

# Poplar Pipeline Response

Glendive, MT

## Environmental Sampling and Analysis Plan

Version 1.0

Prepared On Behalf Of:

Bridger Pipeline LLC

Prepared By:

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## **1.0 INTRODUCTION AND PURPOSE**

This Sampling and Analysis Plan (SAP) was prepared on behalf of Bridger Pipeline LLC (BPL), supporting Unified Command (UC) for the Poplar Pipeline Release in Glendive, MT, which occurred on Saturday January 17, 2015.

The incident involves a pipeline release of crude oil that impacted the Yellowstone River. The objectives of the environmental investigation and proposed sampling include:

- 1) The collection of water, soil, and sediment samples, as necessary, to coarsely delineate areas of potential impact and assess the need for and, effectiveness of, the containment and cleanup activities of areas potentially impacted from the release.
- 2) The collection of background surface water, soil, and sediment samples to develop the range of potential background concentrations for comparative purposes and attempt to distinguish between target analytes related to this incident and non-related target analytes.
- 3) The collection of source crude oil and weathered oil samples from the BPL for cataloging and fingerprinting analysis for comparative purposes and to attempt to distinguish between target analytes related to this incident and non-related target analytes. Also, collection of weathered crude oil samples may occur to document the weathering process.

## **2.0 HEALTH AND SAFETY**

CTEH<sup>®</sup> sampling personnel will review and adhere to the site specific Health and Safety Plan (HASP) developed by CTEH<sup>®</sup>. Sampling activities will only be completed in a safe manner and under safe conditions as dictated by the HASP.

## **3.0 DATA QUALITY OBJECTIVES**

The data collected during field activities will be used to assess potential exposures to human health and the environment to constituents potentially related to the Poplar Pipeline Response. A strategic planning approach will be employed for data collection activities providing a systematic procedure to ensure the type, quantity and quality of data used in decision-making will be appropriate for the intended application. Level II data validation will be performed on 100% of submitted samples. Level IV data validation will be performed on at least 10% of submitted samples. Methods will be selected to strive to get the method detection limit (MDL) below any applicable screening level.

#### **4.0 PLAN ADJUSTMENTS AND SUBMITTALS**

Collection of additional media samples may occur at agreed-upon locations. Sample collection and analysis standard operating procedures, plans and/or methods will be provided upon request in an electronic format

#### **5.0 YELLOWSTONE RIVER WATER AND SEDIMENT EVALUATION / METHODOLOGY**

##### **5.1 Surface Water Monitoring**

The Yellowstone River, downstream of the incident location, will be visually inspected and photo-documented to note adverse impacts, if any. Documentation produced will also note general conditions such as GPS coordinates, odors, water flow, weather, sheen, observations of any dead fish, etc. General water quality readings will also be documented along the Yellowstone River both upstream and downstream of the pipeline release site to monitor for potentially measurable impacts. Surface water quality monitoring will be conducted with a properly calibrated Horiba U-52 (or similar) concurrent with water sample collection and will include the following parameters:

- Temperature
- pH
- Conductivity
- Dissolved Oxygen
- Turbidity
- Oxygen Reduction Potential (ORP)
- Salinity
- Total Dissolved Solids

##### **5.2 Water Column Samples**

Containment measures have been deployed on-site and the pipeline has been shut-in. Water column samples will be collected upstream and downstream of the release site, from the surface and bottom depth, in the Yellowstone River. All sampling will be documented in field notebooks, CTEH® field forms, or hand-held devices and water column samples will be submitted to a NELAP-accredited laboratory.

##### **Methodology and Analysis**

Water quality parameters including: pH, ORP, dissolved oxygen, conductivity, salinity, TDS, temperature, and turbidity will be recorded for each water column sample using a properly calibrated Horiba U-52 (or similar) water quality meter.

The following procedures will be implemented for water column sampling:

1. Grab sampling devices (e.g. Kemmerer bottles) will be used to collect water column samples and water will carefully decanted directly into laboratory supplied sample containers and submitted to Pace Analytical, a NELAP-accredited laboratory
2. Non-disposable equipment will be decontaminated in accordance with Section 9.0 of this SAP.
3. The following field notes will be collected for each water column sample:
  - a. Observations regarding color, odor, etc.
  - b. Depth
  - c. GPS coordinates of sampling points
  - d. Photo-documentation of sample area
  - e. Date and time
4. Sample containers will be clearly labeled with the following information:
  - a. Unique sample identification
  - b. Sampler initials
  - c. Date and time sample collected
5. Field samples will be contained, preserved and handled in accordance with appropriate USEPA specifications consistent with the intended analysis.
6. Evidence of collection, shipment, laboratory receipt, and laboratory custody will be documented by maintaining a chain of custody (COC) that records each sample and the individuals responsible for sample collection. All samples will be accompanied by a COC Record.

CTEH® plans on submitting collected water column samples for analysis of:

- Volatile organic compounds (VOCs) by USEPA Method 8260B
- Semi-volatile organic compounds (SVOCs) by USEPA Method 8270C/D-SIM
- Volatile Petroleum Hydrocarbons (VPH)
- Extractable Petroleum Hydrocarbons (EPH)
  - If a water sample exceeds 1,000 ug/L EPH fractions will be reported

### **Location and Frequency**

Initial sampling will be a one-time event from proposed water column sampling locations along the Yellowstone River. Proposed sample locations include:

- Background
- Below Source
- Intake Dam
- Elk Island
- Sidney Bridge
- Fairview Bridge

See map in Attachment A for proposed water column sample locations.

River water column sampling will resume post-thaw at a frequency and duration deemed necessary by Unified Command. In instances where the presence of ice limits access to the Yellowstone River for sample collection, additional steps, up to and including breaking surface ice, may be conducted if the Site Safety Officer approves the methodology for safe access.

Additional water column sampling may be collected as deemed necessary by Unified Command.

### **5.3 Sediment Samples**

Sediment samples may be collected from select locations along the Yellowstone River to support operations. All sampling will be documented in field notebooks, CTEH® field forms, or hand-held devices, and sediment samples will be submitted to a NELAP-accredited laboratory.

#### **Methodology and Analysis**

The following procedures will be implemented for sediment sampling:

1. Sediment samples from each location will be collected utilizing a stainless steel spoon, or a modified Van Veen-type, self-tripping ponar sampling device (ponar). The overlaying water in the spoon or ponar sampling device will be carefully decanted off. Each sample container will be completely filled to minimize headspace. Vegetation, rocks, litter, and other non-native sediment material will be carefully removed prior to filling sample containers.
2. Non-disposable equipment will be decontaminated in accordance with Section 9.0 of this SAP.
3. The following field notes will be collected for each sediment sample:
  - a. Observations regarding color, odor, etc.
  - b. GPS coordinates of sampling points
  - c. Photo-documentation of sample area
  - d. Date and time
4. Sample containers will be clearly labeled with the following information:
  - a. Unique sample identification
  - b. Sampler initials

- c. Date and time sample collected
- d. Field samples will be contained, preserved and handled in accordance with appropriate USEPA specifications consistent with the intended analysis.
- e. Evidence of collection, shipment, laboratory receipt, and laboratory custody will be documented by maintaining a chain of custody (COC) that records each sample and the individuals responsible for sample collection. All samples will be accompanied by a COC Record.

CTEH® plans on submitting collected sediment samples for analysis of:

- Volatile organic compounds (VOCs) by USEPA Method 8260B
- Semi-volatile organic compounds (SVOCs) by USEPA Method 8270C/D-SIM
- Volatile Petroleum Hydrocarbons (VPH)
- Extractable Petroleum Hydrocarbons (EPH)
  - If a sediment sample exceeds 200 mg/kg EPH fractions will be reported

### **Location and Frequency**

Initial sampling may consist of the one-time collection of sediment samples from the same locations where water column samples are collected. Additional sediment samples may be collected, as deemed necessary by the Unified Command, upon review of the analytical results and on-site operations.

## **6.0 SOIL SAMPLING METHODOLOGY AND ANALYSIS**

### **6.1 Soil Samples**

Soil samples may be collected from select locations along the Yellowstone River to document baseline conditions where operations are occurring (e.g., staging areas, river access points, etc). Other soil samples may be collected, as needed, to support operations. All sampling will be documented in field notebooks, CTEH® field forms, or hand-held devices, and soil samples will be submitted to a NELAP-accredited laboratory.

### **Methodology and Analysis**

The following procedures will be implemented for soil sampling:

1. Soil samples from each location will be collected utilizing a stainless steel spoon or disposable sampling equipment. Each sample container will be completely filled to minimize headspace. Vegetation, rocks, litter, and other non-native soil material will be carefully removed prior to filling the sampling container.

2. Non-disposable equipment will be decontaminated in accordance with Section 9.0 of this SAP.
3. The following field notes will be collected for each soil sample:
  - A. Observations regarding color, odor, texture, etc.
  - B. GPS coordinates of sampling points
  - C. Photo-documentation of sample area
  - D. Date and time
  - E. Sample containers will be clearly labeled with the following information:
    - a. Unique sample identification
    - b. Sampler initials
    - c. Date and time sample collected
  - F. Field samples will be contained in accordance with appropriate USEPA specifications consistent with the intended analysis.
  - G. Evidence of collection, shipment, laboratory receipt, and laboratory custody will be documented by maintaining a chain of custody (COC) that records each sample and the individuals responsible for sample collection. All samples will be accompanied by a COC Record.

CTEH® plans on submitting collected soil samples for analysis of:

- Volatile organic compounds (VOCs) by USEPA Method 8260B
- Semi-volatile organic compounds (SVOCs) by USEPA Method 8270C/D-SIM
- Volatile Petroleum Hydrocarbons (VPH)
- Extractable Petroleum Hydrocarbons (EPH)
  - If a soil samples exceeds 200 mg/kg EPH fractions will be reported

### **Location and Frequency**

Soil samples will be collected to support operations and as directed by the Unified Command.

## **7.0 SOURCE SAMPLING METHODOLOGY AND ANALYSIS**

BPL may at its discretion collect a reference sample directly from the pipeline which will be archived and used as a standard for comparative purposes in order to determine whether hydrocarbons observed/discovered during the course of the response are related to this incident or an unrelated incident.

### **Methodology and Analysis**

The following procedures will be implemented for the source sample in the designated areas.

1. Source oil sample will be collected by carefully decanting into sample containers, if sample can be collected safely.

2. Non-disposable equipment will be decontaminated using a bristled brush and a solution comprised of a laboratory grade, non-phosphate detergent (e.g., Alconox or Liquinox), rinsed with distilled water, and then rinsed a second time with deionized water.
3. The following field notes will be collected for each soil sample:
  - a. Observations regarding color, odor, etc.
4. GPS coordinates of sampling points
5. Photo-documentation of sample area
6. Date and time
7. Sample containers will be clearly labeled with the following information:
  - a. Unique sample identification
  - b. Sampler initials
  - c. Date and time sample collected
8. Field samples will be contained in accordance with appropriate USEPA specifications consistent with the intended analysis.
9. Evidence of collection, shipment, laboratory receipt, and laboratory custody will be documented by maintaining a chain of custody (COC) that records each sample and the individuals responsible for sample collection. All samples will be accompanied by a COC Record.

CTEH® plans on submitting source samples under customary practices to ZymaX Forensics in San Diego, CA and/or Pace Analytical. Source samples may be analyzed for one or more of the following analysis as needed:

- Volatile organic compounds (VOCs) by USEPA Method 8260B
- Semi-volatile organic compounds (SVOCs) by USEPA Method 8270C/D-SIM
- Cations by USEPA Method 6010B
- Anions by USEPA Method SM4500
- Alkyl polycyclic aromatic hydrocarbons (PAHs) by 8272(SIM)
- Comparison of Waterborne Petroleum Oils by Gas Chromatography by ASTM D3328
- Oil Spill Source Identification by Gas Chromatography and Positive Ion Electron Impact Low Resolution Mass Spectrometry\* by ASTM D5739
- Boiling Range Distribution of Petroleum Fractions by Gas Chromatography\*\* by ASTM 2887
- Metals by EPA Method 6010B

### **Location and Frequency**

A representative source sample will be collected as near to the affected portion of pipeline as possible, as soon as access can be safely obtained. Weathered product samples will be collected as deemed necessary if available.

## **8.0 SAMPLE HANDLING PROCEDURES**

Samples will be placed in laboratory supplied sample containers and labeled with a sample identification number, sample depth (for water column sampling), sampler name, sample date, analysis and methodology requested, and time of sample collection, and immediately placed in a cooler on ice pending laboratory analysis. Samples will be packaged, labeled, retained on ice, and documented in an area which is free of impact and provides for secure storage. Custody seals will be placed on each sample-containing cooler, and chain-of-custody procedures will be maintained from the time of sample collection until arrival at the laboratory to protect sample integrity. Shipping or transporting of samples to the laboratory will be done within a timeframe such that recommended holding times are met. Samples are being collected in adequate volumes in sample containers of a broad variety to ensure that any future requested analyses can be performed given the collected sample container types assuming that preservatives and hold times are met.

### **8.1 SAMPLE LABELING**

Sample containers will be clearly labeled with a unique sample designation and include the following information:

- Unique sample identification;
- Sample Type (discrete or composite, sediment and/or soil samples only);
- Sampler name or initials;
- Date sample collected;
- Time sample collected; and
- Analysis to be performed.

## **9.0 QUALITY ASSURANCE**

Sampling will be carried out in conjunction with a well-defined quality assurance (QA) program. The goal of the field QA program is to document that samples are collected without the effects of accidental cross- or systematic contamination and refers to the sampling, analysis, and data validation procedures for generating valid and defensible data. To provide QA for the proposed sampling event, the following sampling, analysis, and data validation procedures will be performed:

### **9.1 Field Calibration**

Instruments used in the field as part of this sampling event are anticipated to consist of Horiba U-52 water quality meters, GPS units, digital cameras, and hand-held data collection devices such as tablets/smart phones. Horibas will be calibrated daily. Other equipment is not anticipated to require field calibration. Operators of each piece of equipment are responsible for maintaining (including proper battery charge) and operating this equipment such that it conforms to each respective manufacturer's specifications.

## **9.2 Field Duplicate Sample**

For approximately every ten samples collected in the field, one field duplicate will be collected and submitted for laboratory analysis to verify the reproducibility of the sampling methods. Field duplicates will be prepared by separately submitting an aliquot from the same sample location to the laboratory for analysis consistent with the proscribed analyses.

## **9.3 Field Split Samples**

Field split samples refer to samples collected by the on-site regulatory agency or its designee from the same sampling location and independently submitted to a different laboratory for analysis. Field split samples may be collected at the discretion of representatives of the regulatory agency or Incident Command.

## **9.4 Laboratory QA**

Laboratory quality control procedures will be conducted in a manner consistent with relevant state and federal regulatory guidance. Deliverables will contain the supporting documentation necessary for data validation. Internal laboratory quality control checks will include method blanks, matrix spikes (and matrix spike duplicates), surrogate samples, calibration standards, and laboratory control standards (LCSs).

## **9.5 Matrix Spike/Matrix Spike Duplicate Sample**

Matrix Spike/Matrix Spike Duplicate (MS/MSD) samples refer to field samples spiked with the analytes of interest prior to being analyzed at the laboratory to gauge the quality of analysis. Approximately one in twenty samples will be analyzed as MS/MSD samples.

## **9.6 Blank Samples**

Rinsate blank samples will be collected once daily per non-disposable piece of equipment after decontamination to demonstrate decontamination procedures are adequate. One trip blank will be placed in each cooler for analysis if there are VOC samples in the cooler.

## **9.7 Data Validation**

Validation of the data generated by the laboratory performing the analyses will include at a minimum sample holding times, accuracy, precision, contamination of field generated or laboratory method blanks, and surrogate compound recovery. Accuracy will be determined by evaluating LCS and MS recovery. Precision will be determined by evaluating laboratory and field duplicate samples. Level II data validation will be performed on 100% of submitted samples. Level IV data validation will be performed on at least 10% of submitted samples.

## 10.0 DECONTAMINATION PROCEDURES

Decontamination procedures for non-disposable equipment refer to the steps undertaken to minimize the potential for contamination and cross-contamination between individual sampling locations. Prior to collecting any sample for this investigation, the following decontamination procedures will be undertaken: non-disposable sampling equipment such as Kemmerer water sampling devices which come into contact with sampling media will be decontaminated using a bristled brush and a solution comprised of a laboratory grade, non-phosphate detergent (e.g., Alconox or Liquinox) and deionized water. Depending on ancillary activities being conducted for the response to this release, the decontamination of sampling equipment will be conducted over poly sheeting at the sample location or in a nearby designated area. The sampling equipment to be decontaminated will first be placed in a bucket containing the detergent solution and thoroughly washed using a bristled brush. The items will then be transferred to the second 5-gallon bucket containing deionized water for rinsing. Following the initial rinsing, the item will be held over the third 5-gallon bucket while deionized water is carefully decanted over each item. Decontaminated items will be wrapped in clean aluminum foil for transit to the next sampling location.

Nitrile gloves will be worn by sampling personnel and changed between activities at each discrete sample collection location. Previously worn nitrile gloves will be discarded in appropriate waste receptacles with other PPE.

## 11.0 WASTE DISPOSAL

The method for storage and disposal of investigative-derived waste materials will comply with applicable local, state, and federal regulations in a manner consistent with the Waste Management Plan.

## 12.0 DATA ANALYSIS

To assess the potential environmental impact, the results of sampling will be reviewed for the presence/absence of on-site constituents. The concentrations of detected compounds may then be compared to appropriate regulatory standards and screening levels. See table below:

<b>Media</b>	<b>Document</b>
Surface Water	Montana Circular DEQ-7 Numerical Water Quality Standards
Soil	Tier I Risk Based Corrective action – Risk based screening levels
Sediment	EPA BTAG Fresh Water Quality Benchmarks and RBCA RBSLs for soil if no BTAG

The results of laboratory analyses will be provided to UC.

### **13.0 RECORDS MANAGEMENT**

Records management refers to the procedures for generating, controlling, and archiving project-specific records and records of field activities. Project records, particularly those that are anticipated to be used as evidentiary data, directly support current or ongoing technical studies and activities, and provide historical evidence needed for later reviews and analyses, will be legible, identifiable, retrievable and protected against damage, deterioration, or loss on a centralized electronic database. Handwritten records will be written in indelible ink. Records will likely include, but are not limited to, the following: bound field notebooks on pre-numbered pages, sample collection forms, personnel qualification and training forms, sample location maps, equipment maintenance and calibration forms, chain-of custody forms, maps and drawings, transportation and disposal documents, reports issued as a result of the work, procedures used, correspondences, and any deviations from the procedural records. Documentation errors will be corrected by drawing a single line through the error so it remains legible and will be initialed by the responsible individual, along with the date of change, and the correction will be written adjacent to the error.

**ATTACHMENT A**  
**Proposed Sample Locations**



# Surface Water Sample Locations

Poplar Pipeline Response - January 24, 2015



Project: 106955  
Client: Poplar Pipeline  
City: Glendive, MT  
County: Dawson

