

SEMI-ANNUAL EFFLUENT REPORT

JULY - DECEMBER

1978

PUBLIC SERVICE COMPANY OF COLORADO

FORT ST. VRAIN NUCLEAR GENERATING STATION

FEBRUARY 1979

7902270366

## SECTION 1.0 - SUMMARY

This report summarizes the radiological and non-radiological effluent released from the Fort St. Vrain Nuclear Generating Station for the period July through December 1978. These data are reported pursuant to the requirements of 10 CFR 50.36a and the Technical Specifications of Fort St. Vrain, Appendix B, AC NR 1.1.

Tables 2.1, 2.2 and 2.3 summarize the liquid effluent released from the plant. Tables 2.1 and 2.2 summarize the batch releases from the liquid waste tanks. The primary radionuclides are tritium and  $^{133}\text{Xe}$ . Table 2.3 is a summary of the continuous discharge of liquid effluent from the reactor building sump. On two occasions during the report period, the reactor building sump was used as a dilution basin for processing liquid effluent from the liquid waste system. These data were excluded from the summary for Table 2.3. This item was discussed with the Region IV Office of Inspection and Enforcement, and was pointed out in I & E Inspection Report 78-15. An in-house procedure has been developed to insure proper handling of liquid effluent which may be released via this pathway.

Table 3.1, 3.2 and 3.3 summarize the radioactive gaseous effluent released from the plant during this reporting period. The primary radionuclides released are tritium, xenon and krypton.

Table 4.1 summarizes the non-radiological effluent released from the station during the reporting period.

Table 5.1 summarizes the radiological sampling and analysis of various cooling water systems of the plant. System 21 samples are taken from the bearing water portion of the helium circulator system. System 31 samples

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are taken from the feedwater and condensate system. Systems 41 and 42 are the circulating and service water systems. System 46 is the PCRV cooling water system and System 47 provides cooling water to the heat exchangers in the helium purification system. All these systems may add liquid effluent into the liquid waste system or building sumps.

The "Farm Pond" is the final mixing basin prior to release of all the plant effluent to the South Platte River.

Table 6.1 summarizes solid waste shipments made during the reporting period.

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$$\begin{aligned} 4.7\text{E-5} &= 4.7 \times 10^{-5} \\ 5.2\text{E3} &= 5.2 \times 10^3 \end{aligned}$$

NSA means no significant activity.

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$$\begin{aligned} 4.7\text{E}-5 &= 4.7 \times 10^{-5} \\ 5.2\text{E}3 &= 5.2 \times 10^3 \end{aligned}$$

NSA means no significant activity.

TABLE 2.2 - RADIOACTIVE LIQUID EFFLUENT RELEASES FOR 1978

## SYNOPSIS OF BATCH LIQUID RELEASES

Release No.	222	223	224	225	226
Date	7/3/78	7/5/78	7/7/78	7/10/78	7/12/78
Total Time of Hours Release	7.5	7.6	5.3	4.35	3.83
% of Tech. Spec. Limit Based on Gross $\beta$ $\gamma$	2.29E+00	5.84E+00	2.03E+01	2.57E+00	1.16E+01
% of MPC Limit for Tritium	5.63E+00	1.97E+01	5.34E-01	3.04E-01	7.34E-01
Total Volume Released (liters)	9226	9028	8831	7644	8238

Release No.	227	228	229	230	231
Date	7/15/78	7/17/78	7/18/78	7/20/78	7/28/78
Total Time of Hours Release	5.75	9.02	5.28	4.67	4.72
% of Tech. Spec. Limit Based on Gross $\beta$ $\gamma$	8.71E+00	2.23E+00	4.80E+00	1.33E+00	7.35E+00
% of MPC Limit for Tritium	3.27E-01	6.65E-02	3.59E-02	7.47E-01	9.27E+01
Total Volume Released (liters)	8699	9160	9160	8982	4745

Release No.	232*	233	234	235	236
Date	7/29/78	8/2/78	8/3/78	8/5/78	8/9/78
Total Time of Hours Release	15.17	17.0	7.33	4.33	7.33
% of Tech. Spec. Limit Based on Gross $\beta$ $\gamma$	3.30E+01	2.11E+01	1.26E+01	7.52E+0	7.40E+0
% of MPC Limit for Tritium	3.56E-02	1.08E+01	2.59E+01	1.86E+01	6.24E+01
Total Volume Released (liters)	125,094	164,273	8,699	9,226	8,831

\* Release #232 was batch released via the Reactor Building Sump. These data were not included in the data reported in table 2.3.

TABLE 2.2 - RADIOACTIVE LIQUID EFFLUENT RELEASES FOR 1978

## SYNOPSIS OF BATCH LIQUID RELEASES

Release No.	237	238	239	240	241
Date	8/10/78	8/12/78	8/23/78	8/27/78	9/2/78
Total Time of Hours Release	6.66	3.58	42.58	4.8	4.17
% of Tech. Spec. Limit Based on Gross $\beta$ $\gamma$	7.40E+0	4.13E+01	1.39E+01	1.77E+01	1.74E+01
% of MPC Limit for Tritium	3.82E+01	3.82E+01	4.46E+01	3.15E+01	5.75E+0
Total Volume Released (liters)	8303	34330	18 <sup>2</sup> 232	7842	7974

Release No.	242	243	244	245	246
Date	9/13/78	9/18/78	9/20/78	9/24/78	9/28/78
Total Time of Hours Release	63.42	5.17	4.27	6.3	4.33
% of Tech. Spec. Limit Based on Gross $\beta$ $\gamma$	4.38E+0	4.08E+0	2.80E+0	4.05E+0	3.30E+01
% of MPC Limit for Tritium	4.56E+01	2.52E+01	1.09E+01	7.12E+0	1.41E+01
Total Volume Released (liters)	214651	9292	8962	9226	8897

Release No.	247	248	249	250	251
Date	9/29/78	10/2/78	10/7/78	10/12/78	10/16/78
Total Time of Hours Release	4.11	3.17	4.8	15.3	6.4
% of Tech. Spec. Limit Based on Gross $\beta$ $\gamma$	2.95E+01	3.68E+01	7.67E+01	6.44E+0	1.02E+01
% of MPC Limit for Tritium	7.42E+0	1.16E+01	1.58E+01	2.44E+01	3.78E+01
Total Volume Released (liters)	8501	6261	49087	7644	8040

\* Release #232 was batch released via the Reactor Building Sump. These data were not included in the data reported in Table 2.3



TABLE 2.2 - RADIOACTIVE LIQUID EFFLUENT RELEASES FOR 1978

## SYNOPSIS OF BATCH LIQUID RELEASES

Release No.	252	253	254	255	256
Date	10/19/78	10/21/78	10/23/78	10/26/78	10/28/78
Total Time of Hours Release	24.7	8.1	7.7	6.7	5.3
% of Tech. Spec. Limit Based on Gross $\beta$ $\gamma$	5.35E+0	7.42E+0	5.55E+0	8.80E+0	6.55E+0
% of MPC Limit for Tritium	2.51E+0	3.89E+01	3.01E+01	2.35E+01	1.24E+01
Total Volume Released (liters)	206968	6985	8567	8238	8435

Release No.	257	258	259	260	261
Date	11/1/78	11/6/78	11/6/78	11/9/78	11/12/78
Total Time of Hours Release	7.3	21.8	10.0	3.7	4.2
% of Tech. Spec. Limit Based on Gross $\beta$ $\gamma$	1.04E+01	8.94E+0	7.18E+0	5.21E+01	2.04E+01
% of MPC Limit for Tritium	6.94E+01	5.25E+01	1.56E+01	4.97E+01	2.90E+01
Total Volume Released (liters)	8106	235806	7842	8501	8172

Release No.	262	263	264	265	266
Date	11/14/78	11/16/78	11/18/78	11/21/78	11/22/78
Total Time of Hours Release	6.6	4.6	3.7	4.0	3.8
% of Tech. Spec. Limit Based on Gross $\beta$ $\gamma$	1.92E+01	3.33E+01	8.48E+0	6.08E+0	3.68E+0
% of MPC Limit for Tritium	6.47E+01	2.69E+01	1.66E+01	9.32E+0	7.00E+0
Total Volume Released (liters)	7908	8303	6985	8369	8435

\* Release #232 was batch released via the Reactor Building Sump. These data were not included in the data reported in Table 2.3.



TABLE 2.2 - RADIOACTIVE LIQUID EFFLUENT RELEASES FOR 1978

## SYNOPSIS OF BATCH LIQUID RELEASES

Release No.	267	268	269	270	271
Date	11/27/78	11/29/78	12/ 2/78	12/ 4/78	12/ 6/78
Total Time of Hours Release	3.7	5.0	4.2	4.6	6.1
% of Tech. Spec. Limit Based on Gross $\beta$ $\gamma$	1.27E+01	3.12E+0	6.62E+00	7.85E+00	4.15E+00
% of MPC Limit for Tritium	5.16E+0	2.05E+0	3.30E+00	2.36E+00	4.67E+00
Total Volume Released (liters)	8040	9160	7315	8897	8303

Release No.	272	273	274	275	276
Date	12/11/78	12/13/78	12/15/78	12/18/78	12/22/78
Total Time of Hours Release	4.5	6.0	3.7	3.9	14.5
% of Tech. Spec. Limit Based on Gross $\beta$ $\gamma$	1.12E+01	1.69E+01	1.14E+01	1.49E+01	6.81E+00
% of MPC Limit for Tritium	8.13E+00	4.87E+01	3.61E+01	3.17E+01	5.10E+01
Total Volume Released (liters)	7051	7579	8402	7579	8369

Release No.	277	278			
Date	12/27/78	12/29/78			
Total Time of Hours Release	3.8	4.3			
% of Tech. Spec. Limit Based on Gross $\beta$ $\gamma$	2.22E+00	1.99E+00			
% of MPC Limit for Tritium	6.72E+01	4.55E+01			
Total Volume Released (liters)	8567	8831			

\* Release #232 was batch released via the Reactor Building Sump. These data were not included in the data reported in Table 2.3.

TABLE 2.3: LIQUID EFFLUENT RELEASED VIA THE TURBINE BUILDING SUMP  
AND THE REACTOR BUILDING SUMP (CONTINUOUS RELEASE)

Turbine Building Sump

	July	August	September	Quarterly Total Ci
Volume l	3.26E+06	3.55E+06	3.86E+06	1.07E+07
H <sup>3</sup> pCi/l	6.56E+04	1.98E-05	9.41E+03	2.51E-01
Gross βγ pCi/l	1.15E+01	1.34E-08	1.07E+01	7.88E-05
Gross α pCi/l	4.86E+00	7.00E-09	6.63E+00	4.14E-05

Reactor Building Sump

	July	August	September	Quarterly Total Ci
Volume l	6.98E+04	2.78E+06	7.73E+05 <sup>1)</sup>	3.62E-06
H <sup>3</sup> pCi/l	1.09E+06	4.45E-03	8.5E+05 <sup>1)</sup>	7.33E-01
Gross βγ pCi/l	1.80E+02	3.57E-07	2.84E+01 <sup>1)</sup>	3.45E-05
Gross α pCi/l	3.48E-00	3.26E-09	6.64E+00 <sup>1)</sup>	5.38E-06

(Excluding batch releases from Liquid Waste System)

1) Excluding liquid waste release #232

TABLE 2.3: LIQUID EFFLUENT RELEASED VIA THE TURBINE BUILDING SUMP  
AND THE REACTOR BUILDING SUMP (CONTINUOUS RELEASE)

Turbine Building Sump

	October	November	December	Quarterly Totals
Volume $\ell$	3.15E+06	8.77E+05	5.22E+06	9.25E+06 $\ell$
H <sup>3</sup> pCi/l	1.06E+04	4.23E+04	5.31E+04	3.48E-01 Ci
Gross By pCi/l	1.03E+01	1.15E+01	1.78E+01	1.35E-04 Ci
Gross $\alpha$ pCi/l	4.82E+00	6.36E+00	1.30E+01	8.86E-05 Ci

Reactor Building Sump

	October	November	December	Quarterly Total Ci
Volume $\ell$	5.36E+05	6.64E+05	2.71E+05	1.47E+06 $\ell$
H <sup>3</sup> pCi/l	8.61E+05	1.19E+06 <sup>1</sup>	3.31E+06	2.15E+00 Ci
Gross By pCi/l	4.19E+01	2.80E+01 <sup>1</sup>	2.56E+01	4.80E-05 Ci
Gross $\alpha$ pCi/l	3.58E+00	4.57E+00 <sup>1</sup>	3.07E+00	8.32E-07 Ci

<sup>1</sup> Does not include effluent released via this pathway included in radioactive liquid release #258.

TABLE 3.1 - RADIOACTIVE GASEOUS EFFLUENT RELEASES FOR 1978

		UNITS	JULY	AUGUST	SEPTEMBER	QUARTERLY TOTAL
1a. Total Noble Gases		Curies	3.41E+01	8.06E+0	2.62E+01	6.84E+01
1b. Total Tritium		Curies	6.74E-01	3.00E-01	2.56E-01	1.23E+0
1c. Total Halogens		Curies	NSA	NSA	NSA	NSA
1d. Total Particulate Gross (B,y) Activity RT-7325		Curies	3.91E-12	3.33E-12	3.49E-12	N/A
1e. Total Particulate Gross Alpha Activity RT-7325		Curies	1.41E-12	1.08E-12	1.32E-12	N/A
2. Maximum Hourly Release Rate for Any One Hour Period		ci/hr	1.06E+0	2.49E-01	7.57E-01	1.06E+0
3. Estimated Total Radioactivity Released by Nuclide (MPCa)						
Particulates	MPCa	Curies	N/A			
Halogens	MPCa	Curies	N/A			
Gases	MPCa	Curies				
Tritium	2 E-07		6.74E-01	3.00E-01	2.56E-01	1.23E+0
<sup>133</sup> Xe	3 E-07		3.37E+01	7.64E+0	2.60E+01	6.73E+01
<sup>85</sup> Kr	1 E-07		2.04E-03			2.04E-03
<sup>135</sup> Xe	1 E-07		7.87E-03			7.87E-03
<sup>131m</sup> Xe	4 E-07		2.34E-01	3.41E-01	1.14E-01	6.89E-01
<sup>133m</sup> Xe	3 E-07		1.52E-01	7.63E-02	1.08E-01	3.36E-01

4.7E-05 =  $4.7 \times 10^{-5}$   
 3.2E+03 =  $3.2 \times 10^{+3}$

NSA means no significant activity.

TABLE 3.1 - RADIOACTIVE GASEOUS EFFLUENT RELEASES FOR 1978

	UNITS	OCTOBER	NOVEMBER	DECEMBER	QUARTERLY TOTAL	
1a. Total Noble Gases	Curies	1.27E+01	8.87E+00	2.58E+0	2.42E+01	
1b. Total Tritium	Curies	2.48E-01	1.21E-01	2.22E-01	5.91E-01	
1c. Total Halogens	Curies					
1d. Total Particulate Gross (S,y) Activity RT-7325	Curies	5.60E-12	3.44E-12	3.51E-12	1.26E-11	
1e. Total Particulate Gross Alpha Activity RT-7325	Curies	1.56E-12	1.05E-12	1.29E-12	3.90E-12	
2. Maximum Hourly Release Rate for Any One Hour Period	ci/hr	5.30E-01	4.46E-01	1.32E-01	5.30E-01	
3. Estimated Total Radioactivity Released by Nuclide (MPCa)						
Particulates	MPCa	Curies				
Halogens	MPCa	Curies				
Gases	MPCa	Curies				
Tritium	2E-7		2.48E-01	1.21E-01	2.22E-01	5.91E-01
133Xe	3E-7		1.24E+01	8.85E+0	2.57E+0	2.38E+01
135Xe	1E-7		1.16E-03	4.94E-03	-----	6.10E-03
133Xem	3E-7		5.23E-02	1.73E-02	7.07E-03	7.76E-02
131Xem	4E-7		2.72E-01	---	1.68E-02	2.88E-01

4.7E-5 = 4.7 x 10<sup>-5</sup>5.2E3 = 5.2 x 10<sup>3</sup>

NSA means no significant activity.

TABLE 3.2 - RADIOACTIVE GASEOUS EFFLUENT RELEASES FOR 1978

## SYNOPSIS OF BATCH GASEOUS RELEASES

Release No.	262	263	264	265	266
Date	7/3/78	7/6/78	7/12/78	7/15/78	7/18/78
Total Time of Release	39.17	41.63	32.47	49.32	25.82
Percent of Technical Specification Limit	1.12E-01	1.78E-03	6.54E-03	1.50E-03	1.77E-02
Average Rate of Release ( $\mu$ Ci/sec)	9.96E+00	1.18E-01	3.45E-01	9.83E-02	1.52E+00

Release No.	267	268	269	270	271
Date	7/20/78	7/22/78	7/29/78	8/8/78	8/10/78
Total Time of Release	25.42	27.15	34.33	21.58	22.00
Percent of Technical Specification Limit	3.41E-01	3.29E+00	1.45E-01	3.20E-02	5.19E-02
Average Rate of Release ( $\mu$ Ci/sec)	3.04E+01	2.94E+02	1.29E+01	2.83E+0	4.58E+0

Release No.	272	273	274	275	276
Date	8/14/78	8/17/78	8/21/78	8/27/78	9/2/78
Total Time of Release	29.25	33.88	25.83	25.38	38.00
Percent of Technical Specification Limit	3.68E-02	4.80E-02	4.45E-02	7.65E-01	4.30E-03
Average Rate of Release ( $\mu$ Ci/sec)	3.13E+0	6.14E+0	3.95E+0	6.93E+01	3.28E-01



TABLE 3.2 - RADIOACTIVE GASEOUS EFFLUENT RELEASES FOR 1978

## SYNOPSIS OF BATCH GASEOUS RELEASES

Release No.	277	278	279	280	281
Date	9/6/78	9/13/78	9/19/78	9/30/78	10/7/78
Total Time of Release	29.63	19.08	33.75	34.1	10.1
Percent of Technical Specification Limit	2.74E-02	2.36E+0	1.06E+0	1.42E-2	2.61E-02
Average Rate of Release ( $\mu$ Ci/sec)	2.48E+0	2.10E+02	9.50E+01	1.23E+0	2.10E+0

Release No.	282	283	284	285	286
Date	10/12/78	10/14/78	10/19/78	10/27/78	10/31/78
Total Time of Release	16.5	15.1	16.9	19.2	12.8
Percent of Technical Specification Limit	8.10E-03	1.46E-02	1.50E+0	1.38E-02	9.07E-01
Average Rate of Release ( $\mu$ Ci/sec)	5.79E-01	1.21E+0	1.47E+02	1.07E+0	8.12E+01

Release No.	287	288	289	290	291
Date	11/2/78	11/7/78	11/10/78	11/16/78	11/22/78
Total Time of Release	16.3	18.8	14.2	21.2	19.5
Percent of Technical Specification Limit	1.89E-02	1.38E+0	1.53E-02	6.36E-02	4.14E-03
Average Rate of Release ( $\mu$ Ci/sec)	1.36E+0	1.24E+02	1.32E+0	5.52E+0	2.83E-01

TABLE 3.2 - RADIOACTIVE GASEOUS EFFLUENT RELEASES FOR 1978

## SYNOPSIS OF BATCH GASEOUS RELEASES

Release No.	292	293	294	295	296
Date	11/30/78	12/ 8/78	12/14/78	12/17/78	12/21/78
Total Time of Release	18.0	21.5	21.3	13.4	17.7
Percent of Technical Specification Limit	7.39E-03	5.61E-03	7.24E-03	8.01E-03	2.05E-02
Average Rate of Release ( $\mu$ Ci/sec)	4.80E-01	3.49E-01	4.50E-01	5.39E-01	1.26E+00

Release No.	297	298			
Date	12/22/78	12/29/78			
Total Time of Release	13.2	20.3			
Percent of Technical Specification Limit	4.10E-01	1.42E-03			
Average Rate of Release ( $\mu$ Ci/sec)	3.66E+01	1.23E+01			

Release No.					
Date					
Total Time of Release					
Percent of Technical Specification Limit					
Average Rate of Release ( $\mu$ Ci/sec)					

TABLE 3.3 - RADIOACTIVE GASEOUS EFFLUENT RELEASES FOR 1978

5. The following is a tabulation of meteorological conditions during periods of gaseous effluent release:

RELEASE NO.	262 <sup>a</sup>		DATE	7/3/78		STABILITY CONDITION	e		RELEASE DURATION	39.17 hrs							
AT START OF RELEASE																	
Wind Direction	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	ZERO WIND VEL.
Avg. Wind Velocity (MPH)	4.2	2.0			4.4								4.8	3.7			
% of Time Wind was From the Direction	27.3	4.5			20.7								18.2	13.6			13.6

RELEASE NO.	263 <sup>a</sup>		DATE	7/6/78		STABILITY CONDITION	C		RELEASE DURATION	41.63 hrs							
AT START OF RELEASE																	
Wind Direction	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	ZERO WIND VEL.
Avg. Wind Velocity (MPH)	2.7				5.0				4.0	9.0		9.0	4.0		6.3		
% of Time Wind was From the Direction	13.6				9.0				4.5	4.5		9.0	18.2		31.8		9.0

RELEASE NO.	264 <sup>a</sup>		DATE	7/12/78		STABILITY CONDITION	D		RELEASE DURATION	32.47 hrs							
AT START OF RELEASE																	
Wind Direction	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	ZERO WIND VEL.
Avg. Wind Velocity (MPH)	6.6		2.0		1.5		3.5	5.0	5.4	6.0	4.0	8.0			4.0		
% of Time Wind was From the Direction	27.3		3.0		6.1		12.1	3.0	27.3	9.1	3.0	3.0			6.1		0.0

RELEASE NO.	265 <sup>a</sup>		DATE	7/15/78		STABILITY CONDITION	A		RELEASE DURATION	49.32 hrs							
AT START OF RELEASE																	
Wind Direction	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	ZERO WIND VEL.
Avg. Wind Velocity (MPH)	5.3	4.0	5.0		8.3		2.5	3.0	4.0		5.0		4.0		5.0	8.0	
% of Time Wind was From the Direction	31.0	2.4	11.9		14.3		4.8	4.8	2.4		2.4		2.4		8	2.4	16.7

a) Manual data collection

5. The following is a tabulation of meteorological conditions during periods of gaseous effluent release:

RELEASE NO. 266 DATE 7/18/78 STABILITY CONDITION D RELEASE DURATION 25.82 hrs  
AT START OF RELEASE

Wind Direction	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	ZERO WIND VEL.
Avg. Wind Velocity (MPH)	8.3	2.4	10.8	11.0	8.6	8.5	10.4	15.8	13.7	10.1	9.8	5.4	4.0	4.9	5.7	6.9	
% of Time Wind was From the Direction	4.6	14.1	12.7	7.1	2.0	1.3	9.8	7.8	8.1	5.8	6.8	4.6	2.3	3.8	2.3	0.9	5.7

RELEASE NO. 267 DATE 7/20/78 STABILITY CONDITION D RELEASE DURATION 25.42 hrs  
AT START OF RELEASE

Wind Direction	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	ZERO WIND VEL.
Avg. Wind Velocity (MPH)	17.8	12.3	11.0	12.1	10.4	9.9	13.6	13.4	11.6	14.2	11.7	8.3	9.3	7.1	9.3	10.6	
% of Time Wind was From the Direction	11.7	15.5	12.1	12.3	6.7	1.7	3.7	8.1	6.4	7.1	5.3	0.9	1.1	0.8	1.1	4.3	1.0

RELEASE NO. 268<sup>a</sup> DATE 7/22/78 STABILITY CONDITION E RELEASE DURATION 27.15 hrs  
AT START OF RELEASE

Wind Direction	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	ZERO WIND VEL.
Avg. Wind Velocity (MPH)	1.0				5.0	2.0	2.8		4.0		4.0				1.3		
% of Time Wind was From the Direction	3.7				3.7	3.7	51.9		7.4		3.7				11.1		14.8

RELEASE NO. 269 DATE 7/29/78 STABILITY CONDITION D RELEASE DURATION 34.33 hrs  
AT START OF RELEASE

Wind Direction	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	ZERO WIND VEL.
Avg. Wind Velocity (MPH)	5.3	6.2	5.9	7.8	8.2	10.3	8.5	6.6	6.7	7.0	6.4	4.1	5.4	5.2	6.5	2.7	
% of Time Wind was From the Direction	2.1	6.5	4.7	4.2	4.6	10.4	4.3	3.1	5.5	9.8	11.7	7.4	8.3	5.0	1.6	0.5	10.0

a) Manual data collection

TABLE 3.3 - RADIOACTIVE GASEOUS EFFLUENT RELEASES FOR 1978

5. The following is a tabulation of meteorological conditions during periods of gaseous effluent release:

RELEASE NO. 270 DATE 8/8/78 STABILITY CONDITION D RELEASE DURATION 21.58 hrs  
AT START OF RELEASE

Wind Direction	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	ZERO WIND VEL.
Avg. Wind Velocity (MPH)	14.8	9.0	6.7	10.5	8.4	7.4	5.0	3.9	5.0	4.2	5.5	9.6	6.5	4.6	11.1	17.0	
% of Time Wind was From the Direction	5.3	7.2	10.8	11.3	7.5	3.3	1.2	0.6	2.0	3.1	4.2	7.3	3.3	5.8	3.7	9.1	14.0

RELEASE NO. 271 DATE 8/10/78 STABILITY CONDITION C RELEASE DURATION 22.00 hrs  
AT START OF RELEASE

Wind Direction	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	ZERO WIND VEL.
Avg. Wind Velocity (MPH)	2.4		3.5		10.5		2.5		3.0				4.5		3.0		
% of Time Wind was From the Direction	20.8		8.3		8.3		8.3		12.5				8.3		16.7		16.7

RELEASE NO. 272 DATE 8/14/78 STABILITY CONDITION D RELEASE DURATION 29.52 hrs  
AT START OF RELEASE

Wind Direction	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	ZERO WIND VEL.
Avg. Wind Velocity (MPH)	8.6	3.0			5.0	2.0	2.0	2.0			2.9		2.6		2.0		
% of Time Wind was From the Direction	15.6	6.3			6.3	3.1	3.1	3.1			21.9		34.4		3.1		3.1

RELEASE NO. 273 DATE 8/17/78 STABILITY CONDITION A RELEASE DURATION 33.88 hrs  
AT START OF RELEASE

Wind Direction	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	ZERO WIND VEL.
Avg. Wind Velocity (MPH)	2.0				9.0		4.1		3.0		2.0						
% of Time Wind was From the Direction	5.0				25.0		50.0		15.0		5.0						

TABLE 3.3 - RADIOACTIVE GASEOUS EFFLUENT RELEASES FOR 1978



5. The following is a tabulation of meteorological conditions during periods of gaseous effluent release:

RELEASE NO. 274 DATE 8/21/78 STABILITY CONDITION D RELEASE DURATION 25.83 hrs.  
AT START OF RELEASE

Wind Direction	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	ZERO WIND VEL.
Avg. Wind Velocity (MPH)	4.9	5.3	5.3	5.2	4.8	5.0	5.3	7.7	8.7	15.0	14.8	3.2	5.5	6.5	9.2	6.0	
% of Time Wind was From the Direction	3.6	8.3	6.2	1.7	1.9	0.8	1.9	1.5	3.2	2.2	1.8	1.2	4.6	7.0	9.9	3.8	40.3

RELEASE NO. 275 DATE 8/27/78 STABILITY CONDITION C RELEASE DURATION 25.38 hrs  
AT START OF RELEASE

Wind Direction	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	ZERO WIND VEL.
Avg. Wind Velocity (MPH)	13.3	12.8	8.8	6.8	4.3	6.2	11.5	12.7	10.4	11.4	8.7	4.7	4.1	5.7	4.3	4.9	
% of Time Wind was From the Direction	8.7	18.7	5.0	4.0	3.6	4.5	11.4	9.5	9.4	6.4	3.3	3.3	1.4	1.5	0.4	0.6	8.2

RELEASE NO. 276 DATE 9/2/78 STABILITY CONDITION C RELEASE DURATION 28.0 hrs  
AT START OF RELEASE

Wind Direction	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	ZERO WIND VEL.
Avg. Wind Velocity (MPH)	2.7	2.6	3.3	6.9	7.1	13.2	12.7	12.1	12.2	9.0	7.7	7.6	6.1	6.1	7.5	4.2	
% of Time Wind was From the Direction	2.2	1.8	0.4	0.3	0.6	0.5	6.9	21.9	24.3	29.2	5.2	0.5	0.2	1.1	2.1	1.9	0.8

RELEASE NO. 277 DATE 9/6/78 STABILITY CONDITION D RELEASE DURATION 29.63 hrs  
AT START OF RELEASE

Wind Direction	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	ZERO WIND VEL.
Avg. Wind Velocity (MPH)	6.4	5.6	4.3	4.1	4.6	5.6	7.7	20.3	12.7	9.5	5.3	3.7	4.8	3.6	4.2	3.6	
% of Time Wind was From the Direction	7.9	10.9	4.6	3.3	2.9	3.1	3.4	9.3	7.8	5.0	5.7	4.6	4.7	2.4	2.9	3.8	17.2



TABLE 3.3. - RADIOACTIVE GASEOUS EFFLUENT RELEASES FOR 1978

5. The following is a tabulation of meteorological conditions during periods of gaseous effluent release:

RELEASE NO.	278*	DATE	9/13/78	STABILITY CONDITION C										RELEASE DURATION				19.08 hrs.
AT START OF RELEASE																		
Wind Direction	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	ZERO WIND VEL.	
Avg. Wind Velocity (MPH)																		
% of Time Wind was From the Direction																		

RELEASE NO.	279*	DATE	9/19/78	STABILITY CONDITION										D	RELEASE DURATION					33.57 hrs.
AT START OF RELEASE																				
Wind Direction	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	ZERO WIND VEL.			
Avg. Wind Velocity (MPH)																				
% of Time Wind was From the Direction																				

RELEASE NO.	280*	DATE	9/30/78	STABILITY CONDITION										RELEASE DURATION				34.1 hrs.
				AT START OF RELEASE										C				
Wind Direction	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	ZERO WIND VEL.	
Avg. Wind Velocity (MPH)																		
% of Time Wind was From the Direction																		

RELEASE NO.	281*	DATE	10/7/78	STABILITY CONDITION										C	RELEASE DURATION					10.1 hrs
AT START OF RELEASE																				
Wind Direction	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	ZERO WIND VEL.			
Avg. Wind Velocity(MPH)																				
% of Time Wind was From the Direction																				

\* Meteorological instrumentation not operable, data not collected.

5. The following is a tabulation of meteorological conditions during periods of gaseous effluent release:

RELEASE NO. 282\* DATE 10/12/78 STABILITY CONDITION D RELEASE DURATION 16.5 hrs.  
AT START OF RELEASE

Wind Direction	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	ZERO WIND VEL.
Avg. Wind Velocity (MPH)																	
% of Time Wind was From the Direction																	

RELEASE NO. 283 DATE 10/14/78 STABILITY CONDITION D RELEASE DURATION 15.1 hrs.  
AT START OF RELEASE

Wind Direction	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	ZERO WIND VEL.
Avg. Wind Velocity (MPH)	6.0		8.0	3.0		8.0		9.0					3.0		8.0	4.0	
% of Time Wind was From the Direction	15.4		7.7	7.7		7.7		15.4					7.7		15.4	23.1	0

RELEASE NO. 284 DATE 10/19/78 STABILITY CONDITION D RELEASE DURATION 16.9 hrs  
AT START OF RELEASE

Wind Direction	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	ZERO WIND VEL.
Avg. Wind Velocity (MPH)	3.4	4.6	5.1	6.6	7.8	9.2	10.3	6.5	6.0	6.2	7.8	7.3	5.0	4.3	4.2	3.0	
% of Time Wind was From the Direction	0.4	0.2	0.2	0.8	2.7	4.1	5.3	5.7	6.1	13.5	20.3	15.0	6.3	5.2	3.0	0.8	10.4

RELEASE NO. 285 DATE 10/27/78 STABILITY CONDITION C RELEASE DURATION 19.2 hrs  
AT START OF RELEASE

Wind Direction	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	ZERO WIND VEL.
Avg. Wind Velocity (MPH)	2.4	2.8	5.3	7.3	3.4	3.2	3.0	2.7	2.8	3.2	3.3	3.0	2.1	2.3	2.4	1.7	
% of Time Wind was From the Direction	1.1	3.9	11.9	19.3	6.2	4.0	0.8	0.7	0.8	1.8	3.6	2.9	1.1	1.4	0.5	0.8	38.8

(\*Meteorological instrumentation not operable, data not collected.

5. The following is a tabulation of meteorological conditions during periods of gaseous effluent release:

RELEASE NO. 286 DATE 10/31/78 STABILITY CONDITION C RELEASE DURATION 12.8 hrs.  
AT START OF RELEASE

Wind Direction	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	ZERO WIND VEL.
Avg. Wind Velocity (MPH)	3.8	4.5	2.1	2.1	1.9	2.7	3.5	3.4	2.1	4.0	5.0	4.3	3.7	3.3	2.6	2.5	
% of Time Wind was From the Direction	2.0	3.2	1.9	2.9	0.8	0.4	1.0	0.7	0.3	6.8	18.0	14.1	10.6	8.7	1.5	1.1	27.7

RELEASE NO. 287 DATE 11/2/78 STABILITY CONDITION D RELEASE DURATION 16.3 hrs.  
AT START OF RELEASE

Wind Direction	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	ZERO WIND VEL.
Avg. Wind Velocity (MPH)	5.9	5.0	3.2	3.3	9.4	12.2	9.4	4.9	4.6	4.9	4.5	3.4	3.4	5.0	5.5	3.7	
% of Time Wind was From the Direction	12.4	10.2	1.4	1.5	1.4	17.0	7.0	1.4	0.6	1.4	1.5	2.5	4.4	11.1	12.1	4.0	9.7

RELEASE NO. 288 DATE 11/7/78 STABILITY CONDITION D RELEASE DURATION 18.8 hrs.  
AT START OF RELEASE

Wind Direction	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	ZERO WIND VEL.
Avg. Wind Velocity (MPH)	6.6	6.5	7.4	8.2	4.6	6.1	3.4	3.3	5.3	6.8	8.1	6.8	4.3	3.7	3.0	2.5	
% of Time Wind was From the Direction	6.7	10.8	6.0	2.9	0.2	0.8	3.2	2.7	4.1	11.7	13.8	10.3	4.8	4.5	4.1	1.6	11.5

RELEASE NO. 289 DATE 11/10/78 STABILITY CONDITION D RELEASE DURATION 14.2 hrs.  
AT START OF RELEASE

Wind Direction	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	ZERO WIND VEL.
Avg. Wind Velocity (MPH)	12.3	13.1	13.2	0	0	5.9	0	5.1	0	0	0	0	0	10.7	0	10.5	
% of Time Wind was From the Direction	3.6	84.6	9.8	0	0	0.1	0	0.1	0	0	0	0	0	0.1	0	0.1	0

TABLE 3.3 - RADIOACTIVE GASEOUS EFFLUENT RELEASES FOR 1978

TABLE 3.3 - RADIOACTIVE CASEROUS EFFLUENT RELEASES FOR 1978

5. The following is a tabulation of meteorological conditions during periods of gaseous effluent release:

RELEASE NO. 290		DATE 11/16/78		STABILITY CONDITION B										RELEASE DURATION 21.2 hrs			
				AT START OF RELEASE													
Wind Direction	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	ZERO WIND VEL.
Avg. Wind Velocity (MPH)	3.6	4.5	8.3	7.6	6.6	3.9	6.6	4.8	1.0	5.6	6.6	6.3	3.7	2.0	2.2	1.2	1.2
% of Time Wind was From the Direction	4.2	3.5	7.8	4.0	2.6	2.8	5.5	7.5	15.8	7.0	5.6	14.0	4.3	0.7	0.2	0.1	14.3

RELEASE NO. 291		DATE 11/22/78		STABILITY CONDITION D										RELEASE DURATION 19.5 hrs			
				AT START OF RELEASE													
Wind Direction	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	ZERO WIND VEL.
Avg. Wind Velocity (MPH)	0	1.5	2.9	2.1	5.6	6.8	7.7	6.6	5.9	6.4	9.0	18.3	24.6	17.6	3.3	0	0
% of Time Wind was From the Direction	0	0.1	0.2	0.1	1.3	2.7	4.1	2.6	2.7	4.5	7.0	13.7	56.6	1.1	0.1	0	3.2

RELEASE NO. 292*		DATE 11/30/78		STABILITY CONDITION C										RELEASE DURATION 18.0 hrs.			
				AT START OF RELEASE													
Wind Direction	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	ZERO WIND VEL.
Avg. Wind Velocity (MPH)																	
% of Time Wind was From the Direction																	

RELEASE NO. 293		DATE 12/8/78		STABILITY CONDITION A										RELEASE DURATION 21.5 hrs			
				AT START OF RELEASE													
Wind Direction	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	ZERO WIND VEL.
Avg. Wind Velocity (MPH)	4.2	4.7	4.3	4.3	3.9	2.8	2.4	2.9	3.8	4.6	3.9	4.0	4.6	3.9	3.4	3.4	3.4
% of Time Wind was From the Direction	1.7	7.8	5.2	1.6	1.0	0.6	0.2	0.6	1.8	8.1	8.8	14.4	8.3	4.1	1.9	0.5	33.0

\* Meteorological data not obtained.

5. The following is a tabulation of meteorological conditions during periods of gaseous effluent release:

RELEASE NO. 294 DATE 12/14/78 STABILITY CONDITION C RELEASE DURATION 21.3 hrs  
AT START OF RELEASE

Wind Direction	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	ZERO WIND VEL.
Avg. Wind Velocity (MPH)	3.8	5.7	5.4	6.1	4.7	4.3	6.1	5.8	8.5	5.3	5.5	5.1	5.1	5.7	4.5	3.4	
% of Time Wind was From the Direction	2.4	11.3	15.4	12.2	5.3	1.9	2.3	4.9	8.4	4.0	3.4	3.5	2.8	2.7	1.2	0.6	17.3

RELEASE NO. 295 DATE 12/17/78 STABILITY CONDITION D RELEASE DURATION 13.4 hrs.  
AT START OF RELEASE

Wind Direction	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	ZERO WIND VEL.
Avg. Wind Velocity (MPH)	4.6	5.6	3.4	3.9	4.5	4.4	3.4	4.1	4.9	7.1	7.4	6.7	2.6	4.0	4.2	2.6	
% of Time Wind was From the Direction	5.0	9.1	4.3	4.9	2.2	2.0	2.0	1.5	3.7	11.9	11.8	6.0	2.7	4.2	2.6	0.7	25.2

RELEASE NO. 296 DATE 12/21/78 STABILITY CONDITION B RELEASE DURATION 17.7 hrs.  
AT START OF RELEASE

Wind Direction	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	ZERO WIND VEL.
Avg. Wind Velocity (MPH)	0	7.0	8.3	5.9	5.2	10.8	10.7	7.3	7.1	7.3	9.8	16.3	19.4	21.5	6.6	4.7	
% of Time Wind was From the Direction	0	1.1	3.1	1.8	0.6	4.4	12.5	3.2	2.9	2.6	8.1	22.8	25.9	6.7	0.6	0.1	3.1

RELEASE NO. 297 DATE 12/22/78 STABILITY CONDITION D RELEASE DURATION 13.2 hrs.  
AT START OF RELEASE

Wind Direction	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	ZERO WIND VEL.
Avg. Wind Velocity (MPH)	10.9	5.3	0	2.9	5.3	2.7	4.5	2.8	12.4	7.8	9.8	17.9	16.5	11.5	10.6	11.1	
% of Time Wind was From the Direction	1.5	0.1	0	0.5	0.1	0.2	0.2	0.2	1.8	1.5	2.6	25.0	37.4	10.0	9.7	5.6	3.3



TABLE 3.3. - RADIOACTIVE CASEOUS EFFLUENT RELEASES FOR 1978

5. The following is a tabulation of meteorological conditions during periods of gaseous effluent release:

RELEASE NO.	298	DATE	12/29/78	STABILITY CONDITION										D		RELEASE DURATION 20.3 hrs.			
				AT START OF RELEASE															
Wind Direction	H	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	ZFW			
Avg. Wind Velocity (MPH)	3.6	4.7	5.7	5.9	4.4	2.4	1.9	2.0	2.0	2.1	0	0	2.4	2.5	2.1	1.3	WIND		
% of Recd Wind was From the Direction	1.6	12.4	42.6	19.4	4.7	0.6	0.2	1.3	0.7	0.2	0	0	0.2	0.1	0.2	0.7	14.8		

[illegible][illegible][illegible]



TABLE 4.1 - NON-RADIOLOGICAL EFFLUENT FOR 1978

MONTH		JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	
) SR NR 1.1 S		(5)	(4)	(4)	(5)	(4)		
Total) Million Gallons		68.53	67.98	60.51	72.74	65.60	60.46	
Released to the River.	(Average)	ppm Fe	.286	.13	.293	.198	.263	.338
		ppm Cu	.012	.010	.012	.014	.020	.046
		ppm Zn	.200	.152	.175	.276	.400	1.154
		ppm Cr <sup>+</sup> <sub>6</sub>	.009	.004	.000	.007	.007	.006
		ppm P	3.46	1.17	1.60	2.52	4.68	5.90
		ppm pH	8.15	7.9	7.91	7.79	7.67	7.77
		ppm TDS	1130		999	1302 (1 test)	1543	1415
	(Maximum)	ppm Fe	.722	.37	.370	.303	.505	.430
		ppm Cu	.017	.019	.019	.021	.023	.109
		ppm Zn	.295	.310	.306	.411	1.082	3.46
		ppm Cr <sup>+</sup> <sub>6</sub>	.018	.019	.001	.012	.012	.010
		ppm P	4.60	1.35	2.46	3.4	8.8	8.25
		Max pH	8.25	8.1	8.12	7.98	8.02	8.08
		Min pH	7.99	7.1	7.55	7.64	7.48	7.20
		ppm TDS	1683	1228	999	1302	1543	1415
		ppm 321	0	0	0.00	4.1	0	0
		ppm 71-D5	0	0	0.00	8.6	.97	0
		ppm Cl <sub>2</sub>	0	0	0.00	.8	.40	1.5

) NR 1.2 S		(3)	(5)	(4)	(4)	(5)	(4)
Farm Pond Effluent To Lutte-Temp.	°F Max	81	86	67	66	52	42
	°F Avg	79	76	63	57	43	37.5

) SK NR 1.3 M (1) Note		(13)	(13)	(13)	(13)	(13)	(13)	
(Total)	(Gal)	861,628	939,104	1,020,969	831,308	876,708	1,378,340	
Sump Effluent	(Average)	ppm Fe	.175	.171	1.997	.399	1.111	.403
		ppm Cu	.017	.036	.036	.060	.140	.089
		ppm Zn	1.434	.681	1.774	3.168	2.368	4.288
		ppm Cr <sup>+</sup> <sub>6</sub>	.005	.0	.003	.002	.004	.005
		ppm P	2.034	.857	1.035	1.16	1.673	1.85
		ppm TDS	772	683	404	457	351	587
		pH	6.81	7.2	8.26	6.7	6.31	7.23

NOTE 1: Value in parenthesis indicates the number of measurements made.

TABLE 5.1 - AUXILIARY WATER SYSTEM RADIOCHEMISTRY  
FOR THE MONTH OF July, 1973

SYSTEM DESCRIPTION	GROSS BETA ACTIVITY			GROSS ALPHA ACTIVITY			TRITIUM ACTIVITY		
	MAXIMUM	MINIMUM	AVERAGE	MAXIMUM	MINIMUM	AVERAGE	MAXIMUM	MINIMUM	AVERAGE
System 21	5.34E-08	3.97E-09	1.20E-08 <sup>(8)</sup>	2.24E-09	2.23E-09	2.23E-09 <sup>(8)</sup>	2.54E-04	1.21E-04	1.77E-04 <sup>(8)</sup>
System 31	6.48E-09	5.12E-09	5.88E-09 <sup>(4)</sup>	3.93E-09	2.17E-09	2.64E-09 <sup>(4)</sup>	1.91E-04	9.78E-05	1.52E-04 <sup>(4)</sup>
System 41			3.33E-08 <sup>(1)</sup>			2.84E-09 <sup>(1)</sup>			7.50E-07 <sup>(1)</sup>
System 42			3.15E-08 <sup>(1)</sup>			3.00E-08 <sup>(1)</sup>			4.06E-06 <sup>(1)</sup>
System 46	3.30E-06	6.33E-09	6.61E-07 <sup>(9)</sup>	4.65E-09	2.23E-09	2.50E-09 <sup>(9)</sup>	8.78E-05	3.52E-05	6.67E-05 <sup>(8)</sup>
System 47	1.04E-08	4.93E-09	6.89E-09 <sup>(8)</sup>	2.24E-09	2.23E-09	2.23E-09 <sup>(8)</sup>	2.47E-04	8.67E-05	1.56E-04 <sup>(8)</sup>
Farm Pond Effluent	2.25E-08	5.64E-09	1.11E-08 <sup>(4)</sup>	5.56E-09	2.17E-09	4.02E-09 <sup>(4)</sup>	8.96E-06	3.22E-06	5.87E-06 <sup>(4)</sup>
Turbine Bldg. Sump	2.37E-08	5.58E-09	1.15E-08 <sup>(13)</sup>	9.44E-09	2.22E-09	4.86E-09 <sup>(13)</sup>	9.98E-05	5.02E-05	6.56E-05 <sup>(13)</sup>
Reactor Bldg. Sump	5.66E-07	2.36E-08	1.80E-07 <sup>(23)</sup>	7.20E-09	2.17E-09	3.48E-09 <sup>(23)</sup>	9.04E-02	1.51E-04	1.82E-02 <sup>(23)</sup>
Cooling Tower Blowdown	3.49E-08	5.71E-09	1.89E-08 <sup>(33)</sup>	2.41E-08	2.24E-09	9.48E-09 <sup>(33)</sup>	1.91E-03	5.13E-07	1.87E-04 <sup>(33)</sup>

REMARKS: Tritium values shown for the Reactor Building Sump include all effluent released via this path.

NOTE: All activities are reported in  $\mu\text{Ci/ml}$ .

NOTE: 1.5E9 means  $1.5 \times 10^9$ . Similarly,  $2.7\text{E}^{-7}$  means  $2.7 \times 10^{-7}$ .

NOTE: Circled values indicate the number of samples represented by the average.

TABLE 5.1 - AUXILIARY WATER SYSTEM RADIOCHEMISTRY  
FOR THE MONTH OF August, 19 78

SYSTEM DESCRIPTION	GROSS BETA ACTIVITY			GROSS ALPHA ACTIVITY			TRITIUM ACTIVITY		
	MAXIMUM	MINIMUM	AVERAGE	MAXIMUM	MINIMUM	AVERAGE	MAXIMUM	MINIMUM	AVERAGE
System 21	3.63E-08	4.71E-09	9.58E-09 <sup>(9)</sup>	3.15E-09	2.23E-09	2.44E-09 <sup>(9)</sup>	6.55E-05	1.89E-05	3.80E-05 <sup>(9)</sup>
System 31	8.35E-09	4.53E-09	5.70E-09 <sup>(4)</sup>	4.56E-09	2.23E-09	3.05E-09 <sup>(4)</sup>	6.28E-05	2.67E-05	3.88E-05 <sup>(4)</sup>
System 41			2.40E-08 <sup>(1)</sup>			1.44E-08 <sup>(1)</sup>			5.21E-07 <sup>(1)</sup>
System 42			3.05E-08 <sup>(1)</sup>			3.23E-08 <sup>(1)</sup>			5.21E-07 <sup>(1)</sup>
System 46	8.25E-08	5.20E-09	2.81E-08 <sup>(10)</sup>	3.15E-09	2.23E-09	2.46E-09 <sup>(10)</sup>	8.43E-05	2.51E-05	5.91E-05 <sup>(10)</sup>
System 47	6.48E-09	4.71E-09	5.53E-09 <sup>(10)</sup>	4.02E-09	2.23E-09	2.78E-09 <sup>(10)</sup>	2.67E-04	9.40E-05	1.77E-04 <sup>(10)</sup>
Farm Pond Effluent	1.60E-08	1.04E-08	1.26E-08 <sup>(5)</sup>	1.59E-08	3.64E-09	8.78E-09 <sup>(5)</sup>	1.15E-05	5.09E-07	3.80E-06 <sup>(5)</sup>
Turbine Bldg. Sump	3.88E-08	5.56E-09	1.34E-08 <sup>(13)</sup>	1.67E-08	2.23E-09	7.00E-09 <sup>(13)</sup>	4.68E-05	3.50E-06	1.98E-05 <sup>(13)</sup>
Reactor Bldg. Sump	2.68E-06	1.73E-08	3.12E-07 <sup>(47)</sup>	2.30E-08	2.22E-09	5.83E-09 <sup>(47)</sup>	2.36E-01	7.13E-05	4.62E-02 <sup>(47)</sup>
Cooling Tower Blowdown	4.81E-08	5.17E-09	1.78E-08 <sup>(34)</sup>	3.58E-08	2.27E-09	1.30E-08 <sup>(34)</sup>	1.48E-03	5.09E-07	3.63E-04 <sup>(34)</sup>

REMARKS: Average effluent values are not weighted

NOTE: All activities are reported in  $\mu\text{Ci/ml}$ .

NOTE: 1.5E9 means  $1.5 \times 10^{+9}$ . Similarly,  $2.7E^{-7}$  means  $2.7 \times 10^{-7}$ .

NOTE: Circled values indicate the number of samples represented by the average.

TABLE 5.1 - AUXILIARY WATER SYSTEM RADIOCHEMISTRY  
FOR THE MONTH OF September, 19 78

SYSTEM DESCRIPTION	GROSS BETA ACTIVITY			GROSS ALPHA ACTIVITY			TRITIUM ACTIVITY		
	MAXIMUM	MINIMUM	AVERAGE (8)	MAXIMUM	MINIMUM	AVERAGE (8)	MAXIMUM	MINIMUM	AVERAGE (8)
System 21	2.99E-08	5.95E-09	1.25E-08	6.64E-09	2.13E-09	3.41E-09	5.79E-05	1.43E-06	2.38E-05
System 31	5.78E-09	4.72E-09	5.39E-09	4.45E-09	2.19E-09	2.76E-09	5.12E-05	1.95E-06	1.97E-05
System 41	1.06E-08	1.06E-08	1.06E-08	6.19E-09	6.19E-09	6.19E-09	5.39E-07	5.39E-07	5.39E-07
System 42	1.01E-08	1.01E-08	1.01E-08	3.36E-08	3.36E-08	3.36E-08	5.39E-07	5.39E-07	5.39E-07
System 46	4.10E-08	5.66E-09	1.34E-08	3.81E-09	2.11E-09	2.70E-09	8.03E-05	3.02E-05	5.16E-05
System 47	5.95E-09	4.69E-09	5.66E-09	6.71E-09	2.18E-09	3.57E-09	2.63E-04	9.19E-05	1.98E-04
Farm Pond Effluent	1.58E-08	7.58E-09	1.07E-08	1.61E-08	3.81E-09	9.77E-09	2.53E-05	5.57E-07	9.82E-06
Turbine Bldg. Sump	1.69E-08	5.54E-09	1.07E-08	1.78E-08	2.14E-09	6.63E-09	3.01E-05	1.53E-06	9.41E-06
Reactor Bldg. Sump	1.37E-07	1.10E-08	7.21E-08	4.18E-08	2.14E-09	6.68E-09	1.25E-01	5.63E-05	4.06E-02
Cooling Tower Blowdown	3.23E-08	5.54E-09	1.50E-08	2.68E-08	2.14E-09	1.18E-08	1.15E-03	5.39E-07	3.47E-04

REMARKS: \_\_\_\_\_

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NOTE: All activities are reported in  $\mu\text{Ci/ml}$ .

NOTE:  $1.5\text{E}9$  means  $1.5 \times 10^{+9}$ . Similarly,  $2.7\text{E}^{-7}$  means  $2.7 \times 10^{-7}$ .

NOTE: Circled values indicate the number of samples represented by the average.



TABLE 5.1 - AUXILIARY WATER SYSTEM RADIOCHEMISTRY  
FOR THE MONTH OF October, 19 78

SYSTEM DESCRIPTION	GROSS BETA ACTIVITY			GROSS ALPHA ACTIVITY			TRITIUM ACTIVITY		
	MAXIMUM	MINIMUM	AVERAGE	MAXIMUM	MINIMUM	AVERAGE	MAXIMUM	MINIMUM	AVERAGE
System 21	9.07E-08	4.46E-09	1.74E-08 <sup>(8)</sup>	4.43E-09	2.12E-09	2.74E-09 <sup>(8)</sup>	5.83E-05	1.22E-05	2.86E-05 <sup>(8)</sup>
System 31	2.88E-08	4.59E-09	1.10E-08 <sup>(5)</sup>	3.94E-09	2.11E-09	2.53E-09 <sup>(5)</sup>	5.53E-05	6.00E-06	3.30E-05 <sup>(5)</sup>
System 41	2.23E-08	2.23E-08	2.23E-08 <sup>(1)</sup>	6.87E-09	6.87E-09	6.87E-09 <sup>(1)</sup>	5.60E-07	5.60E-07	5.60E-07 <sup>(1)</sup>
System 42	2.40E-08	2.40E-08	2.40E-08 <sup>(1)</sup>	2.82E-08	2.82E-08	2.82E-08 <sup>(1)</sup>	5.60E-07	5.60E-07	5.60E-07 <sup>(1)</sup>
System 46	4.82E-08	5.03E-09	1.35E-08 <sup>(8)</sup>	4.44E-09	2.13E-09	2.74E-09 <sup>(8)</sup>	5.88E-05	2.76E-05	4.18E-05 <sup>(8)</sup>
System 47	8.19E-09	5.00E-09	6.27E-09 <sup>(8)</sup>	4.48E-09	2.13E-09	2.75E-09 <sup>(8)</sup>	2.10E-04	1.99E-04	2.05E-04 <sup>(8)</sup>
Farm Pond Effluent	2.35E-08	6.87E-09	1.56E-08 <sup>(4)</sup>	1.16E-08	7.63E-09	9.06E-09 <sup>(4)</sup>	1.36E-04	3.18E-06	3.77E-05 <sup>(4)</sup>
Turbine Bldg. Sump	2.10E-08	5.54E-09	1.03E-08 <sup>(9)</sup>	7.90E-09	2.72E-09	4.82E-09 <sup>(9)</sup>	2.22E-05	1.08E-06	1.06E-05 <sup>(9)</sup>
Reactor Bldg. Sump	9.13E-07	9.13E-09	1.78E-07 <sup>(24)</sup>	1.64E-08	2.22E-09	5.18E-09 <sup>(24)</sup>	5.69E-02	8.65E-05	1.17E-02 <sup>(24)</sup>
Cooling Tower Blowdown	5.59E-08	6.40E-09	1.80E-08 <sup>(27)</sup>	3.67E-08	4.70E-09	1.08E-08 <sup>(27)</sup>	1.41E-03	5.43E-07	2.99E-04 <sup>(27)</sup>

REMARKS:

NOTE: All activities are reported in  $\mu\text{Ci/ml}$ .

NOTE: 1.5E9 means  $1.5 \times 10^{+9}$ . Similarly,  $2.7\text{E}^{-7}$  means  $2.7 \times 10^{-7}$ .

NOTE: Circled values indicate the number of samples represented by the average.

TABLE 5.1 - AUXILIARY WATER SYSTEM RADIOCHEMISTRY  
FOR THE MONTH OF November, 19 78

SYSTEM DESCRIPTION	GROSS BETA ACTIVITY			GROSS ALPHA ACTIVITY			TRITIUM ACTIVITY		
	MAXIMUM	MINIMUM	AVERAGE	MAXIMUM	MINIMUM	AVERAGE	MAXIMUM	MINIMUM	AVERAGE
System 21	9.28E-09	5.81E-09	7.03E-09 <sup>(1)</sup>	4.10E-09	2.13E-09	2.90E-09 <sup>(1)</sup>	1.93E-04	5.87E-05	1.07E-04 <sup>(1)</sup>
System 31	8.77E-09	6.43E-09	7.10E-09 <sup>(5)</sup>	4.46E-09	2.25E-09	3.20E-09 <sup>(5)</sup>	1.31E-04	5.59E-05	9.89E-05 <sup>(5)</sup>
System 41	2.66E-08	2.66E-08	2.66E-08 <sup>(1)</sup>	2.75E-08	2.75E-08	2.75E-08 <sup>(1)</sup>	5.51E-07	5.51E-07	5.51E-07 <sup>(1)</sup>
System 42	2.89E-08	2.89E-08	2.89E-08 <sup>(1)</sup>	1.87E-08	1.87E-08	1.87E-08 <sup>(1)</sup>	1.45E-05	1.45E-05	1.45E-05 <sup>(1)</sup>
System 46	9.65E-08	6.08E-09	1.94E-08 <sup>(1)</sup>	4.55E-09	2.12E-09	3.11E-09 <sup>(1)</sup>	5.99E-05	2.90E-05	4.30E-05 <sup>(1)</sup>
System 47	2.59E-08	6.08E-09	1.04E-08 <sup>(1)</sup>	4.84E-09	2.13E-09	3.17E-09 <sup>(1)</sup>	2.09E-04	5.89E-05	1.88E-04 <sup>(1)</sup>
Farm Pond Effluent	2.91E-08	8.12E-09	2.07E-08 <sup>(4)</sup>	2.13E-08	5.91E-09	1.08E-08 <sup>(4)</sup>	2.08E-04	1.22E-05	9.70E-05 <sup>(4)</sup>
Turbine Bldg. Sump	1.99E-08	6.35E-09	1.15E-08 <sup>(14)</sup>	3.4E-08	2.33E-09	6.36E-09 <sup>(14)</sup>	8.28E-05	1.61E-05	4.23E-05 <sup>(14)</sup>
Reactor Bldg. Sump	2.16E-07	6.49E-09	6.85E-08 <sup>(19)</sup>	2.14E-08	2.19E-09	5.57E-09 <sup>(19)</sup>	1.21E-01	7.86E-05	3.32E-02 <sup>(19)</sup>
Cooling Tower Blowdown	3.97E-08	8.14E-09	2.11E-08 <sup>(29)</sup>	4.08E-08	3.95E-09	1.27E-08 <sup>(29)</sup>	1.44E-03	5.48E-07	1.17E-04 <sup>(29)</sup>

REMARKS:

NOTE: All activities are reported in  $\mu\text{Ci/ml}$ .

NOTE:  $1.5\text{E}9$  means  $1.5 \times 10^{+9}$ . Similarly,  $2.7\text{E}^{-7}$  means  $2.7 \times 10^{-7}$ .

NOTE: Circled values indicate the number of samples represented by the average.



TABLE 6.1 - SOLID WASTE (LOW LEVEL) FOR 1978

[illegible]

NOTE: 1.5P9 means  $1.5 \times 10^{+9}$ . Similarly, 2.7N7 means  $2.7 \times 10^{-7}$ .

TABLE 5.1 - AUXILIARY WATER SYSTEM RADIOCHEMISTRY  
FOR THE MONTH OF December, 19 78

SYSTEM DESCRIPTION	GROSS BETA ACTIVITY			GROSS ALPHA ACTIVITY			TRITIUM ACTIVITY		
	MAXIMUM	MINIMUM	AVERAGE	MAXIMUM	MINIMUM	AVERAGE	MAXIMUM	MINIMUM	AVERAGE
System 21	1.23E-08	5.59E-09	6.62E-09 <sup>(8)</sup>	2.49E-09	2.26E-09	2.38E-09 <sup>(8)</sup>	1.89E-04	4.55E-05	1.20E-04 <sup>(8)</sup>
System 31	9.07E-09	5.58E-09	6.63E-09 <sup>(4)</sup>	2.48E-09	2.25E-09	2.36E-09 <sup>(4)</sup>	1.54E-04	4.03E-05	1.10E-04 <sup>(4)</sup>
System 41	2.38E-08	2.38E-08	2.38E-08 <sup>(1)</sup>	8.31E-09	8.31E-09	8.31E-09 <sup>(1)</sup>	5.72E-07	5.72E-07	5.72E-07 <sup>(1)</sup>
System 42	3.61E-08	3.61E-08	3.61E-08 <sup>(1)</sup>	1.49E-08	1.49E-08	1.49E-08 <sup>(1)</sup>	9.97E-07	9.97E-07	9.97E-07 <sup>(1)</sup>
System 46	8.95E-08	5.58E-09	1.86E-08 <sup>(8)</sup>	2.49E-09	2.25E-09	2.40E-09 <sup>(8)</sup>	1.09E-04	3.61E-05	6.90E-05 <sup>(8)</sup>
System 47	5.97E-09	5.58E-09	5.81E-09 <sup>(8)</sup>	2.49E-09	2.25E-09	2.39E-09 <sup>(8)</sup>	2.21E-04	1.93E-04	2.07E-04 <sup>(8)</sup>
Farm Pond Effluent	3.64E-08	9.80E-09	2.64E-08 <sup>(4)</sup>	2.50E-08	6.50E-09	1.45E-08 <sup>(4)</sup>	7.57E-05	9.33E-06	3.83E-05 <sup>(4)</sup>
Turbine Bldg. Sump	3.15E-08	6.79E-09	1.78E-08 <sup>(13)</sup>	4.10E-08	3.30E-09	1.30E-08 <sup>(13)</sup>	1.02E-04	1.01E-05	5.31E-05 <sup>(13)</sup>
Reactor Bldg. Sump	7.55E-08	5.98E-09	2.56E-08 <sup>(14)</sup>	5.09E-09	2.31E-09	3.07E-09 <sup>(14)</sup>	2.04E-02	2.26E-04	3.31E-03 <sup>(14)</sup>
Cooling Tower Blowdown	5.21E-08	1.05E-08	2.82E-08 <sup>(24)</sup>	4.93E-08	5.38E-09	1.48E-08 <sup>(24)</sup>	5.73E-04	5.54E-07	4.02E-05 <sup>(24)</sup>

REMARKS: \_\_\_\_\_

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NOTE: All activities are reported in  $\mu\text{Ci/ml}$ .

NOTE: 1.5E9 means  $1.5 \times 10^{+9}$ . Similarly,  $2.7\text{E}^{-7}$  means  $2.7 \times 10^{-7}$ .

NOTE: Circled values indicate the number of samples represented by the average.