Appendix I

Additional Field Implementation Detail for Selected Monitoring Objectives

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Rocky Flats Site, Colorado

Additional Field Implementation Detail for Selected Monitoring Objectives

July 2013

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Contents

Figures

Tables

Abbreviations

Am	americium-241
AMP	Adaptive Management Plan
COU	Central Operable Unit
DOE	U.S. Department of Energy
POC	point of compliance
POE	point of evaluation
Pu	plutonium-239, 240
RFLMA	*Rocky Flats Legacy Management Agreement*
RFSOG	*Rocky Flats Site, Colorado, Site Operations Guide*
SPPTS	Solar Ponds Plume Treatment System
TSS	total suspended solids

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1.0 Introduction

This appendix to the *Rocky Flats Site, Colorado, Site Operations Guide* (RFSOG) provides additional field implementation detail for selected monitoring objectives other than those prescribed by the *Rocky Flats Legacy Management Agreement* (DOE 2007) (RFLMA). Specific RFLMA monitoring objectives are covered in detail in the RFSOG.

When reportable water quality measurements are detected by surface water monitoring at points of evaluation (POEs) or points of compliance (POCs), additional monitoring may be required to identify[1] the source and evaluate for mitigating action. This Investigative Monitoring, which may be deemed necessary due to recognition of potential impacts to surface water and exceedances of surface water standards, would be performed as a source evaluation. Designing and implementing a source evaluation in response to a RFLMA reportable condition requires that the regulatory agencies be consulted.

Other monitoring data collection and evaluation protocols in this appendix are implemented based on non-regulatory commitments or as best management practices to provide additional useful information. These include No Name Gulch flow monitoring and analytical water quality data indicator parameter monitoring.

Several of the data collection and evaluation protocols also support the objectives of the Adaptive Management Plan (DOE 2013) (AMP). The AMP provides for a monitoring and data evaluation program to assist the U.S. Department of Energy (DOE) in deciding whether to breach the terminal dams during the planned timeframe of 2018–2020, or to delay the completion of dam breaching to gather additional information for evaluation.

The evaluation of breaching the remaining ponds is described in the May 2011 *Rocky Flats Surface Water Configuration Environmental Assessment/Finding of No Significant Impact* (DOE 2011). Breaching the remaining retention pond dams is intended to allow surface water flow to return to the approximate conditions that existed before the retention ponds were constructed. The terminal dams will be operated in a flow-through condition during the period leading up to the breaching of the terminal dams, which will provide data similar to what can be expected post-breach.

The AMP monitoring consists of the following objectives, though some of these objectives were also being implemented before the AMP was finalized and are discussed in RFLMA Contact Record 2010-03, *Non–Rocky Flats Legacy Management Agreement (RFLMA) Surface Water Monitoring Project for North and South Walnut Creeks*, which was approved on March 15, 2010:

- Monitoring to Evaluate Flow-Through Operations at Terminal Ponds A-4, B-5, and C-2
- Storm-Event Monitoring
- CFP Composite Sampling to Evaluate Uranium Transport
- Grab Sampling for Uranium
- Grab Sampling for Nitrate + Nitrite as N

[1] Note that the term "identify" is used here to mean "locate." Characterization is also implied.

2.0 Investigative Monitoring

When reportable water quality measurements are detected by surface water monitoring at POEs or POCs, additional monitoring may be conducted to identify[2] the source and evaluate for mitigating action. This investigative monitoring objective is intended to provide water quality information if reportable water quality values are detected at POEs or POCs or for other situations that can be informed with additional monitoring. The sample locations, type of sample(s), analytes, and frequency may or may not also be the result of the RFLMA consultative process, and may change based on the sampling results. Data collection is generally limited to POE and POC analytes and is intended to be discontinued when acceptable water quality has been demonstrated at POEs and POCs for an extended period.

Many of the investigative monitoring locations are sampled primarily to satisfy other monitoring objectives, although the data are also used for this investigative objective. Locations to be monitored, both upstream and downstream of POEs and POCs, change as data needs change, subject to the consultative process. The RFLMA parties may also elect to collect data using other methods, subject to the characteristics of the reportable water quality values and through the consultative process.

Details and ongoing updates regarding investigative monitoring data collection and evaluation for locations supporting a current reportable condition can be found in Contact Records, Quarterly Reports, and Annual Reports.

Although not in response to an ongoing reportable condition, location GS51 continues to be operated for the foreseeable future to support water-quality evaluations associated with POE SW027 (see Figure 2). GS51 measures flow rate and collects continuous flow-paced composite samples that are analyzed for total suspended solids (TSS), Pu, Am, and uranium.

3.0 No Name Gulch Flow Monitoring

This monitoring objective deals with the measurement of streamflow in No Name Gulch at the confluence with Walnut Creek. No Name Gulch is a small tributary to Walnut Creek, north of the Site, comprising a drainage area of approximately 300 acres. The Present Landfill is located in the upper reaches of No Name Gulch. Flow in No Name Gulch is characterized by intermittent periods of baseflow in the spring, with extended periods of no flow at other times of the year. During these dry periods, a significant precipitation event can cause short-term direct runoff. Flow monitoring at the downstream end of No Name Gulch (location GS33) is conducted to quantify contributions to Walnut Creek. Figure 1 shows the location of GS33.

[2] Note that the term "identify" is used here to mean "locate." Characterization is also implied.

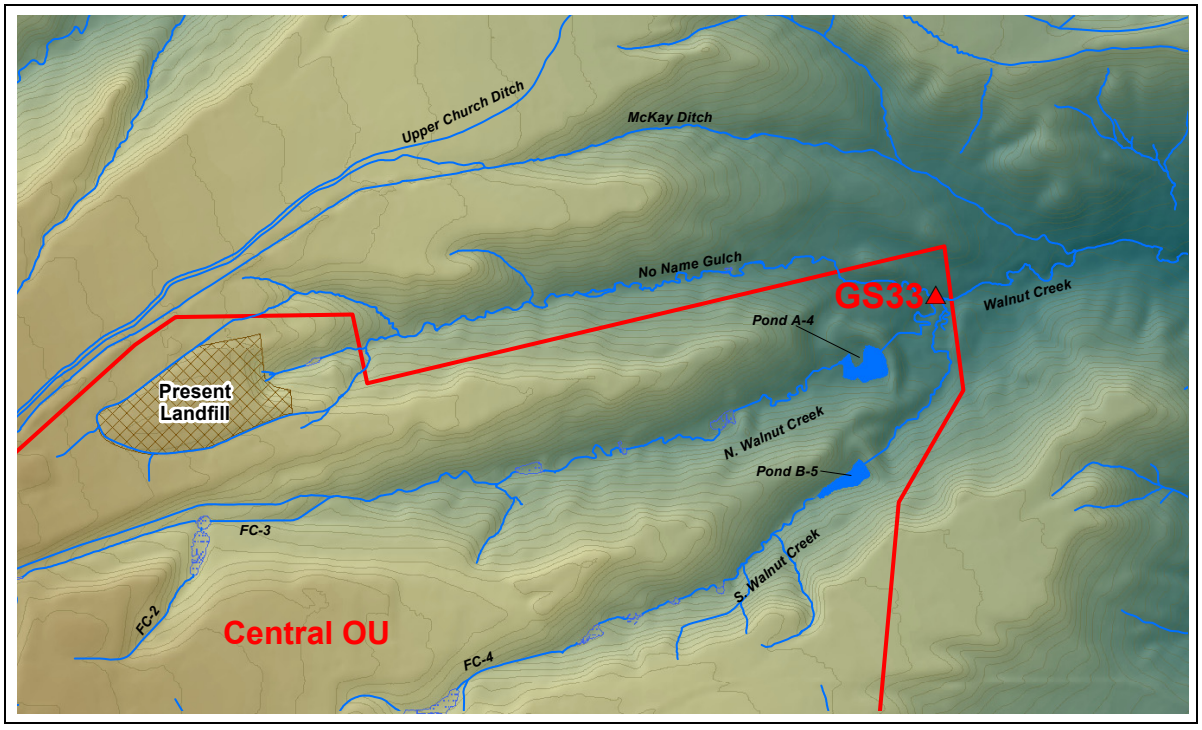

Figure 1. No Name Gulch Flow Monitoring Location

3.1 Data Collection Protocols

Table 1 provides details on instrumentation for the No Name Gulch flow monitoring location. Continuous flow data are collected using automated instrumentation.

Table 1. No Name Gulch Flow Monitoring Location

Location Code	Location Description	Sample Collection	Field Data Collection	Primary Flow Measurement Device	Telemetry?
GS33	No Name Gulch at confluence with Walnut Creek	None	Continuous flow data at 15-minute intervals	9.5-inch Parshall flume	Yes

Note: Both 5- and 15-minute interval flow data are collected.

3.2 Data Evaluation

No specific data evaluation is required. Flow data at GS33 will be collected for information purposes only and for relative comparisons to total Walnut Creek flows.

4.0 Indicator Parameter Monitoring for Assessment of Analytical Water Quality Data

This monitoring objective provides for the collection of general water quality and quantity information at select locations (Figure 2) to be used for various data assessments. Indicator parameter data collected will be used to assess analytical measurements of constituents such as radionuclides and metals to determine whether storm water runoff is affecting water quality. The targeted indicator parameters include TSS, precipitation, and flow rate. Collection of these data will also support evaluations of erosion control measures, the design of water management options, investigations into actinide transport, assessments of statistically significant changes in water quality, and management decision-making.

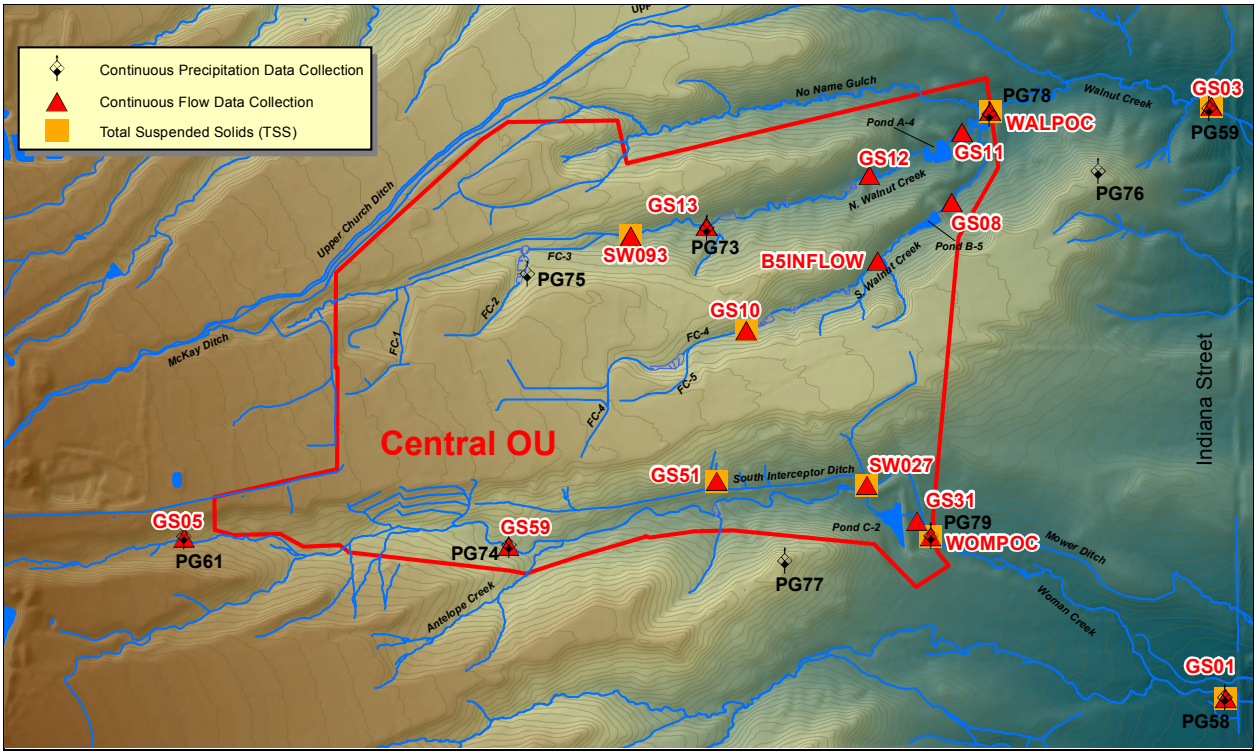

Figure 2. Indicator Parameter Monitoring Locations

4.1 Data and Sample Collection Protocols

Ideally, TSS would be analyzed in conjunction with actinides in samples collected at the locations covered by other surface water monitoring objectives (Table 2). However, automated sampling protocols (e.g., CFP composites) often result in samples collected over periods exceeding the 7-day hold time for TSS analysis. Therefore, TSS cannot be analyzed for in all composite samples but will be analyzed for when possible.

Table 2. Indicator Parameter Monitoring Sample Field Data and Sample Collection

Monitoring Location	Analytical Analyses	TSS Analyses	Flow Measurement Frequency
All automated locations	As required by primary monitoring objectives	For all samples when meeting 7-day TSS hold time requirement when also analyzing for Pu-239,240 or Am-241	15-minute continuous

Notes: Sampling frequency is specified by the primary monitoring objective for each automated location. The data collection shown above includes current parameters. Additional parameters may be added or deleted as needs arise.

To evaluate analytical constituents in conjunction with precipitation, precipitation will be monitored at 10 locations across the Site (Figure 2). The location of precipitation gages allows for the calculation of aerial precipitation for a drainage area tributary to each monitoring location. Each of these locations is equipped with a continuously recording precipitation gage.

To evaluate analytical constituents in conjunction with flow rate, flow is currently monitored at selected automated monitoring locations at the Site. Each of these locations is equipped with a continuously recording flow-measurement device.

4.2 Data Evaluation

No specific data evaluation is prescribed for this objective. Data may be evaluated to develop correlations between flow rate, actinide concentrations, precipitation characteristics, and TSS to further describe short-term, event-driven variability.

5.0 Monitoring to Evaluate Flow-Through Operations at Terminal Ponds A-4, B-5, and C-2

This objective is intended to collect water quality data during flow-through operations to simulate post-breach conditions to demonstrate that water leaving the Central Operable Unit (COU) will attain water quality standards after the terminal dams are breached.

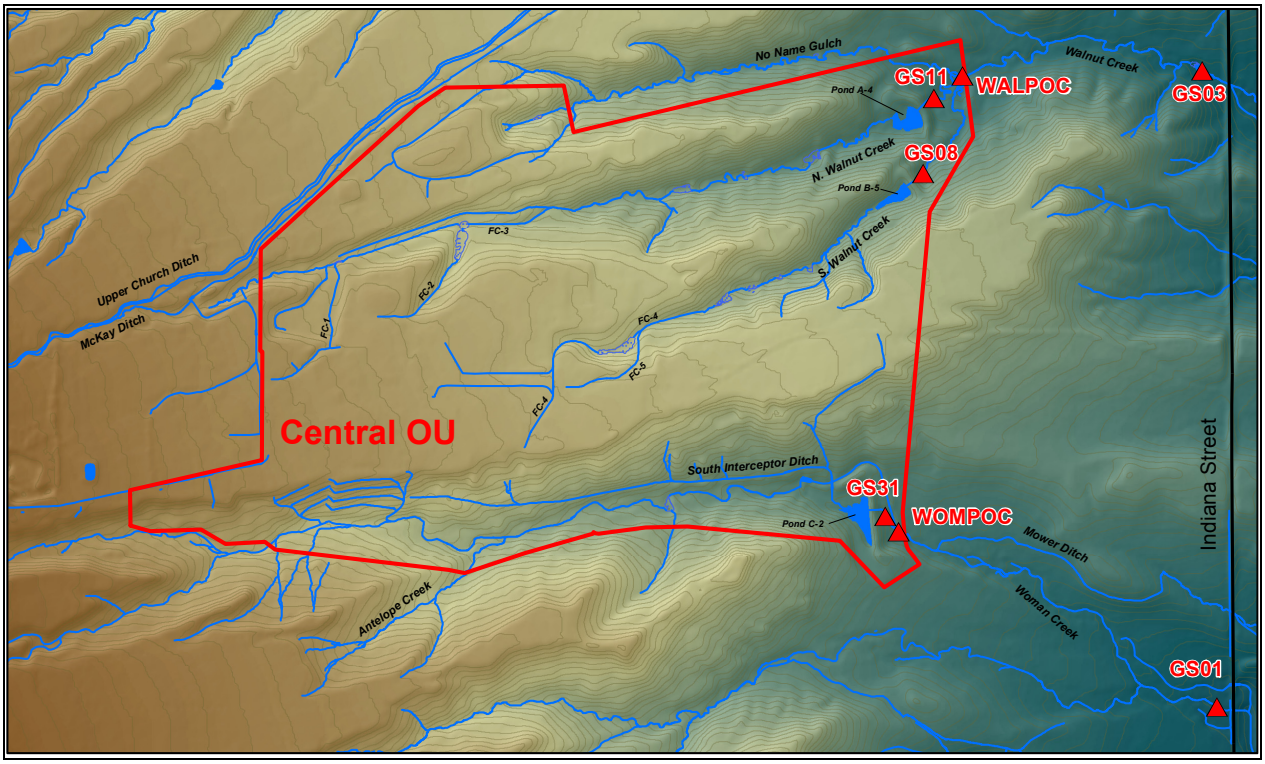

Figure 3. Flow-Through Operations Monitoring Locations

5.1 Data Collection Protocols

Table 3 provides details on the instrumentation for the flow-through operations monitoring locations. Continuous flow data are collected using automated instrumentation (Table 4). These monitoring locations collect CFP composite samples for select analytes (Table 5). The RFSOG discusses the method used to determine appropriate flow-pacing for composite samples. Table 6 lists sample scheduling targets.

Table 3. Flow-Through Operations Monitoring Locations

Location Code	Location Description	Flow Measurement Device	Primary Monitoring Objective
GS01	Woman Creek and Indiana Street	18-inch Parshall flume[a]	RFLMA POC monitoring
GS03	Walnut Creek and Indiana Street	3-foot HL flume	RFLMA POC monitoring
WALPOC	Walnut Creek at East COU boundary	3-foot HL flume	RFLMA POC monitoring
WOMPOC	Woman Creek at East COU boundary	3-foot HL flume	RFLMA POC monitoring
GS08	Pond B-5 outlet	24-inch Parshall flume	RFLMA POC monitoring until WALPOC is operational, then AMP monitoring
GS11	Pond A-4 outlet	24-inch Parshall flume	RFLMA POC monitoring until WALPOC is operational, then AMP monitoring
GS31	Pond C-2 outlet	24-inch Parshall flume	RFLMA POC monitoring until WOMPOC is operational, then AMP monitoring

Notes: [a] This flume is located east on Indiana Street and is owned by the Woman Creek Reservoir Authority; DOE has a Use Agreement with the Woman Creek Reservoir Authority to use this flume; sampling for POC GS01 occurs west of Indiana Street within the Refuge boundary.

Table 4. Flow-Through Operations Field Data Collection

Location Code	Flow Rate	Telemetry
GS01	15-minute continuous	5-minute continuous flow rate; composite sample counts
GS03	15-minute continuous	5-minute continuous flow rate; composite sample counts
WALPOC	15-minute continuous	5-minute continuous flow rate; composite sample counts
WOMPOC	15-minute continuous	5-minute continuous flow rate; composite sample counts
GS08	15-minute continuous	5-minute continuous flow rate; composite sample counts
GS11	15-minute continuous	5-minute continuous flow rate; composite sample counts
GS31	15-minute continuous	5-minute continuous flow rate; composite sample counts

Notes: All locations collect both 5- and 15-minute interval flow data.

Table 5. Flow-Through Operations Sample Collection: Type and Analytes

Location Code	Analytes	
	Pu-239,240; Am-241; U[b]	**Nitrate+Nitrite as N**
GS01	Continuous flow-paced composites[a]	NA
GS03	Continuous flow-paced composites	Grabs[a] at the start of each flow-paced composite
WALPOC	Continuous flow-paced composites	Grabs at the start of each flow-paced composite
WOMPOC	Continuous flow-paced composites	NA[c]
GS08	Continuous flow-paced composites	NA
GS11	Continuous flow-paced composites	Grabs at the start of each flow-paced composite
GS31	Continuous flow-paced composites	NA

Notes: [a] Sample types are defined in the main RFSOG document.
[b] Total uranium
[c] Occasionally, composite samples are collected from the field (and new composite samples are started) when there is no flow. Therefore, nitrate grabs cannot be collected at this time. Under these circumstances, the nitrate grab will be collected at the start of the next flow period; the general intent is that there is a minimum of one nitrate grab collected during each composite sampling period.

Table 6. Annual Flow-Through Operations Monitoring Targets (Number of Composite Samples)

	GS11	GS08	GS31	WALPOC	WOMPOC	GS03	GS01	Total Number of Samples
October	0	0	0	1	0	1	0	2
November	0	1	0	0	1	0	1	3
December	1	0	0	1	2	1	2	7
January	1	1	0	0	1	0	1	4
February	1	0	4	2	3	2	3	15
March	2	1	1	6	6	6	6	28
April	3	4	6	6	6	6	6	37
May	2	2	0	6	6	6	6	28
June	1	1	1	3	1	3	1	11
July	0	1	0	1	0	1	0	3
August	0	0	0	0	0	0	0	0
September	1	1	0	1	1	1	1	6
Annual Total	12	12	12	27	27	27	27	144

Notes: The monthly sample distribution is based on expected water availability that is predicted based on historical flow data. This distribution is intended to be periodically modified as additional flow data are collected. It is expected that for some years, low flows will prevent targets from being met, and for some years, targets will be exceeded; targets are based on an average hydrologic year.
Composite sample counts for GS01, GS03, WALPOC, and WOMPOC are based on the RFLMA POC targets.

5.2 Data Evaluation

Although this objective is not intended to demonstrate regulatory compliance with surface water quality standards (Table 1 of Attachment 2 to RFLMA), data evaluation will be similar to that required for RFLMA POCs. Evaluation will include the calculation of 30-day and 12-month rolling averages. The RFSOG discusses methods for calculating these averages.

Evaluation may also include an assessment of correlations, patterns, variability, and loading. Data evaluation is expected to change over time in response to the data collected, ongoing evaluation results, and the recommendations of the AMP participants.

6.0 Storm-Event Monitoring

This objective is intended to collect targeted water quality data during runoff periods to assess actinide and solids transport.

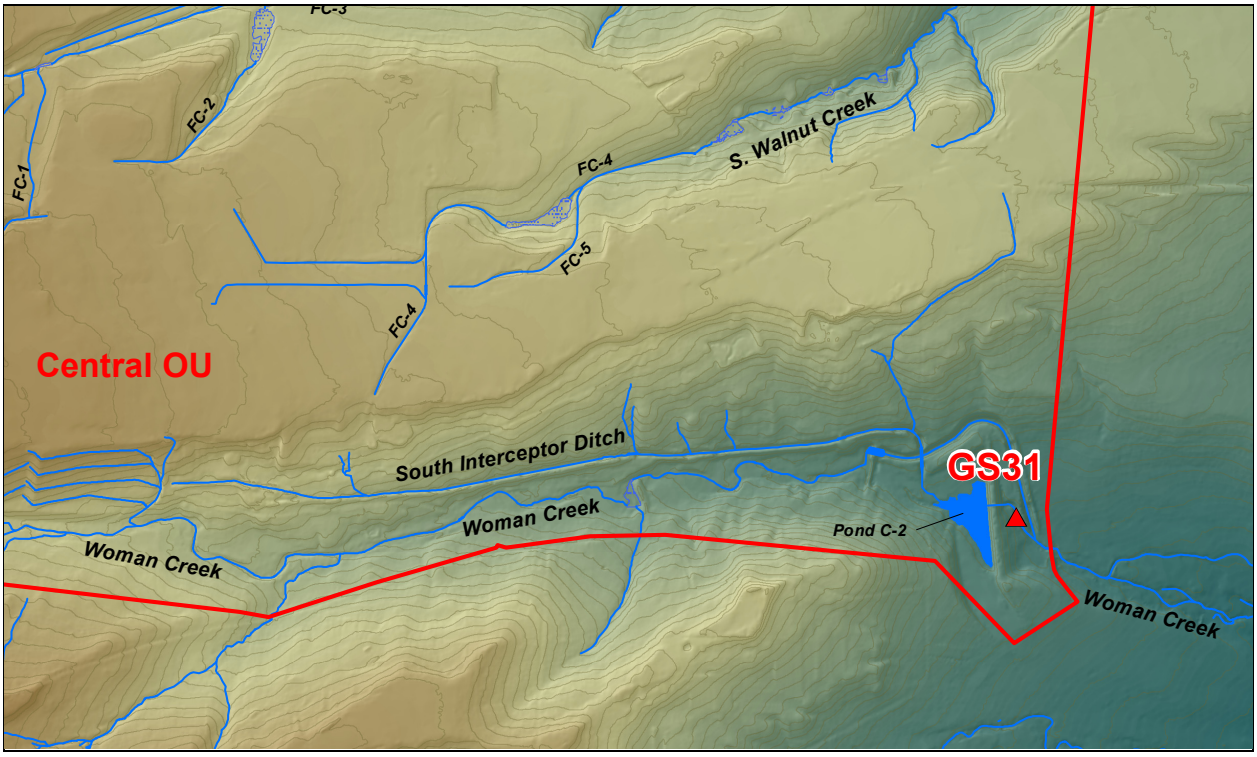

Figure 4. Storm-Event Monitoring Locations

6.1 Data Collection Protocols

Table 7 provides details on the instrumentation for the storm-event monitoring locations. Continuous flow/level data are collected using automated instrumentation at selected locations (Table 8). These locations collect time-paced samples during runoff events, using automated 24-bottle sequential samplers (Table 9). The flowmeter is programmed to trigger the sequential sampler when a rise in water level is detected, indicating a runoff event. This "enable level" is location-specific and varies depending on existing conditions in the creek. The enable level is frequently adjusted so that sample collection is initiated at the start of a runoff period. The time interval between individual sample bottles is also location-specific depending on the usual duration of a runoff event. The time interval will also be periodically changed based on existing conditions and experience with a particular location.

Table 7. Storm-Event Monitoring Locations

Location Code	Location Description	Flow Measurement Device	Primary Monitoring Objective
GS31	Pond C-2 outlet	24-inch Parshall flume	AMP monitoring

Table 8. Storm-Event Field Data Collection

Location Code	Flow Rate/Water Level	Telemetry
GS31	15-minute continuous (flow)	5-minute continuous flow rate; sample counts

Notes: All locations collect both 5- and 15-minute interval flow/level data.

Table 9. Storm-Event Sample Collection: Type and Analytes

Location Code	Analytes
	Pu-239,240; Am-241; U[b], TSS
GS31	Storm-event time-paced sequential samples

Notes: [a] Sample types are defined in the main RFSOG document.
[b] Total uranium

Once the bottles have been filled, only the bottles collected during the rising limb will primarily be selected to be composited and submitted for analysis. Depending on the progress of the data collection under this objective, bottles for the falling limb, the entire runoff hydrograph, or both may also be selected for analysis. Not all sample collection events will be submitted for analysis (some events may be discarded, in particular if the entire rising limb was not sampled, or if all locations along the given stream did not actuate as desired); the goal is to obtain results for runoff events during different seasons and of varying intensity and peak runoff rates. Sample collection using this method is opportunistic. The equipment will be continually maintained to collect all runoff events. Professional judgment and previous sampling successes and failures will be used to determine which events to submit for analysis. In any case, records of discarded samples will be maintained.

6.2 Data Evaluation

Data will be evaluated to develop correlations between flow rate, actinide concentrations, and TSS to further describe short-term, event-driven variability. Data will also be used to assess the effects of ongoing revegetation and erosion control practices.

Data evaluation is expected to change over time in response to the data collected, ongoing evaluation results, and the recommendations of the AMP participants.

7.0 CFP Composite Sampling to Evaluate Uranium Transport

This objective is intended to evaluate the in-stream transport of uranium by assessing correlations, patterns, variability, and loading. As opposed to grab sampling, this CFP sampling is intended to evaluate longer-term spatial and temporal trends. This evaluation is particularly focused on North and South Walnut Creeks.

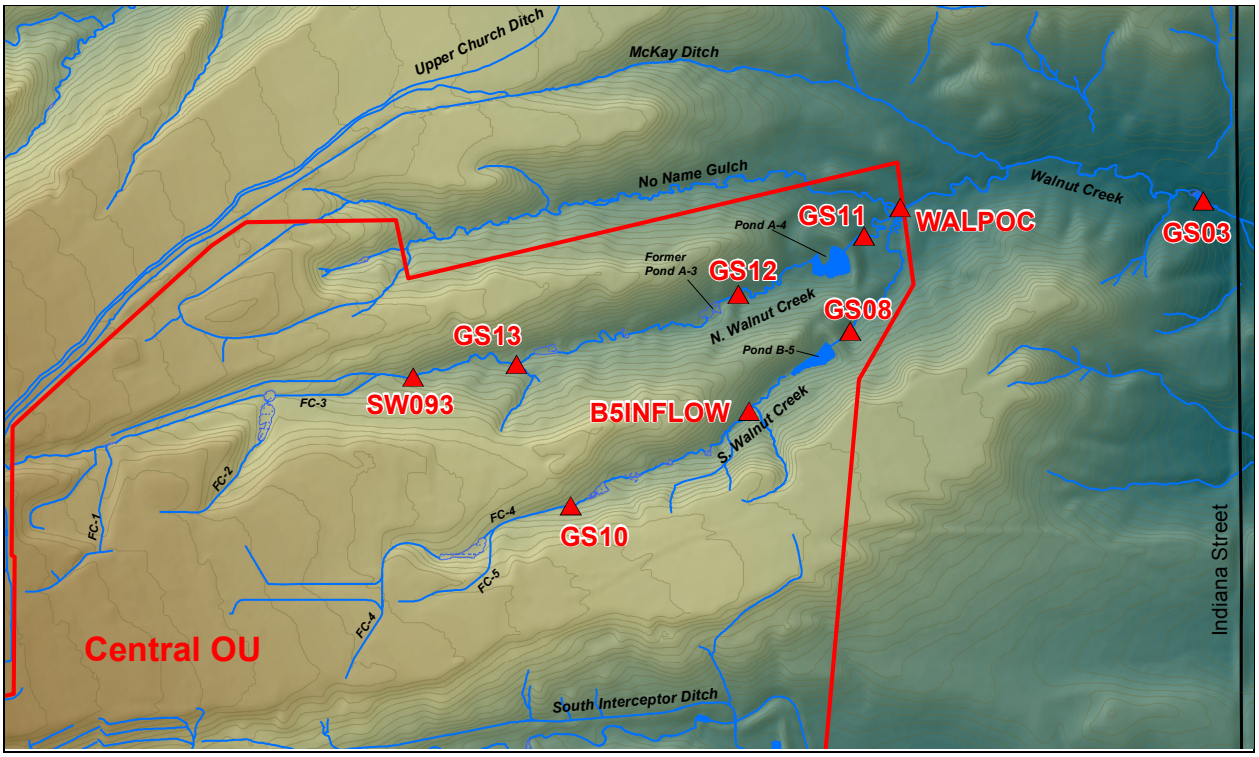

Figure 5. Uranium Transport Monitoring Locations: CFP Sampling

7.1 Data Collection Protocols

Table 10 provides details on the instrumentation for the uranium CFP locations. Continuous flow data are collected using automated instrumentation (Table 11). These locations collect CFP composite samples for total uranium. The RFSOG discusses the method used to determine appropriate flow-pacing for composite samples. Table 12 lists sample scheduling targets.

Table 10. Uranium CFP Monitoring Locations

Location Code	Location Description	Flow Measurement Device	Primary Monitoring Objective
GS03	Walnut Creek and Indiana Street	3-foot HL flume	RFLMA POC monitoring
WALPOC	Walnut Creek at East COU boundary	3-foot HL flume	RFLMA POC monitoring
GS08	Pond B-5 outlet	24-inch Parshall flume	AMP monitoring
GS10	South Walnut Creek upstream of B-Series Bypass	9-inch Parshall flume with weir insert	RFLMA POE monitoring
GS11	Pond A-4 outlet	24-inch Parshall flume	AMP monitoring
GS12	Pond A-3 outlet	30-inch Parshall flume	AMP monitoring
GS13	North Walnut Creek just upstream of A-Series Bypass	6-inch Parshall flume	RFLMA performance monitoring
B5INFLOW	South Walnut Creek upstream of Pond B-5	9-inch Parshall flume	AMP monitoring
SW093	North Walnut Creek 1,300 feet upstream of A-Series Bypass	3-foot H flume	RFLMA POE monitoring

Table 11. Uranium CFP Field Data Collection

Location Code	Flow Rate	Telemetry
GS03	15-minute continuous	5-minute continuous flow rate; composite sample counts
WALPOC	15-minute continuous	5-minute continuous flow rate; composite sample counts
GS08	15-minute continuous	5-minute continuous flow rate; composite sample counts
GS10	15-minute continuous	5-minute continuous flow rate; composite sample counts
GS11	15-minute continuous	5-minute continuous flow rate; composite sample counts
GS12	15-minute continuous	5-minute continuous flow rate; composite sample counts
GS13	15-minute continuous	5-minute continuous flow rate; composite sample counts
B5INFLOW	15-minute continuous	5-minute continuous flow rate; composite sample counts
SW093	15-minute continuous	5-minute continuous flow rate; composite sample counts

Notes: All locations collect both 5- and 15-minute interval flow data.

Table 12. Annual Uranium CFP Monitoring Targets (Number of Composite Samples)

	GS03	WALPOC	GS08	GS10	GS11	GS12	GS13	B5INFLOW	SW093	Total # of Samples
October	1	1	0	1	0	0	0	1	0	4
November	0	0	1	1	0	1	1	1	1	6
December	1	1	0	0	1	1	1	0	0	5
January	0	0	1	1	1	1	1	1	2	8
February	2	2	0	2	1	2	2	2	2	15
March	6	6	1	2	2	3	3	2	2	27
April	6	6	4	6	3	5	5	6	6	47
May	6	6	2	2	2	2	2	2	2	26
June	3	3	1	3	1	2	2	3	2	20
July	1	1	1	0	0	0	0	0	0	3
August	0	0	0	1	0	0	0	1	0	2
September	1	1	1	1	1	1	1	1	1	9
Annual Total	27	27	12	20	12	18	18	20	18	172

Notes: The monthly sample distribution is based on expected water availability that is predicted based on historical flow data. This distribution is intended to be periodically modified as additional flow data are collected. It is expected that for some years, low flows will prevent targets from being met, and for some years, targets will be exceeded; targets are based on an average hydrologic year.
Composite sample counts for GS03, WALPOC, GS10, and SW093 are based on the RFLMA targets.

7.2 Data Evaluation

Although this objective is not intended to demonstrate regulatory compliance with surface water quality standards (Table 1 of Attachment 2 to RFLMA), data evaluation will be similar to that required for RFLMA POCs. Evaluation will include the calculation of 30-day and 12-month rolling averages. The RFSOG discusses methods for calculating these averages.

Evaluation may also include an assessment of correlations, patterns, variability, and loading. Data evaluation is expected to change over time in response to the data collected, ongoing evaluation results, and the recommendations of the AMP participants.

8.0 Grab Sampling for Uranium in North and South Walnut Creeks

This objective is also intended to evaluate the transport of uranium in North and South Walnut Creeks by assessing correlations, patterns, variability, and loading. It is also intended to define the relative impacts that the Solar Ponds Plume Treatment System (SPPTS) contributions have on surface water in North Walnut Creek. As opposed to CFP composite sampling, this periodic grab sampling is intended to evaluate shorter-term spatial and temporal trends by looking at "snapshots" of uranium concentrations; as such, these data will not be truly representative of longer-term in-stream concentrations, but will be informative.

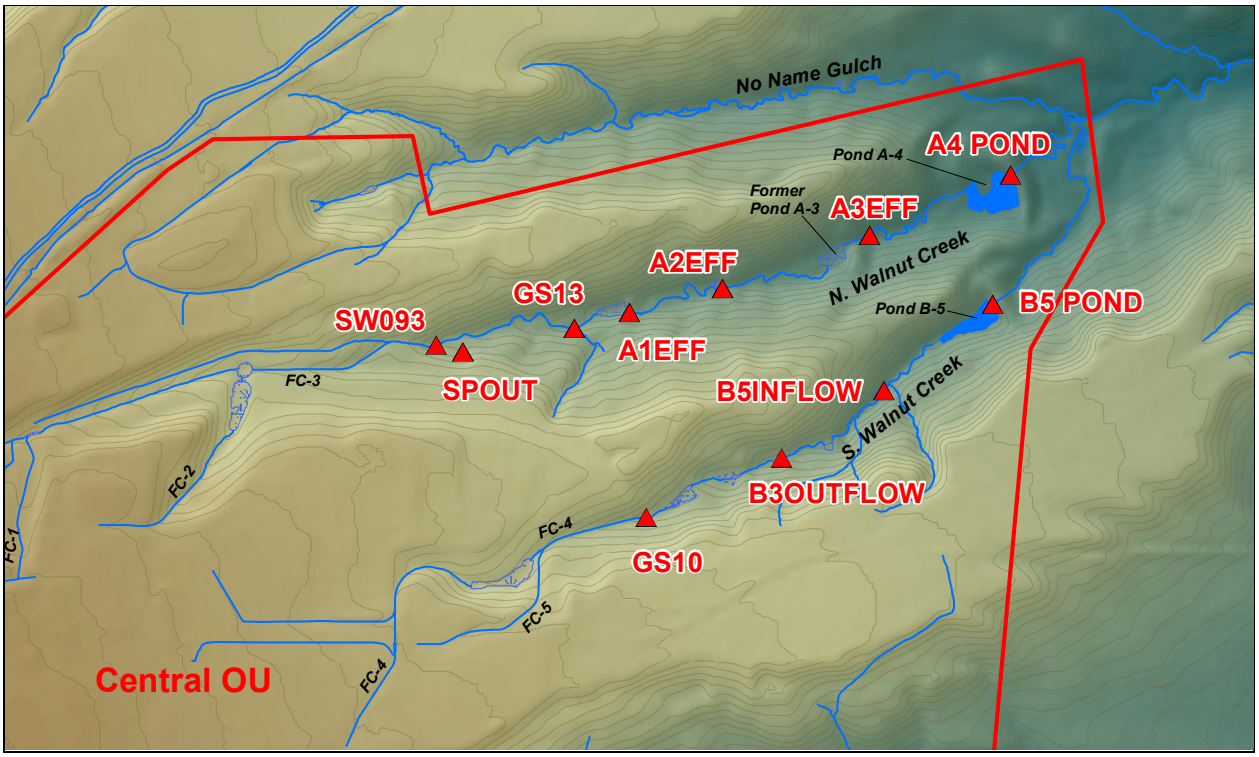

Figure 6. Uranium Grab Sampling Locations

8.1 Data Collection Protocols

Table 13 provides details on the uranium grab sampling locations. Continuous flow data are collected using automated instrumentation at selected locations (Table 14). Grab samples are currently collected biweekly. When a particular location is not flowing, samples will not be collected, even if standing water is present.

Table 13. Uranium Grab Sampling Locations

Location Code	Location Description	Primary Monitoring Objective
SW093	North Walnut Creek 1,300 feet upstream of A-Series Bypass	AMP monitoring
SPOUT[a]	Effluent from SPPTS at ITSS metering vault	AMP monitoring
GS13	North Walnut Creek just upstream of A-Series Bypass	AMP monitoring
A1EFF	Outlet channel of former Pond A-1 at stoplog structure	AMP monitoring
A2EFF	Outlet channel of former Pond A-2 at stoplog structure	AMP monitoring
A3EFF	Pond A-3 outlet	AMP monitoring
A4 POND[b]	Pond A-4 at approximate center of upstream dam face	AMP monitoring
GS10	South Walnut Creek upstream of B-Series Bypass	AMP monitoring
B3OUTFLOW	Outlet channel of former Pond B-3 at stoplog structure	AMP monitoring
B5INFLOW	South Walnut Creek upstream of Pond B-5	AMP monitoring
B5 POND[b]	Pond B-5 at approximate center of upstream dam face	AMP monitoring

Notes: [a] Data from SPPTS optimization at this location will also be used under this objective when analytical results are from contract laboratories.
[b] Data from predischarge sampling (see the RFSOG) at these locations will also be used under this objective, as applicable.

Table 14. Uranium Grab Sampling Field Data Collection

Location Code	Flow Rate/Water Level	Telemetry
SW093	15-minute continuous (flow)	5-minute continuous flow rate
SPOUT	15-minute continuous (flow)	5-minute continuous flow rate
GS13	15-minute continuous (flow)	5-minute continuous flow rate
A1EFF	NA	NA
A2EFF	NA	NA
A3EFF	15-minute continuous (flow)	5-minute continuous flow rate
A4 POND	hourly continuous (level)	hourly continuous pond level
GS10	15-minute continuous (flow)	5-minute continuous flow rate
B3OUTFLOW	NA	NA
B5INFLOW	15-minute continuous (flow)	5-minute continuous flow rate
B5 POND	hourly continuous (level)	hourly continuous pond level

Notes: All locations collect both 5- and 15-minute interval flow/level data.

8.2 Data Evaluation

The transport of uranium in North and South Walnut Creeks will be evaluated by assessing correlations, patterns, variability, and loading. The relative impacts that the SPPTS contributions have on surface water in North Walnut Creek will also be defined.

Data evaluation is expected to change over time in response to the data collected, ongoing evaluation results, and the recommendations of the AMP participants.

9.0 Grab Sampling for Nitrate + Nitrite as N in Walnut Creek

This objective is intended to evaluate the transport of nitrate in North Walnut and Walnut Creeks by assessing correlations, patterns, variability, and loading. It is also intended to define the relative impacts that the SPPTS contributions have on surface water in North Walnut Creek.

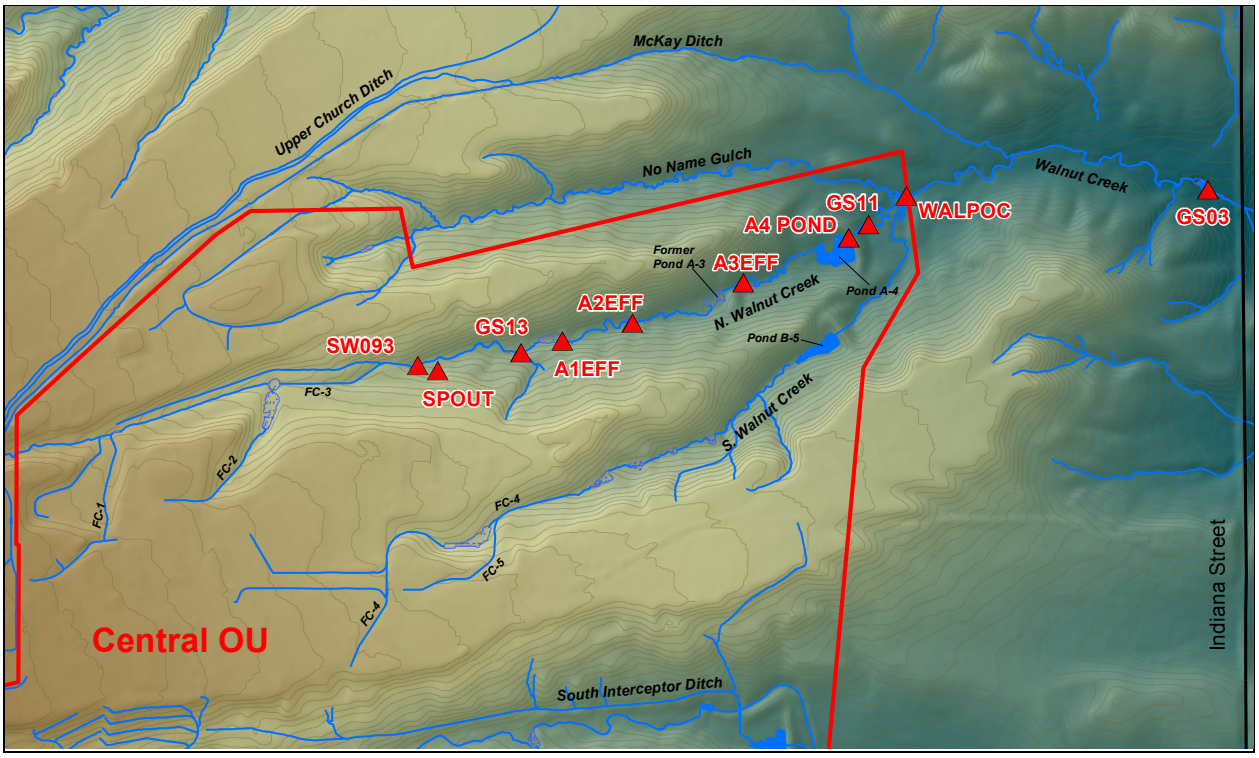

Figure 7. Nitrate + Nitrite Grab Sampling Locations

9.1 Data Collection Protocols

Table 15 provides details on the nitrate grab sampling locations. Continuous flow data are collected using automated instrumentation at selected locations (Table 16). Grab samples are currently collected biweekly at SW093, SPOUT, GS13, A1EFF, A2EFF, A3EFF, and A4 POND. When a particular location is not flowing, samples will not be collected, even if standing water is present. Grab samples at GS11, WALPOC, and GS03 will be collected at the start of each CFP composite at the targeted frequency given in Table 12.

Table 15. Nitrate Grab Sampling Locations

Location Code	Location Description	Primary Monitoring Objective
SW093	North Walnut Creek 1,300 feet upstream of A-Series Bypass	AMP monitoring
SPOUT[a]	Effluent from SPPTS at ITSS metering vault	AMP monitoring
GS13	North Walnut Creek just upstream of A-Series Bypass	AMP monitoring
A1EFF	Outlet channel of former Pond A-1 at stoplog structure	AMP monitoring
A2EFF	Outlet channel of former Pond A-2 at stoplog structure	AMP monitoring
A3EFF	Pond A-3 outlet	AMP monitoring
A4 POND[b]	Pond A-4 at approximate center of upstream dam face	AMP monitoring
GS11	Pond B-5 outlet	AMP monitoring
WALPOC	Walnut Creek at East COU boundary	RFLMA POC monitoring
GS03	Walnut Creek and Indiana Street	RFLMA POC monitoring

Notes: [a] Data from SPPTS optimization at this location will also be used under this objective when analytical results are from contract laboratories.
[b] Data from predischarge sampling (see the RFSOG) at this location will also be used under this objective, as applicable.

Table 16. Nitrate Grab Sampling Field Data Collection

Location Code	Flow Rate/Water Level	Telemetry
SW093	15-minute continuous (flow)	5-minute continuous flow rate
SPOUT	15-minute continuous (flow)	5-minute continuous flow rate
GS13	15-minute continuous (flow)	5-minute continuous flow rate
A1EFF	NA	NA
A2EFF	NA	NA
A3EFF	15-minute continuous (flow)	5-minute continuous flow rate
A4 POND	hourly continuous (level)	hourly continuous pond level
GS11	15-minute continuous (flow)	5-minute continuous flow rate
WALPOC	15-minute continuous (flow)	5-minute continuous flow rate
GS03	15-minute continuous (flow)	5-minute continuous flow rate

Notes: All locations collect both 5- and 15-minute interval flow/level data.

9.2 Data Evaluation

The transport of nitrate in North and South Walnut Creeks will be evaluated by assessing correlations, patterns, variability, and loading. The relative impacts that the SPPTS contributions have on surface water in North Walnut Creek will also be defined.

Data evaluation is expected to change over time in response to the data collected, ongoing evaluation results, and the recommendations of the AMP participants.

10.0 References

DOE (U.S. Department of Energy), 2007. *Rocky Flats Site Legacy Management Agreement*, February.

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