56007

CORRES CONTROL
OUTGOING LTR NO

DOE ORDER # 4700.1
95 RF 04861

DISTRIBUTION	LTR	ENC
AMARAL M E		
BURLINGAME A H		
BRANCH D B		
CARNIVAL G J		
DAVIS J G		
FERERRA D W		
FRAY R E		
GEIS J A		
GLOVER W S		
GOLAN P M		
HANNI B J		
HARMAN L K		
HEALY T J		
HEDAHL T		
HILBIG, J G		
HUTCHINS, N M		
JACKSON D T		
KELL R E		
KUESTER A W		
MARX G E		
McDONALD M M		
McKENNA F G		
MONTROSE J K		
MORGAN R V		
POTTER G L		
PIZZUTO V M		
RISING T L		
SANDLING N B		
SCHWARTZ J K		
SETLOCK, G H		
STEWART D L		
STIGER S G	X	
TOBIN P M		
VOORHEIS G M		
WILSON J M		
RUDDY	X	X
PRIMROSE	X	X
SPENCE	X	X
CORRES CONTROL	X	
ADMIN RECORD	X	X
PROJECT FILE	X	
PATS		
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UNCLASSIFIED	X	
CONFIDENTIAL		
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LETTER APPROVALS

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THS jlm

EG&G ROCKY FLATS

EG&G ROCKY FLATS, INC
ROCKY FLATS PLANT P O BOX 464 GOLDEN COLORADO 80402 0464 (303) 966 7000

June 6, 1995 95-RF-04861

Robert H Birk
Environmental Restoration Division
DOE/RFFO

RESULTS FOR SURFACE WATER SAMPLES OF DISCHARGE FROM PONDS A-3, A-4 AND B-5 COLLECTED ON APRIL 26, 1995 AND MAY 17, 1995 – THS-010-95

Action None required

Enclosed are the analytical results for grab surface water samples collected on April 26, 1995 from discharge of Ponds A-3, A-4 and B-5 The samples were collected by the EG&G Rocky Flats, Inc Surface Water Division to determine the quality of water being discharged from Pond A-4 and Pond A-5 into the North and South Walnut Creek drainages, respectively Water was pumped out of the ponds into the Walnut Creek drainages on April 26, 1995 to control and prevent pond water levels from reaching the maximum limit (due to the unusually high precipitation occurring prior to this time) To accomplish this, water was pumped over the dam of Pond A-3 to Pond A-4, and over the dam of Pond A-4 into North Walnut Creek Likewise, water was pumped over the dam of Pond B-5 into South Walnut Creek

The grab discharge water samples were collected at the time of initial release from the A-3, A-4 and B-5 ponds for laboratory analysis of the following constituents metals (total and dissolved), volatile organic compounds, radionuclides, and physical and biological parameters The analytical results indicate that all constituents detected in the three pond grab samples were observed at concentrations below the Colorado Water Quality Control Commission (CWQCC) Segment 4 Standards for surface water (Attachment 1) The CWQCC standards were adopted in July 1989 for all tributaries to Great Western Reservoir from the Rocky Flats Environmental Technology Site (the Site) EG&G also compared the analytical results for these samples to the preliminary Applicable or Relevant and Appropriate Requirements Upper Tolerance Limits (UTLs) determined for surface water No constituent concentrations detected in the pond samples exceeded the UTLs for surface water

On May 4, 1995, Operable Unit 3 management requested collection of non-routine samples at certain surface water sampling stations on May 5, 1995 to assess water quality in tributaries flowing across the site and potentially into Great Western Reservoir Grab samples were collected from Upper Church Ditch at the west site boundary, upstream of the new landfill, and downstream in the McKay Bypass Canal Samples were also collected from discharge of Pond A-4 and Pond B-5 Analytical results for the May 5, 1995 samples are expected during the week ending June 16, 1995 and will be forwarded to you as soon as they become available

As you are aware, all Walnut Creek flow from the Site has been treated and diverted south around Great Western Reservoir via the Broomfield Diversion Ditch since 1989 On April 26, 1995 and without notification to EG&G Rocky Flats, Inc Surface Water Division, the City of Broomfield opened the water channel gate located east of Indiana Street that is used to divert Walnut Creek flow from the Site into the Broomfield Diversion Ditch This allowed water from Walnut Creek, including discharged water from the A-4 and B-5 ponds, into Great Western Reservoir The City of Broomfield reportedly continued to divert Walnut Creek flow into Great Western Reservoir from April 26 to May 9, 1995 and again from May 17 to May 25, 1995, apparently taking advantage of the record precipitation events during this period of time

ADMIN RE
A-OU03-000543

Samples of discharge water were collected from the A-4 and B-5 ponds when the water was initially released on April 26, 1995 and May 17, 1995 Analytical results for the April 26, 1995 sampling event were sent to you via facsimile on May 8, 1995 and are presented as Attachment 1 to this letter Preliminary results for discharge samples collected from the ponds during the initial May 17, 1995 release (Attachment 2) indicate concentrations of plutonium-239/240 in Pond A-4 (0 097 picocuries per liter – pCi/l) slightly above the CWQCC Segment 4 surface water plutonium standard of 0 05 pCi/l, and concentrations of americium-241 (0 086 pCi/l) in Pond B-5 slightly above the CWQCC Segment 4 surface water americium standard of 0 05 pCi/l It should be noted that the CWQCC Segment 4 surface water standards for plutonium-239/240 and americium-241 are chronic standards based on a 30-day running average The May 17, 1995 results for plutonium and americium represent an acute event and do not indicate an exceedence of the CQWCC Segment 4 standards Preliminary results also indicate slightly elevated concentrations of certain metals (e g , total aluminum and total iron), which would be expected during times of prolonged and/or heavy precipitation events

A comparison of the April 26, 1995 analytical results to the May 17, 1995 results shows that measured concentrations of plutonium and americium increased with an increase in measured Total Suspended Solids A summary of plutonium and americium concentrations (in pCi/l) versus Total Suspended Solids (in mg/l) for the April 26, 1995 and May 17, 1995 sampling events is presented below

	Plutonium-239/240	Americium-241	Total Susp Solids
April 26			
Pond A-4	0 005	0 008	22
Pond B-5	0 019	0 009	< 4
May 17			
Pond A-4	0 097	0 087	230
Pond B-5	incomplete	0 086	507

Based on the above information, it appears that the levels of radionuclides in the Pond discharge samples are related to the amount of Total Suspended Solids present in the samples

Please call me at extension 8551 if you have any questions or require additional information

Tracey H Spence

Tracey H Spence
Operable Unit 3
Group 1 Closures
EG&G Rocky Flats, Inc

THS jlm

Orig and 1 cc - R H Birk

Attachments
As Stated (2)

RFETS Pond A-4 Sampling Results for 4/26/95

		Pond A-4	
Analytes	(Units)	VW21112JE	Segment 4
Sample #		4/26/95	Standards
Physical & Biological			
Ammonia as N	mg/l as N	1 84	
Bicarbonate Alkalinity	mg/l as CaCO3	NA	
Carbonate Alkalinity	mg/l as CaCO3	NA	
Chloride	mg/l	136	250
Conductivity	ms/cm	0 74	
Cyanide (free)	mg/l	<0 003 total	0 005
Dissolved Oxygen	mg/l	10 7	> 5 0
Fluoride	mg/l	0 77	2
Nitrate/Nitrite	mg/l as N	1 93	10
pH	Standard Units	9 1	6 5 to 9 0
Sulfate	mg/l	36	250
Sulfide (S2-)	mg/l	0 30	
Temperature	C	9 7	
Total Alkalinity	mg/l as CaCO3	114	
Total Dissolved Solids	mg/l	414	
Total Residual Chlorine	mg/l	0 05	
Total Suspended Solids	mg/l	22	
Water Hardness	mg/l as CaCO3	157	157
		Basis for TVS Calculations	
Dissolved Metals			
Aluminum	ug/l	29 1 B	87
Antimony	ug/l	27 0 U	
Arsenic	ug/l	1 5 B	150
Barium	ug/l	53 6 B	
Beryllium	ug/l	1.0 U	4
Cadmium	ug/l	0.2 B	1 6
Calcium	ug/l	43000	
Chromium	ug/l	4 0 U	
Cobalt	ug/l	4 0 U	
Copper	ug/l	5 0 B	17 4
Iron	ug/l	8 9	300
Lead	ug/l	4 0 U	7 4
Magnesium	ug/l	9890	
Manganese	ug/l	14 5 B	50
Mercury	ug/l	0 2 U	0 10
Nickel	ug/l	9 0 U	134 7
Potassium	ug/l	6840	
Selenium	ug/l	1 8 B	17
Silver	ug/l	0 2 U	0 7
Sodium	ug/l	8150	
Thallium	ug/l	0 5 U	15
Vanadium	ug/l	4 3 B	
Zinc	ug/l	9 9 B	155 3

NA - Not analyzed U - Undetected J - Compound found below PQL, result is estimated B - Compound found, present in method blank (organic) Result is less than Required Detection Limit, greater than or equal to Instrument Detection Limit (metal)

RFETS Pond A-4 Sampling Results for 4/26/95

		Pond A-4	
Analytes	(Units)	VW21112JE	Segment 4
Sample #		4/26/95	Standards
Total Metals			
Aluminum	ug/l	1180	
Antimony	ug/l	27 0 U	14
Arsenic	ug/l	2 8 B	50
Barium	ug/l	61 8 B	1000
Beryllium	ug/l	1 0 U	4
Cadmium	ug/l	0 1 B	10
Calcium	ug/l	43300	
Chromium	ug/l	4 0 U	50
Cobalt	ug/l	4 0 U	
Copper	ug/l	7 7 B	200
Iron	ug/l	594	1000
Lead	ug/l	4 1 B	50
Magnesium	ug/l	10100	
Manganese	ug/l	55 6	200
Mercury	ug/l	0 2 U	2
Nickel	ug/l	9 0 U	200
Potassium	ug/l	6830	
Selenium	ug/l	1 4 B	10
Silver	ug/l	0.2 U	50
Sodium	ug/l	81500	
Thallium	ug/l	0 5 U	0 012
Vanadium	ug/l	6 0 B	
Zinc	ug/l	19 4 B	2000
Organic			
Volatile Organics (524 2)	ug/l	all U	--
Radionuclides			
Americium-241	pCi/L	0 008 +/- 0 007	0 05
Gross Alpha	pCi/L	3 +/- 2	11
Gross Beta	pCi/L	8 +/- 3	19
Plutonium-239/240	pCi/L	0 005 +/- 0 011	0 05
Tritium	pCi/L	-157 +/- 151	500
Uranium-233/234	pCi/L	1 13 +/- 0 14	10 (total U)
Uranium-238	pCi/L	1 20 +/- 0 14	10 (total U)

NA - Not analyzed U - Undetected J - Compound found below PQL, result is estimated B - Compound found, present in method blank (organic) Result is less than Required Detection Limit, greater than or equal to Instrument Detection Limit (metal)

RFETS Pond B-5 Sampling Results for 4/26/95

		Pond B-5	
Analytes	**(Units)**	VW21111JE	**Segment 4**
Sample #		4/26/95	**Standards**
Physical & Biological			
Ammonia as N	mg/l as N	4 8	
Bicarbonate Alkalinity	mg/l as CaCO3	NA	
Carbonate Alkalinity	mg/l as CaCO3	NA	
Chloride	mg/l	116	250
Conductivity	ms/cm	0 69	
Cyanide (free)	mg/l	<0 003 total	0 005
Dissolved Oxygen	mg/l	8 7	> 5 0
Fluoride	mg/l	0 76	2
Nitrate/Nitrite	mg/l as N	2 1	10
pH	Standard Units	8 7	6 5 to 9 0
Sulfate	mg/l	33	250
Sulfide (S2-)	mg/l	0 30	
Temperature	C	9 2	
Total Alkalinity	mg/l as CaCO3	108	
Total Dissolved Solids	mg/l	378	
Total Residual Chlorine	mg/l	0 04	
Total Suspended Solids	mg/l	<4	
Water Hardness	mg/l as CaCO3	149	149
		Basis for TVS Calculations	
Dissolved Metals			
Aluminum	ug/l	91 8 B	87
Antimony	ug/l	27 0 U	
Arsenic	ug/l	1 0 U	150
Barium	ug/l	43 9 B	
Beryllium	ug/l	1 0 U	4
Cadmium	ug/l	0 5 B	1 6
Calcium	ug/l	40600	
Chromium	ug/l	4 0 U	
Cobalt	ug/l	4 0 U	
Copper	ug/l	3 0 U	16 6
Iron	ug/l	75 4 B	300
Lead	ug/l	4 3	6 8
Magnesium	ug/l	8220	
Manganese	ug/l	48 4	50
Mercury	ug/l	0.2 U	0 10
Nickel	ug/l	9 0 U	129 4
Potassium	ug/l	7530	
Selenium	ug/l	1 0 B	17
Silver	ug/l	0 2 U	0 6
Sodium	ug/l	73200	
Thallium	ug/l	0 5 U	15
Vanadium	ug/l	3 9 B	
Zinc	ug/l	25 6	148 6

NA - Not analyzed U - Undetected J - Compound found below PQL, result is estimated B - Compound found, present in method blank (organics) Result is less than Required Detection Limit, greater than or equal to Instrument Detection Limit (metal)

RFETS Pond B-5 Sampling Results for 4/26/95

		Pond B-5	
Analytes	(Units)	VW21111JE	Segment 4
Sample #		4/26/95	Standards
Total Metals			
Aluminum	ug/l	2030	
Antimony	ug/l	27 0 U	14
Arsenic	ug/l	2.5 B	50
Barium	ug/l	52 0 B	1000
Beryllium	ug/l	1 0 U	4
Cadmium	ug/l	0.5 B	10
Calcium	ug/l	40000	
Chromium	ug/l	4 0 U	50
Cobalt	ug/l	4 0 U	
Copper	ug/l	4 8 B	200
Iron	ug/l	1100	1000
Lead	ug/l	7 1 B	50
Magnesium	ug/l	8220	
Manganese	ug/l	59 5	200
Mercury	ug/l	0 2 U	2
Nickel	ug/l	11 0 B	200
Potassium	ug/l	7510	
Selenium	ug/l	1 2 B	10
Silver	ug/l	0.2 U	50
Sodium	ug/l	71300	
Thallium	ug/l	0 5 U	0 012
Vanadium	ug/l	6 6 B	
Zinc	ug/l	34 1	2000
Organic			
Volatile Organics (524.2)			
4-Isopropyltoluene	ug/l	0 01 J	
Radionuclides			
Americium-241	pCi/L	0 009 +/- 0 009	0 05
Gross Alpha	pCi/L	2 +/- 2	11
Gross Beta	pCi/L	8 +/- 2	19
Plutonium-239/240	pCi/L	0 019 +/- 0 010	0 05
Tritium	pCi/L	-44 +/- 156	500
Uranium-233/234	pCi/L	0 90 +/- 0 10	10 (total U)
Uranium-238	pCi/L	0 87 +/- 0 10	10 (total U)

NA - Not analyzed U - Undetected J - Compound found below PQL, result is estimated B - Compound found, present in method blank (organics) Result is less than Required Detection Limit, greater than or equal to Instrument Detection Limit (metal)

RFETS Pond A-4 Sampling Results Collected 5/17/95

		Pond A-4	
Analytes	**(Units)**	**VW21341JE**	**Segment 4**
Sample #		**5/17/95**	**Standards**
Physical & Biological			
Ammonia as N	mg/l as N	0 09	
Bicarbonate Alkalinity	mg/l as CaCO3	0 0	
Carbonate Alkalinity	mg/l as CaCO3	85 5	
Chloride	mg/l	66 1	250
Conductivity	ms/cm	0 46	
Cyanide (free)	mg/l	<0 003	0 005
Dissolved Oxygen	mg/l	7 1	> 5 0
Fluoride	mg/l	0 60	2
Nitrate/Nitrite	mg/l as N	0 62	10
pH	Standard Units	8 28	6 5 to 9 0
Sulfate	mg/l	23 3	250
Sulfide (S2-)	mg/l	1 12	
Temperature	C	10 2	
Total Alkalinity	mg/l as CaCO3	84	
Total Dissolved Solids	mg/l	272	
Total Residual Chlorine	mg/l	0 09	
Total Suspended Solids	mg/l	230	
Water Hardness	mg/l as CaCO3	116	116
		Basis for TVS Calculations	
Dissolved Metals			
Aluminum	ug/l	74 9 B	87
Antimony	ug/l	27 0 U	
Arsenic	ug/l	1 1 B	150
Barium	ug/l	42.1 B	
Beryllium	ug/l	1 0 U	4
Cadmium	ug/l	0 11 B	1.3
Calcium	ug/l	27000	
Chromium	ug/l	4 0 U	
Cobalt	ug/l	4 0 U	
Copper	ug/l	3 0 U	13 4
Iron	ug/l	39 3	300
Lead	ug/l	3 2	4 8
Magnesium	ug/l	6960	
Manganese	ug/l	17 9	50
Mercury	ug/l	0 2 U	0 10
Nickel	ug/l	9 0 U	107 0
Potassium	ug/l	4020 B	
Selenium	ug/l	1 1 B	17
Silver	ug/l	0.2 U	0 4
Sodium	ug/l	46300	
Thallium	ug/l	0 5 U	15
Vanadium	ug/l	3 0 U	
Zinc	ug/l	12 8 B	120 2

NA-Not analyzed U-Undetected J-Compound found below PQL, result is estimate B-Compound found, present in method blank (organic) Result is less than Required Detection Limit, greater than or equal to Instrument Detection Limit (metal)

RFETS Pond A-4 Sampling Results Collected 5/17/95

		Pond A-4	
Analytes	**(Units)**	**VW21341JE**	**Segment 4**
Sample #		**5/17/95**	**Standards**
Total Metals			
Aluminum	ug/l	14000	
Antimony	ug/l	27 0 U	14
Arsenic	ug/l	2 7 B	50
Barium	ug/l	112 B	1000
Beryllium	ug/l	1 0 U	4
Cadmium	ug/l	0 26 B	10
Calcium	ug/l	32400	
Chromium	ug/l	12.7	50
Cobalt	ug/l	4 0 U	
Copper	ug/l	12 6 B	200
Iron	ug/l	8530	1000
Lead	ug/l	7 2	50
Magnesium	ug/l	9790	
Manganese	ug/l	156	200
Mercury	ug/l	0 2 U	2
Nickel	ug/l	9 0 U	200
Potassium	ug/l	5900	
Selenium	ug/l	1 2 B	10
Silver	ug/l	0 24 B	50
Sodium	ug/l	48700	
Thallium	ug/l	0 99	0 012
Vanadium	ug/l	29 8 B	
Zinc	ug/l	77	2000
Organic			
Semi-volatile Organics			
bis(2-ethylhexyl)phthalate	ug/l	2.0 BJ	1 8
Volatile Organics (524 2)		all U	
Pesticides CLP	ug/l	all U	
Radionuclides			
Americium-241	pCi/L	0 087 +/- 0 024	0 05
Gross Alpha	pCi/L	8 +/- 2	11
Gross Beta	pCi/L	13 +/- 2	19
Plutonium-239/240	pCi/L	0 097 +/- 0 025	0 05
Tritium	pCi/L	87 +/- 147	500
Uranium-233/234	pCi/L	1 09 +/- 0 16	10 (total U)
Uranium-238	pCi/L	1.25 +/- 0 18	10 (total U)

NA-Not analyzed U-Undetected J-Compound found below PQL, result is estimate B-Compound found, present in method blank (organic) Result is less than Required Detection Limit, greater than or equal to Instrument Detection Limit (metal)

RFETS Pond B-5 Sampling Results Collected 5/17/96

		Pond B-5	
Analytes	(Units)	VW21345JE	Segment 4
Sample #		5/17/95	Standards
Physical & Biological			
Ammonia as N	mg/l as N	1 82	
Bicarbonate Alkalinity	mg/l as CaCO3	0 0	
Carbonate Alkalinity	mg/l as CaCO3	88 7	
Chloride	mg/l	37 6	250
Conductivity	ms/cm	0 42	
Cyanide (free)	mg/l	<0 003	0 005
Dissolved Oxygen	mg/l	8 8	> 5 0
Fluoride	mg/l	0 59	2
Nitrate/Nitrite	mg/l as N	1 40	10
pH	Standard Units	8 5	6 5 to 9 0
Sulfate	mg/l	23 2	250
Sulfide (S2-)	mg/l		
Temperature	C	7 2	
Total Alkalinity	mg/l as CaCO3	NA	
Total Dissolved Solids	mg/l	232	
Total Residual Chlorine	mg/l	0 05	
Total Suspended Solids	mg/l	507	
Water Hardness	mg/l as CaCO3	112	112
		Basis for TVS Calculations	
Dissolved Metals			
Aluminum	ug/l	631	87 ✓
Antimony	ug/l	27 0 U	
Arsenic	ug/l	2.3 B	150
Barium	ug/l	107 B	
Beryllium	ug/l	1 0 U	4
Cadmium	ug/l	0 8	1 2
Calcium	ug/l	31700	
Chromium	ug/l	4 0 U	
Cobalt	ug/l	4 0 U	
Copper	ug/l	5 2 B	13 0
Iron	ug/l	287	300
Lead	ug/l	7 1	4 6 ✓
Magnesium	ug/l	5680	
Manganese	ug/l	65 6	50 ✓
Mercury	ug/l	0 2 U	0 10
Nickel	ug/l	9 0 U	104 2
Potassium	ug/l	4310	
Selenium	ug/l	1 2 U	17
Silver	ug/l	0 2 U	0 4
Sodium	ug/l	29100	
Thallium	ug/l	0.5 U	15
Vanadium	ug/l	4 7 B	
Zinc	ug/l	39 5	116 7

NA-Not analyzed U-Undetected J-Compound found below PQL, result is estimated B-compound found; present in method blank (organic) Result is less than Required Detection Limit, greater than or equal to Instrument Detection Limit (metal)

RFETS Pond B-5 Sampling Results Collected 5/17/96

		Pond B-5		
Analytes	**(Units)**	**VW21345JE**	**Segment 4**	
Sample #		**5/17/95**	**Standards**	
Total Metals				
Aluminum	ug/l	22000		✓
Antimony	ug/l	27 0	14	✓
Arsenic	ug/l	7 9 B	50	
Barium	ug/l	189 B	1000	
Beryllium	ug/l	1 1 B	4	
Cadmium	ug/l	0 28 B	10	
Calcium	ug/l	35200		
Chromium	ug/l	24 4	50	
Cobalt	ug/l	4 4 B		
Copper	ug/l	18.7 B	200	
Iron	ug/l	15200	1000	✓
Lead	ug/l	13 3	50	
Magnesium	ug/l	9010		
Manganese	ug/l	140	200	
Mercury	ug/l	0.2 U	2	
Nickel	ug/l	12 4 B	200	
Potassium	ug/l	7320		
Selenium	ug/l	2 0 B	10	
Silver	ug/l	0.43 B	50	
Sodium	ug/l	29200		
Thallium	ug/l	2 1 B	0 012	
Vanadium	ug/l	46 1 B		
Zinc	ug/l	99 8	2000	
Organic				
Semi-volatile Organics				
bis(2-ethylhexyl)phthalate	ug/l	0 9 BJ	1 8	
Volatile Organics (524 2)		all U		
Pesticides CLP	ug/l	all U		
Radionuclides				
Americium-241	pCi/L	0 086 +/- 0 022	0 05	
Gross Alpha	pCi/L	12 +/- 4	11	
Gross Beta	pCi/L	23 +/- 3	19	
Plutonium-239/240	pCi/L	incomplete	0 05	
Tritium	pCi/L	incomplete	500	
Uranium-233/234	pCi/L	1 44 +/- 0 18	10 (total U)	
Uranium-238	pCi/L	1.34 +/ 0 17	10 (total U)	

NA-Not analyzed U-Undetected J-Compound found below PQL, result is estimated B-compound found, present in method blank (organic) Result is less than Required Detection Limit, greater than or equal to Instrument Detection Limit (metal)