

**FIELD SAMPLING AND ANALYSIS PLAN
NEW KENT WOOD PRESERVERS SITE
PROVIDENCE FORGE, NEW KENT COUNTY, VIRGINIA**

Prepared for:



U.S. Environmental Protection Agency Region III
Hazardous Site Cleanup Division
1650 Arch Street
Philadelphia, PA 19103

Prepared by:



Weston Solutions, Inc.
1400 Weston Way
West Chester, Pennsylvania 19380

EPA Contract No.: EP-S3-10-05
TDD No.: WS01-14-05-003
DCN No.: W0233.1E.00945

June 19, 2014

**FIELD SAMPLING AND ANALYSIS PLAN
NEW KENT WOOD PRESERVERS SITE
PROVIDENCE FORGE, NEW KENT COUNTY, VIRGINIA**

Approved by: *Erik Armistead* Date: June 20, 2014
Erik Armistead
START Removal Scope of Work Manager

Approved by: *Gretchen M. Fodor* Date: June 20, 2014
Gretchen Fodor
START QA Manager

Approved by: _____ Date: _____
Ruth Scharr
EPA On-Scene Coordinator

TABLE OF CONTENTS

<u>Section</u>	<u>Page</u>
1.0 INTRODUCTION	1
1.1 KEY PROJECT PERSONNEL	1
2.0 BACKGROUND	3
2.1 SITE LOCATION AND DESCRIPTION	3
2.2 SITE HISTORY	5
3.0 OBJECTIVE AND DATA USE	5
4.0 PROPOSED ACTIVITIES	7
4.1 SCOPE OF WORK	7
4.2 IN-SITU XRF SCREENING	7
4.3 SURFACE SOIL SAMPLING	8
4.4 SAMPLE DESIGNATION	9
4.5 SAMPLE HANDLING AND PREPARATION	9
4.6 INVESTIGATION-DERIVED WASTES	10
5.0 ANALYTICAL PARAMETERS AND METHODS	10
6.0 QUALITY ASSURANCE AND QUALITY CONTROL PROCEDURES	10
6.1 RESPONSIBILITY	10
6.2 FIELD QUALITY CONTROL	11
6.3 LABORATORY QUALITY CONTROL	11
6.4 DATA VALIDATION	11
6.5 DATA EVALUATION AND MANAGEMENT	11
6.5.1 Data Evaluation	11
6.5.2 Data Representativeness and Completeness	12
6.5.3 Data Management	12
7.0 DELIVERABLES	12
8.0 SCHEDULE	12
REFERENCES	14

LIST OF FIGURES

<u>Figures</u>	<u>Page</u>
FIGURE 1 SITE LOCATION MAP	4
FIGURE 2 SITE LAYOUT MAP.....	6

LIST OF TABLES

<u>Table</u>	<u>Page</u>
TABLE 1 PROPOSED WESTON PROJECT PERSONNEL	2
TABLE 2 ANALYTICAL PARAMETERS	10
TABLE 3 PROJECT SCHEDULE	13

1.0 INTRODUCTION

Under the Eastern Area Superfund Technical Assessment and Response Team (START) Contract No. EP-S3-10-05, Technical Direction Document (TDD) No. WS01-14-05-003, the U.S. Environmental Protection Agency (EPA) Region III tasked Weston Solutions, Inc. (WESTON®) to conduct a removal assessment at the New Kent Wood Preservers Site (Site) located in Providence Forge, New Kent County, Virginia. The objective of the removal assessment is to determine concentrations of arsenic, chromium, and copper in surface soils, specifically focusing on areas posing a risk to personnel currently working at the Site. To achieve this objective, surface soil samples will be screened in-situ with handheld X-ray fluorescence (XRF) analyzers, and select locations will be sampled for laboratory analysis.

This Field Sampling Plan (FSP) presents site background information in Section 2.0, outlines project objectives and data use in Section 3.0, describes proposed field activities in Section 4.0, summarizes analytical parameters and methods in Section 5.0, specifies quality assurance and quality control (QA/QC) procedures in Section 6.0, presents proposed deliverables in Section 7.0, and outlines the proposed project schedule in Section 8.0. References cited in this FSP are listed after the text. WESTON developed this FSP in accordance with the provisions of the *EPA Region III START 4 Program-Wide Uniform Federal Policy (UFP) Quality Assurance Project Plan (QAPP)* (WESTON, 2010a).

1.1 KEY PROJECT PERSONNEL

The WESTON project task lead for the TDD is Erik Armistead. The project task lead is responsible and accountable for all aspects of the project scope of work, including achieving the technical, financial, and scheduling objectives for the project. The project task lead will communicate directly with the EPA On-Scene Coordinator (OSC) for this project, Ruth Scharr.

Other WESTON personnel proposed for the project and their responsibilities are presented in Table 1, Proposed WESTON Project Personnel. Technical or field support personnel used for the project may vary depending on the specific needs of the project, as well as on-site conditions and availability of staff.

**Table 1
Proposed WESTON Project Personnel**

Project Function	Name	Responsibilities
Project Task Lead	Erik Armistead	The project task lead is responsible for implementing all activities identified in the TDD; is responsible for developing and implementing the site health and safety plan; has authority to commit resources necessary to complete the work; prepares deliverables required by the TDD; and communicates directly with the EPA OSC, the project team, and any other personnel needed to complete the project.
Field Support Personnel	Matt Fisher	The field support personnel performs necessary sampling or monitoring, as well as other tasks defined in the TDD or assigned by the EPA OSC or the WESTON project task lead; and communicates directly with the WESTON project task lead and, when appropriate, the EPA OSC.
Health and Safety Officer	Christopher Baer	The health and safety officer oversees and supports development of the site health and safety plan; and communicates directly with the WESTON project task lead to ensure that all corporate health and safety protocols applicable to the site are being followed.
Chemist/ QA Officer	Gretchen Fodor	The chemist coordinates with the WESTON project task lead regarding the analytical requirements for the project; solicits and procures laboratory services and reviews and validates analytical data as needed; and communicates directly with WESTON personnel.
Sampling Coordinator	Laura Mathew	The sampling coordinator coordinates with the WESTON project task lead, chemist, and the EPA Office of Analytical Services and Quality Assurance to procure or arrange necessary laboratory services.
Financial Manager	Melissa Newton	The financial manager works with the WESTON project task lead in planning related to the TDD budget and completion date, enters financial information on the project into the WESTON management information system, prepares regular and special reports to assist the WESTON project task lead in managing the project, and submits the invoice and Monthly Status Report to EPA each month.
START Removal Scope of Work Manager	Erik Armistead	The removal scope of work manager assists the WESTON project task lead as necessary to implement the project, commits or helps obtain all necessary company resources to meet the objectives of the TDD, and addresses and helps resolve project management issues with the WESTON project task lead.
START Program Manager	Robert McGlade	Assists the removal scope of work manager and the task leader with any project management issues. The Program Manager will communicate directly with the EPA Contracting Officer and Project Officer when necessary.

Notes:

EPA = U.S. Environmental Protection Agency

OSC = On-Scene Coordinator

QA = Quality Assurance

TDD = Technical Direction Document

WESTON = Weston Solutions, Inc.

2.0 BACKGROUND

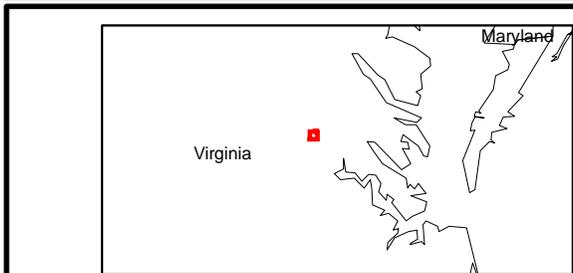
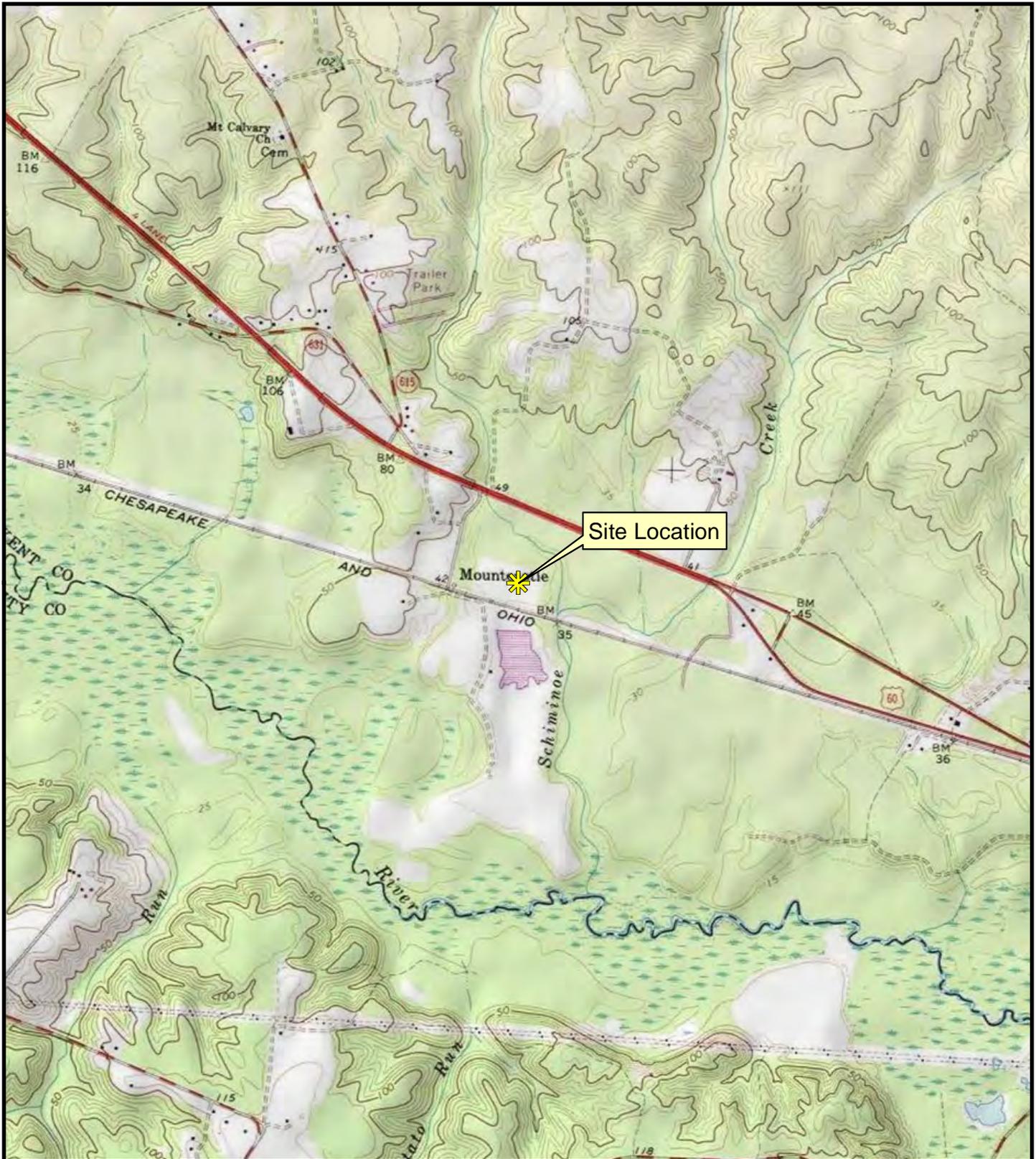
This section describes the site location, presents a description of the Site, and briefly summarizes previous site investigations. A more detailed review of previous site investigation activities is available in the *Final Site Reassessment Report for the New Kent Wood Preservatives, Inc. Site* prepared by Blueskies Environmental Associates, Inc. (Blueskies) for the Virginia Department of Environmental Quality (VADEQ) in May 2012 (Blueskies, 2012).

2.1 SITE LOCATION AND DESCRIPTION

The Site is located at 4101 South Mountcastle Road, Providence Forge, New Kent County, Virginia, and is depicted on Figure 1, Site Location Map. The approximate geographic coordinates of the center of the Site are 37.4539° north latitude and 77.0910° west longitude. The Site is located approximately 1,500 feet south of the intersection of Route 60 and Route 615 in a primarily undeveloped/rural area. Several industrial facilities exist nearby. The Site is currently occupied by two active businesses, McNeil Sales & Service Inc., providing refractory construction and repair services, and Museum Resources Construction and Millwork, Inc., providing construction, design, and millwork services for historic sites, private owners, and commercial buildings.

The Site is surrounded primarily by a mixture of undeveloped woodland and wetlands. The Virginia Recycling Corporation, an active tire recycling facility, is located immediately to the northwest, a farm field and homestead is located to the southwest, and Lee Hy Paving Corporation, an asphalt manufacturer and recycler is located south of the Site beyond a CSX railroad line which runs along the southern edge of the Site. Route 615 runs along the western edge of the property.

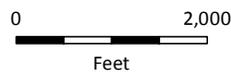
The Shiminoe Creek is located immediately east of the Site, flowing south, into the Chickahominy River.



USGS 7.5 Minute Quadrangle
 Providence Forge, Virginia. 1977



Coordinate System:
 WGS84 UTM Zone 18N Feet



New Kent Wood Preservers
 Providence Forge, New Kent County, VA

Figure 1
 Site Location Map

TDD#: WS01-14-05-003
 Contract: EP-S3-10-05
 Prepared: 6/17/2014



2.2 SITE HISTORY

The Site was operated as a lumber company, pressure treating wood with a chromate copper arsenate (CCA) solution under various names and owners between 1977 and approximately 1993. Figure 2, Site Layout Map, depicts the Site and features used during lumber treatment operations. Throughout the operational history, the location of the drip pad where CCA treated wood would be allowed to dry following treatment remained in the center of the Site. A secondary drip pad was identified in a 1996 assessment by EPA southeast of the primary drip pad. Site drainage was reported to be a significant issue onsite over its history, with the Site often becoming inundated with mud. Ditches were used throughout the Site to assist with site drainage (Blueskies, 2012).

VADEQ and EPA have completed numerous assessments and inspections of the Site, documenting employee complaints, housekeeping issues, and improper material handling which may have caused releases of hazardous materials to the environment. During the most recent sampling assessment, conducted by EPA in 1996, elevated concentrations of arsenic, chromium, and copper were identified throughout site soils as high as 1,110 mg/kg of arsenic, 900 mg/kg of chromium, and 602 mg/kg of copper (Blueskies, 2012).

3.0 OBJECTIVE AND DATA USE

The objective of this removal assessment is to determine if concentrations of arsenic, chromium, or copper concentrations in surface soils at the Site pose a risk to human health or the environment. The data will be used by EPA to further evaluate conditions at the Site. When possible, samples will be collected following procedures to assist the EPA Site Assessment Branch with ongoing investigation activities.



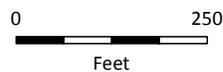
Legend

 Site Boundary

USGS 7.5 Minute Quadrangle
Providence Forge, Virginia. 1977



Coordinate System:
WGS84 UTM Zone 18N Feet



New Kent Wood Preservers
Providence Forge, New Kent County, VA

Figure 2
Site Layout Map

TDD#: WS01-14-05-003
Contract: EP-S3-10-05
Prepared: 6/17/2014



4.0 PROPOSED ACTIVITIES

This section describes the scope of work, including proposed sampling activities and field measurements; summarizes samples for the project; describes how samples will be collected and handled; and describes equipment decontamination procedures and disposal of investigation-derived waste (IDW) generated during sampling.

4.1 SCOPE OF WORK

As part of the sampling assessment for the Site, WESTON will perform the following tasks:

- Conduct in-situ XRF analysis of surface soils throughout the Site, mapping screening locations and results.
- Collect surface soil samples biased towards areas of higher risk and higher concentration.
- Package and ship all samples to the assigned EPA Contract Laboratory Program (CLP) laboratory for analysis of arsenic, copper, and chromium.
- Present a summary of all data collected in a Trip Report for submittal to EPA.

4.2 IN-SITU XRF SCREENING

An XRF analyzer will be utilized for in-situ screening of surface soils to determine the concentrations of metals in surface soils at the Site prior to sample collection activities. To ensure all areas of the Site are sufficiently assessed, 150 foot by 150 foot grids will be established across the Site. A minimum of eight locations will be screened from each grid location. Screening locations may be biased towards areas of high use, historical use, or observations in the field. Additional screening locations will be selected based on the discretion of the OSC.

XRF analysis will be performed in-situ in accordance with EPA Method 6200 Section 11.3 (EPA, 2007). Precision measurements will not be conducted as recommended in Method 6200, Section 11.3. However, XRF standards of known concentrations supplied with the instrument, will be analyzed by the XRF prior to and after use to ensure the XRF is functioning properly. The XRF spectrometer will be operated according to the manufacturer's recommendations in bulk sample mode. Prior to XRF analysis at a specific location, any large, non-representative debris will be removed from the location if necessary. The soil surface should be level so that the probe window of the XRF analyzer has good

contact with the soil surface. Soil should not be saturated with water greater than 5 to 20% if possible. At each location, the XRF analyzer will run for a minimum of 30 seconds and reach a detection level sufficient to detect at least 24 mg/kg of arsenic and 56 mg/kg of chromium.

Each screening location will be recorded to an online data viewer to identify Global Positioning System (GPS) coordinates and screening results in real time. Screening data will be color coded by concentrations determined by the OSC to assist with interpretation of the data in the field. All screening data will be compiled for submittal to EPA in the Trip Report.

4.3 SURFACE SOIL SAMPLING

Surface soil sample locations will be determined in the field at the discretion of the OSC, based on field conditions and results of the in-situ XRF soil screening. Sample locations will be biased towards areas in which existing site employees may be exposed to arsenic, copper, and chromium during work activities, and areas that may pose a risk of release from the Site.

Surface soil samples will be collected in accordance with WESTON Standard Operating Procedure (SOP) No. 302, "Surface Soil Sampling" (WESTON, 2006). Surface soil will be collected using dedicated equipment, such as plastic scoops and nitrile gloves, whenever possible. Each sample location may be prepared for sampling by removing any debris or vegetation and loosening the topsoil, if necessary. Surface soil samples will be collected as grab samples from the prepared sampling location from 0 to 3 inches below ground surface (bgs) using a dedicated plastic scoop. The soil will be placed directly into an 8-ounce clear, wide-mouth glass jar for submittal to the laboratory. The geographic location of each soil sample will be recorded with a Trimble GPS device. All soil samples will be analyzed for arsenic, copper, and total chromium.

One spike/spike duplicate sample will be collected for every 20 samples collected. No additional sample volume is necessary for spike/spike duplicate samples.

Up to three surface soil samples will be collected from areas that are not expected to have been impacted from historical operations at the Site.

4.4 SAMPLE DESIGNATION

Each sample will be assigned a unique CLP number in the format MCXXXX for inorganic analyses, where the “X” in the sample identifier (ID) is an alphanumeric character assigned by Scribe. WESTON will also assign a Station Location ID that identifies the sample location as follows:

NK-SS-##-MMDDYY

The “NK” prefix refers to the Site name, New Kent Wood Preservers Site. The “SS” refers to a surface soil sample, the “##” portion refers to the unique sample number assigned to a specific sampling location. The “MMDDYY” refers to the date of sample collection (i.e., 061914 for June 19, 2014).

4.5 SAMPLE HANDLING AND PREPARATION

The WESTON project task lead will assure that sample quality and integrity are maintained in accordance with WESTON’s *EPA Region III START 4 Program-Wide UFP QAPP* (WESTON, 2010a). Sample handling, packaging, and shipment procedures will be in accordance with the *Contract Laboratory Program Guidance for Field Samplers* (EPA, 2011) and WESTON’s “Environmental Sample Shipment Checklist” (WESTON, 2010b). Sample containers will be shipped with a sample label and sample tag affixed to each container. Tagged samples will be placed in sealed plastic bags. Bagged containers will be placed in appropriate transport containers, and the containers will be preserved with ice. All sample documents (i.e., Scribe generated chain-of-custody forms) will be sealed in a plastic bag affixed to the underside of each transport container lid. The lid will be sealed with shipping tape, and custody seals will be affixed across the gap between the lid and body of the transport container. Transport containers will be labeled with the origin and destination locations and will be shipped to the assigned CLP laboratory.

Regulations for packaging, marking, labeling, and shipping hazardous materials and wastes are promulgated by the U.S. Department of Transportation. Air carriers that transport hazardous materials require compliance with the current International Air Transport Association (IATA) regulations, which apply to shipment and transport of hazardous materials by air carrier. WESTON will follow all applicable IATA regulations.

4.6 INVESTIGATION-DERIVED WASTES

Field activities may produce waste products such as spent sampling supplies and expendable personal protective equipment (PPE). Disposable sampling equipment and PPE will be double-bagged and disposed of as dry, non-hazardous waste.

5.0 ANALYTICAL PARAMETERS AND METHODS

Table 2, Analytical Parameters, summarizes the matrices, analyses, analytical methods, containers, preservatives, detection limits, and technical holding times for all the samples proposed for collection during the sampling event. All samples will be analyzed for arsenic, chromium, and copper by CLP Statement of Work (SOW) Inorganic Superfund Method version 1.2.

Table 2
Analytical Parameters

Matrix	Analysis	Analytical Method	Container	Preservative	Detection Limit	Technical Holding Time
Soil	Arsenic, Chromium, Copper	CLP SOW ISM01.2	1 x 8-oz CWM glass jar	Ice	Arsenic – 1 mg/kg Chromium – 1 mg/kg Copper – 2.5 mg/kg	180 days

Notes:

CLP = Contract Laboratory Program

CWM = clear wide mouth

ISM01.2 = Inorganic Superfund Method version 1.2

mg/kg = milligram per kilogram

oz = Ounce

SOW = Statement of Work

6.0 QUALITY ASSURANCE AND QUALITY CONTROL PROCEDURES

This section describes the QA and QC procedures for personnel during the site sampling event, including responsibilities, field QC, laboratory QC, data evaluation, and data management.

6.1 RESPONSIBILITY

The WESTON project task lead will be responsible for ensuring that sample quality and integrity are maintained in accordance with WESTON's *EPA Region III START 4 Program-Wide UFP QAPP* (WESTON, 2010a).

6.2 FIELD QUALITY CONTROL

Each sampling location will be noted in the field logbook in accordance with WESTON SOP No. 101, “Logbook Documentation” (WESTON, 2010c). Field QA/QC measures will consist of maintaining photographic, logbook, and chain-of-custody documentation. Field duplicate samples will not be collected as field samples will consist of grab samples only, and will not be homogenized prior to analysis. These measures will be applied in accordance with WESTON’s *EPA Region III START 4 Program-Wide UFP QAPP* (WESTON, 2010a).

6.3 LABORATORY QUALITY CONTROL

Samples will be shipped to the EPA CLP laboratory assigned by the EPA Region III Office of Analytical Services and Quality Assurance (OASQA). One soil sample per 20 field samples of the solid matrix will be designated for inorganic spike/duplicate analysis. Laboratory QC measures will consist of all QC elements identified in the CLP Inorganic SOW and will include all forms and deliverables required by the SOW (EPA, 2010).

6.4 DATA VALIDATION

Data will be validated in accordance with *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review*, USEPA-540-R-10-011 (EPA, 2010) by the Environmental Services and Assistance Team (ESAT) contractor to the inorganic IM-2 level as described by the *Region III Modifications to the Laboratory Data Validation Functional Guidelines for Evaluating Inorganic Analyses* (EPA, 1993).

6.5 DATA EVALUATION AND MANAGEMENT

This section describes how WESTON will (1) evaluate data generated from the sampling event; (2) determine whether data are representative of the Site, and (3) make certain that data are secure and retrievable.

6.5.1 Data Evaluation

WESTON will review the ESAT data validation report and summarize the analytical results in addition to site screening data collected in a Trip Report. EPA will use the data to determine if further

action at the Site under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) is warranted.

6.5.2 Data Representativeness and Completeness

This FSP is designed to obtain data representative of site conditions. If sampling activities vary significantly from this plan because of unexpected conditions in the field or other unforeseeable factors, WESTON will discuss the exceptions in the Trip Report and how those variations affect data representativeness.

6.5.3 Data Management

EPA Region III will provide WESTON with a validation report for the analytical data in portable document file (pdf) format along with an Excel electronic data deliverable (EDD). The CLP reports are retained by EPA Region III and are not provided to WESTON for review. WESTON will upload the EDD data to the Scribe database and will compare the EDD results to the sample results received in pdf format in conjunction with the data validation report to ensure their consistency. All electronic data will be stored in a Scribe database for future retrieval and reference, based on the OSC's requirements.

7.0 DELIVERABLES

Information obtained during the sampling event will be compiled into a Trip Report. The Trip Report will discuss data collection methods, document sampling locations, and include data summary tables, figures, maps, and site photographic documentation.

8.0 SCHEDULE

WESTON anticipates that sample collection will take place in June 2014. WESTON will ship samples to the assigned laboratory for analysis. WESTON expects to receive validated analytical data from EPA Region III approximately 35 days after the laboratory receives the samples. WESTON will provide EPA with the Trip Report within 30 days after all site activities are completed and validated data are available. Table 3 below provides the proposed project schedule.

**Table 3
Project Schedule**

Task	Completion Timeframe
Receive and accept TDD	May 23, 2014
Develop site HASP and FSP	June 2014
Conduct sampling activities and ship samples	June 2014
EPA Region III receives CLP data from laboratories	21 days after the laboratory receives the samples
Receive validated CLP data from EPA Region III	14 days after EPA Region III receives CLP data
Evaluate data	7 days after receipt of validated data reports
Develop and submit Draft Trip Report	30 days after receiving validated data
Submit Final Trip Report	14 days after receiving comment from EPA OSC
Complete Final MSR and close out TDD	60 days after all work is completed

Notes:

- CLP = Contract Laboratory Program
- EPA = U.S. Environmental Protection Agency
- FSP = Field Sampling and Analysis Plan
- HASP = Health and Safety Plan
- MSR = Monthly Status Report
- OSC = On-Scene Coordinator
- TDD = Technical Direction Document

REFERENCES

- Blueskies (Blueskies Environmental Associates, Inc.). 2012. *Final Site Reassessment Report for the New Kent Wood Preservatives, Inc. Site*. May.
- EPA (United States Environmental Protection Agency). 1993. *Region III Modifications to the Laboratory Data Validation Functional Guidelines for Evaluating Inorganic Analyses*. Region 3 Office of Analytical Services and Quality Assurance. Fort Meade, Maryland. April.
- EPA. 2010. *USEPA Contract Laboratory Program Statement of Work for Inorganic Superfund Methods, Multi-media, Multi-Concentration. ISM01.2*. January.
- EPA. 2007. "Field Portable X-ray Fluorescence Spectrometry for the Determination of Elemental Concentrations in Soil and Sediment." Method 6200. February.
- EPA. 2010. *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review*. EPA-540-R-10-11. January.
- EPA. 2011. Office of Superfund Remediation and Technology Innovation. *Contract Laboratory Program Guidance for Field Samplers*. January.
- WESTON (Weston Solutions, Inc.). 2006. "Surface Soil Sampling." SOP No. 302. September.
- WESTON. 2010a. *Program-Wide Uniform Federal Policy Quality Assurance Project Plan (QAPP), EPA Region III Superfund Assessment and Response Team 4 (START-4 Contract)*. Final. December.
- WESTON. 2010b. "Environmental Sample Shipment Checklist."
- WESTON. 2010c. "Logbook Documentation." SOP No. 101. December.