LMS/RFS/S31742

Rocky Flats Site, Colorado, Surface Water Configuration Adaptive Management Plan Quarterly Report

Third Quarter Calendar Year 2020

October 2020

U.S. DEPARTMENT OF ENERGY | Legacy Management

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Tables

Abbreviations

AMP	Adaptive Management Plan
CY	calendar year
DOE	U.S. Department of Energy
EA	Environmental Assessment

1.0 Introduction

The Proposed Action assessed in the *Rocky Flats Site, Colorado, Surface Water Configuration Environmental Assessment* (DOE 2011), hereafter referred to as the Environmental Assessment (EA), is to breach the remaining retention pond dams at the Rocky Flats Site, Colorado (Site), to allow surface water flow to return to the approximate conditions that prevailed before the retention ponds were constructed. As stated in the EA, based on extensive water quality monitoring data and a thorough environmental review, the U.S. Department of Energy (DOE) Office of Legacy Management has determined that the Proposed Action does not present a significant impact on the environment under the National Environmental Policy Act evaluation criteria.

Some members of the public have commented that additional information should be collected prior to implementing the final steps of the Proposed Action to help reduce uncertainty about whether completion of the Proposed Action will adversely impact the quality of water flowing from the Site into downstream community watersheds. In response to the requests, DOE initiated a cooperative effort with neighboring community representatives and other interested stakeholders to develop and implement an Adaptive Management Plan (AMP) to provide additional information. The AMP group is composed of these representatives and stakeholders. The resulting AMP, *Surface Water Configuration Adaptive Management Plan for the Rocky Flats Site, Colorado* (DOE 2019), first published in 2011, reflects DOE's long-term commitment to implementing the activities that the AMP describes.

The AMP provides for a monitoring and data evaluation program to assist in deciding whether to implement the final steps of the proposed action (which includes breaching the terminal dams during the initially planned time frame of 2018–2020) or to delay completion of the proposed action to gather additional information for evaluation. The terminal dams will be operated in a flow-through condition until the completion of the Proposed Action, which will provide data similar to what can be expected postbreach. In addition to the monitoring program, the AMP identifies certain performance indicators that DOE will consider in deciding whether to adjust the time frame for completing the Proposed Action.

This AMP Quarterly Report for the third quarter of calendar year (CY) 2020 is provided in accordance with Section 5.0, "Reporting," of the AMP. Section 3.0 of this report describes the third quarter data summary tables, which include all validated analytical data for the AMP monitoring objectives that were available as of September 30, 2020. Subsequent AMP reports will include data that were not tabulated in previous AMP reports.

AMP monitoring objectives, locations, and sampling criteria are itemized in Table 2 of the AMP. Additional field implementation for the AMP monitoring objectives can be found in *Additional Field Implementation Detail for Selected Monitoring Objectives at the Rocky Flats Site, Colorado* (DOE 2018).

This report routinely includes analytical data for the following AMP monitoring objectives:

- Predischarge sampling (Item 1, AMP Table 2)
- Targeted groundwater monitoring (Item 2, AMP Table 2)

- Monitoring to evaluate flow-through operations at terminal Ponds A-4, B-5, and C-2 (Item 4, AMP Table 2)
- Storm-event monitoring (Item 5, AMP Table 2)
- Continuous flow-paced composite sampling to evaluate uranium transport (Item 6, AMP Table 2)
- Grab sampling for uranium in North and South Walnut Creeks (Item 7, AMP Table 2)
- Grab sampling for nitrate + nitrite as nitrogen in Walnut Creek (Item 8, AMP Table 2)

2.0 AMP Highlights: Third Quarter CY 2020

- Two informal emails were transmitted to AMP participants providing notification that recent analytical data from the Points of Compliance had been validated and would soon be available through the Geospatial Environmental Mapping System.
- During the quarter, 11 samples were collected in support of AMP monitoring objectives.

3.0 Analytical Data: Third Quarter CY 2020

Analytical data for the third quarter of CY 2020 are provided in Tables 1 and 2 (at the end of this report). Table 1 provides the analytical results, and Table 2 lists the water sampling events during the quarter.

4.0 References

DOE (U.S. Department of Energy), 2011. *Rocky Flats Site, Colorado, Surface Water Configuration Environmental Assessment*, DOE/EA-1747, LMS/RFS/S06335, Office of Legacy Management, May.

DOE (U.S. Department of Energy), 2018. *Additional Field Implementation Detail for Selected Monitoring Objectives at the Rocky Flats Site, Colorado*, LMS/RFS/S08202, Office of Legacy Management, July.

DOE (U.S. Department of Energy), 2019. *Surface Water Configuration Adaptive Management Plan for the Rocky Flats Site, Colorado*, LMS/RFS/S07698, Office of Legacy Management, July.

DOE, EPA, and CDPHE (U.S. Department of Energy, U.S. Environmental Protection Agency, and Colorado Department of Public Health and Environment), 2007. *Rocky Flats Legacy Management Agreement,* March 14.

Table 1. Analytical Results for Water Samples

LOCATION CODE	LOCATION TYPE	DATE SAMPLED	SAMPLE CODE	CAS	ANALYTE	FILTRATION STATUS	RESULT	UNITS	LAB QUALIFIERS	SAMPLE TYPE	DETECTION LIMIT	UNCER-TAINTY	DATA VALIDATION QUALIFIERS	COLLECTION METHOD	LAB CODE
A1EFF	SL	5/29/2020	RFS01-04.2005040-011	NO3+NO2 AS N	Nitrate + Nitrite as Nitrogen	N	0.11	mg/L		F	0.019			G	STD
A1EFF	SL	5/29/2020	RFS01-04.2005040-011	7440-61-1	Uranium	N	4.4	ug/L		F	0.05			G	STD
A2EFF	SL	5/29/2020	RFS01-04.2005040-010	NO3+NO2 AS N	Nitrate + Nitrite as Nitrogen	N	0.019	mg/L	U	F	0.019			G	STD
A2EFF	SL	5/29/2020	RFS01-04.2005040-010	7440-61-1	Uranium	N	7.4	ug/L		F	0.05			G	STD
A3EFF	SL	5/29/2020	RFS01-04.2005040-009	NO3+NO2 AS N	Nitrate + Nitrite as Nitrogen	N	0.019	mg/L	U	F	0.019			G	STD
A3EFF	SL	5/29/2020	RFS01-04.2005040-009	7440-61-1	Uranium	N	9	ug/L		F	0.05			G	STD
B3OUTFLOW	SL	5/29/2020	RFS01-04.2005040-002	7440-61-1	Uranium	N	7.6	ug/L		F	0.05			G	STD
B5INFLOW	SL	5/27/2020	RFS01-13.2007047-005	7440-61-1	Uranium	N	10.4	ug/L		F	0.067			C	GEN
B5INFLOW	SL	5/29/2020	RFS01-04.2005040-003	7440-61-1	Uranium	N	12	ug/L		F	0.05			G	STD
GS08	SL	5/29/2020	RFS01-04.2005040-012	7440-61-1	Uranium	N	12	ug/L		F	0.05			G	STD
GS10	SL	5/29/2020	RFS01-04.2005040-001	7440-61-1	Uranium	N	12	ug/L		F	0.05			G	STD
GS10	SL	6/15/2020	RFS01-04.2006041-001	7440-61-1	Uranium	N	10	ug/L		F	0.05			G	STD
GS10	SL	6/15/2020	RFS01-04.2006041-015	7440-61-1	Uranium	N	11	ug/L		D	0.05			G	STD
GS10	SL	6/30/2020	RFS01-04.2007042-001	7440-61-1	Uranium	N	5.9	ug/L		F	0.05			G	STD
GS11	SL	5/8/2020	RFS01-05.2006038-003	14596-10-2	Americium-241	N	-0.00921	pCi/L	U	F				C	GEN
GS11	SL	5/8/2020	RFS01-05.2006038-003	13981-16-3	Plutonium-238	N	-0.00117	pCi/L	U	F				C	GEN
GS11	SL	5/8/2020	RFS01-05.2006038-003	PU-239,240	Plutonium-239, 240	N	0.00821	pCi/L	U	F				C	GEN
GS11	SL	5/8/2020	RFS01-05.2006038-003	7440-61-1	Uranium	N	11.7	ug/L		F	0.067			C	GEN
GS11	SL	5/29/2020	RFS01-04.2005040-013	NO3+NO2 AS N	Nitrate + Nitrite as Nitrogen	N	0.019	mg/L	U	F	0.019			G	STD
GS11	SL	5/29/2020	RFS01-04.2005040-015	NO3+NO2 AS N	Nitrate + Nitrite as Nitrogen	N	0.019	mg/L	U	D	0.019			G	STD
GS11	SL	5/29/2020	RFS01-04.2005040-013	7440-61-1	Uranium	N	13	ug/L		F	0.05			G	STD
GS11	SL	5/29/2020	RFS01-04.2005040-015	7440-61-1	Uranium	N	12	ug/L		D	0.05			G	STD
GS11	SL	6/1/2020	RFS01-05.2006038-004	NO3+NO2 AS N	Nitrate + Nitrite as Nitrogen	N	0.017	mg/L	U	F	0.0170		J	G	GEN
GS12	SL	5/13/2020	RFS01-05.2006038-005	7440-61-1	Uranium	N	9.32	ug/L		F	0.067			C	GEN
GS13	SL	5/29/2020	RFS01-04.2005040-007	NO3+NO2 AS N	Nitrate + Nitrite as Nitrogen	N	1.3	mg/L		F	0.019			G	STD
GS13	SL	5/29/2020	RFS01-04.2005040-007	7440-61-1	Uranium	N	4.8	ug/L		F	0.05			G	STD
GS13	SL	6/16/2020	RFS01-04.2006041-007	NO3+NO2 AS N	Nitrate + Nitrite as Nitrogen	N	0.019	mg/L	U	F	0.019		J	G	STD
GS13	SL	6/16/2020	RFS01-04.2006041-007	7440-61-1	Uranium	N	14	ug/L		F	0.05			G	STD
GS13	SL	6/30/2020	RFS01-04.2007042-007	NO3+NO2 AS N	Nitrate + Nitrite as Nitrogen	N	0.019	mg/L	U	F	0.019		J	G	STD
GS13	SL	6/30/2020	RFS01-04.2007042-007	7440-61-1	Uranium	N	14	ug/L		F	0.05			G	STD
SPOUT	TS	5/29/2020	RFS01-04.2005040-006	NO3+NO2 AS N	Nitrate + Nitrite as Nitrogen	N	0.019	mg/L	U	F	0.019			G	STD
SPOUT	TS	5/29/2020	RFS01-04.2005040-006	7440-61-1	Uranium	N	66	ug/L		F	0.05			G	STD
SPOUT	TS	6/15/2020	RFS01-04.2006041-006	NO3+NO2 AS N	Nitrate + Nitrite as Nitrogen	N	0.019	mg/L	U	F	0.019		J	G	STD
SPOUT	TS	6/15/2020	RFS01-04.2006041-006	7440-61-1	Uranium	N	51	ug/L		F	0.05			G	STD
SPOUT	TS	6/30/2020	RFS01-04.2007042-006	NO3+NO2 AS N	Nitrate + Nitrite as Nitrogen	N	0.019	mg/L	U	F	0.019		J	G	STD
SPOUT	TS	6/30/2020	RFS01-04.2007042-006	7440-61-1	Uranium	N	39	ug/L		F	0.05			G	STD
SPOUT	TS	7/14/2020	RFS01-04.2007043-006	NO3+NO2 AS N	Nitrate + Nitrite as Nitrogen	N	0.052	mg/L	B	F	0.019		U	G	STD
SPOUT	TS	7/14/2020	RFS01-04.2007043-006	7440-61-1	Uranium	N	58	ug/L		F	0.05			G	STD
SPOUT	TS	7/30/2020	RFS01-04.2007044-006	NO3+NO2 AS N	Nitrate + Nitrite as Nitrogen	N	0.019	mg/L	U	F	0.019			G	STD
SPOUT	TS	7/30/2020	RFS01-04.2007044-015	NO3+NO2 AS N	Nitrate + Nitrite as Nitrogen	N	0.019	mg/L	U	D	0.019			G	STD
SPOUT	TS	7/30/2020	RFS01-04.2007044-006	7440-61-1	Uranium	N	43	ug/L		F	0.05			G	STD
SPOUT	TS	7/30/2020	RFS01-04.2007044-015	7440-61-1	Uranium	N	43	ug/L		D	0.05			G	STD
SPOUT	TS	8/13/2020	RFS01-04.2008045-006	NO3+NO2 AS N	Nitrate + Nitrite as Nitrogen	N	0.019	mg/L	U	F	0.019			G	STD
SPOUT	TS	8/13/2020	RFS01-04.2008045-006	7440-61-1	Uranium	N	47	ug/L	B	F	0.05			G	STD
SW093	SL	5/29/2020	RFS01-04.2005040-004	NO3+NO2 AS N	Nitrate + Nitrite as Nitrogen	N	0.46	mg/L	B	F	0.019			G	STD
SW093	SL	5/29/2020	RFS01-04.2005040-004	7440-61-1	Uranium	N	1.8	ug/L		F	0.05			G	STD
SW093	SL	6/16/2020	RFS01-04.2006041-004	NO3+NO2 AS N	Nitrate + Nitrite as Nitrogen	N	0.51	mg/L		F	0.019		J	G	STD
SW093	SL	6/16/2020	RFS01-04.2006041-004	7440-61-1	Uranium	N	4.5	ug/L		F	0.05			G	STD
SW093	SL	6/30/2020	RFS01-04.2007042-004	NO3+NO2 AS N	Nitrate + Nitrite as Nitrogen	N	0.54	mg/L		F	0.019		J	G	STD
SW093	SL	6/30/2020	RFS01-04.2007042-015	NO3+NO2 AS N	Nitrate + Nitrite as Nitrogen	N	0.61	mg/L		D	0.019		J	G	STD
SW093	SL	6/30/2020	RFS01-04.2007042-004	7440-61-1	Uranium	N	3	ug/L		F	0.05			G	STD
SW093	SL	6/30/2020	RFS01-04.2007042-015	7440-61-1	Uranium	N	2.8	ug/L		D	0.05			G	STD
SW093	SL	7/14/2020	RFS01-04.2007043-004	NO3+NO2 AS N	Nitrate + Nitrite as Nitrogen	N	0.057	mg/L	B	F	0.019		U	G	STD
SW093	SL	7/14/2020	RFS01-04.2007043-004	7440-61-1	Uranium	N	6.5	ug/L		F	0.05			G	STD
SW093	SL	7/30/2020	RFS01-04.2007044-004	NO3+NO2 AS N	Nitrate + Nitrite as Nitrogen	N	0.059	mg/L		F	0.019			G	STD
SW093	SL	7/30/2020	RFS01-04.2007044-004	7440-61-1	Uranium	N	5	ug/L		F	0.05			G	STD
SW093	SL	8/13/2020	RFS01-04.2008045-004	NO3+NO2 AS N	Nitrate + Nitrite as Nitrogen	N	0.019	mg/L	U	F	0.019			G	STD
SW093	SL	8/13/2020	RFS01-04.2008045-015	NO3+NO2 AS N	Nitrate + Nitrite as Nitrogen	N	0.019	mg/L	U	D	0.019			G	STD
SW093	SL	8/13/2020	RFS01-04.2008045-004	7440-61-1	Uranium	N	5.6	ug/L	B	F	0.05			G	STD
SW093	SL	8/13/2020	RFS01-04.2008045-015	7440-61-1	Uranium	N	5.7	ug/L	B	D	0.05			G	STD
WALPOC	SL	5/19/2020	RFS01-13.2006045-003	14596-10-2	Americium-241	N	1.91E-09	pCi/L	U	F				C	GEN
WALPOC	SL	5/19/2020	RFS01-13.2006045-003	13981-16-3	Plutonium-238	N	0	pCi/L	U	F				C	GEN
WALPOC	SL	5/19/2020	RFS01-13.2006045-003	PU-239,240	Plutonium-239, 240	N	0.0157	pCi/L	U	F				C	GEN
WALPOC	SL	5/19/2020	RFS01-13.2006045-003	7440-61-1	Uranium	N	11.9	ug/L		F	0.067			C	GEN
WOMPOC	SL	5/27/2020	RFS01-13.2006045-002	14596-10-2	Americium-241	N	0.00808	pCi/L	U	F				C	GEN

Table 1. Analytical Results for Water Samples

LOCATION CODE	LOCATION TYPE	DATE SAMPLED	SAMPLE CODE	CAS	ANALYTE	FILTRATION STATUS	RESULT	UNITS	LAB QUALIFIERS	SAMPLE TYPE	DETECTION LIMIT	UNCER-TAINTY	DATA VALIDATION QUALIFIERS	COLLECTION METHOD	LAB CODE
WOMPOC	SL	5/27/2020	RFS01-13.2006045-002	13981-16-3	Plutonium-238	N	1.42E-09	pCi/L	U	F				C	GEN
WOMPOC	SL	5/27/2020	RFS01-13.2006045-002	PU-239,240	Plutonium-239, 240	N	0.00852	pCi/L	U	F				C	GEN
WOMPOC	SL	5/27/2020	RFS01-13.2006045-002	7440-61-1	Uranium	N	1.24	ug/L		F	0.067			C	GEN

EXPLANATION

FILTRATION STATUS

N = Sample was not filtered.
Y = Sample was filtered.

UNITS

mg/L; ppm = milligrams per liter
pCi/L = picocuries per liter
ug/L = micrograms per liter
C = degrees celsius
mS/cm = milliSiemens per centimeter
NTU = normal turbidity units
s.u. = standard pH units
uS/cm = microSiemens per centimeter
umhos/cm = microSiemens per centimeter

SAMPLE_TYPE

F = Field Sample
D = Duplicate

DATA_VALIDATION_QUALIFIERS

<blank>	No qualifiers needed for result.
F	Low flow sampling method used.
G	Possible grout contamination, pH > 9.
J	Estimated value.
L	Less than 3 bore volumes purged prior to sampling.
Q	Qualitative result due to sampling technique
R	Unusable result.
U	Parameter analyzed for but was not detected.
X	Location is undefined.
999	Validation not complete

LAB_QUALIFIERS

*	Replicate analysis not within control limits.
+	Correlation coefficient for MSA < 0.995.
>	Result above upper detection limit.
A	TIC is a suspected aldol-condensation product.
B	Inorganic: Result is between the IDL and CRDL. Organic & Radiochemistry: Analyte also found in method blank.
C	Pesticide result confirmed by GC-MS.
D	Analyte determined in diluted sample.
E	Inorganic: Estimate value because of interference, see case narrative. Organic: Analyte exceeded calibration range of the GC-MS.
H	Holding time expired, value suspect.
I	Increased detection limit due to required dilution.
J	Estimated
M	GFAA duplicate injection precision not met.
N	Inorganic or radiochemical: Spike sample recovery not within control limits. Organic: Tentatively identified compund (TIC).
P	> 25% difference in detected pesticide or Arochlor concentrations between 2 columns.
S	Result determined by method of standard addition (MSA).
U	Analytical result below detection limit.
W	Post-digestion spike outside control limits while sample absorbance < 50% of analytical spike absorbance.
X	Laboratory defined (USEPA CLP organic) qualifier, see case narrative.
Y	Laboratory defined (USEPA CLP organic) qualifier, see case narrative.
Z	Laboratory defined (USEPA CLP organic) qualifier, see case narrative.

LOCATION_TYPE

SL	SURFACE LOCATION
TS	TREATMENT SYSTEM
WL	WELL

LAB_CODE

GEN	Gel Laboratories
STD	Test America

COLLECTION_METHOD

G	Grab
C	Composite

Table 2. Water Sampling Events: Third Quarter CY 2020

	Sampling Dates		Sample Info			Analytes					Sample Tracking Info
Location Code	**Start**	**End**	**Collection Method**	**Type**	**Filtered**	**VOC**	**U**	**Nitrate**	**Pu/Am**	**TSS**	**Sample ID**
B5INFLOW	5/27/2020 12:26	7/7/2020 12:40	composite	F	No		X				RFS01-13.2004035-004
SPOUT	7/14/2020 10:10	7/14/2020 10:10	grab	F	No		X	X			RFS01-13.2004035-003
SW093	7/14/2020 10:15	7/14/2020 10:15	grab	F	No		X	X			RFS01-13.2004035-002
SPOUT	7/30/2020 9:40	7/30/2020 9:40	grab	F	No		X	X			RFS01-13.2004036-002
SPOUT	7/30/2020 9:40	7/30/2020 9:40	grab	D	No		X	X			RFS01-13.2004036-004
SW093	7/30/2020 9:50	7/30/2020 9:50	grab	F	No		X	X			RFS01-13.2004036-003
SPOUT	8/13/2020 8:50	8/13/2020 8:50	grab	F	No		X	X			RFS01-13.2004037-002
SW093	8/13/2020 9:05	8/13/2020 9:05	grab	F	No		X	X			RFS01-13.2004037-004
SW093	8/13/2020 9:05	8/13/2020 9:05	grab	D	No		X	X			RFS01-13.2004037-003
SPOUT	8/31/2020 10:20	8/31/2020 10:20	grab	F	No		X	X			RFS01-05.2004035-002
SW093	8/31/2020 10:30	8/31/2020 10:30	grab	F	No		X	X			RFS01-13.2004038-002
SPOUT	9/14/2020 10:20	9/14/2020 10:20	grab	F	No		X	X			RFS01-13.2004038-004
SW093	9/14/2020 10:30	9/14/2020 10:30	grab	F	No		X	X			RFS01-13.2004038-003