

Rocky Flats Plant

Eric: Pls review to see
if relevant exhibits for
upcoming meeting (Aunt)

OCTOBER
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Monthly Environmental Monitoring Report

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Executive Summary

The Rocky Flats Plant is part of a nationwide Department of Energy complex for the research, development, and production of nuclear weapons. The plant is responsible for fabricating nuclear weapons components from plutonium, uranium, beryllium, and stainless steel. Primary production activities include metal fabrication and assembly, chemical recovery and purification of process-produced transuranic radionuclides, and related quality control functions.

Because radioactive and chemically hazardous materials are used or handled at the Rocky Flats Plant, the plant maintains an extensive environmental protection program. Included in that program is regular monitoring for radioactive and hazardous constituents at onsite, plant boundary, and offsite locations. This Environmental Monitoring Report provides a monthly summary of environmental monitoring data collected by the Rocky Flats Plant. Summarized below are highlights from the major data categories presented. Remaining data presented in this report are within the ranges historically measured for their respective parameters and locations.

Radiation standards for protection of the public are discussed in Appendix A of this report. The primary standards are based on calculations of radiation dose. These calculations are performed annually using monitoring data presented in the Monthly Environmental Monitoring Report. Radiation doses to the public from Rocky Flats Plant operations are typically well below any regulatory limit and far less than are received from naturally occurring radiation sources in the Denver metropolitan area (see Appendix A).

The Rocky Flats Plant Radiological Health Laboratory had been shut down for much of January through March 1991 because of needed maintenance on its process wastewater transfer system. Environmental monitoring sample analyses for beryllium, plutonium, uranium, and americium in air and surface water and for tritium in surface water were not performed during this shutdown. The maintenance has been completed, and the laboratory now is fully operational. Analyses for beryllium and for isotope-specific radioactive materials on environmental monitoring samples have resumed. Analytical results for samples impacted by the shutdown now are complete and have been reported; some of those results are included in Appendix D.

Ambient Air Sampling Results

The concentration of plutonium (0.000181 ± 0.000032 pCi/m³) in onsite ambient air for the S-38 sampling location for October 1990 was above the level typically seen for that location. (See Appendix D.) A reanalysis for the sample on a remaining aliquot of the dissolved sample filter was performed. The reanalysis confirmed the original results. Both the original and the confirming analysis met all laboratory quality assurance criteria. No Rocky Flats Plant-related operations could be identified that might have contributed to the above-normal result. Reporting of the analytical results was inadvertently delayed as a result of the break in the Plant's data reporting routine during the Radiological Health Laboratory shutdown.

**October
1991**

Rocky Flats Plant Environmental Monitoring Report

Introduction

This report summarizes the effluent and environmental monitoring programs at the Rocky Flats Plant (RFP) for the month of October 1991. The data presented herein reflect the best information available to the RFP at this time. Should subsequent analyses indicate that any data presented herein are inaccurate or misleading, appropriate revisions will be issued promptly.

Tables 1 through 3 show monitoring results for radioactive and nonradioactive airborne effluents continuously sampled from plant buildings. Tables 4 through 6 summarize environmental monitoring data from the RFP ambient air sampling network. This network is comprised of continuously operating outdoor air samplers located on plantsite, around the plant boundary, and in neighboring communities.

Water sampling results for radioactive constituents are given in Tables 7 through 11. Results are summarized for plant surface water control ponds, for nearby drinking water reservoirs, and for tap water for neighboring communities. Nitrate monitoring for Great Western Reservoir and Standley Lake, the two drinking water reservoirs that can receive surface water discharges from the plant, are summarized in Table 12. Surface water discharges from RFP currently are being diverted around these drinking water reservoirs.

The Environmental Protection Agency (EPA) has issued to the plant a National Pollutant Discharge Elimination System (NPDES) permit for control of surface water discharges. Water sampling results associated with the NPDES permit, as modified by a March 25, 1991, Federal Facilities Compliance Agreement (FFCA) with EPA, are reported in Table 13. Applicable NPDES/FFCA limits are included in Table 13 for comparison. Monitoring results for which no limits have been established under the NPDES/FFCA are reported in Table 14. Appendix B

lists the volatile organic compounds for which monitoring is required under the NPDES/FFCA. Analytical results for nonradioactive parameters in water at the Walnut Creek at Indiana Street location are summarized in Table 15. Daily flow data for surface water from the two plant drainage systems (Walnut Creek and Woman Creek) are given in Tables 16 and 17. Daily flow data for water transferred from Pond B-5 to Pond A-4, for subsequent discharge offsite, are given in Table 18. Meteorological data, including percent wind direction frequency by wind speed class and daily precipitation, are given in Tables 19 and 20.

Appendix D contains corrections and updates on previously reported information.

Error terms in the form of "a±b" are included with some of the data. For a single sample, "a" is the analytical-blank corrected value; for multiple samples it represents the arithmetic mean, the volume-weighted mean, or the annual total, as indicated in the table. The error term "b" accounts for the propagated statistical counting uncertainty of the sample(s) and the associated analytical blanks at the 95 percent confidence level. These error terms represent a minimum estimate of error for the data.

Plutonium, uranium, americium, tritium, and beryllium measured concentrations are given in this report. Most of the measured concentrations are at or very near background levels, and often there is little or no amount of these materials in the media being analyzed. When this occurs, the results of the laboratory analyses can be expected to show a statistical distribution of positive and negative numbers near zero and numbers that are less than the calculated minimum detectable concentration for the analyses. The laboratory analytical blanks, used to correct for background contributions to the measurements, show a similar statistical distribution around their average values. Negative sample values result when the measured value for a laboratory analytical blank is subtracted from a sample analytical result smaller than the analytical blank value. Results that are less than calculated minimum detectable levels indicate that the results are below the level of statistical confidence in the actual numerical values. All reported results - including negative values and values that are less than minimum detectable levels - are included in any arithmetic calculations on the data set. Reporting all values allows all of the data to be evaluated using appropriate statistical treatment. This assists in

identifying any bias in the analyses, allows better evaluation of distributions and trends in environmental data, and helps in estimating the true sensitivity of the measurement process.

The reader should use caution in interpreting individual values that are negative or less than minimum detectable levels. A negative value has no physical significance. Values less than minimum detectable levels lack statistical confidence as to what the actual number is, although it is known with high confidence that it is below the specified detection level. Such values should not be interpreted as being the actual amount of material in the sample, but should be seen as reflecting a range (from zero to the minimum detectable level) in which the actual amount would likely lie. These values are significant, however, when taken together with other analytical results that indicate that the distribution is near zero.

The data provided in this report are provided as a matter of courtesy and should not be construed as an application for a permit or license, or in support of such an application. Approval of the Department of Energy should be obtained before publication of any data contained in this report.

Abbreviations used within this report are as defined.

Abbreviations

C Average	Average concentration
C Maximum	Maximum concentration
C Minimum	Minimum concentration
m ³	Cubic meter
m/s	Meters per second
mCi	Millicurie
mg/l	Milligrams per liter
mrem	Millirem
pCi/l	Picocuries per liter
pCi/m ³	Picocuries per cubic meter
pH	Hydrogen ion concentration
SU	Standard Unit
μg/m ³	Micrograms per cubic meter
#/100 ml	Number per 100 milliliter
μCi	Microcurie

Table 1

Plutonium and Americium Airborne Effluent Data

Month	Plutonium-239, -240 (09/16/91 - 10/18/91)		Americium-241 (08/15/91 - 09/17/91)	
	Release (μCi)	C Maximum (pCi/m^3)	Release (μCi)	C Maximum (pCi/m^3)
CY90	1.039	0.0078 \pm 0.0018	0.396	0.0014 \pm 0.0002
January	0.030 \pm 0.007	0.0005 \pm 0.0001	0.0075 \pm 0.0030	0.0006 \pm 0.0001
February	0.017 \pm 0.007	0.0002 \pm 0.0001	0.0076 \pm 0.0032	0.0001 \pm 0.0001
March	0.018 \pm 0.007	0.0001 \pm 0.0000	0.0008 \pm 0.0039	0.0001 \pm 0.0000
April	0.029 \pm 0.008	0.0001 \pm 0.0000	0.0046 \pm 0.0044	0.0000 \pm 0.0000
May	0.220 \pm 0.035	0.0030 \pm 0.0006	0.0070 \pm 0.0100	0.0002 \pm 0.0001
June	0.036 \pm 0.007	0.0001 \pm 0.0000	0.0093 \pm 0.0032	0.0000 \pm 0.0000
July	0.097 \pm 0.016	0.0009 \pm 0.0002	0.0221 \pm 0.0076	0.0002 \pm 0.0000
August	0.039 \pm 0.008	0.0003 \pm 0.0001	0.0092 \pm 0.0054	0.0001 \pm 0.0000
September	0.027 \pm 0.008 ^a	0.0002 \pm 0.0001	0.0080 \pm 0.0036	0.0000 \pm 0.0000
October	0.094 \pm 0.022	0.0003 \pm 0.0001		
November				
December				
Year to Date	0.607 \pm 0.124	0.0030 \pm 0.0006	0.076 \pm 0.044	0.0006 \pm 0.0001

^a Previously reported as incomplete data.

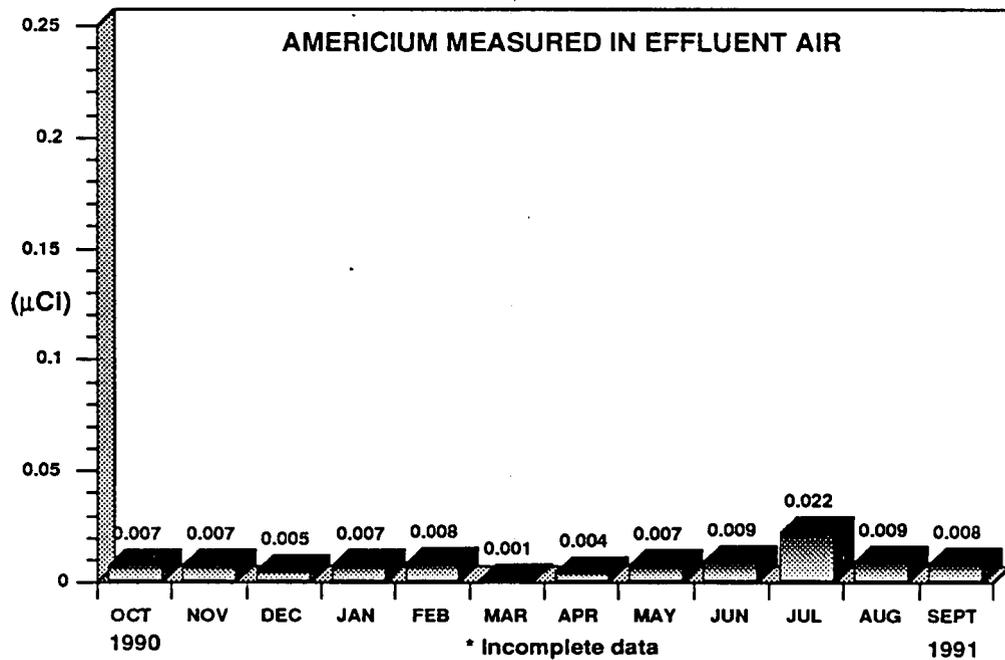
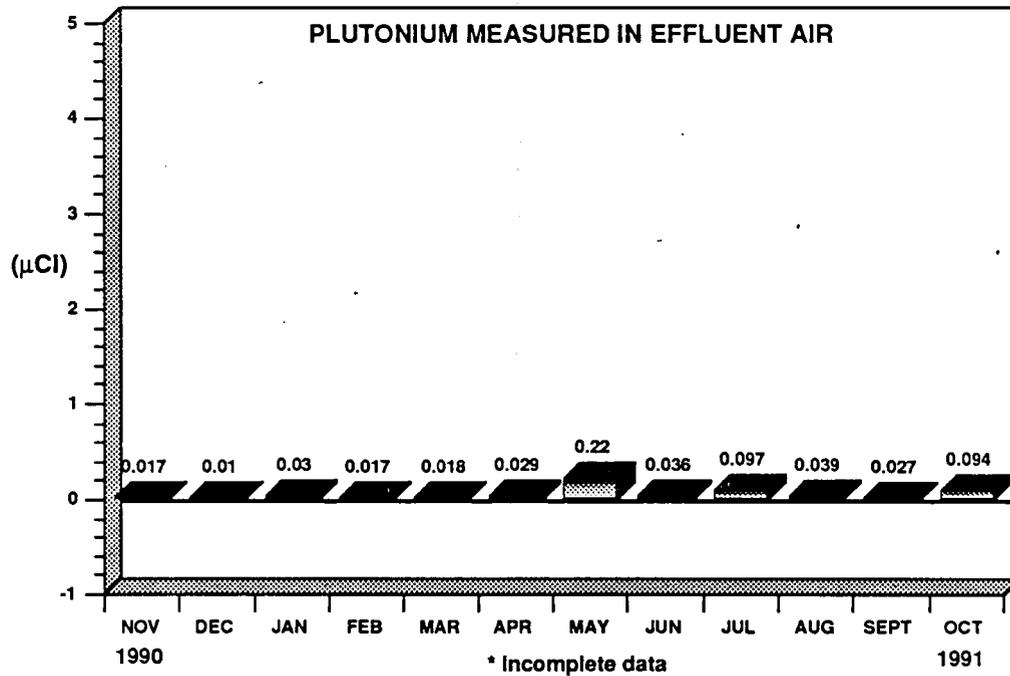


Table 2

Uranium Airborne Effluent Data

Month	Uranium-233, -234 (09/16/91 - 10/18/91)		Uranium-238 (09/16/91 - 10/18/91)	
	Release (μCi)	C Maximum (pCi/m^3)	Release (μCi)	C Maximum (pCi/m^3)
CY90	0.098	0.0026 \pm 0.0005	0.508	0.0003 \pm 0.0001
January	0.003 \pm 0.013	0.0001 \pm 0.0001	0.020 \pm 0.013	0.0002 \pm 0.0001
February	0.004 \pm 0.013	0.0001 \pm 0.0000	0.001 \pm 0.011 ^a	0.0001 \pm 0.0000
March	0.026 \pm 0.021	0.0001 \pm 0.0001	0.033 \pm 0.012	0.0001 \pm 0.0000
April	0.036 \pm 0.013	0.0001 \pm 0.0001	0.039 \pm 0.012	0.0002 \pm 0.0001
May	0.143 \pm 0.029	0.0001 \pm 0.0001	0.163 \pm 0.030	0.0001 \pm 0.0001
June	0.127 \pm 0.023	0.0001 \pm 0.0001	0.147 \pm 0.021	0.0003 \pm 0.0001
July	0.080 \pm 0.018	0.0001 \pm 0.0001	0.119 \pm 0.018	0.0005 \pm 0.0002
August	0.032 \pm 0.019	0.0001 \pm 0.0001	0.076 \pm 0.019	0.0002 \pm 0.0001
September	0.041 \pm 0.019	0.0001 \pm 0.0001	0.063 \pm 0.020	0.0001 \pm 0.0001
October	0.031 \pm 0.020 ^a	0.0001 \pm 0.0000	0.085 \pm 0.023 ^a	0.0002 \pm 0.0001
November				
December				
Year to Date	0.523 \pm 0.187	0.0001 \pm 0.0001	0.747 \pm 0.179	0.0005 \pm 0.0002

^a The data for 14 uranium locations are missing because of failure of Quality Assurance Criteria. The samples are being rerun.

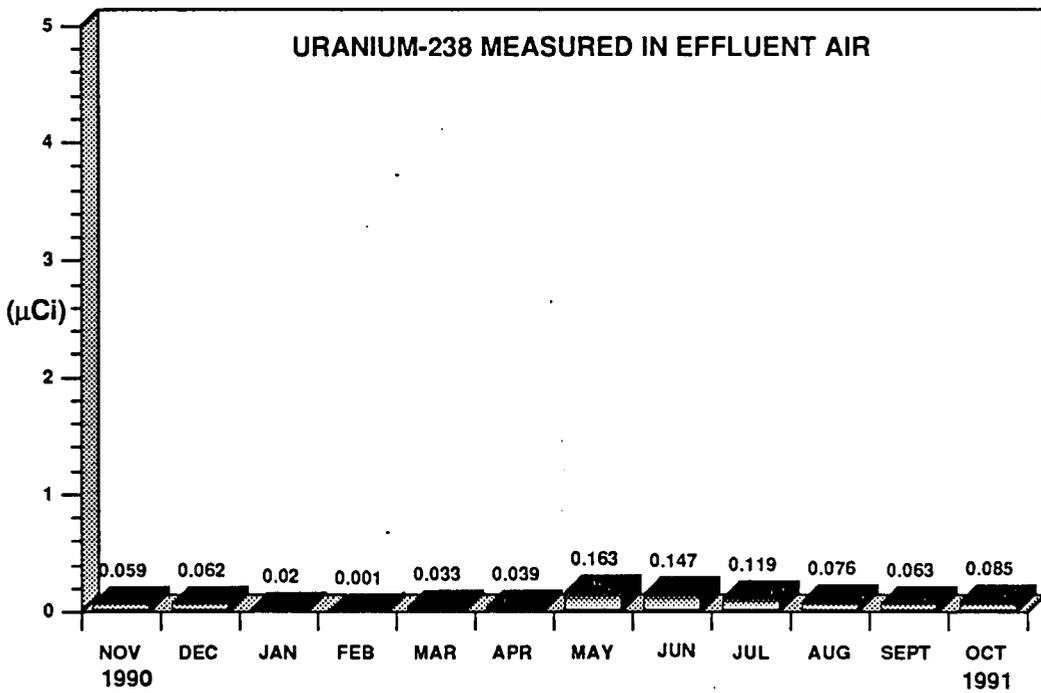
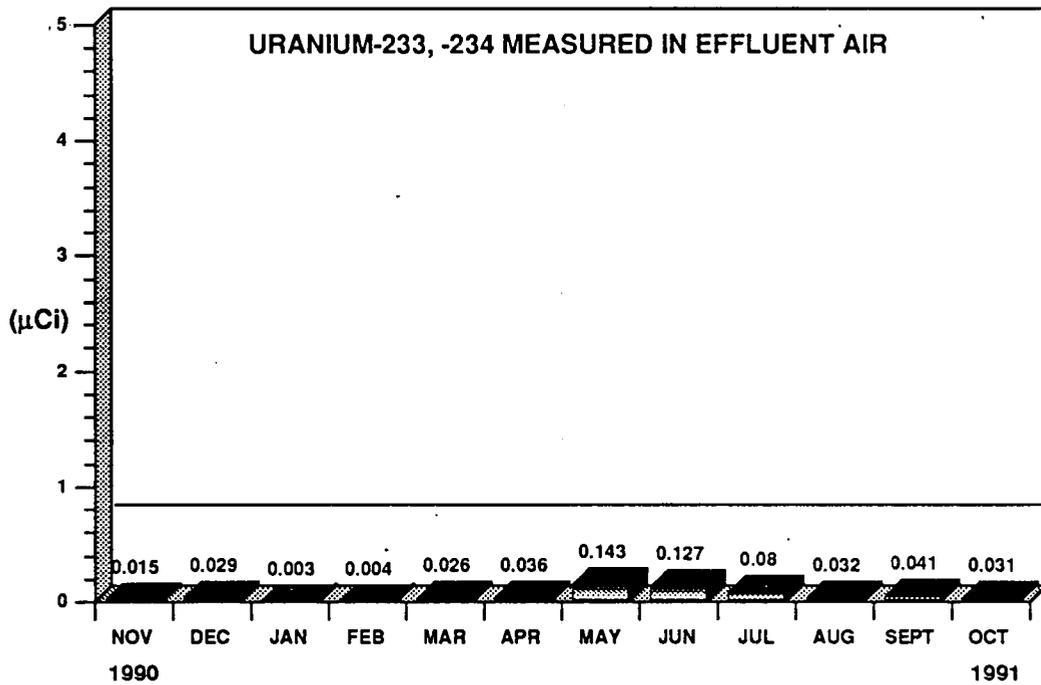


Table 3

Tritium and Beryllium Airborne Effluent Data

<u>Month</u>	<u>Tritium, H-3</u> <u>(09/30/91 - 10/30/91)</u>		<u>Beryllium</u> <u>(09/16/91 - 10/18/91)</u>	
	<u>Release</u> <u>(mCi)</u>	<u>C Maximum</u> <u>(pCi/m³)</u>	<u>Release</u> <u>(grams)</u>	<u>C Maximum</u> <u>(µg/m³)</u>
CY90	3.849	88 ± 7	1.4991	0.00136
January	0.082	19 ± 8	0.1468 ± 0.011	0.00059
February	0.147	30 ± 18	0.1212 ± 0.009	0.00049
March	0.179	27 ± 9	0.1051 ± 0.007	0.00032
April	0.358	40 ± 17	0.1300 ± 0.008	0.00184
May	0.121	21 ± 6	0.1016 ± 0.007	0.00043
June	0.450	94 ± 55	0.2200 ± 0.014	0.00065
July	0.857	68 ± 10	0.0893 ± 0.006	0.00034
August	0.483	61 ± 13	0.0695 ± 0.004	0.00022
September	0.330	46 ± 15	0.0802 ± 0.005	0.00062
October	0.674	50 ± 8	0.0608 ± 0.004	0.00076
November				
December				
Year to Date	3.681	94 ± 55	1.1245 ± 0.075	0.00184

NOTE: Beryllium measured at the remaining 44 locations was below the screening level of 0.1 gram per month. Beryllium emissions from Rocky Flats Plant are regulated by the State of Colorado under Colorado Air Quality Control Regulation #8. The limit for beryllium air emissions is 10 grams per stationary source in a 24-hour period.

The calibration methodology for the beryllium analyses was changed beginning with the September 1990 samples to improve quality assurance. The previous procedure used the single-point, "simple method of additions," one of the methods recommended by the manufacturer of the graphite furnace atomic absorption analytical equipment. The current method is based on EPA Contract Laboratory Program protocol. It uses multi-point calibration curves, periodic validation of the curve with EPA validation standards, and periodic blank and sample checks to assure absence of equipment contamination and matrix effects during the analysis. No blank corrections are made to any beryllium data.

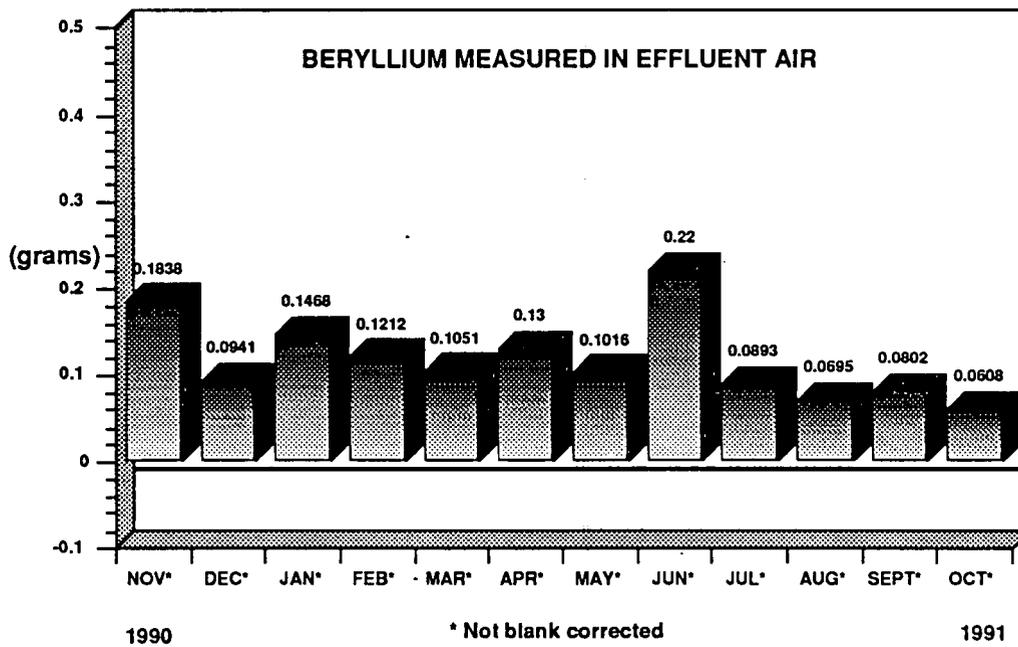
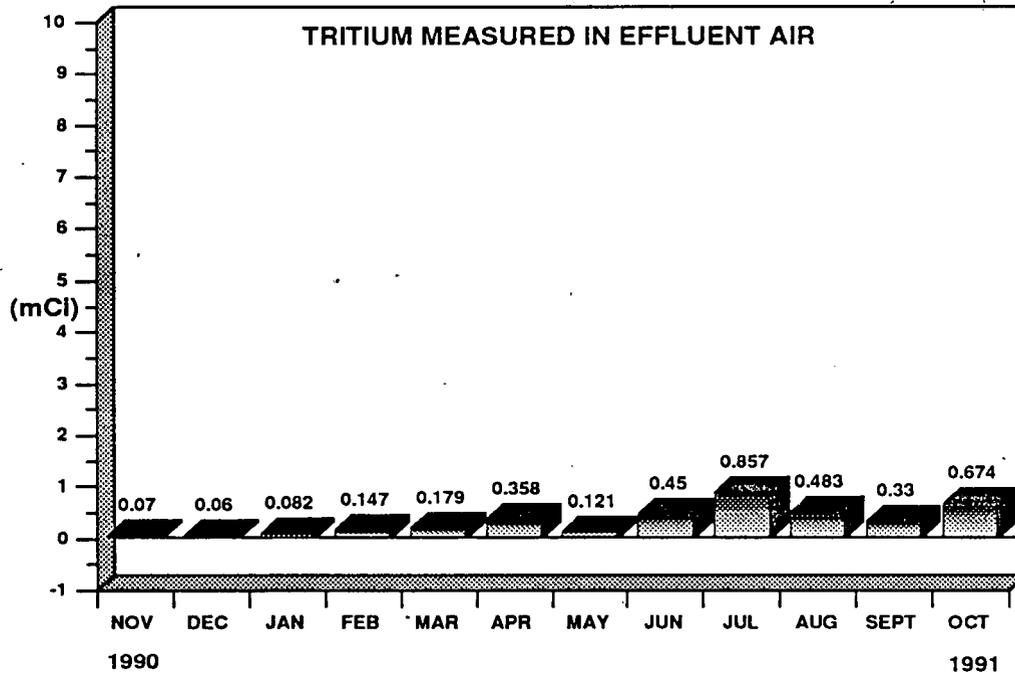


Table 4**Plutonium Concentrations in Ambient Air for Onsite Samplers**

(09/30/91 - 10/28/91)

<u>Location</u>	<u>Number Composited Monthly Samples</u>	<u>Volume (m³)</u>	<u>Plutonium Concentration (pCi/m³)</u>	<u>± 95 percent Confidence Interval (pCi/m³)</u>
S-01 ^a	1	10000	0.000484	0.000076
S-02	1	31000	0.000013	0.000007
S-03	1	30000	0.000006	0.000004
S-04	1	26000	0.000013	0.000005
S-05	1	31000	0.000044	0.000008
S-06	1	28000	0.000107	0.000021
S-07	1	28000	0.000107	0.000019
S-08	1	32000	0.000169	0.000029
S-09	1	31000	0.000082	0.000017
S-10	1	30000	0.000004	0.000003
S-11	1	32000	0.000004	0.000003
S-12 ^b				
S-13	1	30000	0.000004	0.000002
S-14 ^c	1			
S-15 ^b				
S-16	1	29000	0.000001	0.000002
S-17	1	29000	0.000004	0.000003
S-18	1	30000	0.000018	0.000006
S-19	1	29000	0.000022	0.000006
S-20	1	30000	0.000012	0.000005
S-21	1	33000	0.000023	0.000006
S-22	1	27000	0.000008	0.000004
S-23	1	31000	0.000002	0.000002
S-24	1	30000	0.000001	0.000002
S-25 ^d	1	32000	0.000062	0.000011
S-81	1	40000	0.000008	0.000005

a Sampler was inoperable during part of the sampling period.

b These samplers were removed from the RAAMP network and will be used at the new community operated monitoring stations.

c Incomplete laboratory analyses.

d This sampler was previously designated as sampler number S-8B.

Table 5

Plutonium Concentrations in Ambient Air for Perimeter Samplers

(09/24/91 - 10/22/91)

<u>Location</u>	<u>Number Composited Monthly Samples</u>	<u>Volume (m³)</u>	<u>Plutonium Concentration (pCi/m³)</u>	<u>± 95 percent Confidence Interval (pCi/m³)</u>
S-31	1	32000	-0.000003	0.000003
S-32	1	33000	-0.000003	0.000003
S-33	1	32000	-0.000002	0.000004
S-34	1	30000	-0.000002	0.000004
S-35	1	33000	-0.000001	0.000004
S-36	1	32000	-0.000001	0.000004
S-37	1	30000	0.000001	0.000004
S-38	1	25000	-0.000002	0.000005
S-39 ^a	1	28000	-0.000002	0.000004
S-40	1	32000	0.000000	0.000004
S-41	1	32000	-0.000002	0.000004
S-42	1	30000	-0.000001	0.000004
S-43	1	32000	0.000001	0.000006
S-44	1	28000	0.000005	0.000006

^a This volume was calculated because of mechanical problems with the meter.

Table 6

Plutonium Concentrations in Ambient Air for Community Samplers

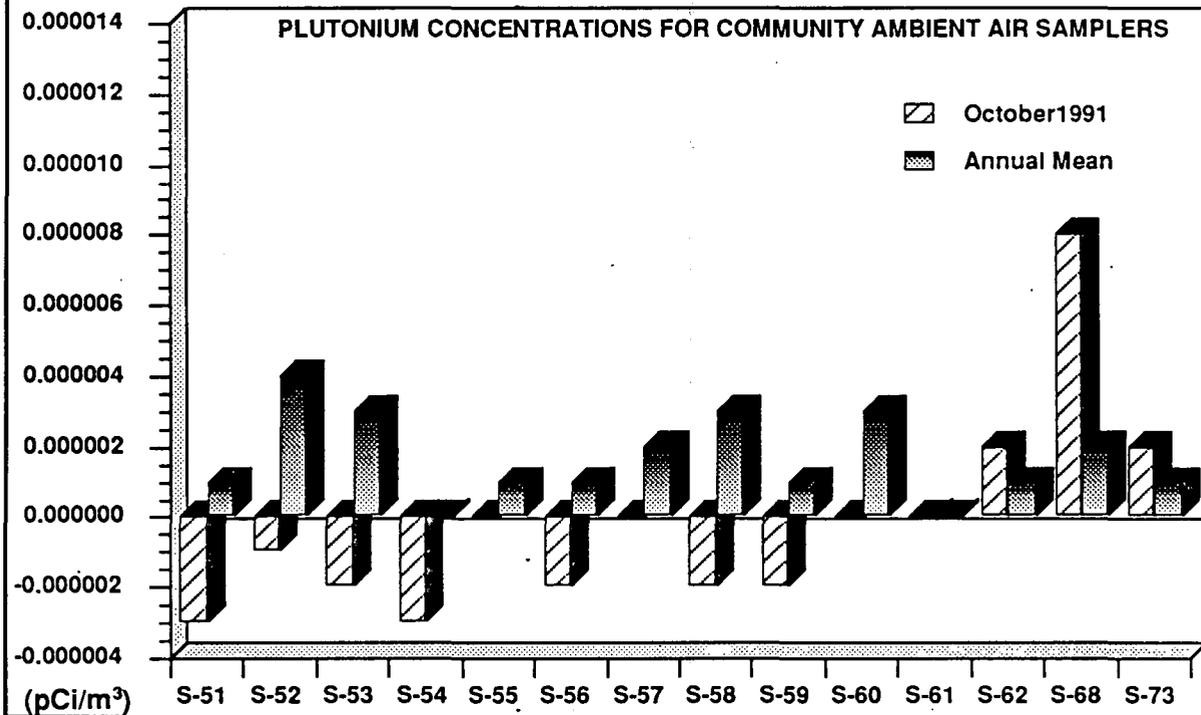
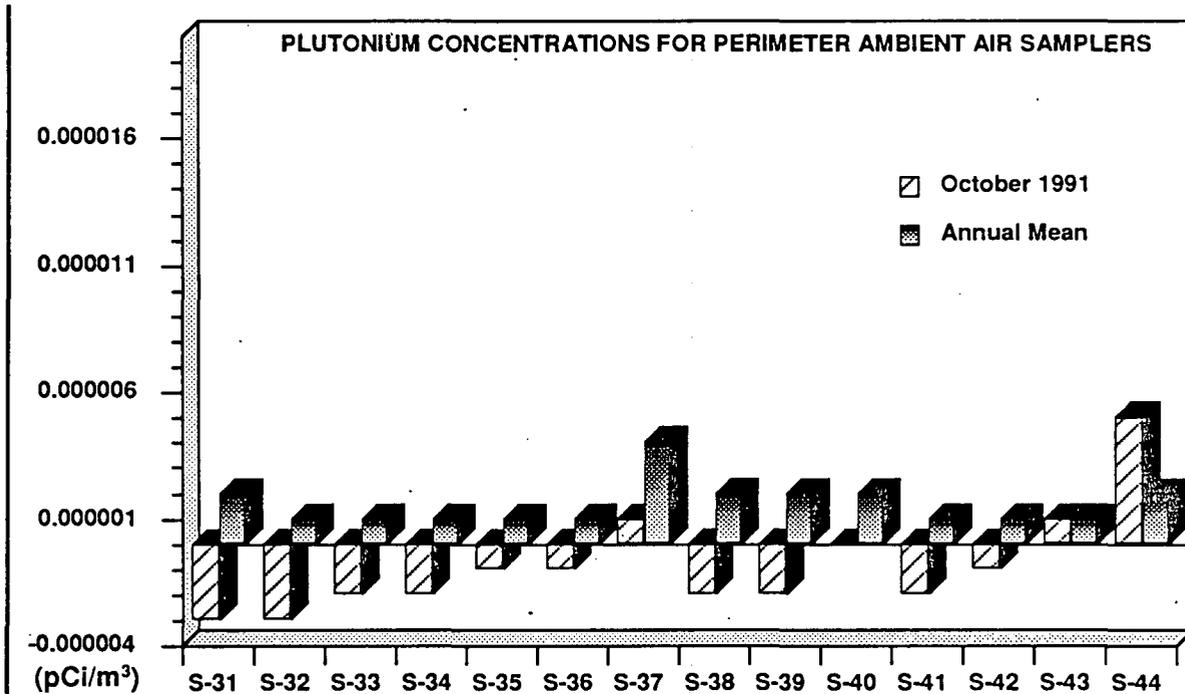
(09/25/91 - 10/23/91)

<u>Location</u>	<u>Community Name</u>	<u>Number Composited Monthly Samples</u>	<u>Volume (m³)</u>	<u>Plutonium Concentration (pCi/m³)</u>	<u>± 95 percent Confidence Interval (pCi/m³)</u>
S-51	Marshall	1	31000	-0.000003	0.000003
S-52	Jeffco Airport	1	32000	-0.000001	0.000004
S-53	Superior	1	32000	-0.000002	0.000003
S-54	Boulder	1	32000	-0.000003	0.000003
S-55 ^a	Lafayette				
S-56	Broomfield	1	27000	-0.000002	0.000004
S-57 ^a	Walnut Creek				
S-58	Wagner	1	31000	-0.000002	0.000004
S-59	Leyden	1	31000	-0.000002	0.000004
S-60 ^b	Westminster	1			
S-61 ^c	Denver				
S-62	Golden	1	27000	0.000002	0.000007
S-68	Lakeview Pointe	1	29000	0.000008	0.000008
S-73	Cotton Creek	1	28000	0.000002	0.000005

^a This sampler was damaged beyond repair and must be replaced.

^b This sampler was inoperable during the sampling period.

^c Sampler S-61 located in Denver was inoperative during this period. This sampler has been temporarily removed because of construction activities on the building where it is installed.



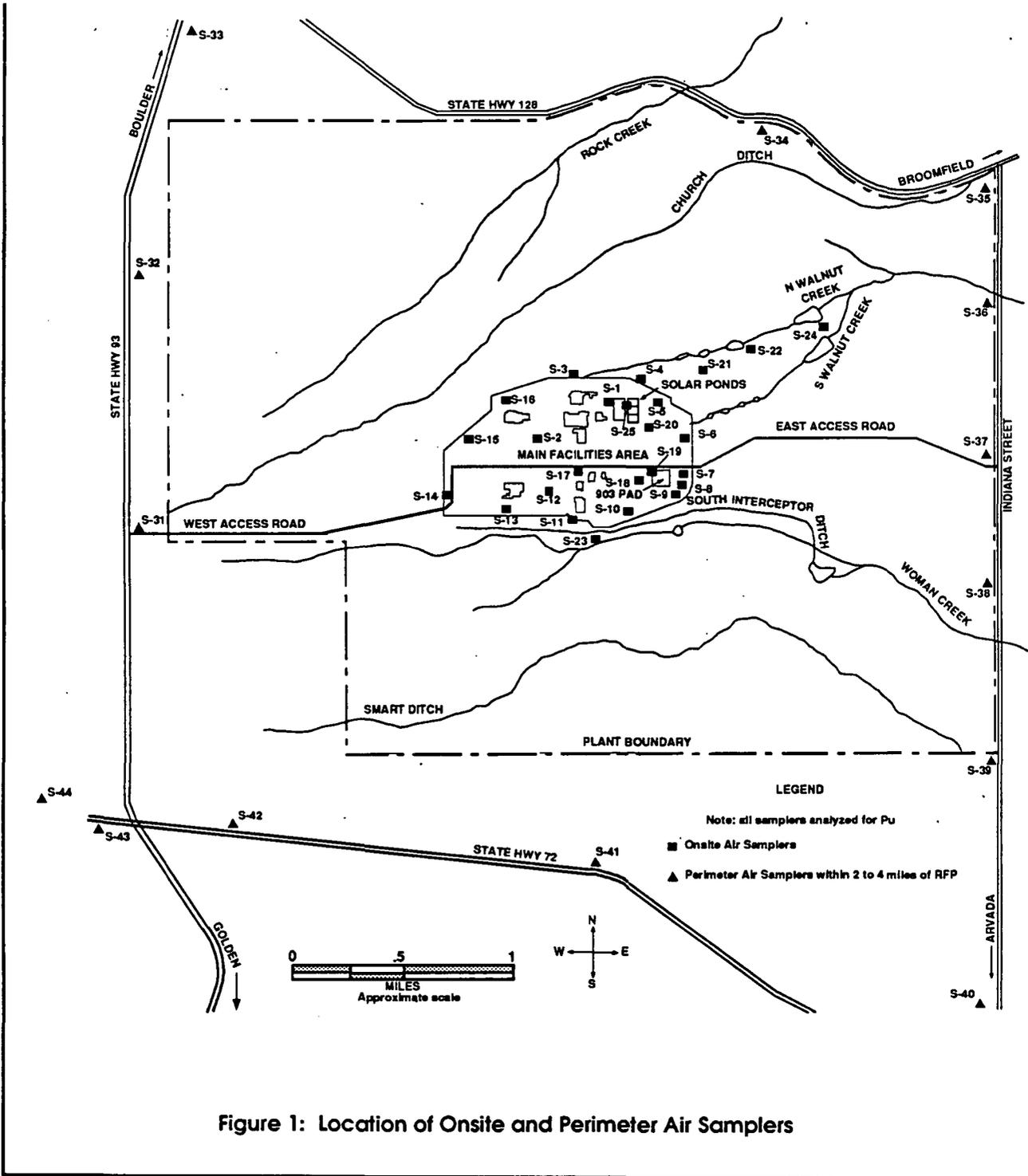
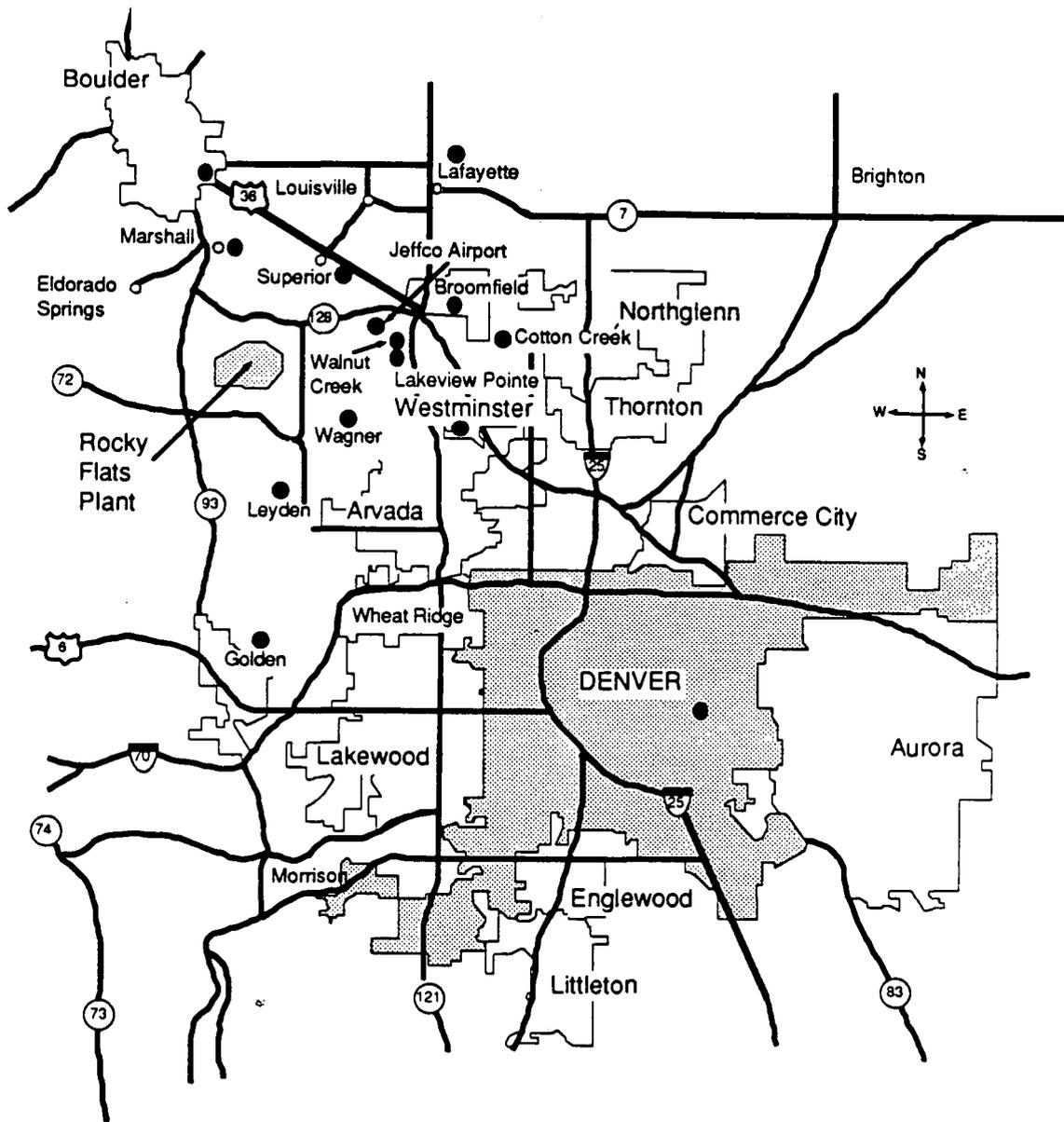


Figure 1: Location of Onsite and Perimeter Air Samplers



LEGEND

● Community Air Samplers

Figure 2: Location of Community Air Samplers

Table 7

Onsite Water Sample Results - Plutonium and Americium

Holding Pond Outfall (pCi/l)

<u>Location</u>	<u>Plutonium-239, -240</u>	<u>Americium-241</u>
<u>Pond A-4</u>		
10/25/91 - 10/31/91	a	a
Volume weighted average concentration	a	a
<u>Pond B-5</u> - No discharge		
<u>Pond C-1</u>		
10/07/91 - 10/11/91	a	a
10/14/91 - 10/18/91	a	a
10/21/91 - 10/25/91	a	- 0.001 ± 0.004
10/28/91 - 11/01/91	a	a
Average concentration	a	a
<u>Pond C-2</u> - No discharge		
<u>Walnut Creek at Indiana</u>		
10/26/91 - 10/31/91	a	a
Volume weighted average concentration		

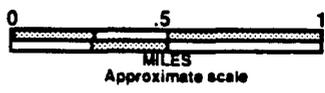
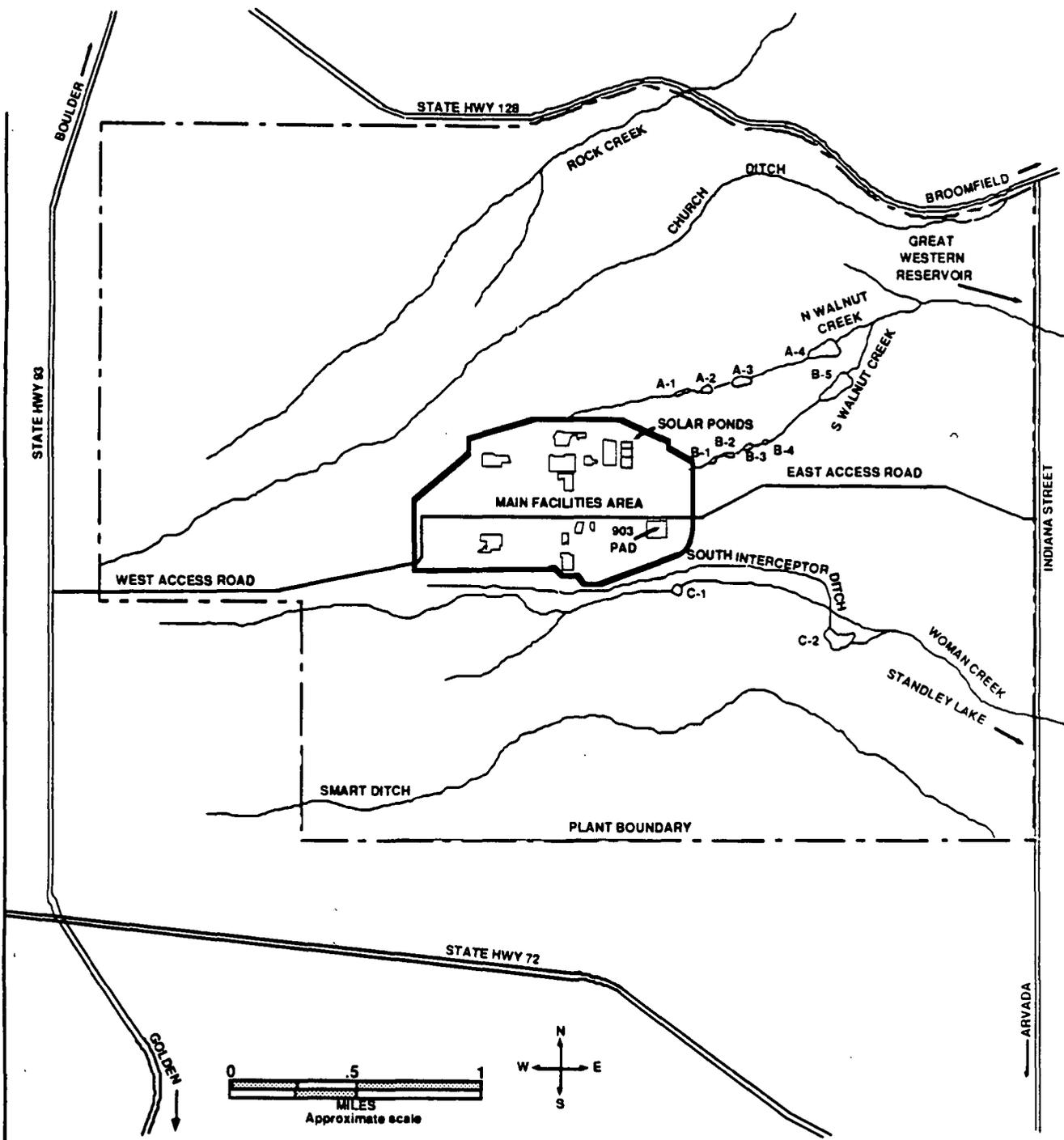
a Incomplete lab analysis.

Table 8

Onsite Water Sample Results - Uranium

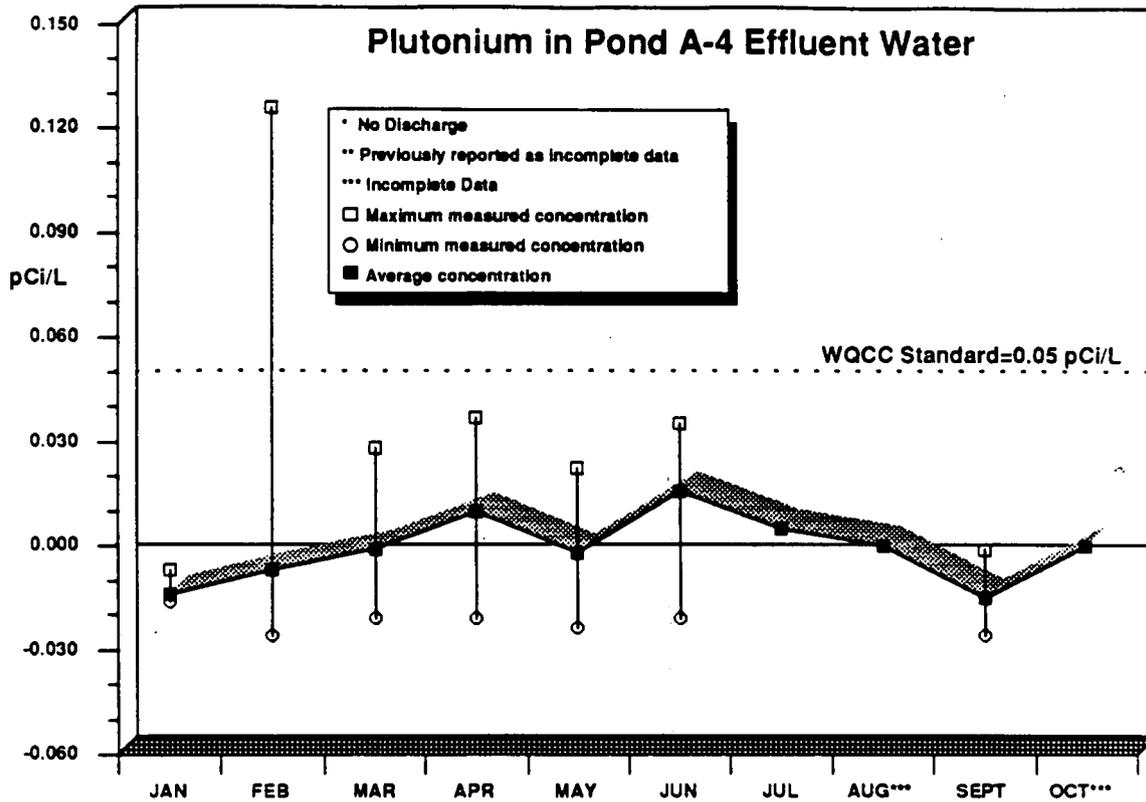
Holding Pond Outfall (pCi/l)

<u>Location</u>	<u>Uranium-233, -234</u>		<u>Uranium-238</u>	
<u>Pond A-4</u>				
10/25/91 - 10/31/91	a		a	
Volume weighted average concentration	a		a	
<u>Pond B-5</u> - No discharge				
<u>Pond C-1</u>				
10/07/91 - 10/11/91	0.82	± 0.20	0.56	± 0.15
10/14/91 - 10/18/91	a		a	
10/21/91 - 10/25/91	a		a	
10/28/91 - 11/01/91	a		a	
Average concentration	a		a	
<u>Pond C-2</u> - No discharge				
<u>Walnut Creek at Indiana</u>				
10/26/91 - 10/31/91	a		a	
Volume weighted average concentration	a		a	
a Incomplete lab analysis.				

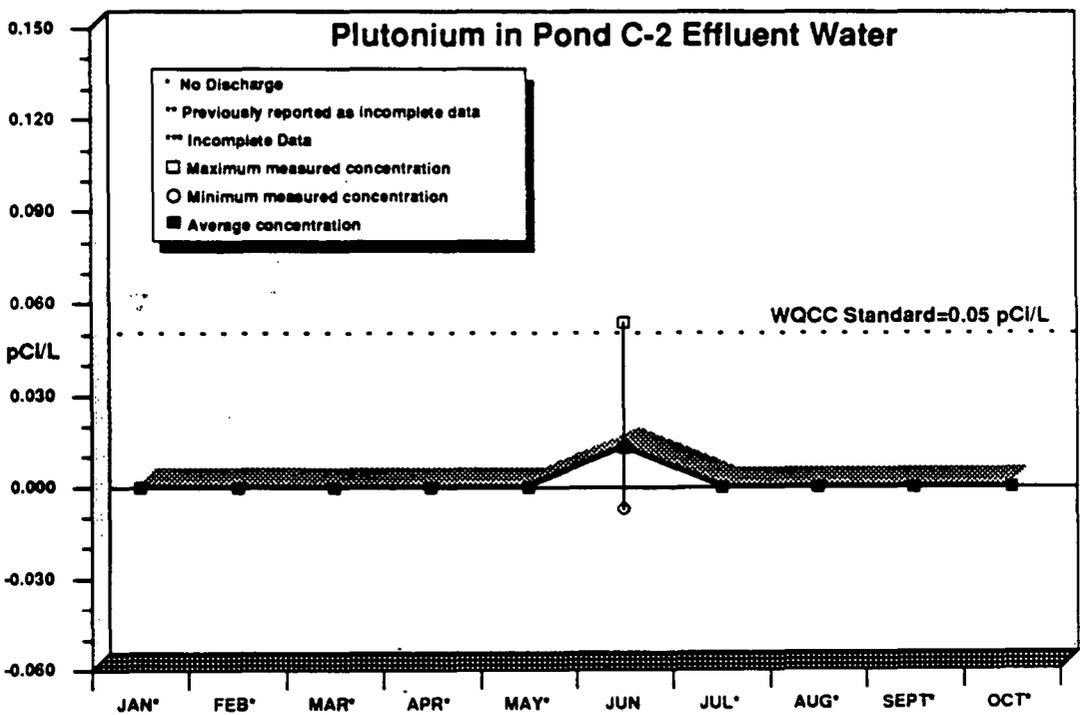
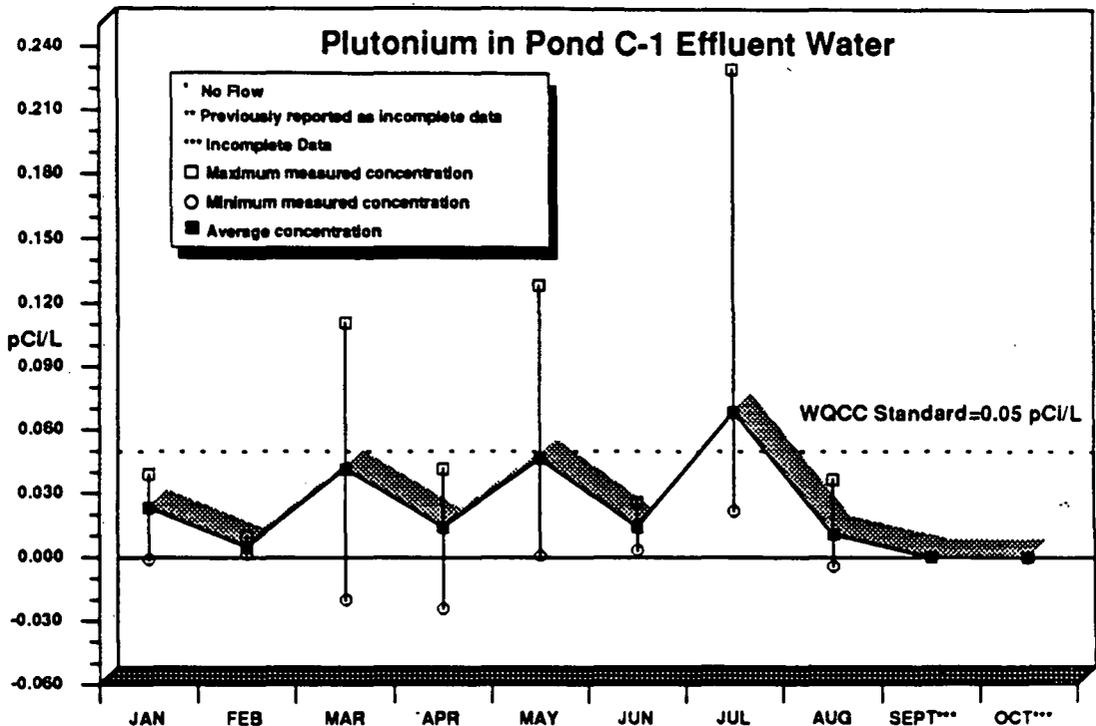


Note: Stream flow in the Rocky Flats area is to the east.

Figure 3: Holding Pond and Liquid Effluent Water Courses



No Discharge from Pond B-5 during 1991



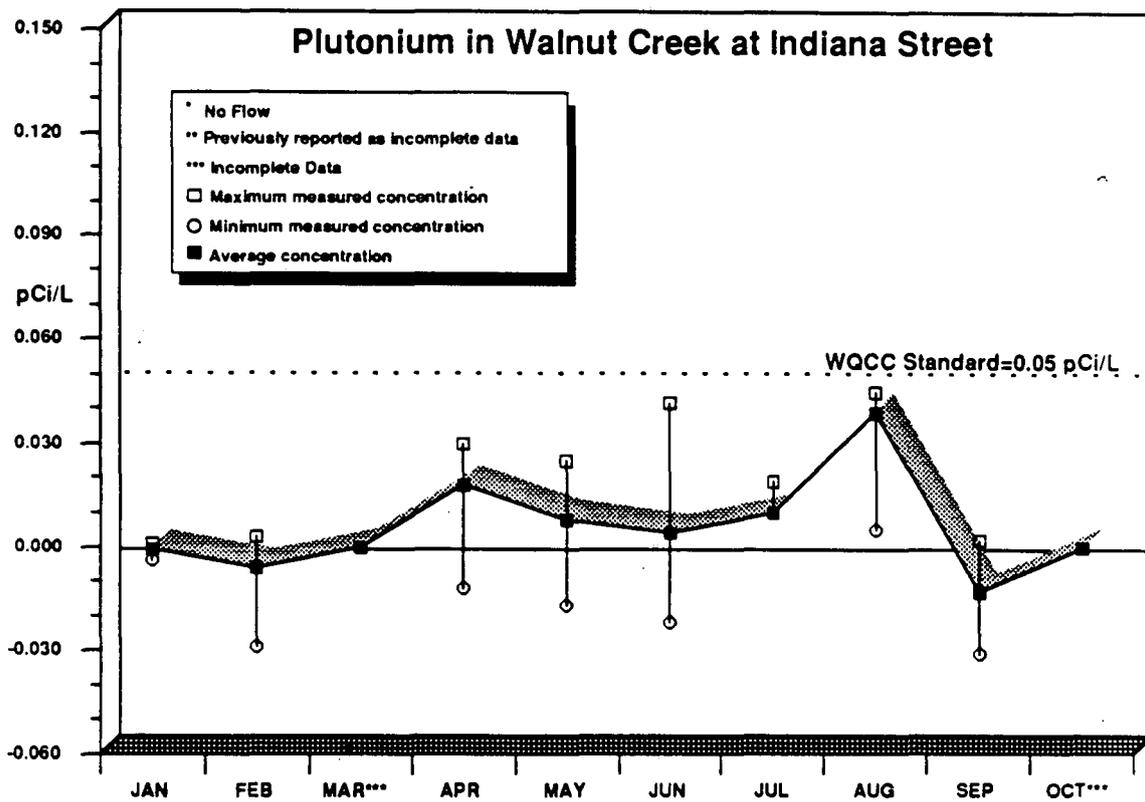


Table 9

Offsite Water Sample Results - Plutonium and Americium

<u>Location</u>	<u>Number of Samples</u>	<u>Reservoirs (pCi/l)</u>	
		<u>Plutonium-239, -240</u>	<u>Americium-241</u>
Great Western	1	0.001 ± 0.005	a
Standley Lake	1	0.008 ± 0.007	a
Community Tap Water (pCi/l)			
Boulder	1	-0.002 ± 0.004	a
Broomfield	1	0.035 ± 0.012	a
Westminster	1	0.006 ± 0.008	a

a Incomplete analysis.

Table 10

Offsite Water Sample Results - Uranium

<u>Location</u>	<u>Number of Samples</u>	<u>Reservoirs (pCi/l)</u>	
		<u>Uranium-233, -234</u>	<u>Uranium-238</u>
Great Western	1	a	a
Standley Lake	1	a	a
Community Tap Water (pCi/l)			
Boulder	1	a	a
Broomfield	1	a	a
Westminster	1	a	a

a Uranium analyses were performed on one sample composited from four weekly grab samples.

Table 11

Onsite and Offsite Water Sample Results - Tritium

Tritium (pCi/l)				
<u>Location</u>	<u>Number of Samples</u>	<u>C Minimum</u>	<u>C Maximum</u>	<u>C Average</u>
Pond A-4	7	a	a	a
Pond C-1	4	-100 ± 200	210 ± 190	50 ± 190
Boulder	5	-130 ± 190	110 ± 180	0 ± 200
Broomfield	5	-100 ± 170	120 ± 180	40 ± 200
Great Western	5	-50 ± 180	180 ± 170	70 ± 200
Standley Lake	5	a	a	a
Westminster	5	-40 ± 180	170 ± 180	10 ± 180
Walnut at Indianab	7	a	a	a

a Incomplete lab analysis.

b Volume weighted average concentration.

Table 12

Offsite Water Sample Results - Nitrate as Nitrogen

Nitrate (as N) at Great Western Reservoir

<u>Sample Date</u>	<u>Nitrate (as N) (mg/l)</u>
10/03/91	<0.02
10/10/91	0.02
10/17/91	0.05
10/24/91	0.10
10/31/91	0.02

Nitrate (as N) at Standley Lake

10/03/91	<0.02
10/10/91	0.04
10/17/91	0.06
10/24/91	0.10
10/31/91	0.03

Note: For some nonradioactive parameters, the concentrations that are measured at or below the minimum detectable concentration (MDC) are assigned to MDC. The less than symbol (<) indicates MDC values and calculated values that include one or more MDCs.

Table 13

NPDES/FFCA Permit Water Sample Results

Discharge 001-A (Pond B-3)		Discharge from 10/01/91 through 10/05/91 and 10/07/91 through 10/31/91.			
<u>Parameters</u>		<u>Measured 30-Day Average</u>	<u>Limit 30-Day Average</u>	<u>Measured Max. 7-Day Average</u>	<u>Limit Max. 7-Day Average</u>
Nitrate	mg/l	4.0	10	4.0	20
Total Residual Chlorine	mg/l		<u>Measured Maximum</u> 0.06	<u>Limit Maximum</u> 0.5	
Discharge 001-B (Sewage Treatment Plant)		Continuous discharge from 10/01/91 through 10/31/91.			
<u>Parameters</u>		<u>Measured 30-Day Average</u>	<u>Limit 30-Day Average</u>	<u>Measured Maximum</u>	<u>Limit Maximum</u>
CBOD5	mg/l	2.0	10	3.0	25
Total Phosphorus	mg/l	0.3	8	0.8	12
Total Chromium	mg/l	<0.004	50	<0.005	100
<u>Parameters</u>		<u>Measured 30-Day Average</u>	<u>Limit 30-Day Average</u>	<u>Measured Max. 7-Day Average</u>	<u>Limit Max. 7-Day Average</u>
Fecal Coliforms	#/100 ml	2(Geometric)	200(Geometric)	3(Geometric)	400(Geometric)
Total Suspended Solids	mg/l	5	30	10	45
<u>Parameters</u>		<u>Measured Minimum</u>	<u>Limit Minimum</u>	<u>Measured Maximum</u>	<u>Limit Maximum</u>
pH	SU	6.55	6.0	7.12	9.0
<u>Parameters</u>		<u>Observed Sheen</u>	<u>Limit Sheen</u>		
Oil and Grease		No visual	No visual		
Discharge 002 (Pond A-3)		No discharge.			
<u>Parameters</u>		<u>Measured 30-Day Average</u>	<u>Limit 30-Day Average</u>	<u>Measured Maximum</u>	<u>Limit Maximum</u>
Nitrates as N	mg/l				
<u>Parameters</u>		<u>Measured Minimum</u>	<u>Limit Minimum</u>	<u>Measured Maximum</u>	<u>Limit Maximum</u>
pH	SU				

Table 13

NPDES/FFCA Permit Water Sample Results (Continued)

Discharge 003 (RO Pilot Plant) and Discharge 004 (RO Plant) are inactive outfalls and will be eliminated from the new NPDES permit.

Discharge 005 (Pond A-4) Continuous discharge from 10/25/91 through 10/31/91.

<u>Parameters</u>		<u>Measured Maximum</u>	<u>Limit Maximum</u>
Total Chromium	mg/l	6	50

Discharge 006 (Pond B-5) - No discharge.

<u>Parameters</u>		<u>Measured Maximum</u>	<u>Limit Maximum</u>
Nitrate as N	mg/l		
Total Residual Chlorine	mg/l		
Total Chromium	mg/l		

Discharge 007 (Pond C-2) - No Discharge.

<u>Parameters</u>		<u>Measured Maximum</u>	<u>Limit Maximum</u>
Total Chromium	mg/l		

Table 14

NPDES/FFCA Effluent Monitoring

Discharge 001-A (Pond B-3) Continuous discharge from 10/01/91 through 10/05/91 and 10/07/91 through 10/31/91.

<u>Parameters</u>		<u>Measured Maximum</u>	<u>Measured 30-Day Average</u>
BOD5	mg/l	6	4
CBOD5	mg/l	3	2
Total Suspended Solids	mg/l	12	6

Discharge 001-B (Sewage Treatment Plant [STP]) Continuous discharge from 10/01/91 through 10/31/91.

<u>Parameters</u>		<u>Measured Maximum</u>	<u>Measured 30-Day Average</u>
BOD5	mg/l	3	2
Nitrate as N	mg/l	6.07	3.62
Total Residual Chlorine	mg/l	0.02	0.01

Whole Effluent Toxicity^a Reported quarterly; data reported in September 1991.

Ceriodaphnia % Eff to LC50:
Fathead Minnows % Eff to LC50:

Metals were sampled on 10/02/91 and 10/09/91.

	<u>Measured 30-Day Average</u>
--	--

Metals, total ug/l

Antimony	<38
Arsenic	<1.0
Beryllium	<1
Cadmium	<4
Copper	<7
Iron	124.5
Lead	1.6
Manganese	32.7
Mercury	<.2
Nickel	<15
Silver	<5
Zinc	40.3

**Concentrations
that were above
PQL**

Volatile Organic
Compounds (VOCs) ug/l

PQL^b

Chloroform

Table 14

NPDES/FFCA Effluent Monitoring (Continued)

Discharge 003 (Reverse Osmosis Pilot Plant) and Discharge 004 (Reverse Osmosis Plant) are inactive outfalls and will be eliminated from the new NPDES permit.

Discharge 005 (Pond A-4)

Whole Effluent Toxicity^a Reported quarterly; data reported in September 1991.

Ceriodaphnia	% Eff to LC50:
Fathead Minnows	% Eff to LC50:

Discharge 006 (Pond B-5) No discharge.

Whole Effluent Toxicity^a

Ceriodaphnia	% Eff to LC50:
Fathead Minnows	% Eff to LC50:

Discharge 007 (Pond C-2) No discharge.

Whole Effluent Toxicity^a

Ceriodaphnia	% Eff to LC50:
Fathead Minnows	% Eff to LC50:

^a Results for whole effluent toxicity are given in percentage of effluent sample that will cause mortality to half the test result organisms within the time frame of the test. For example, >100 percent indicates that 100 percent pure effluent did not cause acute toxicity to at least half of the organisms. A lower percentage LC₅₀ (lethal concentration to 50 percent of test organisms) indicates a greater toxic effect since less of the sample is required to observe a sufficiently extensive adverse effect.

^b PQL is the Practical Quantitation Limit. It is equal to ten times the Method Detection Limit and represents the quantity at which 70 percent of laboratories can report in the 95 percent confidence interval.

Table 15

Water Sample Results, Nonradioactive Parameters

Walnut Creek at Indiana Street

<u>Parameters</u>		<u>Number of Samples</u>	<u>C Minimum</u>	<u>C Maximum</u>	<u>C Average</u>
pH	SU	6	7.93	8.24	N/A
Nitrates as N	mg/l	6	0.04	2.08	1.63

Flow occurred from 10/26/91 through 10/31/91.

Table 16

Daily Flow Data Recorded at the Walnut Creek at Indiana Gaging Station, Ponds A-4 and B-5

<u>Date</u>	<u>Walnut Creek at Indiana (Gallons)</u>	<u>Pond A-4 (Gallons)</u>	<u>Pond B-5 (Gallons)</u>
10/01/91	No discharge	No discharge	No discharge
10/02/91			
10/03/91			
10/04/91			
10/05/91			
10/06/91			
10/07/91			
10/08/91			
10/09/91			
10/10/91			
10/11/91			
10/12/91			
10/13/91			
10/14/91			
10/15/91			
10/16/91			
10/17/91			
10/18/91			
10/19/91			
10/20/91			
10/21/91			
10/22/91			
10/23/91			
10/24/91	No discharge	No discharge	
10/25/91	Not read	674,000	
10/26/91	1,241,000	1,120,000	
10/27/91	1,192,000	1,371,000	
10/28/91	1,156,000	1,039,000	
10/29/91	1,429,000	1,348,000	
10/30/91	1,323,000	1,285,000	
10/31/91	1,287,000	1,115,000	No discharge
Total	7,628,000	7,952,000	No discharge

Table 17

Daily Flow Data Recorded at Ponds C-1 and C-2 (Woman Creek)

<u>Date</u>	<u>Pond C-1 (Gallons)</u>	<u>Pond C-2 (Gallons)</u>
10/01/91	80,000	No discharge
10/02/91	48,000	
10/03/91	36,000	
10/04/91	55,000	
10/05/91	98,000	
10/06/91	77,000	
10/07/91	66,000	
10/08/91	54,000	
10/09/91	48,000	
10/10/91	45,000	
10/11/91	57,000	
10/12/91	66,000	
10/13/91	62,000	
10/14/91	64,000	
10/15/91	72,000	
10/16/91	66,000	
10/17/91	56,000	
10/18/91	56,000	
10/19/91	67,000	
10/20/91	80,000	
10/21/91	80,000	
10/22/91	69,000	
10/23/91	70,000	
10/24/91	107,000	
10/25/91	122,000	
10/26/91	132,000	
10/27/91	114,000	
10/28/91	99,000	
10/29/91	126,000	
10/30/91	139,000	
10/31/91	140,000	No discharge
Total	2,451,000	No discharge

Table 18

Daily Transfer Flow Data Recorded for Pond B-5 to Pond A-4

<u>Date</u>	<u>Pond B-5 to Pond A-4 (gallons)</u>
10/01/91	No transfer
10/02/91	
10/03/91	
10/04/91	
10/05/91	
10/06/91	
10/07/91	
10/08/91	
10/09/91	
10/10/91	
10/11/91	
10/12/91	
10/13/91	
10/14/91	
10/15/91	
10/16/91	
10/17/91	
10/18/91	
10/19/91	
10/20/91	
10/21/91	
10/22/91	
10/23/91	
10/24/91	
10/25/91	
10/26/91	
10/27/91	
10/28/91	
10/29/91	
10/30/91	
10/31/91	No transfer
Total	No transfer

Site Meteorology and Climatology

Meteorological data were collected on the plantsite from instrumentation installed on a 61-meter (200-foot) tower located in the west buffer zone during October 1991. Meteorological information in this report represents over 97 percent data recovery. Table 19 is the October 1991 summary of the percent frequency of wind directions (16 compass points) divided into four wind-speed categories. The compass point designations indicate the true bearing when facing against the wind. These frequency values are represented graphically in the accompanying wind rose. The wind rose vectors also represent the bearing against the wind (i.e., wind along each vector blows toward the center).

The high frequency of winds with a westerly component is normal at the RFP (when there are no strong synoptic systems). The low frequency of winds greater than 7 meters per second (m/s) (15.6 mph) with easterly components is also normal.

October's weather started out mild. In the first few weeks a few periods of some cool upslope conditions were present between warm October days. The month ended with a snowy winter blast as a deep trough brought Alaska weather to the mainland. The precipitation towards the end of the month was not well recorded because of a malfunction in the collection system. The total monthly precipitation for October may be underestimated because of this malfunction.

The mean wind speed for October 1991 was 3.6 m/s (8.2 mph). The highest wind gust for October 1991 was 20.9 m/s (46.8 mph), which occurred during a chinook event on the 22nd of the month at approximately 3:15 a.m.

The mean temperature recorded for October 1991 was 9.9 °C (49.8 °F). The maximum temperature recorded was 28.3 °C (82.9 °F) on October 16. The minimum temperature recorded was -15.9 °C (3.5 °F) on October 29, 1991, at approximately 6:15 a.m.

In October 1991, the RFP recorded 1.27 centimeters (.50 inches) of precipitation. The maximum precipitation for a 15-minute period was .13 centimeters (.05 inches), which occurred between 2:00 and 2:15 p.m. on October 23. The maximum precipitation recorded for a 24-hour period was .48 centimeters (.19 inches), which fell on the last day of October.

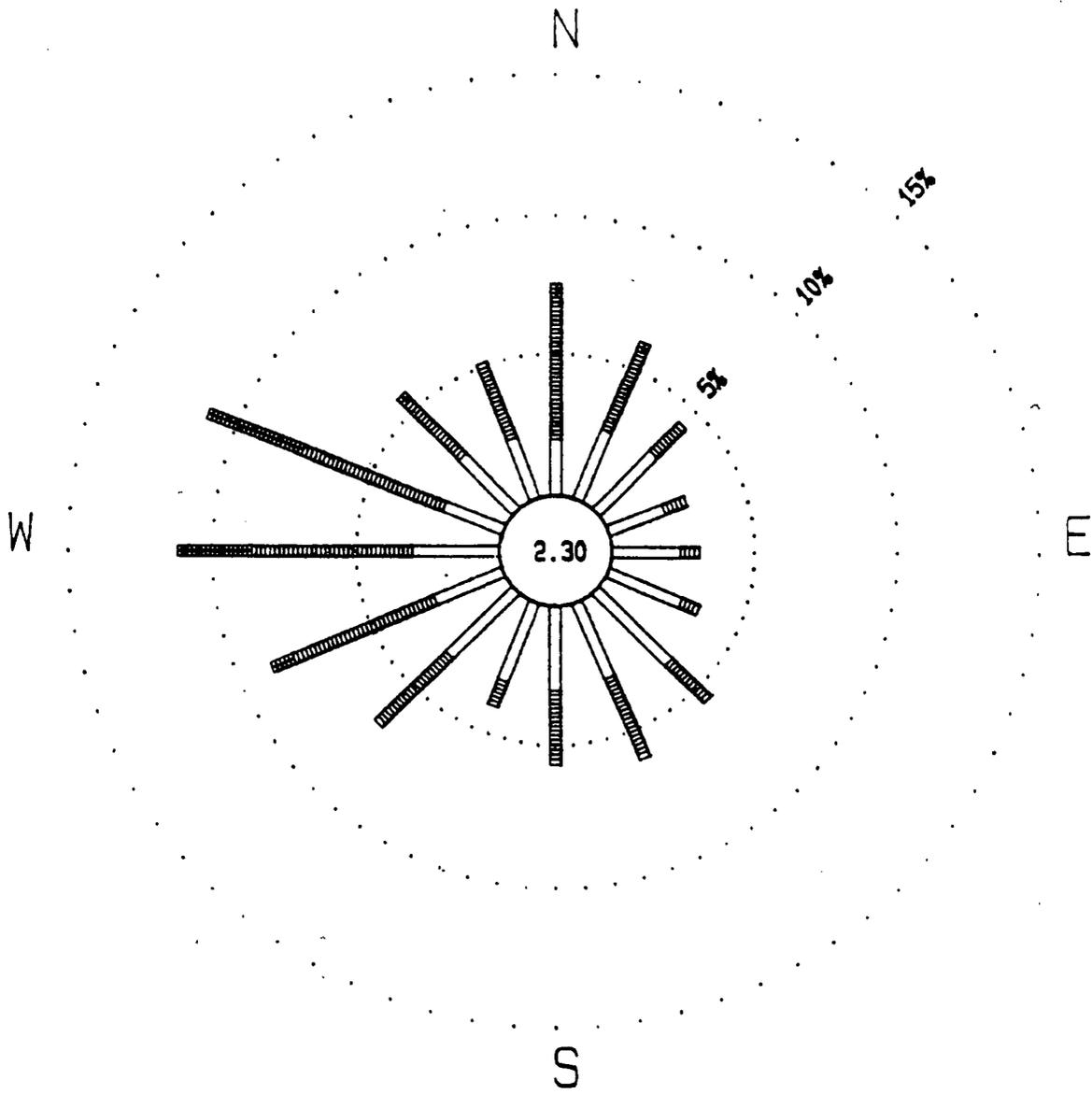
Table 19**Rocky Flats Plant Wind Direction Frequency (Percent) by Four Wind-Speed Classes**

(Fifteen-Minute Averages - October 1991)

	<u>Calm</u>	<u>1-3</u> <u>(m/s)</u>	<u>3-7</u> <u>(m/s)</u>	<u>7-15</u> <u>(m/s)</u>	<u>>15</u> <u>(m/s)</u>	<u>Total</u>
.	2.30	-	-	-	-	2.30
N	-	1.93	5.18	0.41	0.00	7.52
NNE	-	2.52	3.14	0.17	0.00	5.94
NE	-	2.90	1.42	0.00	0.00	4.52
ENE	-	2.00	0.76	0.00	0.00	2.76
E	-	2.45	0.59	0.00	0.00	3.04
ESE	-	2.76	0.59	0.00	0.00	3.35
SE	-	3.69	1.97	0.00	0.00	5.66
SSE	-	2.90	3.11	0.14	0.00	6.18
S	-	3.07	2.59	0.03	0.00	5.69
SSW	-	3.11	0.93	0.00	0.00	4.14
SW	-	3.38	3.52	0.07	0.00	7.18
WSW	-	2.66	5.49	0.73	0.00	8.88
W	-	3.11	5.70	2.52	0.00	11.33
WNW	-	2.24	5.42	3.63	0.00	11.28
NW	-	2.73	2.76	0.17	0.00	5.66
NNW	-	2.24	2.94	0.00	0.00	5.18
Totals	2.30	43.72	46.11	7.87	0.00	100.0

Table 20**Precipitation Report**

<u>Date</u>	<u>Daily Total</u>
10-04-91	.12 inches
10-23-91	.05 inches
10-25-91	.06 inches
10-28-91	.07 inches
10-30-91	.01 inches
10-31-91	.19 inches
Total Precipitation	.50 inches



Wind Rose for the Rocky Flats Plant - October 1991

Appendix A

Radiation Standards for Protection of the Public

Calculation of Potential Plant Contribution to Public Radiation Dose

The primary standards for protection of the public from radiation are based on radiation dose. Radiation dose is a means of quantifying the biological damage or risk of ionizing radiation. The unit of radiation dose is the rem or the millirem (1 rem = 1,000 mrem). Radiation protection standards for the public are annual standards, based on the projected radiation dose from a year's exposure to or intake of radioactive materials.

Radiation dose is a calculated value. It is calculated by multiplying radioactivity concentrations in air and water or on contaminated surfaces by assumed intake rates (for internal exposures) or by exposure times (for external exposure to penetrating radiation), then by the appropriate radiation dose conversion factors. That is:

$$\text{Radiation Dose} = \text{Radioactivity Concentration} \times \text{Intake Rate/Exposure Time} \times \text{Dose Conversion Factor}$$

Radioactivity concentrations can be determined either by measurements in the environment or by calculations using computer models. These computer models perform airborne dispersion/dose modeling of measured building radioactivity effluents and estimated diffuse source term emissions (e.g., from resuspension from contaminated soil areas).

Assumed intake rates and dose conversion factors used are based on recommendations of national and international radiation protection advisory organizations, such as the National Council on Radiation Protection and Measurements (NCRP) and the International Commission on Radiological Protection (ICRP).

Radioactive materials of importance in calculating radiation dose to the public from Rocky Flats Plant (RFP) activities include plutonium, uranium, americium, and tritium. Alpha radiation emissions from plutonium, uranium, and americium are primary contributors to the projected radiation dose.

DOE Radiation Protection Standards for the Public

ICRP-Recommended Standards for all Pathways:

Temporary Increase - 500 mrem/year Effective Dose Equivalent (with prior approval of DOE EH-2)

Normal Operations - 100 mrem/year Effective Dose Equivalent

EPA Clean Air Act Standards for the Air Pathway Only:

10 mrem-year Effective Dose Equivalent

DOE Derived Concentration Guides for Radionuclides of Interest at the Rocky Flats Plant	
Air Inhalation:	
Radionuclide	DCG (pCi/m ³)
Plutonium-239, -240	0.02
Water Ingestion:	
Radionuclide	DCG (pCi/l)
Plutonium-239, -240	30
Americium-241	30
Uranium-233, -234	500
Uranium-238	600
Hydrogen-3 (Tritium)	2,000,000

Potential public radiation dose commitments, which could have resulted from plant operations and from background (i.e., non-Plant) contributions, are calculated from average radionuclide concentrations measured at the Department of Energy (DOE) property boundary and in surrounding communities. Inhalation and water ingestion are the principal potential pathways of human exposure.

On February 8, 1990, DOE adopted DOE Order 5400.5, "Radiation Protection of the Public and the Environment," a radiation protection standard for DOE environmental activities (US 90). This standard incorporates guidance from the International Commission on Radiological Protection (ICRP), as well as from the Environmental Protection Agency Clean Air Act air emission standards (as implemented in 40 CFR 61, Subpart H). Included in DOE Order 5400.5 is a revision of the dose limits for members of the public. Tables of radiation dose conversion factors currently used for calculating dose from intakes of radioactive materials were issued in July 1988 (US88a, US88b). The dose factors are based on the ICRP Publications 30 and 48 methodology and biological models for radiation dosimetry. The DOE Order 5400.5 and the dose conversion factor tables are used for assessment of any potential RFP contribution to public radiation dose. On December 15, 1989, EPA published revised Clean Air Act air emission standards for DOE facilities (US89). DOE radiation standards for protection of the public are given in this Appendix and include the December 15, 1989, EPA Clean Air Act air pathway standards.

DOE Derived Concentration Guides

Secondary radioactivity concentration guides can be calculated from the primary radiation dose standards and used as comparison values for measured radioactivity concentrations. DOE provides tables of these "Derived Concentration Guides" - in Order 5400.5. Derived Concentration Guides (DCGs) are the concentrations that would result in an effective dose equivalent of 100 mrem from one year's chronic exposure or intake. In calculating air inhalation DCGs, DOE assumes that the exposed individual inhales 8,400 cubic meters of air at the calculated DCG during the year. Ingestion DCGs

**Compliance with EPA
Clean Air Act Standards**

assume a water intake of 730 liters at the calculated DCG for the year. The table on page 40 lists the most restrictive air and water DCGs for the principal radionuclides of interest at the RFP.

To determine compliance with the EPA air emissions standards, measured airborne effluent radioactivity emissions are entered into the EPA-approved atmospheric dispersion/dose calculation computer model, AIRDOS-PC, for calculation of the maximum radiation dose that an individual in the public could receive from the air pathway only.

For comparison with the annual radiation dose standards for protection of the public, the maximum annual effective dose equivalent that a member of the public could receive as a result of RFP activities is typically less than 1 mrem, or less than 1 percent of the recommended annual standard for all pathways.

Dose Equivalent and Effective Dose Equivalent

Dose equivalent is a calculated value used to quantify radiation dose; it reflects the degree of biological effect from ionizing radiation. Differences in the biological effect of different types of ionizing radiation (e.g., alpha, beta, gamma, or x-rays) are accounted for in the calculation of dose equivalent.

Effective dose equivalent is a calculated value used to allow comparisons of total health risk (based primarily on the risk of cancer mortality) from exposures of different types of ionizing radiation to different body organs. It is calculated by first calculating the dose equivalent to those organs receiving significant exposures, multiplying each organ dose equivalent by a health risk weighting factor, and then summing those products. One millirem effective dose equivalent from natural background radiation would have the same health risk as one millirem effective dose equivalent from an artificially produced source of radiation.

References

US88a DOE/EH-0070, "External Dose-Rate Conversion Factors for Calculation of Dose to the Public," United States Department of Energy, Asst. Secretary for Environment, Safety and Health, July 1988.

US88b DOE/EH-0071, "Internal Dose Conversion Factors for Calculation of Dose to the Public," United States Department of Energy, Asst. Secretary of Environment, Safety and Health, July 1988.

US89 United States Environmental Protection Agency, Code of Federal Regulations 40 CFR 61, Subpart H, "National Emission Standards for Emissions of Radionuclides other than Radon from Department of Energy Facilities," Washington, D.C., December 15, 1989.

US90 United States Department of Energy, DOE Order 5400.5, "Radiation Protection of the Public and the Environment," Washington, D.C., February 8, 1990.

Appendix B

National Pollution Discharge Elimination System/Federal Facilities Compliance Agreement Volatile Organic Compounds

The following is a list of volatile organic compounds (VOCs) for which monitoring is required by the Environmental Protection Agency National Pollution Discharge Elimination System/Federal Facilities Compliance Agreement (NPDES/FFCA).

<u>Compound</u>	<u>PQL (ug/l)</u>	<u>Compound</u>	<u>PQL (ug/l)</u>
Acrolein ^a	5	1,2-dichloropropane	5
Acrylonitrile ^a	5	1,3-dichloropropylene	5
Benzene	5	Ethylbenzene	5
Bromoform	5	Methyl bromide	10
Carbon Tetrachloride	5	Methyl chloride	10
Chlorobenzene	5	Methylene chloride	5
Chlorodibromomethane	5	1,1,2,2-tetrachloroethane	5
Chloroethane	10	Tetrachloroethylene	5
2-chloroethylvinyl ether ^a	10	Toluene	5
Chloroform	5	1,2-trans-dichloroethylene	5
Dichlorobromomethane	5	1,1,1-trichloroethane	5
1,1-dichloroethane	5	1,1,2-trichloroethane	5
1,2-dichloroethane	5	Trichloroethylene	5
1,1-dichloroethylene	5	Vinyl chloride	10

^a Indicates compounds that are currently being analyzed at an offsite laboratory because the onsite laboratory lacks the proper instrumentation and standards to perform these analyses. Because the RFP does not maintain an inventory of these compounds or use them in manufacturing processes, none are expected to be found in the STP effluent. As a result, EPA may eliminate the requirement to monitor for these compounds in the future based on the results of the offsite laboratory analyses.

Appendix C

Colorado Water Quality Control Commission Standards

The Colorado Water Quality Control Commission has promulgated new standards for the Walnut Creek and Woman Creek drainages downstream from the Rocky Flats Plant. The Environmental Protection Agency has not yet written a new National Pollutant Discharge Elimination System permit that reflects these standards; however, in the spirit of the Agreement in Principle completed between the Department of Energy and the State of Colorado, the plant is attempting to meet the standards at this time.

Appendix D

*Corrections and Updates
for Previously Reported Information*

Table 5 - Errata October 1990

Plutonium Concentrations in Ambient Air for Perimeter Samplers

(09/25/90 - 10/24/90)

<u>Location</u>	<u>Number Composited Monthly Samples</u>	<u>Volume (m³)</u>	<u>Average Plutonium Concentration (pCi/m³)</u>	<u>± 95 percent Confidence Interval (pCi/m³)</u>
S-31	1	31000	0.000001	0.000002
S-32	1	32000	0.000002	0.000002
S-33	1	32000	0.000001	0.000002
S-34	1	30000	0.000005	0.000004
S-35	1	34000	0.000001	0.000002
S-36	1	33000	0.000001	0.000002
S-37	1	34000	0.000003	0.000003
S-38 ^a	1	31000	0.000181	0.000032
S-39	1	32000	0.000002	0.000002
S-40	1	32000	0.000002	0.000002
S-41	1	34000	0.000002	0.000002
S-42	1	32000	0.000001	0.000002
S-43	1	34000	0.000004	0.000002
S-44	1	30000	0.000000	0.000002

^a Previously reported as incomplete lab analysis. This value is higher than is typical for this location. A confirming analysis on a remaining aliquot of the original sample verified the original result. No Rocky Flats Plant activities could be identified that would have resulted in the above-normal value.

Table 4 - Errata January 1991

Plutonium Concentrations in Ambient Air for Onsite Samplers

(12/24/90 - 01/21/91)

<u>Location</u>	<u>Number Composited Monthly Samples</u>	<u>Volume (m³)</u>	<u>Plutonium Concentration (pCi/m³)</u>	<u>± 95 percent Confidence Interval (pCi/m³)</u>
S-01a	1	36000	0.001957	0.000347
S-02	1	36000	0.000073	0.000013
S-03	1	34000	0.000004	0.000002
S-04	1	28000	0.000003	0.000002
S-05	1	36000	0.000069	0.000014
S-06	1	32000	0.000074	0.000016
S-07	1	32000	0.000020	0.000006
S-08	1	38000	0.000045	0.000008
S-8B	1	34000	0.000230	0.000044
S-09	1	35000	0.000461	0.000085
S-10	1	31000	0.000004	0.000000
S-11	1	31000	0.000005	0.000002
S-12	1	34000	0.000010	0.000003
S-13	1	30000	0.000001	0.000001
S-14	1	30000	0.000001	0.000001
S-15	1	32000	0.000002	0.000002
S-16	1	36000	0.000002	0.000002
S-17	1	32000	0.000007	0.000004
S-18	1	32000	0.000021	0.000006
S-19	1	32000	0.000010	0.000003
S-20	1	32000	0.000013	0.000004
S-21	1	35000	0.000018	0.000005
S-22	1	29000	0.000011	0.000004
S-23	1	31000	0.000002	0.000002
S-24	1	36000	0.000003	0.000002
S-81 ^b				

^a Previously reported as incomplete lab analyses. This value is based on one analyses, as the remainder of the sample aliquot was discarded prior to a request for a rerun.

^b Sampler was inoperable during the sampling period.

Table 4 - Errata July 1991

Plutonium Concentrations in Ambient Air for Onsite Samplers

(06/24/91 - 07/22/91)

<u>Location</u>	<u>Number Composited Monthly Samples</u>	<u>Volume (m³)</u>	<u>Average Plutonium Concentration (pCi/m³)</u>	<u>± 95 percent Confidence Interval (pCi/m³)</u>
S-01a				
S-02	1	28000	0.000007	0.000003
S-03a				
S-04d	1	31000	0.000005	0.000002
S-05	1	30000	0.000038	0.000010
S-06	1	27000	0.000062	0.000014
S-07	1	28000	0.000101	0.000021
S-08	1	36000	0.000165	0.000025
S-8B	1	20000	0.000090	0.000021
S-09b	1	28000	0.000160	0.000030
S-10	1	30000	0.000010	0.000007
S-11	1	30000	0.000015	0.000009
S-12c				
S-13	1	30000	0.000028	0.000011
S-14	1	27000	0.000006	0.000005
S-15c				
S-16	1	33000	0.000028	0.000013
S-17	1	29000	0.000017	0.000009
S-18	1	32000	0.000014	0.000006
S-19	1	28000	0.000013	0.000008
S-20b	1	28000	0.000461	0.000075
S-21	1	24000	0.000012	0.000004
S-22	1	27000	0.000009	0.000003
S-23e	1	16000	0.000008	0.000004
S-24	1	27000	0.000003	0.000002
S-81	1	34700	0.000004	0.000003

- a Sampler was inoperable during the sampling period.
- b Previously reported as incomplete lab analyses.
- c These samplers were removed from the RAAMP network and will be used at the new community operated monitoring stations.
- d This volume has been estimated because of mechanical problems with the hour meter.
- e Sampler was inoperable for part of the sampling period.

Table 5 - Errata July 1991

Plutonium Concentrations in Ambient Air for Perimeter Samplers

(06/18/91 - 07/30/91)

<u>Location</u>	<u>Number Composited Monthly Samples</u>	<u>Volume (m³)</u>	<u>Average Plutonium Concentration (pCi/m³)</u>	<u>± 95 percent Confidence Interval (pCi/m³)</u>
S-31	1	48000	0.000003	0.000001
S-32	1	49000	0.000002	0.000001
S-33 ^a	1			
S-34	1	45000	0.000000	0.000001
S-35	1	50000	0.000005	0.000002
S-36	1	41000	0.000002	0.000001
S-37	1	46000	0.000007	0.000002
S-38	1	41000	0.000004	0.000002
S-39	1	29000	0.000004	0.000002
S-40	1	48000	0.000002	0.000001
S-41	1	49000	0.000001	0.000001
S-42	1	44000	0.000000	0.000001
S-43	1	48000	0.000002	0.000001
S-44	1	41000	0.000001	0.000001

^a Because of low recovery of this sample in the laboratory, data are unavailable.

Table 6 - Errata July 1991

Plutonium Concentrations in Ambient Air for Community Samplers

(06/19/91 - 07/31/91)

<u>Location</u>	<u>Community Name</u>	<u>Number Composited Monthly Samples</u>	<u>Volume (m³)</u>	<u>Average Plutonium Concentration (pCi/m³)</u>	<u>± 95 percent Confidence Interval (pCi/m³)</u>
S-51	Marshall	1	46000	0.000003	0.000002
S-52	Jeffco Airport	1	48000	0.000005	0.000002
S-53	Superior	1	48000	0.000000	0.000001
S-54	Boulder	1	48000	0.000001	0.000001
S-55	Lafayette	1	41000	0.000001	0.000001
S-56	Broomfield	1	43000	0.000001	0.000001
S-57	Walnut Creek	1	50000	0.000003	0.000002
S-58a	Wagner	1	40000	0.000002	0.000001
S-59	Leyden	1	48000	0.000004	0.000002
S-60 ^b	Westminster	1			
S-61 ^c	Denver				
S-62	Golden	1	39000	0.000004	0.000002
S-68 ^d	Lakeview Pointe	1	42000	0.000002	0.000001
S-73	Cotton Creek	1	44000	0.000002	0.000001

- a This volume was estimated because of mechanical problems with the hour meter.
- b Because of low recovery of this sample in the laboratory, data are unavailable.
- c Sampler S-61 located in Denver was inoperative during this period. This sampler has been temporarily removed because of construction activities on the building where it is installed.
- d Previously reported as incomplete lab analyses.

Table 4 - Errata September 1991

Plutonium Concentrations in Ambient Air for Onsite Samplers

(08/27/91 - 09/30/91)

<u>Location</u>	<u>Number Composited Monthly Samples</u>	<u>Volume (m³)</u>	<u>Average Plutonium Concentration (pCi/m³)</u>	<u>± 95 percent Confidence Interval (pCi/m³)</u>
S-01a				
S-02	1	43000	0.000006	0.000002
S-03a				
S-04	1	45000	0.000015	0.000003
S-05	1	45000	0.000076	0.000012
S-06	1	44000	0.000161	0.000021
S-07	1	42000	0.000081	0.000014
S-08	1	49000	0.000125	0.000017
S-08B	1	45000	0.000041	0.000008
S-09	1	45000	0.000002	0.000001
S-10	1	46000	0.000016	0.000004
S-11	1	46000	0.000005	0.000002
S-12b				
S-13	1	46000	0.000002	0.000001
S-14	1	47000	0.000001	0.000001
S-15b				
S-16	1	49000	0.000001	0.000001
S-17	1	43000	0.000005	0.000002
S-18	1	48000	0.000015	0.000003
S-19	1	43000	0.000015	0.000004
S-20	1	44000	0.000014	0.000004
S-21c	1	50000	0.000013	0.000005
S-22	1	42000	0.000008	0.000002
S-23	1	48000	0.000006	0.000002
S-24	1	44000	0.000004	0.000002
S-81	1	50866	0.000005	0.000002

a Sampler was inoperable during the sampling period.

b These samplers were removed from the RAAMP network and will be used at the new community operated monitoring stations.

c Previously reported as incomplete lab analyses.

Distribution

Federal Agencies

USDOE, RFO
Attn: R.M. Nelson, Jr.
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999 18th Street
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Attn: B. Lavelle
999 18th Street, Suite 500
8 HWM-FF
Denver, CO 80202-2405

State Government Agencies

Colorado Water Conservation Board
Attn: N.C. Ioannides
823 State Centennial Building
1313 Sherman Street
Denver, CO 80203

Denver Regional Council of
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Attn: L. Mugler
2480 W. 27th Avenue, #200B
Denver, CO 80211

Department of Natural Resources
Attn: B. Hamlett III
1313 Sherman Street
Denver, CO 80203

Rocky Flats Environmental
Monitoring Council
Attn: G. Swartz
1536 Cole Blvd., Suite 325
Denver West Office Park #4
Golden, CO 80401

City Governments

City of Arvada
Utilities Division
Attn: C. Videtich
8101 Ralston Road
Arvada, CO 80002

City of Boulder
Office of the City Manager
Attn: J. Piper, A. Struthers
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Boulder, CO 80302

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Broomfield, CO 80020

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300 La Porte
Fort Collins, CO 80525

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City of Thornton
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9500 Civic Center Drive
Thornton, CO 80229-1120

City of Westminster
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4800 W. 92nd Avenue
Westminster, CO 80030

Denver Water Department
Quality Control
Attn: J. Dice
1600 W. 12th Avenue
Denver, CO 80254

Health Departments

Boulder City/County Health
Department - Division of
Environmental Health
Attn: T. Douville, V. Harris
3450 Broadway
Boulder, CO 80020

Colorado Department of Health
4210 E. Eleventh Avenue
Denver, CO 80020
Attn: B. Barry, G. Dancik, D. Fox,
P. Frohardt, D. Holme, J. Jacobi,
A. Lockhart R. Quillin, J. Sowinski,
R. Terry, T. Vernon

Jefferson County Health Department
Attn: Dr. M. Johnson, C. Sanders
260 South Kipling
Lakewood, CO 80226

Tri County District Health
Attn: S. Salyards
4301 E. 72nd Avenue
Commerce City, CO 80022

Environmental

Advance Sciences, Inc.
Attn: D. Kaskie, M.G. Waltermire
405 Urban Street, Suite 401
Lakewood, CO 80228

American Friends Service Co.
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Denver, CO 80218

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Golden, CO 80401

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350 Terry Street
Longmont, CO 80501

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400 W. Colfax Avenue
Denver, CO 80204

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National Center for Atmospheric
Research
Attn: S. Sadler
P.O. Box 3000
Boulder, CO 80307-3000

Physicians for Social
Responsibility
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