



MIDWEST LABORATORY
700 LANDWEHR ROAD
NORTHBROOK, ILLINOIS 60062-7310
(708) 564-0700 FAX (708) 564-4517

REPORT
TO
IOWA ELECTRIC LIGHT AND POWER
CEDAR RAPIDS, IOWA

ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM
FOR THE
DUANE ARNOLD ENERGY CENTER
CEDAR RAPIDS, IOWA
Docket No. 50-331

ANNUAL REPORT - PART II
DATA TABULATIONS AND ANALYSES
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PREPARED AND SUBMITTED
BY
TELEDYNE ISOTOPES MIDWEST LABORATORY
PROJECT NO. 8001

Approved by:

L. G. Huebner / BG
L. G. Huebner
General Manager

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PDR ADOCK 05000331
R PDR

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1.0 INTRODUCTION

The following constitutes a Supplement to the Annual Report for the Radiological Environmental Monitoring Program conducted at the Duane Arnold Energy Center, Cedar Rapids, Iowa in 1991. Results of completed analyses are presented in the attached tables.

For information regarding sampling locations, type and frequency of collection, and sample codes, please see Tables 5.3 - 5.5 and Figures 5-1 and 5-2 of Part 1.

2.0 LISTING OF MISSED SAMPLES

Sample Type	Location	Expected Collection Date	Reason
Milk	D-93	01-08-91	Animal dry.
Milk	D-101	02-05-91	Animal dry.
Milk Air Particulate/ Air Iodine	D-101 D-1	03-05-91 03-28-91	Animal dry. Sample missing at time of collection.
Milk	D-101	04-02-91	Animal dry.
Milk	D-101	05-07-91	Animal dry.
Milk	D-101	05-21-91	Animal dry.
Milk	D-93	08-13-91	Sample lost during shipment.
Milk	D-94	08-13-91	Sample lost during shipment.
TLD	D-22	3rd Qtr. 1991	TLD lost in the field.
Milk	D-93	12-03-91	Animal dry.
Milk	D-101	12-03-91	Animal dry.
TLD	D-7	4th Qtr. 1991	TLD lost in the field.
TLD	D-22	4th Qtr. 1991	TLD lost in the field.

3.0 DATA TABLES

Table 1. Airborne particulates collected at Location D-1 (Cedar Rapids), analysis for gross beta. Collection: Weekly.

Date Collected	Volume (m ³)	Gross Beta (pCi/m ³)	Date Collected	Volume (m ³)	Gross Beta (pCi/m ³)
01-10-91	285	0.044±0.004	07-10-91	293	0.020±0.003
01-17-91	285	0.046±0.004	07-17-91	293	0.021±0.003
01-24-91	286	0.028±0.004	07-25-91 ^c	331	0.033±0.004
01-31-91	285	0.032±0.004	08-01-91	291	0.017±0.003
02-07-91	286	0.035±0.003	08-08-91	290	0.026±0.003
02-14-91	286	0.024±0.004	08-15-91	294	0.022±0.003
02-21-91	285	0.022±0.003	08-22-91	291	0.031±0.003
02-28-91	285	0.022±0.003	08-29-91	292	0.038±0.004
03-07-91	286	0.029±0.004	09-05-91	291	0.019±0.003
03-14-91	285	0.023±0.003	09-11-91 ^b	249	0.025±0.004
03-21-91	285	0.020±0.003	09-19-91 ^c	334	0.020±0.003
03-28-91	ND ^a	--	09-26-91	292	0.017±0.002
			10-03-91	291	0.029±0.004
1st Qtr. mean ± s.d.		0.030±0.009	3rd Qtr. mean ± s.d.		0.024±0.007
04-04-91	293	0.016±0.003	10-10-91	290	0.022±0.003
04-11-91	292	0.018±0.003	10-17-91	280	0.015±0.003
04-18-91	294	0.018±0.003	10-24-91	282	0.032±0.004
04-24-91 ^b	251	0.012±0.003	10-31-91	278	0.014±0.003
05-02-91 ^c	337	0.015±0.002	11-07-91	281	0.027±0.004
05-09-91	294	0.012±0.003	11-14-91	280	0.030±0.004
05-16-91	294	0.017±0.003	11-21-91	280	0.028±0.004
05-23-91	294	0.011±0.003	11-27-91 ^b	240	0.022±0.004
05-30-91	293	0.014±0.003	12-05-91 ^c	319	0.026±0.003
06-06-91	295	0.011±0.003	12-12-91	280	0.032±0.004
06-12-91 ^b	252	0.017±0.003	12-19-91	281	0.024±0.004
06-20-91 ^c	336	0.018±0.003	12-26-91	277	0.023±0.004
06-26-91 ^b	250	0.018±0.003	01-02-92	281	0.036±0.004
07-03-91	288	0.023±0.002			
2nd Qtr. mean ± s.d.		0.016±0.003	4th Qtr. mean ± s.d.		0.025±0.006

^a ND = No data; sample missing at time of collection.

^b Six day collection.

^c Eight day collection.

Table 2. Airborne particulates collected at Location D-2 (Marion), analysis for gross beta and iodine-131.^a Collection: Weekly.

Date Collected	Volume (m ³)	Gross Beta (pCi/m ³)	Date Collected	Volume (m ³)	Gross Beta (pCi/m ³)
01-10-91	285	0.047±0.004	07-10-91	290	0.019±0.003
01-17-91	285	0.051±0.004	07-17-91	287	0.019±0.003
01-24-91	289	0.034±0.004	07-25-91 ^d	331	0.025±0.003
01-31-91	223	0.006±0.003 ^b	08-01-91	287	0.016±0.003
02-07-91	255	0.026±0.003	08-08-91	287	0.021±0.003
02-14-91	285	0.019±0.003	08-15-91	290	0.019±0.003
02-21-91	285	0.018±0.003	08-22-91	288	0.029±0.003
02-28-91	286	0.022±0.003	08-29-91	288	0.030±0.004
03-07-91	286	0.024±0.003	09-05-91	288	0.016±0.003
03-14-91	291	0.019±0.003	09-11-91 ^c	249	0.025±0.004
03-21-91	291	0.015±0.003	09-19-91 ^d	328	0.018±0.003
03-28-91	292	<u>0.014±0.003</u>	09-26-91	289	0.016±0.002
			10-03-91	288	<u>0.025±0.004</u>
1st Qtr. mean ± s.d.		0.025±0.013	3rd Qtr. mean ± s.d.		0.021±0.005
04-04-91	291	0.018±0.003	10-10-91	288	0.024±0.004
04-11-91	289	0.015±0.003	10-17-91	289	0.020±0.003
04-18-91	292	0.013±0.003	10-24-91	292	0.031±0.004
04-24-91 ^c	251	0.011±0.003	10-31-91	276	0.016±0.003
05-02-91 ^d	331	0.016±0.003	11-07-91	275	0.028±0.004
05-09-91	291	0.010±0.003	11-14-91	277	0.027±0.004
05-16-91	292	0.016±0.003	11-21-91	277	0.028±0.004
05-23-91	291	0.009±0.003	11-27-91 ^c	238	0.019±0.004
05-30-91	292	0.012±0.003	12-05-91 ^d	316	0.026±0.003
06-06-91	292	0.010±0.003	12-12-91	278	0.027±0.004
06-12-91 ^c	248	0.012±0.003	12-19-91	276	0.027±0.004
06-20-91 ^d	334	0.015±0.003	12-26-91	277	0.020±0.004
06-26-91 ^c	247	0.017±0.003	01-02-92	281	<u>0.036±0.004</u>
07-03-91	286	<u>0.021±0.002</u>			
2nd Qtr. mean ± s.d.		0.014±0.003	4th Qtr. mean ± s.d.		0.025±0.005

^a Iodine-131 concentrations are <0.07 pCi/m³ unless noted otherwise.

^b Filter very light; pump malfunction.

^c Six day collection.

^d Eight day collection.

Table 3. Airborne particulates collected at Location D-3 (Hiawatha), analysis for gross beta. Collection: Weekly.

Date Collected	Volume (m ³)	Gross Beta (pCi/m ³)	Date Collected	Volume (m ³)	Gross Beta (pCi/m ³)
01-10-91	285	0.041±0.004	07-10-91	287	0.019±0.003
01-17-91	285	0.040±0.004	07-17-91	284	0.020±0.003
01-24-91	288	0.028±0.004	07-25-91 ^b	327	0.032±0.004
01-31-91	283	0.027±0.004	08-01-91	285	0.017±0.003
02-07-91	287	0.032±0.003	08-08-91	283	0.025±0.003
02-14-91	285	0.019±0.003	08-15-91	288	0.024±0.003
02-21-91	285	0.016±0.003	08-22-91	285	0.032±0.003
02-28-91	286	0.022±0.003	08-29-91	285	0.039±0.004
03-07-91	268	0.031±0.004	09-05-91	285	0.021±0.003
03-14-91	286	0.019±0.003	09-11-91 ^a	245	0.030±0.004
03-21-91	285	0.020±0.003	09-19-91 ^b	326	0.020±0.003
03-28-91	285	<u>0.017±0.003</u>	09-26-91	286	0.017±0.002
			10-03-91	285	<u>0.031±0.004</u>
1st Qtr. mean ± s.d.		0.026±0.009	3rd Qtr. mean ± s.d.		0.025±0.007
04-04-91	285	0.019±0.003	10-10-91	286	0.024±0.004
04-11-91	295	0.020±0.003	10-17-91	296	0.019±0.003
04-18-91	297	0.019±0.003	10-24-91	299	0.032±0.004
04-24-91 ^a	255	0.016±0.004	10-31-91	297	0.017±0.003
05-02-91 ^b	339	0.018±0.003	11-07-91	297	0.024±0.003
05-09-91	296	0.010±0.003	11-14-91	297	0.027±0.003
05-16-91	298	0.024±0.003	11-21-91	296	0.030±0.004
05-23-91	297	0.016±0.003	11-27-91 ^a	255	0.022±0.004
05-30-91	297	0.019±0.003	12-05-91 ^b	339	0.025±0.003
06-06-91	297	0.014±0.003	12-12-91	296	0.027±0.004
06-12-91 ^a	254	0.023±0.004	12-19-91	299	0.024±0.003
06-20-91 ^b	339	0.022±0.003	12-26-91	297	0.024±0.004
06-26-91 ^a	255	0.025±0.004	01-02-92	298	<u>0.035±0.004</u>
07-03-91	295	0.026±0.002			
2nd Qtr. mean ± s.d.		0.019±0.004	4th Qtr. mean ± s.d.		0.025±0.005

^a Six day collection.

^b Eight day collection.

Table 4. Airborne particulates collected at Location D-5 (Palo), analysis for gross beta and iodine-131^a. Collection: Weekly.

Date Collected	Volume (m ³)	Gross Beta (pCi/m ³)	Date Collected	Volume (m ³)	Gross Beta (pCi/m ³)
01-10-91	284	0.050±0.004	07-10-91	288	0.023±0.004
01-17-91	286	<0.003 ^b	07-17-91	286	0.021±0.003
01-24-91	286	0.027±0.004	07-25-91 ^d	326	0.032±0.004
01-31-91	285	0.032±0.004	08-01-91	287	0.019±0.003
02-07-91	285	0.035±0.003	08-08-91	283	0.024±0.003
02-14-91	284	0.021±0.003	08-15-91	286	0.023±0.003
02-21-91	285	0.021±0.003	08-22-91	287	0.035±0.003
02-28-91	286	0.022±0.003	08-29-91	285	0.044±0.004
03-07-91	300	0.030±0.004	09-05-91	285	0.022±0.003
03-14-91	300	0.021±0.003	09-11-91 ^c	245	0.038±0.005
03-21-91	299	0.017±0.003	09-19-91 ^d	325	0.024±0.003
03-28-91	300	<u>0.022±0.003</u>	09-26-91	286	0.020±0.002
			10-03-91	282	<u>0.027±0.004</u>
1st Qtr. mean ± s.d.		0.027±0.009	3rd Qtr. mean ± s.d.		0.027±0.008
04-04-91	299	0.022±0.003	10-10-91	282	0.023±0.004
04-11-91	298	0.020±0.003	10-17-91	282	0.019±0.003
04-18-91	300	0.018±0.003	10-24-91	285	0.026±0.004
04-24-91 ^c	257	0.013±0.003	10-31-91	281	0.015±0.003
05-02-91 ^d	342	0.016±0.003	11-07-91	284	0.028±0.004
05-09-91	300	0.011±0.003	11-14-91	282	0.025±0.003
05-16-91	299	0.021±0.003	11-21-91	283	0.030±0.004
05-23-91	300	0.015±0.003	11-27-91 ^c	242	0.021±0.004
05-30-91	299	0.018±0.003	12-05-91 ^d	322	0.027±0.003
06-06-91	300	0.014±0.003	12-12-91	281	0.030±0.004
06-12-91 ^c	257	0.018±0.003	12-19-91	284	0.025±0.004
06-20-91 ^d	343	0.019±0.003	12-26-91	284	<0.004 ^e
06-26-91 ^c	243	0.023±0.004	01-02-92	282	<u>0.037±0.004</u>
07-03-91	284	0.020±0.002			
2nd Qtr. mean ± s.d.		0.018±0.004	4th Qtr. mean ± s.d.		0.026±0.006

^a Iodine-131 concentrations are <0.07 pCi/m³ unless noted otherwise.

^b Sample very light; bad seal.

^c Six day collection.

^d Eight day collection.

^e Filter very light; possible pump malfunction.

Table 5. Airborne particulates collected at Location D-6 (Center Point), analysis for gross beta. Collection: Weekly.

Date Collected	Volume (m ³)	Gross Beta (pCi/m ³)	Date Collected	Volume (m ³)	Gross Beta (pCi/m ³)
01-10-91	284	0.059±0.005	07-10-91	288	0.022±0.004
01-17-91	287	0.062±0.005	07-17-91	286	0.020±0.003
01-24-91	288	0.040±0.004	07-25-91 ^b	326	0.032±0.004
01-31-91	284	0.045±0.004	08-01-91	287	0.019±0.003
02-07-91	285	0.048±0.003	08-08-91	283	0.027±0.004
02-14-91	286	0.032±0.004	08-15-91	286	0.021±0.003
02-21-91	285	0.028±0.004	08-22-91	287	0.032±0.003
02-28-91	286	0.035±0.004	08-29-91	284	0.033±0.004
03-07-91	298	0.029±0.004	09-05-91	285	0.022±0.003
03-14-91	297	0.021±0.003	09-11-91 ^a	245	0.029±0.004
03-21-91	296	0.019±0.003	09-19-91 ^b	324	0.019±0.003
03-28-91	297	<u>0.019±0.003</u>	09-26-91	286	0.016±0.002
			10-03-91	95 ^c	<u>0.018±0.008</u>
1st Qtr. mean ± s.d.		0.036±0.015	3rd Qtr. mean ± s.d.		0.024±0.006
04-04-91	297	0.020±0.003	10-10-91	288	0.022±0.003
04-11-91	295	0.022±0.003	10-17-91	288	0.020±0.003
04-18-91	297	0.016±0.003	10-24-91	291	0.033±0.004
04-24-91 ^a	254	0.016±0.004	10-31-91	301	0.013±0.003
05-02-91 ^b	336	0.019±0.003	11-07-91	303	0.025±0.003
05-09-91	297	0.013±0.003	11-14-91	302	0.031±0.004
05-16-91	297	0.024±0.003	11-21-91	262	0.030±0.004
05-23-91	298	0.014±0.003	11-27-91 ^a	260	0.022±0.004
05-30-91	296	0.018±0.003	12-05-91 ^b	345	0.028±0.003
06-06-91	298	0.017±0.003	12-12-91	302	0.031±0.004
06-12-91 ^a	253	0.019±0.003	12-19-91	303	0.026±0.003
06-20-91 ^b	340	0.021±0.003	12-26-91	304	0.026±0.004
06-26-91 ^a	243	0.023±0.004	01-02-92	295	<u>0.039±0.004</u>
07-03-91	284	<u>0.024±0.002</u>			
2nd Qtr. mean ± s.d.		0.019±0.004	4th Qtr. mean ± s.d.		0.027±0.007

^a Six day collection.

^b Eight day collection.

^c Low volume due to power interruption at pump site.

Table 6. Airborne particulates collected at Location D-7 (Shellsburg), analysis for gross beta and iodine-131.^a Collection: Weekly.

Date Collected	Volume (m ³)	Gross Beta (pCi/m ³)	Date Collected	Volume (m ³)	Gross Beta (pCi/m ³)
01-10-91	284	0.036±0.004	07-10-91	285	0.023±0.004
01-17-91	287	0.045±0.004	07-17-91	283	0.021±0.003
01-24-91	286	0.032±0.004	07-25-91 ^c	322	0.032±0.004
01-31-91	285	0.030±0.004	08-01-91	284	0.018±0.003
02-07-91	285	0.031±0.003	08-08-91	275	0.022±0.003
02-14-91	281	0.021±0.003	08-15-91	283	0.024±0.003
02-21-91	285	0.018±0.003	08-22-91	282	0.034±0.003
02-28-91	286	0.017±0.003	08-29-91	280	0.040±0.004
03-07-91	286	0.023±0.003	09-05-91 ^b	282	0.018±0.003
03-14-91	268	0.018±0.003	09-11-91 ^c	242	0.033±0.004
03-21-91	268	0.015±0.003	09-19-91	322	0.020±0.003
03-28-91	268	<u>0.020±0.004</u>	09-26-91	283	0.018±0.002
			10-03-91	291	<u>0.030±0.004</u>
1st Qtr. mean ± s.d.		0.026±0.009	3rd Qtr. mean ± s.d.		0.026±0.007
04-04-91	268	0.020±0.003	10-10-91	290	0.023±0.004
04-11-91	267	0.018±0.003	10-17-91	291	0.021±0.003
04-18-91	268	0.018±0.003	10-24-91	294	0.032±0.004
04-24-91 ^b	230	0.017±0.004	10-31-91	290	0.015±0.003
05-02-91 ^c	307	0.016±0.003	11-07-91	292	0.024±0.003
05-09-91	269	0.010±0.003	11-14-91	290	0.029±0.004
05-16-91	268	0.021±0.004	11-21-91	292	0.029±0.004
05-23-91	269	0.014±0.003	11-27-91 ^b	250	0.024±0.004
05-30-91	268	0.016±0.004	12-05-91 ^c	333	0.028±0.003
06-06-91	268	0.016±0.003	12-12-91	290	0.031±0.004
06-12-91 ^b	230	0.020±0.004	12-19-91	291	0.024±0.003
06-20-91 ^c	307	0.019±0.003	12-26-91	293	0.022±0.004
06-26-91 ^b	241	0.019±0.004	01-02-92	290	<u>0.043±0.004</u>
07-03-91	281	<u>0.023±0.002</u>			
2nd Qtr. mean ± s.d.		0.018±0.003	4th Qtr. mean ± s.d.		0.026±0.007

^a Iodine-131 concentrations are <0.07 pCi/m³ unless noted otherwise.

^b Six day collection.

^c Eight day collection.

Table 7. Airborne particulates collected at Location D-8, (Urbana), analysis for gross beta and iodine-131^a. Collection: Weekly.

Date Collected	Volume (m ³)	Gross Beta (pCi/m ³)	Date Collected	Volume (m ³)	Gross Beta (pCi/m ³)
01-10-91	284	0.045±0.004	07-10-91	291	0.018±0.003
01-17-91	286	0.047±0.004	07-17-91	292	0.024±0.003
01-24-91	287	0.032±0.004	07-25-91 ^c	332	0.028±0.003
01-31-91	285	0.028±0.004	08-01-91	293	0.014±0.003
02-07-91	285	0.032±0.003	08-08-91	287	0.020±0.003
02-14-91	286	0.022±0.003	08-15-91	292	0.021±0.003
02-21-91	285	0.022±0.003	08-22-91	292	0.032±0.003
02-28-91	285	0.020±0.003	08-29-91	290	0.039±0.004
03-07-91	286	0.028±0.004	09-05-91	291	0.018±0.003
03-14-91	268	0.021±0.004	09-11-91 ^b	250	0.028±0.004
03-21-91	268	0.021±0.003	09-19-91 ^c	334	0.016±0.003
03-28-91	266	<u>0.021±0.004</u>	09-26-91	292	0.017±0.002
			10-03-91	291	<u>0.028±0.004</u>
1st Qtr. mean ± s.d.		0.028±0.009	3rd Qtr. mean ± s.d.		0.023±0.007
04-04-91	268	0.021±0.003	10-10-91	290	0.021±0.003
04-11-91	267	0.018±0.003	10-17-91	276	0.017±0.003
04-18-91	268	0.016±0.003	10-24-91	280	<0.003 ^d
04-24-91 ^b	230	0.015±0.004	10-31-91	276	0.015±0.003
05-02-91 ^c	307	0.017±0.003	11-07-91	278	0.027±0.004
05-09-91	269	0.010±0.003	11-14-91	277	0.027±0.004
05-16-91	268	0.026±0.004	11-21-91	277	0.031±0.004
05-23-91	269	0.014±0.003	11-27-91 ^b	238	0.019±0.004
05-30-91	268	0.015±0.003	12-05-91 ^c	316	0.028±0.003
06-06-91	268	0.013±0.003	12-12-91	276	0.030±0.004
06-12-91 ^b	230	0.016±0.004	12-19-91	268	0.025±0.004
06-20-91 ^c	306	0.019±0.003	12-26-91	278	0.024±0.004
06-26-91 ^b	225	0.021±0.004	01-02-92	276	<u>0.028±0.004</u>
07-03-91	290	<u>0.017±0.002</u>			
2nd Qtr. mean ± s.d.		0.017±0.004	4th Qtr. mean ± s.d.		0.024±0.005

^a Iodine-131 concentrations are <0.07 pCi/m³ unless noted otherwise.

^b Six day collection.

^c Eight day collection.

^d Filter white; possible pump malfunction.

Table 8. Airborn. particulates collected at Location D-10 (Atkins), analysis for gross beta. Collection: Weekly.

Date Collected	Volume (m ³)	Gross Beta (pCi/m ³)	Date Collected	Volume (m ³)	Gross Beta (pCi/m ³)
01-10-91	262	0.058±0.005	07-10-91	295	0.023±0.003
01-17-91	263	0.057±0.005	07-17-91	294	0.022±0.003
01-24-91	262	0.037±0.004	07-25-91 ^b	334	0.029±0.003
01-31-91	263	0.037±0.004	08-01-91	294	0.018±0.003
02-07-91	263	0.045±0.003	08-08-91	292	0.023±0.003
02-14-91	262	0.027±0.004	08-15-91	297	0.025±0.003
02-21-91	282	0.024±0.003	08-22-91	294	0.031±0.003
02-28-91	263	0.027±0.004	08-29-91	294	0.039±0.004
03-07-91	276	0.034±0.004	09-05-91	294	0.018±0.003
03-14-91	263	0.023±0.004	09-11-91 ^a	251	0.022±0.004
03-21-91	263	0.020±0.003	09-19-91 ^b	335	0.021±0.003
03-28-91	263	<u>0.021±0.004</u>	09-26-91	295	0.018±0.002
			10-03-91	294	<u>0.027±0.004</u>
1st Qtr. mean ± s.d.		0.034±0.013	3rd Qtr. mean ± s.d.		0.024±0.006
04-04-91	284	0.017±0.003	10-10-91	293	0.025±0.004
04-11-91	284	0.016±0.003	10-17-91	309	0.015±0.003
04-18-91	286	0.015±0.003	10-24-91	310	0.034±0.004
04-24-91 ^a	244	0.010±0.003	10-31-91	307	0.018±0.003
05-02-91 ^b	325	0.015±0.003	11-07-91	310	0.030±0.004
05-09-91	288	0.010±0.003	11-14-91	308	0.038±0.004
05-16-91	284	0.023±0.004	11-21-91	308	0.032±0.004
05-23-91	285	0.016±0.003	11-27-91 ^a	264	0.024±0.004
05-30-91	205	0.015±0.003	12-05-91 ^b	352	0.034±0.003
06-06-91	288	0.012±0.003	12-12-91	309	0.036±0.004
06-12-91 ^a	242	0.016±0.003	12-19-91	309	0.033±0.004
06-20-91 ^b	326	0.021±0.003	12-26-91	307	0.035±0.004
06-26-91 ^a	243	0.020±0.004	01-02-92	308	<u>0.045±0.004</u>
07-03-91	292	<u>0.025±0.002</u>			
2nd Qtr. mean ± s.d.		0.016±0.004	4th Qtr. mean ± s.d.		0.031±0.008

^a Six day collection.

^b Eight day collection.

Table 9. Airborne particulates collected at Location D-11 (Toddville), analysis for gross beta and iodine-131.^a Collection: Weekly.

Date Collected	Volume (m ³)	Gross Beta (pCi/m ³)	Date Collected	Volume (m ³)	Gross Beta (pCi/m ³)
01-10-91	282	0.037±0.004	07-10-91	295	0.021±0.003
01-17-91	282	0.045±0.004	07-17-91	293	0.021±0.003
01-24-91	286	0.024±0.004	07-25-91 ^c	337	0.032±0.004
01-31-91	280	0.026±0.004	08-01-91	294	0.016±0.003
02-07-91	283	0.034±0.003	08-08-91	292	0.026±0.003
02-14-91	280	0.016±0.003	08-15-91	296	0.021±0.003
02-21-91	281	0.016±0.003	08-22-91	291	0.032±0.003
02-28-91	283	0.018±0.003	08-29-91	293	0.043±0.004
03-07-91	283	0.022±0.003	09-05-91	294	0.020±0.003
03-14-91	283	0.018±0.003	09-11-91 ^b	253	0.032±0.004
03-21-91	283	0.014±0.003	09-19-91 ^c	334	0.018±0.003
03-28-91	283	<u>0.008±0.003</u>	09-26-91	295	0.018±0.002
			10-03-91	293	<u>0.026±0.004</u>
1st Qtr. mean ± s.d.		0.023±0.011	3rd Qtr. mean ± s.d.		0.025±0.008
04-04-91	291	0.016±0.003	10-10-91	294	0.018±0.003
04-11-91	288	0.020±0.003	10-17-91	293	0.018±0.003
04-18-91	292	0.014±0.003	10-24-91	288	0.029±0.004
04-24-91 ^b	251	0.014±0.004	10-31-91	284	0.020±0.003
05-02-91 ^c	331	0.014±0.003	11-07-91	286	0.026±0.004
05-09-91	292	0.009±0.003	11-14-91 ^c	286	0.032±0.004
05-16-91	284	0.023±0.004	11-21-91	285	0.031±0.004
05-23-91	290	0.012±0.003	11-27-91 ^b	245	0.020±0.004
05-30-91	292	0.016±0.003	12-05-91 ^c	326	0.030±0.003
06-06-91	292	0.009±0.003	12-12-91	284	0.032±0.004
06-12-91 ^b	249	0.015±0.003	12-19-91	287	0.025±0.004
06-20-91 ^c	332	0.018±0.003	12-26-91	285	0.027±0.004
06-26-91 ^b	249	0.023±0.004	01-02-92	285	<u>0.040±0.004</u>
07-03-91	290	<u>0.022±0.002</u>			
2nd Qtr. mean ± s.d.		0.016±0.005	4th Qtr. mean ± s.d.		0.027±0.006

^a Iodine-131 concentrations are <0.07 pCi/m³ unless noted otherwise.

^b Six day collection.

^c Eight day collection.

Table 10. Airborne particulates collected at Location D-13 (Alburnett), analysis for gross beta. Collection: Weekly.

Date Collected	Volume (m ³)	Gross Beta (pCi/m ³)	Date Collected	Volume (m ³)	Gross Beta (pCi/m ³)
01-10-91	304	0.041±0.004	07-10-91	291	0.025±0.004
01-17-91	307	0.039±0.004	07-17-91	289	0.023±0.003
01-24-91	308	0.027±0.003	07-25-91 ^b	329	0.035±0.004
01-31-91	303	0.027±0.004	08-01-91	290	0.017±0.003
02-07-91	305	0.032±0.003	08-08-91	280	0.025±0.004
02-14-91	306	0.021±0.003	08-15-91	289	0.021±0.003
02-21-91	304	0.016±0.003	08-22-91	290	0.035±0.003
02-28-91	306	0.021±0.003	08-29-91	287	0.041±0.004
03-07-91	306	0.024±0.003	09-05-91	288	0.021±0.003
03-14-91	305	0.017±0.003	09-11-91 ^a	247	0.033±0.004
03-21-91	305	0.014±0.003	09-19-91 ^b	326	0.022±0.003
03-28-91	303	<u>0.015±0.003</u>	09-26-91	289	0.018±0.002
			10-03-91	288	<u>0.028±0.004</u>
1st Qtr. mean ± s.d.		0.024±0.009	3rd Qtr. mean ± s.d.		0.026±0.007
04-04-91	302	0.017±0.003	10-10-91	288	0.021±0.003
04-11-91	301	0.023±0.003	10-17-91	305	0.017±0.003
04-18-91	303	0.017±0.003	10-24-91	299	0.025±0.003
04-24-91 ^a	259	0.018±0.004	10-31-91	304	0.014±0.003
05-02-91 ^b	342	0.017±0.003	11-07-91	306	0.026±0.003
05-09-91	303	0.010±0.003	11-14-91	305	0.025±0.003
05-16-91	301	0.022±0.003	11-21-91	306	0.026±0.004
05-23-91	303	0.012±0.003	11-27-91 ^a	263	0.021±0.004
05-30-91	302	0.015±0.003	12-05-91 ^b	348	0.022±0.003
06-06-91	303	0.011±0.003	12-12-91	305	0.031±0.004
06-12-91 ^a	257	0.021±0.004	12-19-91	306	0.024±0.003
06-20-91 ^b	345	0.020±0.003	12-26-91	307	0.019±0.004
06-26-91 ^a	258	0.023±0.004	01-02-92	305	<u>0.029±0.004</u>
07-03-91	287	<u>0.023±0.002</u>			
2nd Qtr. mean ± s.d.		0.018±0.004	4th Qtr. mean ± s.d.		0.023±0.005

^a Six day collection.

^b Eight day collection.

Table 11. Airborne particulates collected at Location D-15, (On-site), analysis for gross beta and iodine-131.^a Collection: Weekly.

Date Collected	Volume (m ³)	Gross Beta (pCi/m ³)	Date Collected	Volume (m ³)	Gross Beta (pCi/m ³)
01-10-91	284	0.037±0.004	07-10-91	288	0.019±0.003
01-17-91	286	0.030±0.004	07-17-91	286	0.018±0.003
01-24-91	287	0.026±0.004	07-25-91 ^c	326	0.026±0.003
01-31-91	285	0.022±0.003	08-01-91	287	0.015±0.003
02-07-91	285	0.014±0.002	08-08-91	283	0.021±0.003
02-14-91	284	0.018±0.003	08-15-91	286	0.018±0.003
02-21-91	285	0.015±0.003	08-22-91	286	0.030±0.003
02-28-91	286	0.011±0.003	08-29-91	60 ^d	<0.018
03-07-91	286	0.023±0.003	09-05-91	251	0.015±0.003
03-14-91	298	0.015±0.003	09-11-91 ^b	250	0.023±0.004
03-21-91	301	0.015±0.003	09-19-91 ^c	332	0.018±0.003
03-28-91	300	0.017±0.003	09-26-91	290	0.014±0.002
			10-03-91	292	0.021±0.004
1st Qtr. mean ± s.d.		0.020±0.008	3rd Qtr. mean ± s.d.		0.020±0.005
04-04-91	299	0.019±0.003	10-10-91	290	0.017±0.003
04-11-91	298	0.018±0.003	10-17-91	291	0.016±0.003
04-18-91	299	0.013±0.003	10-24-91	293	0.026±0.003
04-24-91 ^b	257	0.015±0.004	10-31-91	281	0.013±0.003
05-02-91 ^c	342	0.017±0.003	11-07-91	283	0.016±0.003
05-09-91	300	0.008±0.003	11-14-91	282	0.024±0.003
05-16-91	300	0.017±0.003	11-21-91	283	0.026±0.004
05-23-91	300	0.014±0.003	11-27-91 ^b	242	0.019±0.004
05-30-91	299	0.013±0.003	12-05-91 ^c	322	0.022±0.003
06-06-91	295	0.013±0.003	12-12-91	282	0.031±0.004
06-12-91 ^b	257	0.016±0.003	12-19-91	273	0.020±0.003
06-20-91 ^c	344	0.017±0.003	12-26-91	284	0.017±0.004
06-26-91 ^b	256	0.021±0.004	01-02-92	281	0.026±0.004
07-03-91	284	0.020±0.002			
2nd Qtr. mean ± s.d.		0.016±0.003	4th Qtr. mean ± s.d.		0.021±0.005

^a Iodine-131 concentrations are <0.07 pCi/m³ unless noted otherwise.

^b Six day collection.

^c Eight day collection.

^d Low volume due to pump failure; LLD for I-131 not reached due to low volume, I-131 concentration <0.20 pCi/m³.

Table 12. Airborne particulates collected at Location D-16, (Onsite), analysis for gross beta. Collection: Weekly.

Date Collected	Volume (m ³)	Gross Beta (pCi/m ³)	Date Collected	Volume (m ³)	Gross Beta (pCi/m ³)
01-10-91	287	0.051±0.004	07-10-91	284	0.018±0.003
01-17-91	289	0.054±0.004	07-17-91	284	0.017±0.003
01-24-91	290	0.034±0.004	07-25-91 ^b	323	0.025±0.003
01-31-91	288	0.032±0.004	08-01-91	284	0.012±0.003
02-07-91	288	0.035±0.003	08-08-91	280	0.021±0.003
02-14-91	289	0.021±0.003	08-15-91	286	0.018±0.003
02-21-91	288	0.017±0.003	08-22-91	285	0.026±0.003
02-28-91	288	0.023±0.003	08-29-91	282	0.030±0.004
03-07-91	289	0.029±0.004	09-05-91	282	0.015±0.003
03-14-91	284	0.022±0.003	09-11-91 ^a	242	0.028±0.004
03-21-91	286	0.019±0.003	09-19-91 ^b	324	0.014±0.003
03-28-91	286	<u>0.017±0.003</u>	09-26-91	282	0.013±0.002
			10-03-91	295	<u>0.022±0.004</u>
1st Qtr. mean ± s.d.		0.030±0.012	3rd Qtr. mean ± s.d.		0.020±0.006
04-04-91	285	0.022±0.003	10-10-91	293	0.023±0.003
04-11-91	284	0.020±0.003	10-17-91	293	0.017±0.003
04-18-91	285	0.018±0.003	10-24-91	296	0.030±0.004
04-24-91 ^a	245	0.016±0.004	10-31-91	293	0.016±0.003
05-02-91 ^b	326	0.015±0.003	11-07-91	295	0.023±0.003
05-09-91	286	0.010±0.003	11-14-91	293	0.028±0.003
05-16-91	285	0.023±0.004	11-21-91	295	0.025±0.004
05-23-91	286	0.016±0.003	11-27-91 ^a	252	0.018±0.004
05-30-91	285	0.019±0.004	12-05-91 ^b	335	0.024±0.003
06-06-91	284	0.016±0.003	12-12-91	294	0.029±0.004
06-12-91 ^a	245	0.017±0.003	12-19-91	294	0.026±0.004
06-20-91 ^b	326	0.022±0.003	12-26-91	295	0.026±0.004
06-26-91 ^a	241	0.019±0.004	01-02-92	293	<u>0.042±0.004</u>
07-03-91	281	<u>0.021±0.002</u>			
2nd Qtr. mean ± s.d.		0.018±0.003	4th Qtr. mean ± s.d.		0.025±0.007

^a Six day collection.

^b Eight day collection.

Table 13. Airborne particulate samples, quarterly composites of weekly samples, analysis for gamma-emitting isotopes.

	Sample Description and Activity (pCi/m ³)			
	1st Qtr.	2nd Qtr.	3rd Qtr.	4th Qtr.
<u>Location D-1</u>				
Lab Code	DAP-2575	DAP-2694	DAP-2810	DAP-2905
Volume (m ³)	3175	4063	3832	3649
Be-7	0.047±0.019	0.050±0.012	0.060±0.012	0.035±0.008
Nb-95	<0.0023	<0.0017	<0.0012	<0.0017
Zr-95	<0.0028	<0.0027	<0.0014	<0.0021
Ru-103	<0.0015	<0.0013	<0.0009	<0.0008
Ru-106	<0.011	<0.0077	<0.0049	<0.0080
Cs-134	<0.0011	<0.0007	<0.0006	<0.0008
Cs-137	<0.0012	<0.0007	<0.0008	<0.0007
Ce-141	<0.0034	<0.0015	<0.0013	<0.0010
Ce-144	<0.0077	<0.0025	<0.0029	<0.0027
<u>Location D-2</u>				
Lab Code	DAP-2576	DAP-2695	DAP-2811	DAP-2906
Volume (m ³)	3353	4017	3790	3640
Be-7	0.053±0.013	0.044±0.013	0.053±0.011	0.032±0.008
Nb-95	<0.0018	<0.0025	<0.0023	<0.0013
Zr-95	<0.0028	<0.0031	<0.0031	<0.0019
Ru-103	<0.0014	<0.0016	<0.0019	<0.0010
Ru-106	<0.0084	<0.0088	<0.014	<0.0072
Cs-134	<0.0008	<0.0008	<0.0014	<0.0008
Cs-137	<0.0009	<0.0010	<0.0014	<0.0010
Ce-141	<0.0014	<0.0029	<0.0035	<0.0013
Ce-144	<0.0025	<0.0055	<0.0088	<0.0034

Table 13. Airborne particulate samples, quarterly composites of weekly samples, analysis for gamma-emitting isotopes (continued)

	Sample Description and Activity (pCi/m ³)			
	1st Qtr.	2nd Qtr.	3rd Qtr.	4th Qtr.
<u>Location D-3</u>				
Lab Code	DAP-2577	DAP-2696	DAP-2812	DAP-2907
Volume (m ³)	3408	4099	3752	3852
Be-7	0.072±0.015	0.070±0.013	0.065±0.012	0.058±0.016
Nb-95	<0.0022	<0.0019	<0.0012	<0.0021
Zr-95	<0.0033	<0.0024	<0.0019	<0.0029
Ru-103	<0.0014	<0.0012	<0.0008	<0.0018
Ru-106	<0.0011	<0.0065	<0.0045	<0.012
Cs-134	<0.0011	<0.0007	<0.0008	<0.0010
Cs-137	<0.0013	<0.0006	<0.0008	<0.0015
Ce-141	<0.0026	<0.0015	<0.0010	<0.0028
Ce-144	<0.0067	<0.0023	<0.0025	<0.0089
<u>Location D-5</u>				
Lab Code	DAP-2578	DAP-2697	DAP-2813	DAP-2908
Volume (m ³)	3480	4121	3751	3674
Be-7	0.060±0.011	0.070±0.016	0.063±0.015	0.034±0.008
Nb-95	<0.0016	<0.0024	<0.0015	<0.0014
Zr-95	<0.0015	<0.0034	<0.0020	<0.0018
Ru-103	<0.0007	<0.0014	<0.0011	<0.0009
Ru-106	<0.0077	<0.0089	<0.0080	<0.0086
Cs-134	<0.0008	<0.0010	<0.0009	<0.0010
Cs-137	<0.0007	<0.0010	<0.0011	<0.0011
Ce-141	<0.0011	<0.0028	<0.0024	<0.0012
Ce-144	<0.0026	<0.0059	<0.0063	<0.0038

Table 13. Airborne particulate samples, quarterly composites of weekly samples, analysis for gamma-emitting isotopes (continued)

	Sample Description and Activity (pCi/m ³)			
	1st Qtr.	2nd Qtr.	3rd Qtr.	4th Qtr.
<u>Location D-6</u>				
Lab Code	DAP-2579	DAP-2698	DAP-2814	DAP-2909
Volume (m ³)	3473	4085	3562	3844
Be-7	0.074±0.015	0.068±0.011	0.052±0.016	0.039±0.010
Nb-95	<0.0020	<0.0019	<0.0024	<0.0015
Zr-95	<0.0022	<0.0025	<0.0023	<0.0015
Ru-103	<0.0014	<0.0012	<0.0013	<0.0011
Ru-106	<0.010	<0.0079	<0.012	<0.0058
Cs-134	<0.0010	<0.0008	<0.0010	<0.0008
Cs-137	<0.0012	<0.0008	<0.0009	<0.0009
Ce-141	<0.0028	<0.0026	<0.0026	<0.0010
Ce-144	<0.0083	<0.0045	<0.0061	<0.0026
<u>Location D-7</u>				
Lab Code	DAP-2580	DAP-2699	DAP-2815	DAP-2910
Volume (m ³)	3369	3741	3714	3786
Be-7	0.057±0.012	0.056±0.013	0.047±0.009	0.051±0.009
Nb-95	<0.0020	<0.0019	<0.0016	<0.0015
Zr-95	<0.0018	<0.0021	<0.0020	<0.0024
Ru-103	<0.0010	<0.0014	<0.0011	<0.0013
Ru-106	<0.0085	<0.0073	<0.0072	<0.0092
Cs-134	<0.0008	<0.0007	<0.0009	<0.0009
Cs-137	<0.0008	<0.0007	<0.0009	<0.0009
Ce-141	<0.0013	<0.0015	<0.0014	<0.0020
Ce-144	<0.0027	<0.0028	<0.0039	<0.0061

Table 13. Airborne particulate samples, quarterly composites of weekly samples, analysis for gamma-emitting isotopes (continued)

	Sample Description and Activity (pCi/m ³)			
	1st Qtr.	2nd Qtr.	3rd Qtr.	4th Qtr.
<u>Location D-8</u>				
	DAP-2581	DAP-2700	DAP-2816	DAP-2911
(m ³)	3371	3733	3827	3606
Be-7	0.077±0.014	0.069±0.012	0.054±0.009	0.052±0.018
Nb-95	<0.0019	<0.0019	<0.0015	<0.0027
Zr-95	<0.0019	<0.0022	<0.0022	<0.0034
Ru-103	<0.0012	<0.0013	<0.0011	<0.0018
Ru-106	<0.0072	<0.0060	<0.0075	<0.014
Cs-134	<0.0007	<0.0006	<0.0008	<0.0013
Cs-137	<0.0010	<0.0007	<0.0009	<0.0015
Ce-141	<0.0014	<0.0027	<0.0020	<0.0029
Ce-144	<0.0024	<0.0050	<0.0048	<0.0096
<u>Location D-10</u>				
Lab Code	DAP-2582	DAP-2701	DAP-2817	DAP-2912
Volume (m ³)	3185	3956	3863	3994
Be-7	0.069±0.019	0.058±0.012	0.054±0.011	0.050±0.009
Nb-95	<0.0025	<0.0022	<0.0024	<0.0015
Zr-95	<0.0024	<0.0021	<0.0031	<0.0020
Ru-103	<0.0014	<0.0014	<0.0017	<0.0011
Ru-106	<0.0085	<0.0082	<0.013	<0.0085
Cs-134	<0.0012	<0.0008	<0.0014	<0.0008
Cs-137	<0.0014	<0.0008	<0.0016	<0.0010
Ce-141	<0.0028	<0.0019	<0.0034	<0.0019
Ce-144	<0.0056	<0.0037	<0.0086	<0.0057

Table 13. Airborne particulate samples, quarterly composites of weekly samples, analysis for gamma-emitting isotopes (continued)

	Sample Description and Activity (pCi/m ³)			
	1st Qtr.	2nd Qtr.	3rd Qtr.	4th Qtr.
<u>Location D-11</u>				
Lab Code	DAP-2583	DAP-2702	DAP-2818	DAP-2913
Volume (m ³)	3389	4023	3863	3728
Be-7	0.038±0.009	0.048±0.015	0.052±0.013	0.042±0.011
Nb-95	<0.0014	<0.0027	<0.0018	<0.0017
Zr-95	<0.0021	<0.0031	<0.0026	<0.0016
Ru-103	<0.0010	<0.0017	<0.0013	<0.0010
Ru-106	<0.0087	<0.0084	<0.0082	<0.0059
Cs-134	<0.0007	<0.0009	<0.0008	<0.0008
Cs-137	<0.0010	<0.0010	<0.0010	<0.0008
Ce-141	<0.0016	<0.0034	<0.0026	<0.0009
Ce-144	<0.0042	<0.0060	<0.0068	<0.0028
<u>Location D-13</u>				
Lab Code	DAP-2584	DAP-2703	DAP-2819	DAP-2914
Volume (m ³)	3662	4166	3783	3957
Be-7	0.051±0.010	0.065±0.013	0.069±0.013	0.035±0.009
Nb-95	<0.0023	<0.0022	<0.0013	<0.0011
Zr-95	<0.0032	<0.0029	<0.0017	<0.0013
Ru-103	<0.0017	<0.0016	<0.0013	<0.0008
Ru-106	<0.013	<0.0083	<0.0044	<0.0057
Cs-134	<0.0012	<0.0008	<0.0008	<0.0004
Cs-137	<0.0013	<0.0007	<0.0006	<0.0009
Ce-141	<0.0029	<0.0027	<0.0014	<0.0012
Ce-144	<0.0076	<0.0051	<0.0036	<0.0034

Table 13. Airborne particulate samples, quarterly composites of weekly samples, analysis for gamma-emitting isotopes (continued)

	Sample Description and Activity (pCi/m ³)			
	1st Qtr.	2nd Qtr.	3rd Qtr.	4th Qtr.
<u>Location D-15</u>				
Lab Code	DAP-2585	DAP-2704	DAP-2820	DAP-2915
Volume (m ³)	3476	4130	3517	3687
Be-7	0.051±0.008	0.050±0.016	0.048±0.010	0.033±0.009
Nb-95	<0.0015	<0.0032	<0.0016	<0.0015
Zr-95	<0.0018	<0.0036	<0.0023	<0.0021
Ru-103	<0.0010	<0.0018	<0.0012	<0.0011
Ru-106	<0.0075	<0.010	<0.0075	<0.0074
Cs-134	<0.0006	<0.0011	<0.0009	<0.0006
Cs-137	<0.0008	<0.0008	<0.0012	<0.0009
Ce-141	<0.0011	<0.0031	<0.0015	<0.0022
Ce-144	<0.0029	<0.0050	<0.0042	<0.0057
<u>Location D-16</u>				
Lab Code	DAP-2586	DAP-2705	DAP-2821	DAP-2916
Volume (m ³)	3452	3944	3733	3821
Be-7	0.046±0.008	0.059±0.014	0.062±0.015	0.037±0.010
Nb-95	<0.0007	<0.0022	<0.0020	<0.0011
Zr-95	<0.0015	<0.0015	<0.0019	<0.0014
Ru-103	<0.0006	<0.0012	<0.0012	<0.0008
Ru-106	<0.0054	<0.0046	<0.0074	<0.0050
Cs-134	<0.0006	<0.0004	<0.0008	<0.0006
Cs-137	<0.0008	<0.0008	<0.0010	<0.0007
Ce-141	<0.0007	<0.0025	<0.0010	<0.0012
Ce-144	<0.0038	<0.0040	<0.0029	<0.0033

Table 14. Ambient gamma radiation (TLD), quarterly exposure.

Location No.	mR/91 days			
	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
<u>Air Particulate Locations</u>				
D-1	15.0±0.2	13.2±0.4	13.0±0.9	15.4±0.5
D-2	13.1±0.4	10.9±0.3	11.5±0.3	13.5±0.6
D-3	14.6±0.4	13.6±1.0	13.9±0.3	14.6±0.5
D-5	14.6±0.6	15.8±0.7	17.7±1.5	16.6±0.6
D-6	13.3±0.8	14.3±0.4	14.4±1.0	15.9±0.7
D-7	17.3±1.0	15.8±0.7	16.8±0.4	ND ^a
D-8	15.7±0.7	16.4±0.4	18.8±1.0	17.6±0.5
D-10	15.6±0.3	16.3±0.5	15.2±0.5	14.3±0.7
D-11	10.7±0.3	13.7±0.6	11.6±0.4	15.7±0.7
D-13	10.6±0.3	12.0±0.8	12.8±0.4	12.3±0.9
D-15	13.8±0.4	13.2±0.5	15.6±0.4	14.4±0.6
D-16	<u>13.2±0.5</u>	<u>13.8±0.4</u>	<u>13.9±0.3</u>	<u>16.4±0.8</u>
Mean ± s.d.	14.0±2.0	14.1±1.7	14.6±2.3	15.2±1.5
<u>Within 0.5 Mile of Stack</u>				
D-18	15.0±0.3	15.3±0.6	16.1±0.3	17.9±0.7
D-19	14.9±0.6	15.5±0.5	16.4±0.3	17.4±0.6
D-20	17.8±0.6	16.3±0.5	18.9±0.7	18.0±0.7
D-21	16.0±0.3	15.3±0.5	16.7±0.4	18.0±0.6
D-22	16.6±0.4	15.6±0.9	ND ^a	ND ^a
D-23	15.4±0.7	14.1±0.4	14.3±1.2	16.9±0.6
D-28	17.7±0.9	18.8±0.8	19.0±0.7	21.1±0.7
D-29	18.2±0.3	20.9±0.5	19.8±0.4	24.2±0.5
D-30	20.5±0.2	21.4±0.8	22.4±0.3	22.0±0.6
D-31	20.3±0.4	23.1±1.1	23.1±0.4	22.4±0.5
D-32	18.1±0.6	19.6±0.5	21.1±1.4	22.3±0.5
D-82	16.1±0.6	14.8±0.7	15.8±0.8	16.6±0.8
D-83	16.8±1.1	17.6±0.9	18.3±0.7	18.8±0.6
D-84	16.2±0.4	17.8±1.1	16.6±0.4	19.4±0.6
D-85	14.8±0.4	16.0±0.4	14.8±0.7	19.0±0.5
D-86	17.4±1.0	20.5±1.4	19.1±0.7	20.6±1.0
D-91	<u>15.2±0.4</u>	<u>13.5±0.6</u>	<u>14.0±1.0</u>	<u>14.6±0.6</u>
Mean ± s.d.	16.9±1.7	17.4±2.8	17.9±2.8	19.3±2.6

^a ND = No data; TLD lost in the field.

Table 14. Ambient gamma radiation (TLD), quarterly exposure (continued)

Location No.	mR/91 days			
	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
<u>Within 1.0 Mile of Stack</u>				
D-43	14.6±0.9	15.5±0.9	15.5±0.6	18.1±0.5
D-44	19.4±1.0	19.3±0.6	21.2±0.8	20.8±0.6
D-45	15.0±0.6	17.1±0.6	15.0±1.0	20.0±0.6
D-46	18.3±0.6	20.2±0.4	20.0±0.6	22.7±0.8
D-47	21.4±1.0	18.2±0.5	21.2±0.7	19.1±0.6
D-48	<u>18.6±0.4</u>	<u>21.5±0.7</u>	<u>20.4±0.3</u>	<u>24.2±0.7</u>
Mean ± s.d.	17.9±2.6	18.6±2.2	18.9±2.9	20.8±2.3
<u>Within 3.0 Miles of Stack</u>				
D-33	13.7±1.0	12.9±0.3	13.5±0.4	15.5±0.8
D-34	13.9±0.6	15.3±1.1	14.3±0.5	17.5±0.7
D-35	14.6±0.6	13.5±0.6	14.5±0.3	16.3±0.5
D-36	16.5±0.3	16.4±0.4	16.8±0.3	20.7±0.6
D-37	20.2±0.3	21.3±0.9	21.4±0.5	25.0±1.4
D-38	16.1±1.1	16.5±0.4	18.9±1.1	19.0±1.0
D-39	16.8±1.0	19.1±1.3	17.9±0.9	19.8±0.8
D-40	16.1±0.5	16.0±0.5	16.5±0.4	19.9±0.8
D-41	<u>15.4±1.0</u>	<u>17.4±0.9</u>	<u>15.3±0.4</u>	<u>20.6±1.0</u>
Mean ± s.d.	15.9±2.0	16.5±2.6	16.6±2.5	19.4±2.8

Table 15. Milk samples, analyses for I-131 and gamma-emitting isotopes.
 Collection: Monthly during non-grazing season (October 1 through April 30); biweekly during grazing season (May 1 through September 30)

Date Collected	Lab Code	Concentration (pCi/L)					
		I-131	K-40	Cs-134	Cs-137	Ba-140	La-140
<u>Indicator</u>							
<u>Location D-63</u>							
01-08-91	DMI-5794	<1.0	1050±140	<15	<18	<60	<15
02-05-91	5870	<1.0	1330±120	<15	<18	<60	<15
03-05-91	5946	<1.0	1340±160	<15	<18	<60	<15
04-02-91	6008,9	<1.0	1200±80	<15	<18	<60	<15
05-07-91	6110	<1.0	1110±130	<15	<18	<60	<15
05-21-91	6201	<1.0	1440±150	<15	<18	<60	<15
06-04-91	6288	<1.0	1270±100	<15	<18	<60	<15
06-18-91	6356	<1.0	1220±130	<15	<18	<60	<15
07-02-91	6441	<1.0	1440±120	<15	<18	<60	<15
07-16-91	6542	<1.0	1200±130	<15	<18	<60	<15
07-30-91	6605	<1.0	1280±170	<15	<18	<60	<15
08-13-91	6719	<1.0	1200±110	<15	<18	<60	<15
08-27-91	6773	<1.0	1240±140	<15	<18	<60	<15
09-10-91	6851	<1.0	1200±160	<15	<18	<60	<15
09-24-91	6941	<1.0	1240±150	<15	<18	<60	<15
10-08-91	7017	<1.0	1100±160	<15	<18	<60	<15
10-22-91	7178	<1.0	1330±170	<15	<18	<60	<15
12-03-91	7249,50	<1.0	1290±100	<15	<18	<60	<15

Table 15. Milk samples, analyses for I-131 and gamma-emitting isotopes
(continued)

Date Collected	Lab Code	Concentration (pCi/L)					
		I-131	K-40	Cs-134	Cs-137	Ba-140	La-140
<u>Indicator</u>							
<u>Location D-93</u>							
01-03-91	NS ^a	--	--	--	--	--	--
02-05-91	DMI-5871	<1.0	1450±160	<15	<18	<60	<15
03-05-91	5960	<1.0	1450±150	<15	<18	<60	<15
04-02-91	6010	<1.0	1670±180	<15	<18	<60	<15
05-07-91	6111	<1.0	1570±150	<15	<18	<60	<15
05-21-91	6202	<1.0	1670±160	<15	<18	<60	<15
06-04-91	6289	<1.0	1870±200	<15	<18	<60	<15
06-18-91	6357	<1.0	1690±190	<15	<18	<60	<15
07-02-91	6442	<1.0	1810±170	<15	<18	<60	<15
07-16-91	6543	<1.0	1750±180	<15	<18	<60	<15
07-30-91	6606	<1.0	1450±150	<15	<18	<60	<15
08-13-91	NS ^b	--	--	--	--	--	--
08-27-91	DMI-6774	<1.0	1450±150	<15	<18	<60	<15
09-10-91	6852	<1.0	1350±170	<15	<18	<60	<15
09-24-91	6942	<1.0	1640±170	<15	<18	<60	<15
10-08-91	7018	<1.0	1650±170	<15	<18	<60	<15
11-05-91	7179	<1.0	1320±140	<15	<18	<60	<15
12-03-91	NS ^a	--	--	--	--	--	--
<u>Location D-94</u>							
01-08-91	DMI-5795	<1.0	1250±150	<15	<18	<60	<15
02-05-91	5872	<1.0	1280±100	<15	<18	<60	<15
03-05-91	5947	<1.0	1250±140	<15	<18	<60	<15
04-02-91	6011	<1.0	1260±160	<15	<18	<60	<15
05-07-91	6112	<1.0	1350±110	<15	<18	<60	<15
05-21-91	6203	<1.0	1190±150	<15	<18	<60	<15
06-04-91	6290	<1.0	1250±140	<15	<18	<60	<15
06-18-91	6358,9	<1.0	1160±90	<15	<18	<60	<15
07-02-91	6443	<1.0	1170±150	<15	<18	<60	<15
07-16-91	6544	<1.0	1410±150	<15	<18	<60	<15
07-30-91	6607	<1.0	1280±160	<15	<18	<60	<15
08-13-91	NS ^b	--	--	--	--	--	--
08-27-91	DMI-6775	<1.0	1060±130	<15	<18	<60	<15
09-10-91	6853	<1.0	1170±150	<15	<18	<60	<15
09-24-91	6943	<1.0	1040±130	<15	<18	<60	<15
10-08-91	7019	<1.0	1450±160	<15	<18	<60	<15
11-05-91	7180	<1.0	1100±130	<15	<18	<60	<15
12-03-91	7251	<1.0	1170±150	<15	<18	<60	<15

^a NS = No sample; sample not available.

^b NS = No sample; sample lost during shipment.

Table 15. Milk samples, analyses for I-131 and gamma-emitting isotopes (continued)

Date Collected	Lab Code	Concentration (pCi/L)					
		I-131	K-40	Cs-134	Cs-137	Ba-140	La-140
<u>Indicator</u>							
<u>Location D-96</u>							
01-08-91	DMI-5796	<1.0	1280±130	<15	<18	<60	<15
02-05-91	5873	<1.0	1180±140	<15	<18	<60	<15
03-05-91	5948	<1.0	1210±160	<15	<18	<60	<15
04-02-91	6012	<1.0	1240±110	<15	<18	<60	<15
05-07-91	6113	<1.0	1290±110	<15	<18	<60	<15
05-21-91	6204,5	<1.0	1240±90	<15	<18	<60	<15
06-04-91	6291	<1.0	1380±170	<15	<18	<60	<15
06-18-90	6360	<1.0	1140±140	<15	<18	<60	<15
07-02-91	6444	<1.0	1420±120	<15	<18	<60	<15
07-16-91	6545	<1.0	1250±160	<15	<18	<60	<15
07-30-91	6608	<1.0	1360±160	<15	<18	<60	<15
08-13-91	6720	<1.0	1070±150	<15	<18	<60	<15
08-27-91	6776,7	<1.0	1260±100	<15	<18	<60	<15
09-10-91	6854	<1.0	1160±150	<15	<18	<60	<15
09-24-91	6944,5	<1.0	1310±100	<15	<18	<60	<15
10-08-91	7020,1	<1.0	1240±100	<15	<18	<60	<15
11-05-91	7181	<1.0	1110±160	<15	<18	<60	<15
12-03-91	7252	<1.0	1390±140	<15	<18	<60	<15
<u>Location D-101</u>							
01-08-91	DMI-5797	<1.0	1090±150	<15	<18	<60	<15
02-05-91	NS ^a	--	--	--	--	--	--
03-05-91	NS	--	--	--	--	--	--
04-02-91	NS	--	--	--	--	--	--
05-07-91	NS	--	--	--	--	--	--
05-21-91	NS	--	--	--	--	--	--
06-04-91	6292,3	<1.0	1890±220	<15	<18	<60	<15
06-18-91	6361	<1.0	1650±170	<15	<18	<60	<15
07-02-91	6445	<1.0	1750±180	<15	<18	<60	<15
07-16-91	6546,7	<1.0	1800±90	<15	<18	<60	<15
07-30-91	6609	<1.0	1910±180	<15	<18	<60	<15
08-13-91	6721,2	<1.0	1610±120	<15	<18	<60	<15
08-27-91	6778	<1.0	2020±140	<15	<18	<60	<15
09-10-91	6855,6	<1.0	1970±130	<15	<18	<60	<15
09-24-91	6946	<1.0	1750±170	<15	<18	<60	<15
10-08-91	7022	<1.0	1760±190	<15	<18	<60	<15
11-05-91	7182	<1.0	1890±160	<15	<18	<60	<15
12-03-91	NS	--	--	--	--	--	--

^a NS = No sample; sample not received.

Table 15. Milk samples, analyses for I-131 and gamma-emitting isotopes
(continued)

Date Collected	Lab Code	Concentration (pCi/L)					
		I-131	K-40	Cs-134	Cs-137	Ba-140	La-140
<u>Indicator</u>							
<u>Location D-106</u>							
01-08-91	DMI-5799	<1.0	1230±140	<15	<18	<60	<15
02-05-91	5875	<1.0	1280±110	<15	<18	<60	<15
03-05-91	5961	<1.0	1300±120	<15	<18	<60	<15
04-02-91	6014	<1.0	1140±130	<15	<18	<60	<15
05-07-91	6115	<1.0	1220±120	<15	<18	<60	<15
05-21-91	6207	<1.0	1390±130	<15	<18	<60	<15
06-04-91	6295	<1.0	960±120	<15	<18	<60	<15
06-18-91	6363	<1.0	1310±150	<15	<18	<60	<15
07-02-91	6447,8	<1.0	1160±100	<15	<18	<60	<15
07-16-91	6549	<1.0	1280±160	<15	<18	<60	<15
07-30-91	6611,2	<1.0	1510±120	<15	<18	<60	<15
08-13-91	6724	<1.0	1410±120	<15	<18	<60	<15
08-27-91	6780	<1.0	1440±150	<15	<18	<60	<15
09-10-91	6858	<1.0	1410±150	<15	<18	<60	<15
09-24-91	6948	<1.0	1420±130	<15	<18	<60	<15
10-08-91	7024	<1.0	1450±160	<15	<18	<60	<15
11-05-91	7184,5	<1.0	1420±90	<15	<18	<60	<15
12-03-91	7254	<1.0	1480±150	<15	<18	<60	<15
<u>Control</u>							
<u>Location D-105</u>							
01-08-91	DMI-5798	<1.0	1350±140	<15	<18	<60	<15
02-05-91	5874	<1.0	1460±140	<15	<18	<60	<15
03-05-91	5949	<1.0	1310±150	<15	<18	<60	<15
04-02-91	6013	<1.0	1420±160	<15	<18	<60	<15
05-07-91	6114	<1.0	1470±170	<15	<18	<60	<15
05-21-91	6206	<1.0	1320±140	<15	<18	<60	<15
06-04-91	6294	<1.0	1420±150	<15	<18	<60	<15
06-18-91	6362	<1.0	1170±130	<15	<18	<60	<15
07-02-91	6446	<1.0	1460±130	<15	<18	<60	<15
07-16-91	6548	<1.0	1330±120	<15	<18	<60	<15
07-30-91	6610	<1.0	1330±160	<15	<18	<60	<15
08-13-91	6723	<1.0	1330±160	<15	<18	<60	<15
08-27-91	6779	<1.0	1420±130	<15	<18	<60	<15
09-10-91	6857	<1.0	1310±160	<15	<18	<60	<15
09-24-91	6947	<1.0	1510±140	<15	<18	<60	<15
10-08-91	7023	<1.0	1180±130	<15	<18	<60	<15
11-05-91	7183	<1.0	1390±170	<15	<18	<60	<15
12-03-91	7253	<1.0	1200±130	<15	<18	<60	<15

Table 16. Ground water samples, analysis for gross beta and tritium.
Collection: Quarterly.

Location and 1991 Collection Period	Lab Code	Concentration (pCi/L)	
		Gross Beta	H-3
<u>D-53</u>			
Treated Municipal Water			
1st Quarter	DWW-177	2.8±0.5	<330
2nd Quarter	1331	2.7±0.5	<330
3rd Quarter	2690	2.5±0.8	<330
4th Quarter	3810	<u>1.8±0.5</u>	<u><330</u>
Annual Mean ± s.d.		2.4±0.4	<330
<u>D-54</u>			
Inlet to Municipal Water Treatment			
1st Quarter	DWW-178	3.2±0.5	<330
2nd Quarter	1332	3.6±0.6	<330
3rd Quarter	2691	2.8±0.5	<330
4th Quarter	3811	<u>2.6±0.5</u>	<u><330</u>
Annual Mean ± s.d.		2.9±0.3	<330
<u>D-55</u>			
On-site Well			
1st Quarter	DWW-179	<0.9	<330
2nd Quarter	1333	1.6±0.6	<330
3rd Quarter	2695	1.3±0.5	<330
4th Quarter	3812	<u>1.4±0.4</u>	<u><330</u>
Annual Mean ± s.d.		1.4±0.2	<330
<u>D-57</u>			
Bull Farm			
1st Quarter	DWW-180	1.1±0.6	<330
2nd Quarter	1334	1.4±0.5	<330
3rd Quarter	2692	1.0±0.4	<330
4th Quarter	3813	<u>1.3±0.4</u>	<u><330</u>
Annual Mean ± s.d.		1.2±0.2	<330

Table 16. Ground water samples, analysis for gross beta and tritium
(continued)

Location and 1991 Collection Period	Lab Code	Concentration (pCi/L)	
		Gross Beta	H-3
<u>D-58</u>			
Franz Farm			
1st Quarter	D/W-181,2	4.4±0.4	<330
2nd Quarter	1335,6	3.4±0.5	<330
3rd Quarter	2693	3.1±0.6	<330
4th Quarter	3814	<u>3.8±0.6</u>	<u><330</u>
Annual Mean ± s.d.		3.7±0.6	<330
<u>D-72</u>			
Van Note Farm			
1st Quarter	D/W-183	0.9±0.4	<330
2nd Quarter	1337	0.7±0.4	<330
3rd Quarter	2694	<0.8	<330
4th Quarter	3815	<u><0.8</u>	<u><330</u>
Annual Mean ± s.d.		0.8±0.1	<330

Table 17. Vegetation samples (broadleaf), analysis for I-131 and gamma-emitting isotopes.
Collection: Annually.

Sample Description and Activity (pCi/g wet)					
Location	Indicator				Control
	D-57	D-58	D-63	D-72	D-105
Date Collected	07-01-91	07-01-91	07-30-91	07-01-91	07-02-91
Type	Lettuce	Lettuce	Cabbage	Lettuce	Lettuce
Lab Code	DVE-1104	DVE-1105	DVE-1128	DVE-1106	DVE-1108
I-131	<0.025	<0.022	<0.054	<0.027	<0.028
K-40	2.14±0.24	3.65±0.36	4.98±0.86	5.93±0.43	2.39±0.28
Mn-54	<0.018	<0.014	<0.048	<0.021	<0.022
Co-58	<0.018	<0.015	<0.047	<0.019	<0.023
Co-60	<0.016	<0.015	<0.050	<0.016	<0.021
Nb-95	<0.018	<0.017	<0.047	<0.021	<0.024
Zr-95	<0.036	<0.026	<0.083	<0.036	<0.034
Ru-103	<0.019	<0.012	<0.044	<0.018	<0.021
Ru-106	<0.017	<0.12	<0.044	<0.16	<0.20
Cs-134	<0.017	<0.012	<0.045	<0.014	<0.021
Cs-137	<0.018	<0.014	<0.050	0.046±0.023	<0.023
Ce-141	<0.036	<0.018	<0.061	<0.038	<0.045
Ce-144	<0.15	<0.076	<0.26	<0.15	<0.19
Location	D-93	D-94	D-106		
Date Collected	07-02-91	06-18-91	07-02-91		
Type	Lettuce	Lettuce	Lettuce		
Lab Code	DVE-1107	DVE-1089	DVE-1109,10		
I-131	<0.014	<0.044	<0.011		
K-40	2.49±0.22	5.49±0.81	2.74±0.46		
Mn-54	<0.012	<0.045	<0.016		
Co-58	<0.011	<0.041	<0.016		
Co-60	<0.012	<0.047	<0.017		
Nb-95	<0.012	<0.043	<0.015		
Zr-95	<0.019	<0.080	<0.027		
Ru-103	<0.010	<0.035	<0.010		
RU-106	<0.098	<0.39	<0.12		
Cs-134	<0.011	<0.036	<0.012		
Cs-137	<0.011	<0.043	<0.012		
Ce-141	<0.014	<0.052	<0.005		
Ce-144	<0.059	<0.25	<0.023		

Table 18. Vegetation samples, analysis for gamma-emitting isotopes.
Collection: Annually.

Sample Description and Activity (pCi/g wet)				
	Indicator			
Location	D-16	D-57	D-63	D-72
Date Collected	07-30-91	07-30-91	07-30-91	07-30-91
Type	Hay	Hay	Hay	Hay
Lab Code	DVE-1126	DVE-1127	DVE-1135	DVE-1129
K-40	8.10±0.87	15.32±0.70	14.45±1.31	12.94±1.31
Mn-54	<0.035	<0.028	<0.043	<0.048
Co-58	<0.036	<0.030	<0.045	<0.038
Co-60	<0.039	<0.027	<0.050	<0.052
Nb-95	<0.037	<0.034	<0.056	<0.044
Zr-95	<0.069	<0.056	<0.081	<0.076
Ru-103	<0.032	<0.033	<0.041	<0.042
Ru-106	<0.30	<0.24	<0.29	<0.43
Cs-134	<0.035	<0.024	<0.036	<0.041
Cs-137	<0.039	<0.030	<0.060	<0.049
Ce-141	<0.050	<0.070	<0.062	<0.068
Ce-144	<0.22	<0.26	<0.26	<0.29

	Indicator			Control
Location	D-93	D-94	D-106	D-105
Date Collected	07-30-91	07-30-91	07-30-91	07-30-91
Type	Hay	Hay	Hay	Hay
Lab Code	DVE-1130	DVE-1131,2	DVE-1134	DVE-1133
K-40	4.04±0.68	12.20±0.78	11.40±0.44	11.40±0.68
Mn-54	<0.019	<0.052	<0.017	<0.032
Co-58	<0.025	<0.056	<0.017	<0.032
Co-60	<0.034	<0.060	<0.017	<0.036
Nb-95	<0.033	<0.057	<0.019	<0.032
Zr-95	<0.058	<0.096	<0.032	<0.056
Ru-103	<0.036	<0.039	<0.017	<0.022
Ru-106	<0.26	<0.41	<0.15	<0.24
Cs-134	<0.022	<0.042	<0.016	<0.027
Cs-137	<0.030	<0.050	<0.017	<0.030
Ce-141	<0.053	<0.023	<0.058	<0.012
Ce-144	<0.21	<0.089	<0.12	<0.052

Table 18. Vegetation samples, analysis for gamma-emitting isotopes (continued)

Sample Description and Activity (pCi/g wet)					
Location	Indicator				
	D-15	D-57	D-58	D-63	D-72
Date Collected	09-26-91	09-26-91	09-26-91	10-08-91	09-26-91
Type	Soybeans	Corn Feed	Corn Feed	Corn Feed	Corn Feed
Lab Code	DVE-1257	DVE-1255	DVE-1256	DVE-1273	DVE-1258
K-40	8.05±0.91	1.78±0.23	2.03±0.24	2.07±0.17	3.76±0.18
Mn-54	<0.036	<0.009	<0.011	<0.006	<0.013
Co-58	<0.040	<0.010	<0.011	<0.007	<0.013
Co-60	<0.041	<0.010	<0.012	<0.008	<0.012
Nb-95	<0.040	<0.011	<0.013	<0.007	<0.013
Zr-95	<0.076	<0.017	<0.022	<0.013	<0.023
Ru-103	<0.031	<0.008	<0.009	<0.007	<0.014
Ru-106	<0.27	<0.077	<0.086	<0.056	<0.11
Cs-134	<0.031	<0.008	<0.008	<0.005	<0.011
Cs-137	<0.038	<0.009	<0.010	<0.006	<0.013
Ce-141	<0.049	<0.013	<0.014	<0.011	<0.025
Ce-144	<0.20	<0.048	<0.052	<0.038	<0.093

Location	Indicator			Control
	D-93	D-94	D-106	D-105
Date Collected	10-08-91	09-10-91	10-08-91	10-08-91
Type	Corn Feed	Corn Feed	Corn Feed	Corn Feed
Lab Code	DVE-1274	DVE-1227	DVE-1277	DVE-1275,6
K-40	2.17±0.12	1.84±0.33	2.44±0.18	2.17±0.10
Mn-54	<0.006	<0.019	<0.007	<0.007
Co-58	<0.006	<0.020	<0.007	<0.007
Co-60	<0.006	<0.019	<0.006	<0.006
Nb-95	<0.007	<0.019	<0.009	<0.008
Zr-95	<0.011	<0.033	<0.013	<0.014
Ru-103	<0.006	<0.015	<0.008	<0.008
Ru-106	<0.048	<0.15	<0.059	<0.064
Cs-134	<0.005	<0.014	<0.007	<0.006
Cs-137	<0.006	<0.016	<0.007	<0.007
Ce-141	<0.010	<0.019	<0.012	<0.016
Ce-144	<0.037	<0.080	<0.042	<0.057

Table 19. Surface water samples, analysis for gamma-emitting isotopes.
Collection: Monthly.

Sample Description and Activity (pCi/L)						
<u>Indicator</u>	<u>D-50 - Plant Intake</u>					
Date Collected	01-25-91	02-27-91	03-25-91	04-30-91	05-29-91	06-26-91
Lab Code	DSW-9508,9	DSW-9753	DSW-173	DSW-640	DSW-917	DSW-1327
Mn-54	<15	<15	<15	<15	<15	<15
Fe-59	<30	<30	<30	<30	<30	<30
Co-58	<15	<15	<15	<15	<15	<15
Co-60	<15	<15	<15	<15	<15	<15
Zn-65	<30	<30	<30	<30	<30	<30
Nb-95	<15	<15	<15	<15	<15	<15
Zr-95	<30	<30	<30	<30	<30	<30
I-131	<500	<500	<500	<500	<500	<500
Cs-134	<15	<15	<15	<15	<15	<15
Cs-137	<18	<18	<18	<18	<18	<18
Ba-140	<60	<60	<60	<60	<60	<60
La-140	<15	<15	<15	<15	<15	<15
Date Collected	07-29-91	08-28-91	09-30-91	10-31-91	11-22-91	12-16-91
Lab Code	DSW-1752	DSW-2173	DSW-2685	DSW-3237	DSW-3460	DSW-3805
I-131	<500	<2.0	<2.0	<2.0	<2.0	<2.0
Mn-54	<15	<15	<15	<15	<15	<15
Fe-59	<30	<30	<30	<30	<30	<30
Co-58	<15	<15	<15	<15	<15	<15
Co-60	<15	<15	<15	<15	<15	<15
Zn-65	<30	<30	<30	<30	<30	<30
Nb-95	<15	<15	<15	<15	<15	<15
Zr-95	<30	<30	<30	<30	<30	<30
Cs-134	<15	<15	<15	<15	<15	<15
Cs-137	<18	<18	<18	<18	<18	<18
Ba-140	<60	<60	<60	<60	<60	<60
La-140	<15	<15	<15	<15	<15	<15

Table 19. Surface water samples, analysis for gamma-emitting isotopes.
(continued)

Sample Description and Activity (pCi/L)						
<u>Indicator</u>	<u>D-51 - Plant Discharge</u>					
Date Collected	01-25-91	02-27-91	03-25-91	04-30-91	05-29-91	06-26-91
Lab Code	DSW-9510	DSW-9754	DSW-174	DSW-641,2	DSW-918	DSW-1328
Mn-54	<15	<15	<15	<15	<15	<15
Fe-59	<30	<30	<30	<30	<30	<30
Co-58	<15	<15	<15	<15	<15	<15
Co-60	<15	<15	<15	<15	<15	<15
Zn-65	<30	<30	<30	<30	<30	<30
Nb-95	<15	<15	<15	<15	<15	<15
Zr-95	<30	<30	<30	<30	<30	<30
I-131	<500	<500	<500	<500	<500	<500
Cs-134	<15	<15	<15	<15	<15	<15
Cs-137	<18	<18	<18	<18	<18	<18
Ba-140	<60	<60	<60	<60	<60	<60
La-140	<15	<15	<15	<15	<15	<15
Date Collected	07-29-91	08-28-91	09-30-91	10-31-91	11-22-91	12-16-91
Lab Code	DSW-1753	DSW-2174	DSW-2686	DSW-3238,9	DSW-3461	DSW-3806
I-131	<500	<2.0	<2.0	<2.0	<2.0	<2.0
Mn-54	<15	<15	<15	<15	<15	<15
Fe-59	<30	<30	<30	<30	<30	<30
Co-58	<15	<15	<15	<15	<15	<15
Co-60	<15	<15	<15	<15	<15	<15
Zn-65	<30	<30	<30	<30	<30	<30
Nb-95	<15	<15	<15	<15	<15	<15
Zr-95	<30	<30	<30	<30	<30	<30
Cs-134	<15	<15	<15	<15	<15	<15
Cs-137	<18	<18	<18	<18	<18	<18
Ba-140	<60	<60	<60	<60	<60	<60
La-140	<15	<15	<15	<15	<15	<15

Table 19. Surface water samples, analysis for gamma-emitting isotopes.
(continued)

Sample Description and Activity (pCi/L)						
<u>Indicator</u>	<u>D-99 - Pleasant Creek</u>					
Date Collected	01-25-91	02-27-91	03-25-91	04-30-91	05-29-91	06-24-91
Lab Code	DSW-9511	DSW-9755	DSW-175	DSW-643	DSW-919	DSW-1329
Mn-54	<15	<15	<15	<15	<15	<15
Fe-59	<30	<30	<30	<30	<30	<30
Co-58	<15	<15	<15	<15	<15	<15
Co-60	<15	<15	<15	<15	<15	<15
Zn-65	<30	<30	<30	<30	<30	<30
Nb-95	<15	<15	<15	<15	<15	<15
Zr-95	<30	<30	<30	<30	<30	<30
I-131	<500	<500	<500	<500	<500	<500
Cs-134	<15	<15	<15	<15	<15	<15
Cs-137	<18	<18	<18	<18	<18	<18
Ba-140	<60	<60	<60	<60	<60	<60
La-140	<15	<15	<15	<15	<15	<15
Date Collected	07-29-91	08-28-91	09-30-91	10-31-91	11-22-91	12-16-91
Lab Code	DSW-1754	DSW-2175,6	DSW-2687,8	DSW-3240	DSW-3462	DSW-3807
I-131	<500	<2.0	<2.0	<2.0	<2.0	<2.0
Mn-54	<15	<15	<15	<15	<15	<15
Fe-59	<30	<30	<30	<30	<30	<30
Co-58	<15	<15	<15	<15	<15	<15
Co-60	<15	<15	<15	<15	<15	<15
Zn-65	<30	<30	<30	<30	<30	<30
Nb-95	<15	<15	<15	<15	<15	<15
Zr-95	<30	<30	<30	<30	<30	<30
Cs-134	<15	<15	<15	<15	<15	<15
Cs-137	<18	<18	<18	<18	<18	<18
Ba-140	<60	<60	<60	<60	<60	<60
La-140	<15	<15	<15	<15	<15	<15

Table 19. Surface water samples, analysis for gamma-emitting isotopes.
(continued)

Sample Description and Activity (pCi/L)						
Indicator	D-107 - Plant Sewage Discharge					
Date Collected	01-25-91	02-27-91	03-25-91	04-30-91	05-29-91	06-24-91
Lab Code	DSW-9512	DSW-9756	DSW-176	DSW-644	DSW-920	DSW-1330
K-40 ^a	25.0	26.1	21.0	22.0	18.5	15.7
Mn-54	<15	<15	<15	<15	<15	<15
Fe-59	<30	<30	<30	<30	<30	<30
Co-58	<15	<15	<15	<15	<15	<15
Co-60	<15	<15	<15	<15	<15	<15
Zn-65	<30	<30	<30	<30	<30	<30
Nb-95	<15	<15	<15	<15	<15	<15
Zr-95	<30	<30	<30	<30	<30	<30
I-131	<500	<500	<500	<500	<500	<500
Cs-134	<15	<15	<15	<15	<15	<15
Cs-137	<18	<18	<18	<18	<18	<18
Ba-140	<60	<60	<60	<60	<60	<60
La-140	<15	<15	<15	<15	<15	<15
Date Collected	07-29-91	08-28-91	09-30-91	10-31-91	11-22-91	12-16-91
Lab Code	DSW-1755	DSW-2177	DSW-2689	DSW-3241	DSW-3463	DSW-3808,9
K-40 ^a	18.9	20.3	22.7	19.4	22.8	16.2
I-131	<500	<2.0	<2.0	<2.0	<2.0	<2.0
Mn-54	<15	<15	<15	<15	<15	<15
Fe-59	<30	<30	<30	<30	<30	<30
Co-58	<15	<15	<15	<15	<15	<15
Co-60	<15	<15	<15	<15	<15	<15
Zn-65	<30	<30	<30	<30	<30	<30
Nb-95	<15	<15	<15	<15	<15	<15
Zr-95	<30	<30	<30	<30	<30	<30
Cs-134	<15	<15	<15	<15	<15	<15
Cs-137	<18	<18	<18	<18	<18	<18
Ba-140	<60	<60	<60	<60	<60	<60
La-140	<15	<15	<15	<15	<15	<15

^a Analyzed by flame photometry.

Table 19. Surface water samples, analysis for gamma-emitting isotopes.
(continued)

Sample Description and Activity (pCi/L)						
<u>Control</u>						
	<u>D-49 - Lewis Access</u>					
Date Collected	01-25-91	02-27-91	03-25-91	04-30-91	05-29-91	06-24-91
Lab Code	DSW-9507	DSW-9752	DSW-172	DSW-639	DSW-916	DSW-1326
Mn-54	<15	<15	<15	<15	<15	<15
Fe-59	<30	<30	<30	<30	<30	<30
Co-58	<15	<15	<15	<15	<15	<15
Co-60	<15	<15	<15	<15	<15	<15
Zn-65	<30	<30	<30	<30	<30	<30
Nb-95	<15	<15	<15	<15	<15	<15
Zr-95	<30	<30	<30	<30	<30	<30
I-131	<500	<500	<500	<500	<500	<500
Cs-134	<15	<15	<15	<15	<15	<15
Cs-137	<18	<18	<18	<18	<18	<18
Ba-140	<60	<60	<60	<60	<60	<60
La-140	<15	<15	<15	<15	<15	<15
Date Collected	07-29-91	08-28-91	09-30-91	10-31-91	11-22-91	12-16-91
Lab Code	DSW-1751	DSW-2172	DSW-2684	DSW-3236	DSW-3259	DSW-3804
I-131	<500	<2.0	<2.0	<2.0	<2.0	<2.0
Mn-54	<15	<15	<15	<15	<15	<15
Fe-59	<30	<30	<30	<30	<30	<30
Co-58	<15	<15	<15	<15	<15	<15
Co-60	<15	<15	<15	<15	<15	<15
Zn-65	<30	<30	<30	<30	<30	<30
Nb-95	<15	<15	<15	<15	<15	<15
Zr-95	<30	<30	<30	<30	<30	<30
Cs-134	<15	<15	<15	<15	<15	<15
Cs-137	<18	<18	<18	<18	<18	<18
Ba-140	<60	<60	<60	<60	<60	<60
La-140	<15	<15	<15	<15	<15	<15

Table 20. Surface water samples, quarterly composites of monthly samples, analysis for tritium.

Location and 1991 Collection Period	Lab Code	Concentration (pCi/L) H-3
<u>Indicator</u>		
<u>D-50</u>		
1st Quarter	DSW-209,10	<330
2nd Quarter	1345	<330
3rd Quarter	2697	<330
4th Quarter	3823	<330
Annual Mean \pm s.d.		<330
<u>D-51</u>		
1st Quarter	DSW-211	<330
2nd Quarter	1346,7	<330
3rd Quarter	2698,9	<330
4th Quarter	3824	<330
Annual Mean \pm s.d.		<330
<u>D-99</u>		
1st Quarter	DSW-212	<330
2nd Quarter	1348	<330
3rd Quarter	2700	<330
4th Quarter	3825,6	<330
Annual Mean \pm s.d.		<330
<u>D-107</u>		
1st Quarter	DSW-213	<330
2nd Quarter	1349	<330
3rd Quarter	2701	<330
4th Quarter	3827	<330
Annual Mean \pm s.d.		<330
<u>Control</u>		
<u>D-49</u>		
1st Quarter	DSW-208	<330
2nd Quarter	1344	<330
3rd Quarter	2696	<330
4th Quarter	3822	<330
Annual Mean \pm s.d.		<330

Table 21. Fish samples, analysis of edible portion for gamma-emitting isotopes.
Collection: Semiannually.

Sample Description and Activity (pCi/g wet)			
<u>Indicator</u>			
<u>Downstream D-61</u>			
Date Collected	07-03-91	07-03-91	07-03-91
Type	Carp	Channel Catfish	Buffalo
Lab Code	DF-1503	DF-1504	DF-1505
K-40	2.90±0.53	3.20±0.42	3.15±0.43
Mn-54	<0.017	<0.015	<0.020
Co-58	<0.025	<0.020	<0.023
Co-60	<0.015	<0.021	<0.017
Nb-95	<0.028	<0.036	<0.034
Zr-95	<0.047	<0.035	<0.045
Ru-103	<0.029	<0.025	<0.027
Ru-106	<0.14	<0.14	<0.16
Cs-134	<0.016	<0.014	<0.016
Cs-137	<0.017	<0.015	<0.018
Ce-141	<0.027	<0.026	<0.032
Ce-144	<0.075	<0.061	<0.067
Date Collected	10-10-91	10-10-91	10-10-91
Type	Carp	River Carpsucker	Channel Catfish
Lab Code	DF-1559	DF-1560	DF-1561
K-40	3.31±0.36	2.77±0.37	2.79±0.23
Mn-54	<0.021	<0.020	<0.011
Co-58	<0.034	<0.035	<0.018
Co-60	<0.021	<0.018	<0.012
Nb-95	<0.058	<0.066	<0.034
Zr-95	<0.054	<0.067	<0.034
Ru-103	<0.044	<0.053	<0.027
Ru-106	<0.16	<0.15	<0.097
Cs-134	<0.015	<0.017	<0.010
Cs-137	<0.018	<0.018	<0.010
Ce-141	<0.071	<0.092	<0.057
Ce-144	<0.095	<0.10	<0.074

Table 21. Fish samples, analysis of edible portion for gamma-emitting isotopes.
(continued)

Sample Description and Activity (pCi/g wet)			
<u>Control</u>			
Upstream D-49			
Date Collected	07-03-91	07-03-91	07-03-91
Type	Carp	Carp sucker	Buffalo
Lab Code	DF-1500	DF-1501	DF-1502
K-40	2.91±0.47	3.10±0.51	2.92±0.40
Mn-54	<0.020	<0.024	<0.017
Co-58	<0.024	<0.023	<0.022
Co-60	<0.013	<0.019	<0.015
Nb-95	<0.035	<0.027	<0.030
Zr-95	<0.041	<0.052	<0.044
Ru-103	<0.023	<0.024	<0.024
Ru-106	<0.16	<0.15	<0.12
Cs-134	<0.016	<0.018	<0.016
Cs-137	<0.016	<0.016	<0.018
Ce-141	<0.027	<0.030	<0.026
Ce-144	<0.071	<0.071	<0.059
Date Collected	10-10-91	10-10-91	10-10-91
Type	Carp	River Carpsucker	Channel Catfish
Lab Code	DF-1556	DF-1557	DF-1558
K-40	2.30±0.29	2.61±0.46	2.87±0.48
Mn-54	<0.020	<0.023	<0.022
Co-58	<0.031	<0.031	<0.037
Co-60	<0.019	<0.017	<0.015
Nb-95	<0.057	<0.072	<0.087
Zr-95	<0.066	<0.068	<0.088
Ru-103	<0.043	<0.051	<0.046
Ru-106	<0.18	<0.16	<0.16
Cs-134	<0.016	<0.018	<0.016
Cs-137	<0.017	<0.017	<0.017
Ce-141	<0.10	<0.059	<0.066
Ce-144	<0.13	<0.070	<0.082

Table 22. River sediment samples, analysis for gamma-emitting isotopes.
Collection: Semiannually.

Sample Description and Activity (pCi/g dry)				
Control				
Location	D-50	D-50		
Date Collected	07-11-91 ^a	09-18-91		
Lab Code	DBS-985	DBS-997		
K-40	8.53±0.55	4.58±0.29		
Mn-54	<0.032	<0.016		
Co-58	<0.036	<0.018		
Co-60	<0.042	<0.018		
Nb-95	<0.045	<0.027		
Zr-95	<0.067	<0.036		
Ru-103	<0.036	<0.020		
Ru-106	<0.29	<0.12		
Cs-134	<0.032	<0.018		
Cs-137	<0.031	<0.014		
Ce-141	<0.079	<0.050		
Ce-144	<0.22	<0.10		
Indicator				
Location	D-51	D-51	D-107	D-107
Date Collected	07-11-91 ^a	09-18-91	07-11-91 ^a	09-18-91
Lab Code	DBS-986	DBS-998	DBS-987	DBS-999
K-40	9.35±0.66	5.73±0.41	6.23±0.45	10.06±0.80
Mn-54	<0.044	<0.019	<0.031	<0.038
Co-58	<0.047	<0.021	<0.037	<0.055
Co-60	<0.049	<0.024	<0.040	<0.048
Nb-95	<0.064	<0.032	<0.046	<0.071
Zr-95	<0.098	<0.039	<0.065	<0.098
Ru-103	<0.051	<0.022	<0.037	<0.048
Ru-106	<0.43	<0.13	<0.35	<0.34
Cs-134	<0.047	<0.014	<0.038	<0.030
Cs-137	<0.043	<0.017	<0.031	<0.047
Ce-141	<0.11	<0.025	<0.078	<0.10
Ce-144	<0.30	<0.060	<0.22	<0.23

^a Collection schedule delayed due to unsafe water levels.

Table 23. Precipitation samples, analysis for gamma-emitting isotopes.
Collection: Monthly, 1991.

Sample Description and Concentration (pCi/L)				
Collection Period Lab Code	January DP-1018,9	February DP-1027	March DP-1036	April DP-1047
Mn-54	<4	<5	<3	<6
Fe-59	<10	<11	<9	<16
Co-58	<5	<5	<3	<6
Co-60	<4	<5	<3	<5
Zn-65	<8	<10	<7	<13
Nb-95	<5	<6	<4	<7
Zr-95	<7	<9	<6	<11
I-131	<15	<12	<10	<13
Cs-134	<4	<4	<3	<5
Cs-137	<4	<5	<3	<6
Ba-140	<27	<27	<18	<34
La-140	<7	<5	<4	<10
Collection Period Lab Code	May DP-1055	June DP-1057	July DP-1060	August DP-1062,3
Mn-54	<7	<3	<7	<7
Fe-59	<15	<9	<17	<15
Co-58	<6	<3	<7	<7
Co-60	<6	<3	<6	<6
Zn-65	<18	<6	<14	<16
Nb-95	<8	<5	<7	<7
Zr-95	<12	<6	<12	<13
I-131	<12	<28	<14	<13
Cs-134	<7	<3	<6	<7
Cs-137	<7	<3	<7	<8
Ba-140	<36	<44	<36	<33
La-140	<13	<14	<11	<8
Collection Period Lab Code	September DP-1071	October DP-1088	November ^a DP-1090	December DP-1099
Mn-54	<5	<4	<29	<4
Fe-59	<12	<11	<60	<9
Co-58	<5	<4	<30	<4
Co-60	<6	<4	<29	<3
Zn-65	<13	<9	<63	<7
Nb-95	<7	<5	<32	<4
Zr-95	<11	<7	<53	<6
I-131	<10	<10	<50	<7
Cs-134	<6	<4	<30	<3
Cs-137	<6	<4	<31	<3
Ba-140	<28	<27	<147	<17
La-140	<9	<8	<39	<5

^a High LLD's due to low sample volume (80 ml).

Table 24. Precipitation samples, quarterly composites of monthly samples, analysis for tritium.

Location and 1991 Collection Period	Lab Code	<u>Concentration (pCi/L)</u> H-3
1st Quarter	DP-1038	<330
2nd Quarter	DP-1058	<330
3rd Quarter	DP-1072	<330
4th Quarter	DP-1100	<330

Table 26. Soil samples, analysis for strontium-90 and gamma-emitting isotopes.
Collection: Annually.

Sample Description and Activity (pCi/g dry)		
Location	D-15	D-16
Date Collected	07-29-91	07-29-91
Lab Code	DS0-559	DS0-560,1
Sr-90	0.080±0.010	0.049±0.009
K-40	9.05±0.54	13.10±0.54
Mn-54	<0.029	<0.045
Co-58	<0.027	<0.043
Ce-60	<0.040	<0.058
Ni-95	<0.032	<0.049
Zr-95	<0.051	<0.082
Ru-103	<0.027	<0.039
Ru-106	<0.29	<0.48
Cs-134	<0.032	<0.054
Cs-137	0.54 ± 0.030	<0.045
Ce-141	54	<0.081
Ce-144	21	<0.31