LMS/RFS/S08202-5.0

Additional Field Implementation Detail for Selected Monitoring Objectives at the Rocky Flats Site, Colorado

September 2025

U.S. DEPARTMENT OF ENERGY | Legacy Management

This document has been designed for online viewing.

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Abbreviations

Am	americium
AMP	Adaptive Management Plan
CFP	continuous flow-paced
COU	Central Operable Unit
N	nitrogen
POC	Point of Compliance
POE	Point of Evaluation
Pu	plutonium
RFLMA	*Rocky Flats Legacy Management Agreement*
RFSOG	Rocky Flats Site Operations Guide
SPPTS	Solar Ponds Plume Treatment System
TSS	total suspended solids
U	uranium

1.0 Introduction

This U.S. Department of Energy Office of Legacy Management document provides supplemental detail to the *Rocky Flats Site, Colorado, Site Operations Guide* (DOE 2021), also called the Rocky Flats Site Operations Guide (RFSOG), regarding field implementation of selected monitoring objectives other than those prescribed by the *Rocky Flats Legacy Management Agreement* (RFLMA) (CDPHE et al. 2007). The RFLMA was executed on March 14, 2007; Attachment 2 has been modified since, most recently in 2018. 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 appropriate mitigating actions, if any. This investigative monitoring (Section 2.0) 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 document are implemented based on nonregulatory commitments or as best management practices to provide additional useful information. These include analytical water quality data indicator parameter monitoring (Section 3.0) and No Name Gulch flow monitoring (Section 4.0).

Several of the data collection and evaluation protocols detailed in this document support the objectives of the *Surface Water Configuration Adaptive Management Plan for the Rocky Flats Site, Colorado* (DOE 2023), also known as the AMP. The AMP provides for a monitoring and data evaluation program to assist in deciding when to implement the final steps of the proposed action, which includes breaching the terminal dams. The AMP-related objectives in this document are implemented in conjunction with the requirements detailed in the AMP.

Field implementation detail for the following AMP monitoring objectives is included in this document as follows:

- Monitoring to Evaluate Flow-Through Operations at Terminal Ponds A-4, B-5, and C-2 (Section 5.0)
- Storm-Event Monitoring (Section 6.0)
- CFP Composite Sampling to Evaluate Uranium Transport (Section 7.0)
- Grab Sampling for Uranium in North and South Walnut Creeks (Section 8.0)
- Grab Sampling for Nitrate + Nitrite as N in North Walnut Creek (Section 9.0)

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[1] the source and evaluate for appropriate mitigating actions, if any. This investigative monitoring objective is intended to

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

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 some 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 or other written correspondence, in quarterly reports, and in annual reports.

Although not necessarily in response to an ongoing reportable condition, for the foreseeable future, location GS51 continues to be operated to support water quality evaluations associated with POE SW027 (see Figure 1). GS51 measures flow rate and collects continuous flow-paced (CFP) composite samples that are analyzed for total suspended solids (TSS)[2], plutonium (Pu), americium (Am), and uranium (U).

In this document, "plutonium" or "Pu" refers to plutonium-239,240 or $^{239}Pu + ^{240}Pu$; "americium" or "Am" refers to americium-241 or ^{241}Am; and "nitrate" refers to nitrate + nitrite as nitrogen (N). In addition, the terms "activity" and "concentration" are used interchangeably for both Pu and Am to represent the amount of radioactivity or radioactive material per unit of water (i.e., picocuries per liter).

3.0 Indicator Parameter Monitoring for the Assessment of Analytical Water Quality Data

This monitoring objective provides for the collection of general water quality and quantity information at selected locations (Figure 1) to be used for various data assessments. Indicator parameter data may be used to assess analytical measurements of constituents, such as radionuclides and metals, to determine whether stormwater runoff is affecting water quality. The targeted indicator parameters include TSS, precipitation, and flow rate. Collection of these data may also support the evaluation 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.

[2] TSS is analyzed when composite samples are collected and analyzed within TSS hold time limits.

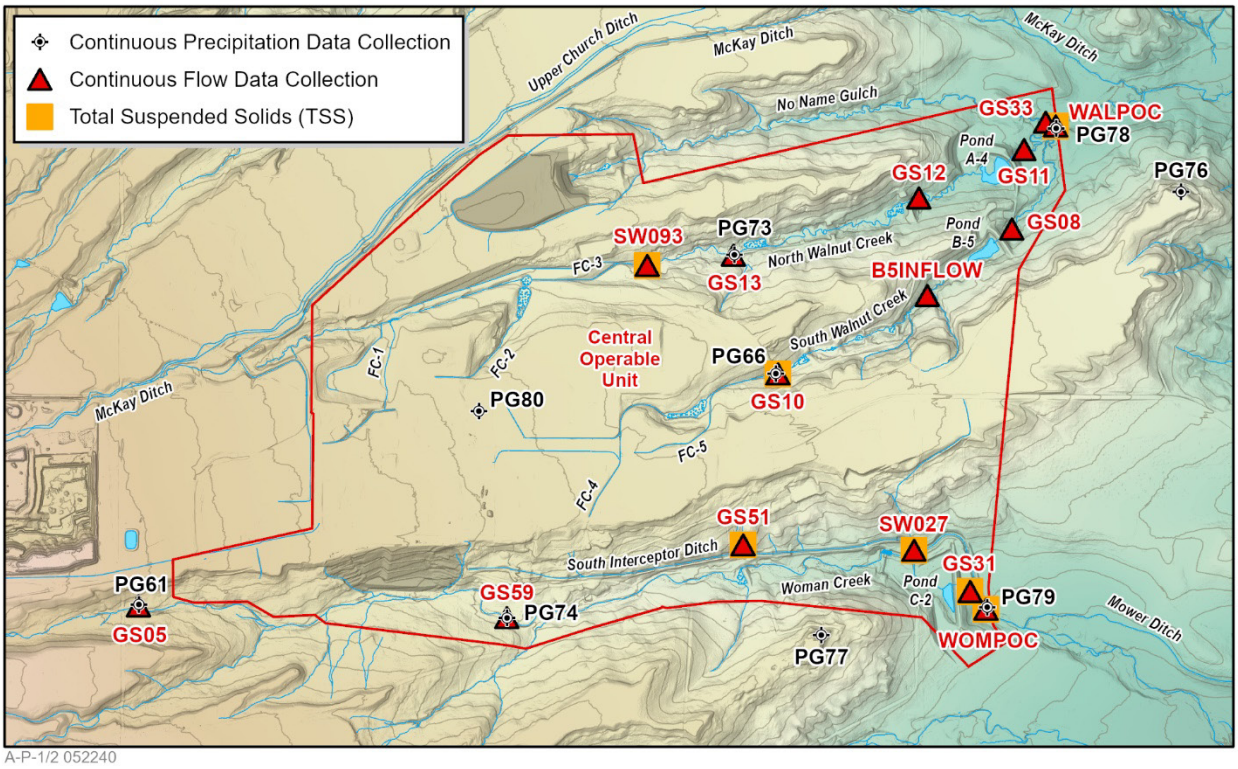


Figure 1. Indicator Parameter Monitoring Locations

3.1 Data 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 1). 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 all composite samples but will be analyzed when possible.

Table 1. 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 the 7-day TSS hold time requirement when also analyzing for Pu and Am	5-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 nine locations across the Site (Figure 1). 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 all automated monitoring locations at the Site. Each of these locations is equipped with a continuously recording flow measurement device.

3.2 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.

4.0 No Name Gulch Flow Monitoring

This monitoring objective focuses on 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 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 2).

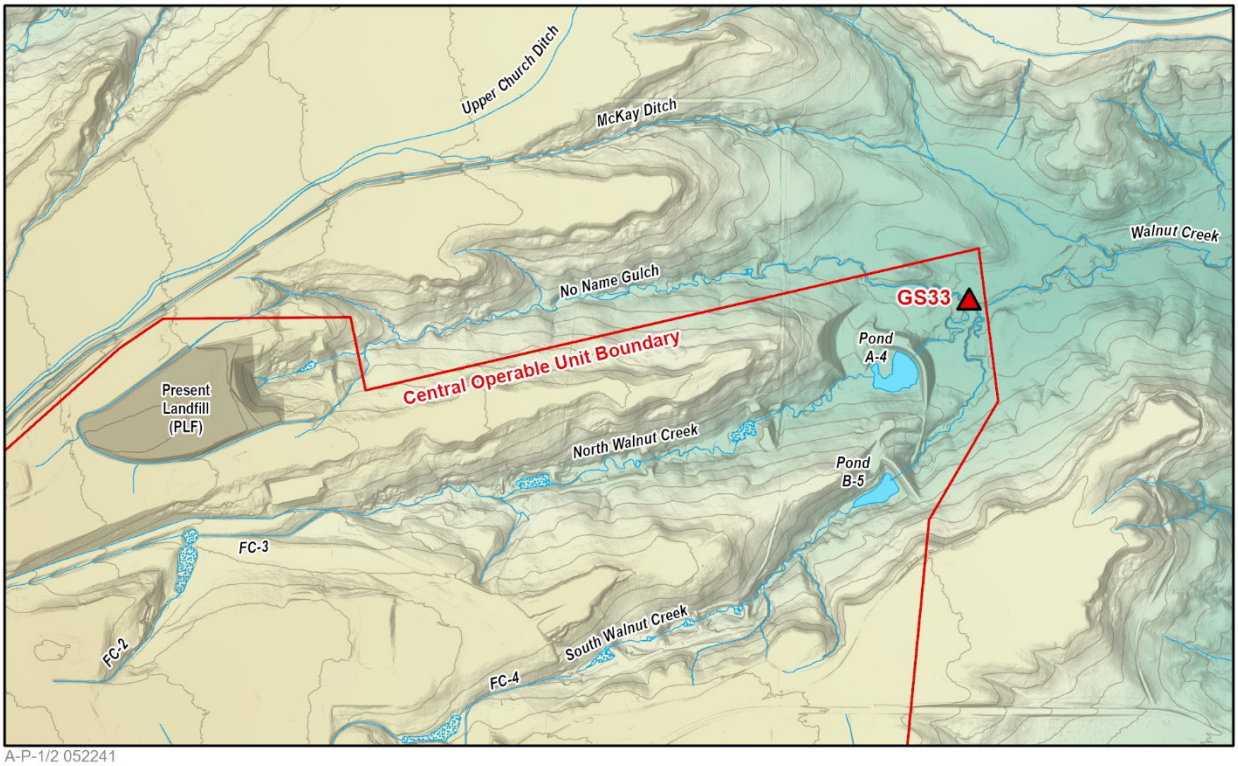


Figure 2. No Name Gulch Flow Monitoring Location

4.1 Data Collection Protocols

Table 2 provides details on instrumentation for the No Name Gulch flow monitoring location. Continuous flow data are collected using automated instrumentation.

Table 2. No Name Gulch Flow Monitoring Location Details

Location Code	Location Description	Sample Collection	Field Data Collection	Primary Flow Measurement Device	Telemetry?
GS33	No Name Gulch at confluence with Walnut Creek	CFP composites for U analysis; 8 samples/year	Continuous flow data at 5-minute intervals	9.5-inch Parshall flume	Yes

4.2 Data Evaluation

No specific data evaluation is required. Data at GS33 will be collected for informational purposes only and for relative comparisons to Walnut Creek.

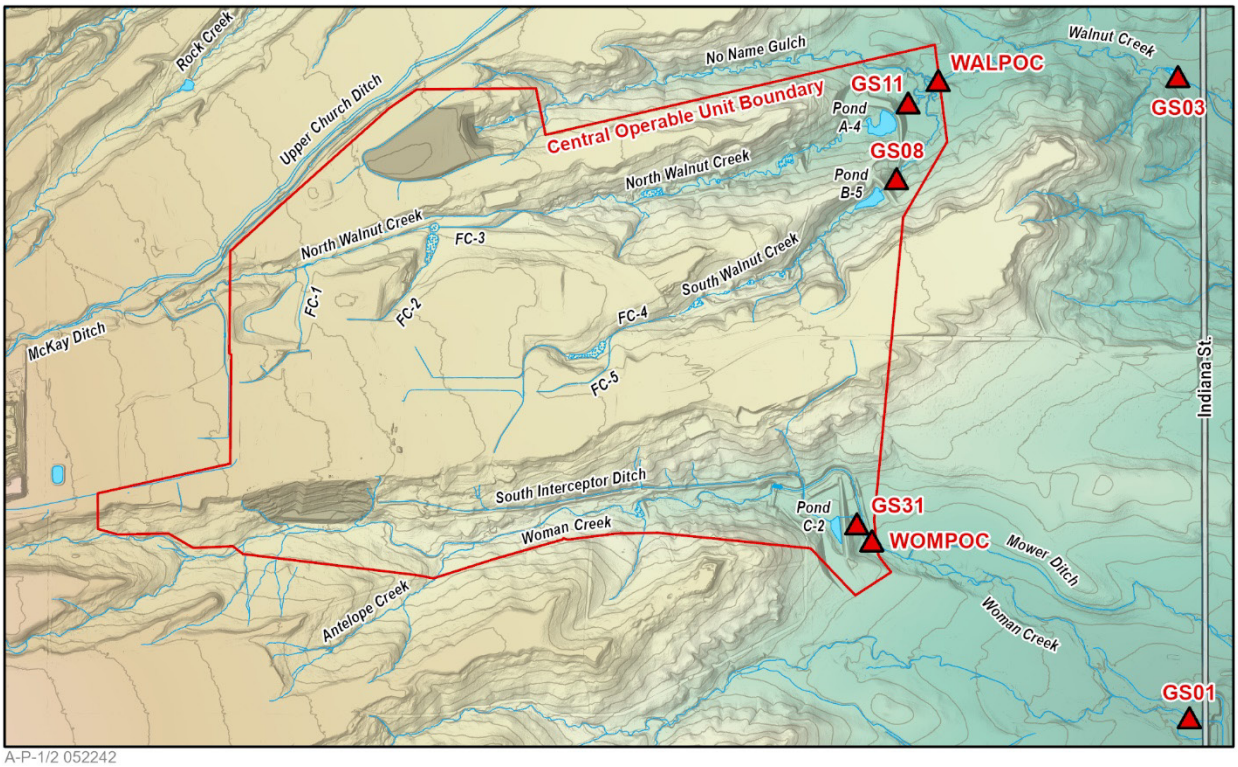
5.0 Monitoring to Evaluate Flow-Through Operations at Terminal Ponds A-4, B-5, and C-2

This AMP monitoring objective is intended to collect water quality data during flow-through operations to simulate post-breach conditions and to demonstrate that water leaving the Central Operable Unit (COU) will continue to attain water quality standards after the terminal dams are breached. The specific locations are shown in Figure 3.

The two locations at the COU boundary, WALPOC and WOMPOC, became RFLMA POCs on September 28, 2011, and September 9, 2011, respectively. At that time, locations GS03 and GS01 were also RFLMA POCs and continued to be POCs until September 28, 2013, and September 9, 2013, respectively. Following those dates and at the request of the AMP participants, GS01 and GS03 were operated as AMP monitoring locations for 2 years. Monitoring at both locations was discontinued on October 1, 2015.

Terminal pond outfall monitoring locations GS11 (Pond A-4) and GS08 (Pond B-5) were operated as POCs until September 28, 2011, when they transitioned to operate as AMP monitoring locations. Similarly, terminal pond outfall monitoring location GS31 (Pond C-2) was operated as a POC until September 9, 2011, when it also transitioned to operate as an AMP monitoring location.

Flow-through operation of Ponds A-4 and B-5 began on September 12, 2011; that was also the first day of actual flow at WALPOC. Flow-through operation of Pond C-2 began on November 7, 2011. WOMPOC first began measuring actual flow in Woman Creek on October 14, 2011.



Note: Monitoring at locations GS01 and GS03 was discontinued on October 1, 2015.

Figure 3. Flow-Through Operations Monitoring Locations

5.1 Data Collection Protocols

Table 3 provides details 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 Details

Location Code	Location Description	Flow Measurement Device	Primary Monitoring Objective
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 with weir insert	AMP monitoring
GS11	Pond A-4 outlet	24-inch Parshall flume with weir insert	AMP monitoring
GS31	Pond C-2 outlet	24-inch Parshall flume with weir insert	AMP monitoring

Table 4. Flow-Through Operations Field Data Collection Details

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

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

Location Code	Analytes	
	Pu, Am, U	Nitrate + Nitrite as N
WALPOC	CFP composites	Grabs at the start of each flow-paced composite[b]
WOMPOC	CFP composites	NA
GS08	CFP composites	NA
GS11	CFP composites	Grabs at the start of each flow-paced composite[b]
GS31	CFP composites	NA

Notes:

[a] Sample types are defined in the RFSOG main document.

[b] 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.

Abbreviation:

NA = not applicable

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

	GS11	GS08	GS31	WALPOC	WOMPOC	Total Number of Samples
October	0	0	0	0	0	0
November	0	0	0	0	1	1
December	0	0	1	0	1	2
January	0	0	1	1	1	3
February	1	1	1	1	2	6
March	1	1	2	4	3	11
April	3	2	1	6	5	17
May	5	5	4	6	6	26
June	1	1	1	3	2	8
July	0	1	0	0	0	1
August	1	0	0	0	0	1
September	0	1	1	1	1	4
Annual Total	12	12	12	22	22	80

Notes:

The monthly sample distribution is based on expected water availability, which is 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 that for other years, that the targets will be exceeded; targets are based on an average hydrologic year.

Composite sample counts for 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 the 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 may change over time in response to the data collected, ongoing evaluation results, and recommendations of the AMP participants.

6.0 Storm-Event Monitoring

This AMP monitoring objective is intended to collect targeted water quality data during runoff periods to assess actinide and solids transport. See Figure 4 for a map of storm-event monitoring locations.

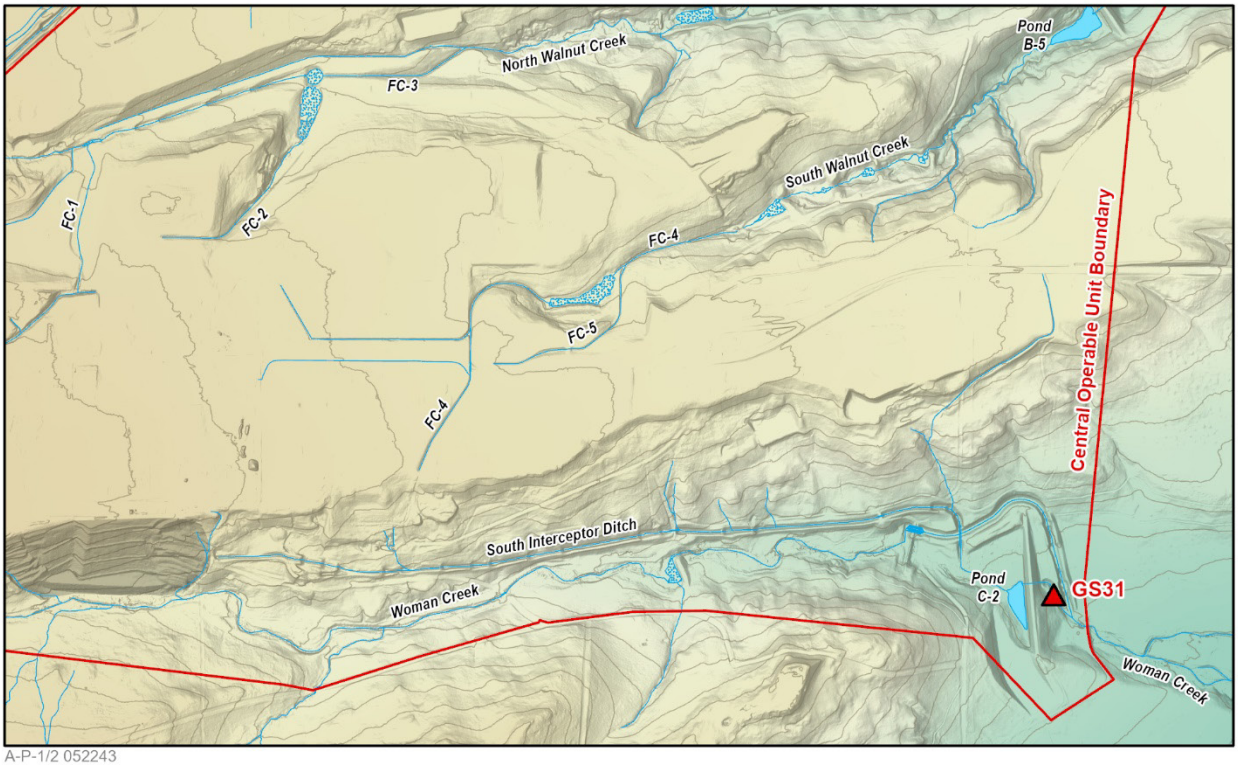


Figure 4. Storm-Event Monitoring Locations

6.1 Data Collection Protocols

Table 7 provides details on the instrumentation for GS31, currently the only storm-event monitoring location. Continuous flow/level data are collected using automated instrumentation (Table 8). Time-paced samples are collected during runoff events using automated 24-bottle

sequential samplers (Table 9). The flow meter 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 it 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 Location Details

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

Table 8. Storm-Event Field Data Collection Details

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

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

Location Code	Analytes
	Pu, Am, U, TSS
GS31	Storm-event time-paced sequential samples

Once the bottles have been filled, the bottles collected during the rising limb of the hydrograph will primarily be selected for the composite sample and submitted for analysis. Depending on the progress of the data collection under this objective, bottles for the falling limb of the hydrograph, 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, particularly if the entire rising limb was not sampled or if the South Interceptor Ditch was not flowing into Pond C-2). 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, and 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 documented.

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

7.0 CFP Composite Sampling to Evaluate Uranium Transport

This AMP monitoring 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 focused on North and South Walnut Creeks. Figure 5 shows uranium transport monitoring locations.

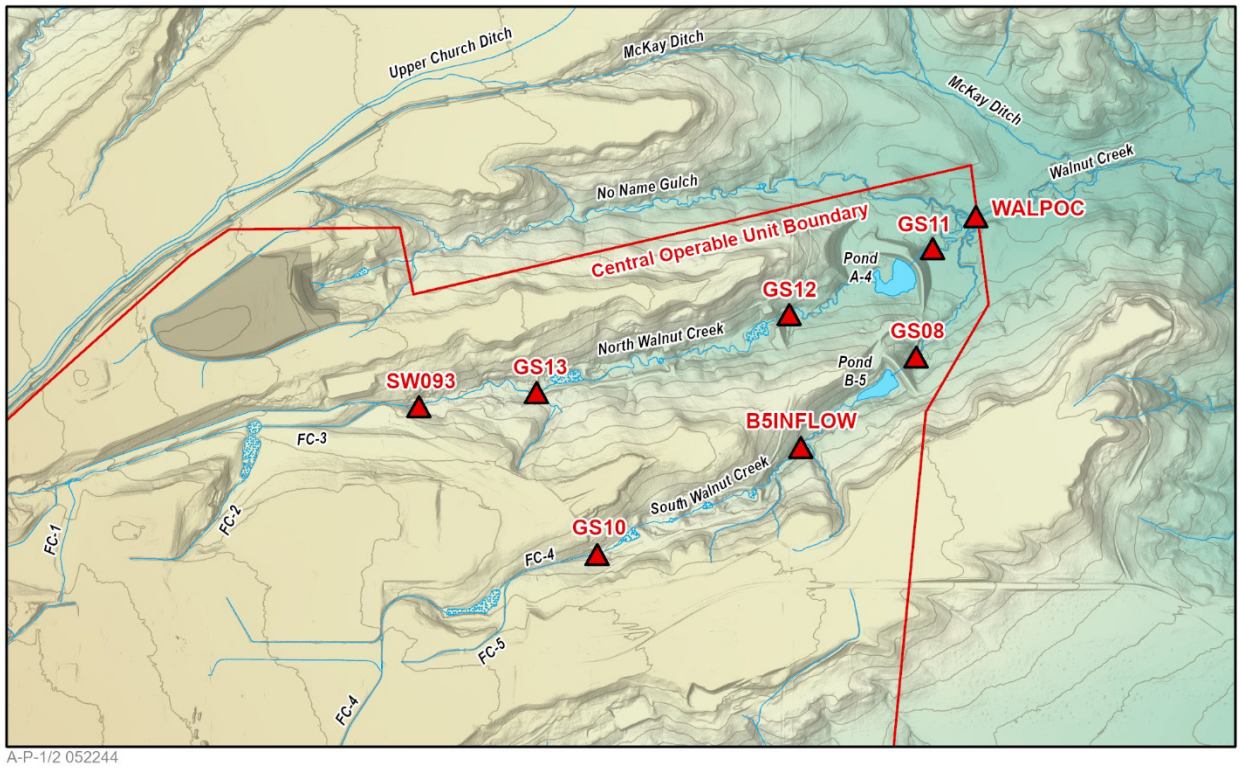


Figure 5. Uranium Transport Monitoring Locations: CFP Sampling

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 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 Details

Location Code	Location Description	Flow Measurement Device	Primary Monitoring Objective
B5INFLOW	South Walnut Creek upstream of Pond B-5	9-inch Parshall flume	AMP monitoring
GS08	Pond B-5 outlet	24-inch Parshall flume with weir insert	AMP monitoring
GS10	South Walnut Creek upstream of former B-series bypass	2.5-foot H flume	RFLMA POE monitoring
GS11	Pond A-4 outlet	24-inch Parshall flume with weir insert	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
SW093	North Walnut Creek 1300 feet upstream of A-series bypass	3-foot H flume	RFLMA POE monitoring
WALPOC	Walnut Creek at east COU boundary	3-foot HL flume	RFLMA POC monitoring

Table 11. Uranium CFP Field Data Collection Details

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

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

	WALPOC	GS08	GS10	GS11	GS12	GS13	B5INFLOW	SW093	Total Number of Samples
October	0	0	1	0	0	0	0	0	1
November	0	0	1	0	0	0	0	0	1
December	0	0	1	0	0	0	0	0	1
January	1	0	2	0	0	1	1	0	5
February	1	1	2	1	1	1	0	1	8
March	4	1	4	1	2	2	2	1	17
April	6	2	6	3	2	2	2	2	25
May	6	5	6	5	5	4	4	2	37
June	3	1	4	1	1	1	2	1	14
July	0	1	3	0	0	0	0	0	4
August	0	0	1	1	0	0	0	0	2
September	1	1	1	0	1	1	1	1	7
Annual Total	22	12	32	12	12	12	12	8	122

Notes:
The monthly sample distribution is based on expected water availability, which is 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 that for other years, targets will be exceeded; targets are based on an average hydrologic year.
Composite sample counts for WALPOC, GS10, and SW093 are based on the RFLMA targets.

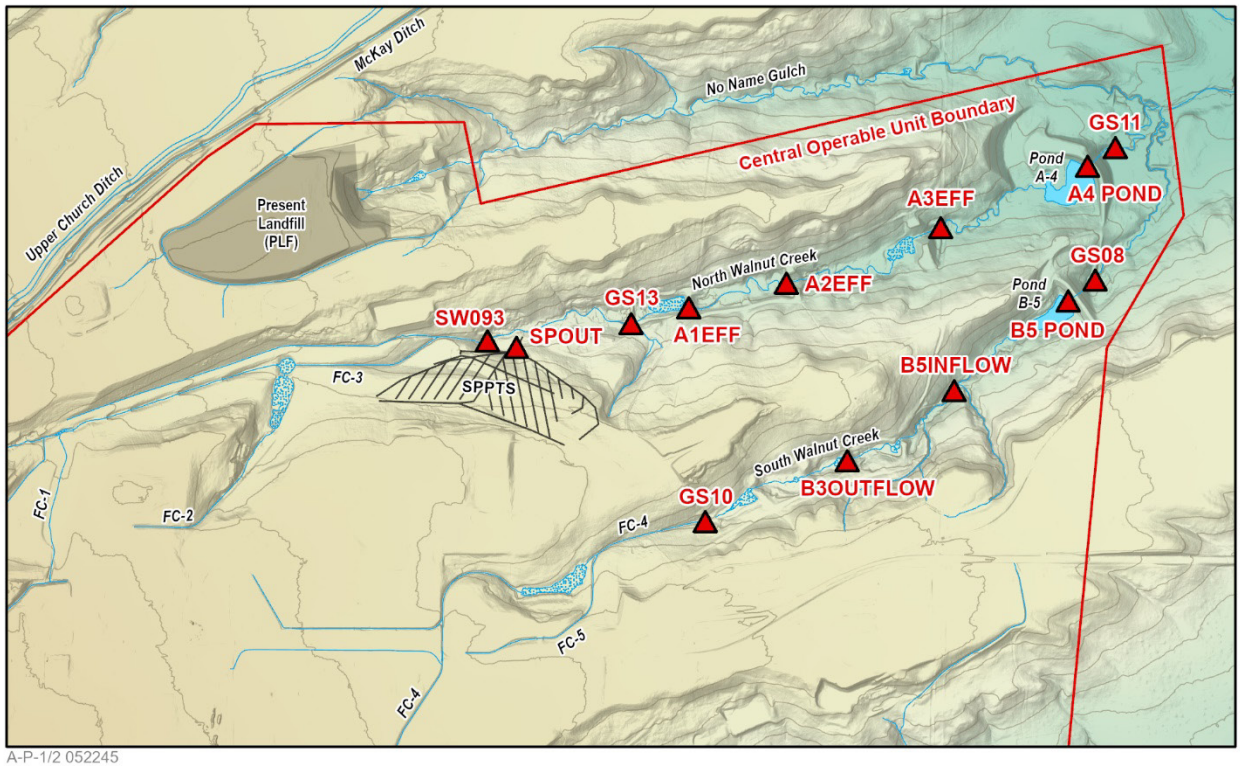
7.2 Data Evaluation

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

8.0 Grab Sampling for Uranium in North and South Walnut Creeks

Like the CFP composite sampling objective described in Section 7.0, this AMP monitoring objective is also intended to evaluate the transport of uranium in North and South Walnut Creeks by assessing correlations, patterns, variability, and loading. In addition, it is 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 they will be informative. Figure 6 shows the uranium grab sampling locations for this objective.



Notes:
The orange line shows the location of the A-series bypass pipeline. Location A3EFF is colocated with GS12 (A3EFF is the grab sampling location, while GS12 is the automated composite sampling location). Sampling at locations A4 POND and B5 POND was discontinued on October 31, 2015.

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 collected monthly from 11 of the 13 locations shown in Figure 6. It should be noted that sampling under this objective at GS11 and GS08 started on April 30, 2015 and that sampling under this objective at locations A4 POND and B5 POND was discontinued on October 31, 2015. When a particular location is not flowing, samples will not be collected, even if standing water is present.

Table 13. Uranium Grab Sampling Location Details

Location Code	Location Description	Primary Monitoring Objective
SW093	North Walnut Creek 1300 feet upstream of A-series bypass	AMP monitoring
SPOUT[a]	Effluent from SPPTS at the Interceptor Trench System sump metering vault	RFLMA treatment system 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
GS11	Pond A-4 outlet	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
GS08	Pond B-5 at approximate center of upstream dam face	AMP monitoring

Note:
[a] Data from SPPTS optimization samples at this location will also be used under this objective when analytical results are from contract laboratories and where collection and analytical methods are comparable.

Table 14. Uranium Grab Sampling Field Data Collection Details

Location Code	Flow Rate/Water Level	Telemetry
SW093	5-minute continuous (flow)	5-minute continuous flow rate
SPOUT	5-minute continuous (flow)	5-minute continuous flow rate
GS13	5-minute continuous (flow)	5-minute continuous flow rate
A1EFF	Not collected	Not collected
A2EFF	Not collected	Not collected
A3EFF	5-minute continuous (flow)	5-minute continuous flow rate
GS11	5-minute continuous (flow)	5-minute continuous flow rate
GS10	5-minute continuous (flow)	5-minute continuous flow rate
B3OUTFLOW	Not collected	Not collected
B5INFLOW	5-minute continuous (flow)	5-minute continuous flow rate
GS08	5-minute continuous (flow)	5-minute continuous flow rate

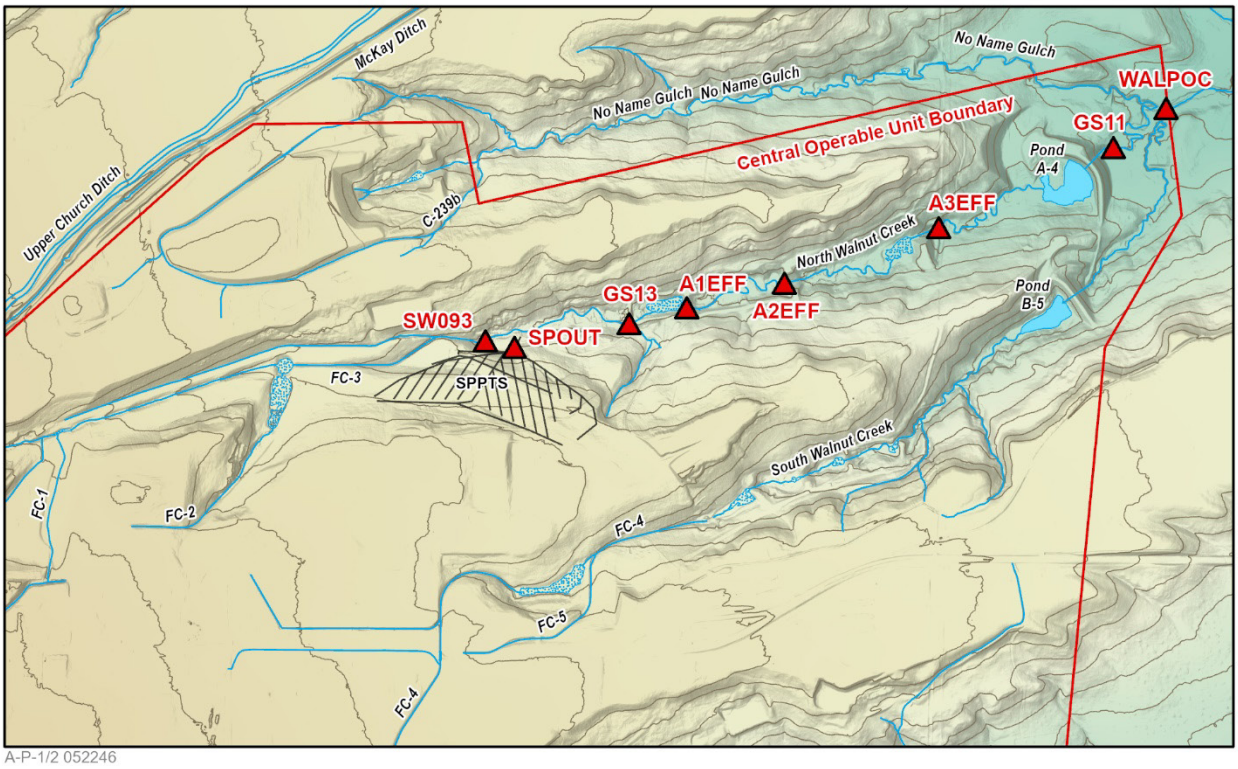
8.2 Data Evaluation

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

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

This AMP monitoring 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 shows nitrate grab sampling locations.



Note: Sampling location A4 POND was discontinued on October 31, 2015.

Figure 7. Nitrate 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 select locations (Table 16). Grab samples are collected semimonthly from eight of the nine locations shown in Figure 7. It should be noted that sampling under this objective at location A4 POND was discontinued on October 31, 2015. When a particular location is not flowing, samples will not be collected, even if standing water is present. Additional grab samples at GS11 and WALPOC will be collected at the start of each CFP composite at the targeted frequency given in Table 12.

Table 15. Nitrate Grab Sampling Locations Details

Location Code	Location Description	Primary Monitoring Objective
SW093	North Walnut Creek 1300 feet upstream of A-series bypass	AMP monitoring
SPOUT[a]	Effluent from SPPTS at the Interceptor Trench System sump metering vault	RFLMA treatment system monitoring
GS13	North Walnut Creek just upstream of A-series bypass	RFLMA performance 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
GS11	Pond B-5 outlet	AMP monitoring
WALPOC	Walnut Creek at East COU boundary	RFLMA POC monitoring

Notes:
Sampling location A4 POND was discontinued on October 31, 2015.
[a] Data from SPPTS optimization samples at this location will also be used under this objective when analytical results are from contract laboratories and where collection and analytical methods are comparable.

Table 16. Nitrate Grab Sampling Field Data Collection Details

Location Code	Flow Rate/Water Level	Telemetry
SW093	5-minute continuous (flow)	5-minute continuous flow rate
SPOUT	5-minute continuous (flow)	5-minute continuous flow rate
GS13	5-minute continuous (flow)	5-minute continuous flow rate
A1EFF	Not collected	Not collected
A2EFF	Not collected	Not collected
A3EFF	5-minute continuous (flow)	5-minute continuous flow rate
GS11	5-minute continuous (flow)	5-minute continuous flow rate
WALPOC	5-minute continuous (flow)	5-minute continuous flow rate

9.2 Data Evaluation

The transport of nitrate in North Walnut Creek 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 may change over time in response to the data collected, ongoing evaluation results, and recommendations of the AMP participants.

10.0 References

CDPHE (Colorado Department of Public Health and Environment), DOE (U.S. Department of Energy), and EPA (U.S. Environmental Protection Agency), 2007. *Rocky Flats Legacy Management Agreement*, executed on March 14, Attachment 2 updated December 2018.

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