

DUQUESNE LIGHT COMPANY  
Beaver Valley Power Station  
Unit 1 & Unit 2

Semi-Annual  
Radioactive Effluent Release Report  
For The 6-Month Period.  
July 1, 1991 thru December 31, 1991

DOQUESNE LIGHT COMPANY  
Beaver Valley Power Station  
Unit 1 & Unit 2

Semi- Annual Radioactive Effluent Release Report  
For The 6-Month Period:  
July 1, 1991 thru December 31, 1991

INDEX

Table No.	Title	Page
	Supplemental Information Page	1
Table 1A	Gaseous Effluents - Summation Of All Releases	2
Table 1B	Gaseous Effluents - Elevated Releases	3
Table 1C1	Gaseous Effluents - Ground Level Releases (Unit 1)	4
Table 1C2	Gaseous Effluents - Ground Level Releases (Unit 2)	5
Table 2A	Liquid Effluents - Summation Of All Releases	6
Table 2B	Liquid Effluents	7
Table 3	Solid Waste And Irradiated Fuel Shipments	8
Table 4	Lower Limits Of Detectability	9
Table 5A	Assessment Of Radiation Doses (Unit 1)	10
Table 5B	Assessment Of Radiation Doses (Unit 2)	11
Table 6	Technical Specification Effluent Monitoring Instrumentation Channels Not Returned To Operable Status Within 30 Days	12
Table 7	40 CFR 190 Environmental Doses	13
Table 8	Technical Specification Surveillance Deficiencies	14
Table 9	Unit 1 Offsite Dose Calculation Manual Changes (Description)	15
Table 10	Unit 2 Offsite Dose Calculation Manual Changes (Description)	16
Attachment 1	Joint Frequency Distribution Tables	

2nd Half - 1991

## SEMI-ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT

## SUPPLEMENTAL INFORMATION PAGE

FACILITY: B.V.P.S. Units 1 and 2

LICENSEE: Duquesne Light Company

## 1. Regulatory Limits

- a. Fission and activation gases: \*\*\*\*\*  
 b. Iodines: \*\*\*\*\*  
 c. Particulates, half-lives > 8 days: \*\*\*\*\* Technical Specifications, Article 3/4.11  
 d. Liquid effluents: \*\*\*\*\*

## 2. Maximum Permissible Concentrations

Provide the MPC's used in determining allowable release rates or concentrations.

- a. Fission and activation gases: \*\*\*\*\*  
 b. Iodines: \*\*\*\*\*  
 c. Particulates, half-lives > 8 days: \*\*\*\*\* 10 CFR 20 Appendix B, Table II  
 d. Liquid effluents: \*\*\*\*\*

## 3. Average Energy

Provide the average energy (E) of the radionuclide mixture in release of fission and activation gases, if applicable: ... NOT APPLICABLE

## 4. Measurements and Approximations of Total Radioactivity

Provide the methods used to measure or approximate the total radioactivity in effluents and the methods used to determine radionuclide composition.

- a. Fission and activation gases: Ge Gamma Spectrometry, Liquid Scintillation Counter  
 b. Iodines: Ge Gamma Spectrometry  
 c. Particulates, half-lives > 8 days: Ge Gamma Spectrometry, Low Background Proportional Counter  
 d. Liquid effluents: Ge Gamma Spectrometry, Low Background Proportional Counter, Liquid Scintillation Counter

## 5. Batch Releases

Provide the following information relating to batch releases of radioactive materials in liquid and gaseous effluents.

a. Liquid	3rd Quarter	4th Quarter
1. Number of batch releases:	34	20
2. Total time period for batch releases:	11257 minutes	6564 minutes
3. Maximum time period for a batch release:	1200 minutes	1080 minutes
4. Average time period for batch releases:	331 minutes	328 minutes
5. Minimum time period for a batch release:	58 minutes	66 minutes
6. Average river flow during periods of release:	9033 cuft/sec	17600 cuft/sec
b. Gaseous	3rd Quarter	4th Quarter
1. Number of batch releases:	12	12
2. Total time period for batch releases:	7513 minutes	11753 minutes
3. Maximum time period for a batch release:	1020 minutes	5570 minutes
4. Average time period for batch releases:	626 minutes	980 minutes
5. Minimum time period for a batch release:	102 minutes	237 minutes

## 6. Abnormal Releases

a. Liquid	3rd Quarter	4th Quarter
1. Number of releases:	1	NONE
2. Total activity released:	1.10E+06 Curies	0.00E+00 Curies
b. Gaseous	3rd Quarter	4th Quarter
1. Number of releases:	NONE	NONE
2. Total activity released:	0.00E+00 Curies	0.00E+00 Curies

TABLE 1A

2nd Half - 1991

## SEMI-ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT

## GASEOUS EFFLUENTS - SUMMATION OF ALL RELEASES

	Unit	3rd Quarter	4th Quarter	Est. total Error, %
--	------	----------------	----------------	------------------------

## A. Fission &amp; Activation Gases

1. Total release	Ci	2.59E+00	2.28E+00	2.65E+01
2. Average release rate for period	uCi/sec	3.29E-01	2.90E-01	
3. Percent of technical specification limit	%	N/A	N/A	

## B. Iodines

1. Total iodine - 131	Ci	0.00E+00	1.62E-05	2.83E+01
2. Average release rate for period	uCi/sec	0.00E+00	2.06E-06	
3. Percent of technical specification limit	%	N/A	N/A	

## C. Particulates

1. Particulates with half-lives > 8 days	Ci	2.04E-05	4.64E-05	3.00E+01
2. Average release rate for period	uCi/sec	2.59E-06	5.88E-06	
3. Percent of technical specification limit	%	N/A	N/A	
4. Gross alpha radioactivity	Ci	1.49E-06	9.92E-07	

## D. Tritium

1. Total release	Ci	4.96E+01	2.16E+01	3.29E+01
2. Average release rate for period	uCi/sec	6.29E+00	2.74E+00	
3. Percent of technical specification limit	%	N/A	N/A	

N/A = NOT APPLICABLE

The amount of time (in seconds) used to calculate the release rates specified in A.2, B.2, C.2 and D.2 is the average amount of seconds per calendar quarter (7.88E+6 seconds).

TABLE 1B

2nd Half - 1991

## SEMI-ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT

## GASROUS EFFLUENTS - ELEVATED RELEASES

		CONTINUOUS MODE		BATCH MODE	
		3rd	4th	3rd	4th
Nuclides released		Quarter	Quarter	Quarter	Quarter
1. Fission gases					
argon-41	Cl	LLD	LLD	LLD	LLD
krypton-85	Cl	LLD	LLD	1.52E-02	4.94E-01
krypton-85m	Cl	LLD	LLD	LLD	LLD
krypton-87	Cl	LLD	LLD	LLD	LLD
krypton-88	Cl	LLD	LLD	LLD	LLD
xenon-131m	Cl	LLD	LLD	4.14E-04	2.77E-03
xenon-133	Cl	1.55E-02	3.94E-02	6.27E-05	2.05E-02
xenon-133m	Cl	LLD	LLD	LLD	LLD
xenon-135	Cl	LLD	LLD	LLD	LLD
xenon-135m	Cl	LLD	LLD	LLD	LLD
xenon-138	Cl	LLD	LLD	LLD	LLD
unidentified	Cl	NONE	NONE	NONE	NONE
Total for period	Cl	1.55E-02	3.94E-02	1.57E-02	5.17E-01
2. Iodines					
iodine-131	Cl	LLD	2.10E-07	LLD	LLD
iodine-133	Cl	LLD	LLD	LLD	LLD
iodine-135	Cl	LLD	LLD	LLD	LLD
Total for period	Cl	0.00E+00	2.10E-07	0.00E+00	0.00E+00
3. Particulates					
manganese-54	Cl	LLD	LLD	LLD	LLD
iron-59	Cl	LLD	LLD	LLD	LLD
cobalt-58	Cl	LLD	LLD	LLD	LLD
cobalt-60	Cl	LLD	LLD	LLD	LLD
zinc-65	Cl	LLD	LLD	LLD	LLD
strontium-89	Cl	LLD	LLD	LLD	LLD
strontium-90	Cl	LLD	LLD	LLD	LLD
molybdenum-95	Cl	LLD	LLD	LLD	LLD
cesium-134	Cl	LLD	LLD	LLD	LLD
cesium-137	Cl	LLD	LLD	LLD	LLD
cerium-141	Cl	LLD	LLD	LLD	LLD
cerium-144	Cl	LLD	LLD	LLD	LLD
unidentified	Cl	NONE	NONE	NONE	NONE
Total for period	Cl	0.00E+00	0.00E+00	0.00E+00	0.00E+00

LLD = Below the lower limit of detectability, in uCi/cc (Table 4).



TABLE 1C-1

2nd Half - 1991

## SEMI-ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT

## GASEOUS EFFLUENTS - GROUND-LEVEL RELEASES

		CONTINUOUS MODE		BATCH MODE	
		3rd	4th	3rd	4th
Nuclides released		Quarter	Quarter	Quarter	Quarter
1. Fission gases					
krypton-85	Cl	8.89E-01	8.14E-01	LLD	3.08E-02
krypton-85m	Cl	LLD	LLD	LLD	LLD
krypton-87	Cl	LLD	LLD	LLD	LLD
krypton-88	Cl	LLD	LLD	LLD	LLD
xenon-131m	Cl	LLD	LLD	LLD	2.41E-03
xenon-133	Cl	6.36E-02	LLD	4.55E-01	6.16E-01
xenon-133m	Cl	LLD	LLD	LLD	LLD
xenon-135	Cl	LLD	LLD	LLD	4.49E-02
xenon-135m	Cl	LLD	LLD	LLD	LLD
xenon-136	Cl	LLD	LLD	LLD	LLD
unidentified	Cl	NONE	NONE	NONE	NONE
Total for period	Cl	9.53E-01	8.14E-01	4.55E-01	6.94E-01
2. Iodines					
iodine-131	Cl	LLD	1.60E-05	LLD	LLD
iodine-133	Cl	LLD	LLD	LLD	LLD
iodine-135	Cl	LLD	LLD	LLD	LLD
Total for period	Cl	0.00E+00	1.60E-05	0.00E+00	0.00E+00
3. Particulates					
manganese-54	Cl	LLD	LLD	LLD	LLD
iron-59	Cl	LLD	LLD	LLD	LLD
cobalt-58	Cl	LLD	4.55E-06	LLD	LLD
cobalt-60	Cl	LLD	3.31E-05	LLD	LLD
zinc-65	Cl	LLD	LLD	LLD	LLD
strontium-89	Cl	LLD	LLD	LLD	LLD
strontium-90	Cl	LLD	4.23E-07	LLD	LLD
molybdenum-99	Cl	LLD	LLD	LLD	LLD
cesium-134	Cl	LLD	LLD	LLD	LLD
cesium-137	Cl	2.00E-05	5.08E-06	LLD	LLD
cerium-141	Cl	LLD	1.45E-06	LLD	LLD
cerium-144	Cl	LLD	LLD	LLD	LLD
unidentified	Cl	NONE	NONE	NONE	NONE
Total for period	Cl	2.00E-05	4.46E-05	0.00E+00	0.00E+00

LLD = Below the lower limit of detectability, in uCi/cc (Table 4).

TABLE 1C-2

2nd Half - 1991

SEMI-ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT  
GASEOUS EFFLUENTS - GROUND-LEVEL RELEASES

		CONTINUOUS MODE		BATCH MODE	
		3rd	4th	3rd	4th
Nuclides released		Quarter	Quarter	Quarter	Quarter
1. Fission gases					
argon-41	Cl	LLD	1.36E-01	NR	NR
krypton-85	Cl	1.15E+00	2.17E-01	NR	NR
krypton-85m	Cl	LLD	LLD	NR	NR
krypton-87	Cl	LLD	LLD	NR	NR
krypton-88	Cl	LLD	LLD	NR	NR
xenon-131m	Cl	LLD	LLD	NR	NR
xenon-133	Cl	LLD	LLD	NR	NR
xenon-133m	Cl	LLD	LLD	NR	NR
xenon-135	Cl	LLD	LLD	NR	NR
xenon-135m	Cl	LLD	LLD	NR	NR
xenon-138	Cl	LLD	LLD	NR	NR
unidentified	Cl	NONE	NONE	NR	NR
Total for period	Cl	1.15E+00	2.17E-01	0.00E+00	0.00E+00
2. Iodines					
iodine-131	Cl	LLD	LLD	NR	NR
iodine-133	Cl	LLD	LLD	NR	NR
iodine-135	Cl	LLD	LLD	NR	NR
Total for period	Cl	0.00E+00	0.00E+00	0.00E+00	0.00E+00
3. Particulates					
manganese-54	Cl	LLD	LLD	NR	NR
iron-59	Cl	LLD	LLD	NR	NR
cobalt-58	Cl	LLD	LLD	NR	NR
cobalt-60	Cl	LLD	LLD	NR	NR
zinc-65	Cl	LLD	LLD	NR	NR
strontium-89	Cl	LLD	1.71E-06	NR	NR
strontium-90	Cl	LLD	3.60E-08	NR	NR
niobium-95m	Cl	4.42E-07	LLD	NR	NR
molybdenum-99	Cl	LLD	LLD	NR	NR
cesium-134	Cl	LLD	LLD	NR	NR
cesium-137	Cl	LLD	LLD	NR	NR
cerium-141	Cl	LLD	LLD	NR	NR
cerium-144	Cl	LLD	LLD	NR	NR
unidentified	Cl	NONE	NONE	NR	NR
Total for period	Cl	4.42E-07	1.75E-06	0.00E+00	0.00E+00

LLD = Below the lower limit of detectability, in uCi/cc (Table 4).

NR = No Releases this period

TABLE 2A

2nd Half - 1991

## SEMI-ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT

## LIQUID EFFLUENTS - SUMMATION OF ALL RELEASES

	Unit	3rd Quarter	4th Quarter	Est. total Error, %
A. Fission & activation products				
1. Total release (excluding H-3, gases & alpha)	Ci	8.18E-02	2.47E-02	2.60E+01
2. Average diluted concentration during period	uCi/ml	6.05E-08	5.29E-08	
3. Percent of applicable limit	%	N/A	N/A	
B. Tritium				
1. Total release	Ci	9.30E+01	1.37E+02	2.50E+01
2. Average diluted concentration during period	uCi/ml	6.87E-05	2.94E-04	
3. Percent of applicable limit	%	2.29E+00	9.79E+00	
C. Dissolved and entrained gases				
1. Total release	Ci	9.02E-04	2.91E-04	2.70E+01
2. Average diluted concentration during period	uCi/ml	6.67E-10	6.24E-10	
3. Percent of applicable limit	%	3.33E-04	3.12E-04	
D. Gross alpha radioactivity				
1. Total release	Ci	LLD	LLD	2.89E+01
E. Volume of waste released (prior to dilution)				
	liters	1.71E+06	9.81E+05	1.12E+01
F. Volume of dilution water used during period				
	liters	1.35E+09	4.66E+08	2.29E+01

N/A = NOT APPLICABLE

LLD = Below the lower limit of detectability, in uCi/ml (Table 4).

B.3 is based on a limit of 3.00E-3 uCi/ml.

C.3 is based on a limit of 2.00E-4 uCi/ml.

The values listed at F. are the volumes during the actual liquid waste discharge periods.  
 The total dilution volume for a continuous calendar quarter is approximately 1E+10 liters for BVPS-1 and BVPS-2. (ie; 22,000 GPM is the approximate combined cooling tower blowdown flowrates from the site)



TABLE 2B

2nd Half - 1991

## SEMI-ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT

## LIQUID EFFLUENTS

		CONTINUOUS MODE		BATCH MODE	
		3rd	4th	3rd	4th
Nuclides released		Quarter	Quarter	Quarter	Quarter
1. Fission and activation products					
beryllium-7	Cl	N/A	N/A	LLD	LLD
sodium-24	Cl	N/A	N/A	2.14E-03	2.04E-04
chromium-51	Cl	N/A	N/A	4.56E-04	LLD
manganese-54	Cl	N/A	N/A	2.59E-03	2.66E-04
iron-55	Cl	N/A	N/A	1.64E-02	1.41E-02
iron-59	Cl	N/A	N/A	2.43E-04	LLD
cobalt-57	Cl	N/A	N/A	4.62E-04	3.79E-05
cobalt-58	Cl	N/A	N/A	2.30E-02	9.88E-04
cobalt-60	Cl	N/A	N/A	3.18E-02	5.27E-03
zinc-65	Cl	N/A	N/A	LLD	LLD
strontium-89	Cl	N/A	N/A	LLD	LLD
strontium-90	Cl	N/A	N/A	LLD	2.84E-06
zirconium/niohium-95	Cl	N/A	N/A	4.31E-04	3.15E-05
niobium-97	Cl	N/A	N/A	3.38E-04	2.72E-04
molybdenum-99	Cl	N/A	N/A	LLD	LLD
technetium-99m	Cl	N/A	N/A	LLD	LLD
rubidium-103	Cl	N/A	N/A	LLD	LLD
silver-110m	Cl	N/A	N/A	3.53E-04	2.42E-04
antimony-124	Cl	N/A	N/A	2.51E-04	7.11E-05
antimony-125	Cl	N/A	N/A	3.26E-03	2.99E-03
iodine-131	Cl	N/A	N/A	LLD	LLD
iodine-133	Cl	N/A	N/A	LLD	LLD
cesium-134	Cl	N/A	N/A	LLD	LLD
cesium-137	Cl	N/A	N/A	5.48E-05	1.91E-04
barium/lanthanum-140	Cl	N/A	N/A	LLD	LLD
cerium-141	Cl	N/A	N/A	LLD	LLD
cerium-144	Cl	N/A	N/A	LLD	LLD
unidentified	Cl	N/A	N/A	NONE	NONE
Total for period	Cl	0.00E+00	0.00E+00	6.18E-02	2.47E-02

## 2. Dissolved and entrained gases

argon-41	Cl	N/A	N/A	LLD	LLD
krypton-85	Cl	N/A	N/A	7.11E-04	LLD
xenon-133	Cl	N/A	N/A	1.48E-04	2.68E-04
xenon-133m	Cl	N/A	N/A	LLD	LLD
xenon-135	Cl	N/A	N/A	4.34E-05	2.29E-05
unidentified	Cl	N/A	N/A	NONE	NONE
Total for period	Cl	0.00E+00	0.00E+00	9.02E-04	2.91E-04

LLD = Below the lower limit of detectability, in uCi/ml (Table 4).

N/A = NOT APPLICABLE (liquids not discharged in a continuous mode)

TABLE 3  
2nd Half - 1991  
SEMI-ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT  
SOLID WASTE AND IRRADIATED FUEL SHIPMENTS

A. SOLID WASTE SHIPPED OFFSITE FOR BURIAL OR DISPOSAL (Not irradiated fuel)

1. Type of Waste

Spent resins, Oil Filter sludges Swag, bottoms (3)	Dry comp. waste Contain. equipment etc. (2)	Irrad. components Control rods etc.	Estimated Total Error
--	---	---	-----------------------------

Container Volume	9.71E+01 cu. meter	3.61E+02 cu. meter	0.00E+00 cu. meter	3.00E+00 % (1)
Total Activity	3.82E+02 Curies	1.95E+01 Curies	0.00E+00 Curies	3.00E+01 %

2. Estimate of Major Nuclide Composition by Type of Waste (percent)

H-3	1.43E-01 %	4.13E+00 %	0.00E+00 %
C-14	1.54E-01 %	2.58E+00 %	0.00E+00 %
P-32	3.75E-06 %	3.71E-03 %	0.00E+00 %
Cr-51	1.25E-02 %	0.00E+00 %	0.00E+00 %
Mn-54	6.36E-01 %	4.43E-01 %	0.00E+00 %
Fe-55	2.36E+01 %	1.94E+01 %	0.00E+00 %
Fe-59	6.76E-05 %	1.10E-07 %	0.00E+00 %
Co-57	1.37E-01 %	2.13E-02 %	0.00E+00 %
Co-58	3.96E+00 %	4.80E+00 %	0.00E+00 %
Co-60	4.80E+01 %	1.48E+01 %	0.00E+00 %
Ni-59	1.13E-01 %	4.75E-01 %	0.00E+00 %
Ni-63	2.29E+01 %	4.53E+01 %	0.00E+00 %
Zn-65	6.52E-05 %	0.00E+00 %	0.00E+00 %
Sr-89	4.17E-05 %	1.51E-05 %	0.00E+00 %
Sr-90	6.58E-04 %	7.47E-02 %	0.00E+00 %
Nb-94	3.84E-03 %	0.00E+00 %	0.00E+00 %
Nb-95	2.82E-02 %	2.54E-02 %	0.00E+00 %
Zr-95	5.21E-02 %	8.66E-05 %	0.00E+00 %
Tc-99	1.40E-03 %	4.18E-02 %	0.00E+00 %
Ag-110m	2.32E-03 %	1.43E-02 %	0.00E+00 %
Sn-113	9.43E-04 %	0.00E+00 %	0.00E+00 %
Sb-124	0.00E+00 %	9.17E-05 %	0.00E+00 %
Sb-125	4.34E-02 %	3.9E-01 %	0.00E+00 %
I-129	2.31E-03 %	1.2E-02 %	0.00E+00 %
I-131	0.00E+00 %	7.4E-03 %	0.00E+00 %
Ba-133	0.00E+00 %	6.39E-07 %	0.00E+00 %
Cs-134	3.12E-03 %	1.31E+00 %	0.00E+00 %
Cs-137	1.76E-01 %	5.73E+00 %	0.00E+00 %
Ba-140	2.84E-09 %	3.62E-22 %	0.00E+00 %
Ce-144/Pr-144	3.20E-04 %	0.00E+00 %	0.00E+00 %
Ti-230	0.00E+00 %	1.55E-07 %	0.00E+00 %
Pu-238	3.65E-04 %	2.52E-03 %	0.00E+00 %
Pu-239/240	2.02E-04 %	1.49E-03 %	0.00E+00 %
Pu-241	2.41E-02 %	0.00E+00 %	0.00E+00 %
Am-241	1.29E-04 %	1.18E-03 %	0.00E+00 %
Cm-242	1.61E-04 %	3.07E-05 %	0.00E+00 %
Cm-243/244	1.35E-04 %	1.79E-03 %	0.00E+00 %

3. Number of Shipments

11	14	0
----	----	---

Type of Container Used	LSA	11	14	0
	Type A	0	0	0
	Type B	0	0	0
	Large Quantity	0	0	0

Solidification Agent Used	Cement	0	0	0
	Urea Formaldehyde	0	0	0
	None	11	14	0

Mode of Transport	Truck	11	14	0
	Rail	0	0	0

Final Destination	Barnwell, SC	2	0	0
	Oak Ridge, TN (2)	7	8	0
	Beatty, NV	2	0	0
	Wampum, PA	0	6	0

Waste Class per 10 CFR 61	Class A	8	14	0
	Class B	3	0	0
	Class C	0	0	0
	> Class C	0	0	0

B. No Irradiated Fuel Shipments

- (1) Since container volumes are provided by the burial site, a calculational error of zero is assumed.
- (2) For shipments of DAW: 1 went to Quadrex, 6 went to ALARON & 7 went to SEG for volume reduction. Therefore, the volume listed is the volume shipped. The total volume of DAW buried this period was 5.64E+1 cu. meters.
- (3) 2 shipments of Spent Resin, 3 shipments of Oil & 2 shipments of Sludge went to SEG for volume reduction. Therefore, the volume listed is the volume shipped. The total volume of this category buried this period was 8.63E+1 cu. meters.

TABLE 4

2nd Half - 1991

## SEMI-ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT

## LOWER LIMITS OF DETECTABILITY (LLD)

	* uCi/cc	uCi/ml	uCi/cc
	GAS	LIQUID	FILTER PAPER / CHARCOAL
	GRAB SAMPLE	GRAB SAMPLE	CONTINUOUS EFFLUENT SAMPLE
* NUCLIDE	(1000 cc)	(1000 ml)	(2.85E+8 cc) **
H-3	1.00E-06	1.00E-06	-----
Na-24	4.03E-07	2.66E-08	4.16E-13
Ar-41	3.83E-07	4.09E-08	-----
Cr-51	3.43E-06	2.02E-07	2.38E-12
Mn-54	3.04E-07	3.42E-08	1.98E-13
Fe-55	-----	* 1.00E-06	-----
Fe-59	6.80E-07	5.54E-08	6.03E-13
Co-57	2.37E-07	1.45E-08	1.41E-13
Co-58	3.74E-07	2.39E-08	1.83E-13
Co-60	4.86E-07	4.63E-08	2.66E-13
Zn-65	7.68E-07	3.90E-08	4.24E-13
Kr-85	3.92E-5 / *1.00E-10	9.24E-06	-----
Kr-85m	3.44E-07	1.92E-08	-----
Kr-87	7.17E-07	4.89E-08	-----
Kr-88	1.11E-06	6.32E-08	-----
Sr-89	-----	* 5.00E-08	* 1.00E-13
Sr-90	-----	* 5.00E-08	* 1.00E-14
Sr-92	4.06E-07	5.24E-08	3.31E-13
Nb-95	3.03E-07	2.46E-08	2.45E-13
Nb-97	3.99E-07	2.29E-08	3.07E-13
Zr-95	4.70E-07	3.99E-08	4.37E-13
Mo-99	2.94E-07	1.88E-08	1.26E-13
Tc-99m	2.86E-07	1.83E-08	1.22E-13
Ag-110m	4.14E-07	2.73E-08	3.19E-13
Sb-124	3.94E-07	2.60E-08	2.01E-13
Sb-126	1.21E-06	6.42E-08	6.92E-13
I-131	2.98E-07	1.67E-08	2.06E-13
I-133	3.92E-07	2.19E-08	2.48E-13
I-135	1.53E-06	1.22E-07	9.55E-13
Xe-131m	1.45E-05	7.29E-07	-----
Xe-133	5.77E-07	5.14E-08	-----
Xe-133m	2.50E-06	1.55E-07	-----
Xe-135	2.57E-07	1.98E-08	-----
Xe-135m	5.00E-07	2.77E-08	-----
Xe-138	7.91E-07	5.28E-08	-----
Ce-134	3.40E-07	2.45E-08	2.02E-13
Ce-137	5.92E-07	3.17E-08	3.08E-13
Ba-139	1.46E-06	1.02E-07	6.03E-13
Ba-140	1.29E-06	8.50E-08	1.00E-12
La-140	2.26E-07	3.15E-08	5.00E-13
Ce-141	4.53E-07	3.88E-08	2.97E-13
Ce-144	2.01E-06	1.30E-07	1.37E-12
Gross Alpha	-----	* 1.00E-07	1.72E-16

All LLDs listed above meet the minimum requirements listed in Tables 4.11-1 and 4.11-2 of the Technical Specifications.

\* Sample analyses performed by a contractor laboratory.

\*\* These LLD calculations contain a default weekly continuous sample volume of 2.85E+8 cc. Therefore, grab sample LLD values would reflect a different volume (ie: 10 cubic feet or 2.83E+5 cc).

Table 5A

2nd Half - 1991

SEMI-ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT  
ASSESSMENT OF RADIATION DOSES

UNIT 1		1st Quarter		2nd Quarter		3rd Quarter		4th Quarter		Year	
LIQUID EFFLUENTS		Dose	% of Tech Spec Limit	Dose	% of Tech Spec Limit	Dose	% of Tech Spec Limit	Dose	% of Tech Spec Limit	Dose	% of Tech Spec Limit
Batch Releases											
O R G A N (1)	BONE DOSE	7.81E-03	0.1562	3.68E-03	0.0736	2.27E-03	0.0454	3.53E-03	0.0706	1.73E-02	0.1729
	LIVER DOSE	1.09E-02	0.2180	5.25E-03	0.1050	2.44E-03	0.0488	5.51E-03	0.1102	2.41E-02	0.2410
	TOTAL BODY DOSE	7.26E-03	0.4840	3.57E-03	0.2380	2.19E-03	0.1460	3.86E-03	0.2573	1.69E-02	0.5627
	THYROID DOSE	1.18E-03	0.0236	1.53E-03	0.0307	8.16E-04	0.0163	9.07E-04	0.0182	4.44E-03	0.0444
	KIDNEY DOSE	3.95E-03	0.0790	1.92E-03	0.0384	1.11E-03	0.0222	2.34E-03	0.0468	9.32E-03	0.0932
	LUNG DOSE	2.71E-03	0.0542	2.79E-03	0.0558	1.15E-03	0.0230	1.55E-03	0.0310	8.20E-03	0.0820
	GI-LLI DOSE	1.22E-02	0.2440	1.18E-01	2.3520	2.11E-02	0.4212	7.33E-03	0.1465	1.58E-01	1.5819

UNIT 1		1st Quarter		2nd Quarter		3rd Quarter		4th Quarter		Year	
GASEOUS EFFLUENTS		Dose	% of Tech Spec Limit	Dose	% of Tech Spec Limit	Dose	% of Tech Spec Limit	Dose	% of Tech Spec Limit	Dose	% of Tech Spec Limit
Batch & Continuous Releases											
(2)	BETA AIR DOSE	1.28E-01	1.2800	2.97E-01	2.9660	1.34E-02	0.1335	1.03E-02	0.1025	4.48E-01	2.2410
(2)	GAMMA AIR DOSE	4.36E-02	0.8720	9.23E-02	1.8460	6.47E-04	0.0129	1.12E-03	0.0224	1.38E-01	1.3767
O R G A N (3)	BONE DOSE	4.61E-04	0.0061	3.91E-03	0.0521	6.83E-04	0.0091	3.13E-06	0.0000	5.05E-03	0.0337
	LIVER DOSE	2.57E-02	0.3427	4.29E-02	0.5720	7.47E-02	0.9960	1.08E-01	1.4400	2.51E-01	1.6753
	TOTAL BODY DOSE	2.55E-02	0.3400	4.18E-02	0.5573	7.45E-02	0.9933	1.08E-01	1.4400	2.50E-01	1.6653
	THYROID DOSE	1.53E-01	2.0400	1.99E-01	2.6533	7.52E-02	1.0027	1.09E-01	1.4533	5.36E-01	3.547
	KIDNEY DOSE	2.59E-02	0.3453	4.23E-02	0.5640	7.46E-02	0.9947	1.08E-01	1.4400	2.51E-01	1.6720
	LUNG DOSE	2.55E-02	0.3400	4.40E-02	0.5867	7.48E-02	0.9973	1.08E-01	1.4400	2.52E-01	1.6820
	GI-LLI DOSE	2.54E-02	0.3387	4.16E-02	0.5547	7.45E-02	0.9933	1.08E-01	1.4400	2.49E-01	1.6633

(1) These doses are listed in mrem; they are calculated for the maximum individual for all batch liquid effluents

(2) These doses are listed in mrad; they are calculated at the site boundary for batch &amp; continuous gaseous effluents (0.4 mi NW)

(3) These doses are listed in mrem; they are calculated for the most likely exposed real individual (child) via all real pathways at 0.89 mi NW.

Limits used for calculation of percent (%) are from Section 3/4.11, Article 3.11.1.2, 3.11.2.1, 3.11.2.2 and 3.11.2.3 of the Technical Specifications (considered to be the Design Objectives).



Table 5B

2nd Half - 1991

## SEMI-ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT

## ASSESSMENT OF RADIATION DOSES

UNIT 2		1st Quarter		2nd Quarter		3rd Quarter		4th Quarter		Year	
LIQUID EFFLUENTS											
Batch Releases		Dose	% of Tech Spec Limit	Dose	% of Tech Spec Limit	Dose	% of Tech Spec Limit	Dose	% of Tech Spec Limit	Dose	% of Tech Spec Limit
ORGAN (1)	BONE DOSE	7.81E-03	0.1562	3.66E-03	0.0736	2.27E-03	0.0454	3.53E-03	0.0706	1.73E-02	0.1729
	LIVER DOSE	1.09E-02	0.2180	5.25E-03	0.1050	2.44E-03	0.0488	5.51E-03	0.1102	2.41E-02	0.2410
	TOTAL BODY DOSE	7.26E-03	0.4640	3.57E-03	0.2380	2.19E-03	0.1460	3.86E-03	0.2573	1.69E-02	0.5627
	THYROID DOSE	1.18E-03	0.0236	1.53E-03	0.0307	8.16E-04	0.0163	9.07E-04	0.0182	4.44E-03	0.0444
	KIDNEY DOSE	3.95E-03	0.0790	1.92E-03	0.0384	1.11E-03	0.0222	2.34E-03	0.0468	9.32E-03	0.0932
	LUNG DOSE	2.71E-03	0.0542	2.79E-03	0.0558	1.15E-03	0.0230	1.55E-03	0.0310	8.20E-03	0.0820
	GI-LLI DOSE	1.22E-02	0.2440	1.16E-01	2.3520	2.11E-02	0.4212	7.33E-03	0.1465	1.58E-01	1.5819

UNIT 2		1st Quarter		2nd Quarter		3rd Quarter		4th Quarter		Year	
GASEOUS EFFLUENTS											
Batch & Continuous Releases		Dose	% of Tech Spec Limit	Dose	% of Tech Spec Limit	Dose	% of Tech Spec Limit	Dose	% of Tech Spec Limit	Dose	% of Tech Spec Limit
(2)	BETA AIR DOSE	8.69E-02	0.8695	1.78E-02	0.1785	9.54E-03	0.0955	9.15E-03	0.0916	1.23E-01	0.6175
(2)	GAMMA AIR DOSE	1.12E-02	0.2240	1.80E-03	0.0360	1.30E-04	0.0026	8.10E-05	0.0016	1.32E-02	0.1321
ORGAN (3)	BONE DOSE	4.31E-04	0.0057	4.29E-04	0.0057	7.35E-07	0.0000	0.00E+00	0.0000	8.61E-04	0.0057
	LIVER DOSE	7.77E-02	1.0360	6.22E-02	0.8293	4.43E-02	0.5907	4.10E-02	0.5467	2.25E-01	1.5013
	TOTAL BODY DOSE	7.78E-02	1.0373	6.23E-02	0.8307	4.43E-02	0.5907	4.10E-02	0.5467	2.25E-01	1.5027
	THYROID DOSE	7.77E-02	1.0360	6.22E-02	0.8293	4.43E-02	0.5907	4.10E-02	0.5467	2.25E-01	1.5013
	KIDNEY DOSE	7.77E-02	1.0360	6.22E-02	0.8293	4.43E-02	0.5907	4.10E-02	0.5467	2.25E-01	1.5013
	LUNG DOSE	7.77E-02	1.0360	6.22E-02	0.8293	4.43E-02	0.5907	4.10E-02	0.5467	2.25E-01	1.5013
	GI-LLI DOSE	7.77E-02	1.0360	6.22E-02	0.8293	4.43E-02	0.5907	4.10E-02	0.5467	2.25E-01	1.5013

- (1) These doses are listed in mrem; they are calculated for the maximum individual for all batch liquid effluents
- (2) These doses are listed in mrad; they are calculated at the site boundary for batch & continuous gaseous effluents (0.4 mi NW)
- (3) These doses are listed in mrem; they are calculated for the most likely exposed real individual (child) via all real pathways at 0.89 mi NW.

Limits used for calculation of percent (%) are from Section 3/4.11, Article 3.11.1.2, 3.11.2.1, 3.11.2.2 and 3.11.2.3 of the Technical Specifications (considered to be the Design Objectives).



TABLE 6

2nd Half - 1991

SEMI-ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT

TECHNICAL SPECIFICATION EFFLUENT MONITORING INSTRUMENTATION CHANNELS NOT RETURNED TO OPERABLE STATUS WITHIN 30 DAYS

There were no  
Technical Specification Effluent Monitoring Instrumentation Channels  
Not Returned To Operable Status Within 30 Days  
during this report period.

TABLE 7

2nd Half - 1991

## SEMI-ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT

## 40 CFR 190 ENVIRONMENTAL DOSES

Total Dose from all facility releases for the 12-month period  
January 1, 1991 thru December 31, 1991

ORGAN	DOSE (mrem)	% OF TECH. SPEC. LIMIT
BONE	4.05E-02	0.16%
LIVER	5.25E-01	2.10%
TOTAL BODY	6.60E-01	2.64%
THYROID	7.70E-01	1.03%
KIDNEY	4.95E-01	1.98%
LUNG	4.94E-01	1.98%
GI-LLI	7.92E-01	3.17%

The above cumulative dose contributions from liquid and gaseous effluents were determined in accordance with the applicable Technical Specifications and the ODCM.

Technical Specification 3.11.4.1 states: The dose or dose commitment to MEMBER(S) OF THE PUBLIC from all facility releases is limited to  $\leq 25$  mrem to the total body or any organ (except the thyroid, which is limited to  $\leq 75$  mrem) for a calendar year.

Note that an assessment of radiation doses from radioactive effluents to MEMBER(S) OF THE PUBLIC due to their activities inside the site boundary is not applicable.

TABLE 6

2nd Half - 1991

## SEMI-ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT

## TECHNICAL SPECIFICATION SURVEILLANCE DEFICIENCIES

As specified by Surveillance Requirement 4.11.2.1.2, Radioactive gaseous wastes shall be sampled and analyzed according to the sampling and analysis program of Table 4.11-2. Contrary to this, the following deficiency was observed during this report period:

The normal continuous particulate filter (47 mm filter paper) and iodine cartridge samples were not collected as required for the period 10/15/91 (1516 hrs) through 10/16/91 (0555 hrs) from the Unit 2 SLCRS Vent (Elevated Release) Effluent Monitor (2HVS-RQ-109).

However, for this same period, an alternate particulate sample (moving filter paper) was collected. This paper was analyzed for principal gamma emitters and no nuclides were identified. The moving paper was then analyzed by a contractor laboratory, and no composite nuclides (ie; Sr-89, Sr-90 and Gross Alpha) were identified.

As required, the two gas grab samples were collected during this period. These samples were analyzed for principal gamma emitters and no nuclides were identified.

There were no safety implications to the health and safety of the general public as a result of the failure to properly collect and analyze these samples. It should be noted that the upstream effluent pathway radiation monitors (4 airborne monitors) were in service and these monitors did not give any alarm conditions during the period of non Tech Spec sampling. This item is documented in Incident Report No. 2-91-029.

## TABLE 9

2nd Half - 1991

## SEMI-ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT

## UNIT 1 OFFSITE DOSE CALCULATION MANUAL CHANGES (DESCRIPTION)

There were no changes made to the  
Unit 1 Offsite Dose Calculation Manual  
during this report period

TABLE 10

2nd Half - 1991

SEMI-ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT

UNIT 2 OFFSITE DOSE CALCULATION MANUAL CHANGES (DESCRIPTION)

There were no changes made to the  
Unit 2 Offsite Dose Calculation Manual  
during this report period



BEAVER VALLEY - UNITS 1&2

ATTACHMENT 1

2nd Half - 1991

SEMI-ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT

JOINT FREQUENCY DISTRIBUTION TABLES

Table 1  
Beaver Valley Meteorological Data Recovery  
Third Quarter 1991

	<u>Continuous Release</u>	<u>Batch Release</u>	<u>Comments</u>
Joint delta-T (150ft-35ft)	98.1%	100.0%	There were ten hours of data loss due to moisture ingestion into the aspirators.
Joint delta-T (500ft-35ft)	98.2%	100.0%	There were ten hours of data loss due to moisture ingestion into the aspirators.

Beaver Valley  
Joint Frequency Distribution Tables  
for  
Continuous Releases

Delta T (150ft-35ft) and 35-Ft Wind  
and  
Delta T (500ft-35ft) and 500-Ft Wind

Third Quarter 1991

PROGRAM: JFD VERSION: PL-1.1

BEAVER VALLEY JFD - GROUND LEVEL CONTINUOUS RELEASE

SITE IDENTIFIER: DLBV2

DATA PERIOD EXAMINED: 7/ 1/91 - 9/30/91

\*\*\* 3RD AIR 1991 \*\*\*

# STABILITY CLASS A

STABILITY BASED ON: DELTA T BETWEEN 150.0 AND 35.0 FEET

WIND MEASURED AT: 35.0 FEET

WIND THRESHOLD AT: .75 MPH

JOINT FREQUENCY DISTRIBUTION OF WIND SPEED AND DIRECTION IN HOURS AT 35.00 FEET

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM																	0
.76- 3.50	2	15	2	6	3	4	11	3	4	3	1	1	4	4	8	11	81
3.51- 7.50	31	13	6	1	0	0	3	1	4	18	8	40	48	35	24	25	257
7.51-12.50	0	0	0	0	0	0	0	0	0	2	3	6	7	0	0	0	18
12.51-18.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18.51-24.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
>24.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	33	28	8	7	3	4	14	4	8	23	12	47	59	39	32	35	356

# STABILITY CLASS B

STABILITY BASED ON: DELTA T BETWEEN 150.0 AND 35.0 FEET

WIND MEASURED AT: 35.0 FEET

WIND THRESHOLD AT: .75 MPH

JOINT FREQUENCY DISTRIBUTION OF WIND SPEED AND DIRECTION IN HOURS AT 35.00 FEET

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM																	0
.76- 3.50	0	2	1	0	0	0	0	1	3	0	0	0	3	2	4	6	22
3.51- 7.50	3	0	0	0	0	0	0	0	1	3	2	14	9	2	0	6	40
7.51-12.50	0	0	0	0	0	0	0	0	0	0	3	8	0	0	0	0	11
12.51-18.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18.51-24.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
>24.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	3	2	1	0	0	0	0	1	4	3	5	22	12	4	4	12	73

PROGRAM: JFD VERSION: PC-1.1

BEAVER VALLEY JFD - GROUND LEVEL CONTINUOUS RELEASE

SITE IDENTIFIER: DLBVZ

DATA PERIOD EXAMINED: 7/ 1/91 - 9/30/91

\*\*\* 3RD QTR 1991 \*\*\*

# STABILITY CLASS C

STABILITY BASED ON: DELTA T BETWEEN 150.0 AND 35.0 FEET

WIND MEASURED AT: 35.0 FEET

WIND THRESHOLD AT: .75 MPH

JOINT FREQUENCY DISTRIBUTION OF WIND SPEED AND DIRECTION IN HOURS AT 35.00 FEET

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM	1	0	3	0	1	0	0	1	1	1	2	4	4	3	3	9	33
.76- 3.50	5	0	0	0	0	0	0	0	0	0	2	7	5	2	3	4	29
3.51- 7.50	0	0	0	0	0	0	0	0	0	0	5	4	0	0	0	9	9
7.51-12.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12.51-18.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18.51-24.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
>24.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	6	0	3	0	1	0	0	1	2	1	9	15	9	5	6	13	71

# STABILITY CLASS D

STABILITY BASED ON: DELTA T BETWEEN 150.0 AND 35.0 FEET

WIND MEASURED AT: 35.0 FEET

WIND THRESHOLD AT: .75 MPH

JOINT FREQUENCY DISTRIBUTION OF WIND SPEED AND DIRECTION IN HOURS AT 35.00 FEET

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM	20	19	8	8	7	11	6	6	8	11	13	34	40	34	26	28	279
.76- 3.50	10	3	1	0	0	0	0	1	7	10	33	57	24	17	11	8	112
3.51- 7.50	0	0	0	0	0	0	0	0	0	1	11	13	2	0	1	0	28
7.51-12.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12.51-18.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18.51-24.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
>24.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	30	22	9	8	7	11	6	7	15	22	57	104	66	51	38	36	450



PROGRAM: JFD VERSION: PC-1.1

BEAVER VALLEY JFD - GROUND LEVEL CONTINUOUS RELEASE

SITE IDENTIFIER: DLBV2

DATA PERIOD EXAMINED: 7/ 1/91 - 9/30/91

\*\*\* 3RD QTR 1991 \*\*\*

# STABILITY CLASS E

STABILITY BASED ON: DELTA T BETWEEN 150.0 AND 35.0 FEET

WIND MEASURED AT: 35.0 FEET

WIND THRESHOLD AT: .75 MPH

JOINT FREQUENCY DISTRIBUTION OF WIND SPEED AND DIRECTION IN HOURS AT 35.00 FEET

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM	15	18	21	20	27	25	27	28	54	48	23	20	13	16	16	24	16
.76- 3.50				1	0	0	0	0	2	16	24	15	5	0	0	3	397
3.51- 7.50	1	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	68
7.51-12.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
12.51-18.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18.51-24.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
>24.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	16	19	21	21	27	25	27	28	56	64	51	35	23	16	16	27	485

# STABILITY CLASS F

STABILITY BASED ON: DELTA T BETWEEN 150.0 AND 35.0 FEET

WIND MEASURED AT: 35.0 FEET

WIND THRESHOLD AT: .75 MPH

JOINT FREQUENCY DISTRIBUTION OF WIND SPEED AND DIRECTION IN HOURS AT 35.00 FEET

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM	2	2	3	12	38	60	66	65	32	15	4	1	3	0	0	1	35
.76- 3.50				0	0	0	0	0	1	0	1	0	0	0	0	0	394
3.51- 7.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
7.51-12.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12.51-18.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18.51-24.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
>24.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	2	2	3	12	38	60	66	65	33	15	5	1	3	0	0	1	341

PROGRAM: JFD VERSION: PC-1.1

BEAVER VALLEY JFD - GROUND LEVEL CONTINUOUS RELEASE

SITE IDENTIFIER: DLBV2

DATA PERIOD EXAMINED: 7/ 1/91 - 9/30/91

\*\*\* 3RD QTR 1991 \*\*\*

STABILITY CLASS G

STABILITY BASED ON: DELTA T BETWEEN 150.0 AND 35.0 FEET

WIND MEASURED AT: 35.0 FEET

WIND THRESHOLD AT: .75 MPH

JOINT FREQUENCY DISTRIBUTION OF WIND SPEED AND DIRECTION IN HOURS AT 35.00 FEET

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM																	16
.76- 3.50	1	0	1	2	21	76	135	75	20	3	1	0	0	0	0	0	335
3.51- 7.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
7.51-12.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12.51-18.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18.51-24.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
>24.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	1	0	1	2	21	76	135	75	20	4	1	0	0	0	0	0	352

STABILITY CLASS ALL

STABILITY BASED ON: DELTA T BETWEEN 150.0 AND 35.0 FEET

WIND MEASURED AT: 35.0 FEET

WIND THRESHOLD AT: .75 MPH

JOINT FREQUENCY DISTRIBUTION OF WIND SPEED AND DIRECTION IN HOURS AT 35.00 FEET

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM																	66
.76- 3.50	41	56	39	48	97	176	245	179	122	81	44	60	69	59	57	78	1451
3.51- 7.50	50	17	7	2	0	0	3	2	16	48	70	133	91	56	38	46	579
7.51-12.50	0	0	0	0	0	0	0	0	0	3	26	31	9	0	1	0	70
12.51-18.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18.51-24.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
>24.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	91	73	46	50	97	176	248	181	138	132	140	224	169	115	96	124	2166

PROGRAM: JFD VERSION: PC-1.1

BEAVER VALLEY JFD - GROUND LEVEL CONTINUOUS RELEASE

SITE IDENTIFIER: DLBV2

DATA PERIOD EXAMINED: 7/ 1/91 - 9/30/91

\*\*\* 3RD QTR 1991 \*\*\*

STABILITY BASED ON: DELTA T BETWEEN 150.0 AND 35.0 FEET

WIND MEASURED AT: 35.0 FEET

WIND THRESHOLD AT: .75 MPH

TOTAL NUMBER OF OBSERVATIONS: 2208

TOTAL NUMBER OF VALID OBSERVATIONS: 2166

TOTAL NUMBER OF MISSING OBSERVATIONS: 42

PERCENT DATA RECOVERY FOR THIS PERIOD: 98.1 %

MEAN WIND SPEED FOR THIS PERIOD: 2.9 MPH

TOTAL NUMBER OF OBSERVATIONS WITH BACKUP DATA: 0

# PERCENTAGE OCCURRENCE OF STABILITY CLASSES

A	B	C	D	E	F	G
16.44	3.37	3.28	22.62	22.30	15.74	16.25

# DISTRIBUTION OF WIND DIRECTION VS STABILITY

	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	CALM
A	33	28	8	7	3	4	14	4	8	23	12	47	59	39	32	35	0
B	3	2	1	0	0	0	0	1	4	3	5	22	12	4	4	12	0
C	6	0	3	0	1	0	0	1	2	1	9	15	9	5	6	13	0
D	30	22	9	8	7	11	6	7	15	22	57	104	66	51	38	36	1
E	16	19	21	21	27	25	27	28	56	64	51	35	20	16	16	27	14
F	2	2	3	12	38	60	66	65	33	15	5	1	3	0	0	1	35
G	1	0	1	2	21	76	135	75	20	4	1	0	0	0	0	0	16
TOTAL	91	73	46	50	97	176	248	181	138	132	140	224	169	115	96	124	66

BEAVER VALLEY JFD - ELEVATED CONTINUOUS RELEASE

SITE IDENTIFIER: DLBVZ

DATA PERIOD EXAMINED: 7/ 1/91 - 9/30/91

\*\*\* 3RD QTR 1991 \*\*\*

## STABILITY CLASS A

STABILITY BASED ON: DELTA T BETWEEN 500.0 AND 35.0 FEET

WIND MEASURED AT: 500.0 FEET

WIND THRESHOLD AT: .75 MPH

JOINT FREQUENCY DISTRIBUTION OF WIND SPEED AND DIRECTION IN HOURS AT 500.00 FEET

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NNW	TOTAL
CALM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
.76- 3.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3.51- 7.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7.51-12.50	1	1	3	0	1	1	0	0	1	0	0	0	0	0	0	8
12.51-18.50	0	0	2	0	0	0	0	1	0	0	0	0	0	0	0	3
18.51-24.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
>24.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	1	1	3	0	1	1	0	1	1	0	0	0	0	0	0	11

## STABILITY CLASS B

STABILITY BASED ON: DELTA T BETWEEN 500.0 AND 35.0 FEET

WIND MEASURED AT: 500.0 FEET

WIND THRESHOLD AT: .75 MPH

JOINT FREQUENCY DISTRIBUTION OF WIND SPEED AND DIRECTION IN HOURS AT 500.00 FEET

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NNW	TOTAL
CALM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
.76- 3.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3.51- 7.50	0	0	0	1	0	0	2	2	0	0	0	0	0	0	0	5
7.51-12.50	3	0	3	0	0	1	2	1	0	0	0	1	0	0	0	12
12.51-18.50	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	2
18.51-24.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
>24.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	3	0	3	1	0	1	4	4	0	0	0	1	0	1	0	19

PROGRAM: JFD VERSION: PC-1.1

BEAVER VALLEY JFD - ELEVATED CONTINUOUS RELEASE

SITE IDENTIFIER: DLBV2

DATA PERIOD EXAMINED: 7/ 1/91 - 9/30/91

\*\*\* 3RD QTR 1991 \*\*\*

# STABILITY CLASS C

STABILITY BASED ON: DELTA T BETWEEN 500.0 AND 35.0 FEET

WIND MEASURED AT: 500.0 FEET

WIND THRESHOLD AT: .75 MPH

JOINT FREQUENCY DISTRIBUTION OF WIND SPEED AND DIRECTION IN HOURS AT 500.00 FEET

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
.76- 3.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3.51- 7.50	3	0	2	1	2	2	1	0	0	0	0	3	4	5	3	1	17
7.51-12.50	6	2	2	2	0	0	3	2	0	0	0	3	4	5	3	2	34
12.51-18.50	1	1	0	1	0	0	1	0	0	0	0	1	0	3	0	0	8
18.51-24.00	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	1
>24.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	10	3	4	4	2	2	5	2	0	0	0	7	6	8	4	3	60

# STABILITY CLASS D

STABILITY BASED ON: DELTA T BETWEEN 500.0 AND 35.0 FEET

WIND MEASURED AT: 500.0 FEET

WIND THRESHOLD AT: .75 MPH

JOINT FREQUENCY DISTRIBUTION OF WIND SPEED AND DIRECTION IN HOURS AT 500.00 FEET

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM	4	10	4	5	8	4	4	7	5	3	8	11	3	5	9	6	96
.76- 3.50	19	9	16	13	11	6	6	11	14	17	16	35	48	42	25	21	309
3.51- 7.50	50	10	7	1	5	0	7	13	11	23	37	59	37	46	36	47	389
7.51-12.50	7	4	1	2	0	0	1	1	3	18	52	42	32	14	10	4	191
12.51-18.50	1	0	0	0	0	0	0	0	0	2	10	2	13	4	2	2	36
18.51-24.00	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
TOTAL	81	33	26	21	24	10	18	32	33	63	123	149	133	112	82	80	1022



BEAVER VALLEY JFD - ELEVATED CONTINUOUS RELEASE

SITE IDENTIFIER: DLB42

DATA PERIOD EXAMINED: 7/ 1/91 - 9/30/91

\*\*\* 3RD QTR 1991 \*\*\*

## STABILITY CLASS E

STABILITY BASED ON: DELTA T BETWEEN 500.0 AND 35.0 FEET

WIND MEASURED AT: 500.0 FEET

WIND THRESHOLD AT: .75 MPH

JOINT FREQUENCY DISTRIBUTION OF WIND SPEED AND DIRECTION IN HOURS AT 500.00 FEET

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM																	4
.76- 3.50	9	13	13	9	11	8	6	6	6	4	12	14	24	11	12	4	162
3.51- 7.50	18	17	20	14	16	5	12	6	11	8	15	28	33	25	8	4	240
7.51-12.50	22	9	3	3	4	5	10	8	11	14	25	16	26	8	13	6	183
12.51-18.50	7	6	8	0	0	0	5	3	7	13	21	4	1	2	0	4	91
18.51-24.00	0	0	0	0	0	0	1	0	0	2	7	0	0	0	0	0	10
>24.00	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
TOTAL	56	45	44	26	31	18	34	23	35	41	81	62	84	46	33	18	651

## STABILITY CLASS F

STABILITY BASED ON: DELTA T BETWEEN 500.0 AND 35.0 FEET

WIND MEASURED AT: 500.0 FEET

WIND THRESHOLD AT: .75 MPH

JOINT FREQUENCY DISTRIBUTION OF WIND SPEED AND DIRECTION IN HOURS AT 500.00 FEET

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM																	2
.76- 3.50	10	7	7	9	10	5	5	9	5	10	11	10	11	10	11	8	138
3.51- 7.50	11	4	17	16	8	5	2	3	5	4	12	16	13	21	3	6	146
7.51-12.50	3	4	1	5	2	3	0	0	2	6	16	5	1	4	0	2	54
12.51-18.50	2	2	0	0	2	0	0	0	0	6	9	0	1	0	0	0	22
18.51-24.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
>24.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	26	17	25	30	22	13	7	12	12	26	48	31	26	35	14	15	362

PROGRAM: JFD VERSION: PC-1.1

BEAVER VALLEY JFD - ELEVATED CONTINUOUS RELEASE

SITE IDENTIFIER: DLB2

DATA PERIOD EXAMINED: 7/ 1/91 - 9/30/91

\*\*\* 3RD QTR 1991 \*\*\*

# STABILITY CLASS: G

STABILITY BASED ON: DELTA T BETWEEN 500.0 AND 35.0 FEET

WIND MEASURED AT: 500.0 FEET

WIND THRESHOLD AT: .75 MPH

JOINT FREQUENCY DISTRIBUTION OF WIND SPEED AND DIRECTION IN HOURS AT 500.00 FEET

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM	1	0	0	3	1	0	1	0	0	0	0	0	0	0	0	0	1
.76- 3.50	0	0	0	0	0	1	1	1	0	0	1	0	1	0	0	0	6
3.51- 7.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
7.51-12.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
12.51-18.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18.51-24.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
>24.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	1	0	0	3	1	1	2	1	0	0	1	0	2	0	0	0	13

# STABILITY CLASS: ALL

STABILITY BASED ON: DELTA T BETWEEN 500.0 AND 35.0 FEET

WIND MEASURED AT: 500.0 FEET

WIND THRESHOLD AT: .75 MPH

JOINT FREQUENCY DISTRIBUTION OF WIND SPEED AND DIRECTION IN HOURS AT 500.00 FEET

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM	24	30	24	26	30	17	16	22	16	17	31	35	38	26	32	18	402
.76- 3.50	51	30	55	45	37	19	24	23	30	29	44	82	96	88	37	32	722
3.51- 7.50	85	26	19	11	12	10	22	24	25	43	78	84	69	63	53	57	681
7.51-12.50	17	13	11	3	2	0	7	6	10	37	82	47	34	20	10	8	307
12.51-18.50	1	0	0	0	0	0	1	0	0	4	17	2	14	4	2	2	47
18.51-24.00	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	2
>24.00	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	2
TOTAL	178	99	109	85	81	46	70	75	81	130	253	250	251	202	134	117	2168

PROGRAM: JFD      VERSION: PC-1.1

BEAVER VALLEY JFD - ELEVATED CONTINUOUS RELEASE  
 SITE IDENTIFIER: DLBV2  
 DATA PERIOD EXAMINED: 7/ 1/91 - 9/30/91

\*\*\* 3RD QTR 1991 \*\*\*

STABILITY BASED ON: DELTA T      BETWEEN 500.0 AND 35.0 FEET  
 WIND MEASURED AT: 500.0 FEET  
 WIND THRESHOLD AT: .75 MPH

TOTAL NUMBER OF OBSERVATIONS: 2208  
 TOTAL NUMBER OF VALID OBSERVATIONS: 2168  
 TOTAL NUMBER OF MISSING OBSERVATIONS: 40  
 PERCENT DATA RECOVERY FOR THIS PERIOD: 98.2 %  
 MEAN WIND SPEED FOR THIS PERIOD: 8.0 MPH  
 TOTAL NUMBER OF OBSERVATIONS WITH BACKUP DATA: 0

PERCENTAGE OCCURRENCE OF STABILITY CLASSES

A	B	C	D	E	F	G
.51	.88	2.77	47.14	31.41	16.70	.60

DISTRIBUTION OF WIND DIRECTION VS STABILITY

	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	CALM
A	1	1	5	0	1	1	0	1	1	0	0	0	0	0	0	0	0
B	3	0	3	1	0	1	4	4	0	0	0	1	0	1	1	0	0
C	10	3	4	4	2	2	5	2	0	0	0	7	6	8	4	3	0
D	81	33	28	21	24	10	18	32	33	63	123	149	133	112	82	80	0
E	56	45	44	26	31	18	34	23	35	41	81	62	84	46	33	18	4
F	26	17	25	30	22	13	7	12	12	26	48	31	26	35	14	16	2
G	1	0	0	3	1	1	2	1	0	0	1	0	2	0	0	0	1
TOTAL	177	99	109	85	81	46	70	75	81	130	253	250	251	202	134	117	7