Accession #: D196221416

Document #: DOE-RL-96-24

Title/Desc:

RADIOACTIVE AIR EMISSIONS NOTICE OF CONSTRUCTION FOR USE OF A PORTABLE EXHAUSTER ON 241A101 TANK DURING SALT WELL PUMPING & OTHER ROUTINE ACTIVITIES

Pages: 31

DOE/RL-96-24

UC-630

Radioactive Air Emissions Notice of Construction Use of a Portable Exhauster on 241-A-101 Tank During Salt Well Pumping and Other Routine Activities

Date Published
March 1996

United States
Department of Energy
P.O. Box 550
Richland, Washington 99352

Approved for Public Release

THIS PAGE INTENTIONALLY
LEFT BLANK

T INTENTIONALLY BLANK

IRR page 1 of 3

S

Date Received by IRA: 4/19/96

INFORMATION RELEASE REQUEST - (Long Form)

(GRAY SHADED AREAS NOT TO BE FILLED IN BY INITIATOR)

1. COMPLETE THIS SECTION FOR ALL DOCUMENTS

A. Information Category

Speech or Presentation

- [ ] Full Paper
- [ ] Summary
- [ ] Abstract
- [ ] Visual Aid
- [ ] Journal Article
- [ ] Multimedia Presentation
- [ ] Software
- [X] Other Permit Application

B. Document ID Number (include rev., vol., etc.)

DOE/RL-96-24 Rev. 0

C. List attachments (i.e., copyright permission, copyright transfer)

D. Document Title

Radioactive Air Emissions Notice of Construction for the use of a Portable Exhauster on 241-A-101 Tank During Salt Well Pumping and Other Routine Activities

E. WHC Project or Program

Flammable Gas Safety Program Single Shell Tank Exhausters

F. New or novel (patentable) subject matter? [N] No or Yes

If "Yes", has disclosure been submitted by WHC? [ ] No or Yes If "Yes", Disclosure No(s): ______

G. Information received from others in confidence, such as proprietary data, and/or inventions? [N] No or Yes If "Yes", contact WHC General Counsel.

H. Copyrights? [N] No or Yes If "Yes", attach permission.

I. Trademarks? [N] No or Yes If "Yes", identify in document.

2. COMPLETE THIS SECTION FOR ALL DOCUMENTS REQUIRING SUBMISSION TO OSTI

A. Unclassified Category UC - 630

B. Budget & Reporting Code B&R - EW3120072

3. COMPLETE THIS SECTION ONLY FOR A JOURNAL SUBMISSION

A. Title of Journal

4. COMPLETE THIS SECTION ONLY FOR A SPEECH OR PRESENTATION

A. Title for Conference or Meeting

B. Group or Society Sponsoring

C. Date(s) of Conference or Meeting

D. City/State

E. Will material be published in proceedings? [ ] No or Yes

Will material be handed out? [ ] No or Yes

5. REVIEWS

Reviewers — Signature indicates Approval as Requested unless otherwise indicated

Reviewers	Yes	Name (print)	Signature/Date	Limited-Use Info.
General Counsel	[ ]			[ ]
DOE-RL see attached as page 3	[X]	#96-MSD-076 TRANSMITTAL LETTER signed by J. E. Rasmussen		[ ]
Communications	[ ]			[ ]
Applied Technology-Export Controlled Information or International Program	[ ]			[ ]
Other	[ ]			[ ]
Other	[ ]			[ ]

6. Applied Technology Material Referenced [X] No [ ] Yes

7. Release Level [X] Public [ ] Limited Distribution

8. Author/Requestor

N. A. Homan (signature) 4/10/96

(Print and Sign) Date

9. Responsible Manager

J. J. Luke (signature) 4-10-96

(Print and Sign) Date

INFORMATION RELEASE ADMINISTRATION APPROVAL

IRA Approval is required before release. Release is contingent upon resolution of mandatory comments. NOTE: This block for IRA use only.

APPROVED FOR RELEASE — OFFICIAL DOCUMENT — VB — Date 4/17/96

Date Cancelled

Date Disapproved

A-6001-401 (07/94)

THIS PAGE INTENTIONALLY
LEFT BLANK

IRM page 2 of 3

DOE/RL-96-24 Rev. 0

Document ID Number

10. LEGENDS/NOTICES/MARKINGS (Required by WHC-CM-3-4 or Reviewer). Reviewer indicates applicable markings to be affixed or removed.

	Affix	Remove	Initials
Applied Technology	☐	☐	
Availability - OSTI	☒	☐	VB
Availability - ESTSC	☐	☐	
Availability - NTIS	☒	☐	VB
Business-Sensitive Information	☐	☐	
Computer Software Notice	☐	☐	
Copyright License Notice	☐	☐	
Export Controlled Information	☐	☐	
Legal Disclaimer	☐	☐	
Limited Disclosure	☐	☐	
Official Use Only	☐	☐	
Patent Status	☐	☐	
Predecisional Information	☐	☐	
Programmatic Notice	☐	☐	
Proprietary Information	☐	☐	
Purpose and Use	☐	☐	
Thesis/Dissertation	☐	☐	
Trademark Disclaimer	☒	☐	VB
Other:	☐	☐	

11. MANDATORY COMMENTS (List only mandatory comments here. All other comments shall be made on the document and returned to the author.)	Reviewer (Print & Sign)	Date	Resolved by Author/Requestor (Print & Sign)	Date

12. ADDITIONAL INFORMATION/COMMENTS:

A-6001-401R (07/94)

THIS PAGE INTENTIONALLY
LEFT BLANK

IRR page 3083

Department of Energy
Richland Operations Office
P.O. Box 550
Richland, Washington 99352

96-MSD-076

MAY 0 2 1996

Mr. A. W. Conklin, Head
Air Emissions and Defense Waste Section
Division of Radiation Protection
State of Washington
Department of Health
P. O. Box 47827
Olympia, Washington 98504-7827

Mr. Jerry Leitch, Chief
Radiation and Indoor Air Section
U.S. Environmental Protection Agency
Region 10
1200 Sixth Avenue
Seattle, Washington 98101

Dear Messrs. Conklin and Leitch:

RADIOACTIVE AIR EMISSIONS NOTICE OF CONSTRUCTION (NOC) FOR ACTIVE VENTILATION ON 241-A-101 TANK

Enclosed is the NOC for use of a portable exhauster on 241-A-101 Tank. The NOC is being submitted pursuant to Code 40 of the Federal Regulations Part 61.96 and Washington Administrative Code 246-247-060.

Requirements for actively exhausting the 241-A-101 Tank are based on the Los Alamos National Laboratory's Safety Analysis Report (SAR). The SAR states that in order to get the postulated accidents, to within the risk guidelines, an exhauster is required.

The estimated potential unabated offsite dose from active ventilation at the 241-A-101 Tank is 1.81 E-02 millirem per year.

Should you have any questions or comments, please contact Ms. Carolyn Haass on (509) 372-2731 or Mr. Hector M. Rodriguez on (509) 376-6421.

Sincerely,

James E. Rasmussen

James E. Rasmussen, Director
Environmental Assurance, Permits, and Policy Division

MSD:SDB

Enclosure

cc w/encl:
D. Alison, WHC
E. Greager, WHC
R. Jim, YIN
D. Powaukee, Nez Perce Tribe
J. Wilkinson, CTUIR

THIS PAGE INTENTIONALLY
LEFT BLANK

CONTENTS

FIGURES

TABLES

TERMS

ALARA	as low as reasonably achievable
ANSI	American National Standards Institute
BARCT	best available radionuclide control technology
CFR	*Code of Federal Regulations*
DCRT	double-contained receiver tank
DF	decontamination factor
DST	double-shell tank
DOH	Washington State Department of Health
EPA	U.S. Environmental Protection Agency
Ecology	Washington State Department of Ecology
HEPA	high-efficiency particulate air
MEI	maximally exposed individual
NEPA	*National Environmental Policy Act of 1969*
NOC	notice of construction
RCRA	*Resource Conservation and Recovery Act of 1976*
SEPA	*State Environmental Policy Act of 1971*
SST	single-shell tank
Tri-Party Agreement	*Hanford Federal Facility Agreement and Consent Order*
WAC	*Washington Administrative Code*

METRIC CONVERSION CHART

The following conversion chart is provided to the reader as a tool to aid in conversion.

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
square miles	259	hectares	hectares	0.00391	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 feet per minute	0.02832	cubic meters per minute			
cubic yards	0.76	cubic meters	cubic meters	1.308	cubic yards
Temperature			**Temperature**		
BTU/hour	2.93 E-4	kilowatts			
Fahrenheit	subtract 32 then multiply by 5/9ths	Celsius	Celsius	multiply by 9/5ths, then add 32	Fahrenheit

RADIOACTIVE AIR EMISSIONS NOTICE OF CONSTRUCTION USE OF A PORTABLE EXHAUSTER ON 241-A-101 TANK DURING SALT WELL PUMPING AND OTHER ROUTINE ACTIVITIES

1.0 INTRODUCTION

This document serves as a notice of construction (NOC), pursuant to the requirements of Washington Administrative Code (WAC) 246-247-060, and as a request for approval to construct pursuant to 40 Code of Federal Regulations (CFR) 61.96 for the use of a portable exhauster on 241-A-101 single-shell tank (SST) during salt well pumping and other routine activities at the tank. Approval for salt well pumping is not being requested as this is a routine activity performed to manage the waste within the SST Tank System.

The primary objective of providing active ventilation to the 241-A-101 tank is to satisfy the requirements of a Los Alamos National Laboratories (LANL) Safety Analysis Report (SAR) that requires postulated accidents to remain within risk guidelines. It is anticipated that salt well pumping will release gases entrapped within the waste as the liquid level is lowered, because of less hydrostatic force keeping the gases in place. Other routine activities also have the potential to release trapped gases by interrupting gas pockets within the waste. Hanford Site waste tanks must comply with the National Fire Protection Association guidelines, which mandate that flammable gas concentration be less than 25 percent of the lower flammability limits. The LANL SAR indicates that the lower flammability limit may be exceeded during certain postulated accident scenarios. Also, the potentials for electrical (pump motor, heat tracing) and mechanical (equipment installation) spark sources exist. Therefore, because of the presence of ignition sources and the increase in released flammable gases, active ventilation will be required to reduce the 'time at risk' while performing routine operations at the tank.

Salt well pumping is the first planned activity at the tank requiring active ventilation. The exhauster may be operated continuously or intermittently as required by flammable gas levels. The pumping campaign will take approximately 3 years to complete and it is likely other routine activities will be performed in this timeframe. Also, once the pumping campaign has been completed the need for continued operation of the exhauster may arise for routine activities performed at the tank.

The 241-A-101 tank is a 3,785,400-liter capacity SST used for storage of mixed waste. This tank was put into service in 1956 and removed from service in 1980. The integrity of this tank is categorized as 'sound'. Currently the 241-A-101 tank holds approximately 3,607,486 liters of waste, of which 1,563,370 liters are pumpable interstitial liquid. The 241-A-101 tank is on the flammable gas watchlist and the organic watchlist. Salt well pumping of this tank is included in *Hanford Federal Facility Agreement and Consent Order* (Tri-Party Agreement) Milestone M-41-10, "Start Interim Stabilization of Two

Flammable Gas Watchlist Tanks in 241-A/AX Tank Farms by April 30, 1996". The milestone is currently under renegotiation for a later date.

2.0 FACILITY LOCATION (Requirement 1)

The 241-A-101 tank is one of six tanks included in the 241-A Tank Farm, located in the 200 East Area of the Hanford Site. Figure 1 shows the location of the 200 East Area within the Hanford Site. Figure 2 shows the location of the 241-A Tank Farm within the 200 East Area. The geodetic coordinates of the 241-A-101 tank are as follows:

Latitude: 46° 33' 11" N   Longitude: 119° 30' 59" W

U.S. Department of Energy, Richland Operations Office
Hanford Site
200 East Area, 241-A-101 Tank
Richland, Washington 99352

3.0 RESPONSIBLE MANAGER (Requirement 2)

The responsible manager's name and address are as follows:

Mr. A. B. Sidpara, Director
Tank Operations Division
U.S. Department of Energy, Richland Operations Office
P.O. Box 550
Richland, Washington 99352
(509) 376-0933

4.0 TYPE OF PROPOSED ACTION (Requirement 3)

The proposed action is a modification to an existing emission unit at the 241-A Tank Farm. The proposed modification is to install and operate a portable exhauster on the 241-A-101 tank while salt well pumping and/or other routine activities are being performed. Presently, the tank is passively ventilated and once salt well pumping has been completed the need for continued operation of the exhauster may arise for other routine activities performed at the tank.

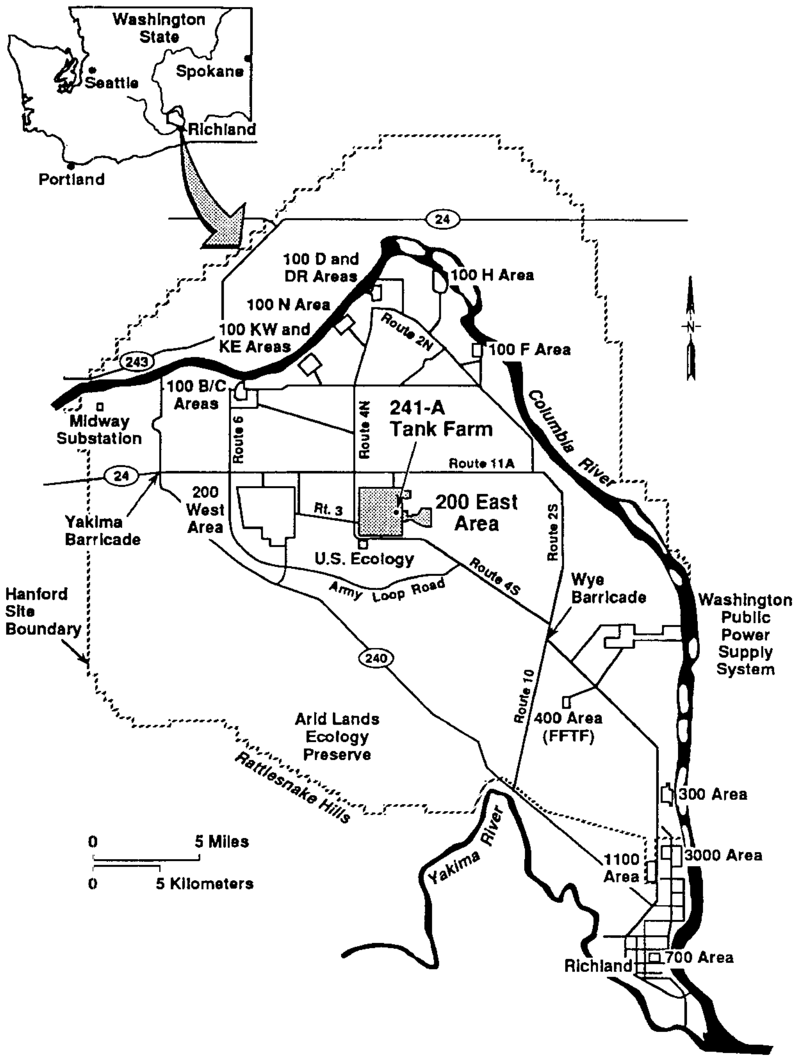

Figure 1. Hanford Site.

H96020397.2

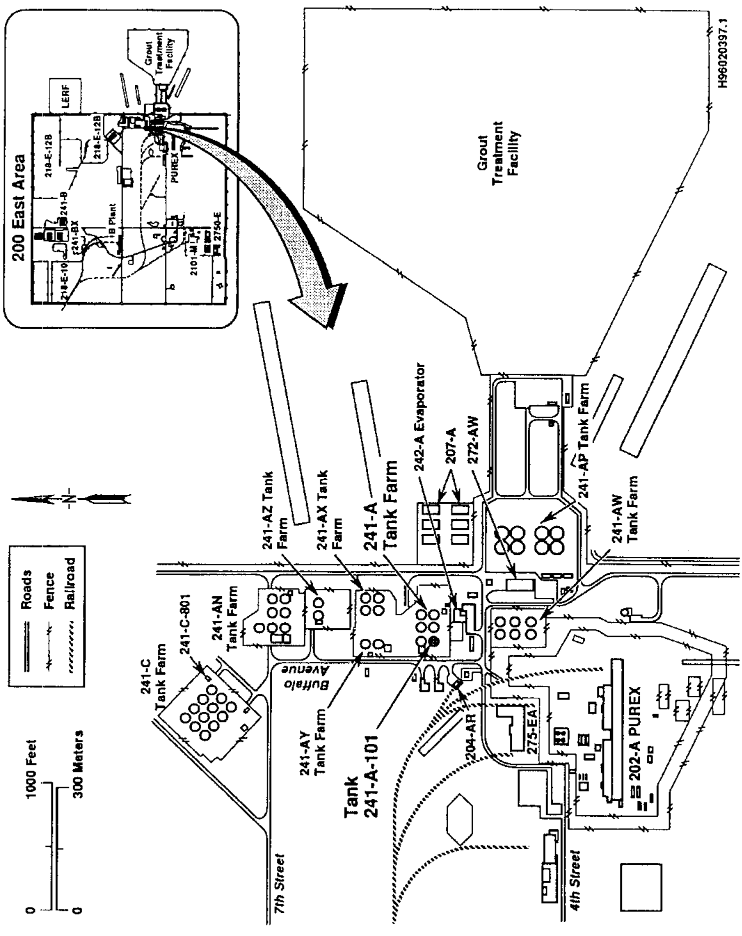

Figure 2. Location of the 241-A-101 Tank within the 200 East Area.

5.0 STATE ENVIRONMENTAL POLICY ACT (Requirement 4)

The *National Environmental Policy Act of 1969* documentation for this activity will be adopted to satisfy the SEPA process. Washington State Department of Ecology is the lead agency and Mr. Geoff Tallent [(206) 407-7112] coordinates all SEPA activities for the Hanford Site.

6.0 PROCESS DESCRIPTION (Requirements 5 and 7)

The 241-A-101 tank, a 22.9-meter diameter, 3,785,400-liter capacity SST, was constructed from the fourth generation of tank designs, which were capable of holding boiling or self-concentrating waste. The construction features a reinforced concrete shell, dome, and base with a mild steel liner covering the bottom and sidewalls. The tank has a flat bottom with a usable waste depth of approximately 9.4 meters.

The tank was put into service in 1956 to store plutonium-uranium extraction (PUREX) high-level waste and organic wash waste. The waste was allowed to self-concentrate until 1968. Tank sluicing was performed in 1969 and again in 1976 to reduce the amount of strontium and cesium, the two isotopes found to be the main heat generating sources in the tank. In 1978, the tank was reassigned for saltcake storage. The tank was taken out of service in November 1980 and partially isolated in 1982.

Salt well pumping is a method used to interim stabilize SSTs. Interim stabilization is commenced once all the liquid above the solids has been removed (primary stabilization). Interim stabilization removes the gravity drainable liquid and the interstitial liquid between solid from the SST and transfers the liquid to a double-shell tank (DST), or to a staging double-contained receiver tank (DCRT), which is subsequently transferred to a DST. Pumping is accomplished at very low flow rates, 15.1 liters per minute or less. Slow collection of the liquid in the well often requires pumping at less than 3.8 liters per minute.

Normally, salt well pumping is performed without the need of an exhauster. However, recent safety evaluations concluded that a minimum exhaust flow rate of 7.1 cubic meters per minute would be required to enhance the safety of the tank. Therefore, active ventilation will be part of this process for the 241-A-101 tank.

7.0 ANNUAL POSSESSION QUANTITY AND PHYSICAL FORM (Requirements 8, 10, 11, and 12)

There is no record of historical sampling and analysis information for the 241-A-101 tank. An estimate of the contents of this tank has been developed by reviewing process histories, waste transfer data, and by tank layering models and inventory estimates developed by Los Alamos National Laboratories (WHC 1994).

Currently, the 241-A-101 tank holds approximately 3,607,486 liters of waste; 1,525,516 liters of salt slurry, 2,070,613 liters of saltcake, and 11,370 liters of sludge (WHC 1994), of which 1,563,370 liters are pumpable interstitial liquid (WHC 1995). The current nominal bulk temperature of the waste is 68.3 °C. Assembled tank photographs show a white to grayish-yellow saltcake surface with no visible liquid. Table 1 contains the estimated inventory, and the isotopes are assumed to be in particulate form. Gaseous isotopes are expected to be present, however, the proportions of gaseous radionuclides to particulate radionuclides should not be significantly greater in 241-A-101 tank than in other tanks. Therefore, it is unlikely that gaseous radionuclides will contribute to more than 10 percent of the potential offsite dose of 241-A-101 tank emissions.

Table 1. Radionuclide Waste Inventory for the 241-A-101 Tank.

Constituent	Concentration	Total inventory
Pu	4.79 E-02 µCi/g	4.41 E+00 kg*
U	2.00 E+03 µg/g	1.11 E+04 kg*
Cs-137	4.20 E+02 µCi/g	2.31 E+06 Ci
Sr-89/90	3.04 E-01 µCi/g	1.68 E+05 Ci

* Reported in kg because the source document considered them important from a toxilogical standpoint. The constituents are radioactive elements, however, they play a very minimal role in dose consequence calculations.

µCi/g = microcuries per gram.
kg = kilogram.
Ci = curie.

8.0 CONTROL SYSTEM (Requirement 6)

During exhauster operation, the offgas flows through a prefilter and two high-efficiency particulate air (HEPA) filters in series before entering the fan and exiting through the stack. The HEPA filters are rated for 28.3 cubic meters per minute and are equipped with fluid seals. Each stage is fully testable to the requirements of ASME N509/510. Each filter is 99.95 percent efficient for the removal of particulates 0.3 microns and larger. The fan is rated for 14.2 cubic meters per minute of air and is of nonsparking design. A system heater will not be used at this time; however, space will be designed into the filter train to insert an intrinsically safe electric or glycol heater later. The heater system will be located upstream of the prefilter. The stack is circular, 15.2 centimeters in diameter and 3.7 to 4.6 meters high from ground level. Exhaust temperatures will be between 57.2 and 60.0 °C. Figure 3 shows plan and elevation views of the ventilation control system.

9.0 MONITORING SYSTEM (Requirement 9)

The potential unabated total effective dose for this application of the exhauster is less than 0.1 millirem per year. Therefore, in accordance with 40 CFR 61, Subpart H, periodic confirmatory measurements will be made (at least annually) to verify the low emissions.

A National Emission Standards for Hazardous Air Pollutants (NESHAPs)-compliant monitoring system is not required for use of the exhauster on 241-A-101 tank. However, provisions in the exhaust stack will be made so that isokinetic sample probes could be placed into the airstream if a continuous monitoring system is required for other uses.

10.0 RELEASE RATES (Requirement 13)

Emissions resulting from the use of an exhauster on the 241-A-101 tank during salt well pumping and other routine activities are expected to be low. These activities minimally disturb the tank waste and vapor space. The following estimate is based on analyses of upstream filter papers in sampling equipment used for vapor space sampling in support of worker health and safety issues. The vapor sample analysis did not include radionuclide analytes; therefore, analyses of the filter papers were used for this estimate. Data from five tanks were used. Results specific to 241-A-101 tank were used, and as Cs-137 was not reported for the 241-A-101 tank, the average of the four SSTs that did have Cs-137 was used (Table 2). The estimate assumes stagnant tank conditions.

10.1 UNABATED EMISSIONS

The unabated emissions were estimated from measured total alpha, total beta, and Cs-137 on upstream filter papers of vapor sampling equipment. The total alpha was assumed to be all from Am-241 because it provides the highest dose consequence of all alpha emitters (the Pu and U contributions from Table 1 are accounted for in the total alpha activity). The total beta was assumed to be all from Sr-90. Also, the total beta activity was increased by 5 percent to account for the difference in the counting efficiencies for Cs-137 and Sr-90 (Cs-137 was used to calibrate the instrument for total beta). Curie concentrations from the filter papers are shown in Table 2.

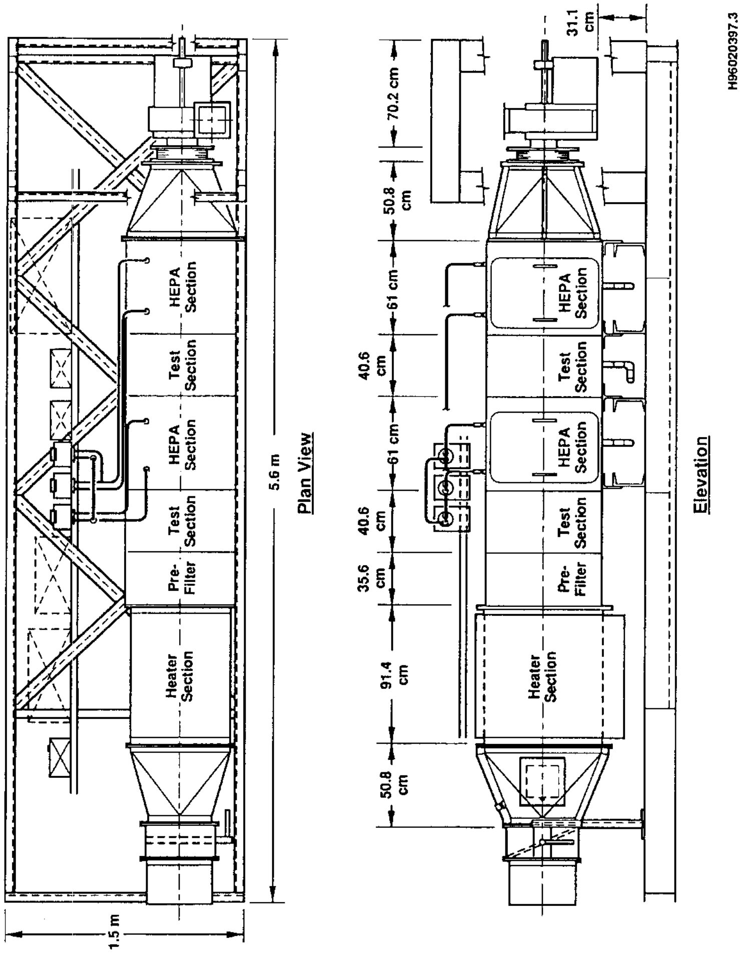

Figure 3. Ventilation Control System Diagram.

Table 2. Potential Annual Unabated Emissions for Use of an Exhauster on the 241-A-101 Tank.

Radionuclide	Tank	Filter paper concentration μCi/mL	Unabated Emission Ci/yr
Sr-90 (total beta)	241-A-101	9.79 E-10	7.29 E-03
Cs-137	241-S-102	3.89 E-09	
	241-SX-101	2.40 E-10	
	241-SX-109	1.00 E-10	
	241-T-110	1.00 E-10	
	Average	1.08 E-09	8.04 E-03
Am-241 (total alpha)	241-A-101	1.80 E-10	1.34 E-03

μCi/mL = microcuries per milliliter.
Ci/yr = curies per year.

The estimate is considered to be conservative because the activities measured on the filter papers were attributed largely to radon daughters. Most of the filter papers were analyzed the day after the sampling occurred. Subsequent analysis over the next 7 to 14 days showed that the average half-life of the activity on the filters was approximately 10 days, representative of the radon daughters.

The exhauster was assumed to run at 14.2 cubic meters per minute, 24 hours per day, and 365 days per year. The starting concentration is that from the filter papers and is shown in Table 2. The potential unabated emissions also are shown in Table 2. The following is a sample calculation:

$$(9.79\text{ E-10 } \frac{\mu Ci}{ml})(\text{E-06 } \frac{Ci}{\mu Ci})(\text{E+03 } \frac{ml}{l})(500 \frac{ft^3}{min})(28.3168 \frac{l}{ft^3})(60 \frac{min}{hr})(24 \frac{hr}{day})(365 \frac{day}{yr}) = 7.29\text{ E-03 } \frac{Ci}{yr}.$$

10.2 ABATED EMISSIONS

The abated emissions were calculated from the unabated emissions listed in Table 2 and the decontamination factor (DF) (DF = 1/ 1 - efficiency) for the HEPA filter. The DF for each HEPA filter is 2,000. The overall DF is determined by multiplying the DFs for the individual components together. The abated emissions equals the unabated emissions divided by the overall DF. The potential annual abated emissions are shown in Table 3.

Table 3. Potential Annual Abated Emissions for Use of an Exhauster on the 241-A-101 Tank.

Radionuclide	Unabated Emissions Ci/yr	Overall DF	Abated emissions Ci/yr
Sr-90 (total beta)	7.29 E-03	4.00 E+06	1.82 E-09
Cs-137	8.04 E-03	4.00 E+06	2.01 E-09
Am-241 (total alpha)	1.34 E-03	4.00 E+06	3.35 E-10

Ci/yr = curies per year.

11.0 OFFSITE IMPACT (Requirements 14 and 15)

This section contains information regarding the effective dose equivalents to the maximally exposed individual (MEI) offsite resulting from unabated and abated emissions from the use of an exhauster on 241-A-101 tank during routine operations. The MEI is located 16 kilometers east of the 200 East Area. The potential unabated dose is summarized in Table 4 and the potential abated dose is summarized in Table 5. The unit dose factors included in the tables were submitted previously to the Washington State Department of Health. The information required to develop the unit dose factors from the Clean Air Assessment Package 1988 computer code is also included in *Unit Dose Calculation Methods Summary of Facility Effluent Monitoring Plan Determinations* (WHC 1991).

The estimated abated dose is 4.52 E-09 millirems per year. The dose resulting from all Hanford Site operations in 1994 was determined to be 5.00 E-03 millirems per year for an individual located at the Sagemore Road farm, excluding radon (DOE/RL-95-49). The emissions originating from the 241-A-101 tank exhauster, in conjunction with other current operations on the Hanford Site, will not result in a violation of the National Emission Standard of 10 millirems per year.

12.0 COST FACTORS AND FACILITY LIFETIME (Requirements 16 and 17)

It is proposed that the HEPA filtration system, as described in Section 8.0, be approved as best available radionuclide control technology for this application. As such, cost factors for construction, operation, and maintenance of the control technology components and system have not been provided.

Table 4. Potential Annual Unabated Offsite Dose from the Use of an Exhauster on the 241-A-101 Tank.

Radionuclide	Unabated emissions Ci/yr	Unit dose factor mrem/Ci	Unabated dose mrem/yr
Sr-90	7.29 E-03	4.38 E-02	3.19 E-04
Cs-137	8.04 E-03	2.39 E-02	1.92 E-04
Am-241	1.34 E-03	1.31 E+01	1.17 E-02
Total	N/A	N/A	1.81 E-02

Ci/yr = curies per year.
mrem/Ci = millirem per curie.
mrem/yr = millirem per year.
N/A = not applicable.

Table 5. Potential Annual Abated Offsite Dose from the Use of an Exhauster on the 241-A-101 Tank.

Radionuclide	Abated emissions Ci/yr	Unit dose factor mrem/Ci	Abated dose mrem/yr
Sr-90	1.82 E-09	4.38 E-02	7.97 E-11
Cs-137	2.01 E-09	2.39 E-02	4.80 E-11
Am-241	3.35 E-10	1.31 E+01	4.39 E-09
Total	N/A	N/A	4.52 E-09

Ci/yr = curies per year.
mrem/Ci = millirem per curie.
mrem/yr = millirem per year.
N/A = not applicable.

The minimum design life of the exhauster equipment is 20 years. The exhauster may be operated continuously or intermittently, as required by flammable gas levels, for the duration of the pumping campaign, including installation of the pump. Pumping operations will be in a continuous mode for approximately 3 years and it is likely other routine activities will be performed in that timeframe. The campaign will be operated by personnel divided into 3 shifts per day, operating 24 hours a day, 7 days a week. Pumping is scheduled to begin in the second quarter of 1996. After transfer of the waste, continued operation of the exhauster may be needed for routine activities at the tank.

13.0 TECHNOLOGY STANDARDS (Requirement 18)

The installation and operation of an exhauster during routine operation of the 241-A-101 tank has a potential to emit radioactive particles less than 0.1 millirem per year total effective dose equivalent (TEDE) to the MEI; therefore, the design must meet, as applicable and to the extent justified by a cost/benefit evaluation, the technology standards listed under WAC 246-247-110(18). Table 6 summarizes the compliance of emissions control equipment with the listed technology standards.

Table 6. Emissions Control Equipment Standards Compliance.

Standard	Does design comply	If not, what standard was used
ASME/ANSI AG-1	Yes	
ASME/ANSI N509	Yes	
ASME/ANSI N510	Yes	
ANSI/ASME NQA-1	Yes	
ANSI N13.1	No	Not required for periodic confirmatory measurement
40 CFR 60, Appendix A Test Methods: 1, 1A	No	Not required for periodic confirmatory measurement
2, 2A, 2C, 2D	No	Not required for periodic confirmatory measurement
4	No	
5, 17	No	

14.0 REFERENCES

DOE/RL-95-49, *Radionuclide Air Emissions Report for the Hanford Site, Calendar Year 1994*, June 1995, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

WHC, 1991, *Unit Dose Calculation Methods Summary of Facility Effluent Monitoring Plan Determinations*, WHC-EP-0498, Westinghouse Hanford Company, Richland, Washington.

WHC, 1994, *Historical Tank Content Estimate for the Northeast Quadrant of the Hanford 200 East Areas*, WHC-SD-WM-ER-349, Westinghouse Hanford Company, Richland Washington.

WHC, 1995, *Waste Tank Summary for Month Ending May, 1995*, WHC-EP-0182-82, Westinghouse Hanford Company, Richland, Washington.

This page intentionally left blank.

DISTRIBUTION

OFFSITE

A. W. Conklin, Head
Air Emissions and Defense Waste Section
Division of Radiation Protection
State of Washington Department of Health
Airdustrial Park Building 5, LE-13
Olympia, Washington 98504-0095

J. Leitch, Chief
Radiation and Indoor Air Section
U.S. Environmental Protection Agency
Region 10
1200 Sixth Avenue
Seattle, Washington 98101

J. Wilkinson
Confederated Tribes of the Umatilla
Indian Reservation
P. O. Box 638
Pendleton, Oregon 97801

D. Powaukee
Nez Perce Tribe
P. O. Box 305
Lapwai, Idaho 80540

R. Jim, Manager
Environmental Restoration/
Waste Management Program
Confederated Tribes and Bands
of the Yakama Nation
P. O. Box 151
Toppenish, Washington 98948

ONSITE

U.S. Department of Energy, <u>Richland Operations Office</u>	**MSIN**
R. M. Carosino	A4-52
C. C. Haass	S7-51
J. C. Peschong	S7-53
H. M. Rodriguez	A5-15
G. H. Sanders	S7-53
A. B. Sidpara	S7-54
OSTI (2)	E6-44
Reading Room (2)	H2-53

960408.0933

DISTRIBUTION (cont)

ONSITE	MSIN
Pacific Northwest Laboratory	
Hanford Technical Library	K1-11
Westinghouse Hanford Company	
D. Alison (2)	R2-06
N. A. Homan (2)	H6-25
J. R. Kriskovich	S2-24
J. J. Luke	H6-25
W. E. Ross	S5-07
Air Operating Permit File	H6-25
WHC Central Files	A3-88