Pond Discharge Notification Cover Sheet
Date: 12/10/09
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 A-4.

Initial pre-discharge samples for Pond A-4 were collected on 11/23/09. All results indicate that water quality is acceptable for discharge. Discharge of Pond A-4 is scheduled to begin on 12/12/09 at 9:00 a.m.

Pond A-4 will be direct discharged using the outlet works to North Walnut Creek through Point of Compliance (POC) location GS11. The discharge is expected to continue through approximately 12/21/09, with a total discharge volume of approximately 8.5 million gallons.

All available analytical data accompany this notice, and all data show that water quality meets applicable surface-water standards.

Please contact me if you have questions.

Bill Ritter, Jr., Governor
James B. Martin, Executive Director

STATE OF COLORADO

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

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Colorado Department of Public Health and Environment

Laboratory Results For Sample Number: ENV-2009013544-

Site ID/PWSID

Site Address

Site Description ROCKY FLATS POND A-4

Customer ID 00008835

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

Denver CO 80246

Contact Carl Spreng
Phone x3358
Fax
Email

Collected By CS
Collected 11/23/2009 09:30:00
Received 11/23/2009 10:47:00
Reported 12/09/2009 00:00:00
Bottles 1-250NEUT 1-CUB
Matrix Surface Water
Field Fluoride
Residual Chlorine
Temperature at Receipt 12.4C

Test Name	Result	Units	MCL	MRL	Method Name	Date Analyzed	Qualifier
Nitrogen, Nitrate	0.32	mg/L	NA	0.2	EPA 300.0	11/24/2009 00:00:00	
Nitrogen, Nitrite	<0.04	mg/L	NA	0.04	EPA 300.0	11/23/2009 00:00:00	
Uranium, Total	0.0069	mg/L	NA	0.001	EPA 200.8	11/24/2009 00:00:00	
Americium-241	< 0.006	pCi/L	NA	Varies	ASTM-3084-89	12/07/2009 00:00:00	
Plutonium-239+240	< 0.010	pCi/L	NA	0.01	ASTM-3084-89	12/07/2009 00:00:00	

Comments:
Due to high conductivity, the sample was analyzed for nitrate and nitrite at a dilution.

Am-241 MDA = 0.006 pCi/L.

Registry Comments:
AM/PU U (METALS) NITRAT/NITRITE FROM CUBITAINER

MRL - Minimum Reporting Limit. 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

PRELIMINARY RESULTS REPORT
RIN: 09112725
Site: Rocky Flats Surface Water
Location: A4
Ticket Number: HMY 217
Report Date: 12/9/2009

Parameter	Units	Date Sampled	Date Analyzed	Result	Qualifier(s)	Uncertainty	Detection Limit	Method
Americium-241	pCi/L	11/23/2009	12/02/2009	-0.00388	U	0.00441	0.0158	Am-05-RC Modified
Uranium	ug/L	11/23/2009	11/30/2009	6.56			0.050	EPA 3005/6020
Plutonium-238	pCi/L	11/23/2009	12/02/2009	0.00199	U	0.00277	0.0114	Pu-11-RC Modified
Plutonium-239/240	pCi/L	11/23/2009	12/02/2009	0.00299	U	0.00339	0.0122	Pu-11-RC Modified
NO2+NO3 as N	mg/L	11/23/2009	11/30/2009	0.330			0.050	EPA 353.2

U.S. DEPARTMENT OF ENERGY | Office of Legacy Management

Data Review and Validation Report

General Information

Report Number (RIN):	09112725
Sample Event:	Composite sample collected November 23, 2009
Site(s):	Rocky Flats, Colorado; Surface Water
Laboratory:	GEL Laboratories, Charleston, South Carolina
Work Order No.:	241698
Analysis:	Metals, Wet Chemistry, and Radiochemistry
Validator:	Steve Donivan
Review Date:	December 10, 2009

This validation was performed according to the *Environmental Procedures Catalog*, (LMS/PRO/S04325, continually updated) "Standard Practice for Validation of Laboratory Data," GT-9(P). 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
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

Data Qualifier Summary

None of the analytical results required further qualification.

Sample Shipping/Receiving

GEL Laboratories in Charleston, South Carolina, received one water sample on November 24, 2009, accompanied by a Chain of Custody (COC) 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 exception that the temperature requirement for hardness preservation was not listed. The air waybill number was listed on the Sample Receipt and Review Form.

Preservation and Holding Times

The sample shipment was received intact with the temperature inside the iced cooler at 5 °C, which complies with requirements. 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.

Method 353.2, Nitrate + Nitrite as N
Calibrations were performed on November 30, 2009, using five 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 method detection limit (MDL). Calibration and laboratory spike standards were prepared from independent sources. Initial and continuing calibration verification checks were made at the required frequency resulting in three verification checks. All calibration checks met the acceptance criteria.

Method SW-846 6020, Uranium
Calibrations were performed on November 30, 2009, using a two-point calibration. The absolute values of the intercepts were less than three times the method detection limit (MDL). Calibration and laboratory spike standards were prepared from independent sources. 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 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 two sigma total propagated uncertainty (TPU).

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 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 metals and wet chemistry samples were below the practical quantitation limits for all analytes. In cases where a blank concentration exceeds the method detection limit (MDL), the associated sample results are qualified with a “U” flag (not detected) when the sample result is greater than the MDL but less than five times the blank concentration. The radiochemistry method blank results were less than 1.65 times the respective total propagated uncertainty (TPU) or below the minimum detectable 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. For the hardness spike analysis, the laboratory used a sample from another client. No data qualification is necessary because the hardness method is exempt from the general inorganic matrix spike requirements.

Laboratory Replicate Analysis

Laboratory replicate sample results demonstrate acceptable laboratory precision. The relative percent difference values for the non-radiochemical sample replicates were less than 20 percent for results that are greater than five times the practical quantitation limit, indicating acceptable precision. The radiochemical relative error ratio (calculated using the one-sigma total propagated uncertainty) for the laboratory control sample replicates 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 100 times the practical quantitation limit (PQL) for ICP-MS or greater than 50 times the PQL for ICP. 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 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 December 9, 2009. 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:

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.

No values from this sampling event were identified as potential outliers. The data for this RIN are acceptable as qualified.

Report Prepared By: _____

Steve Donivan
Laboratory Coordinator

SAMPLE MANAGEMENT SYSTEM

General Data Validation Report

RIN: 09112725 **Lab Code:** GEN **Validator:** Steve Donivan **Validation Date:** 12/9/2009

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: 09112725 **Lab Code:** GEN **Date Due:** 12/8/2009

Matrix: Water **Site Code:** RFS02 **Date Completed:** 12/9/2009

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	11/30/2009			OK	OK	OK	OK	OK	106.0	109.0		1.0	109.0	1.4	106.0

SAMPLE MANAGEMENT SYSTEM

Wet Chemistry Data Validation Worksheet

RIN: 09112725 **Lab Code:** GEN **Date Due:** 12/8/2009

Matrix: Water **Site Code:** RFS02 **Date Completed:** 12/9/2009

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	11/30/2009	0.000	1.0000	OK	OK	OK	OK	OK	97.80	99.4		1.00	

SAMPLE MANAGEMENT SYSTEM
Radiochemistry Data Validation Worksheet

RIN: 09112725 **Lab Code:** GEN **Date Due:** 12/8/2009

Matrix: Water **Site Code:** RFS02 **Date Completed:** 12/9/2009

Sample	Analyte	Date Analyzed	Result	Flag	Tracer %R	LCS %R	MS %R	Duplicate
A4	Americium-241	12/02/2009			74.0			
Blank_Spike	Americium-241	12/02/2009			78.0	100.0		
Blank_Spike_Du	Americium-241	12/02/2009			101.0	91.9		1.00
Blank	Americium-241	12/02/2009	-0.0023	U	90.0			
A4	Plutonium-238	12/02/2009			87.0			
Blank	Plutonium-238	12/02/2009	-0.0283	U	85.0			
Blank	Plutonium-238	12/02/2009	0.0566	U				
Blank_Spike	Plutonium-239/240	12/02/2009				96.5		
Blank_Spike_Du	Plutonium-239/240	12/02/2009				102.0		0.70