is designed to minimize potential emissions. A radial HEPA filter (see Figure 3) will be used to vent the tanker truck while it is being filled. To prevent the potential for inadvertent release during the connection and disconnection of the hoses "dry-break" connections will be used. The top of the tanker truck where the condensate is pumped into the truck will have a catch basin so that any condensate does not reach the ground. ALARA practices will be employed during pumping operations and the loading and unloading of the tanker truck.

The tanker truck emission unit will be identified by W-AZ301Tanker-001 and the poly tank will be identified by P-AZ301PolyTank-001.

Figure 3. Drawing of AZ-301 and tanker truck.



8.0 RADIONUCLIDES OF CONCERN – POTENTIAL EMISSIONS

Regulatory Requirement: *Identify each radionuclide that could contribute greater than ten percent of the potential-to-emit TEDE to the MEI, or greater than 0.1 mrem/yr potential-to-emit TEDE to the MEI.*

Maximum gross alpha and gross beta contamination from previous condensate sampling were collected and analyzed and used to calculate the potential emissions. The radionuclides in the condensate were assumed to be alpha (plutonium-239) and beta-gamma (strontium-90) based upon them having the most conservative dose conversion factor from DOE/RL-2006-29, Rev 1, *Calculating Potential-to-Emit Radiological Releases and Doses*. The radionuclides of concern for the AZ-301 Tanker Truck Project that could contribute greater than 10% to the offsite MEI are Strontium-90 (18%) and Plutonium-239 (82%) as identified in Appendix A.

9.0 EFFLUENT MONITORING SYSTEM

Regulatory Requirement: *Describe the effluent monitoring system for the proposed control system. Describe each piece of monitoring equipment and its monitoring capability, including detection limits, for each radionuclide that could contribute greater than ten percent of the potential-to-emit TEDE to the MEI, or greater than 0.1 mrem/yr potential-to-emit TEDE to the MEI, or greater than twenty-five percent of the TEDE to the MEI, after controls. Describe the method for monitoring or calculating those radionuclide emissions. Describe the method with detail sufficient to demonstrate compliance with the applicable requirements.*

9.1 MONITORING DURING PUMPING

Radiological surveys will be taken each day of tanker truck loading operations.

10.0 RADIOLOGICAL SURVEYS OF THE TANKER TRUCK AND TRANSFER LINE WILL BE PERFORMED. RADIONUCLIDE ANNUAL POSSESSION QUANTITY

Regulatory Requirement: *Indicate the annual possession quantity for each radionuclide.*

The annual possession quantity (APQ) is the sum of the quantity of a radionuclide on hand at the beginning of the calendar year and the quantity of that radionuclide received or produced during the calendar year. The APQ for the potential for inadvertent release is included in the tanker truck APQ. Condensate samples were collected from the catch tank in October 1999, January 2003, April 2005, January 2007, and July 2013. In developing the APQ, the following assumptions were made:

- The maximum gross alpha and gross beta/gamma levels in the AZ-301 condensate were used.

- A safety factor of 45 was applied to the condensate concentration to allow for either increased volume of condensate or increased radioactive condensate concentrations.
- The total expected volume of condensate trucked in one year is expected to be approximately 480,000 liters (127,000 gallons).

Table 2. Annual Possession Quantity

Analyte	APQ (Ci)
Sr-90	9.36E+01
Pu-239	9.57E-01
Total	9.45E+01

11.0 RADIONUCLIDE PHYSICAL AND RELEASE FORM - INVENTORY

Regulatory Requirement: *Indicate the physical form and release form of each radionuclide in inventory: Particulate solids, vapor, or gas. Give the chemical form and ICRP 30 solubility class, if known.*

The physical form of the radionuclides is expected to be a particulate having a release factor of 1.0E-03 in accordance with WAC 246-247-030(21).

12.0 RELEASE RATES

Regulatory Requirement: *(a) New emission unit(s): Give predicted release rates without any emissions control equipment (the potential-to-emit) and with the proposed control equipment using the efficiencies described in subsection (6) of WAC 246-247-110(b). Modified emission unit(s): Give predicted release rates without any emissions control equipment (the potential-to-emit) and with the existing and proposed control equipment using the efficiencies described in subsection (6. Provide the latest year's emissions data or emissions estimates. In all cases, indicate whether the emission unit is operating in a batch or continuous mode.*

The PTE is defined in WAC 246-247-030(21) as the rate of release of radionuclides from an emission unit based on the actual or potential discharge of the effluent stream that would result if all abatement control equipment did not exist, but operations are otherwise normal.

The PTE is determined by multiplying the APQ, discussed in Section 11.0, and applying the release factors of 1E-03 defined in WAC 246-030-21(a) for particulates. An estimate of the continuous unabated and abated dose in mrem/yr to a MEI is determined by applying the dose-per-unit release factors as published in DOE/RL-2006-29 Rev 1, *Calculating Potential-to-Emit*

Radiological Releases and Doses. Unabated and abated doses to the MEI in mrem/yr are further discussed in Section 14.0 and the calculation is shown in Appendix A.

The emissions from the tanker truck will be continuous except when the tanker truck is transporting the condensate for disposal when the HEPA filter will be valved off. Previous emissions or estimates from the AZ-301 tank, which would be comparable to the tanker truck emissions, are not available because the catch tank is exhausted as part of the 241-AY/AZ ventilation system.

13.0 DISTANCES AND DIRECTION OF THE MAXIMALLY EXPOSED INDIVIDUAL

Regulatory Requirement: *Identify the MEI by distance and direction from the emission unit(s). The MEI is determined by considering distance, windrose data, presence of vegetable gardens, and meat or milk producing animals at unrestricted areas surrounding the emission unit.*

The MEI is determined using Clean Air Act Assessment Package - 1988 (CAP-88) dispersion factors, which are derived for use on the Hanford Site and published in DOE/RL-2006-29 Rev 1, *Calculating Potential-to-Emit Radiological Releases and Doses*.

The MEI is the offsite receptor because this individual receives the higher dose as noted in Section 15.0. DOE/RL-2006-29 Rev 1, Table 4-2 indicates the distances and direction of the offsite MEI. For the AY/AZ Tank Farms in the 200 East Area, the offsite MEI is located 20,200 meters (12.6 miles) in an east southeast direction at the Hanford Site across the river from the Columbia Generating Station (Figure 1). The onsite MEI is located 16,630 m (10.3 miles) in an east southeast direction at the Columbia Generating Station.

14.0 TOTAL EFFECTIVE DOSE EQUIVALENT TO THE MAXIMALLY EXPOSED INDIVIDUAL

Regulatory Requirement: *Calculate the TEDE to the MEI using an approved procedure (WAC 246-247-085). For each radionuclide identified in subsection (8) of this section, determine the TEDE to the MEI for existing and proposed emission controls, and without any emission controls (the potential-to-emit) using the release rates from subsection (13) of this section. Provide all input data used in the calculations.*

The estimated TEDE to the offsite MEI was determined by applying the highest (most conservative) offsite dose-per-unit release factor from Table 4-7, 200 East Area (DOE/RL-2006-29), with an effective release height of less than 40 meters (131 feet). Appendix A shows the calculated abated dose to the offsite MEI to be 1.07E-05 mrem/yr for tanker truck operation.

15.0 COST FACTORS/BEST AVAILABLE RADIONUCLIDE CONTROL TECHNOLOGY OR BEST AVAILABLE RADIONUCLIDE CONTROL TECHNOLOGY COMPLIANCE DEMONSTRATION

Regulatory Requirement: *Provide cost factors for construction, operation, and maintenance of the proposed control technology components and system, if a BARCT or ALARACT demonstration is not submitted with the NOC.*

The AZ-301 Tanker Truck Project assumes that all radionuclides in the condensate are released during pumping and temporary storage. The tanker truck will have a vent with a radial HEPA filter to abate any potential radionuclides to allow the tank to breathe when being filled. The transfer hose from AZ-301 to the tanker truck will be a hose-in-hose configuration and the valves on the connections will be designed to minimize any inadvertent release upon disconnection. Washington State Department of Health has provided guidance that HEPA filters are the Best Available Radionuclide Control Technology (BARCT) for particulate emissions (AIR 92-107). Because the radionuclides of concern are particulates, it is proposed that the HEPA filter controls described in Section 6 and compliance with technology described in Section 7 be accepted as BARCT.

16.0 DURATION OR LIFETIME

Regulatory Requirement: *Provide an estimate of the lifetime for the facility process with the emission rates provided in this application.*

It is anticipated that the AZ-301 Tanker Truck Project will start in December of 2013 and will continue until an alternate or more permanent solution to the tank space issues are resolved. A permanent tie into a pipeline to ETF was investigated and was not able to meet the schedule and determined to be cost prohibitive.

17.0 CONTROL TECHNOLOGY STANDARDS

Regulatory Requirement: *Indicate which of the following control technology standards have been considered and will be complied with in the design and operation of the emission unit(s) described in this application:*

- ASME/ANSI AG-1, *Code on Nuclear Air and Gas Treatment* (where there are conflicts in standards with the other listed references, this standard shall take precedence)
- ASME/ANSI N509, *Nuclear Power Plant Air-Cleaning Units and Components*
- ASME/ANSI N510, *Testing of Nuclear Air Treatment Systems*
- ASME/ANSI NQA-1, *Quality Assurance Program Requirements for Nuclear Facilities*
- 40 CFR 60, *Appendix A, Methods 1, 1A, 2, 2A, 2C, 2D, 4, 5, and 17*
- ANSI N13.1, *Guide to Sampling Airborne Radioactive Materials in Nuclear Facilities.*

For each standard not so indicated, give reason(s) to support adequacy of the design and operation of the emission unit(s) as proposed.

The control technology standards in WAC 246-247-110, Appendix A have been considered as applicable as described below. The radial filter on the vacuum pump exhaust will be selected based upon DOE-HDBK-1169-2033, *Nuclear Air Cleaning Handbook,* which consolidates the requirements of ASME AG-1-2009, ASME N50-2002, ASME N510-2007, and ASME N511-2007. National Codes and Standards, as specified in AZ-301 tanker truck project design documents, will be followed. Consistent with existing requirements and practices the radial filters will be replaced annually.

- ASME/ANSI AG-1, *Code on Nuclear Air and Gas Treatment* (where there are conflicts in standards with the other listed references, this standard shall take precedence)
  - The tanker truck HEPA filter will be a 40 cfm radial filter that will meet applicable requirements of ASME AG-1.
- ASME/ANSI N509, *Nuclear Power Plant Air-Cleaning Units and Components*
  - This standard covers the design, construction, qualification and testing of air cleaning units, the AZ-301 Tanker Truck Project does not have these systems so the standard is not applicable.
- ASME/ANSI N510, *Testing of Nuclear Air Treatment Systems*
  - The tanker truck HEPA filter will not be testable per ANSI N510. The HEPA filter will be replaced annually.
- ASME/ANSI NQA-1, *Quality Assurance Program Requirements for Nuclear Facilities*
  - The AZ-301 Tanker Truck Project will adhere to the Tank Farms NQA-1 standards for the air emission components.
- Title 40, *Code of Federal Regulations*, Part 60, "Standards of Performance for New Stationary Sources," Appendix A, "Test Methods," Methods 1, 1A, 2, 2A, 2C, 2D, 4, 5, and 17 (40 CFR 60).

  - These methods are for stacks and duct sampling systems, because of the expected low emission rates a graded approach is being used for sampling. The tanker truck HEPA filters will be replaced annually.

- ANSI N13.1, *Guide to Sampling Airborne Radioactive Materials in Nuclear Facilities.*
  - This standard applies to sampling and monitoring stacks and ducts and a graded approach as described in ANSI N13.1 was employed and administrative controls and limited monitoring as described in Sections 6.1, 6.2 and 9.1 will be used.

18.0 REFERENCES

40 CFR 61, "National Emission Standards for Hazardous Air Pollutant," *Code of Federal Regulations*, as amended

AIR 92-107, October 5, 1992, Letter from Allen W. Conklin, Washington Department of Health to James D. Bauer, Department of Energy, Richland, Washington

ALARACT 5.1, *Tank Farm ALARACT Demonstration for Soil Excavation*,

DOE-HDBK-1169-2033, Nuclear Air Cleaning Handbook, U.S. Department of Energy, Washington, D.C.

DOE/RL-2006-29, Rev 1, *Calculating Potential-to-Emit Radiological Releases and Doses*, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

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APPENDIX A: AZ-301 TANKER TRUCK EMISSIONS

Radioactive Emissions - Tanker Truck[1]

	APQ (Ci)	Release Fraction	Unabated Release (Ci)	Abated Release (Ci)	MAX Dose-per-Unit-Release Factor - 200E OFFSITE MEI[1] (mrem/Ci)	OFFSITE Unabated Dose (mrem/yr)	OFFSITE Abated Dose (mrem/yr)	OFFSITE Contribution to Dose (%)	MAX Dose-per-Unit-Release Factor - 200E ONSITE MEI[1] (mrem/Ci)	ONSITE Unabated Dose (mrem/yr)	ONSITE Abated Dose (mrem/yr)	ONSITE Contribution to Dose (%)
	B	C	D=B*C	E=D/2000	F	G=D*F	H=E*F	I=H/(sum H)	J	K=D*J	L=E*J	M=L/(sum L)
Strontium-90 (beta/gamma)	9.36E+01	1.00E-03	9.36E-02	4.68E-05	1.88E-01	1.76E-02	8.80E-06	82%	1.14E-02	1.07E-03	5.33E-07	18%
Plutonium-239 (alpha)	9.57E-01	1.00E-03	9.57E-04	4.79E-07	4.00E+00	3.83E-03	1.91E-06	18%	5.03E+00	4.82E-03	2.41E-06	82%
Totals	**9.45E+01**		**9.45E-02**	**4.73E-05**		**2.14E-02**	**1.07E-05**	**100%**		**5.88E-03**	**2.94E-06**	**100%**

[1] See Radioactive Emissions – Inadvertent Releases table for the maximum radionuclide concentration (column B).

Radioactive Emissions – Inadvertent Releases

	Concentration (Ci/L)	Volume of Spills (L)	Spills APQ (Ci)	Release Fraction	Unabated Release (Ci)	MAX Dose-per-Unit-Release Factor - 200E OFFSITE MEI[1] (mrem/Ci)	OFFSITE Unabated Dose (mrem/yr)	OFFSITE Contribution to Dose (%)	MAX Dose-per-Unit-Release Factor - 200E ONSITE MEI[1] (mrem/Ci)	ONSITE Unabated Dose (mrem/yr)	ONSITE Contribution to Dose (%)
	B	C	D=B*C	E	F=D*E	G	H=F*G	I=H/(sum H)	J	K=F*J	L=K/(sum K)
Strontium-90 (beta/gamma)	1.94E-04	20	3.87E-03	1.00E-03	3.87E-06	1.88E-01	7.28E-07	82%	1.14E-02	4.41E-08	18%
Plutonium-239 (Alpha)	1.98E-06	20	3.96E-05	1.00E-03	3.96E-08	4.00E+00	1.58E-07	18%	5.03E+00	1.99E-07	82%
Totals	**1.95E-04**				**3.91E-06**		**8.86E-07**	**100%**		**2.43E-07**	**100%**

Total Emissions

	APQ (Ci)	Unabated Release (Ci/yr)	Abated Release (Ci/yr)	OFFSITE Unabated Dose (mrem/yr)	OFFSITE Abated Dose (mrem/yr)	OFFSITE Contribution to Dose (%)	ONSITE Unabated Dose (mrem/yr)	ONSITE Abated Dose (mrem/yr)	ONSITE Contribution to Dose (%)
Strontium-90 (beta/gamma)	9.36E+01	9.36E-02	4.68E-05	1.76E-02	8.80E-06	82%	1.07E-03	5.33E-07	18%
Plutonium-239 (alpha)	9.57E-01	9.57E-04	4.79E-07	3.83E-03	1.91E-06	18%	4.82E-03	2.41E-06	82%
Totals	**9.45E+01**	9.45E-02	4.73E-05	2.14E-02	1.07E-05		5.88E-03	2.94E-06	