

## Raynes, Scott (CONTR)

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**From:** Squibb, George (CONTR)  
**Sent:** Wednesday, November 02, 2011 12:02 PM  
**To:** Bob Krugmire (bkrugmir@cityofwestminster.us); Boylan, John; Bruce Hastings (bruce\_hastings@fws.gov); Bud Hart (Thornton); Carl Spreng (carl.spreng@state.co.us); Carpenter, Andy (CONTR); Cathy Shugarts (cshugarts@cityofwestminster.us); Christine Hawley (hawley@hydrosconsulting.com); Craig Hoffman (choffman@ci.broomfield.co.us); Dan Mayo (dmayo@ci.broomfield.co.us); Darr, Bob (CONTR); David Abelson (dabelson@rockyflatssc.org); David Allen (dallen@ci.broomfield.co.us); DiSalvo, Rick (CONTR); Ed Lanyon (edward.lanyon@cityofthornton.net); Emily Hunt (emily.hunt@cityofthornton.net); Hooten, Gwen (Gwen.Hooten@lm.doe.gov); Kaiser, Linda (CONTR); Kathy Schnoor; Laura Hubbard; Mark Gutke (JeffCo) ; McLaughlin, Jeremiah; Paul Winkle (DOW) ; rc-rocky.flats; Rik Getty (rgetty@rockyflatssc.org); Shelly Stanley (SStanley@northglenn.org); Shirley Garcia (sgarcia@ci.broomfield.co.us); Steve Berendzen (steve\_berendzen@fws.gov); Surovchak, Scott; Vera Moritz (moritz.vera@epa.gov)  
**Subject:** Pond Discharge Notification  
**Attachments:** C-2BroadcastEmail111102.pdf  
**Importance:** High

Please see attached notification.

Contact me if you have any questions or comments. Thanks

George S. Squibb IV  
Sr. Environmental Engineer / Surface-Water Lead S.M. Stoller, Rocky Flats Site  
720-377-9675 (office); 303-994-0145 (mobile) [george.squibb@lm.doe.gov](mailto:george.squibb@lm.doe.gov)

**Pond Discharge Notification Cover Sheet**

**Date: 11/2/11**

**Total pages including cover sheet = 14**

**To:**

<b>Carl Spreng,</b>	<b>CDPHE</b>	<a href="mailto:carl.spreng@state.co.us"><u>carl.spreng@state.co.us</u></a>
<b>Vera Moritz</b>	<b>EPA</b>	<a href="mailto:moritz.vera@epa.gov"><u>moritz.vera@epa.gov</u></a>
<b>Steve Berendzen</b>	<b>USFWS</b>	<a href="mailto:steve_berendzen@fws.gov"><u>steve_berendzen@fws.gov</u></a>
<b>David Allen</b>	<b>Broomfield</b>	<a href="mailto:dallen@ci.broomfield.co.us"><u>dallen@ci.broomfield.co.us</u></a>
<b>Shirley Garcia</b>	<b>Broomfield</b>	<a href="mailto:sgarcia@ci.broomfield.co.us"><u>sgarcia@ci.broomfield.co.us</u></a>
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<b>Bob Krugmire</b>	<b>Westminster</b>	<a href="mailto:bkrugmire@ci.westminster.co.us"><u>bkrugmire@ci.westminster.co.us</u></a>
<b>Cathy Shugarts</b>	<b>Westminster</b>	<a href="mailto:cshurgarts@ci.westminster.co.us"><u>cshurgarts@ci.westminster.co.us</u></a>
<b>Mark Gutke</b>	<b>JeffCo</b>	<a href="mailto:mgutke@co.jefferson.co.us"><u>mgutke@co.jefferson.co.us</u></a>
<b>Paul Winkle</b>	<b>DOW</b>	<a href="mailto:paul.winkle@state.co.us"><u>paul.winkle@state.co.us</u></a>
<b>David Abelson</b>	<b>RFSC</b>	<a href="mailto:dabelson@rockyflatssc.org"><u>dabelson@rockyflatssc.org</u></a>

**From: George Squibb, Rocky Flats Surface Water Lead, telephone (303) 994-0145**

**Re: Discharge notification for Rocky Flats Pond C-2.**

**Pre-discharge samples for Pond C-2 were collected on 9/15/11. All results indicate that water quality standards at downstream Points of Compliance (POCs) will be met during discharge.**

**Per the Surface Water Configuration Adaptive Management Plan for the Rocky Flats Site (AMP) Section 3.1, Ecological Monitoring, one growing season will occur prior to initiating flow-through operations at Pond C-2 to allow for additional vegetative cover for erosion control in the Point of Evaluation SW027 drainage. Prior to initiating flow-through, DOE will provide the evaluation of the additional erosion controls and seeding performed in the SW027 drainage in 2010 to the AMP Group.**

**On October 28, 2011, the U.S. Department of Energy posted the AMP report, SW027 Hillside and South Interceptor Ditch (SID) Vegetation/Erosion Controls Evaluation, to the AMP page of the DOE Legacy Management Rocky Flats website at <[http://www.lm.doe.gov/Rocky\\_Flats\\_AMP.pdf](http://www.lm.doe.gov/Rocky_Flats_AMP.pdf)>.**

**Pond C-2 will be direct discharged using the outlet works to Woman Creek through AMP monitoring location GS31 starting on Monday, November 7, 2011. All required monitoring at downstream POCs WOMPOC (Woman Creek at Site boundary) and GS01 (Woman Creek at Indiana Street) will be performed according to the normal protocols in Attachment 2 to RFLMA. The discharge is expected to continue for approximately 5 days until the water level reaches the outlet valve elevation (pond**

volume of approximately 2%). At that point the valve will remain open and Pond C-2 will subsequently be operated in a flow-through configuration. From then on, locations GS31, WOMPOC, and GS01 will operate continuously and collect samples according to the location-specific requirements and water availability.

All available analytical data accompany this notice.

Please contact me if you have questions.



Dedicated to protecting and improving the health and environment of the people of Colorado

Laboratory Services Division  
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303-692-3090  
www.cdphe.state.co.us/lr

## Laboratory Results For Sample Number: ENV-2011011090-

Site ID/PWSID

Site  
Address

Contact Carl Spreng

Phone x3358

Fax

Email

Site Description ROCKY FLATS POND C-2

Customer ID 00008835

Customer CDPHE - HMWMD - Rocky Flats Unit  
4300 Cherry Creek Drive South

Denver

CO 80246

Collected By CS

Collected 09/15/2011 09:30:00

Received 09/16/2011 09:40:00

Reported 10/03/2011 00:00:00

Bottles 1 CUB

Matrix Surface Water

Temperature at Receipt 20C

Test Name	Result +/- 95% CI	Units	MDA	Method Name	Date Analyzed	Qualifier
Uranium, Total*	0.0069	mg/L	0.001	EPA 200.8	09/28/2011 00:00:00	
Plutonium, Isotopic Package*						
Americium-241	< 0.024	pCi/L	Varies	ASTM-3084-89	10/03/2011 00:00:00	
Plutonium-239+240	< 0.020	pCi/L	Varies	ASTM-3084-89	10/03/2011 00:00:00	

Comments:

Am-241 MDL= 0.024 pCi/L

Pu-239 MDL= 0.020 pCi/L

Registry Comments:

EMAIL RESULTS

MDA - Minimum Detectable Activity. MCL - Maximum Contaminant Limit per EPA regulations.

BDL - Below Detection Limit. H - Holding Time exceeded. Q - Quality Control limit exceeded. NT - No Test.

Units: mg/L - milligrams per liter (ppm), ug/L - micrograms per liter (ppb), pCi - picoCuries

LSD Internet Address: <http://www.cdphe.state.co.us/lr/lrhom.htm>

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**PRELIMINARY RESULTS REPORT****RIN: 11094086****Site: Rocky Flats Surface Water****Site Code: RFS01 Location: C2 POND****Ticket Number: JKV 922****Report Date: 10/6/2011**

Parameter	Units	Date Sampled	Date Analyzed	Result	Qualifier(s)	Uncertainty	Detection Limit	Method
Americium-241	pCi/L	09/15/2011	09/27/2011	0.00775	U	0.0072	0.0167	Am-05-RC Modified
Uranium	ug/L	09/15/2011	09/22/2011	9.09			0.067	EPA 3005/6020
Plutonium-238	pCi/L	09/15/2011	10/04/2011	-0.00938	U	0.0106	0.013	Pu-11-RC Modified
Plutonium-239/240	pCi/L	09/15/2011	10/04/2011	0.0172	U	0.012	0.0228	Pu-11-RC Modified



## *Data Review and Validation Report*

### General Information

Report Number (RIN): 11094086  
 Sample Event: September 12–15, 2011  
 Site(s): Rocky Flats, Colorado; Surface Water  
 Laboratory: GEL Laboratories, Charleston, South Carolina  
 Work Order No.: 286149  
 Analysis: Metals, Wet Chemistry, and Radiochemistry  
 Validator: Steve Donovan  
 Review Date: November 2, 2011

This validation was performed according to the *Environmental Procedures Catalog*, (LMS/PRO/S04325, continually updated) “Standard Practice for Validation of Laboratory Data.” The procedure was applied at Level 3, Data Validation. See attached Data Validation Worksheets for supporting documentation on the data review and validation. All analyses were successfully completed. The samples were prepared and analyzed using accepted procedures based on methods specified by line item code, which are listed in Table 1.

*Table 1. Analytes and Methods*

Analyte	Line Item Code	Prep Method	Analytical Method
Americium-241	ASP-A-020	HASL-300, Am-05	HASL-300, Am-05-RC
Nitrate + Nitrite as N	WCH-A-022	EPA 353.2	EPA 353.2
Plutonium Isotopes	LMR-08	HASL-300, Pu-11	HASL-300, Pu-11-RC
Uranium	LMM-02	SW-846 3005A	SW-846 6020

### Data Qualifier Summary

Analytical results were qualified as listed in Table 1. Refer to the sections below for an explanation of the data qualifiers applied.

*Table 1. Data Qualifier Summary*

Sample Number	Location	Analyte(s)	Flag	Reason
All	All	Nitrate + nitrite as N	J	Sample temperature over range

### Sample Shipping/Receiving

GEL Laboratories in Charleston, South Carolina, received nine water samples on September 19, 2011, accompanied by a Chain of Custody (COC) form. The air waybill numbers were listed on the Sample Receipt and Review Form. The COC form was checked to confirm that all of the samples were listed with sample collection dates and times, and that signatures and dates were present indicating sample relinquishment and receipt. The COC form was complete with no errors or omissions with the following exceptions. One four liter container was received for samples C2 POND, WALPOC, and GS03 instead of the two liter containers listed on the COC form. Sample GS11 listed on the COC form was not included in the shipment. This sample was included in a later submittal.

### Preservation and Holding Times

The sample shipments were received intact with the temperature inside the iced cooler of 9 °C which does not comply with requirements. Sample nitrate + nitrite as N results are qualified with a "J" flag as estimated values. All samples were received in the correct container types and had been preserved correctly for the requested analyses. All samples were analyzed within the applicable holding times.

### Laboratory Instrument Calibration

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing acceptable qualitative and quantitative data for all analytes. Initial calibration demonstrates that the instrument is capable of acceptable performance in the beginning of the analytical run and of producing a linear curve. Compliance requirements for continuing calibration checks are established to ensure that the instrument continues to be capable of producing acceptable qualitative and quantitative data. All laboratory instrument calibrations were performed correctly in accordance with the cited methods. Calibration and laboratory spike standards were prepared from independent sources.

#### *Method EPA 353.2, Nitrate + Nitrite as N*

Calibrations were performed using five calibration standards on September 26, 2011. The calibration curve correlation coefficient values were greater than 0.995 and the absolute values of the intercepts were less than three times the method detection limit (MDL). Initial and continuing calibration verification checks were made at the required frequency resulting in six verification checks. All calibration check results were within the acceptance criteria. A reporting limit verification check was made to verify the linearity of the calibration curve near the practical quantitation limit and all results were acceptable.

#### *Method SW-846 6020, Uranium*

Calibrations were performed September 22, 2011, using two calibration standards. The calibration curve correlation coefficient values were greater than 0.995 and the absolute values of the intercepts were less than three times the MDL. Initial and continuing calibration verification checks were made at the required frequency resulting in three verification checks. All calibration checks met the acceptance criteria. Reporting limit verification checks were made at the required frequency to verify the linearity of the calibration curve near the practical quantitation limit and all results were within the acceptance range. Mass calibration and resolution verifications were

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performed at the beginning of each analytical run in accordance with the analytical procedure. Internal standard recoveries associated with requested analytes were stable and within acceptable ranges.

### Radiochemical Analysis

Radiochemical results are qualified with a “U” flag (not detected) when the result is greater than the minimum detectable concentration (MDC) but less than the Decision Level Concentration, estimated as three times the one-sigma total propagated uncertainty. Results above the Decision Level Concentration and the MDC are qualified with a “J” flag (estimated) when the result is less than the Determination Limit (three times the MDC).

### *Alpha Spectrometry*

Alpha spectrometry calibrations and instrument backgrounds were performed within a month previous to sample analysis. Calibration standards were counted to obtain a minimum of 10,000 counts per peak. Daily instrument checks met the acceptance criteria. The tracer recoveries met the acceptance criteria of 30 to 110 percent for all samples. The full width at half maximum (FWHM) was reviewed to evaluate the spectral resolution. All internal standard FWHM values were below 100 kiloelectron volts (keV) demonstrating acceptable resolution. All internal standard peaks were within 50 keV of the expected position. The regions of interest (ROIs) for analyte peaks were reviewed. All ROIs were satisfactory and all manual integrations were performed correctly. All results were blank-corrected using data from a blank population.

### Method and Calibration Blanks

Method blanks are analyzed to assess any contamination that may have occurred during sample preparation. Calibration blanks are analyzed to assess instrument contamination prior to and during sample analysis. All method blank and calibration blank results associated with metals and wet chemistry samples were below the practical quantitation limits and method detection limits. The radiochemistry method blank results were less than the Decision Level Concentration.

### Inductively Coupled Plasma (ICP) Interference Check Sample (ICS) Analysis

ICP interference check samples ICSA and ICSAB were analyzed at the required frequency to verify the instrumental interelement and background correction factors. All ICSAB check sample results met the acceptance criteria.

### Matrix Spike Analysis

Matrix spike (MS) samples are used to measure method performance in the sample matrix. The MS data are not evaluated when the concentration of the unspiked sample is greater than four times the spike concentration. The spike recoveries met the acceptance criteria for all analytes evaluated.

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### Laboratory Replicate Analysis

Laboratory replicate analyses are used to determine laboratory precision for each sample matrix. The relative percent difference for non-radiochemical replicate results that are greater than 5 times the practical quantitation limit (PQL) should be less than 20 percent. For results that are less than the PQL, the range should be no greater than the PQL. The replicate results met these criteria, demonstrating acceptable laboratory precision. The relative error ratio for radiochemical replicate results (calculated using the one-sigma total propagated uncertainty) was less than three, indicating acceptable precision.

### Laboratory Control Sample

Laboratory control samples were analyzed at the correct frequency to provide information on the accuracy of the analytical method and the overall laboratory performance, including sample preparation. All control sample results were acceptable.

### Metals Serial Dilution

Serial dilutions were prepared and analyzed for the metals analyses to monitor chemical or physical interferences in the sample matrix. Serial dilution data are evaluated when the concentration of the undiluted sample is greater than 50 times the practical quantitation limit for method 6010 or greater than 100 times the practical quantitation limit for method 6020. All evaluated serial dilution data were acceptable.

### Detection Limits/Dilutions

No dilutions were required for sample analysis. The required detection limits were met for all metals and wet chemistry analytes. All radiochemical minimum detectable concentrations (MDCs) were calculated using data from a blank population and the equation specified in *Quality Systems for Analytical Services*. All reported MDCs were less than the required MDCs.

### Completeness

Results were reported in the correct units for all analytes requested using contract-required laboratory qualifiers. The analytical report included the method detection limit (minimum detectable concentration for radiochemistry) and practical quantitation limit for all analytes and all required supporting documentation.

### Electronic Data Deliverable (EDD) File

The EDD file arrived on October 6, 2011. The Sample Management System EDD validation module was used to verify that the EDD file was complete and in compliance with requirements. The module compares the contents of the file to the requested analyses to ensure all and only the requested data are delivered. The contents of the EDD were manually examined to verify that the sample results accurately reflect the data contained in the sample data package.

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## Outliers Report

Potential outliers are measurements that are extremely large or small relative to the rest of the data and, therefore, are suspected of misrepresenting the population from which they were collected. Potential outliers may result from transcription errors, data-coding errors, or measurement system problems. However, outliers may also represent true extreme values of a distribution and indicate more variability in the population than was expected.

Statistical outlier tests give probabilistic evidence that an extreme value does not "fit" with the distribution of the remainder of the data and is therefore a statistical outlier. These tests should only be used to identify data points that require further investigation. The tests alone cannot determine whether a statistical outlier should be discarded or corrected within a data set.

There are three steps involved in identifying extreme values or outliers:

1. Identify extreme values that may be potential outliers by generating the Outliers Report using the Sample Management System from data in the SEEPro database. The application compares the new data set with historical data and lists all new data that fall outside the historical data range. Data listed in the report are highlighted if the concentration detected is not within 50 percent of historical minimum or maximum values. A determination is also made if the data are normally distributed using the Studentized Range Test.
2. Apply the appropriate statistical test. Dixon's Extreme Value test is used to test for statistical outliers when the sample size is less than or equal to 25. This test considers both extreme values that are much smaller than the rest of the data (case 1) and extreme values that are much larger than the rest of the data (case 2). This test is valid only if the data without the suspected outlier are normally distributed. Rosner's Test is a parametric test that is used to detect outliers for sample sizes of 25 or more. This test also assumes that the data without the suspected outliers are normally distributed.
3. Scientifically review statistical outliers and decide on their disposition.

The uranium result for the sample from C2 POND was identified as a potential outlier. There were no analytical errors identified during the review of these data and the results from this sampling event are acceptable as qualified.

Report Prepared By: \_\_\_\_\_

Steve Donovan  
Laboratory Coordinator

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**Data Validation Outliers Report - No Field Parameters**

**Comparison: All Historical Data**

Laboratory:

RIN: 11094086

Report Date: 11/2/2011

Site Code	Location Code	Sample ID	Sample Date	Analyte	Result	Current		Historical Maximum			Historical Minimum			Number of Data Points		Statistical Outlier
						Qualifiers		Result	Qualifiers		Result	Qualifiers		N	N Below Detect	
						Lab	Data		Lab	Data		Lab	Data			
RFS01	C2 POND	N001	09/15/2011	Uranium	0.009090			0.0053			0.00251			6	0	Yes

**STATISTICAL TESTS:**

The distribution of the data is tested for normality or lognormality using the Shapiro-Wilk Test

Outliers are identified using Dixon's Test when there are 25 or fewer data points.

Outliers are identified using Rosner's Test when there are 26 or more data points.

See Data Quality Assessment: Statistical Methods for Practitioners, EPA QC/G-9S, February 2006.

# SAMPLE MANAGEMENT SYSTEM

## General Data Validation Report

RIN: 11094086 Lab Code: GEN Validator: Steve Donovan Validation Date: 11/2/2011

Project: Rocky Flats Surface Water Analysis Type:  Metals  General Chem  Rad  Organics

# of Samples: 9 Matrix: Water Requested Analysis Completed: Yes

### Chain of Custody

Present: OK Signed: OK Dated: OK

### Sample

Integrity: OK Preservation: OK Temperature: NO

### Select Quality Parameters

- Holding Times
- Detection Limits
- Field/Trip Blanks
- Field Duplicates

All analyses were completed within the applicable holding times.

The reported detection limits are equal to or below contract requirements.

**SAMPLE MANAGEMENT SYSTEM**  
**Metals Data Validation Worksheet**

RIN: 11094086      Lab Code: GEN      Date Due: 10/3/2011  
 Matrix: Water      Site Code: RFS02      Date Completed: 10/6/2011

Analyte	Method Type	Date Analyzed	CALIBRATION						Method Blank	LCS %R	MS %R	MSD %R	Dup. RPD	ICSAB %R	Serial Dil. %R	CRI %R
			Int.	R^2	ICV	CCV	ICB	CCB								
Uranium	ICP/MS	09/22/2011	0.0000	1.0000	OK	OK	OK	OK	108.0	109.0		0.0	102.0	5.0	118.0	

**SAMPLE MANAGEMENT SYSTEM**  
**Wet Chemistry Data Validation Worksheet**

**RIN:** 11094086      **Lab Code:** GEN      **Date Due:** 10/3/2011  
**Matrix:** Water      **Site Code:** RFS02      **Date Completed:** 10/6/2011

Analyte	Date Analyzed	CALIBRATION						Method Blank	LCS %R	MS %R	MSD %R	DUP RPD	Serial Dil. %R
		Int.	R^2	ICV	CCV	ICB	CCB						
NO2+NO3 as N	09/26/2011	0.000	0.9998	OK	OK	OK	OK	OK	105.00	101.0		4.00	
NO2+NO3 as N	09/26/2011									98.9			

**SAMPLE MANAGEMENT SYSTEM**  
**Radiochemistry Data Validation Worksheet**

**RIN:** 11094086                      **Lab Code:** GEN                      **Date Due:** 10/3/2011  
**Matrix:** Water                      **Site Code:** RFS02                      **Date Completed:** 10/6/2011

Sample	Analyte	Date Analyzed	Result	Flag	Tracer %R	LCS %R	MS %R	Duplicate
C2 POND	Americium-241	09/27/2011			74.0			
GS03	Americium-241	09/27/2011			75.0			
WALPOC	Americium-241	09/27/2011			78.0			
Blank_Spike	Americium-241	09/27/2011			100.0	99.70		
Blank_Spike_Du	Americium-241	09/27/2011			99.0	97.60		0.30
Blank	Americium-241	09/27/2011	0.0050	U	98.0			
Blank	Plutonium-238	10/01/2011	0.0020	U	66.0			
C2 POND	Plutonium-238	10/04/2011			55.0			
GS03	Plutonium-238	10/04/2011			51.0			
WALPOC	Plutonium-238	10/04/2011			49.0			
Blank	Plutonium-239	10/01/2011	0.0060	U				
Blank_Spike	Plutonium-239/240	10/01/2011				103.00		
Blank_Spike_Du	Plutonium-239/240	10/01/2011				93.40		1.20