

**Pond Discharge Notification Cover Sheet**  
**Date: 7/28/2010**  
**Total pages including cover sheet = 12**

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**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 7/7/10. All results indicate that applicable water quality standards will be met at downstream POCs during discharge. The pre-discharge sample results are attached below. A validation report for the Rocky Flats contract lab results is also included.**

**Discharge of Pond C-2 is scheduled to begin on 7/29/10 at 9:00 a.m.**

**Pond C-2 will be direct discharged using the outlet works to Woman Creek through Point of Compliance (POC) location GS31. All required monitoring at downstream POCs GS31 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 14 days, with a total discharge volume of approximately 7.2 million gallons.**

**Please contact me if you have questions.**



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

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## Laboratory Results For Sample Number: ENV-2010008011-

Site ID/PWSID		Contact	Carl Spreng
Site	ROCKY FLATS SITE	Phone	x3358
Address		Fax	
		Email	
Site Description	POND C-2	Collected By	CS
Customer ID	00008835	Collected	07/07/2010 11:40:00
Customer	CDPHE - HMWMD - Rocky Flats Unit	Received	07/07/2010 13:17:00
	4300 Cherry Creek Drive South	Reported	07/21/2010 00:00:00
	Denver	Bottles	2-CUB
	CO 80246	Matrix	Surface Water
		Temperature at Receipt	21.1C

Test Name	Result	Units	MCL	MDA	Method Name	Date Analyzed	Qualifier
Plutonium, Isotopic Package*							
Americium-241	< 0.012	pCi/L	NA	Varies	ASTM-3084-89	07/20/2010 00:00:00	
Plutonium-238	< 0.010	pCi/L	NA	0.01	ASTM-3084-89	07/20/2010 00:00:00	
Plutonium-239+240	< 0.009	pCi/L	NA	Varies	ASTM-3084-89	07/20/2010 00:00:00	
Uranium, Total*	<0.005	mg/L	NA	0.005	EPA 200.8	07/09/2010 00:00:00	

### Comments:

Pu-239 MDA= 0.009 pCi/L  
Am-241 MDA = 0.012 pCi/L

### Registry Comments:

PRE DISCHARGE SAMPLING (INO RF1 & RAD RF1) RUSH

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**PRELIMINARY RESULTS REPORT****RIN: 10073204****Site: Rocky Flats Surface Water****Site Code: RFS01 Location: C2 POND****Ticket Number: IY 026****Report Date: 7/22/2010**

Parameter	Units	Date Sampled	Date Analyzed	Result	Qualifier(s)	Uncertainty	Detection Limit	Method
Americium-241	pCi/L	07/07/2010	07/14/2010	-0.00336	U	0.0058	0.0215	Am-05-RC Modified
Plutonium-238	pCi/L	07/07/2010	07/14/2010	0.00771	U	0.0112	0.0116	Pu-11-RC Modified
Plutonium-239/240	pCi/L	07/07/2010	07/14/2010	0.0022	U	0.00529	0.0118	Pu-11-RC Modified
Uranium	ug/L	07/07/2010	07/14/2010	2.51			0.050	EPA 3005/6020

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## *Data Review and Validation Report*

### General Information

Report Number (RIN): 10073204  
Sample Event: July 7, 2010  
Site(s): Rocky Flats, Colorado; Surface Water  
Laboratory: GEL Laboratories, Charleston, South Carolina  
Work Order No.: 256180  
Analysis: Uranium and Radiochemistry  
Validator: Steve Donovan  
Review Date: July 23, 2010

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
Uranium	LMM-02	SW-846 3005A	SW-846 6020
Plutonium Isotopes	LMR-08	HASL-300, Pu-11	HASL-300, Pu-11-RC

### Data Qualifier Summary

None of the analytical results required qualification.

### Sample Shipping/Receiving

GEL Laboratories in Charleston, South Carolina, received one water sample on July 9, 2010, accompanied by a Chain of Custody (COC) form. The COC form was checked to confirm that the sample was listed with sample collection date and time, and that signatures and dates were present indicating sample relinquishment and receipt. The COC form was complete with no

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errors or omissions. The air waybill numbers were listed on the Sample Receipt and Review Forms.

### Preservation and Holding Times

The sample shipments were received intact and at ambient temperature, which complies with requirements. 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. 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. All calibration and laboratory spike standards were prepared from independent sources.

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

Calibrations were performed on July 14, 2010, using a two-point calibration. 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 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 "J" flag (estimated) when the result is greater than the minimum detectable concentration (MDC), but less than Determination Limit (three times the MDC). Radiochemical results are qualified with a "U" flag (not detected) when the result is greater than the MDC, but less than the Decision Level Concentration estimated as the two sigma total propagated uncertainty. All results were below the Decision Level Concentration.

#### *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. 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. No manual integrations were performed and all ROIs were satisfactory. All

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results were blank-corrected using data from a blank population. Americium results were corrected for tracer impurity.

### 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 uranium samples were below the 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.

### 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 radiochemical relative error ratio for all laboratory control sample duplicates (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. The uranium serial dilution data were not evaluated because the concentration of the undiluted sample was less than 100 times the practical quantitation limit.

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### Detection Limits/Dilutions

No dilutions were required for sample analysis. The required detection limit was met for uranium.

All radiochemical MDCs were calculated using data from a blank population and the following equation as specified in *Quality Systems for Analytical Services*.

$$MDC = \frac{3.29 \times S_b}{K \times T} + \frac{3}{K \times T}$$

Where:

$S_b$  = Standard deviation of the blank population counts

K = Efficiency factor

T = Count time in minutes

The calculation of the MDCs using the equation above was verified. All minimum detectable concentrations (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 July 22, 2010. 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.

### 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:

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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 C2 POND was identified as a potential outlier because there are few data points with low variability. There were no errors identified with the uranium data, and the results from this sampling event are acceptable as qualified.

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

Steve Donovan  
Laboratory Coordinator

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

**Comparison: All Historical Data**

Laboratory:

RIN: 10073204

Report Date: 7/23/2010

Site Code	Location Code	Sample ID	Sample Date	Analyte	Result	Current Qualifiers		Historical Maximum Qualifiers			Historical Minimum Qualifiers			Number of Data Points		Statistical Outlier
						Lab	Data	Result	Lab	Data	Result	Lab	Data	N	N Below Detect	
RFS01	C2 POND	N001	07/07/2010	Uranium	0.002510			0.0053			0.0047			5	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: 10073204    Lab Code: GEN    Validator: Steve Donovan    Validation Date: 7/23/2010

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

# of Samples: 1    Matrix: Water    Requested Analysis Completed: Yes

### Chain of Custody

Present: OK    Signed: OK    Dated: OK

### Sample

Integrity: OK    Preservation: OK    Temperature: OK

### 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: 10073204      Lab Code: GEN      Date Due: 7/23/2010  
 Matrix: Water      Site Code: RFS02      Date Completed: 7/23/2010

Analyte	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	07/14/2010			OK	OK	OK	OK	OK	95.2	93.7		4.0	97.4		109.0

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

**RIN:** 10073204                      **Lab Code:** GEN                      **Date Due:** 7/23/2010  
**Matrix:** Water                      **Site Code:** RFS02                      **Date Completed:** 7/23/2010

Sample	Analyte	Date Analyzed	Result	Flag	Tracer %R	LCS %R	MS %R	Duplicate
C2 POND	Americium-241	07/14/2010			56.0			
Blank_Spike	Americium-241	07/14/2010			118.0	88.40		
Blank_Spike_Du	Americium-241	07/14/2010			106.0	80.30		1.10
Blank	Americium-241	07/14/2010	0.0070	U	85.0			
C2 POND	Plutonium-238	07/14/2010			86.0			
Blank	Plutonium-238	07/14/2010	0.0016	U	92.0			
Blank_Spike	Plutonium-239/240	07/14/2010				91.90		
Blank_Spike_Du	Plutonium-239/240	07/14/2010				90.90		0.10
Blank	Plutonium-239/240	07/14/2010	0.0016	U				