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RR-RP-00945

Colorado Department of Health

Environmental Surveillance Report

on the

U.S. Department of Energy

Rocky Flats Plant

JULY 1987

Monthly Information Exchange Meeting

This is a numerical summary of data accumulated during

JULY 1987

pertaining to environmental surveillance activities of the Department Also included are additional data not previously reported for earlier periods

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SW-A-003697
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Summary Rocky Flats Report, July 1987

This report is a summary of all current analytical data collected by the Radiation Control Division for the purpose of environmental surveillance and impact assessment of the Rocky Flats Plant. This information is collected as part of a continuing effort by the Colorado Department of Health to identify trends in radioactive hazards that may be associated with operations at Rocky Flats. The data included in this issue of the report is consistent with information collected from the same or similar sampling locations in the past.

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COLORADO DEPARTMENT OF HEALTH

U.S. DOE ROCKY FLATS PLANT SURVEILLANCE

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TABLE A

_ORADO DEPARTMENT OF HEALTH
diation Control Division
oss Alpha and Beta Activity in Hi-Volume Air Filters

SURVEILLANCE SUMMARY
JUL 1987

	Number of Samples *******	Gross Alpha Mean Concen pCi/m^3 *******	Gross Alpha Standard Deviation pCi/M^3 *********	Gross Alpha Max pCi/M^3 *******	Gross Alpha Min pCi/M^3 *******	Gross Beta Mean Concen pCi/M^3 *******	Gross Beta Standard Deviation pCi/M^3 *********	Gross Beta Max pCi/M^3 *******	Gross Beta Min pCi/M^3 *******	Total Volume M^3 ******
-SITE (SECURITY)										
D-1 ON-SITE (SECURITY)	13	<0 007	0 002	0 011	<0 003	<0 05	0 01	0 07	0 03	43802
D-2 ON-SITE (SECURITY)	13	<0 007	0 003	0 016	<0 004	0 05	0 01	0 07	0 03	43999
D-3 ON-SITE (SECURITY)	14	<0 013	0 010	0 036	0 004	0 05	0 02	0 08	0 03	52591
D-4 ON-SITE (SECURITY)	14	<0 010	0 005	0 025	<0 005	<0 05	0 01	0 08	0 02	50161
JUL GROUP SUMMARY	54	<0 009	0 006	0 036	<0 003	<0 05	0 01	0 08	0 02	190553
-SITE (PERIMETER)										
D-5 ON-SITE (PERIMETER)	14	<0 006	0 002	0 012	0 003	0 04	< 01	0 06	0 02	53744
D-6 ON-SITE (PERIMETER)	14	<0 007	0 002	0 010	<0 004	<0 05	0 01	0 07	0 02	50656
D-7 ON-SITE (PERIMETER)	14	<0 005	0 002	0 008	0 003	<0 05	< 01	0 06	0 03	50587
D-8 ON-SITE (PERIMETER)	13	<0 007	0 002	0 011	0 004	<0 05	0 02	0 09	0 03	42887
JUL GROUP SUMMARY	55	<0 006	0 002	0 012	0 003	<0 05	0 01	0 09	0 02	197874
FF-SITE (METRO)										
ROOMFIELD	5	0 006	0 002	0 009	0 004	0 04	< 01	0 05	0 03	33945
DAMS CITY 4301 E 72nd Ave	5	<0 007	0 002	<0 009	<0 005	<0 09	0 02	0 11	<0 07	8200
URORA 1633 Florence Street	5	<0 007	0 002	<0 009	<0 005	<0 07	< 01	0 08	<0 07	8410
OULDER 13th & Spruce	4	<0 008	0 002	0 010	<0 005	0 08	< 01	0 10	0 08	6636
ENVER 414 Fourteenth Street	5	<0 008	0 002	<0 010	0 006	0 09	0 01	0 10	0 08	7679
NGLEWOOD 4857 South Broadway	5	<0 007	0 003	<0 011	<0 005	<0 08	0 02	0 11	<0 07	7528
AKEWOOD 260 South Kipling	4	<0 008	0 002	<0 009	<0 005	0 09	0 02	0 11	0 08	6575
JUL GROUP SUMMARY	33	<0 007	0 002	<0 011	0 004	<0 08	0 02	0 11	0 03	78973
FF-SITE (REMOTE)										
URANGO Fire Station	5	<0 008	0 001	<0 009	0 006	<0 09	0 02	0 11	<0 08	7563
ENDVILLE 510 Harrison Avenue	5	<0 006	0 001	<0 008	<0 005	0 10	0 02	0 13	0 08	7771
TERLING 3rd & Ash Street	3	<0 008	0 002	<0 009	<0 005	<0 10	0 04	0 14	<0 07	5191
JUL GROUP SUMMARY	13	<0 007	0 002	<0 009	<0 005	<0 10	0 02	0 14	<0 07	20525

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TABLE B
AIR SURVEILLANCE SUMMARY
MONTHLY COMPARISON DATA
1986 and 1987

Station	N	Total Long-lived ALPHA (pCi/m³) x̄	S.D.	max	min.	Total Long-lived BETA (pCi/m³) x̄	S.D.	max.	min.	Volume (m³)
ON-SITE (Security)										
1986										
July	52	<0.004	0.002	0.012	<0.003	<0.03	<0.01	0.05	0.02	187257
August	52	<0.004	0.001	0.008	<0.002	<0.04	0.01	0.07	0.02	184851
September	51	<0.005	0.002	0.012	<0.002	<0.03	<0.01	0.06	0.02	178992
October	56	<0.004	0.002	0.011	<0.002	<0.03	<0.01	0.05	0.02	207360
November	46	<0.006	0.001	0.010	<0.003	<0.03	<0.01	0.06	<0.02	167350
December	54	<0.005	0.001	0.007	<0.003	<0.03	<0.01	0.06	<0.02	196299
1987										
January	52	<0.004	0.002	0.011	<0.002	<0.02	<0.01	0.04	0.01	188312
February	47	<0.003	0.001	0.008	<0.000	<0.03	<0.01	<0.05	<0.00	199755
March	48	<0.004	0.002	<0.013	<0.002	<0.03	0.01	<0.10	<0.02	166275
April	49	<0.004	0.002	0.012	<0.002	<0.03	<0.01	0.05	<0.02	178166
May	47	<0.005	0.004	0.025	<0.002	<0.03	0.01	0.07	<0.02	165496
June	40	<0.004	0.002	0.012	<0.002	<0.03	<0.01	0.05	0.02	146031
July	54	<0.009	0.006	0.036	<0.003	<0.05	0.01	0.08	0.02	190553
ON-SITE (Perimeter)										
1986										
July	47	<0.004	0.001	0.006	<0.002	<0.03	<0.01	<0.05	0.02	173579
August	49	<0.003	0.001	0.011	<0.002	<0.04	<0.01	0.05	0.02	181472
September	52	<0.004	0.001	0.006	<0.002	<0.03	<0.01	0.05	0.02	192581
October	56	<0.003	<0.001	0.006	<0.002	<0.03	0.01	0.06	0.02	21524
November	46	<0.005	0.001	<0.008	<0.003	<0.03	<0.01	0.05	<0.02	176086
December	54	<0.005	0.001	<0.008	<0.003	<0.03	0.01	0.09	<0.02	206344
1987										
January	49	<0.003	<0.001	<0.005	<0.002	<0.02	<0.01	0.06	<0.01	184438
February	48	<0.003	<0.001	<0.004	<0.002	<0.03	<0.01	0.04	<0.02	185409
March	50	<0.003	<0.001	0.005	<0.002	<0.02	<0.01	0.03	<0.02	185301
April	51	<0.003	<0.001	0.005	<0.001	<0.03	<0.01	0.05	0.01	194260
May	45	<0.003	0.002	0.008	<0.001	<0.03	0.01	0.05	<0.02	173240
June	50	<0.004	0.001	0.008	<0.002	<0.03	<0.01	0.06	<0.02	188610
July	55	<0.006	0.002	0.012	0.003	<0.05	0.01	0.09	0.02	197874

TABLE B, CONT

Station	N	Total Long-lived ALPHA (pCi/m^3) $\bar{x}$	S D	max	min	Total Long-lived BETA (pCi/m^3) $\bar{x}$	S D	max	min	Volume (m^3)
OFF-SITE (Metro)										
1986										
July	54	<0 005	0 001	0 008	<0 001	<0 05	0 01	<0 06	<0 01	119083
August	36	<0 005	<0 001	<0 007	<0 002	<0 05	<0 01	0 08	0 03	85560
September	35	<0 004	0 001	0 011	0 002	<0 05	0 01	0 07	0 02	79628
October	37	<0 005	0 001	<0 008	0 002	<0 05	0 02	0 10	0 02	96020
November	34	<0 008	0 002	<0 012	<0 002	<0 04	<0 01	<0 05	<0 01	81158
December	39	<0 010	0 003	<0 015	<0 003	<0 04	<0 01	<0 06	0 02	10244
1987										
January	36	<0 006	0 002	<0 011	<0 002	<0 04	<0 01	<0 05	0 01	84046
February	34	<0 006	0 001	<0 007	<0 002	<0 05	<0 01	0 07	0 02	75269
March	35	<0 006	0 002	<0 010	<0 003	<0 04	<0 01	<0 05	0 02	81739
April	41	<0 006	0 001	<0 007	<0 002	<0 05	0 01	0 08	0 02	93465
May	32	<0 005	0 001	<0 007	<0 002	<0 05	<0 01	0 06	0 03	73401
June	29	<0 005	0 001	<0 006	<0 002	<0 06	0 02	0 10	0 02	63557
July	33	<0 007	0 002	<0 011	0 004	<0 08	0 02	0 11	0 03	78973
OFF-SITE (Remote)										
1986										
June	25	<0 006	<0 001	<0 007	<0 004	<0 05	<0 01	<0 06	<0 04	38866
July	27	<0 006	<0 001	<0 007	<0 005	<0 06	<0 01	0 07	<0 05	42545
August	22	<0 006	0 001	<0 007	<0 004	<0 05	<0 01	0 08	<0 05	36968
September	27	<0 005	<0 001	0 007	<0 004	<0 05	<0 01	0 06	<0 04	44653
October	21	<0 005	0 001	<0 008	<0 004	<0 06	0 02	0 10	<0 04	37576
November	20	<0 009	0 002	<0 015	<0 007	<0 05	<0 01	<0 07	<0 04	34766
1987										
January	26	<0 006	0 001	<0 009	<0 005	<0 05	0 01	0 09	<0 04	46920
February	21	<0 006	0 002	<0 011	<0 004	<0 05	<0 01	0 07	<0 04	37201
March	20	<0 006	0 001	<0 008	<0 004	<0 05	<0 01	0 06	<0 04	34650
April	15	<0 005	<0 001	<0 007	<0 004	<0 05	0 02	0 08	0 03	25685
May	17	<0 005	<0 001	<0 007	<0 005	<0 05	<0 01	0 06	<0 04	26453
June	11	<0 005	<0 001	<0 005	<0 004	<0 07	<0 02	0 11	<0 05	17436
July	13	<0 007	0 002	<0 009	<0 005	<0 10	0 02	0 14	<0 07	20525

NOTE N = number of observations (samples)
$\bar{x}$ = arithmetic mean
S D = standard deviation of the population of results observed (1 sigma)
max = maximum individual sample concentration observed
min = minimum individual sample concentration observed
Nominal values for the minimum detectable activity are listed in Appendix III
SI Unit Equivalent 1 pCi/l = 0 037 Bq/l
20 pCi/l = 0 48 Bq/l

TABLE C
PLUTONIUM AND TOTAL LONG-LIVED ALPHA
CONCENTRATIONS IN AIR
July 1987

Station	DATE Month/Quarter	$Pu^{239+240}$ (pCi/m^3)	Total Long-lived ALPHA (pCi/m^3)
RF-1	09/86	0.00004 ± 0.00001	<0.005
RF-2	09/86	0.00125 ± 0.00004	<0.004
RF-3	09/86	0.00008 ± 0.00001	<0.007
RF-4	09/86	0.00013 ± 0.00002	<0.005
RF-5	09/86	<0.00001	<0.003
RF-6	09/86	<0.00001	<0.004
RF-7	09/86	<0.00001	<0.004
RF-8	09/86	<0.00001	<0.004
RF-1	10/86	<0.00002	<0.004
RF-2	10/86	<0.00001	<0.003
RF-3	10/86	0.00147 ± 0.00002	<0.005
RF-4	10/86	0.00031 ± 0.00001	<0.004
RF-5	10/86	<0.00001	<0.003
RF-6	10/86	<0.00001	<0.003
RF-7	10/86	<0.00001	<0.003
RF-8	10/86	0.00001 ± 0.00001	<0.004
RF-1	04/87	0.00007 ± 0.00001	<0.003
RF-2	04/87	0.00019 ± 0.00001	<0.003
RF-3	04/87	0.00137 ± 0.00004	<0.004
RF-4	04/87	0.00054 ± 0.00004	<0.003
RF-5	04/87	<0.00001	<0.002
RF-6	04/87	<0.00001	<0.003
RF-7	04/87	<0.00001	<0.003
RF-8	04/87	<0.00001	<0.003

NOTE: Total long-lived ALPHA and Plutonium error terms are based on the 2 sigma counting error for the single analysis.
Nominal values for the minimum detectable activity are listed in Appendix III.
The standard for general population exposure for soluble Pu is 0.02 pCi/m^3.

TABLE D
WATER SURVEILLANCE SUMMARY
(INDIVIDUAL SAMPLES)
July 1987

Station	Date	Activity (pCi/l) ALPHA	BETA	TRITIUM
R F Pond A-3				
R F Pond B-3	07/01/87	6 ± 4	12 ± 4	<350
	07/08/87	<4	8 ± 4	<350
	07/15/87	<4	7 ± 4	364 ± 181
	07/22/87	4 ± 3	12 ± 4	<350
	07/29/87	<4	10 ± 4	<350
Monthly Average		<4	<10	<353
Walnut Creek at Indiana	07/01/87	13 ± 5	12 ± 4	<350
	*07/08/87			
	07/10/87	13 ± 8	20 ± 5	<350
	*07/13/87			
	07/03/87	9 ± 4	7 ± 4	<350
	*07/15/87			
	07/17/87	11 ± 5	10 ± 4	<350
	*07/22/87			
	*07/27/87			
	*07/29/87			
Monthly Average		10	12	<350
Broomfield	07/01/87	<4	<5	<350
	07/08/87	10 ± 4	8 ± 4	<350
	07/15/87	<4	<5	<350
	07/22/87	<4	5 ± 3	<350
	07/29/87	5 ± 3	<5	<350
Monthly Average		<5	<6	<350
Woman Creek at Indiana	07/13/87	6 ± 4	5 ± 4	<350
Westminster	07/08/87	<3	5 ± 3	<350
	07/22/87	<3	<5	<350
Monthly Average		<3	<5	<350

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TABLE D
WATER SURVEILLANCE SUMMARY
(INDIVIDUAL SAMPLES)
July 1987

Station	Date	Activity (pCi/l) ALPHA	BETA	TRITIUM
Arvada	07/21/87	<2	<5	<350
Boulder	07/21/87	<3	<5	<350
Golden	07/21/87	<3	<5	<350
North Table Mountain	07/21/87	<3	<5	<350
CDH (ppt)	07/02/87			<350
	07/13/87			<350
D-4 (ppt)	07/01/87			<350
	07/13/87			<350
Planned Releases				
A-4	07/08/87	9 ± 4	11 ± 4	<350
B-5	07/01/87	5 ± 5	9 ± 4	
C-2	07/01/87	7 ± 4	<5	

NOTE. Error terms are based on the 2 sigma counting error for the single analysis. Nominal values for the minimum detectable activity are listed in Appendix III.
* = dry not running
SI unit equivalent: 1 pCi/l = 0.037 Bq/l
20 pCi/l = 0.74 Bq/l

**** No Tritium results this month

TABLE E-1
WATER SURVEILLANCE SUMMARY
MONTHLY COMPARISON DATA
POND A-3
1986 and 1987

Date		ALPHA (pCi/l)	BETA (pCi/l)	TRITIUM (pCi/l)
1986				
	July	<5	<5	<350
	August	<5	6 ± 4	<350
	September	4 ± 3	5 ± 4	433 ± 160
	October	6 ± 4	5 ± 4	<350
	November	30 ± 6	22 ± 4	<350
	December*			
	Annual Data	<7	<7	<358
1987				
	January	<4	14 ± 5	<350
	February	<3	<5	<350
	March	5 ± 4	13 ± 4	<350
	April	35 ± 8	20 ± 5	<350
	May	5 ± 3	4 ± 3	<350
	June	18 ± 6	7 ± 4	<350
	July	<8	<8	<350

NOTE Error terms are based on the 2 sigma counting error for the single analysis
Nominal values for the minimum detectable activity are listed in Appendix III
* = No sample collected
SI unit equivalent 1 pCi/l = 0 037 Bq/l
20 pCi/l = 0 74 Bq/l

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TABLE E-2
WATER SURVEILLANCE SUMMARY
MONTHLY COMPARISON DATA
POND B-3
1986 and 1987

Date	N	ALPHA (pCi/l) $\bar{x}$	max.	min.	BETA (pCi/l) $\bar{x}$	max.	min.	TRITIUM (pCi/l) $\bar{x}$	max.	min.
1986										
July	5	<4	4	<3	9	11	6	<350	<350	<350
August	4	<3	<3	<3	10	11	9	<350	<350	<350
September	4	<5	7	<3	<10	14	<5	<350	<350	<350
October	5	<5	7	<4	<9	15	<5	<350	<350	<350
November	4	<5	8	<3	14	16	12	<350	<350	<350
December	5	<6	10	<3	12	17	9	<689	2046	<350
Annual Data	52	<4	10	2	<11	19	<5	<379	2046	<350
1987										
January	4	<4	5	<4	14	15	13	<350	<350	<350
February	3	<5	7	<4	11	14	7	<350	<350	<350
March	4	<5	9	<4	10	13	5	<361	394	<350
April	5	<5	5	4	10	11	9	<556	960	<350
May	4	<5	<5	<4	<10	14	5	<350	<350	<350
June	4	<6	8	<4	<8	12	5	<350	<350	<350
July	5	<4	6	<4	<10	12	7	<350	364	<350

NOTE: N = number of observations (samples)
$\bar{x}$ = arithmetic mean
max. = maximum individual sample concentration observed
min. = minimum individual sample concentration observed
Nominal values for the minimum detectable activity are listed in Appendix III
SI Unit Equivalent: 1 pCi/l = 0.037 Bq/l
20 pCi/l = 0.48 Bq/l

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TABLE E-3
WATER SURVEILLANCE SUMMARY
MONTHLY COMPARISON DATA
WALNUT CREEK AT INDIANA
1986 and 1987

Date	N	ALPHA (pCi/l) $\bar{x}$	max	min	BETA (pCi/l) $\bar{x}$	max	min	TRITIUM (pCi/l) $\bar{x}$	max	min
1986										
July	2	<5	6	<4	<5	<5	<5	<350	<350	<350
August	1	<4	<4	<4	7	7	7	<350	<350	<350
September*										
October	1	6	6	6	5	5	5	<350	<350	<350
November	3	<7	8	<5	8	9	7	<350	<350	<350
December*										
Annual Data	62	<7	15	<2	<7	18	<5	<356	655	<350
1987										
January*										
February	8	<6	7	<6	<5	6	<5	<350	<350	<350
March	13	<9	24	<4	<8	20	<5	<365	549	<350
April	13	<4	10	<3	<6	10	<5	<457	747	<350
May	13	<6	14	<3	<6	11	<5	<350	<350	<350
June	8	<8	22	<5	<8	12	<5	<350	<350	<350
July	4	10	13	9	12	20	7	<350	<350	<350

NOTE N = number of observations (samples)
$\bar{x}$ = arithmetic mean
max = maximum individual sample concentration observed
min = minimum individual sample concentration observed
Nominal values for the minimum detectable activity are listed in Appendix III
* = No sample collected
SI Unit Equivalent 1 pCi/l = 0 037 Bq/l
20 pCi/l = 0 48 Bq/l

TABLE E-4
WATER SURVEILLANCE SUMMARY
MONTHLY COMPARISON DATA
BROOMFIELD*
1986 and 1987

Date	N	ALPHA (pCi/l) $\bar{x}$	max.	min.	BETA (pCi/l) $\bar{x}$	max.	min.	TRITIUM (pCi/l) $\bar{x}$	max	min.
1986										
July	5	<4	7	<3	<5	<5	<5	<350	<350	<350
August	4	<3	3	<3	<5	<5	<5	<350	<350	<350
September	4	<3	<3	<3	<5	<5	<5	<385	488	<350
October	5	<4	5	<3	<5	<5	<5	<350	<350	<350
November	4	<6	11	<3	<5	<6	<5	<350	<350	<350
December	5	<4	6	<3	<6	8	<5	<350	<350	<350
Annual Data	50	<4	11	<3	<5	8	<5	<354	488	350
1987										
January	4	<3	3	<3	<5	<6	<5	<350	<350	<350
February	4	<3	<3	<3	<5	<6	<5	<350	<350	<350
March	4	<3	4	<3	<5	5	<5	<350	<350	<350
April	5	<4	<4	<3	<5	6	<5	<443	858	<350
May	4	<4	<4	<3	<5	5	<5	<350	<350	<350
June	4	<5	7	<4	<6	10	<5	<350	<350	<350
July	5	<5	10	<4	<6	8	<5	<350	<350	<350

NOTE: N = number of observations (samples)
$\bar{x}$ = arithmetic mean
* = Weekly composite
max. = maximum individual sample concentration observed
min. = minimum individual sample concentration observed
Nominal values for the minimum detectable activity are listed in Appendix III
SI Unit Equivalent: 1 pCi/l = 0.037 Bq/l
20 pCi/l = 0.48 Bq/l

TABLE E-5
WATER SURVEILLANCE SUMMARY
MONTHLY COMPARISON DATA
WOMAN CREEK AT INDIANA
1986 and 1987

Date	ALPHA (pCi/l)	BETA (pCi/l)	TRITIUM (pCi/l)
1986			
July*			
August*			
September*			
October*			
November	<3	<5	<350
December	<3	<5	<350
Annual Data	<5	<5	<350
1987			
January	4 ± 3	<5	<350
February	<4	<5	<350
March	<4	<5	<350
April	<4	<5	<350
May	5 ± 3	6 ± 4	<350
June	5 ± 4	5 ± 4	<350
July	6 ± 4	5 ± 4	<350

NOTE Error terms are based on the 2 sigma counting error for the single analysis
Nominal values for the minimum detectable activity are listed in Appendix III
* = No sample collected
SI unit equivalent 1 pCi/l = 0 037 Bq/l
20 pCi/l = 0 74 Bq/l

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TABLE E-6
WATER SURVEILLANCE SUMMARY
MONTHLY COMPARISON DATA
WESTMINSTER
1986 and 1987

te	N	ALPHA (pCi/l) $\bar{x}$	max.	min.	BETA (pCi/l) $\bar{x}$	max.	min.	TRITIUM (pCi/l) $\bar{x}$	max.	min.
986										
July	2	<3	<3	<3	<5	<5	<5	<350	<350	<350
August	2	<5	6	<3	<5	5	<5	<350	<350	<350
September	2	<3	3	<3	<5	<5	<5	<350	<350	<350
October	3	<3	<3	<3	<5	<5	<5	<350	<350	<350
November	2	<3	3	<3	<5	<5	<5	<350	<350	<350
December	1	<3	<3	<3	<5	<5	<5	<350	<350	<350
Annual Data	24		7	<3	<5	5	4	<350	<350	<350
1987										
January	2	<4	5	<3	<5	<5	<5	<350	<350	<350
February	2	<3	<3	<3	<5	<5	<5	<350	<350	<350
March	2	<3	3	<3	<5	<5	<5	<350	<350	<350
April	3	<4	4	<3	<5	<5	<5	<350	856	<350
May	2	<3	<3	<3	<5	8	<5	<519	<350	<350
June	2	<3	<3	<3	<6	<5	<5	<350	<350	<350
July	2	<3	<3	<3	<5	<5	<5	<350	<350	<350
					<5	<5	<5	<350	<350	<350
					5			<350		

NOTE: N = number of observations (samples)
$\bar{x}$ = arithmetic mean
max. = maximum individual sample concentration observed
min. = minimum individual sample concentration observed
Nominal values for the minimum detectable activity are listed in Appendix III.
SI unit equivalent: 1 pCi/l = 0.037 Bq/l
20 pCi/l = 0.74 Bq/l

TABLE E-7
WATER SURVEILLANCE SUMMARY
MONTHLY COMPARISON DATA
ARVADA
1986 and 1987

Date	ALPHA (pCi/l)	BETA (pCi/l)	TRITIUM (pCi/l)
1986			
July	<2	<5	<350
August	<2	<5	<350
September	<2	<5	<350
October	<2	<5	<350
November	<2	<5	<350
December	<2	<5	<350
Annual Data	<2	<5	<350
1987			
January	<2	<5	<350
February	<2	<5	<350
March	<2	<5	<350
April	2 ± 2	<5	907 ± 184
May	<3	<5	*
June	<2	<5	<350
July	<2	<5	<350

NOTE Error terms are based on the 2 sigma counting error for the single analysis
Nominal values for the minimum detectable activity are listed in Appendix III
* = No sample collected
SI unit equivalent 1 pCi/l = 0 037 Bq/l
20 pCi/l = 0 74 Bq/l

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TABLE E-8
WATER SURVEILLANCE SUMMARY
MONTHLY COMPARISON DATA
NORTH TABLE MOUNTAIN
1986 and 1987

Date	ALPHA (pCi/l)	BETA (pCi/l)	TRITIUM (pCi/l)
1986			
July	<2	<5	<350
August	<2	<5	<350
September	<2	<5	<350
October	3 ± 2	<5	<350
November	4 ± 2	5 ± 3	<350
December	<2	<5	<350
Annual Data	<2	<5	<350
1987			
January	<2	<5	<350
February	<2	<5	<350
March	<2	5 ± 3	<350
April	3 ± 2	<5	976 ± 184
May	<3	<5	*
June	<3	<5	<350
July	<3	<5	<350

NOTE. Error terms are based on the 2 sigma counting error for the single analysis.
Nominal values for the minimum detectable activity are listed in Appendix III.
* - No sample collected
SI unit equivalent: 1 pCi/l = 0.037 Bq/l
20 pCi/l = 0.74 Bq/l

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TABLE E-9
WATER SURVEILLANCE SUMMARY
QUARTERLY COMPARISON DATA
BOULDER AND GOLDEN
1986 and 1987

Date	ALPHA (pCi/l)	BETA (pCi/l)	TRITIUM (pCi/l)
Boulder			
1986			
3rd Q - 07/30/86	<2	<5	<350
4th Q - 11/28/86	<2	<5	<350
Annual Data	<2	<5	<350
1st Q - 02/18/87	<2	<5	<350
2nd Q - 05/19/87	<3	<5	
Golden			
1986			
3rd Q - 07/30/86	4 ± 2	7 ± 4	<350
4th Q - 11/19/86	<3	<5	<350
Annual Data	<3	<6	<367
1st Q - 01/21/87	<3	<5	<350
2nd Q - 05/13/87	<3	<5	
3rd Q	<3	<5	<350

NOTE Error terms are based on the 2 sigma counting error for the single analysis
Nominal values for the minimum detectable activity are listed in Appendix III
* = No sample collected
SI unit equivalent 1 pCi/l = 0 037 Bq/l
20 pCi/l = 0 74 Bq/l

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TABLE F
PLUTONIUM AND TOTAL ALPHA
CONCENTRATIONS IN WATER
June 1987

Station	DATE Month/Day/QTR	$Pu^{239+240}$ (pCi/l)	Total Alpha (pCi/l)
R.F. Pond A-3	06/87	0.02 ± 0.01	18 ± 6
	07/84	<0.01	<8
R.F. Pond B-3	06/87	0 03 ± 0 01	<6
Westminster	06/87	<0.01	<3

NOTE The 95%/% confidence interval for total alpha analysis is propagated from the sample count and background counts. The 95%/% confidence interval for plutonium analysis is propagated from the sample count, the background count, the tracer count, the tracer background count, and the contribution of tracer progeny to the sample count. Nominal values for the minimum detectable activity are listed in Appendix III.
The standard for general population exposure for soluble Pu is 1600 pCi/l.

TABLE G
NATURAL URANIUM AND TOTAL ALPHA
CONCENTRATIONS IN WATER
May 1987

Station	Date	URANIUM (ug/l)	URANIUM (pCi/l)	ALPHA (pCi/l)
R F Pond A-3	02/14/84	6 1	4 1	
R F Pond B-3	07/07/87	8 3	5 5	
Walnut Creek at Indiana	07/07/87	<3	<2	
Broomfield	07/07/87	<3	<2	
Woman Creek at Indiana	02/28/84	3 3	2 2	
	02/16/83	3 2	2 1	
	03/14/83	4 3	2 9	
Westminster	07/07/87	<3	<2	
North Table Mountain	12/20/84	<3	<2	

NOTE Total Alpha error terms are based on the 2 sigma counting error for the single analysis Nominal values for the minimum detectable activity are listed in Appendix III

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APPENDIX I
ROCKY FLATS PLANT AIR SURVEILLANCE
STATION IDENTIFICATION

On-Site (Security)	Location
D - 1	Rocky Flats Plant, Eastern perimeter at the security fence, North to south
D - 2	
D - 3	
D - 4	

On-Site (Perimeter	
D - 5	SE
D - 6	NE
D - 7	N
D - 8	NW

Rocky Flats Plant, Plant Boundary

Off-Site (Metro)	
BROOMFIELD	Garden Office Center
ADAMS CITY	4301 East 72nd Avenue
ARVADA	8101 Ralston Road
AURORA	1633 Florence Street
BOULDER	13th & Spruce
DENVER	414 - 14th Street
ENGLEWOOD	4857 South Broadway
GOLDEN	911 - 10th Street
LAKEWOOD	260 South Kipling

Off-Site (Remote)	
COLORADO NATIONAL MONUMENT	Fire Station
DURANGO	Municipal Complex
LAMAR	510 Harrison Avenue
LEADVILLE	3rd & Ash Street
STERLING	

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