Sampling QA/QC Work Plan
Removal Site Evaluation

Kiskimere Groundwater Well Investigation Site
Parks Township, Armstrong County, Pennsylvania

EPA Region III

START IV - West

Superfund Technical Assessment and Response Team

Contract No: EP-S3-10-04
TL01-13-02-005-DCN483

March 29, 2013

Prepared for Rich Rupert, On-Scene Coordinator
U.S. Environmental Protection Agency, Region III
1650 Arch Street
Philadelphia, Pennsylvania 19103

SAMPLING QA/QC WORK PLAN

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EPA Contract No.: EP-S3-10-04
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EPA Work Assigner: Rich Rupert
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Prepared by: TechLaw, Inc.

APPROVALS			
NAME	TITLE	SIGNATURE	DATE
[redacted]	START Site Leader		
[redacted]	START Quality Assurance Coordinator		
Rich Rupert	EPA On-Scene Coordinator		

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LIST OF ACRONYMS

Acronym	Definition
˚C	Degrees Celsius
AEC	United States Atomic Energy Commission
amsl	Above mean sea level
AOC	Area of Concern
B&W	Babcock & Wilcox Company
BTAG	Biological Technical Assessment Group
BWXT	BWX Technologies, Inc.
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CLP	Contract Laboratory Program
COC	chain-of-custody
CRQL	Contract Required Quantitation Limit
CST	Client Services Team
DAS	Delivery of Analytical Services
DOT	Department of Transportation
EPA	Environmental Protection Agency
ESAT	Environmental Services Assistance Team
FB	Field Blank
FUSRAP	Formerly Utilized Sites Remedial Action Program
GPS	Global Positioning System
Hg	Mercury
IATA	International Air Transport Association
ICP	Inductively Coupled Plasma
IDW	Investigation-derived waste
MA	Modified Analysis
ml	Milliliters
MS	Mass Spectrometry
MS/MSD	matrix spike/matrix spike duplicate
NRC	Nuclear Regulatory Commission
NUMEC	Nuclear Materials and Equipment Company

LIST OF ACRONYMS

Acronym	Definition
OASQA	Office of Analytical Services and Quality Assurance
OSC	On-Scene Coordinator
oz	ounce
PADEP	Pennsylvania Department of Environmental Protection
PCBs	Polychlorinated biphenyls
QA	Quality Assurance
QC	Quality Control
Ra	Radium
RAS	Routine Analytical Services
RB	Rinsate Blank
RI	Remedial Investigation
SD	Sediment
SLDA	Shallow Land Disposal Area
SNM	Spent Nuclear Material
SOW	Statement of work
START	Superfund Technical Assessment and Response Team
SVOCs	Semivolatile Organic Compounds
SW	Surface Water
TAL	Target Analyte List
TAT	Turnaround Time
TB	Trip Blank
TBD	To be determined
TCL	Target Compound List
TDD	Technical Direction Document
TR	Traffic Report
U	Uranium
USACE	United States Army Corps of Engineers
VOCs	Volatile Organic Compounds

1.0 INTRODUCTION

On February 8, 2013, U.S. Environmental Protection Agency (EPA) Region III On-Scene Coordinator (OSC) Rich Rupert tasked TechLaw, Inc. (TechLaw) to conduct a Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) removal site evaluation sampling assessment at the Kiskimere Groundwater Investigation Site (Site) located in Parks Township, Armstrong County, Pennsylvania. This work plan covers collection of groundwater seep, spring, outfall and sediment samples. The samples will undergo laboratory analyses for volatile and semi-volatile organics, 1,4-dioxane, polychlorinated biphenyls, metals and radiological contaminants. The samples will be collected from properties surrounding the Shallow Land Disposal Area (SLDA) and the Parks Township sites which are undergoing remediation. The data will be used to determine if contaminants from the SLDA or Parks Township sites are migrating off the property to nearby surface water and sediment receptors including Dry Run, Calahan Run and the Kiskiminetas River watersheds in the area. These sampling activities will be conducted under EPA Superfund Technical Assessment and Response Team (START) – West contract EP-S3-10-04 and Technical Direction Document (TDD) #TL-01-13-02-005.

2.0 SITE DESCRIPTION

The address for the Site is the intersection of Kiskimere and Eisenhower Streets in Parks Township which is located approximately 23 miles east-northeast of Pittsburgh, Pennsylvania (see Figure 1 – Site Location Map). The Site includes the Community of Kiskimere and neighboring properties in an area of concern (AOC) surrounding the Shallow Land Disposal Area (SLDA) and Parks Township Sites which are active remediation sites. The 44-acre SLDA is a former nuclear burial site that is undergoing cleanup. The Parks Township site is undergoing remediation due in part to groundwater and soil contamination from the operation of a nuclear fuel facility.

The Community of Kiskimere is located between the Kiskiminetas River and the southwest border of the SLDA and Parks Township sites (see Figures 2 and 3 – Site Topographic and Site Aerial Maps). Commercial property is located north of the remediation sites, and rural woodland and farmland border the SLDA to the south and east. Local ground surface elevation ranges from approximately 770 feet on the Kiskiminetas River to approximately 950 feet east of

Kiskimere. The Kiskiminetas River is located approximately 900 feet west of Kiskimere where it flows northwestward in a meandering course until it joins the Allegheny River approximately eight miles downstream. The Kiskiminetas River receives Site runoff from two tributaries near the Site. Dry Run is a small intermittent stream that collects surface water and seeps in the upper trench area of the SLDA. It flows along the northern border of the SLDA and reportedly loses some water to the mine through the strip mine tailings near the lower trench area (Trench 10) before emptying into the river. Carnahan Run is a larger, perennially flowing stream on the southern border of the study area.

Coal was historically extracted from beneath the Site from the Upper Freeport Coal seam which is part of the Glenshaw Member of the Conemaugh Group. The coal was strip mined in the lower elevations near the Kiskiminetas River and deep mined under the higher elevation central and eastern portions of the Site. Open (non-collapsed) abandoned room-and-pillar coal mines in the Upper Freeport underlie the majority of the Site. The coal seam has an average thickness of approximately 3.5 feet The top of the Upper Freeport coal is approximately 840 feet elevation above mean sea level (amsl). The seam is oriented with a slight southward dip beneath the Site and has an underlying clay layer. Mine outfall discharge has been documented at two locations along Carnahan Run to the south and southeast. Five hydrostratigraphic zones have been identified beneath the Site making up a somewhat complex groundwater system. These zones are described in the Remedial Investigation (RI) Report (USACE 2005) as Overburden; First Shallow Bedrock; Second Shallow Bedrock; Upper Freeport Coal; and Deep Bedrock.

3.0 BACKGROUND

The former SLDA Site was used for disposal of radioactive waste generated by the Nuclear Materials and Equipment Company (NUMEC) between 1961 and 1970. NUMEC operated the nearby Apollo nuclear fuel fabrication facility beginning in the late 1950s to convert enriched uranium to naval reactor fuel. In 1957, NUMEC initiated small-scale production of high- and low-enriched uranium and thorium fuel in Apollo, Pennsylvania. The Apollo facility was located approximately 2.5 miles south of the SLDA site. Waste from this facility was disposed of in 10 trenches at the SLDA in accordance with the United States Atomic Energy Commission (AEC) regulation in effect at the time, 10 CFR 20.304 (this regulation was rescinded in 1981). In 1970, NUMEC discontinued use of the SLDA for radioactive waste disposal. In 1971, the

Babcock & Wilcox Company (B&W) acquired NUMEC. In 1997, BWX Technologies, Inc. (BWXT) assumed ownership of the SLDA as well as the Apollo and Parks properties. Until 1995, the SLDA Site was included under a license issued by the United States Nuclear Regulatory Commission (NRC) for the adjacent Parks nuclear fuel fabrication facility (Spent Nuclear Material [SNM]-414). In 1995, to facilitate the decommissioning of the Parks facility, the SLDA Site was issued a separate license (SNM-2001). BWXT is the current licensee for the SLDA Site and is responsible for compliance with the terms and conditions of NRC License SNM-2001 (USEPA 2011).

3.1 Previous Investigations

The United States Army Corps of Engineers (USACE) conducted an investigation of the radiological contamination at the SLDA site under the Formerly Utilized Sites Remedial Action Program (FUSRAP) consistent with guidance issued by the EPA. The results of these investigations are presented in the RI report (USACE 2005). To support preparation of the RI report, USACE conducted a number of field investigations from August 2003 through January 2004 to determine the nature and extent of radioactive contamination at the SLDA Site. These field investigations were conducted in accordance with field sampling plans that were provided to the Pennsylvania Department of Environmental Protection (PADEP) and NRC, and were discussed with local regulatory agencies prior to implementation. All input received from these oversight agencies was reflected in the characterization process. Prior to this fieldwork, in-depth historical record searches and analyses were conducted, and detailed interviews performed with individuals familiar with disposal operations at the SLDA. In conducting the RI, USACE collected samples from surface and subsurface soils, trench waste, the five water-bearing geologic units, sediment, surface water, and groundwater seeps. This sampling program indicated that surface water and sediment in Carnahan Run were uncontaminated, while low levels of radioactive contamination were present at on-site locations in Dry Run and groundwater seeps in the upper trench area. This indicated that the radioactive wastes in the trenches may be impacting on-site surface water and sediment in Dry Run. Such impacts were not noted at off-site locations. Groundwater at the SLDA Site, outside of perched areas within the trenches, did not appear to be contaminated, other than some localized areas in the upper trench area in the upper

shallow bedrock water-bearing zone downgradient of disposal trenches 1 and 2. Some low levels of contamination were identified at this location, which may have been associated with the radioactive wastes in these two trenches. In summary, the contaminated media identified at the SLDA Site were the trench wastes, surface and subsurface soils, and sediment in Dry Run.

Residents from both the Community of Kiskimere and its adjacent neighboring towns (Vandergrift and Leechburg), have contacted EPA and expressed concern that their well water may have been and may currently be contaminated by leachate from the disposed materials at the SLDA and Parks Township clean-up Sites. During 2011, EPA began investigating these concerns and collected groundwater samples from residential homes that currently use well water and are located in the vicinity of the nearby cleanups. In addition, EPA is investigating surface waters and sediments, including those of the Kiskiminetas River and its tributaries near the Site, to evaluate if migration of source area contaminants into perimeter areas has occurred.

4.0 PROJECT ORGANIZATION AND RESPONSIBILITIES

EPA On-Scene Coordinator Rich Rupert will provide overall direction to TechLaw staff concerning project sampling requirements, objectives, and schedule. The START Site Leader [redacted] is the primary point of contact with the EPA OSC. The Site Leader is responsible for the development and completion of the Sampling QA/QC Work Plan, project team organization, and supervision of all project tasks, including reports and deliverables. The following TechLaw personnel will work on this project:

Personnel	Responsibility
[redacted]	Site Leader
[redacted]	QAC
TBD	Environmental Scientist/Sampler/technician

5.0 PROJECT DESCRIPTION

5.1 Objectives

The primary objective of this sampling event is as follows:

- Determine if contamination from the SLDA or Parks Township remediation areas has migrated into adjacent areas and is present in emerging groundwater seeps, springs, or outfalls and the associated sediments at those locations.

5.2 Scope of work

The scope of work includes collection of up to 10 surface water and 10 sediment samples from emerging springs, seeps, and/or outfalls as determined by the OSC. Surface water and sediment samples will be analyzed for Target Compound List (TCL) volatile (trace volatile compounds for surface water) and semi-volatile organic compounds (VOC, SVOC), 1,4-dioxane, polychlorinated biphenyls (PCB Aroclors, sediment only) , Target Analyte List (TAL) metals including mercury (Hg) and uranium (U), and radiochemical contaminants and activity including Radium-226 (Ra-226), Ra-228, gamma spec, and gross alpha/beta.

Initially, a Site reconnaisance will be conducted by EPA and START to determine the sampling locations which are anticipated to be within the Dry Run, Calahan Run, and Kiskiminetas watersheds near the Site (see Figure 4 - Groundwater Seeps and Springs Recon Area Map). Surface water samples will be collected as close to the groundwater seep, spring or outfall emergence point as is practicable. Sediment samples will be collected at the locations where surface water samples are collected and as designated by the OSC. Depending on the physical nature of each sampling location (e.g. marshy seep, bedrock drip or weep, surface flow, outfall flow, etc.) the surface water sample will be collected using an appropriate technique as discussed in Section 7.0 below. At minimum, water temperature will be recorded at each sample location. The sample team(s) will record measurement parameters, sample location descriptions and sample methods in field logbooks and will photograph and obtain global positioning system (GPS) longitude and latitude coordinates at each location.

6.0 DATA USE OBJECTIVES

The following data quality objectives apply to this project:

Program Area	Sampling Objective	Data Type
Removal	Determine the existence and extent of contamination	Definitive

The analytical data will be used to determine if contamination is potentially migrating from the source areas to nearby surface waters and sediments including tributaries of the Kiskiminetas River. Surface water and sediment data will be compared against EPA Biological Technical Assessment Group (BTAG) fresh water and sediment benchmarks.

7.0 PROJECT DESCRIPTION

The following table presents a list of areas to be sampled, sample matrices, analytical parameters, and analytical methods.

Area	Matrix	Parameters	Method(s)
Locations of groundwater seeps, springs, and/or outfalls in the watersheds of Dry Run, Calahan Run, and Kiskiminetas River near the Site	Surface water (from ground-water seeps, springs, or outfalls	TAL Metals+Hg+U	CLP ISM01.3 ICP MS/ MA 2183.0 for U (or equivalent)
		TCL Trace VOA/SVOA+TICs	CLP SOM01.2 (or equivalent)
		1,4-Dioxane	CLP SOM01.2 – MA 1679.3
		Radium-226	EPA 903.1
		Radium-228	EPA 904.0
		Gamma Spec	EPA 901.1
		Gross Alpha/Beta	EPA 900.0
	Sediment	TAL Metals+Hg+U	CLP ISM01.3 ICP MS/ MA 2183.0 for U (or equivalent)
		TCL VOA/SVOA/PCB+TICs	SOM01.2 (or equivalent)
		1,4-Dioxane	CLP SOM01.2 – MA 1679.3
		Radium-226	EPA 903.1
		Radium-228	EPA 904.0
		Gamma Spec	EPA 901.1
		Gross Alpha/Beta	EPA 900.0

Laboratory services will be requested through the EPA Region III Office of Analytical Services and Quality Assurance (OASQA) Client Services Team (CST). The proposed reconnaissance area from which samples are anticipated to be collected is shown on Figure 4.

7.1 Sampling Design/Analytical Methodology for Surface Water

As many as 10 spring, groundwater seep, and/or outfall water samples, including a field duplicate, will be collected from the Site and study area. All groundwater seep, spring or outfall samples will be collected from a location at or as close to the observed emergence point as is practicable. Samples will be collected in sequence from downstream to upstream locations. If available and accessible, a background sample will be collected from a location that is upgradient from both the source areas and other surface water sample locations. Preferably background samples will be collected in the same watershed at similar elevations as the other field samples. More than one background sample may be collected as determined by the OSC. If a duplicate sample is to be collected, the duplicate sample container will be filled immediately after the primary sample container is filled (per analysis). Sample containers will be filled in the following order based on analyses: VOC, SVOC, 1,4-dioxane, metals, radiochemical. Preferrably, spring, groundwater seep, and/or outfall water samples will be collected before collecting sediment samples to minimize turbidity in the water sample. A sediment sample may be collected first if a depression needs to be dug out out of the sediment at the seep location in order to create a pool for water sampling.

Sampling procedures for springs and groundwater seeps with emerging pools include use of a clean, dedicated transfer device such as a syringe, flask or bottle that will be used to collect and transfer the sample to the sample container. Alternately, a peristaltic pump may be used to collect non-VOA samples by inserting the end of the inlet tube into the pool while taking care not to draw in or disturb the sediment. At spring/seep locations where there is an emerging pool, the transfer vessel will be inverted and submerged in the pool and slowly rotated upright so water flows in. Care must be taken to ensure foreign materials do not enter the transfer vessel. The transfer vessel is then lifted out of the water and poured into the appropriate sample container. The process is repeated until the appropriate sample volume is acquired.

At spring or groundwater seep locations without pools, such as on a bedrock outcrop, it is preferred that sample volumes be collected directly from the emerging flow. A clean, dedicated hand trowel or stainless steel wire or rod may be used to direct flow from the rock face into the sample container.

At spring or groundwater seep locations in moist sediment and without a pool of standing water, a clean, dedicated hand trowel may be used to dig out a depression in the sediment in which groundwater can accumulate and be sampled. A clean dedicated and perforated plastic pail may be inserted into the depression to collect a volume of the seep or spring water during a period of time for later transfer to sample containers. Any sediment particles disturbed during the excavation of the depression will be allowed to settle out or clear prior to collection of the sample. Preferably, seep or spring water in a newly dug depression should be allowed to clear for a period of hours, such as overnight, before sample collection.

Observations at each location will be recorded in the field logbook, including; visual/ olifactory indicators (e.g. clear, turbid, product, odor, etc.), water quality parameters (e.g. temperature), spatial extent and depth of the seep pool, the approximate flow rate of the spring or groundwater seep, and the presence of any flow upstream from the spring /seep into the pool. The sampler should note any alteration that was done at the sampling site including the size and depth of any hole dug in the sediment for sample collection and the rate which groundwater flows into it. Photos and GPS coordinates shall be collected at each location and documented.

The sample containers will be placed into sample coolers and stored on ice at 4° Celsius (° C) until the samples are shipped to the assigned laboratory. In addition, the water sample volumes will be collected as follows:

- Surface water samples to be analyzed for TCL Trace VOCs by Contract Laboratory Program (CLP) Statement of Work (SOW) SOM01.2 will be collected into three 40-milliliter (ml) VOA vials and preserved with hydrochloric acid to achieve pH<2.

- Surface water samples to be analyzed for TCL SVOCs by CLP SOW SOM01.2 or equivalent method(s) will be collected into two 1-liter amber glass containers.

- Surface water samples to be analyzed for 1,4-dioxane by CLP SOM01.2 - MA 1679.3 will be collected into two 1-liter amber glass containers.

- Surface water samples to be analyzed for TCL aroclors by SOM01.2 or equivalent method(s) will be collected into two 1-liter amber glass containers.

- Surface water samples to be analyzed for TAL metals+Hg+U by CLP SOW ISM01.3 Inductively Coupled Plasma (ICP) Mass Spectrometry (MS) and Modified Analysis (MA) 2183.0 for uranium, or equivalent methods, will be collected into one 1-liter poly container and preserved with nitric acid to achieve pH<2.

- Surface water samples to be analyzed for Ra-226, Ra-228, gamma spec and gross alpha/beta by EPA methods 903.1, 904.0, 901.1, 900, respectively, will be collected into one 1-liter poly container per analysis (e.g. 4 containers total) and preserved with nitric acid to achieve pH<2.

Refer to Table 1 for a summary of field and quality control (QC) samples, analytical parameters, and methods. Sample containers, holding times, and preservation requirements are presented in Table 2.

7.2 Sampling Design/analytical Methodology for sediment

Up to 10 sediment samples, including a field duplicate sample, will be collected from locations as designated by the OSC. In general, sediment sampling locations will coincide with the same emergence points of the groundwater seep, spring, and outfall locations discussed in Section 7.1 above. Sediment samples will be collected after collection of associated surface water samples, where practicable, and will be collected in sequence from downstream to upstream locations. Sediment samples will be collected using dedicated, clean, stainless steel trowels to transfer sediment from 0-6 inches depth to sample containers.

The sample containers will be placed into sample coolers and stored on ice at 4° Celsius, until the samples are shipped to the assigned laboratory. In addition, sample volumes will be collected as follows:

- Sediment samples to be analyzed for TCL VOCs by CLP SOW SOM01.2 will be collected first and without homogenizing the matrix. The sampling location will be prepared by removing 0-3 inches of surface soil and vegetation. Sediment samples will be collected by plunging each core sampler directly into the soil. VOC samples will be collected into four 5-gram Encore (or equivalent) core samplers and one 4-ounce glass container (for moisture determination). If the sediment matrix is non-cohesive and granular (wet, rocky, saturated, etc.) and cannot be sampled with a 5-gram sampler, a dedicated clean stainless steel trowel will be used to transfer the soil into five 4-ounce glass containers with septa lids. The containers will be completely filled with no headspace. Sediment samples for VOC analysis have a short holding time and will require same-day shipment and overnight delivery to the laboratory.

- Sediment volumes for remaining analyses, including; TCL SVOCs/PCBs by CLP SOW SOM01.2, 1,4-dioxane by CLP SOM01.2 – MA 1679.3, TAL metals+Hg+U by CLP SOW ISM01.3 ICP/MS+MA 2183.0, and RA-226, Ra-228, gamma spec and gross alpha/beta by EPA methods 903.1, 904.0, 901.1, 900, or equivalent methods, respectively, will be thoroughly homogenized in a dedicated aluminum pan before transferring the matrix to appropriate sample containers. The sampler will decant water and remove foreign and organic matter from the sediment if present and use the finer matrix to fill the sample containers. Container volumes include an 8-ounce glass jar for the SVOC/PCB analyses, an 8-ounce glass jar for the 1,4-dioxane analysis, an 8-ounce glass jar for the TAL metals+Hg+U analysis, and an 8-ounce glass jar for each of the radiochemical analyses (e.g. 4 jars total).

Refer to Table 1 for a summary of field and quality control (QC) samples, analytical parameters, and methods. Sample containers, holding times, and preservation requirements are presented in Table 2.

7.3 Sample Identification Numbers

7.3.1 CLP Samples

Samples to be analyzed by CLP Routine Analytical Services (RAS) laboratories will be assigned CLP sample numbers. The CLP sample numbers will be automatically assigned by the SCRIBE software. The sample number format will be as follows:

- C#### where;

  C = indicates that the sample is to be analyzed under a CLP organics SOW.

  MC = indicates that the sample is to be analyzed under a CLP inorganics SOW.

  #### = alpha-numeric that will be sequentially assigned as the sample data are entered into the SCRIBE program.

7.3.2 DAS Samples

Samples to be analyzed by OASQA-assigned Delivery of Analytical Services (DAS) laboratories will be assigned a DAS sample number. The numbers will be manually assigned by the Team Leader in the SCRIBE software. The sample number format will be as follows:

- R*xxxxx-yy* where;

  R*xxxxx* = indicates the DAS assignment code; and

  yy = indicates the sequential number of the sampling location

Alternatively, the sample station location number may be used as the DAS sample number.

7.3.3 Sample Station Locations

Sample Station Location Identification Numbers will be assigned by the sampling team sequentially in the order they are collected. The sample station location number format will be as follows:

- AA##(F) where;

  AA Represents the sample matrix, as follows:

SW = Surface water sample;

SD = Sediment sample;

TB = Trip blank sample

FB = Field blank sample;

RB = Rinsate blank sample; and

= Sequential number of sample location per matrix or QC sample type.

F = Sample was filtered in the field (aqueous matrix only)

7.4 Sampling Equipment and Decontamination

TechLaw, Inc. will use dedicated, disposable sampling equipment where possible while collecting Site samples. Non-dedicated sampling equipment, when used, will be decontaminated between samples utilizing an Alconox®/water solution and scrub brush followed by a thorough rinse with distilled water. One rinsate sample per each type of sampling device will be collected each day to verify the effectiveness of the decontamination procedures for non-dedicated equipment.

7.5 Investigation-Derived Wastes

START field team members will make every effort to minimize the generation of investigation-derived wastes (IDW) throughout the field event. Disposable personal protective clothing and sampling equipment generated during field activities will be cleaned by physical removal of potentially contaminated soil, rendered unusable by tearing (when appropriate), bagged in opaque plastic garbage bags, and disposed of at a municipal landfill.

Soil cuttings generated during collection of sediment samples will be returned to the respective sample location. Other options for disposal of IDW are presented in EPA's Guide to Management of Investigation-Derived Wastes, EPA Publication 9345.3-03FS (January 1992).

8.0 QUALITY ASSURANCE/QUALITY CONTROL (QA/QC) PROCEDURES

8.1 Quality Control of Field Activities

The START Site Leader is responsible for ensuring that sample quality and integrity are maintained in accordance with the QA/QC Procedures, and that the sample labeling and documentation is performed as described in Section 8.2 of this sampling plan.

8.2 Sample Documentation

All sample documentation will be completed legibly using indelible black ink. Any corrections or revisions will be made by lining through the incorrect entry and by initialing and dating the error.

8.3 Field Logbook

START will document all pertinent Site information in Field Activity Logbooks. The field logbook is a descriptive notebook detailing Site activities and observations so that an accurate account of field procedures can be reconstructed. All entries will be dated and signed by the individual making the entries, and include (at a minimum) the following:

1. Site name and project number.
2. Name(s) of personnel on Site.
3. Dates and times of all entries (military time preferred).
4. Descriptions of all Site activities, including Site entry and exit times.
5. Noteworthy events and discussions.
6. Weather conditions.
7. Site observations.
8. Identification and description of samples and locations.
9. Subcontractor information and names of on-Site personnel.
10. Date and time of sample collections, along with chain of custody information.
11. Record of photographs.

12. Site sketches.

8.3.1 Sample Labels/Tags

Sample labels and tags must clearly identify the particular sample. Required information for sample labels and tags is presented in CLP Guidance for Field Samplers, EPA Publication 540-R-09-03, Final (January 2011) and is provided below.

Sample bottle labels must include the following information:

1. CLP or Regional Sample number, as applicable;
2. CLP Case No. or Regional DAS Case No.;
3. Preservative(s);
4. Analysis/fraction.

Additional information may be included on the label, such as the Station No. and/or Station Location No., date and time collected, etc.

Sample tags must include the following information:

1. CLP or Regional Sample number, as applicable;
2. CLP Case No. or Regional DAS Case No.;
3. Station no. and/or Station Location No. (assigned by sampler);
4. Date sample was collected (month, day, and year);
5. Time sample was collected (in military time);
6. Preservative, if any (specify "None" if sample is not preserved);
7. Type of sample (grab or composite);
8. Analysis/fraction requested;
9. Sampler's names/signature(s);
10. EPA Tag No.

Sample labels will be securely affixed to the sample container. Tie-on sample tags will be properly secured around the neck of the container. . However, if the sample container

is too small for a sample tag to be affixed to it, then the sample tag can be placed in a plastic zipping bag along with the sample container.

8.3.2 Chain of Custody Record

Proper chain of custody will be maintained from the time the sample is collected until its final deposition. Every transfer of custody will be noted and signed. When samples (or groups of samples) are not under direct control of the individual responsible for them, they will be stored in a locked container sealed with a Custody Seal.

As per EPA Directive No. and 9200.1-103, START will use Scribe sample tracking software to prepare sample labels, tags, and chain of custody forms/traffic reports. The Chain of Custody record/EPA Traffic Report (COC/TR) will include (at minimum) the following information:

1. CLP or Regional Sample number, as applicable;
2. CLP Case No. or Regional DAS Case No.;
3. Sample matrices;
4. Concentration (Note: Always specify "low concentration" for CLP samples unless directed otherwise by the project chemist or EPA analytical services coordinator, e.g., Client Services Team [CST]);
5. Specify sample type (grab or composite);
6. Analyses requested;
7. Laboratory turnaround time (TAT) [Note: This does not include the TAT for data validation. If preliminary results (PR) are required, this must be specified on the COC.)
8. Regional specific tracking Nos. (EPA sample Tag Nos.) and No. of containers;
9. Preservative(s);
10. Station location identifier (sampler assigned sample No.);
11. Date and time sample collected;
12. Corresponding CLP organic or inorganic sample No. (if applicable).

13. Field QC information (identify trip/field/rinsate blanks only as "Field QC");
14. Specify samples to be used for laboratory QC (e.g. MS/MSD);
15. Name(s) and signature(s) of sampler(s);
16. Signature(s) of any individual(s) with control over samples;
17. Specify if shipment under the CLP or Regional DAS Case No. is complete (e.g., no additional sample shipments will be made under the case No.); and
18. Carrier, air bill No., and date of the shipment.

8.3.3 Custody seals

Custody seals will be used on all shipping containers used to ship samples. Custody Seals demonstrate that a container has not been tampered with or opened. The individual shipping the sample(s) will sign and date the seal, affixing it in such a manner that the container cannot be opened without breaking the seal. The name of this individual, along with a description of the sample packaging, will be noted in the field logbook.

8.4 Sample Packaging, Storage, and Shipping

In accordance with Contract Laboratory Program Guidance for Field Samplers, EPA Publication 540-R-09-03, Final (January 2011), sample containers will be labeled and shipped with a label and sample tag affixed to each container. Samples will be placed in plastic zipping bags. Bagged containers will be placed in appropriate transport containers and the containers will be packed with appropriate absorbent material and bubble wrap. All sample/traffic reports/COC documents will be affixed to the underside of each transport container lid. The lid will be sealed with shipping tape and custody seals affixed to the transport container. Transport containers will be labeled with the origin and destination locations.

Regulations for packaging, marking, labeling, and shipping of hazardous materials and wastes are promulgated by the U.S. Department of Transportation (DOT). Air carriers which transport hazardous materials, in particular, Federal Express, require compliance with the current International Air Transport Association (IATA) Regulations, which

apply to the shipment and transport of hazardous materials by air carrier. START will follow IATA regulations to ensure compliance.

8.5 Field QC Samples

Field QC will consist of one field duplicate for every ten field samples, or one per batch if fewer than ten are collected. Duplicate samples will be sent "blind" to the laboratory and documented in the Field Activities Logbook and on the Regional copy of the TR/COC. The field duplicate will test the reproducibility of sampling procedures and analytical procedures. One equipment rinsate sample will be collected daily for non-dedicated sampling equipment used. A trip blank will be included in all coolers shipped with samples for VOC analysis and will be analyzed for VOA only. A field blank will be collected and analyzed for the same parameters as the surface water samples.

8.6 Laboratory QC

Laboratory QC will be in accordance with the method/CLP requirements. START will designate one sample per matrix in each batch/sample delivery group (SDG) submitted to the laboratory to be used for a matrix spike/matrix spike duplicate (MS/MSD). A batch/SDG is defined as up to 20 samples of a specific matrix submitted for a specific case; or all the samples of a specific matrix (up to a maximum of 20) received by the laboratory for a specific case within a 7 calendar day period (3 calendar day period for 7 day TAT), with the period beginning with the receipt of the last sample in the SDG.

8.7 Data Validation

Analytical data for organic analyses generated under this Sampling QA/QC Work Plan will be evaluated in accordance with *EPA Region III Modifications to National Functional Guidelines for Organic Data Review Multi-Media, Multi-Concentration* (OLM01.0-OLM01.9) (September 1994) at the M3 level. Analytical data for inorganic analyses will be evaluated in accordance with *EPA Region III Modifications to the Laboratory Data Validation Functional Guidelines for Evaluating Inorganics Analyses* (April 1993) at the IM2 Level. Validation for the analytical services subcontract arranged through TechLaw will be accomplished by an experienced TechLaw data

validator. Validation for analytical services arranged through the EPA Region III CST will be accomplished by the Environmental Services Assistance Team (ESAT).

9.0 SCHEDULE OF ACTIVITIES

The schedule for the Site is projected as follows:

Task Description	Start Date	End Date/Duration
Mobilization to Site	April 8, 2013	April 8, 2013
Site Reconnaissance	April 8, 2013	April 8, 2013
Sample collection / Ship VOA	April 9, 2013	April 10, 2013
Demobilization from Site	April 10, 2013	April 10, 2013
Packaging and shipping samples	April 10, 2013	April 12, 2013

10.0 DELIVERABLES

The following deliverables will be provided under this project:

- A Data Validation Report with lab results will be provided to the EPA OSC within approximately 35 days from receipt of the samples at the laboratory. The EPA ESAT will review and validate analytical data obtained through services arranged through the EPA CST and will prepare the Data Validation Report.

- TechLaw, Inc. will prepare a sample location map and a sample summary/description table within three weeks of the sampling event.

- TechLaw will prepare a trip report following receipt of the validated data.

11.0 LIST OF REFERENCES

US Army Corps of Engineers (USACE). 2005. "*Remedial Investigation: Shallow Land Disposal Area*" Prepared by URS. October, 2005

U.S. Environmental Protection Agency (EPA). 2011. "*Kiskamere Groundwater Well Investigation Site Trip Report/Site Inspection*" Prepared by TechLaw, Inc. November 30, 2012.

FIGURES

TABLES

ATTACHMENT 1

TARGET COMPOUND LIST FOR VOCS

ATTACHMENT 2

TARGET COMPOUND LIST FOR SVOCS

ATTACHMENT 3

TARGET COMPOUND LIST FOR AROCLORS

ATTACHMENT 4

TARGET ANALYTE LIST

ATTACHMENT 5
RADIOCHEMICAL DETECTION LIMITS