Clarks Fork Yellowstone Watershed Project, Water Chemistry 2022

Sampling and Analysis Plan (SAP)
June 2022
WQDMASSAP-34

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ACRONYMS

AU	Assessment Unit
CFYP	Clarks Fork Yellowstone Partnership
DEQ	Department of Environmental Quality
DO	Dissolved Oxygen
DOC	Dissolved organic carbon
DQI	Data quality indicators
EDD	Electronic data deliverables
EPA	Environmental Protection Agency
HUC	Hydrologic Unit Code
LQAP	Laboratory Quality Assurance Program
MT-eWQX	Montana EQUIS Water Quality Exchange Database
NELAC	National Environmental Laboratory Accreditation Conference
QA	Quality assurance
QAPP	Quality Assurance Project Plan
QC	Quality control
SAP	Sampling and Analysis Plan
SOP	Standard Operating Procedures
SVC	Site visit code
SVF	Site visit form
TMDL	Total maximum daily load
TSS	Total dissolved solids
ULL	Ultra-low level
WQPB	Water Quality Planning Bureau

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1.0 Introduction

This section provides background information and context to clarify the motivations for the project and explains the problem statement or need that the monitoring described throughout this Sampling and Analysis Plant (SAP) will support.

1.1 Problem Definition and Project Background

In 2022, the Montana Department of Environmental Quality (DEQ) initiated the water quality planning process for the Clarks Fork Yellowstone Watershed. This will include water quality monitoring and assessment, source assessment, and total maximum daily load (TMDL) monitoring and development on the mainstem of the Clarks Fork Yellowstone River and tributaries within the watershed to address the objectives stated in the Project Plan (DEQ, 2022).

1.2 Project Area

The Clarks Fork Yellowstone Watershed project area encompasses the Clarks Fork Yellowstone River from the Wyoming border to the Yellowstone River confluence and contributing tributaries (**Figure 1**) and coincides with the 10070006 Hydrologic Unit Code (HUC). **Section 1.2** of the Clarks Fork Yellowstone Watershed Project Plan (DEQ, 2022) provides additional information on project area.

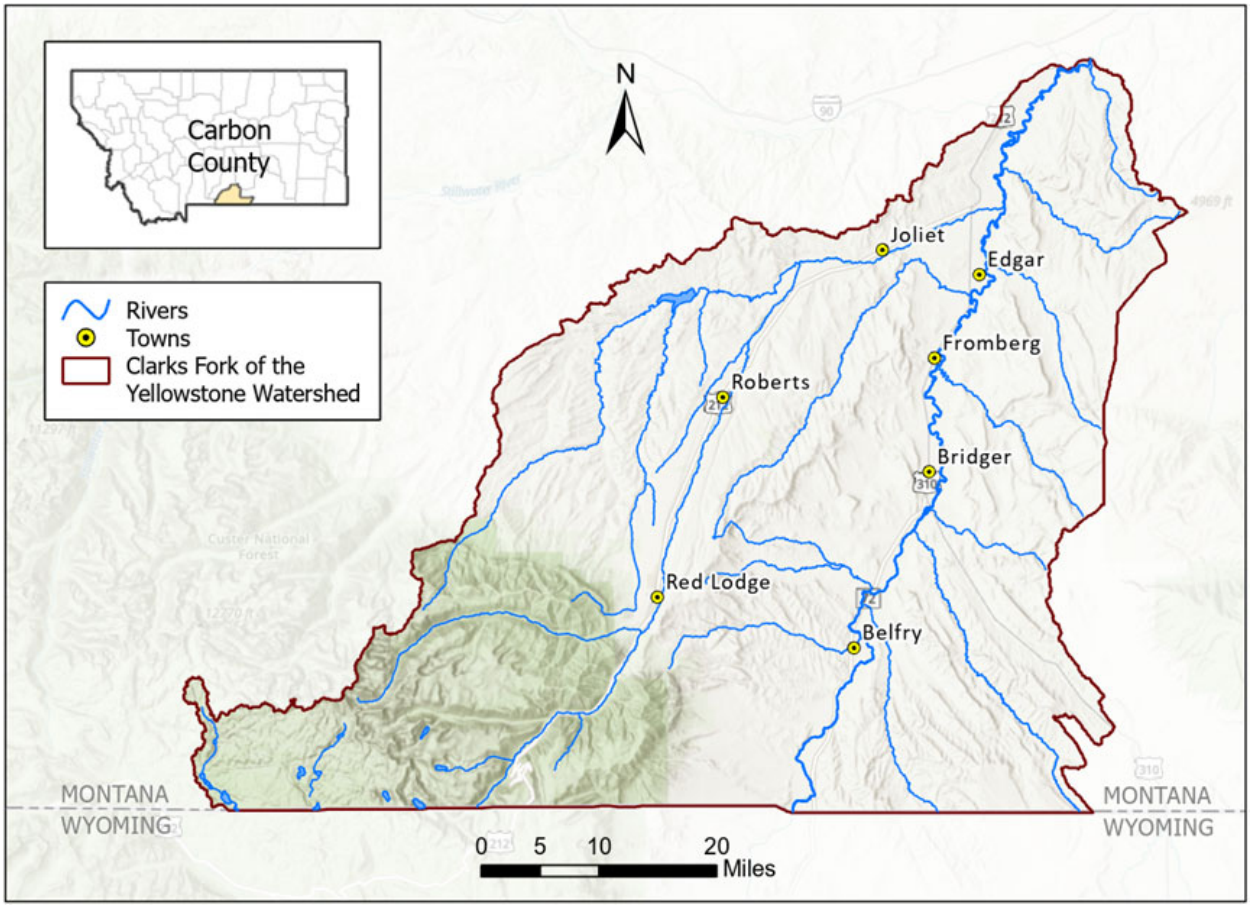

Figure 1. Clarks Fork Yellowstone Watershed Project Area

2.0 OBJECTIVES AND SAMPLING DESIGN

This section states the project's objectives, describes key elements of the sampling design such as monitoring locations and the timing of monitoring events, and outlines information about each parameter that will be monitored.

2.1 MONITORING OBJECTIVES

In 2022, assessment units (AU) within the watershed will be sampled at a minimum of two sites. Each site will be sampled five times throughout the year for water chemistry from June through October. This timeframe should represent samples from runoff, growing season, and baseflow. Sediment metals will be sampled once at each site in late summer or early fall. Water chemistry and sediment chemistry parameters that will be collected are provided in **Table 3**. Other field parameters such as temperature, conductivity, pH, and dissolved oxygen (DO) will be measured *in situ* during each site visit.

Table 1. Project goals and monitoring objectives.

Goal	Objective
To assess current water quality conditions in the Clarks Fork Yellowstone watershed.	To collect nutrients and metals samples in the Clarks Fork Yellowstone watershed from June to October (i.e., runoff, baseflow, and growing season).
	To measure physical parameters with a YSI meter (temperature (°C), dissolved oxygen (mg/l), pH, specific conductivity (µS/cm), and barometric pressure (mmHg)) *in situ* in the Clarks Fork Yellowstone watershed from June to October.
	To measure stream flows during sampling events to calculate discharge and pollutant loads.
	To collect TSS in the Clarks Fork Yellowstone watershed from June to October (i.e., runoff, baseflow, and growing season).

2.2 SAMPLING DESIGN

Sampling design for the Clarks Fork Yellowstone project will follow beneficial use assessment, metals assessment, and nutrient assessment requirements and may help identify sources for TMDL development and restoration planning. A streamlined risk assessment was completed to determine which assessment units and waterbodies to monitor (DEQ, 2022). In 2022, all rivers and streams currently listed as impaired, assessed, or previously monitored will be monitored for water and sediment chemistry. North Fork Dry Creek and South Fork Dry Creek will be monitored due to being the main tributaries to Dry Creek. Assessment units will each have a minimum of two sample sites to meet minimum data requirements for assessments and sites are selected to be representative of water quality condition. In future years of monitoring, sites may be selected for more robust source assessment efforts.

2.3 MONITORING LOCATIONS

A total of 53 sites will be sampled in 2022 within the Clarks Fork Yellowstone Watershed. **Figures 2 and 3** provide general site locations and **Appendix A** lists monitoring locations, parameters to be collected,

and rationale for site selection. Sites are located where there are changes in land use, mouths of tributaries, above or below sources, and above or below confluences of contributing tributaries to assist in identifying sources throughout the watershed. Where possible, sites are located outside of areas of mixing with tributaries or discrete sources.

Sites are located on public and private land. Permission to access any privately owned site locations will be obtained from the appropriate landowners before sampling. If permission is not obtained the site may be moved or abandoned for this sampling event.

Field personnel will locate the sites with GPS assistance as well as directional notes. Once at a site, field personnel will follow the guidelines in the Sample Collection for Chemistry: Water, Sediment, and Biological Tissue Standard Operating Procedure (SOP) to choose the exact location to collect the samples (Section 7.2, Makarowski, 2019).

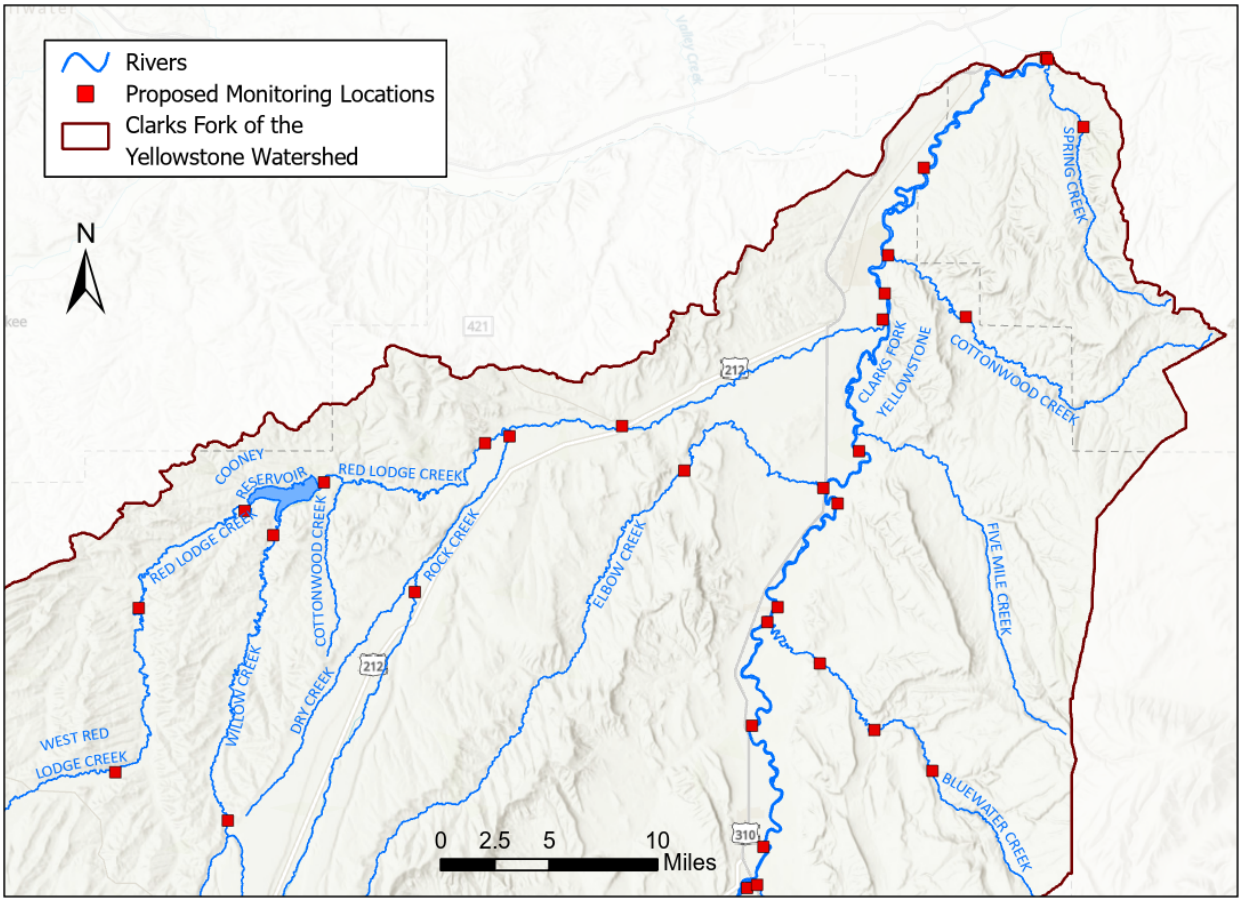

Figure 2. Monitoring site locations in the north section of the watershed.

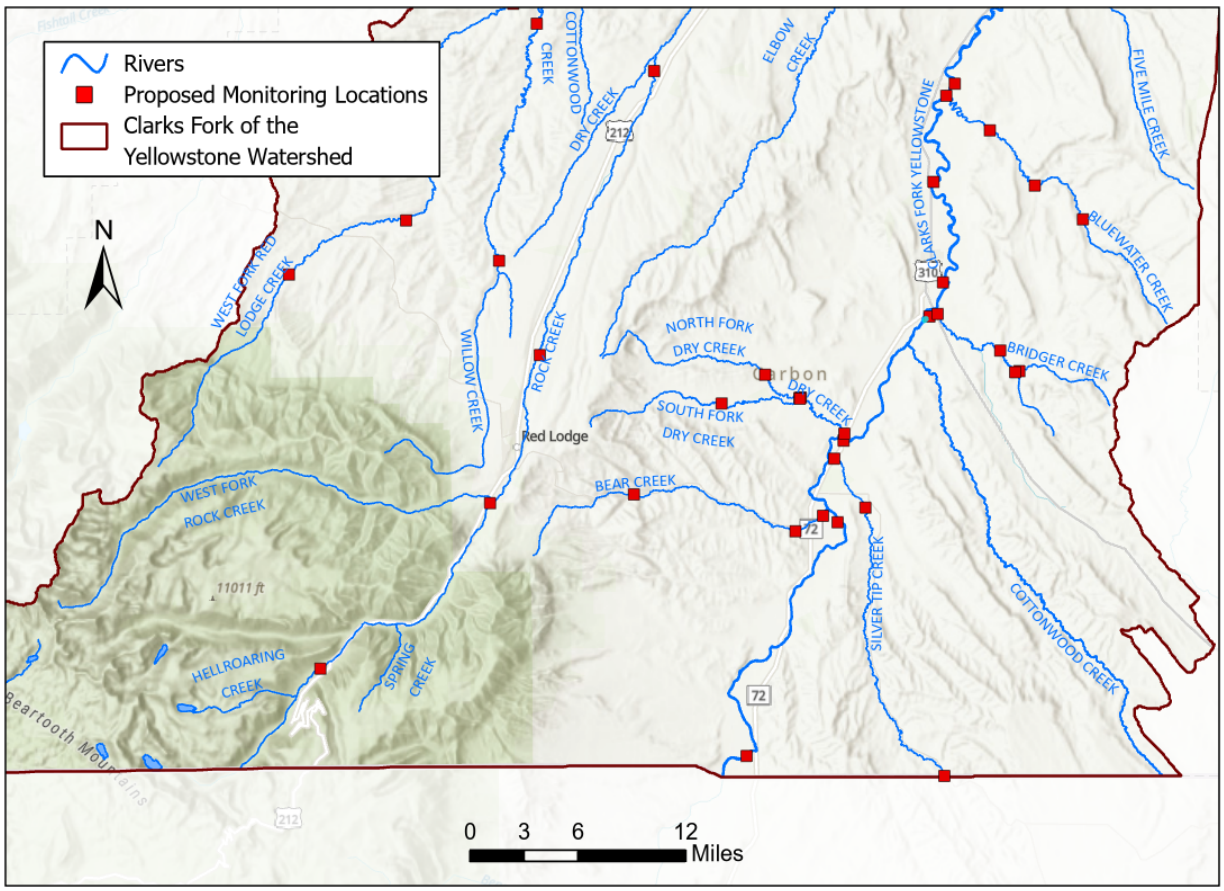

Figure 3. Monitoring site locations in the south section of the watershed.

2.4 Monitoring Timeframe and Schedule

Sampling timeframes were selected to characterize hydrograph-water quality conditions, to meet assessment method requirements, and to aid source assessment. Water column sampling will occur five times at all sites to capture runoff flows (June sampling) and baseflows (July, August, September, and October sampling). Sediment chemistry sampling will occur once at all sites during baseflows (August/September sampling). Flow will occur at all wadable sites during each sampling event. *In situ* measurements will occur at all sites during each monitoring event. Each sampling event will be at least two weeks apart (**Table 2**) due to requirements from Assessment Methodology for Determining Wadeable Stream Impairment Due to Excess Nitrogen and Phosphorus Levels (Suplee and Sada, 2016).

Table 2. Monitoring Schedule

Date of Sampling Event	Rationale for Timing/Frequency	Parameters
Runoff Flow (Late June)	To collect runoff flow samples	TSS, Nutrients, DOC, Total Recoverable Metals, ULL Mercury, Hardness, *In Situ* Measurements, and Flow
Summer Baseflow (July)	To collect baseflow samples during the growing season	TSS, Nutrients, DOC, Total Recoverable Metals, ULL Mercury, Hardness, *In Situ* Measurements, and Flow

Date of Sampling Event	Rationale for Timing/Frequency	Parameters
Summer Baseflow (August)	To collect baseflow samples during the growing season	TSS, Nutrients, DOC, Total Recoverable Metals, ULL Mercury, Hardness, *In Situ* Measurements, and Flow
Summer Baseflow (September)	To collect baseflow samples during the growing season	TSS, Nutrients, DOC, Total Recoverable Metals, ULL Mercury, Hardness, *In Situ* Measurements, and Flow
Fall Baseflow (October)	To collect baseflow sample during cooler weather	TSS, Nutrients, DOC, Total Recoverable Metals, ULL Mercury, Hardness, *In Situ* Measurements, and Flow

2.5 PARAMETERS

Table 3. Water quality parameters to be collected in 2022 during each site visit.

Parameter or Data Type	Collection Approach	Justification for Collecting
Nutrients (TN, TP, NO_{2+3}, NH_{3+4}, and SRP)	Measured via water samples and analyzed by a lab.	DEQ's nutrient assessment method is based on best available science for TN and TP. NO_{2+3}, NH_{3+4}, and SRP help determine pollutant sources, pathways, and biological availability.
Common Cations and Hardness (Ca and Mg)	Measured via water samples and analyzed by a lab.	Common cations generally reflect natural geology and buffer capacity. Calcium and Magnesium are used to calculate hardness. Hardness is necessary to calculate several metals' water quality standards which are hardness dependent.
Total Dissolved Solids (TSS)	Measured via water samples and analyzed by a lab.	TSS is used to help understand nonpoint source erosion and sources of pollutants.
Dissolved Metals (Al)	Measured via water samples and analyzed by a lab.	Dissolved aluminum values will be used for assessment purposes due to the water quality standard for aluminum representing the dissolved fraction.
Total Recoverable Metals (As, Cd, Cr, Cu, Fe, Pb, Se, Ag, and Zn)	Measured via water samples and analyzed by a lab.	Total recoverable metals include dissolved and particulate metals in ambient water. Results are compared to Montana's water quality standards and are used for assessment.
Ultra-Low Level Mercury (ULL Mercury)	Measured via water samples and analyzed by a lab.	Ultra-low level mercury results are compared to Montana's numeric water quality standards and are used for assessment.
Dissolved Organic Carbon (DOC)	Measured via water samples and analyzed by a lab.	DOC may increase or decrease the bioavailability of certain metals.
Sediment Metals (As, Cd, Cr, Cu, Fe, Pb, Hg, and Zn)	Measured via sediment samples and analyzed by a lab.	Sediment metals help identify potential metal toxics that may not be detected in ambient water quality samples.

3.0 PROJECT TEAM AND RESPONSIBILITIES

The Water Quality Monitoring and Assessment Section will conduct this project with assistance from the Clarks Fork Yellowstone Partnership in 2022. **Table 4** provides project team roles and responsibilities.

Table 4. Project Team Roles and Responsibilities

Individuals	Affiliation	Roles	Responsibilities
Abbie Ebert	DEQ	Project Lead	Develops project and oversees field sampling efforts. Coordinates with lab on bottle orders. Main contact for seasonal staff.
Darrin Kron	DEQ	Section Supervisor	Oversees project development.
Ryan Koehnlein	DEQ	Equipment Technician	Oversees equipment and supplies preparation. Coordinates sample delivery with field personnel and project lead.
Seasonal Staff	DEQ	Field Personnel	Prepare equipment and supplies for each field sampling trip, collect field data, and accurately record field information on appropriate field forms. Coordinate sample bottle drop off and pick up with CFYP.
Deanna Tarum	DEQ	Database manager	Enter data into the MT e-WQX database.
Katie Makarowski	DEQ	Quality Assurance Officer	Reviews and approves the SAP.
John Wheaton and Jim Stevenson	Clarks Fork Yellowstone Partnership (CFYP)	External Partners	Collect field data at a select number of sites and accurately record field information on appropriate field forms on assigned sites.

4.0 FIELD PROCEDURES

This section cites or describes each field procedure that will be applied while collecting data during this project and references the field forms that will be used to record data and sample collection activities.

4.1 ORDER OF OPERATIONS

Prior to each sampling event, the project manager, equipment technician, and field personnel will prepare equipment and field supplies required for that trip. Appropriate monthly maintenance and calibrations on the field meter will occur prior to sampling. Field vehicles will be packed with all necessary equipment and supplies. **Appendix B** provides a field equipment and supply list.

After equipment and supplies have been packed, field crews will navigate to the sites as described by the SAP and additional information provided by the project manager. Upon arrival at the site, the field crew will perform the activities that are most sensitive to disturbance first:

- Clean Hands/Dirty Hands ULL Mercury
- Filtered Samples
- Unfiltered Samples
- In situ Measurements (field meter)
- Sediment sampling (once during baseflow)
- Flow Measurement
- Photos
- Wader and equipment decontamination

Before leaving the site, field personnel will ensure all items are packed into the vehicle and all information is recorded correctly on the bottle labels and Site Visit Form.

When field crews return from the field, they will unpack field vehicles and place equipment and supplies in the proper place. Samples shall be placed in a DEQ storage fridge or freezer until delivery to the lab. Field samples will be hand delivered to Energy Laboratory in Helena, MT.

4.2 FIELD FORMS AND SAMPLE LABELS

DEQ's field form and sample label system (Makarowski, 2020) will be followed for this project. All data collection and field activities conducted during a site visit will be recorded on a site visit form (SVF). The SVF will serve as a chain of custody form for any samples that are collected for analysis by an analytical laboratory. A unique site visit code (SVC) will be affixed to each individual SVF, and each field form and routine sample produced during the site visit will be labeled with that same SVC. Separate SVFs and SVCs will be used for additional sets of samples collected during the site visit (i.e., duplicate and blank samples).

All field forms should be printed on water resistant all-weather paper and filled out using pencil (preferable) or permanent fine-line marker. The field forms used during this project are included in **Appendix A** and include:

- Site Visit Form
- Discharge Form

Prior to collecting samples at each site, all sample containers will be labeled, at a minimum, with the SVC, waterbody name, date, and personnel performing the sampling, as well as any other information requested on the label (filtration, transect number, method type). Labels will be filled out with pencil or permanent fine-point marker, affixed to the sample container and covered completely with clear plastic tape to protect the label from being damaged during storage.

All field forms must be reviewed by the field crew prior to departure from each site to verify completeness and accuracy. Field forms will be reviewed by the project manager prior to sample delivery and submitted to the database specialist for entry.

4.3 DATA COLLECTION PROCEDURES

This section describes the field sampling methods for this project. Sections include decontamination procedures, water and sediment sampling, instantaneous measurements, flow measurements, and photo collection.

4.3.1 Decontamination Procedures

Field personnel will visit sites from upstream to downstream when possible in accordance with the Aquatic Invasive Species Decontamination SOP (McWilliams and Esquivel, 2020). At tributary sites or if sites are visited downstream to upstream, field gear (i.e., waders) must be decontaminated following the procedures in Section 10.2.2 - Decontaminating in the Field of McWilliam and Esquivel (2020).

A telescopic pole may be used when accessing the water is either difficult or unsafe for field personnel to approach the proper depth for water chemistry collection. The pole will be decontaminated between sites using hydrochloric acid and deionized water rinsing following the Field Equipment Decontamination SOP (McCarthy, 2014).

4.3.2 Water and Sediment Sampling

Water chemistry samples will be collected via the Sample Collection for Chemistry Analysis: Water, Sediment, and Biological Tissue SOP (Makarowski, 2019) following sections: 10.2.1 Unfiltered Grab Samples, 10.2.2 Filtered Grab Samples, 10.2.3 Clean Hands/Dirty Hands Method, 10.25 Extension (Telescopic) Pole Sampler. Sediment metals samples will be collected using procedures described in sections 10.31 Benthic Sediment Sampling Strategy, and 10.3.5 Processing Benthic Sediment for Inorganic Analyses with Buchner Funnel (Makarowski, 2019).

4.3.3 Instantaneous *in situ* Measurements

Water temperature, pH, specific conductivity, and dissolved oxygen will be collected at each site using a multiparameter sonde. DEQ field personnel will use a YSI Pro Quatro multiparameter sonde during each monitoring event. The CFYP will use a YSI EXO1 multiparameter sonde during each monitoring event. Once the values have stabilized, measurements will be recorded on the SVF before leaving the site. All meter use, maintenance, and calibrations will follow the Instantaneous Field Meter SOP (McWilliams, 2020a). A field thermometer will be placed in a shaded area with sufficient air circulation and allowed to stabilize for approximately 15 minutes, then an air temperature measurement (°C) will be recorded on the SVF.

4.3.4 Flow Measurements

Flow will be measured on wadable streams by following procedures listed in Section 10 - Procedural Steps of the Total Discharge SOP (McWilliams, 2020). If discharged is needed on unwadeable rivers and streams, the project manager will download flow data from nearby USGS gages.

Table 5. USGS gauging stations in relation to sampling site locations.

Site Name and Description	Station ID	Gauging Station	Latitude	Longitude
Clarks Fork Yellowstone River at Chance Rd crossing		USGS 06207500 Clarks Fork Yellowstone River near Belfry, MT	45.0099111	-109.0653667

Site Name and Description	Station ID	Gauging Station	Latitude	Longitude
Clarks Fork Yellowstone River at E Pryor Rd	Y05CLFYR01	USGS 06208500 Clarks Fork Yellowstone River at Edgar MT	45.4657139	-108.8441056
Red Lodge Creek upstream of Cooney Reservoir		USGS 06211000 Red Lodge Creek above Cooney Reservoir near Boyd, MT	45.4378500	-109.2533111
Willow Creek near mouth	Y05WILOC90	USGS 06211500 Willow Creek near Boyd, MT	45.4221472	-109.2305306

4.3.5 Photos

Field personnel will take photos at each site when visited. A minimum of three photos will be taken facing upstream, downstream, and across the waterbody. The photo number and pertinent transect information will be recorded for each photo on the back of the SVF.

4.4 Changes to the Field Sampling Plan

As conditions in the field may vary, it may become necessary to implement minor modifications to sampling as presented in this plan. Field personnel will clearly document any modifications made to the approved plan and will communicate these modifications, preferably before or as soon as possible after, with the project leader. If, for any reason, field staff feel that conditions are unsafe for collecting samples (e.g., swift waters, weather or ice conditions, flooding, other site hazards) they are not to collect the samples. Field personnel will make reasonable effort to reschedule any missed sampling events in consultation with the project leader, or to replace samples that are lost or broken during the sampling event. If field personnel suspect that an instrument is malfunctioning or giving inaccurate readings, they will add a comment to the site visit form explaining the issue and will communicate the issue to the project leader and equipment technician. Project leaders will acknowledge modifications in year-end project reports.

4.5 Field Health and Safety Procedures

Field personnel will carry first aid kits with them during each sampling trip. Field personnel will wear personal protective equipment as appropriate, including but not limited to nitrile gloves, eye protection, wading belts, and personal floatation devices. First aid and CPR training is recommended for all field personnel. Chemical safety precautions will be taken in accordance with chemical safety data sheets. Field personnel will adhere to DEQ's Fieldwork and Emergency Response System (Kron *et al*., 2020). Field personnel will be required to adhere to all safety precautions related to driving, including following traffic regulations, avoiding driving while tired, and selecting appropriate vehicles for anticipated driving conditions. Safety measures will be taken when working in and around water, including wearing wading belts and using approved alternate sampling techniques during excessive flow conditions.

5.0 Sample Handling and Laboratory Analysis

This section contains information pertaining to sample handling, chain of custody, and laboratory analysis.

5.1 SAMPLE HANDLING AND DELIVERY

In the field, samples will be stored according to the preservation requirements shown in **Table 5**. Care will be taken to maintain appropriate temperatures (e.g., adequate air circulation or ice supply), and coolers will be drained frequently to avoid contamination from melted ice. Storage time between sample collection and delivery to the lab will be minimized and samples will be received by the lab within the holding times specified in **Table 5**.

Samples will preferably be delivered by hand to Energy Laboratory in Helena, MT. If samples must be shipped, the method of delivery (USPS, FedEx, or UPS) will be indicated on the site visit form and packing instructions provided by the lab will be followed. Upon delivery of samples at the laboratory, DEQ will keep the original site visit forms with chain of custody signatures in place and the laboratory will keep a photocopy.

5.2 CHAIN OF CUSTODY

A record of chain of custody will be maintained for each sample collected during this project so that physical possession is tracked at all points from sample collection through laboratory analysis. The chain of custody section of each site visit form will be used to record signatures, dates, and times when samples are relinquished and received during transfers among people including laboratory staff. If samples are shipped, custody seals will be used on the shipping container to ensure that custody is maintained and that samples are not tampered with while in transit.

5.3 LABORATORY ANALYTICAL REQUIREMENTS

Table 6 shows the laboratory analytical requirements for each analyte included in this project. For this project samples will be analyzed by Energy Laboratory in Helena, MT.

Table 6. Monitoring Parameter Suite, Sample Handling, Analysis & Preservation

Parameter	**Required Method**	**Required Reporting Limit** (µg/L unless noted otherwise)	**Holding Time** (days unless noted otherwise)	**Container**	**Preservative**
Water Sample – Physical Parameters and Miscellaneous					
Total Suspended Solids (TSS)	A2540 D	4000	7	1000 ml HDPE	None, then place on ice (≤6°C)
Dissolved Organic Carbon (DOC)	A5310 B	500	28	125 ml amber glass	H_3PO_4; field filter 0.45 µm; ≤6° on ice
Water Sample – Nutrients					
Total Persulfate Nitrogen (TN)	A4500-N C	40	28	250 ml HDPE	≤6°C on ice
Total Phosphorus as P	EPA 365.1	3	28	250 ml HDPE	H_2SO_4; ≤6°C on ice

Parameter	Required Method	Required Reporting Limit (µg/L unless noted otherwise)	Holding Time (days unless noted otherwise)	Container	Preservative
Nitrate-Nitrite as N	EPA 353.2	10			
Total Ammonia as N	EPA 350.1	50			
Dissolved Orthophosphate	EPA 365.1	1	45*	250 ml HDPE	Field filter 0.45 µm; freeze
Water Sample – Total Recoverable Metals, Common Ions, and Hardness					
Total Recoverable Metals Digestion	EPA 200.2	N/A	180	250 ml HDPE	HNO_3; ≤6°C on ice
Aluminum	EPA 200.7	30			
Arsenic	EPA 200.8	1			
Cadmium	EPA 200.8	0.03			
Calcium	EPA 200.7	1000			
Chromium	EPA 200.8	1			
Copper	EPA 200.8	1			
Iron	EPA 200.7	20			
Lead	EPA 200.8	0.3			
Magnesium	EPA 200.7	1000			
Selenium	EPA 200.8	1			
Silver	EPA 200.8	0.2			
Zinc	EPA 200.7	8			
Mercury, Ultra-low level	EPA 245.7	0.005	90	125 ml Glass	HCl; ≤6°C on ice
Hardness	A2340 B (Calculated)	1000	-	-	-
Water Sample – Dissolved Metals					
Aluminum	EPA 200.7	9	180	250 ml HDPE	Field filter only 180 ml through a 0.45 µm; HNO_3; ≤6°C on ice
Arsenic	EPA 200.8	1			
Iron	EPA 200.7	20			
Sediment Sample – Total Recoverable Metals					
Arsenic	EPA 200.8	1 mg/kg dry weight	180	2000 ml HDPE, wide mouth	≤6°C on ice
Cadmium	EPA 200.8	0.2 mg/kg dry weight			

Parameter	**Required Method**	**Required Reporting Limit** (µg/L unless noted otherwise)	**Holding Time** (days unless noted otherwise)	**Container**	**Preservative**
Chromium	EPA 200.8	9 mg/kg dry weight			
Copper	EPA 200.8	15 mg/kg dry weight			
Iron	EPA 200.7	10 mg/kg dry weight			
Lead	EPA 200.8	5 mg/kg dry weight			
Zinc	EPA 200.7	20 mg/kg dry weight			
Mercury	EPA 7471B	0.05 mg/kg dry weight	28	2000 ml HDPE wide mouth	≤6°C on ice
Sediment Metals Digestion	A2340 B (Calculated)	1000	-	-	-

* SRP samples must be frozen to extend the holding time to 45 days when sample delivery will exceed the 2-day holding time allowed for unfrozen samples.

6.0 Quality Assurance and Quality Control (QA/QC)

This section describes the quality assurance and quality control elements applicable to this project.

6.1 Training and Qualifications

Before sampling commences, all field personnel conducting monitoring for this project will receive training from experienced professionals. The CFYP volunteers will receive a local training prior to the first monitoring event from the project manager. Each participant will be provided with a copy of this SAP, applicable SOPs, and field forms, will be required to review them, and must keep these copies with them in the field during all sampling events for reference. Whenever feasible, an experienced professional will accompany inexperienced staff or volunteers during initial sampling events until each field personnel demonstrates proficiency. If mistakes are identified throughout the sampling period, efforts will be made to provide supplemental training and clarify guidance documents to prevent further issues, and these corrective actions will be revisited during a "Lessons Learned" review period.

6.2 Instrument Calibration and Maintenance

Instantaneous field meters will be used during each sampling event. Field staff and John Wheaton with CFYP will complete maintenance and calibrations monthly and follow DEQ's SOP for Instantaneous Water Quality Field Meters (McWilliams 2020).

6.3 DATA QUALITY INDICATORS

Data quality indicators (DQIs) are attributes of samples that allow data users to assess data quality. DQI requirements for this project will follow **Section 1.8.3** in the Quality Assurance Project Plan for Water Quality Planning Bureau Environmental Data Operations (DEQ, 2022).

6.3.1 Field Duplicates

Field duplicates are two samples of ambient water (i.e., a routine sample and a duplicate or replicate sample) collected from a waterbody as close as possible to the same time and place by the same person and carried through identical sampling and analytical procedures. Field duplicate samples are labeled, collected, handled and stored in the same way as the routine samples and are sent to the laboratory at the same time.

Field duplicates will be submitted to the analytical lab for each water sample parameter monitored for this project at a rate of at least 10% of the total number of routine samples collected per batch of samples delivered to the laboratory (**Table 7**). Duplicates may be collected at any of the monitoring locations in **Appendix A**. Analytical requirements for field duplicates are shown in **Table 6**.

Table 7. Number of duplicates per trip

Number of Duplicates per Analyte Types and Sampling Trips					
	June	July	August	September	October
Nutrients and TSS	5	6	5	5	5
TR and Dissolved Metals	5	6	5	5	5
Ultra-Low Level Mercury	2	2	2	2	2
Sediment Metals	N/A	N/A	2	3	N/A

6.3.2 Field Blanks

Field blanks are samples of analyte-free, laboratory-grade deionized water poured into a sample container in the field using the same method, container, and preservation as routine samples, and shipped to the lab along with other field (i.e., routine and duplicate) samples. All labeling, rinsing, preservation, and storage requirements applied for routine and duplicate samples are applied to field blanks; the only difference is that the water is deionized water rather than ambient stream water.

One set of field blanks (one blank per analyte) will be submitted with each batch of samples delivered to the laboratory. Field blanks must be prepared while in the field. Field blanks will be prepared at or near the end of each sampling event and submitted to the laboratory alongside the other routine and duplicate samples from that trip. Analytical requirements for blanks are shown in **Table 6**.

6.3.3 Trip Blanks

Trip blanks are provided by the laboratory for certain parameters that are especially sensitive to exposure to the atmosphere such as ultra-low level mercury. Trip blanks are samples of analyte-free, laboratory-grade deionized water prepared by analytical laboratory staff, carried through the sampling event and stored alongside other samples but not opened, and resubmitted to the laboratory alongside

other samples. One ultra-low level mercury trip blank will be submitted with each batch of samples delivered to the laboratory.

6.3.4 Result Qualifiers

Result qualifiers approved for use in this project are specified in the most current MT-eWQX EDD Guidance available on the Water Quality Planning Bureau's WQX webpage: https://deq.mt.gov/water/Programs/sw.

6.4 Laboratory Quality Control

Analytical laboratories shall prepare and analyze the samples in accordance with the chain of custody forms and the methods specified in the analytical requirement table in Section 5 **(Table 6)**. Laboratory standard operating procedures (SOPs) must be controlled under a Laboratory Quality Assurance Program (LQAP) with sufficient rigor for the lab facility to hold a current certification under the State of Montana/EPA Region 8 drinking water certification and/or National Environmental Laboratory Accreditation Conference (NELAC) program. Results from laboratory QC samples (e.g., instrument blanks, method blanks, laboratory control samples, sample matrix spikes) are submitted with the laboratory data report.

7.0 Data Management and Record Keeping

This section describes the process for managing data and maintaining records associated with this monitoring project.

7.1 Data Review and Validation

All data produced by this project will be managed via the Water Quality Planning Bureau (WQPB) data management and quality control system prior to release to project staff for data use and decision making. The WQPB data flow process is summarized in DEQ's Field Data Collection Activities SOP (Makarowski, 2020) and entails receipt of Electronic Data Deliverables (EDDs) from laboratories, merging analytical results with station information and field parameters for each site visit to create a complete data package, quality control review of the entire data package, validating and uploading data into DEQ's EQuIS Water Quality Exchange database (MT-eWQX), and archiving data and records.

The database manager or data technician will verify station information and assign station IDs. EDDs received from the analytical laboratories will undergo QC review by data management staff and will be shared with project leaders for additional quality review in a timely manner to ensure that the analytical results are meeting requirements specified in the project QAPP and SAP. All site visit forms, and other field forms will undergo a quality control review by field personnel prior to departure from each site to verify completeness and accuracy. Forms undergo further quality review throughout the data flow process.

The data management and quality assurance team will produce a QA Oversight & Evaluation report to summarize result qualifiers and other QC issues that may affect the usability of analytical results received from the laboratory. The project manager will document any notable deviations from this SAP and will highlight any QC issues identified during the project, as well as corrective actions, in a year-end review document for the project.

7.2 Data Management

All site information, field measurements and analytical results from laboratories for this project will be uploaded into DEQ's EQuIS Water Quality Exchange database (MT-eWQX). Data uploaded to MT-eWQX is submitted to EPA's National WQX Warehouse and accessible via the Water Quality Portal. All data submitted to DEQ for this project from analytical laboratories and others must adhere to the most current EDD and submittal requirements published in the MT-eWQX EDD Guidance available on the Water Quality Planning Bureau's WQX webpage: https://deq.mt.gov/water/Programs/sw.

All raw electronic files, including EDDs, data logger files, and other, will be retained indefinitely on DEQ's server within the WQPB field season data archive and on the annual WQPB field season archive DVDs. Site Visit Forms (SVF) and other field forms used to document field activities, measurements and site information will be scanned and retained indefinitely in the WQPB data archive and field season archive DVDs. All field photos will be named consistently using WQPB's naming convention (Makarowski, 2020) and archived in electronic project files as well as on the field season archive DVDs.

8.0 Data Analysis and Reporting

This section describes the intended data analyses to be performed using data produced by this project.

8.1 Data Analysis

Data from this project and data uploaded into MT-eWQX by volunteer monitoring groups will be reviewed and analyzed to inform future project planning, site selection, and inform gaps in data collection. Data from 2022 will be compared against water quality standards to inform the project lead and stakeholders about current water quality conditions.

Project data for the entire project and all readily available data will be considered for water quality assessment to update the 303(d) list of impaired waters for the Water Quality Integrated Report (2026 cycle anticipated). Further information on assessment approach can be found in Section 3.3.2 of the Project Plan (DEQ, 2022). Additionally, the data will be used to support source assessment and TMDL development. Further information on the TMDL development strategy can be found in Section 4.0 of the Project Plan (DEQ, 2022).

8.2 Reporting

The results from 2022 analysis will be shared with internal DEQ programs for continued project development. The project lead will provide project result updates to stakeholders and external groups. Presentations, handouts, and reports may be used to convey this information. Assessment outcomes will be documented in DEQ's Water Quality Assessment, Reporting and Documentation System (WARD) and will be made available to the public via DEQ's Clean Water Act Information Center (cwaic.mt.gov).

9.0 REFERENCES

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APPENDIX A – MONITORING LOCATIONS

AUID	Site Name	Station ID	Site Description	Latitude	Longitude	Parameters to Collect	Rationale for Site Selection
MT43D002_020	Bear Creek		0.6 mi above Belfry	-109.0232335	45.1387809	Nutrients, TR Metals, Common Ions, Hardness, Dissolved Al, TSS, DOC, *in situ* Measurements, Flow, Sediment Metals	Transition in land use practices
MT43D002_020	Bear Creek	Y05BEARC01	near mouth	-109.0011187	45.1475289	Nutrients, TR Metals, Common Ions, Hardness, Dissolved Al, TSS, DOC, *in situ* Measurements, Flow, Sediment Metals	Tributary contribution
MT43D002_020	Bear Creek		at S 6th St crossing	-109.1529730	45.1596586	Nutrients, TR Metals, Common Ions, Hardness, Dissolved Al, TSS, DOC, *in situ* Measurements, Flow, Sediment Metals	Downstream of abandoned mines, represents upstream extent of AU
MT43D002_031	Bluewater Creek	Y05BLUWC01	near mouth	-108.9019142	45.3846222	Nutrients, TR Metals, Common Ions, Hardness, Dissolved Al, TSS, DOC, *in situ* Measurements, Flow, Sediment Metals	Tributary contribution
MT43D002_031	Bluewater Creek		at Bluewater Rd crossing	-108.8670331	45.3651540	Nutrients, TR Metals, Common Ions, Hardness, Dissolved Al, TSS, DOC, *in situ* Measurements, Flow, Sediment Metals	Transition in land use practices

AUID	Site Name	Station ID	Site Description	Latitude	Longitude	Parameters to Collect	Rationale for Site Selection
MT43D003_032	Bluewater Creek		d/s of hatchery, above Orchard Ditch	-108.8307321	45.3340703	Nutrients, TR Metals, Common Ions, Hardness, Dissolved Al, TSS, DOC, *in situ* Measurements, Flow, Sediment Metals	Downstream extent of AU
MT43D003_032	Bluewater Creek	Y05BLUWC03	u/s of hatchery	-108.7921641	45.3149525	Nutrients, TR Metals, Common Ions, Hardness, Dissolved Al, TSS, DOC, *in situ* Measurements, Flow, Sediment Metals	Represents upstream extent of AU
MT43D002_170	Bridger Creek		u/s of South Fork Confluence	-108.8432205	45.2293407	Nutrients, TR Metals, Common Ions, Hardness, Dissolved Al, TSS, DOC, *in situ* Measurements, Flow, Sediment Metals	Upstream of tributary confluence, represents upstream extent of AU
MT43D002_170	Bridger Creek		off of Pryor Mountain Rd	-108.8585300	45.2408903	Nutrients, TR Metals, Common Ions, Hardness, Dissolved Al, TSS, DOC, *in situ* Measurements, Flow, Sediment Metals	Downstream of tributary confluence
MT43D002_170	Bridger Creek		at Hwy 310 crossing	-108.9089298	45.2615012	Nutrients, TR Metals, Common Ions, Hardness, Dissolved Al, TSS, DOC, *in situ* Measurements, Flow, Sediment Metals	Tributary contribution
MT43D001_011	Clarks Fork Yellowstone River		d/s of Bridger, at Sand Creek Rd	-108.9123357	45.3359983	Nutrients, TR Metals, Common Ions, Hardness, Dissolved Al, ULL Mercury, TSS, DOC, *in situ* Measurements, Sediment Metals	Downstream of point source discharger

AUID	Site Name	Station ID	Site Description	Latitude	Longitude	Parameters to Collect	Rationale for Site Selection
MT43D001_011	Clarks Fork Yellowstone River		at Thiel Rd, near mouth	-108.7166329	45.6479882	Nutrients, TR Metals, Common Ions, Hardness, Dissolved Al, ULL Mercury, TSS, DOC, *in situ* Measurements, Sediment Metals	Downstream extent of AU
MT43D001_012	Clarks Fork Yellowstone River		at Chance Rd crossing	-109.0625017	45.0114362	Nutrients, TR Metals, Common Ions, Hardness, Dissolved Al, ULL Mercury, TSS, DOC, *in situ* Measurements, Sediment Metals	Site at operational USGS gage at upstream extent of AU, near WY boarder
MT43D001_012	Clarks Fork Yellowstone River		Off of Bear Creek Ln	-108.9892507	45.1438732	Nutrients, TR Metals, Common Ions, Hardness, Dissolved Al, ULL Mercury, TSS, DOC, *in situ* Measurements, Sediment Metals	Upstream of tributary confluence
MT43D001_012	Clarks Fork Yellowstone River		at Hwy 72 crossing	-108.9845891	45.1899478	Nutrients, TR Metals, Common Ions, Hardness, Dissolved Al, ULL Mercury, TSS, DOC, *in situ* Measurements, Sediment Metals	Downstream of multiple tributary confluences
MT43D001_012	Clarks Fork Yellowstone River		u/s of Bridger Creek confluence	-108.9154892	45.2600992	Nutrients, TR Metals, Common Ions, Hardness, Dissolved Al, ULL Mercury, TSS, DOC, *in situ* Measurements, Sediment Metals	Downstream extent of AU

AUID	Site Name	Station ID	Site Description	Latitude	Longitude	Parameters to Collect	Rationale for Site Selection
MT43D001_011	Clarks Fork Yellowstone River		d/s of Bridger Creek confluence	-108.9047437	45.2794189	Nutrients, TR Metals, Common Ions, Hardness, Dissolved Al, ULL Mercury, TSS, DOC, *in situ* Measurements, Sediment Metals	Upper extent of AU
MT43D001_011	Clarks Fork Yellowstone River		at E River Rd crossing	-108.8952425	45.3914638	Nutrients, TR Metals, Common Ions, Hardness, Dissolved Al, ULL Mercury, TSS, DOC, *in situ* Measurements, Sediment Metals	Downstream of tributary confluence
MT43D001_011	Clarks Fork Yellowstone River		u/s of Elbow Creek confluence	-108.8552950	45.4399797	Nutrients, TR Metals, Common Ions, Hardness, Dissolved Al, ULL Mercury, TSS, DOC, *in situ* Measurements, Sediment Metals	Upstream of tributary confluence
MT43D001_011	Clarks Fork Yellowstone River	Y05CLFYR01	at E Pryor Rd	-108.8410042	45.4643349	Nutrients, TR Metals, Common Ions, Hardness, Dissolved Al, ULL Mercury, TSS, DOC, *in situ* Measurements, Sediment Metals	Downstream of tributary confluence
MT43D001_011	Clarks Fork Yellowstone River		d/s of Rock Creek confluence and d/s of Glenwood ditch	-108.8237710	45.5379581	Nutrients, TR Metals, Common Ions, Hardness, Dissolved Al, ULL Mercury, TSS, DOC, *in situ* Measurements, Sediment Metals	Downstream of tributary confluence

AUID	Site Name	Station ID	Site Description	Latitude	Longitude	Parameters to Collect	Rationale for Site Selection
MT43D001_011	Clarks Fork Yellowstone River		d/s of Cottonwood Creek at Tawny Trail	-108.7978277	45.5965441	Nutrients, TR Metals, Common Ions, Hardness, Dissolved Al, ULL Mercury, TSS, DOC, *in situ* Measurements, Sediment Metals	Downstream of tributary confluence
MT43D002_140	Cottonwood Creek		at McDowell Lane	-108.8215259	45.5557930	Nutrients, TR Metals, Common Ions, Hardness, Dissolved Al, TSS, DOC, *in situ* Measurements, Flow, Sediment Metals	Tributary contribution
MT43D002_140	Cottonwood Creek		0.3 mi u/s Little Cottonwood Creek	-108.7699373	45.5270421	Nutrients, TR Metals, Common Ions, Hardness, Dissolved Al, TSS, DOC, *in situ* Measurements, Flow, Sediment Metals	Represents upstream extent of AU
MT43D002_190	Dry Creek		near mouth off Hwy 72	-108.9839878	45.1940108	Nutrients, TR Metals, Common Ions, Hardness, Dissolved Al, TSS, DOC, *in situ* Measurements, Flow, Sediment Metals	Tributary contribution
MT43D002_190	Dry Creek		d/s of North Fork and South Fork Confluence	-109.0188478	45.2142817	Nutrients, TR Metals, Common Ions, Hardness, Dissolved Al, TSS, DOC, *in situ* Measurements, Flow, Sediment Metals	Upper extent of AU
MT43D002_010	Elbow Creek		at Joliet Fromberg Rd crossing	-108.9572697	45.4553490	Nutrients, TR Metals, Common Ions, Hardness, Dissolved Al, TSS, DOC, *in situ* Measurements, Flow, Sediment Metals	Transition in land use practices

AUID	Site Name	Station ID	Site Description	Latitude	Longitude	Parameters to Collect	Rationale for Site Selection
MT43D002_010	Elbow Creek		near mouth	-108.8647286	45.4471211	Nutrients, TR Metals, Common Ions, Hardness, Dissolved Al, TSS, DOC, *in situ* Measurements, Flow, Sediment Metals	Tributary contribution
	North Fork Dry Creek		near mouth	-109.0200843	45.2141929	Nutrients, TR Metals, Common Ions, Hardness, Dissolved Al, TSS, DOC, *in situ* Measurements, Flow, Sediment Metals	Tributary contribution
	North Fork Dry Creek		N Dry Creek Rd crossing	-109.0777056	45.2349180	Nutrients, TR Metals, Common Ions, Hardness, Dissolved Al, TSS, DOC, *in situ* Measurements, Flow, Sediment Metals	Represents upstream extent of waterbody
MT43D002_060	Red Lodge Creek		at Lone Tree Rd crossing	-109.0900764	45.4680442	Nutrients, TR Metals, Common Ions, Hardness, Dissolved Al, TSS, DOC, *in situ* Measurements, Flow, Sediment Metals	Tributary contribution
MT43D002_060	Red Lodge Creek		d/s of Cooney Reservoir outlet	-109.1972010	45.4497941	Nutrients, TR Metals, Common Ions, Hardness, Dissolved Al, TSS, DOC, *in situ* Measurements, Flow, Sediment Metals	Upper extent of AU
MT43D002_050	Red Lodge Creek		u/s of Cooney Reservoir	-109.2501456	45.4364644	Nutrients, TR Metals, Common Ions, Hardness, Dissolved Al, TSS, DOC, *in situ* Measurements, Sediment Metals	Downstream extent of AU

AUID	Site Name	Station ID	Site Description	Latitude	Longitude	Parameters to Collect	Rationale for Site Selection
MT43D002_050	Red Lodge Creek		at Red Lodge Creek Rd crossing near Election Rd	-109.3206792	45.3911567	Nutrients, TR Metals, Common Ions, Hardness, Dissolved Al, TSS, DOC, *in situ* Measurements, Flow, Sediment Metals	Accessible site on limited access assessment unit
MT43D002_131	Rock Creek		near 8575 Hwy 12	-109.1368349	45.3986343	Nutrients, TR Metals, Common Ions, Hardness, Dissolved Al, ULL Mercury, TSS, DOC, *in situ* Measurements, Flow, Sediment Metals	Middle extent of AU
MT43D002_131	Rock Creek		u/s of Red Lodge Creek confluence	-109.0736464	45.4713126	Nutrients, TR Metals, Common Ions, Hardness, Dissolved Al, ULL Mercury, TSS, DOC, *in situ* Measurements, Flow, Sediment Metals	Downstream extent of AU
MT43D002_120	Rock Creek	Y05ROCKC02	at Hwy 212 crossing	-108.9986905	45.4760374	Nutrients, TR Metals, Common Ions, Hardness, Dissolved Al, ULL Mercury, TSS, DOC, *in situ* Measurements, Flow, Sediment Metals	Upper extent of AU
MT43D002_120	Rock Creek		near mouth	-108.8251880	45.5258381	Nutrients, TR Metals, Common Ions, Hardness, Dissolved Al, ULL Mercury, TSS, DOC, *in situ* Measurements, Flow, Sediment Metals	Tributary contribution

AUID	Site Name	Station ID	Site Description	Latitude	Longitude	Parameters to Collect	Rationale for Site Selection
MT43D002_132	Rock Creek		d/s of Wyoming Creek	-109.4049404	45.0608943	Nutrients, TR Metals, Common Ions, Hardness, Dissolved Al, ULL Mercury, TSS, DOC, *in situ* Measurements, Flow, Sediment Metals	Downstream of tributary confluence
MT43D002_132	Rock Creek		u/s of West Fork Rock Creek	-109.2687079	45.1546685	Nutrients, TR Metals, Common Ions, Hardness, Dissolved Al, ULL Mercury, TSS, DOC, *in situ* Measurements, Flow, Sediment Metals	Downstream extent of AU
MT43D002_131	Rock Creek		d/s of Red Lodge	-109.2287396	45.2384290	Nutrients, TR Metals, Common Ions, Hardness, Dissolved Al, ULL Mercury, TSS, DOC, *in situ* Measurements, Flow, Sediment Metals	Downstream of point source discharger
MT43D002_100	Silvertip Creek		near WY boarder	-108.9034585	45.0001201	Nutrients, TR Metals, Common Ions, Hardness, Dissolved Al, TSS, DOC, *in situ* Measurements, Flow, Sediment Metals	Upper extent of AU
MT43D002_100	Silvertip Creek		off of S Silvertip Road	-108.9670426	45.1521445	Nutrients, TR Metals, Common Ions, Hardness, Dissolved Al, TSS, DOC, *in situ* Measurements, Flow, Sediment Metals	Transition in land use practices
MT43D002_100	Silvertip Creek		at Hwy 72 crossing	-108.9921105	45.1797849	Nutrients, TR Metals, Common Ions, Hardness, Dissolved Al, TSS, DOC, *in*	Downstream extent of AU

AUID	Site Name	Station ID	Site Description	Latitude	Longitude	Parameters to Collect	Rationale for Site Selection
						situ Measurements, Flow, Sediment Metals	
MT43D002_180	South Fork Bridger Creek		near mouth	-108.8467454	45.2286327	Nutrients, TR Metals, Common Ions, Hardness, Dissolved Al, TSS, DOC, *in situ* Measurements, Flow, Sediment Metals	Downstream extent of AU, tributary contribution
	South Fork Dry Creek		near mouth	-109.0196659	45.2137016	Nutrients, TR Metals, Common Ions, Hardness, Dissolved Al, TSS, DOC, *in situ* Measurements, Flow, Sediment Metals	Tributary contribution
	South Fork Dry Creek		at Johns Ln crossing	-109.0826158	45.2109941	Nutrients, TR Metals, Common Ions, Hardness, Dissolved Al, TSS, DOC, *in situ* Measurements, Flow, Sediment Metals	Represents upstream extent of waterbody
MT43D002_040	Spring Creek		near mouth	-108.7154413	45.6469738	Nutrients, TR Metals, Common Ions, Hardness, Dissolved Al, TSS, DOC, *in situ* Measurements, Flow, Sediment Metals	Tributary contribution
MT43D002_040	Spring Creek		0.4 mi above Spring Creek Rd	-108.6915803	45.6155673	Nutrients, TR Metals, Common Ions, Hardness, Dissolved Al, TSS, DOC, *in situ* Measurements, Flow, Sediment Metals	Represents upstream extent of AU

AUID	Site Name	Station ID	Site Description	Latitude	Longitude	Parameters to Collect	Rationale for Site Selection
MT43D002_080	West Red Lodge Creek		at second May Grade Rd bridge	-109.3362274	45.3143163	Nutrients, TR Metals, Common Ions, Hardness, Dissolved Al, TSS, DOC, *in situ* Measurements, Flow, Sediment Metals	Downstream extent of AU
MT43D002_080	West Red Lodge Creek	Y05RDLWC10	at Luther Roscoe Rd Crossing	-109.4303536	45.2838698	Nutrients, TR Metals, Common Ions, Hardness, Dissolved Al, TSS, DOC, *in situ* Measurements, Flow, Sediment Metals	Accessible site on limited access assessment unit
MT43D002_070	Willow Creek	Y05WILOC90	near mouth	-109.2311985	45.4251992	Nutrients, TR Metals, Common Ions, Hardness, Dissolved Al, TSS, DOC, *in situ* Measurements, Sediment Metals	Downstream extent of AU
MT43D002_070	Willow Creek		at Taylor Hill Rd crossing	-109.2614216	45.2916535	Nutrients, TR Metals, Common Ions, Hardness, Dissolved Al, TSS, DOC, *in situ* Measurements, Flow, Sediment Metals	Represents upstream extent of AU

*These are proposed sampling locations which may change due to unforeseen access or other issues.

APPENDIX B – FIELD FORMS

Place Site Visit Label Here

Site Visit Form

Project ID: ________________

Date: ____________ Time: ___________ Personnel: ____

Waterbody: ____________________________________ Location: ___________________________________

Station ID: _______________ HUC: ____________ County: ______________ AUID: ______________

Latitude: Longitude: Elevation: ________ ft m

☐Field Duplicate to __________ ☐Field Blank ☐Trip Blank ☐ Field Equipment Blank

Samples Collected		Sample ID	Sample Collection Information/Preservation
Water	☐		☐GRAB ☐EWI ☐BACT
Analysis:			0.45µ Filtered | HNO_3 H_2SO_4 H_3PO_4 HCL | Ice Frozen
Analysis:			0.45µ Filtered | HNO_3 H_2SO_4 H_3PO_4 HCL | Ice Frozen
Analysis:			0.45µ Filtered | HNO_3 H_2SO_4 H_3PO_4 HCL | Ice Frozen
Analysis:			0.45µ Filtered | HNO_3 H_2SO_4 H_3PO_4 HCL | Ice Frozen
Analysis:			0.45µ Filtered | HNO_3 H_2SO_4 H_3PO_4 HCL | Ice Frozen
Analysis:			0.45µ Filtered | HNO_3 H_2SO_4 H_3PO_4 HCL | Ice Frozen
Analysis:			0.45µ Filtered | HNO_3 H_2SO_4 H_3PO_4 HCL | Ice Frozen
Analysis:			0.45µ Filtered | HNO_3 H_2SO_4 H_3PO_4 HCL | Ice Frozen
Sediment	☐		SED-1
Analysis:			Preserved: None Other:
Benthic Chl-a	☐		Sample Method: C=Core H=Hoop T=Template N=None
☐ Composite at Lab ☐ AFDW ☐ Visual Est. <50 mg/m2			Sample Location: R=Right C=Center L=Left
Transect: A__-__ B__-__ C__-__ D__-__ E__-__			F__-__ G__-__ H__-__ I__-__ J__-__ K__-__
Phytoplankton Chl-a	☐		D1 Filtered:________mL D2 Filtered:________mL
Phytoplankton CNP	☐		CN Filtered:________mL P Filtered:________mL
Algae	☐		☐ PERI-1-MOD ☐ PERI-1 ☐ OTHER:
Macroinvertebrates	☐		☐ MAC-R-500 ☐ OTHER: # of Jars:

Field Measurements	Time: ____(24 hr)	Field Assessments
Water Temp: °C °F	Air Temp: °C °F	☐ Photos ☐ Data Logger ☐ Aquatic Plant Tracking
Bar. Pressure: mm/Hg	SC: uS/cm	☐ AQPVA ☐ Total Discharge ☐ SAM (Sediment Assess)
pH: | DO: mg/L	Turbidity: NTU	☐ EMAP ☐ Bacteria ☐ NRCS (Riparian Assess)
Turbidity: ☐Clear ☐Slight ☐Turbid ☐Opaque		☐ BEHI ☐ Greenline ☐ HAM (Habitat Assess)
		☐ SUM ☐ Wetland ☐ Other:
Flow: ft3/sec (☐Dry Bed ☐Stranded Pools)		☐Only Transect F Total Site Length________m
☐Meter ☐Meter-Auto ☐Float ☐Gage ☐Visual Est.		Transect Length______m Average Wetted Width______m

Photos	#	#
	#	#

Chemistry Lab Information		
Lab Samples Submitted to: Energy Lab	Account #:	Term Contract Number: STC SPB 19-0156T-ELI -221004
Invoice Contact: Darrin Kron – DEQ/WQ / PO Box 200901 / Helena, MT 59620-0901 / 406-444-4765		
Contact Name & Phone: Darrin Kron – DEQ – 406-444-4765		EDD ☒ Format: MT-eWQX Compatible
1) Relinquished By & Date/Time:	1) Shipped By: ☐USPS ☐Hand ☐FedEx/UPS	1) Received By & Date/Time:
2) Relinquished By & Date/Time:	2) Shipped By: ☐USPS ☐Hand ☐FedEx/UPS	2) Received By & Date/Time:

Lab Use Only - Delivery Temperature: Wet Ice______°C Dry Ice______°C Rev. 3/22/22

Place Site Visit Label Here

Site Visit Form Continued

Data Loggers	☐Temperature	☐YSI	☐MiniDOT	☐EC	☐TruTrack	☐AquaRod	☐Weather Station
	☐Deployed	☐Cleaned/Checked	☐Retrieved				

Field Meter Calibration			
pH Meter:	Manufacturer & Model:		Date of Last Calibration:
	Comments:		
Multiparameter Meter:	Manufacturer & Model:		
	Date of SC Calibration:	☐DO calibrated at site visit	
	Comments:		

Site Visit Comments
Data Logger Notes:
Time data logger removed:
Time data logger returned:
☐Data logger cleaned
☐Data logger downloaded
☐Data logger re-launched

APPENDIX C – EQUIPMENT AND SUPPLIES

- Project SAP
- SOPs
- Forms
- Labels
- Project ID stickers
- Site Visit Codes (SVCs)
- Clip Board(s)
- Mechanical Pencils and fine tip Sharpies
- Tape for labels
- InReach
- GPS with loaded sites
- Camera
- Road Atlas
- Sample Containers (i.e. bottle sets)
- Large cooler(s) for collecting up to 40 sets
- Small dry ice cooler (for frozen SRP samples)
- Dry Ice (at least 20 lbs)
- Mercury Cooler
- Mercury Sampling Kit
- Bags for mercury sampling
- Syringes
- Filters
- DI water (6 to 9 L)
- Extension (telescopic) pole sampler and HCl for decontamination (if needed)
- Benthic sediment sampling kit (including buchner funnel) plus dilute nitric acid for decontamination
- Flow meter, rod, pins, tape (for tributary sampling)
- YSI handheld meter
    - Ensure that the proper weekly and month calibrations and maintenance have occurred before sampling.
- AIS Decon supplies
    - Jug with spigot marked with “Decon Tap Water”
    - Virkon® Aquatic disinfectant powder
    - Powder scoop (provided with Virkon® Aquatic)
    - Protective gloves
    - Eye/face protection
    - Container with gamma sealed lid marked with “2% Virkon”
    - Stiff-bristled brush (1 per person)
    - Pressurized sprayer Pole Sampler with HCL vials