DIESEL & ETHANOL RELEASE
DRAFFIN, KY
Surface Water Sampling and Analysis Plan

Prepared for:

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1.0 INTRODUCTION AND BACKGROUND

CSX Transportation (CSXT) retained the services of EnviroScience, Inc. (EnviroScience) on February 13, 2020 to provide environmental consulting services associated with a diesel and ethanol release resulting from a train derailment. At approximately 7:05 EST, a CSXT train consisting of 96 ethanol cars, traveling southbound derailed due to a rockslide. This event resulted in three locomotives and a five rail cars derailing along the Russell Fork near Pond Creek Rd. in Draffin, KY. Surface water sampling in Russell Fork, Pond Creek, and the Levisa Fork was initiated by EnviroScience on February 13, 2020. Surface Water sampling was initiated to assess the effectiveness of the cleanup and recovery operations onsite and to quantify concentrations of diesel and ethanol in surface waters.

2.0 SURFACE WATER SAMPLING

2.1. SURFACE WATER SAMPLING LOCATIONS

EnviroScience personnel conducted site reconnaissance on February 13, 2020 and identified eight surface water sampling locations, which include four samples from Russell Fork, three samples from Levisa Fork, and a reference site within Pond Creek. All surface water sampling locations are presented in Attachment A. EnviroScience coordinated with the Kentucky Department of Environmental Protection (KYDEP) and the U.S. Environmental Protection Agency (USEPA) to determine an appropriate approach in development of this plan.

Table 2.1. Surface Water Sample Location Summary and Description

Sample ID	Latitude*	Longitude*	Waterway	Description
RF-US-1	37.332615	-82.387003	Russell Fork	Reference sample to monitor ambient conditions of Russell Fork upstream of the release point. Located approximately 2,500 feet upstream of the incident location.
RF-DS-1	37.338632	-82.395034	Russell Fork	Located approximately 1,300 feet downstream of the incident location.
PC-1	37.336936	-82.397813	Pond Creek	Located approximately 1,000 feet upstream of confluence with Russell Fork.
RF-DS-2	37.366603	-82.412314	Russell Fork	Located approximately 1.6 river miles downstream of the incident location.
RF-DS-3	37.367144	-82.413299	Russell Fork	Located approximately 3.6 river miles downstream of the incident location.
LF-US-1	37.419451	-82.412693	Levisa Fork	Reference sample to show preexisting conditions of Levisa Fork upstream of the confluence with Russell Fork. Located approximately 1.9 river miles upstream of the confluence.
LF-DS-1	37.417856	-82.457585	Levisa Fork	Located approximately 1.4 river miles downstream of the confluence with Russell Fork. Approximately 8.8 river miles downstream of the incident location.
LF-DS-2	37.464431	-82.525967	Levisa Fork	Located approximately 18.4 river miles downstream of the incident location.

*Indicates locations are subject to change upon field investigation and Differential GPS (dGPS) correction

Surface water samples will be collected twice daily until a sufficient amount of analytical results or cleanup and recovery operations warrant reducing the sampling frequency or ceasing to collect surface water samples. This frequency may be increased in the event that onsite activities warrant additional precaution.

Sampling location LF-DS-2 was not included in the sampling event performed on February 13, 2020, but will be included in subsequent sampling events.

2.2. WATER TREATMENT PLANT SAMPLING LOCATIONS

In coordination with KYDEP and the USEPA, ARCADIS will collect samples of raw water from four water treatment plants located downstream of the incident. These locations are presented in the table below and in Attachment A.

Table 2.2. Water Treatment Plant Sample Location Summary and Description

Sample ID	Facility Name	Source Waterway	Distance from Incident Location (River miles)
MW-WTP	Mountain Water District	Russel Fork	3.3
PC-WTP	City of Pikeville	Levisa Fork	17.4
PR-WTP	Prestonsburg City Utilities	Levisa Fork	48.1
SW-WTP	Southern Water	Levisa Fork	48.1

Water treatment plant water samples will be collected twice daily until a sufficient amount of analytical results or cleanup and recovery operations warrant reducing the sampling frequency or ceasing to collect surface water samples. This frequency may be increased in the event that onsite activities warrant additional precaution.

Sample IDs will include an identifier to represent whether the sample was collected during the first or second daily round of sample collection. Additionally, the date of sample collection will be included in all sample IDs.

2.3. SURFACE WATER AND WATER TREATMENT PLANT SAMPLING METHODOLOGY

Surface water and water treatment plant sampling will follow, where applicable, the methodology below and will be consistent with Kentucky Department for Environmental Protection's (KDEP) *Standard Operating Procedures: Sampling Surface Water Quality in Lotic Systems (KDEP, 2011)*. Along with collection of analytical surface water samples, temperature, dissolved oxygen, specific conductivity, and pH will be recorded at each surface water sample location using a YSI Pro DSS multi-probe (or equivalent), which will be calibrated daily. In-field water quality parameters, along with other pertinent field data, will be documented in field notebooks.

The surface water and water treatment plant samples will be collected as follows:

1. Samplers will approach each surface water sampling collection site from downgradient, whenever practical, in order to minimize any disturbance at the collection site
2. Once at a designated sampling location, samplers will don fresh nitrile gloves and gather laboratory-supplied sample containers. Gloves will be discarded after use at each location.
3. Discrete grab surface water samples (0-6 inches) or water treatment plant samples will be collected using laboratory-supplied containers.
4. All containers will be labeled with appropriate information and immediately placed in a cooler with wet ice and chilled to 4°C or below.
5. Sample coolers will be delivered to Pace Analytical's Madisonville, KY laboratory utilizing chain-of-custody (COC) protocols.

Any appreciable deviations from these procedures will be documented in field notebooks.

2.4. SURFACE WATER SAMPLING ANALYSIS

All surface water and water treatment plant samples will be analyzed by Pace Analytical for the following parameters. EnviroScience and ARCADIS will collect samples for selected Volatile

Organic Compounds (benzene, toluene, ethylbenzene, and xylenes (BTEX), and ethanol) and Polycyclic Aromatic Hydrocarbons (PAHs). Samples will be analyzed using the noted USEPA methods shown in Table 2.3.

Table 2.3. Methods with Containers, Preservation, and Holding Times.

Parameter	Analytical Method	Containers	Preservation	Hold Time
BTEX, Ethanol	8260B	3 – 40ml VOAs	HCl / None	14 days / 7 days
PAHs	8270	2 – 1L Amber Glass Jar	None	7 days

*days for extraction; 40 days after extraction

Pace Analytical will provide Level II data packages for 100% of samples. Sample results will be compared to applicable screening criteria and/or ambient conditions, as appropriate, for evaluation purposes. Pace Analytical will provide an expedited turn around on all surface water and water treatment plant samples to provide analytical data as quickly as practical.

2.5. SURFACE WATER SAMPLE HANDLING AND DELIVERY PROCEDURES

Concurrent with sample collection, field sampling personnel will record the sample identification number (Sample ID), location, water characteristics, and other relevant field data in field notebooks. Sample containers will be provided by Eurofins TestAmerica or Pace Analytical, and all samples will be labelled with a unique Sample ID, date and time of sample collection, and the initials or name of the person collecting the sample. Samples will immediately be placed on ice in a cooler.

All samples will be delivered to Pace **Analytical**'s Madisonville, KY laboratory along with a completed laboratory-provided COC form verifying the sample location, matrix, date and time of collection, and sample custody. COC procedures will be maintained from the time of sample collection until arrival at the laboratory to protect sample integrity. Transportation of samples to the laboratory will be completed within a timeframe that ensures hold times are met. One copy of the COC record will be maintained by field personnel.

3.0 QUALITY ASSURANCE/QUALITY CONTROL

The goal of QA/QC is to ensure samples are collected without the effects of accidental cross-contamination or systemic contamination and refers to the sampling and analysis procedures for generating defensible data. The following sections describe the procedures that will be performed to generate defensible data.

3.1. CALIBRATION

In-field water quality measurements will be taken using a YSI Pro DSS multi-probe (or equivalent). Calibration of the YSI DSS multi-probe (or equivalent) meter will be conducted according to the YSI Environmental Operations Manual at the start of each work day. The pH probe will be calibrated using three different buffers (4, 7, and 10 S.U.). The acceptable differences for pH is ±0.3. If the measurements do not meet quality control goals, best professional judgment will be used to decide if any of the data collected during that period may still be accurate. If any data that do not meet quality control goals are used, a rationale for their inclusion will be provided when the data are submitted.

3.2. QA/QC SAMPLES

3.2.1. Duplicate Samples

Duplicate samples will be collected to evaluate the precision of the laboratory by collecting samples simultaneously from the same source under identical conditions; however, samples will be placed into separate containers by alternatively filling the standard sample containers and the duplicate sample containers until both are full. Each sample will be assigned its own unique sample ID so that the duplicate sample will be blind to the laboratory. Duplicate samples will be collected at a frequency of 10% (1 per 10) and will be analyzed for the same parameters as the standard samples.·

3.2.2. Matrix Spike/Matrix Spike Duplicate Samples

Matrix Spike/Matrix Spike Duplicate (MS/MSD) samples will be collected to evaluate the precision and accuracy of the laboratory by collecting samples simultaneously from the same source under identical conditions; however, samples will be placed into separate containers by alternatively filling the standard sample containers and the MS/MSD sample containers until all containers are full. Each sample will be assigned its own unique sample ID, but samples will be clearly identified as MS/MSD samples on the chain of custody (COC) so that the laboratory can spike the MS/MSD samples with an analyte of interest. MS/MSD samples will be collected at a frequency of 5% (1 per 20) and will be analyzed for the same parameters as the standard samples.

3.2.3. Trip Blanks

Each cooler that is transported to the laboratory will include a laboratory-provided VOA vial that contains analyte free water. The trip blank will stay in the cooler and not be exposed to sampling and the results will include any potential sources of contamination from transport or laboratory sources. Trip blanks will be analyzed for VOCs only.

3.2.4. Split Samples

Split samples are samples that are collected from the same location and divided among two or more laboratories to provide an inter-laboratory or inter-organization comparison. If necessary, split samples will be collected using sampling procedures described in Section 2.2 of this plan Split samples are not anticipated, but may be collected at the discretion of the KDEP or other third party as requested.

3.2.5. QA/QC Sample Frequency Summary

Table 3.1 summarizes the QA/QC Field Sample Frequency.

Table 3.1. QA/QC Field Samples and Frequency

QA/QC Field Sample Frequency	
Sample/Blank Type	**Frequency**
Duplicate Sample	10% (1 per 10)
Matrix Spike/Matrix Spike Duplicate Samples	5% (1 per 20)
Trip Blank	One per cooler

3.3. LABORATORY QA/QC

All field and QA/QC samples will be submitted to Pace Analytical, a NELAP accredited laboratory in Knoxville, TN. Internal laboratory QC checks may include but not be limited to:

- Method Blank – Extraction solvent spiked with surrogate and handled exactly as sample extracts to monitor contamination during sample handling.
- Laboratory Control Sample – Method blank spike with calibration solution and handled exactly as sample extracts to monitor the accuracy of the laboratory.
- Laboratory Control Sample Duplicate – Second method blank spike with calibration solution and handled exactly as sample extracts to measure the precision of the laboratory.
- MS/MSD – Field samples spiked with known concentration of analyte to determine precision and accuracy of analysis relative to potential matrix interference.

Laboratory QA/QC will be conducted in accordance with relevant state and federal guidance documents.

4.0 FIELD VARIANCES

Every effort will be made to follow the Sampling and Analysis Plan as presented. However, as conditions in the field may change, it may become necessary to implement minor modifications to sampling as presented in this plan. If deviations are deemed appropriate and necessary by field personnel, the project manager will be notified, and a verbal approval will be obtained before implementing any necessary changes. Any modifications to the approved Sampling and Analysis Plan will be documented in field notebooks.

5.0 REPORTING

Details of all work conducted, including sampling methods, results, and conclusions will be compiled for submission.

6.0 LITERATURE CITED

KDEP. 2011. *Standard Operating Procedures: Sampling Surface Water Quality in Lotic Systems.* January 2011. https://eec.ky.gov/Environmental-Protection/Water/QA/BioLabSOPs/Sampling%20Surface%20Water%20Quality%20in%20Lotic%20Systems.pdf

Attachment A

Surface Water and Water Treatment Plant Sampling Locations

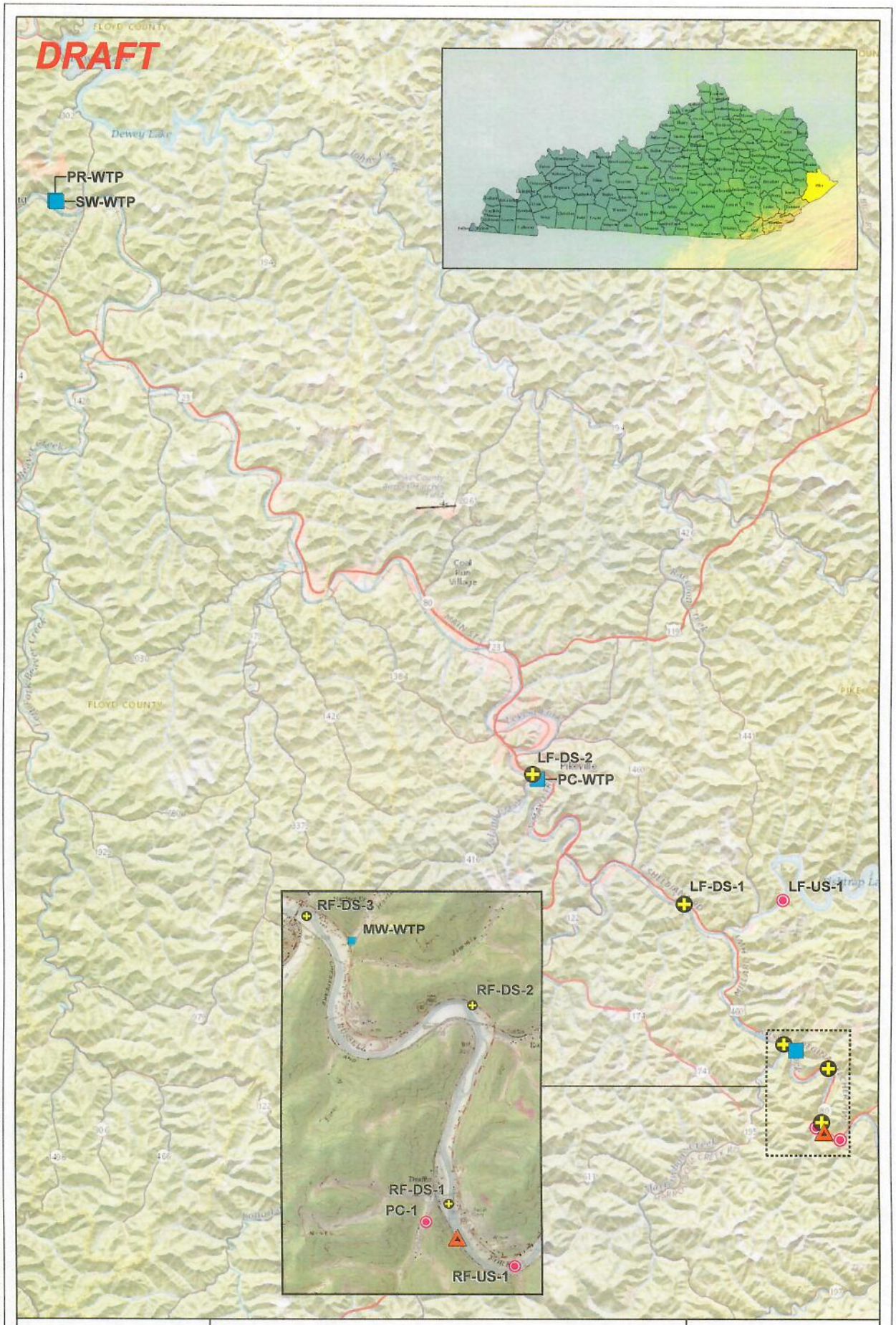

Figure 1: Surface Water and Water Treatment Plant Sampling Locations.

Path: C:\Users\Gregory Hoover\Desktop\CSKT_GIS\Map1_Site_REV.mxd

Date: 2/14/2020

Basemap courtesy of Esri.

Attachment B

Unified Command Authorization Forms

Authorization

Signature [redacted] Date 15 Feb 2020

Affiliation/Agency US EPA

Signature [redacted] Date 15 Feb 2020

Affiliation/Agency KY DEP

Signature [redacted] Date 2/15/20

Affiliation/Agency CSX Remediation

Signature [redacted] Date 2/15/20

Affiliation/Agency CSP

Signature _____ Date _____

Affiliation/Agency _____

Signature _____ Date _____

Affiliation/Agency _____

Signature _____ Date _____

Affiliation/Agency _____

Authorization

Signature_____ Date_____

Affiliation/Agency_____

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