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RADIOACTIVITY IN GASEOUS WASTE DISCHARGED
FROM THE SEPARATIONS FACILITIES DURING 1969

by

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Operations Analysis
Waste Management Section
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INTRODUCTION

This document is issued annually for the purpose of summarizing the radioactive gaseous wastes that are discharged from facilities of the Chemical Processing Division, Altantic Richfield Hanford Company. Data on alpha, beta, and iodine emissions during 1969 are presented where relevant to the gaseous effluent. Emission data are not included on gaseous wastes produced within the 200 Areas by other Hanford contractors.

SUMMARY

During 1969, approximately 4.04×10^{11} cubic feet of gaseous effluents were monitored for radioactivity by the CPD stack sampling program. The sum of the analyzed radioactivity from all measured points of release was as follows:

Alpha (assumed source - Pu)	≤ 0.037	curies
Alpha (assumed source - U)	$< 8.6 \times 10^{-4}$	curies
Beta	4.29	curies
Iodine-131	1.58	curies

DISCUSSION

Gaseous effluents from CPD stacks are normally analyzed either for alpha, beta, or iodine-131 activity or depending upon the facility, for a combination of these indices. Analyses for other radioisotopes are performed if warranted by the alpha or beta level.

A summary is presented in Table I of the radioactive gaseous waste discharged from individual CPD stacks during 1969. Volume estimates are also included in Table I. The activity of gaseous effluents is detailed on a month-to-month basis in Table II. Identification of stacks was based upon item 1 of the Bibliography which utilizes 291- as the prefix for the 200 foot main stacks and 296- as the prefix for other stacks.

TABLE I
SUMMARY OF RADIOACTIVE GASEOUS WASTE
DISCHARGED FROM SEPARATIONS FACILITIES DURING 1969

<u>Stack</u>	Volume (n x 10 ⁶ cubic feet)	<u>Alpha (Ci)</u> Assumed Source		<u>Beta (Ci)</u>	<u>I-131 (Ci)</u>
		<u>Pu</u>	<u>U</u>		
291-A-1 Purex process and canyon	64,400	0.034	---	2.328	1.577
296-A-1 Purex N & Q Cells & Pr room	3,990	1.1x10 ⁻³	---	2.0x10 ⁻⁴	---
296-A-2 Purex west sample gallery hoods	2,260	2.7x10 ⁻⁶	---	6.6x10 ⁻⁵	---
296-A-3 Purex east sample gallery hoods	2,370	1.1x10 ⁻⁶	---	3.6x10 ⁻⁵	---
296-A-5 Purex Lab hoods & glove boxes	13,100	6.8x10 ⁻⁵	---	7.9x10 ⁻⁵	---
296-A-6 Purex east sample gallery & U cell	7,100	7.8x10 ⁻⁵	---	7.2x10 ⁻³	---
296-A-7 Purex west sample gallery & R cell	10,700	1.1x10 ⁻⁴	---	0.045	---
296-A-8 Purex P & O gallery (white room)	9,200	8.1x10 ⁻⁶	---	2.5x10 ⁻⁴	---
296-A-10 Purex burial tunnel No. 2	3,150	4.9x10 ⁻⁵	---	0.723	---

Table I (Continued) Summary Radioactive Gaseous Waste - 1969

<u>Stack</u>	<u>Volume (n x 10⁶ cubic feet)</u>	<u>Alpha (Ci)</u> Assumed Source		<u>Beta (Ci)</u>	<u>I-131 (Ci)</u>
		<u>Pu</u>	<u>U</u>		
296-A-12 AR Vault vessel vent	368	---	---	1.1×10^{-5}	1.1×10^{-4}
296-A-13 AR Vault canyon & cell	12,600	---	---	1.5×10^{-4}	1.1×10^{-4}
296-A-17 241 & AX Tank Farm vent	2,630	---	---	2.4×10^{-4}	---
291-B-1 B Plant process and canyon	28,900	---	---	0.996	---
296-B-2 In-Tank Solidification No. 1	1,840	---	---	8.2×10^{-5}	---
296-B-3 In-Tank Solidification No. 2	210	---	---	5.1×10^{-5}	---
291-C-1 Semiworks process and cells	10,500	---	---	3.6×10^{-4}	---
296-C-2 Semiworks A & C sample galleries	4,200	---	---	1.5×10^{-5}	---
296-C-5 CR Vault cell & vessel vent	1,840	---	---	7.3×10^{-5}	---

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Table I (Continued) Summary Radioactive Gaseous Waste - 1969

<u>Stack</u>	<u>Volume (n x 10⁶ cubic feet)</u>	<u>Alpha (Ci)</u> <u>Assumed Source</u>		<u>Beta (Ci)</u>	<u>I-131 (Ci)</u>
		<u>Pu</u>	<u>U</u>		
291-S-1 Redox process and canyon	18,900	$<1.7 \times 10^{-4}$	---	0.111	---
296-S-1 Redox south sample gallery	1,840	$<1.0 \times 10^{-6}$	---	9.7×10^{-6}	---
296-S-2 Redox north sample gallery & hoods	1,840	$<3.0 \times 10^{-7}$	---	8.6×10^{-6}	---
296-S-4 Redox regulated shop & tool room and SWP lobby	1,160	$<8.2 \times 10^{-5}$	---	4.9×10^{-5}	---
296-S-5 Redox product removal cage	946	2.5×10^{-6}	---	1.6×10^{-5}	---
296-S-6 Redox silo sample gallery	5,570	4.8×10^{-6}	---	2.1×10^{-4}	---
296-S-7 Redox product (233-S) process & greenhouse	4,050	3.6×10^{-5}	---	2.9×10^{-4}	---
296-S-13 Redox laboratory	33,600	$<1.1 \times 10^{-4}$	---	7.5×10^{-3}	---
296-S-15 241-SX sludge cooling	3,680	$<1.5 \times 10^{-6}$	---	5.3×10^{-5}	---
296-S-16 Redox lab waste tank & vault	53	$<3.6 \times 10^{-6}$	---	9.2×10^{-5}	---

Table I (Continued) Summary Radioactive Gaseous Waste - 1969

<u>Stack</u>	<u>Volume (n x 10⁶ cubic feet)</u>	<u>Alpha (Ci)</u> <u>Assumed Source</u>		<u>Beta (Ci)</u>	<u>I-131 (Ci)</u>
		<u>Pu</u>	<u>U</u>		
291-T-1 T Plant canyon	18,900	$<4.7 \times 10^{-4}$	---	5.0×10^{-2}	---
296-T-1 242-T Evaporator hot cells	420	$<1.7 \times 10^{-6}$	---	2.5×10^{-4}	---
296-T-2 242-T Evaporator cold cells	420	$<2.9 \times 10^{-6}$	---	2.6×10^{-4}	---
296-T-4 241-TX supernatant cooling	3,680	$<2.5 \times 10^{-6}$	---	2.1×10^{-3}	---
296-U-2 Uranium Oxide 224-UA filters	1,210	---	$<7.8 \times 10^{-4}$	9.7×10^{-3}	---
296-U-3 Uranium oxide 224-U filter	499	---	$<7.1 \times 10^{-5}$	3.0×10^{-4}	---
296-U-5 224-U F cell	303	---	$<5.6 \times 10^{-6}$	1.1×10^{-4}	---
291-Z-1 Z Plant process and ventilation	<u>128,000</u>	<u>3.4×10^{-4}</u>	<u>---</u>	<u>2.5×10^{-3}</u>	<u>---</u>
Total	<u>404,000</u>	<u>≤ 0.037</u>	<u>$<8.6 \times 10^{-4}$</u>	<u>4.29</u>	<u>1.58</u>

TABLE II
RADIOACTIVE GASEOUS WASTE - MONTHLY DATA - 1969

STACK NO. (Plant Code)	291-A-1 (291-A)			296-A-1 (E-1)		296-A-2 (E-2)	
FACILITY	Purex			Purex		Purex	
FUNCTION	Air from 291-A filters. Includes canyon ventilation air, vessel, and condenser vents, treated dissolver off-gas.			Filtered air from N and Q Cells and Pr Room		Hood exhaust from west sample gallery	
<u>Radioactivity</u> (curies)	<u>Alpha</u>	<u>Beta</u>	<u>I-131</u>	<u>Alpha</u>	<u>Beta</u>	<u>Alpha</u>	<u>Beta</u>
January	3.2×10^{-4}	0.024	0.210	1.3×10^{-4}	1.3×10^{-5}	1.2×10^{-7}	7.0×10^{-7}
February	1.5×10^{-4}	0.410	0.022	9.1×10^{-6}	1.2×10^{-5}	1.3×10^{-7}	9.0×10^{-8}
March	6.8×10^{-5}	0.135	0.017	7.0×10^{-6}	1.0×10^{-6}	7.0×10^{-8}	1.0×10^{-6}
April	1.7×10^{-5}	0.794	0.032	1.4×10^{-5}	3.6×10^{-6}	1.0×10^{-8}	1.8×10^{-8}
May	1.3×10^{-4}	0.110	0.220	3.0×10^{-4}	7.5×10^{-6}	1.0×10^{-8}	3.2×10^{-6}
June	1.2×10^{-4}	0.074	0.870	8.2×10^{-5}	1.4×10^{-6}	5.0×10^{-8}	1.0×10^{-6}
July	4.7×10^{-5}	0.062	0.020	1.5×10^{-4}	7.8×10^{-6}	1.0×10^{-7}	5.3×10^{-6}
August	6.0×10^{-5}	0.260	0.021	1.6×10^{-5}	3.6×10^{-6}	1.0×10^{-8}	4.1×10^{-6}
September	5.7×10^{-5}	0.044	0.014	2.8×10^{-5}	5.6×10^{-6}	2.4×10^{-8}	4.0×10^{-6}
October	2.7×10^{-3}	0.185	0.030	7.2×10^{-5}	3.2×10^{-5}	2.0×10^{-7}	4.2×10^{-5}
November	2.2×10^{-2}	0.110	0.101	1.3×10^{-4}	1.7×10^{-6}	1.5×10^{-6}	1.3×10^{-6}
December	8.7×10^{-3}	0.120	0.020	1.6×10^{-4}	1.1×10^{-4}	5.2×10^{-7}	3.3×10^{-6}
Total	<u>0.034</u>	<u>2.328</u>	<u>1.577</u>	<u>1.1×10^{-3}</u>	<u>2.0×10^{-4}</u>	<u>2.7×10^{-6}</u>	<u>6.6×10^{-5}</u>

Radioactive Gaseous Waste - 1969 (Continued)

STACK NO. (Plant Code)	296-A-3 (E-3)		296-A-5 (E-5)		296-A-6 (E-6)		296-A-7 (E-7)	
FACILITY	Purex (202-A)		Purex		Purex		Purex	
FUNCTION	Hood exhaust air from east sample gallery		Filtered air from 202-A laboratory hoods and glove boxes		Unfiltered air from east sample gallery and U Cell		Unfiltered air from west sample gallery and R cell	
<u>Radioactivity</u> (curies)	<u>Alpha</u>	<u>Beta</u>	<u>Alpha</u>	<u>Beta</u>	<u>Alpha</u>	<u>Beta</u>	<u>Alpha</u>	<u>Beta</u>
January	4.0x10 ⁻⁸	7.2x10 ⁻⁶	4.0x10 ⁻⁷	1.6x10 ⁻⁵	9.8x10 ⁻⁷	4.8x10 ⁻⁴	6.7x10 ⁻⁵	9.8x10 ⁻⁴
February	1.0x10 ⁻⁸	1.2x10 ⁻⁶	1.0x10 ⁻⁸	9.6x10 ⁻⁶	5.6x10 ⁻⁷	5.2x10 ⁻⁴	4.9x10 ⁻⁶	8.3x10 ⁻⁴
March	2.0x10 ⁻⁸	1.0x10 ⁻⁶	1.0x10 ⁻⁷	7.0x10 ⁻⁶	1.0x10 ⁻⁷	2.5x10 ⁻⁵	1.0x10 ⁻⁶	3.4x10 ⁻³
April	2.0x10 ⁻⁸	2.5x10 ⁻⁶	3.1x10 ⁻⁷	2.8x10 ⁻⁶	2.9x10 ⁻⁷	1.8x10 ⁻⁴	7.6x10 ⁻⁶	3.2x10 ⁻⁴
May	3.0x10 ⁻⁸	5.1x10 ⁻⁶	3.1x10 ⁻⁷	1.4x10 ⁻⁵	3.4x10 ⁻⁷	7.3x10 ⁻⁴	1.3x10 ⁻⁶	3.3x10 ⁻³
June	1.3x10 ⁻⁷	1.1x10 ⁻⁶	2.1x10 ⁻⁷	9.0x10 ⁻⁷	1.6x10 ⁻⁷	2.7x10 ⁻³	1.2x10 ⁻⁶	1.3x10 ⁻³
July	1.0x10 ⁻⁷	2.0x10 ⁻⁶	6.5x10 ⁻⁵	3.0x10 ⁻⁸	2.0x10 ⁻⁷	1.1x10 ⁻⁴	5.4x10 ⁻⁶	2.7x10 ⁻⁴
August	2.0x10 ⁻⁸	8.6x10 ⁻⁷	1.2x10 ⁻⁷	8.3x10 ⁻⁷	9.0x10 ⁻⁸	7.2x10 ⁻⁵	2.0x10 ⁻⁶	3.8x10 ⁻³
September	2.8x10 ⁻⁸	7.7x10 ⁻⁷	2.7x10 ⁻⁷	1.4x10 ⁻⁵	7.8x10 ⁻⁸	5.0x10 ⁻⁶	1.7x10 ⁻⁷	3.3x10 ⁻⁴
October	7.0x10 ⁻⁸	4.6x10 ⁻⁶	3.5x10 ⁻⁷	3.3x10 ⁻⁶	2.0x10 ⁻⁷	1.3x10 ⁻⁴	1.1x10 ⁻⁵	2.7x10 ⁻²
November	2.0x10 ⁻⁸	5.3x10 ⁻⁶	1.9x10 ⁻⁷	8.4x10 ⁻⁶	6.0x10 ⁻⁸	6.3x10 ⁻⁴	6.7x10 ⁻⁷	2.6x10 ⁻³
December	<u>6.4x10⁻⁷</u>	<u>4.5x10⁻⁶</u>	<u>3.7x10⁻⁷</u>	<u>2.0x10⁻⁶</u>	<u>7.5x10⁻⁵</u>	<u>1.6x10⁻³</u>	<u>5.9x10⁻⁶</u>	<u>1.2x10⁻³</u>
Total	<u>1.1x10⁻⁶</u>	<u>3.6x10⁻⁵</u>	<u>6.8x10⁻⁵</u>	<u>7.9x10⁻⁵</u>	<u>7.8x10⁻⁵</u>	<u>7.2x10⁻³</u>	<u>1.1x10⁻⁴</u>	<u>0.045</u>

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Radioactive Gaseous Waste - 1969 (Continued)

STACK NO. (Plant Code)	296-A-8 (Rack 73)		296-A-10 (BT-2)		296-A-12 (150 ft.) (ARVVS)		296-A-13 (ARCS)	
FACILITY	Purex		Purex		244-AR Vault		244-AR Vault	
FUNCTION	Unfiltered air from west end of P & O gallery. (White Room exhaust)		Filtered air from burial tunnel No. 2		Filtered air from vessel vent system		Filtered air from canyon and cell ventilation	
<u>Radioactivity</u> (curies)	<u>Alpha</u>	<u>Beta</u>	<u>Alpha</u>	<u>Beta</u>	<u>Beta</u>	<u>I131</u>	<u>Beta</u>	<u>I131</u>
January	1.9x10 ⁻⁶	2.6x10 ⁻⁵	2.0x10 ⁻⁸	0.650	<5.1x10 ⁻⁷	<1.4x10 ⁻⁷	<4.7x10 ⁻⁶	<6.0x10 ⁻⁶
February	1.0x10 ⁻⁶	3.8x10 ⁻⁵	4.9x10 ⁻⁵	1.1x10 ⁻³	4.9x10 ⁻⁷	<1.8x10 ⁻⁷	<4.4x10 ⁻⁶	<7.0x10 ⁻⁶
March	1.0x10 ⁻⁷	4.9x10 ⁻⁵	3.0x10 ⁻⁷	8.8x10 ⁻⁴	2.6x10 ⁻⁶	9.7x10 ⁻⁷	<9.0x10 ⁻⁶	4.0x10 ⁻⁶
April	4.9x10 ⁻⁷	2.7x10 ⁻⁵	1.0x10 ⁻⁸	6.0x10 ⁻⁴	1.1x10 ⁻⁶	1.5x10 ⁻⁵	<1.6x10 ⁻⁵	<4.0x10 ⁻⁶
May	2.7x10 ⁻⁷	6.0x10 ⁻⁵	1.4x10 ⁻⁸	1.4x10 ⁻⁴	7.7x10 ⁻⁷	1.3x10 ⁻⁵	9.1x10 ⁻⁶	<7.7x10 ⁻⁶
June	6.0x10 ⁻⁸	1.1x10 ⁻⁵	1.0x10 ⁻⁸	1.8x10 ⁻⁴	1.5x10 ⁻⁶	7.0x10 ⁻⁵	1.0x10 ⁻⁵	1.9x10 ⁻⁵
July	1.0x10 ⁻⁷	2.6x10 ⁻⁶	2.0x10 ⁻⁸	6.4x10 ⁻⁵	1.2x10 ⁻⁶	1.4x10 ⁻⁶	<8.6x10 ⁻⁶	<2.8x10 ⁻⁵
August	2.0x10 ⁻⁸	2.4x10 ⁻⁶	1.0x10 ⁻⁸	3.0x10 ⁻⁶	<1.6x10 ⁻⁷	<9.6x10 ⁻⁸	<4.7x10 ⁻⁵	<1.8x10 ⁻⁶
September	9.0x10 ⁻⁸	1.1x10 ⁻⁵	2.8x10 ⁻⁸	1.3x10 ⁻⁴	<2.1x10 ⁻⁷	<1.4x10 ⁻⁷	8.6x10 ⁻⁶	<7.4x10 ⁻⁶
October	3.4x10 ⁻⁷	6.0x10 ⁻⁶	4.7x10 ⁻⁸	5.4x10 ⁻³	<1.8x10 ⁻⁷	<4.4x10 ⁻⁷	1.7x10 ⁻⁵	5.2x10 ⁻⁶
November	5.0x10 ⁻⁸	7.0x10 ⁻⁷	3.0x10 ⁻⁸	0.064	<1.2x10 ⁻⁷	<3.0x10 ⁻⁷	1.3x10 ⁻⁵	1.2x10 ⁻⁵
December	<u>3.7x10⁻⁶</u>	<u>1.5x10⁻⁵</u>	<u>9.0x10⁻⁹</u>	<u>9.9x10⁻⁴</u>	<u>2.2x10⁻⁶</u>	<u>9.0x10⁻⁶*</u>	<u>6.0x10⁻⁶</u>	<u>5.5x10⁻⁶</u>
Total	<u>8.1x10⁻⁶</u>	<u>2.5x10⁻⁴</u>	<u>4.9x10⁻⁵</u>	<u>0.723</u>	<u>1.1x10⁻⁵</u>	<u>1.1x10⁻⁴</u>	<u>1.5x10⁻⁴</u>	<u>1.1x10⁻⁴</u>

*Estimate

Radioactive Gaseous Waste - 1969 (Continued)

STACK NO. (Plant Code)	296-A-17 (AXFS)	291-B-1 (200 ft.) (291-B)	296-B-2 (BYS-ITS#1)	296-B-3 (BYS-ITS#2)
FACILITY	241-A Tank Farm	B Plant (221-B)	In-Tank Solidification No. 1	In-Tank Solidification No. 2
FUNCTION	Filtered noncondensable vapors from waste storage tanks in 241-A & AX tank farms	Air from 291-B-1 filters. Includes canyon ventilation air and air from the No. 1 process vessel vent.	Filtered off-gas from the process exhaust train.	Filtered off-gas from the process exhaust train.

<u>Radioactivity</u> (curies)	<u>Beta</u>	<u>Beta</u>	<u>Beta</u>	<u>Beta</u>
January	New facility	4.2×10^{-4}	6.5×10^{-6}	1.5×10^{-6}
February	placed in service on March 7.	2.7×10^{-4}	3.8×10^{-6}	2.9×10^{-7}
March	1.5×10^{-5}	5.0×10^{-4}	9.6×10^{-6}	7.6×10^{-7}
April	8.5×10^{-6}	8.0×10^{-3}	4.1×10^{-6}	5.1×10^{-7}
May	9.7×10^{-6}	8.4×10^{-3}	9.1×10^{-6}	2.9×10^{-6}
June	3.9×10^{-5}	0.014	5.5×10^{-6}	4.1×10^{-6}
July	5.6×10^{-5}	0.013	6.1×10^{-6}	6.0×10^{-7}
August	5.7×10^{-6}	0.100	3.0×10^{-6}	1.0×10^{-5}
September	8.5×10^{-6}	0.105	5.7×10^{-6}	6.7×10^{-6}
October	8.1×10^{-5}	0.137	9.5×10^{-6}	1.9×10^{-5}
November	9.3×10^{-6}	0.235	1.3×10^{-5}	2.9×10^{-6}
December	<u>4.8×10^{-6}</u>	<u>0.374</u>	<u>5.8×10^{-6}</u>	<u>1.3×10^{-6}</u>
Total	<u><u>2.4×10^{-4}</u></u>	<u><u>0.996</u></u>	<u><u>8.2×10^{-5}</u></u>	<u><u>5.1×10^{-5}</u></u>

Radioactive Gaseous Waste - 1969 (Continued)

STACK NO. (Plant Code)	291-C-1 (200 ft.) (SSWS)	296-C-2 (WPS)	296-C-5 (CRV)
FACILITY	Semiworks (201-C)	Semiworks (201-C)	244-CR Vault
FUNCTION	Filtered air from cell ventilation and process vessel vent.	Filtered air from A and C sample galleries	Filtered air from cell ventilation and process vessel vent

<u>Radioactivity</u> (curies)	<u>Beta</u>	<u>Beta</u>	<u>Beta</u>
January	7.3×10^{-5}	$<3.3 \times 10^{-6}$	6.1×10^{-6}
February	1.4×10^{-5}	8.0×10^{-7}	2.2×10^{-6}
March	3.1×10^{-5}	$<3.0 \times 10^{-7}$	8.0×10^{-6}
April	7.0×10^{-5}	$<5.0 \times 10^{-7}$	$<4.3 \times 10^{-6}$
May	8.7×10^{-5}	8.0×10^{-7}	3.2×10^{-6}
June	1.9×10^{-5}	2.5×10^{-7}	2.8×10^{-6}
July	2.0×10^{-5}	$<2.0 \times 10^{-7}$	$<1.3 \times 10^{-6}$
August	7.8×10^{-6}	$<2.4 \times 10^{-7}$	3.0×10^{-6}
September	1.8×10^{-5}	1.1×10^{-6}	1.5×10^{-5}
October	9.7×10^{-6}	$<3.3 \times 10^{-7}$	1.6×10^{-5}
November	4.9×10^{-6}	$<5.9 \times 10^{-7}$	5.3×10^{-6}
December	<u>4.2×10^{-6}</u>	<u>6.6×10^{-6}</u>	<u>5.5×10^{-6}</u>
Total	<u><u>3.6×10^{-4}</u></u>	<u><u>1.5×10^{-5}</u></u>	<u><u>7.3×10^{-5}</u></u>

Radioactive Gaseous Waste - 1969 (Continued)

STACK NO. (Plant Code)	291-S-1 (200 ft.) (291-S)		296-S-1 (X-1)		296-S-2 (X-2)	
FACILITY	Redox (202-S)		Redox		Redox	
FUNCTION	Filtered air from canyon ventilation and vessel vent, and treated dissolver off- gas (Plant down)		Filtered air from south sample gallery		Filtered air from north sample gallery and sampler hoods	
<u>Radioactivity</u> (curies)	<u>Alpha</u>	<u>Beta</u>	<u>Alpha</u>	<u>Beta</u>	<u>Alpha</u>	<u>Beta</u>
January	9.0×10^{-6}	9.1×10^{-3}	$<1.0 \times 10^{-8}$	3.4×10^{-7}	---	---
February	9.7×10^{-6}	5.5×10^{-3}	$<2.0 \times 10^{-8}$	3.2×10^{-7}	---	---
March	$<8.3 \times 10^{-7}$	2.8×10^{-4}	$<1.5 \times 10^{-8}$	3.0×10^{-7}	$<1.3 \times 10^{-8}$	3.3×10^{-7}
April	8.8×10^{-6}	4.8×10^{-3}	$<1.8 \times 10^{-8}$	1.3×10^{-6}	$<2.3 \times 10^{-8}$	2.8×10^{-7}
May	$<9.6 \times 10^{-7}$	2.1×10^{-4}	$<1.0 \times 10^{-8}$	3.6×10^{-7}	$<1.3 \times 10^{-8}$	3.5×10^{-7}
June	$<4.3 \times 10^{-5}$	1.4×10^{-4}	$<2.8 \times 10^{-8}$	5.0×10^{-7}	$<1.3 \times 10^{-8}$	2.8×10^{-6}
July	$<2.3 \times 10^{-5}$	2.5×10^{-2}	$<2.3 \times 10^{-8}$	8.4×10^{-7}	$<1.0 \times 10^{-8}$	3.2×10^{-7}
August	$<1.4 \times 10^{-5}$	2.6×10^{-2}	$<2.0 \times 10^{-8}$	5.2×10^{-7}	$<1.0 \times 10^{-7}$	9.3×10^{-7}
September	$<6.0 \times 10^{-6}$	2.4×10^{-3}	$<7.0 \times 10^{-7}$	3.4×10^{-6}	$<1.1 \times 10^{-8}$	9.1×10^{-7}
October	$<1.9 \times 10^{-5}$	1.7×10^{-2}	$<1.3 \times 10^{-7}$	9.5×10^{-7}	$<2.8 \times 10^{-8}$	4.8×10^{-7}
November	$<2.1 \times 10^{-5}$	2.9×10^{-3}	$<1.8 \times 10^{-8}$	7.7×10^{-7}	$<1.0 \times 10^{-8}$	4.8×10^{-7}
December	$<1.1 \times 10^{-5}$	3.9×10^{-3}	$<1.0 \times 10^{-8}$	9.0×10^{-8}	$<3.3 \times 10^{-8}$	2.7×10^{-7}
Total	$<1.7 \times 10^{-4}$	0.111	$<1.0 \times 10^{-6}$	9.7×10^{-6}	$<3.0 \times 10^{-7*}$	$8.6 \times 10^{-6*}$

*Estimate for year

Radioactive Gaseous Waste - 1969 (Continued)

STACK NO. (Plant Code)	296-S-4 (EF-3)		296-S-5 (PR-33)		296-S-6 (8-X)	
FACILITY	Redox		Redox (202-S)		Redox	
FUNCTION	Filtered air from decon- tamination room and regulated shop. Unfiltered air from regulated toolroom low-level decontamination sink and SWP lobby		Filtered air from the product removal cage		Unfiltered air from the Silo gallery, organic feed tank, and sample elevator	
<u>Radioactivity</u> (curies)	<u>Alpha</u>	<u>Beta</u>	<u>Alpha</u>	<u>Beta</u>	<u>Alpha</u>	<u>Beta</u>
January	<3.7x10 ⁻⁸	1.0x10 ⁻⁶	1.2x10 ⁻⁸	2.3x10 ⁻⁷	3.2x10 ⁻⁷	1.2x10 ⁻⁴
February	<2.2x10 ⁻⁷	2.7x10 ⁻⁶	6.9x10 ⁻⁸	5.3x10 ⁻⁷	1.1x10 ⁻⁷	7.7x10 ⁻⁶
March	<2.1x10 ⁻⁷	4.8x10 ⁻⁶	<4.0x10 ⁻⁷	5.1x10 ⁻⁷	4.4x10 ⁻⁷	8.0x10 ⁻⁶
April	<3.6x10 ⁻⁷	3.1x10 ⁻⁶	1.4x10 ⁻⁷	3.8x10 ⁻⁷	4.3x10 ⁻⁷	7.1x10 ⁻⁶
May	1.6x10 ⁻⁸	1.5x10 ⁻⁵	9.0x10 ⁻⁸	5.2x10 ⁻⁷	7.6x10 ⁻⁸	7.6x10 ⁻⁶
June	<1.9x10 ⁻⁷	4.6x10 ⁻⁶	5.4x10 ⁻⁷	2.0x10 ⁻⁶	4.2x10 ⁻⁷	1.2x10 ⁻⁵
July	<3.1x10 ⁻⁸	3.5x10 ⁻⁶	2.3x10 ⁻⁷	8.1x10 ⁻⁶	1.9x10 ⁻⁷	8.4x10 ⁻⁶
August	<1.4x10 ⁻⁷	3.9x10 ⁻⁶	9.0x10 ⁻⁸	1.5x10 ⁻⁶	3.7x10 ⁻⁷	8.3x10 ⁻⁶
September	<8.0x10 ⁻⁵	2.0x10 ⁻⁶	4.3x10 ⁻⁷	1.1x10 ⁻⁶	3.0x10 ⁻⁷	8.9x10 ⁻⁶
October	<3.4x10 ⁻⁸	2.7x10 ⁻⁶	3.0x10 ⁻⁷	5.2x10 ⁻⁷	1.0x10 ⁻⁶	1.0x10 ⁻⁵
November	2.6x10 ⁻⁷	4.2x10 ⁻⁶	1.2x10 ⁻⁷	6.1x10 ⁻⁷	1.2x10 ⁻⁷	7.4x10 ⁻⁶
December	<u>2.2x10⁻⁷</u>	<u>1.6x10⁻⁶</u>	<u>3.7x10⁻⁸</u>	<u>1.8x10⁻⁷</u>	<u>9.9x10⁻⁷</u>	<u>3.5x10⁻⁶</u>
Total	<u><8.2x10⁻⁵</u>	<u>4.9x10⁻⁵</u>	<u>2.5x10⁻⁶</u>	<u>1.6x10⁻⁵</u>	<u>4.8x10⁻⁶</u>	<u>2.1x10⁻⁴</u>

Radioactive Gaseous Waste - 1969 (Continued)

STACK NO. (Plant Code)	296-S-7 (KX-3,4)		296-S-13 (222-S Stack Breach)		296-S-15 (108-SX)
FACILITY	Redox-Pu Processing		Redox-Laboratory		Sludge Cooling
FUNCTION	Filtered greenhouse ventilation and process vessel vent air from 233-S (Plant down)		Filtered air from hoods, glove boxes, hot cells, and ventilation		Filtered exhaust from air cooling of dried sludge in certain SX farm tanks
<u>Radioactivity</u> (curies)	<u>Alpha</u>	<u>Beta</u>	<u>Alpha</u>	<u>Beta</u>	<u>Alpha</u> <u>Beta</u>
January	5.6×10^{-7}	5.5×10^{-7}	$<1.4 \times 10^{-6}$	3.3×10^{-4}	
February	1.1×10^{-5}	1.6×10^{-5}	$<2.1 \times 10^{-6}$	3.4×10^{-4}	
March	3.1×10^{-6}	1.8×10^{-6}	$<5.7 \times 10^{-6}$	4.7×10^{-4}	
April	1.8×10^{-6}	2.4×10^{-4}	$<9.5 \times 10^{-6}$	9.9×10^{-4}	
May	1.3×10^{-6}	3.1×10^{-6}	$<1.2 \times 10^{-5}$	5.7×10^{-4}	
June	1.8×10^{-6}	3.1×10^{-6}	$<1.8 \times 10^{-5}$	3.3×10^{-4}	
July	2.4×10^{-6}	2.2×10^{-6}	$<7.8 \times 10^{-6}$	4.5×10^{-4}	
August	4.3×10^{-6}	5.1×10^{-6}	$<1.6 \times 10^{-5}$	8.2×10^{-4}	
September	3.0×10^{-6}	5.9×10^{-6}	$<5.5 \times 10^{-6}$	9.0×10^{-4}	
October	1.2×10^{-6}	3.4×10^{-6}	$<1.8 \times 10^{-5}$	1.3×10^{-3}	
November	1.7×10^{-6}	2.6×10^{-6}	$<6.1 \times 10^{-6}$	3.8×10^{-4}	
December	<u>3.7×10^{-6}</u>	<u>6.2×10^{-6}</u>	<u>$<5.1 \times 10^{-6}$</u>	<u>6.5×10^{-4}</u>	
Total	<u><u>3.6×10^{-5}</u></u>	<u><u>2.9×10^{-4}</u></u>	<u><u>$<1.1 \times 10^{-4}$</u></u>	<u><u>7.5×10^{-3}</u></u>	<u><u>$<1.5 \times 10^{-6*}$</u></u> <u><u>$5.3 \times 10^{-5*}$</u></u>

*Annual estimate from periodic samples

Radioactive Gaseous Waste - 1969 (Continued)

STACK NO. (Plant Code)	296-S-16 (219-S)	291-T-1 (291-T)	296-T-1 (EVP-1)
FACILITY	Interim Storage Redox Laboratory Waste	T Plant	242-T Waste Evaporator
FUNCTION	Filtered exhaust air from 219-S Vault and waste tanks	Filtered ventilation air from 221-T canyon	Unfiltered air from hot side cells

<u>Radioactivity</u> (curies)	<u>Alpha</u>	<u>Beta</u>	<u>Alpha</u>	<u>Beta</u>	<u>Alpha</u>	<u>Beta</u>
January			$<1.1 \times 10^{-4}$	4.2×10^{-3}	$<5.9 \times 10^{-8}$	3.9×10^{-5}
February			$<2.6 \times 10^{-5}$	4.4×10^{-3}	$<4.6 \times 10^{-8}$	3.0×10^{-5}
March			$<1.0 \times 10^{-5}$	1.4×10^{-3}	$<5.7 \times 10^{-8}$	9.2×10^{-6}
April			$<1.7 \times 10^{-5}$	1.3×10^{-3}	$<6.6 \times 10^{-7}$	1.1×10^{-5}
May			$<1.6 \times 10^{-5}$	3.5×10^{-3}	$<6.0 \times 10^{-8}$	5.3×10^{-6}
June			9.5×10^{-5}	7.6×10^{-3}	$<1.4 \times 10^{-7*}$	$2.1 \times 10^{-5*}$
July			$<1.5 \times 10^{-5}$	1.3×10^{-2}	$<4.9 \times 10^{-8}$	1.4×10^{-5}
August			$<1.9 \times 10^{-5}$	3.3×10^{-3}	$<4.0 \times 10^{-8}$	1.4×10^{-5}
September			9.8×10^{-5}	3.2×10^{-3}	$<6.5 \times 10^{-8}$	1.1×10^{-5}
October			$<2.1 \times 10^{-5}$	4.6×10^{-3}	$<1.9 \times 10^{-7}$	2.5×10^{-5}
November			$<1.4 \times 10^{-5}$	1.4×10^{-3}	$<1.7 \times 10^{-7}$	1.2×10^{-5}
December			$<2.4 \times 10^{-5}$	2.0×10^{-3}	$<1.2 \times 10^{-7}$	5.7×10^{-5}
Total	$<3.6 \times 10^{-6*}$	$9.2 \times 10^{-5*}$	$<4.7 \times 10^{-4}$	5.0×10^{-2}	$<1.7 \times 10^{-6}$	2.5×10^{-4}

*Annual estimate from periodic samples

Radioactive Gaseous Waste - 1969 (Continued)

STACK NO. (Plant Code)	296-T-2 (EVP-2)	296-T-4 (241-TX)	296-U-2* (X-31-1)
FACILITY	242-T Waste Evaporator	242-T Waste Evaporator	Uranium Oxide
FUNCTION	Unfiltered air from condensate catch tank cell (cold cell)	Filtered exhaust air from air cooling of concentrate receiving tanks in TX Farm	Exhaust from 224-UA bag filter No. 1

<u>Radioactivity</u> (curies)	<u>Alpha</u>	<u>Beta</u>	<u>Alpha</u>	<u>Beta</u>	<u>Alpha</u>	<u>Beta</u>
January	<1.6x10 ⁻⁷	4.0x10 ⁻⁵	<2.3x10 ⁻⁷	7.5x10 ⁻⁴	<3.3x10 ⁻⁵	7.4x10 ⁻⁵
February	<7.6x10 ⁻⁸	5.7x10 ⁻⁶	<1.5x10 ⁻⁷	1.7x10 ⁻⁴	<1.2x10 ⁻⁵	6.3x10 ⁻⁵
March	<1.6x10 ⁻⁷	1.4x10 ⁻⁵	<1.4x10 ⁻⁷	2.7x10 ⁻⁴	1.5x10 ⁻⁵	4.8x10 ⁻⁵
April	<3.6x10 ⁻⁷	1.5x10 ⁻⁵	<1.5x10 ⁻⁷	5.6x10 ⁻⁵	<4.8x10 ⁻⁵	1.0x10 ⁻⁴
May	<2.2x10 ⁻⁷	3.2x10 ⁻⁵	<1.4x10 ⁻⁷	1.7x10 ⁻⁴	<4.0x10 ⁻⁵	8.6x10 ⁻⁵
June	<2.8x10 ⁻⁷	9.0x10 ⁻⁶	<1.3x10 ⁻⁷	4.9x10 ⁻⁴	<7.2x10 ⁻⁶	2.7x10 ⁻⁵
July	<1.8x10 ⁻⁷	1.4x10 ⁻⁵	<2.0x10 ⁻⁷	3.1x10 ⁻⁵	<9.6x10 ⁻⁷	9.1x10 ⁻⁶
August	<2.5x10 ⁻⁷	2.2x10 ⁻⁵	<2.7x10 ⁻⁷	5.2x10 ⁻⁵	<5.9x10 ⁻⁵	1.3x10 ⁻⁴
September	<4.2x10 ⁻⁷	9.3x10 ⁻⁶	<1.3x10 ⁻⁷	6.1x10 ⁻⁵	5.1x10 ⁻⁵	9.2x10 ⁻⁵
October	<3.0x10 ⁻⁷	9.3x10 ⁻⁶	<5.8x10 ⁻⁷	1.8x10 ⁻⁵	<5.0x10 ⁻⁵	8.4x10 ⁻⁵
November	<4.0x10 ⁻⁷	6.9x10 ⁻⁵	<2.2x10 ⁻⁷	1.0x10 ⁻⁵	<1.6x10 ⁻⁵	3.2x10 ⁻⁵
December	<1.0x10 ⁻⁷	2.0x10 ⁻⁵	<1.6x10 ⁻⁷	1.2x10 ⁻⁵	<8.8x10 ⁻⁶	1.6x10 ⁻⁵
Total	<2.9x10 ⁻⁶	2.6x10 ⁻⁴	<2.5x10 ⁻⁶	2.1x10 ⁻³	<3.4x10 ⁻⁴	7.6x10 ⁻⁴

*Single stack servicing dual exhausters and filters

Radioactive Gaseous Waste - 1969 (Continued)

STACK No. (Plant Code)	296-U-2* (X-31-2)	296-U-3 (X-13)	296-U-5 (F Cell)	291-Z-1 (200 ft.) (291-Z)
FACILITY	Uranium Oxide	Uranium Oxide	Uranium Oxide	Z Plant
FUNCTION	Exhaust from 224-UA bag filter No. 2	Exhaust from 224-U bag filter	Unfiltered air from F Cell	Filtered process and ventilation air from 234-5, 232-Z, 236-Z and 242-Z

Radioactivity (curies)	Alpha	Beta	Alpha	Beta	Alpha	Beta	Alpha	Beta
January	$<1.9 \times 10^{-5}$	8.0×10^{-3}	$<4.9 \times 10^{-5}$	1.9×10^{-4}	$<7.7 \times 10^{-7}$	1.6×10^{-5}	1.2×10^{-5}	5.7×10^{-5}
February	$<3.8 \times 10^{-6}$	2.3×10^{-5}	$<1.6 \times 10^{-5}$	3.7×10^{-5}	$<1.1 \times 10^{-6}$	1.3×10^{-5}	1.6×10^{-5}	4.4×10^{-5}
March	$<4.8 \times 10^{-7}$	6.0×10^{-6}	$<2.6 \times 10^{-7}$	2.8×10^{-6}	$<9.5 \times 10^{-7}$	2.0×10^{-5}	3.1×10^{-5}	1.1×10^{-4}
April	$<4.3 \times 10^{-5}$	2.7×10^{-4}	$<9.3 \times 10^{-7}$	5.2×10^{-6}	$<2.7 \times 10^{-7}$	1.2×10^{-5}	2.4×10^{-5}	2.3×10^{-4}
May	$<6.7 \times 10^{-5}$	1.0×10^{-4}	$<3.6 \times 10^{-7}$	3.5×10^{-6}	$<1.4 \times 10^{-7}$	3.9×10^{-6}	3.2×10^{-5}	1.7×10^{-4}
June	5.2×10^{-5}	7.7×10^{-5}	$<1.0 \times 10^{-6}$	9.0×10^{-6}	$<3.0 \times 10^{-7}$	4.0×10^{-6}	1.6×10^{-5}	7.5×10^{-5}
July	$<3.7 \times 10^{-6}$	2.0×10^{-5}	$<2.5 \times 10^{-7}$	3.2×10^{-6}	$<6.3 \times 10^{-7}$	1.0×10^{-5}	7.1×10^{-5}	4.4×10^{-4}
August	8.7×10^{-5}	1.3×10^{-4}	$<3.1 \times 10^{-7}$	2.9×10^{-6}	$<3.6 \times 10^{-7}$	8.6×10^{-6}	2.7×10^{-5}	3.9×10^{-4}
September	$<4.7 \times 10^{-5}$	7.8×10^{-5}	7.8×10^{-7}	5.2×10^{-6}	$<2.3 \times 10^{-7}$	4.3×10^{-6}	2.0×10^{-5}	3.5×10^{-4}
October	$<2.8 \times 10^{-5}$	5.5×10^{-5}	$<4.9 \times 10^{-7}$	2.5×10^{-5}	$<4.4 \times 10^{-7}$	7.9×10^{-6}	4.7×10^{-5}	2.1×10^{-4}
November	$<5.2 \times 10^{-5}$	6.8×10^{-5}	$<3.6 \times 10^{-7}$	4.5×10^{-6}	$<1.6 \times 10^{-7}$	4.9×10^{-6}	1.9×10^{-5}	2.0×10^{-4}
December	$<3.8 \times 10^{-5}$	6.1×10^{-5}	$<9.0 \times 10^{-7}$	1.6×10^{-5}	$<2.5 \times 10^{-7}$	1.0×10^{-5}	2.3×10^{-5}	1.9×10^{-4}
Total	$<4.4 \times 10^{-4}$	8.9×10^{-3}	$<7.1 \times 10^{-5}$	3.0×10^{-4}	$<5.6 \times 10^{-6}$	1.1×10^{-4}	3.4×10^{-4}	2.5×10^{-3}

*Single stack servicing dual exhausters and filters

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