REMEDIAL ACTION CONTRACT 2 FOR
REMEDIAL, ENFORCEMENT OVERSIGHT, AND
NON-TIME-CRITICAL REMOVAL ACTIVITIES
IN REGION 5

ATTACHMENT B

REMEDIAL INVESTIGATION/FEASIBILITY STUDY QUALITY ASSURANCE PROJECT PLAN USS LEAD SUPERFUND SITE EAST CHICAGO, LAKE COUNTY, INDIANA

Prepared for
U.S. Environmental Protection Agency
Region 5
77 West Jackson Boulevard
Chicago, IL 60604

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EPA Region:	5
Work Assignment No,:	054-RICO-053J
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B-1 SITE LOCATION MAP

ACRONYMS AND ABBREVIATIONS

%D	Percent difference
%R	Percent recovery
µg/L	Microgram per liter
µm	Micrometer
AES	Atomic emission spectroscopy
ASTM	ASTM International (formerly American Society for Testing and Materials)
bgs	Below ground surface
CA	Corrective action
$CaCO_3$	Calcium carbonate
CADRE	Computer-aided data review
CAMU	Corrective Action Management Unit
CAS	Chemical Abstract Services
cc	Cubic centimeter
CCV	Continuing calibration verification
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CF	Calibration factor
CLP	Contract Laboratory Program
CRL	Central Regional Laboratory
CRQL	Contract-required quantitation limit
DQI	Data quality indicator
EPA	U.S. Environmental Protection Agency
FS	Feasibility study
FSP	Field sampling plan
GC	Gas chromatography
HAZWOPER	Hazardous Waste Operations and Emergency Response Standard
HCl	Hydrochloric acid
HNO_3	Nitric acid
ICP	Inductively coupled plasma
ID	Identification
IDEM	Indiana Department of Environmental Management

L/min	Liter per minute
LIMS	Laboratory information management system
MA	Modified analysis
MCE	Mixed cellulose ester
MCL	Maximum contaminant level
mg/kg	Milligram per kilogram
mL	Milliliter
mm	Millimeter
MRRC	Mining Remedial Recovery Co.
MS	Matrix spike
MSD	Matrix spike duplicate
NA	Not applicable
NaOH	Sodium hydroxide
NC	No criteria
NFG	National Functional Guidelines
NIOSH	National Institute for Occupational Safety and Health
NPL	National Priorities List
OSHA	Occupational Safety and Health Administration
PCB	Polychlorinated biphenyl
ppm	Part per million
PQO	Project quality objective
PRG	Preliminary remediation goal
PTFE	Polytetrafluoroethylene
QA	Quality assurance
QAPP	Quality assurance project plan
QC	Quality control
QL	Quantitation limit
RAC	Remedial Action Contract
RI	Remedial investigation
ROD	Record of Decision
RPD	Relative percent difference
RRF	Relative response factor
RSCC	Regional Sample Control Coordinator
RSD	Relative standard deviation
SAP	Sampling and analysis plan
SMO	Sample Management Office
SOP	Standard operating procedure

ACRONYMS AND ABBREVIATIONS (CONTINUED)

SOW	Statement of work
SPLP	Synthetic precipitation leaching procedure
SVOC	Semivolatile organic compound
SW	Solid waste
TAL	Target Analyte List
TBD	To be determined
TCE	Trichloroethene
TCLP	Toxicity characteristic leaching procedure
TCRA	Time-critical removal action
UFP	Uniform Federal Policy for Implementing Environmental Quality Systems
USS Lead	U.S. Smelter and Lead Refinery, Inc.
VOA	Volatile organic analysis
VOC	Volatile organic compound
WA	Work assignment
WAM	Work assignment manager
XRF	X-ray fluorescence

1.0 INTRODUCTION

SulTRAC has prepared this quality assurance project plan (QAPP) as part of the sampling and analysis plan (SAP) for the U.S. Smelter and Lead Refinery, Inc. (USS Lead) Superfund Site in East Chicago, Lake County, Indiana, under the U.S. Environmental Protection Agency (EPA) Response Action Contract (RAC) 2 for Region 5, Contract No. EP-S5-06-02, Work Assignment (WA) No. 054-RICO-053J. USS Lead is a Superfund Site because of the presence of documented hazardous substances and releases, particularly lead contamination, at residential properties. The SAP consists of the field sampling plan (FSP) (Attachment A) and this QAPP (Attachment B), which are among the site-specific plans to be prepared under the WA in accordance with Task 1 of the EPA statement of work (SOW) (EPA 2009).

This QAPP describes the quality assurance (QA) and quality control (QC) protocols, objectives, methods, and procedures to be performed by SulTRAC during the phases of the remedial investigation/feasibility study (RI/FS) at the USS Lead Superfund Site. This QAPP, as outlined in the USS Lead work plan (SulTRAC 2009), has been developed to delineate the approach to be used to characterize contamination during the initial field investigation and to delineate the extent of this contamination within the area (Phase 1). The data will subsequently be used to support the selection of a recommended technical approach for site remediation (Phase II). QAPP scoping information directly related to USS Lead was gathered from aerial photographs, site diagrams, previous reports, maps, and other assorted documents that describe operational details and nature and extent of contamination in and around the USS Lead Site.

This QAPP discusses field sampling and analytical criteria for data acquisition throughout the RI/FS. Section 2.0 of this QAPP addresses the site description and history, and Section 3.0 discusses the QAPP procedures. The QAPP Worksheets are presented after Section 3.0. References used in preparing this QAPP are listed after the Worksheets, and Figure B-1 is presented after the list of references.

2.0 SITE DESCRIPTION AND HISTORY

USS Lead is located on a 79-acre tract of land in East Chicago, Indiana (see Figure B-1). The residential portion of the study area consists of the area bounded by the Indiana Harbor Canal to the west, Chicago Avenue to the north, and Parrish Avenue to the East. The southern boundary is defined as East 151th Street from the canal to Huish Drive, the southernmost railroad tracks from Huish Drive to Grasselli Street, and East 149th Place from Frasselli Street to Parrish Avenue. This area includes fifteen residential blocks (approximately 390 homes) east of the railroad tracks; fourteen residential blocks (approximately 375 homes) west of the railroad tracks; one full block and four half-blocks of residences (approximately 75 homes) on the west side of McCook Avenue; and the large public-housing complex with 96 individual dwellings and two multi-story apartment complexes west of McCook Avenue.

In total, the residential study area contains approximately 940 dwellings. SulTRAC will collect samples from properties on each side of each block, for a total of approximately 3 sites per block. The field team will attempt to evenly distribute sampled properties to provide complete and unbiased coverage of the study area, subject to property access. Ninety residential properties will be sampled during the first stage of the investigation, and an additional 20 samples will be collected in the area between McCook Avenue and the canal. Six additional sites will include playgrounds, parks, and one school yard, for a total of 115 properties to be evaluated.

2.1 Site History

Delamar Copper Refinery operated at the facility as a copper smelter from 1906 to 1920. The refinery was located immediately south of the residential area discussed in this QAPP. In 1920, the property was purchased by U.S. Smelting Refining and Mining, and it became a lead refinery. The property was later bought by USS Lead and, in 1973, was converted into a secondary lead smelter recovering lead for scrap metal and automobile batteries. All operations ended in December 1985, after the Indiana State Board of Health declared that USS Lead was in violation of State law because it was emitting lead particles into the air downwind of the site. In 1987, Sharon Steel Corporation, owner of USS Lead, filed for bankruptcy and the facility was assigned to Mining Remedial Recovery Co. (MRRC) by the bankruptcy court.

Two main waste materials were generated during smelting at this plant: the blast furnace slag (calcium sulfate sludge waste piles) and lead-contaminated dust (baghouse dust waste piles). Other sources of contamination included stack emissions from blast-furnace operations, a slag pile placed in the southeast portion of the nearby wetlands, and oil releases from an aboveground storage tank.

2.2 Previous Site Investigations

The USS Lead site was proposed for the National Priorities List (NPL) in 1992. This classification was put on hold when EPA elected to pursue clean-up funds under another federal program, the Resource Conservation and Recovery Act (RCRA). EPA corrective action under RCRA has overseen the remediation and management of lead contamination at USS Lead.

The residential area has been sampled multiple times by various different groups as follows: EPA in 1985; Entact in 1999; EPA/IDEM in 2002; EPA RCRA in 2003; and EPA in 2006.

Several cleanup actions have been undertaken on this site under RCRA. One of these actions was the establishment of a "Corrective Action Management Unit" or CAMU by EPA in 1996. A CAMU is an area of consolidated hazardous material. This CAMU included the waste from three closed waste dumps and additional sediment and soil from corrective actions on site.

EPA sampled soil from private yards in the residential area north of USS Lead in 2003 and again in 2006. High levels of lead contamination were found in several yards and, in 2008, the Superfund Removal Program excavated13 residential yards.

Lead contamination is the primary concern at the USS Lead Superfund Site. Lead is highly hazardous to human health and the environment. The Superfund Lead Contaminated Residential Sites Handbook (EPA 2003a)., defines two surface soil lead concentrations of concern: 400 mg/kg where a long-term remedial action may be merited, and 1,200 mg/kg, where a time-critical removal action may be merited

CHEMICALS OF INTEREST AT USS LEAD

Chemical of Interest	Long-Term Remedial Action level[1]	Time-Critical Removal Action Level[1]
Lead	400 mg/kg	1,200 mg/kg

mg/kg Milligram per kilogram

[1] Superfund Lead Contaminated Residential Sites Handbook (EPA 2003a)

3.0 QUALITY ASSURANCE PROJECT PLAN PROCEDURES

This QAPP presents procedures that will be used to ensure the quality of data generated for the USS Lead Superfund Site. The QAPP provides a framework for how environmental data will be collected to achieve specific project objectives; it also describes procedures that will be implemented to obtain data of known and adequate quality. This QAPP was prepared in accordance with the EPA's "Uniform Federal Policy for Implementing Environmental Quality Systems" (UFP) (EPA 2005a).

During the Phase I field investigation at USS Lead, which is anticipated to start in December 2009, SulTRAC will collect samples from approximately 115 properties in the area, including residential yards, local parks, and schools. SulTRAC will conduct x-ray fluorescence (XRF) screening for all samples collected, estimated to be 1,230.

In addition, the following will be submitted to a Contract Laboratory Program (CLP) laboratory:

- Samples from 10% of the properties (12 locations), to be analyzed for volatile organic compounds (VOC), semivolatile organic compounds (SVOC), pesticides, and polychlorinated biphenyls (PCB);
- Samples from 5% of the properties (6 locations), for sieve analysis, separating fine (<250 micrometer [µm]) particles from coarse (<250 micrometer [µm]), particles before metals analysis is performed on both sieved fractions of the sample (approximately 6 samples); and
- 20% of all soil samples collected (approximately 246) will be analyzed for total metals.

QAPP WORKSHEET #1
TITLE AND APPROVAL PAGE

Quality Assurance Project Plan for Remedial Investigation/Feasibility Study, USS Lead Site, East Chicago, Lake County, Indiana

Document Title

SulTRAC

Lead Organization

Tiffany Angus SulTRAC

Preparer's Name and Organizational Affiliation

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Preparer's Address, Telephone Number, and E-mail Address

October 28, 2009

Preparation Date

Rik Lantz — 10/26/2009

SulTRAC Project Manager — Signature/Date

John Dirgo — 10/26/2009

SulTRAC QA Officer — Signature/Date

Approval Signatures:

Signature/Date

Michael Berkoff, Work Assignment Manager

Printed Name/Title

Approval Authority
Other Approval Signatures:

Signature/Date

Printed Name/Title

QAPP WORKSHEET #2
QAPP IDENTIFYING INFORMATION

1. Identify guidance used to prepare QAPP:
"Uniform Federal Policy for Implementing Environmental Quality Systems" (UFP) (EPA 2005a) and "EPA Guidance for Quality Assurance Project Plans" (EPA 2002)

2. Identify regulatory program:
Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)

3. Identify approval entity: EPA Region 5

4. Indicate whether the QAPP is a generic or project-specific QAPP: Project-specific

5. List dates of scoping sessions that were held: September 23, 2009

6. List dates and titles of QAPP documents written for previous work at site, if applicable:

Title	Approval Date
N/A	N/A

7. List organizational partners (stakeholders) and connection with lead organization:
EPA Region 5, SulTRAC, Indiana Department of Environmental Management (IDEM)

8. List data users: EPA Region 5, SulTRAC, IDEM

9. If any required QAPP elements and required information are not applicable to the project, then circle the omitted QAPP elements and required information on the attached table. Provide an explanation for their exclusion below: No specific audits or assessments have been planned for this project, so Worksheet Nos. 31 and 32 are not applicable.

Identify where each required QAPP element is located in the QAPP (provide section, worksheet, table, or figure number) or other project planning documents (provide complete document title, date, section number, page numbers, and location of the information in the document). Circle QAPP elements and required information that are not applicable to the project. Provide an explanation in the QAPP.

QAPP WORKSHEET #2 (CONTINUED)
QAPP IDENTIFYING INFORMATION

Required QAPP Element(s) and Corresponding QAPP Section(s)	Required Information	QAPP Worksheet # or Crosswalk to Related Documents
Project Management and Objectives		
2.1 - Title and Approval Page	Title and Approval Page	1
2.2 - Document Format and Table of Contents	Table of Contents	
2.2.1 Document Control Format	QAPP Identifying Information	2
2.2.2 Document Control Numbering System		
2.2.3 Table of Contents		
2.2.4 QAPP Identifying Information		
2.3 - Distribution List and Project Personnel Sign-Off Sheet		
2.3.1 Distribution List	Distribution List	3
2.3.2 Project Personnel Sign-Off Sheet	Project Personnel Sign-Off Sheet	4
2.4 - Project Organization		
2.4.1 Project Organization Chart	Project Organization Chart	5
2.4.2 Communication Pathways	Communication Pathways	6
2.4.3 Personnel Responsibilities and Qualifications	Personnel Responsibilities and Qualifications	7
2.4.4 Special Training Requirements and Certification	Special Training Requirements and Certification	8
2.5 - Project Planning/Problem Definition		
2.5.1 Project Planning (Scoping)	Project Planning Session Documentation (including Data Needs tables)	9
	Project Scoping Session Participants Sheet	
2.5.2 Problem Definition, Site History, and Background	Problem Definition, Site History, and Background	10
	Site Maps (historical and present)	Figure B1

QAPP WORKSHEET #2 (CONTINUED)
QAPP IDENTIFYING INFORMATION

Required QAPP Element(s) and Corresponding QAPP Section(s)	Required Information	QAPP Worksheet # or Crosswalk to Related Documents
2.6 - Project Quality Objectives (PQO) and Measurement Performance Criteria		
2.6.1 Development of PQOs Using the Systematic Planning Process	Site-Specific PQOs	11
2.6.2 Measurement Performance Criteria	Measurement Performance Criteria Table	12
2.7 - Secondary Data Evaluation	Sources of Secondary Data and Information	13
	Secondary Data Criteria and Limitations Table	
2.8 - Project Overview and Schedule		
2.8.1 Project Overview	Summary of Project Tasks	14
	Reference Limits and Evaluation Table	15
2.8.2 Project Schedule	Project Schedule/Timeline Table	16
Measurement/Data Acquisition		
3.1 - Sampling Tasks		
3.1.1 Sampling Process Design and Rationale	Sampling Design and Rationale	17, Field Sampling Plan
	Sampling Location Map	18, Field Sampling Plan, Figure B1
	Sampling Locations and Methods/Standard Operating Procedures (SOP) Requirements Table	
3.1.2 Sampling Procedures and Requirements		
3.1.2.1 Sampling Collection Procedures	Field Quality Control Sample Summary Table	20
	Sampling SOPs	21
	Project Sampling SOP References Table	21
3.1.2.2 Sample Containers, Volume, and Preservation	Analytical Methods/SOP Requirements Table	19, 23

QAPP WORKSHEET #2 (CONTINUED)
QAPP IDENTIFYING INFORMATION

Required QAPP Element(s) and Corresponding QAPP Section(s)	Required Information	QAPP Worksheet # or Crosswalk to Related Documents
3.1.2.3 Equipment/Sample Containers Cleaning and Decontamination Procedures	Analytical Methods, Containers, Preservatives, and Holding Times Table	19
3.1.2.4 Field Equipment Calibration, Maintenance, Testing, and Inspection Procedures	Field Equipment, Calibration, Maintenance, Testing, and Inspection Procedures Table	22
3.1.2.5 Supply Inspection and Acceptance Procedures		
3.1.2.6 Field Documentation Procedures		
3.2 - Analytical Tasks		
3.2.1 Analytical SOPs	Analytical SOPs	23
	Analytical SOP References Table	
3.2.2 Analytical Instrument Calibration Procedures	Analytical Instrument Calibration Table	24
3.2.3 Analytical Instrument and Equipment Maintenance, Testing, and Inspection Procedures	Analytical Instrument and Equipment Maintenance, Testing, and Inspection Table	25
3.2.4 Analytical Supply Inspection and Acceptance Procedures		
3.3 - Sample Collection Documentation, Handling, Tracking, and Custody Procedures	Sample Collection Documentation Handling, Tracking, and Custody SOPs	26, Field Sampling Plan
3.3.1 Sample Collection Documentation	Sample Container Identification	26, 27, Field Sampling Plan
3.3.2 Sample Handling and Tracking System	Sample Handling Flow Diagram	
3.3.3 Sample Custody	Example Chain-of-Custody Form and Seal	
3.4 - Quality Control (QC) Samples		
3.4.1 Sampling QC Samples	QC Samples Table	28
3.4.2 Analytical QC Samples		
3.5 - Data Management Tasks		

QAPP WORKSHEET #2 (CONTINUED)
QAPP IDENTIFYING INFORMATION

Required QAPP Element(s) and Corresponding QAPP Section(s)	Required Information	QAPP Worksheet # or Crosswalk to Related Documents
3.5.1 Project Documentation and Records	Project Documents and Records Table	29
3.5.2 Data Package Deliverables	Analytical Services Table	30
3.5.3 Data Reporting Formats	Data Management SOPs	23 (specified by analytical method) Data Management Plan
3.5.4 Data Handling and Management		
3.5.5 Data Tracking and Control		
Assessment/Oversight		
4.1 - Assessments and Response Actions		
4.1.1 Planned Assessments	Planned Project Assessments Table	31
	Audit Checklists	
4.1.2 Assessment Findings and Corrective Action (CA) Responses	Assessment Findings and CA Responses Table	32
4.2 - QA Management Reports	QA Management Reports Table	33
4.3 - Final Project Report	RI/FS	Not applicable (NA)
Data Review		
5.1 - Overview	NA	NA
5.2 - Data Review Steps		
5.2.1 Step I: Verification	Verification (Step I) Process Table	34
5.2.2 Step II: Validation		
5.2.2.1 Step IIa Validation Activities	Validation (Steps IIa and IIb) Process Table	35
5.2.2.2 Step IIb Validation Activities	Validation (Steps IIa and IIb) Summary Table	36

QAPP WORKSHEET #2 (CONTINUED)
QAPP IDENTIFYING INFORMATION

Required QAPP Element(s) and Corresponding QAPP Section(s)	Required Information	QAPP Worksheet # or Crosswalk to Related Documents
5.2.3 Step III: Usability Assessment		
5.2.3.1 Data Limitations and Actions from Usability Assessment	Usability Assessment	37
5.2.3.2 Activities		
5.3 - Streamlining Data Review	NA	NA
5.3.1 Data Review Steps to be Streamlined		
5.3.2 Criteria for Streamlining Data Review		
5.3.3 Amounts and Types of Data Appropriate for Streamlining		

QAPP WORKSHEET #3
DISTRIBUTION LIST

(UFP QAPP Section 2.3.1)
List individuals who received copies of the approved QAPP, subsequent QAPP revisions, addenda, and amendments.

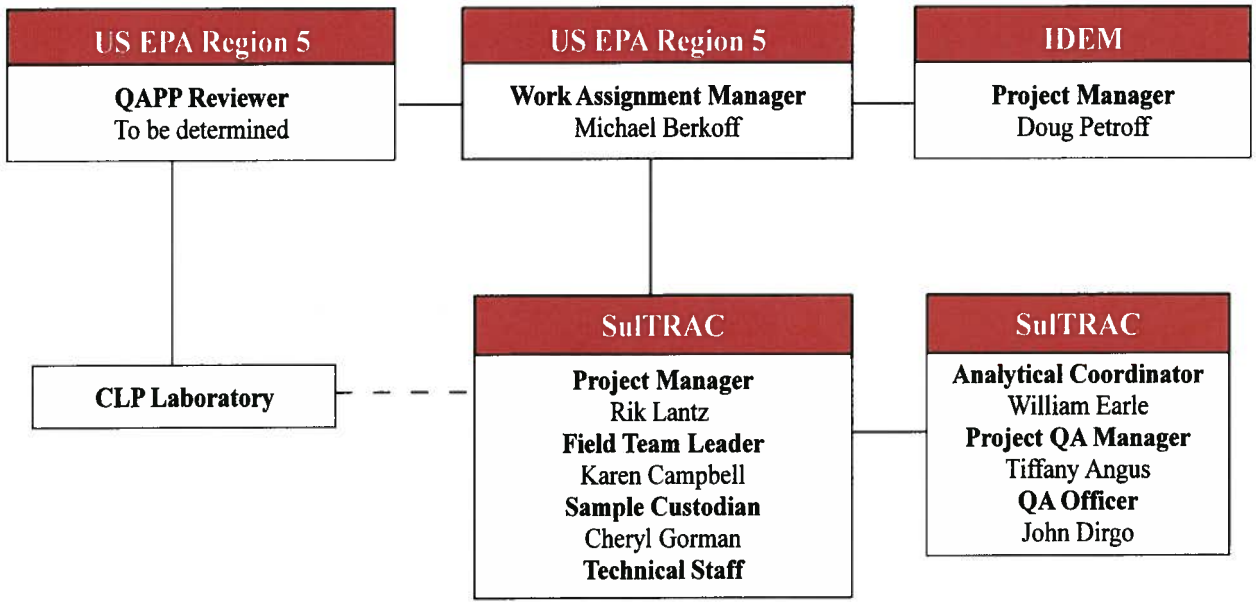
QAPP Recipient	Title	Organization	Telephone Number	E-mail Address
Michael Berkoff	Work Assignment Manager (WAM)	EPA Region 5	(312) 353-8983	Berkoff.michael@epa.gov
To be determined	QAPP Reviewer	EPA Region 5	To be determined	To be determined
Ronald Riesing	Program Manager	SulTRAC	(312) 201-7722	Ronald.riesing@ttemi.com
Rik Lantz	Project Manager	SulTRAC	(312) 443-0550, ext. 16	rlantz@onesullivan.com
Karen Campbell	Field Team Leader	SulTRAC	(317) 910-4275	kcampbell@onesullivan.com
Cheryl Gorman	Field Team Member and Sample Custodian	SulTRAC	(312) 443-0550, ext. 17	cgorman@onesullivan.com
Matt Nied	Field Team Member	SulTRAC	(312) 443-0550	mined@onesullivan.com
Tiffany Angus	Project QA Manager	SulTRAC	(415) 321-1790	Tangus@onesullivan.com
John Dirgo	QA Officer	SulTRAC	(312) 201-7765	john.dirgo@ttemi.com
William Earle	Analytical Coordinator	SulTRAC	(312) 443-0550, ext. 12	wearle@onesullivan.com
David Homer	Ecological Risk Assessor	SulTRAC	(816) 412-1762	david.homer@ttemi.com
Eric Morton	Human Health Risk Assessor	SulTRAC	(312) 201-7797	eric.morton@ttemi.com

QAPP WORKSHEET #4
PROJECT PERSONNEL SIGN-OFF SHEET

(UFP QAPP Section 2.3.2)
Have copies of this form signed by key project personnel from each organization to indicate that they have read the applicable sections of the QAPP and will perform the tasks as described. Ask each organization to forward signed sheets to central project file.

Project Personnel	Organization	Title	Telephone No.	Signature	Date QAPP Read
Rik Lantz	SulTRAC	Project Manager	(312) 443-0550, ext. 16		
William Earle	SulTRAC	Analytical Coordinator	(312) 443-0550, ext. 11		
Tiffany Angus	SulTRAC	Project QA Manager	(415) 321-1790		
John Dirgo	SulTRAC	QA/QC Officer	(312) 201-7765		
Karen Campbell	SulTRAC	Field Team Leader	(317) 910-4275		
Cheryl Gorman	SulTRAC	Field Team Member and Sample Custodian	(312) 443-0550, ext. 17		

QAPP WORKSHEET #5
PROJECT ORGANIZATION CHART



Notes
CLP: Contract laboratory program
EPA: Environmental Protection Agency
IDEM: Indiana Department of Environmental Management
QA: Quality assurance
QAPP: Quality assurance project plan

PROJECT TEAM ORGANIZATION CHART

USS Lead Site

QAPP WORKSHEET #6
COMMUNICATION PATHWAYS

(UFP QAPP Section 2.4.2)
Describe the communication pathways and modes of communication that will be used during the project, after the QAPP has been approved. Describe the procedures for soliciting and/or obtaining approval between project personnel, between different contractors, and between samplers and laboratory staff. Describe the procedure that will be followed when any project activity originally documented in an approved QAPP requires real-time modification to achieve project goals or a QAPP amendment is required. Describe the procedures for stopping work and identify who is responsible.

Communication Drivers	Responsible Entity	Name	Telephone No.	Procedure (Timing, Pathways, etc.)
Point of contact with EPA WAM	Project Manager	Rik Lantz	(312) 443-0550, ext. 16	Rik Lantz will forward all materials and information about the project to Michael Berkoff.
Manage all project phases	Project Manager	Rik Lantz	(312) 443-0550, ext. 16	Communicate information to project team on a timely basis. Notify EPA WAM by telephone or e-mail of any significant issues. Direct field team and facilitate communication with analytical coordinator. Delivery of all CLP data packages to project QA manager for final review of validation.
Daily field progress report	Field Team Leader	Karen Campbell	(317) 910-4275	Conduct specific field investigation tasks, direct field activities of subcontractors, and provide daily communication with project manager and sample custodian.
Manage field sample organization and delivery to Contract Laboratory Program (CLP)	Sample Custodian	Cheryl Gorman	312-350-0865	Ensure field staff is collecting samples in proper containers, observing holding times, and properly packaging and preparing samples for shipment. Coordinate daily with analytical coordinator concerning sample quantities and delivery locations and dates. Communicate daily with field staff and project manager regarding any issues and developments.

Communication Drivers	Responsible Entity	Name	Telephone No.	Procedure (Timing, Pathways, etc.)
Point of contact with EPA Region 5 Regional Sample Control Coordinator (RSCC)	Analytical Coordinator	William Earle	(312) 443-0550, ext. 12	Contact the RSCC before each sampling event to schedule CLP laboratory services. Notify sample custodian and project manager of any CLP issues or developments. Track all CLP data deliveries. Notify project manager and forward data to him.
Release of Analytical Data	SulTRAC Project QA Manager	Tiffany Angus	(415) 321-1790	No analytical data can be released until validation is completed and project QA manager has reviewed and approved the release.
Report of laboratory data quality issues	Laboratory QA Officer	To be determined (TBD)	TBD	All QA/QC issues with project field samples will be reported by the laboratory QA officer to the RSCC.

QAPP WORKSHEET #7
PERSONNEL RESPONSIBILITIES AND QUALIFICATIONS TABLE

(UFP QAPP Section 2.4.3)
Identify project personnel associated with each organization, contractor, and subcontractor participating in responsible roles. Include data users, decision-makers, project managers, QA officers, project contacts for organizations involved in the project, project health and safety officers, geotechnical engineers and hydrogeologists, field operation personnel, analytical services, and data reviewers. Identify project team members with an asterisk (*).

Name	Title	Organization/ Affiliation	Responsibilities	Education and Experience Qualifications
Rik Lantz*	Project Manager	SulTRAC	Manages project; coordinates between lead agency and project team; coordinates CLP data deliverables from analytical coordinator to project QA manager; manages field staff	B.S. Geology, M.S. Geophysics, California Registered Geologist, Illinois Professional Geologist, 23 years of experience.
Karen Campbell*	Field Team Leader	SulTRAC	Supervises field sampling and coordinates all field activities; daily reporting to project manager while conducting field activities	B.S. Environmental Engineering, M.A.S. Environmental Policy and Management, Indiana Professional Engineer, 11 years of experience.
Cheryl Gorman*	Field Team Member and Sample Custodian	SulTRAC	Implements field plan; verifies sample processing, packaging, and shipping	B.S. Environmental Science, 4 years of experience.
Tiffany Angus*	Project QA Manager	SulTRAC	Prepares QAPP, reviews data for completeness and to ensure data meets project quality requirements.	B.S. Biochemistry, Project Chemist, 4 years of experience
John Dirgo*	QA Officer	SulTRAC	Reviews QAPP; QA/QC oversight	Sc.D. Environmental Science and Physiology, 30 years of experience

QAPP WORKSHEET #7 (CONTINUED)
PERSONNEL RESPONSIBILITIES AND QUALIFICATIONS TABLE

Name	Title	**Organization/ Affiliation**	**Responsibilities**	**Education and Experience Qualifications**
William Earle*	Analytical Coordinator	SulTRAC	Coordinates sample scheduling; verifies sample chain of custody; reviews computer-aided data review (CADRE) results; notifies sample custodian and project manager of any issues or developments	B.S. Civil Engineering, Professional Engineer, 17 years of experience

QAPP WORKSHEET #8
SPECIAL PERSONNEL TRAINING REQUIREMENTS TABLE

(UFP QAPP Section 2.4.4)
Provide the following information for those projects requiring personnel with specialized training. Attach training records and/or certificates to the QAPP or note their location.

Project Function	Specialized Training – Title or Description of Course	Training Provider	Training Date	Personnel/Groups Receiving Training	Personnel Titles/ Organizational Affiliation	Location of Training Records/Certificates
Field Staff	40-hour or 8-hour refresher - OSHA HAZWOPER training	Various	Various	SulTRAC	SulTRAC	Corporate human resources office
Field Staff	XRF training	EPA	TBD	SulTRAC	SulTRAC	Chicago Office

Notes:

HAZWOPER Hazardous Waste Operations and Emergency Response Standard
OSHA Occupational Safety and Health Administration

QAPP WORKSHEET #9
PROJECT SCOPING SESSION PARTICIPANTS SHEET

(UFP QAPP Section 2.5.1)
Complete this worksheet for each project scoping session held. Identify project team members who are responsible for planning the project.

Project Name	USS Lead	Site Name	USS Lead Site
Projected Date(s) of Sampling	December 2009 – April 2010	Site Location	East Chicago, Indiana 46312
Project Manager	Rik Lantz		
Date of Session	September 23, 2009		
Scoping Session Purpose:	Define scope of project, determine Phase I sampling strategy.		

Name	Title	Affiliation	Phone #	E-Mail Address	Project Role
Michael Berkoff	WAM	EPA Region 5	(312) 353-8983	Berkoff.michael@epa.gov	WAM
Rik Lantz	Project Manager	SulTRAC	(312) 443-0550 ext 16	RLantz@onesullivan.com	Project Manager
Karen Campbell	Field Team Leader	SulTRAC	(317) 910-4275	KCampbell@OneSullivan.com	Field TeamLeader

QAPP WORKSHEET #10
PROBLEM DEFINITION

(UFP QAPP Section 2.5.2)
Clearly define the problem and the environmental questions that should be answered for the current investigation and develop the project decision "If..., then..." statements in the QAPP, linking data results with possible actions. The prompts below are meant to help the project team define the problem. They are not comprehensive.

The problem to be addressed by the project: The purpose of this investigation is to conduct a remedial investigation/feasibility study (RI/FS) to identify current human health and environment risks at USS Lead Superfund Site. Specifically, this RI/FS will study the extent of lead contamination in the residential area north of the former USS Lead smelter.
The environmental questions being asked: What is the extent of lead contamination at USS Lead and surrounding areas? Do lead concentrations in residential soils exceed the two action levels of 400 mg/kg and 1,200 mg/kg?
Observations from any site reconnaissance reports: In 2003 and 2006, EPA sampled soils in the residential area north of USS Lead for lead contamination. In 2008, 13 private residential yards were removed by the Superfund Removal Program due to lead concentrations above time-critical removal action levels (1,200 mg/kg).
A synopsis of secondary data or information from site reports: See Worksheet #13
The possible classes of contaminants and the affected matrices: All soil samples will be screened for lead using field XRF. In addition, 20% of all samples collected will be sent to CLP laboratory for metals analysis. At 10% of the properties to be screened, a sample will be also analyzed for VOCs, SVOCs, PCBs, and pesticides, and CLP metals analysis to evaluate whether other contaminants are associated with the lead contamination. At 5% of the properties, a sample will be submitted to CLP for sieve analysis before the metals analysis to determine whether lead contamination is associated with fine particles.
Project decision conditions ("If…, then…" statements): If the RI/FS results reveal that contamination at the USS Lead Site poses an unacceptable risk to human health and/or the environment, then a remedial action will be implemented. If lead contamination exceeds 1,200 mg/kg, a time critical removal action (TCRA) will follow. If lead contamination is below 1,200 mg/kg but above 400 mg/kg, a non-TCRA or long-term remedial action will follow.

QAPP WORKSHEET #11
PROJECT QUALITY OBJECTIVES/SYSTEMATIC PLANNING PROCESS STATEMENTS

(UFP QAPP Section 2.6.1)
Use this worksheet to develop PQOs in terms of type, quantity, and quality of data determined using a systematic planning process. Provide a detailed discussion of PQOs in the QAPP. List the PQOs in the form of qualitative and quantitative statements. These statements should answer questions such as those listed below. These questions are examples only; however, they are neither inclusive nor appropriate for all projects.

Who will use the data: EPA Region 5 and SulTRAC will use the data.
What will the data be used for? During the Phase I field investigation, the data will be used to characterize contamination areas and identify human health and environment risks. Data from the investigations will be used to support the selection of an approach for site remediation, and to support a Record of Decision (ROD).
What type of data are needed (target analytes, analytical groups, field screening, on-site analytical or off-site laboratory techniques, sampling techniques)? Surface and subsurface soils will be collected from 115 properties including residences, vacant lots, parks, and schoolyards at the USS Lead site. For residential properties and vacant lots, composite samples will be collected from the front and back yards at depth intervals of 0-6, 6-12, 12-18, and 18-24 inches below ground surface (bgs). Five-point depth-discrete composite samples will be collected from each of four different depths in each yard, in the configuration of an "X," with samples from each corner and one in the center. Each depth-discrete composite sample will consist of the 5 samples collected in the X-configuration from a single depth interval (0-6, 6-12, 12-18, and 18-24 inches bgs).One composite sample will also be collected from the drip line or gutter outfall areas around the house. In addition, if gardens or play areas are present, One depth-discrete grab samples will be collected from each garden or play area at each residence from each of four depth intervals (0-6, 6-12, 12-18, and 18-24 inches bgs). Parks and schools will be divided into four quadrants, and a five-point composite sample will be collected at depth intervals of 0-6, 6-12, 12-18, and 18-24 inches bgs. In addition, grab samples will be collected from each play area in each park at depth intervals of 0-6, 6-12, 12-18, and 18-24 inches bgs. Field screening for lead will be conducted on all samples using an Innov-X XRF analyzer. Additionally, 10% of the properties will be sampled for CLP Laboratory analysis of VOCS, SVOCs, PCBs, pesticides and metals, 5% of properties will be submitted to a CLP laboratory for sieve analysis before metals analysis, and 20% of all samples collected will be submitted for CLP metals analysis.

QAPP WORKSHEET #11 (CONTINUED)
PROJECT QUALITY OBJECTIVES/SYSTEMATIC PLANNING PROCESS STATEMENTS

How "good" do the data need to be in order to support the environmental decision? Ultimately, the data need to allow full assessment of the nature and extent of contamination in the soil samples collected by SulTRAC. The data also need to be validated and used to support risk assessment and the evaluation of remedial alternatives. The accuracy of XRF results will be established by using regression analysis to derive a correlation between XRF and CLP results. The correlation will be used to derive a correction factor, which will be applied to all XRF data. Where both CLP and XRF lead concentrations are available, the CLP results will be used for regulatory decisions about remedial actions. Where only XRF results are available, the corrected XRF results will be used.
How much data will be collected (number of samples for each analytical group, matrix, and concentration)? Sample numbers are approximate due to access restrictions, and property specifics that can only be determined in the field. The total number of samples may vary, depending on the number of gardens, play areas, drip line and gutter outfalls, etc. The following approximations are based on the assumption that 20% of properties surveyed will have one garden or play area, school yards contain two play areas, and parks contain four play areas. SulTRAC will collect approximately 1,230 soil samples for field XRF analysis; 246 soil samples for CLP metal analysis; 12 soil samples for full-scan CLP VOC, SVOC, PCB, pesticide, and metals analysis; and 6 soil samples for CLP sieve analysis, followed by CLP metals analysis of both the fine and coarse fractions. In addition, QC samples will be collected and analyzed, including duplicates, matrix spikes (MS), matrix spike duplicates (MSD), equipment rinsates, and trip blanks.
Where, when, and how should the data be collected/generated? Sampling activities will take place during December 2009 at the USS Lead site, weather permitting. The duration of the field effort is expected to be one month.
Who will collect and generate the data? SulTRAC will collect the samples discussed herein. Field personnel will conduct all field lead analysis using an Innov-X XRF analyzer. A CLP laboratory will analyze soil samples for VOCs, SVOCS, PCBs, pesticides, sieve, and metals analysis. All analyses are routine except for sieve. For a modified metals analysis, the contract laboratory will need to include sieve analysis upon initial sample receipt, followed by metals analysis of the fine (<250 µm) and coarse (>250 µm) particulate fractions. All modified analyses requests will be submitted 3 weeks in advance to the EPA Sample Management Office (SMO).
How will the data be reported? Data will be reported by the CLP laboratory using standard CLP data reporting techniques. Data will be reported in electronic and hard-copy form. SulTRAC will conduct limited data validation of CLP laboratory data in addition to standard CADRE data analysis performed by CLP Laboratory.
How will the data be archived? Electronic and hard copies of CLP analytical data will be archived by the CLP laboratory. Field data (notebooks, sampling sheets, etc.), XRF results, and laboratory analytical data will be maintained at SulTRAC's Chicago office. SulTRAC will also provide 10-year data storage.

QAPP WORKSHEET #12

(UFP QAPP Section 2.6.2)
Complete this worksheet for each matrix, analytical group, and concentration level. Identify the data quality indicators (DQIs), measurement performance criteria (MPC) (percent recovery [%R], and relative percent difference [% RPD]), and QC sample and/or activity used to assess the measurement performance for both the sampling and analytical measurement systems. Use additional worksheets if necessary. If MPC for a specific DQI vary within an analytical parameter, i.e., MPC are analyte-specific, then provide analyte-specific MPC on an additional worksheet.

Matrix	Soil/Solids[1]
Analytical Group[2]	Volatile Organic Analysis (VOA)/CLP
Concentration Level	Low concentration

Sampling Procedure[3]	**Analytical Method SOP[4]**	**DQIs**	**Measurement Performance Criteria**	**QC Sample and/or Activity Used to Assess Measurement Performance**	**QC Sample Assesses Error for Sampling (S), Analytical (A), or both (S&A)**
S-1, S-3	A-1	Precision	RPD ≤ 50%	Field duplicate	S & A
S-1, S-3	A-1	Accuracy/Bias:Contamination	VOC < QL	Trip blank	S & A
S-1, S-3	A-1	Accuracy/Bias:Contamination	VOC < QL	Rinsate blank	S & A
S-1, S-3	A-1	Accuracy/Bias	1,1-Dichloroethene: 59-172 %R Trichloroethene (TCE): 62-137 %R Benzene: 66-142 %R Toluene: 59-139 %R Chlorobenzene: 60-133 %R	MS/MSD	S & A
S-1, S-3	A-1	Precision	1,1-Dichloroethene: 22% RPD TCE: 24% RPD Benzene: 21% RPD Toluene: 21% RPD Chlorobenzene: 21% RPD	MS/MSD	S & A

MEASUREMENT PERFORMANCE CRITERIA TABLE

QAPP WORKSHEET #12 (CONTINUED)
MEASUREMENT PERFORMANCE CRITERIA TABLE

Matrix	Soil/Solids[1]
Analytical Group[2]	VOA/CLP
Concentration Level	Low concentration

Sampling Procedure[3]	Analytical Method SOP[4]	DQIs	Measurement Performance Criteria	QC Sample and/or Activity Used to Assess Measurement Performance	QC Sample Assesses Error for Sampling (S), Analytical (A), or both (S&A)
S-1, S-3	A-1	Accuracy	Vinyl chloride-d_3: 68-122 %R Chloroethane-d_5: 61-130 %R 1,1-Dichloroethene-d_2: 45-132 %R 2-Butanone-d_5: 20-182 %R Chloroform-d: 72-123 %R 1,2-Dichloroethane-d_4: 79-122 %R Benzene-d_6: 80-121 %R 1,2-Dichloropropane-d_6: 74-124 %R Toluene-d_8: 78-121 %R 1,1,2,2-Tetrachloroethane-d_2: 56-161 %R Trans-1,3-Dichloropropene-d_4: 72-130 %R 2-Hexanone-d_5: 17-184 %R 1,4-Dioxane-d_8: 50-150 %R 1,2-Dichlorobnzene-d_4: 70-131 %R	Deuterated monitoring compounds	A
S-1, S-3	A-1	Accuracy/ Bias-Contamination	VOC < QL	Method blank	A
S-1, S-3	A-1	Completeness	≥ 90%	Data completeness defined as data not qualified as rejected after validation	S & A

QAPP WORKSHEET #12 (CONTINUED)
MEASUREMENT PERFORMANCE CRITERIA TABLE

Matrix	Soil/Solids[1]
Analytical Group[2]	Semivolatile Organic Analysis (SVOA)/CLP
Concentration Level	Low concentration

Sampling Procedure[3]	**Analytical Method SOP[4]**	**DQIs**	**Measurement Performance Criteria**	**QC Sample and/or Activity Used to Assess Measurement Performance**	**QC Sample Assesses Error for Sampling (S), Analytical (A), or both (S&A)**
S-1, S-3	A-1	Precision	RPD ≤ 50%	Field duplicate	S & A
S-1, S-3	A-1	Accuracy/Bias: Contamination	SVOC < QL	Rinsate blank	S & A
S-1, S-3	A-1	Accuracy/Bias	Phenol: 26-90 %R 2-Chlorophenol: 25-102 %R N-nitrosodi-N-propylamine: 41-126 %R 4-Chloro-3-methylphenol: 26-103 %R Acenaphthene: 31-137 %R 4-Nitrophenol: 11-114 %R 2,4-Dinitrotoluene: 28-89 %R Pentachlorophenol: 17-109 %R Pyrene: 35-142 %R	MS/MSD	S & A
S-1, S-3	A-1	Precision	Phenol: 35% RPD 2-Chlorophenol: 50% RPD N-nitrosodi-N-propylamine: 38% RPD 4-Chloro-3-methylphenol: 33% RPD Acenaphthene: 19% RPD 4-Nitrophenol: 50% RPD 2,4-Dinitrotoluene: 47% RPD Pentachlorophenol: 47% RPD Pyrene: 36% RPD	MS/MSD	S & A

QAPP WORKSHEET #12 (CONTINUED)
MEASUREMENT PERFORMANCE CRITERIA TABLE

Matrix	Soil/Solids[1]
Analytical Group[2]	Semivolatile Organic Analysis (SVOA)/CLP
Concentration Level	Low concentration

Sampling Procedure[3]	**Analytical Method SOP[4]**	**DQIs**	**Measurement Performance Criteria**	**QC Sample and/or Activity Used to Assess Measurement Performance**	**QC Sample Assesses Error for Sampling (S), Analytical (A), or both (S&A)**
S-1, S-3	A-1	Accuracy	Phenol-d_5: 17-103 %R Bis(2-Chloroethyl)ether-d_8: 12-98 %R 2-Chlorophenol-d_4: 13-101 %R 4-Methylphenol-d_8: 8-100 %R Nitrobenzene-d_5: 16-103 %R 2-Nitrophenol-d_4: 16-104 %R 2,4-Dichlorophenol-d_3: 23-104 %R 4-Chloroaniline-d_4: 1-145 %R Dimethylphthalate-d_6: 43-111 %R Acenaphthylene-d_8: 20-97 %R 4-Nitrophenol-d_4: 16-166 %R Fluorene-d_{10}: 40-108 %R 4,6-Dinitro-2-methylphenol-d_2: 1-121 %R Anthracene-d_{10}: 22-98 %R Pyrene-d_{10}: 51-120 %R Benzo(a)pyrene-d_{12}: 43-111 %R	Deuterated monitoring compounds	A
S-1, S-3	A-1	Accuracy/Bias: Contamination	SVOC < QL	Method blank	A
S-1, S-3	A-1	Completeness	≥ 90%	Data completeness defined as data not qualified as rejected after validation	S&A

QAPP WORKSHEET #12 (CONTINUED)
MEASUREMENT PERFORMANCE CRITERIA TABLE

Matrix	Soil/Solids[1]
Analytical Group[2]	PCB/CLP
Concentration Level	Not applicable

Sampling Procedure[3]	**Analytical Method SOP[4]**	**DQIs**	**Measurement Performance Criteria**	**QC Sample and/or Activity Used to Assess Measurement Performance**	**QC Sample Assesses Error for Sampling (S), Analytical (A), or both (S&A)**
S-1, S-3	A-1	Precision	RPD ≤ 50%	Field duplicate	S & A
S-1, S-3	A-1	Accuracy/Bias: Contamination	PCB < QL	Rinsate blank	S & A
S-1, S-3	A-1	Accuracy/Bias	Aroclor-1016: 29-135 %R Aroclor-1260: 29-135 %R	MS/MSD	S & A
S-1, S-3	A-1	Precision	Aroclor-1016: 15% RPD Aroclor-1260: 20% RPD	MS/MSD	S & A
S-1, S-3	A-1	Accuracy	Decachlorobiphenyl: 30-150 %R	Surrogate spike	A
S-1, S-3	A-1	Accuracy/Bias: Contamination	PCB < QL	Method blank	A
S-1, S-3	A-1	Completeness	≥ 90%	Data completeness defined as data not qualified as rejected after validation	S & A

QAPP WORKSHEET #12 (CONTINUED)
MEASUREMENT PERFORMANCE CRITERIA TABLE

Matrix	Soil/Solids[1]
Analytical Group[2]	Pesticide/CLP
Concentration Level	Not applicable

Sampling Procedure[3]	**Analytical Method SOP[4]**	**DQIs**	**Measurement Performance Criteria**	**QC Sample and/or Activity Used to Assess Measurement Performance**	**QC Sample Assesses Error for Sampling (S), Analytical (A), or both (S&A)**
S-1, S-3	A-1	Precision	RPD ≤ 50%	Field duplicate	S & A
S-1, S-3	A-1	Accuracy/ Bias-Contamination	Pesticides < QL	Rinsate blank	S & A
S-1, S-3	A-1	Accuracy/Bias	Gamma-BHC: 46-127 %R Heptachlor: 35-130 %R Aldrin: 34-132 %R Dieldrin : 31-134 %R Endrin : 42-139 %R 4,4'-DDT : 23-134 %R	MS/MSD	S & A
S-1, S-3	A-1	Precision	Gamma-BHC: 50% RPD Heptachlor: 31% RPD Aldrin: 43% RPD Dieldrin: 38% RPD Endrin: 45% RPD 4,4'-DDT: 50% RPD	MS/MSD	S & A
S-1, S-3	A-1	Accuracy	Tetrachloro-m-xylene: 30-150 %R	Surrogate spike	A
S-1, S-3	A-1	Accuracy/Bias: Contamination	Pesticide < QL	Method blank	A
S-1, S-3	A-1	Completeness	≥ 90%	Data completeness defined as data not qualified as rejected after validation	S & A

QAPP WORKSHEET #12 (CONTINUED)
MEASUREMENT PERFORMANCE CRITERIA TABLE

Matrix	Soil/Solids
Analytical Group	Target Analyte List (TAL) Metals
Concentration Level	Multiconcentration

Sampling Procedure[1]	**Analytical Method SOP[2]**	**DQIs**	**Measurement Performance Criteria**	**QC Sample and/or Activity Used to Assess Measurement Performance**	**QC Sample Assesses Error for Sampling (S), Analytical (A), or both (S&A)**
S-1, S-3	A-2	Precision	RPD ≤ 50%	Field duplicate	S & A
S-1, S-3	A-2	Accuracy/Bias: Contamination	Metal < QL	Rinsate blank	S & A
S-1, S-3	A-2	Accuracy/Bias	All metals: 75-125 %R	MS	A
S-1, S-3	A-2	Precision	All metals: < 20% RPD	Laboratory duplicate	A
S-1, S-3	A-2	Sensitivity/Contamination	Metal <QL	Method blank	A

Notes:

DQI Data quality indicator
QL Quantitation limit
%R Percent recovery
RPD Relative percent difference

[1] Reference number from QAPP Worksheet #21
[2] Reference number from QAPP Worksheet #23

QAPP WORKSHEET #12 (CONTINUED)
MEASUREMENT PERFORMANCE CRITERIA TABLE

Matrix	Water
Analytical Group[1]	SVOA/CLP
Concentration Level	Low concentration

Sampling Procedure[2]	**Analytical Method SOP[3]**	**DQIs**	**Measurement Performance Criteria**	**QC Sample and/or Activity Used to Assess Measurement Performance**	**QC Sample Assesses Error for Sampling (S), Analytical (A), or both (S&A)**
S-3	A-1	Completeness	≥ 90%	Data completeness defined as data not qualified as rejected after validation	S & A

QAPP WORKSHEET #12 (CONTINUED)
MEASUREMENT PERFORMANCE CRITERIA TABLE

Matrix	Water
Analytical Group[1]	SVOA/CLP
Concentration Level	Low concentration

Sampling Procedure[2]	**Analytical Method SOP[3]**	**DQIs**	**Measurement Performance Criteria**	**QC Sample and/or Activity Used to Assess Measurement Performance**	**QC Sample Assesses Error for Sampling (S), Analytical (A), or both (S&A)**
S-3	A-1	Completeness	≥ 90%	Data completeness defined as data not qualified as rejected after validation	S & A

QAPP WORKSHEET #12 (CONTINUED)
MEASUREMENT PERFORMANCE CRITERIA TABLE

Matrix	Water
Analytical Group[1]	PCB/CLP
Concentration Level	Not applicable

Sampling Procedure[2]	**Analytical Method SOP[3]**	**DQIs**	**Measurement Performance Criteria**	**QC Sample and/or Activity Used to Assess Measurement Performance**	**QC Sample Assesses Error for Sampling (S), Analytical (A), or both (S&A)**
S-3	A-1	Precision	RPD ≤ 50%	Field duplicate	S & A
S-3	A-1	Accuracy/Bias-Contamination	PCB < QL	Rinsate blank	S & A
S-3	A-1	Accuracy/Bias	Aroclor-1016: 29-135 %R Aroclor-1260: 29-135 %R	MS/MSD	S & A
S-3	A-1	Precision	Aroclor-1016: 15% RPD Aroclor-1260: 20% RPD	MS/MSD	S & A
S-3	A-1	Accuracy	Decachlorobiphenyl: 30-150 %R	Surrogate spike	A
S-3	A-1	Accuracy/Bias: Contamination	PCB < QL	Method blank	A
S-3	A-1	Completeness	≥ 90%	Data completeness defined as data not qualified as rejected after validation	S & A

QAPP WORKSHEET #12 (CONTINUED)
MEASUREMENT PERFORMANCE CRITERIA TABLE

Matrix	Water
Analytical Group[1]	Pesticide/CLP
Concentration Level	Not applicable

Sampling Procedure[2]	Analytical Method SOP[3]	DQIs	Measurement Performance Criteria	QC Sample and/or Activity Used to Assess Measurement Performance	QC Sample Assesses Error for Sampling (S), Analytical (A), or both (S&A)
S-3	A-1	Precision	RPD ≤ 50%	Field duplicate	S & A
S-3	A-1	Accuracy/Bias: Contamination	Pesticide < QL	Rinsate blank	S & A
S-3	A-1	Accuracy/Bias	Gamma-BHC: 56-123 %R Heptachlor: 40-131 %R Aldrin: 40-120 %R Dieldrin: 52-126 %R Endrin: 56-121 %R 4,4'-DDT : 38-127 %R	MS/MSD	S & A
S-3	A-1	Precision	Gamma-BHC: 15% RPD Heptachlor: 20% RPD Aldrin: 22% RPD Dieldrin: 18% RPD Endrin: 21% RPD 4,4'-DDT: 27% RPD	MS/MSD	S & A
S-3	A-1	Accuracy	Tetrachloro-m-xylene: 30-150 %R	Surrogate spike	A
S-3	A-1	Accuracy/Bias: Contamination	Pesticide < QL	Method blank	A
S-3	A-1	Completeness	≥ 90%	Data completeness defined as data not qualified as rejected after validation	S & A

QAPP WORKSHEET #12 (CONTINUED)
MEASUREMENT PERFORMANCE CRITERIA TABLE

Matrix	Water
Analytical Group	TAL Metals
Concentration Level	Multi-concentration

Sampling Procedure[1]	**Analytical Method SOP**[2]	**DQIs**	**Measurement Performance Criteria**	**QC Sample and/or Activity Used to Assess Measurement Performance**	**QC Sample Assesses Error for Sampling (S), Analytical (A), or both (S&A)**
S-3	A-2	Accuracy	All metals: 75-125 %R	MS	A
S-3	A-2	Precision	All metals: < 20% RPD	Laboratory duplicate	A
S-3	A-2	Sensitivity/Contamination	Metal < QL	Method blank	A

Notes:

DQI Data quality indicator
QL Quantitation limit
%R Percent recovery
RPD Relative percent difference
RSD Relative standard deviation

[1] Reference number from QAPP Worksheet #21
[2] Reference number from QAPP Worksheet #23

Because organic data are being collected for informational purposes only and no regulatory decisions will be made based on organic data, measurement performance criteria are not listed for organic analyses in water.

QAPP WORKSHEET #13
SECONDARY DATA CRITERIA AND LIMITATIONS TABLE

(UFP QAPP Section 2.7)
Identify all secondary data and information that will be used for the project and their originating sources. Specify how the secondary data will be used and the limitations on their use.

Secondary Data	Data Source (Originating Organization, Report Title, and Date)	Data Source (Originating Org, Data Types, data Generation/Collection Dates)	How data will be used	Limitation on Data Use
XRF soil data	USEPA. Final Report on X-Ray Fluorescence Field Study of Selected Properties in Vicinity of Former USS Lead Refinery Facility, East Chicago, Indiana. November 2003.	USEPA; soil XRF data, collected 2003	Data will be used qualitatively to select sampling locations	None
Soil metals data	USEPA. Draft Characterization of Lead and Other Metals in Soil in the Vicinity of the USS Lead Site, East Chicago, Indiana. April 20, 2004.	USEPA, XRF and laboratory metals data collected 2002 and 2004.	Data will be used qualitatively to select sampling locations.	None
Soil metals data	STN. Draft Site Assessment Letter Report, USS Lead Site November 8, 2007.	STN. Soil XRF data, collected 2007.	Data will be used qualitatively to select sampling locations.	None

QAPP WORKSHEET #14
SUMMARY OF PROJECT TASKS

(UFP QAPP Section 2.8.1)
Provide a brief overview of the listed project activities.

Sampling Tasks: 1. Residential properties and vacant lots (110): collect composite soil samples from 0-6, 6-12, 12-18, and 18-24 inch bgs depth intervals in both front and back yards. Collect grab samples at all gardens and play areas from 0-6, 6-12, 12-18, and 18-24 inch bgs depth intervals. Collect one composite sample from the 0-6 inch bgs depth interval from drip line and/or gutter outfalls. 3. Schools (1): collect four 5-point composite soil samples at Carrie Gosh Elementary School (455 E. 148th St.) from each of four depth intervals: 0-6, 6-12, 12-18, 18-24 inches bgs. Collect additional grab samples from each play area from 0-6, 6-12, 12-18, and 18-24 inch bgs depth intervals. 4. Parks (4): collect four composite soil samples from four depth intervals, 0-6, 6-12, 12-18, 18-24 inches bgs. Collect additional grab samples from each play area from 0-6, 6-12, 12-18, and 18-24 inch bgs depth intervals. 5. Perform field analysis of lead using the field portable Innov-X XRF on all samples collected. 6. Log activities and tasks in field notebook and sampling forms. 7. Prepare sample documentation such as chain-of-custody forms, sample labels, custody seals, etc.
Analysis Tasks: The CLP laboratory will analyze samples for metals, VOCs, SVOCs, PCBs, and pesticides, and perform the modified analysis (MA) of metals in the fine (<250 µm) and coarse (>250 µm) particulate fractions.
QC Tasks: The following QC samples will be collected and analyzed during the sampling event: field duplicates, MS/MSD samples, rinsate blanks, and trip blanks.
Secondary Data: See Worksheet #13

QAPP WORKSHEET #14 (CONTINUED)
SUMMARY OF PROJECT TASKS

Data Management Tasks: Analytical data will be archived in an electronic database after validation.
Documentation and Records: All samples collected will be documented in a logbook using a ballpoint pen. The time of collection, identification number, sampling location, field observations, sampler's name, and analyses will be recorded in the logbook for each sample. Each page of the logbook will be dated, numbered, and signed by SulTRAC personnel. Field data records will be maintained at SulTRAC's Chicago office. SulTRAC will follow custody procedures outlined in SulTRAC's program-level QAPP for the RAC 2 contract. Further specifications are described in the FSP.
Assessment/Audit Tasks: Not applicable.
Data Review Tasks: EPA will perform CADRE for all CLP data and will prepare a case narrative detailing any issues or inconsistencies discovered. SulTRAC will conduct limited data validation of all CLP analytical data. The SulTRAC project manager will review the case narrative and will detail any analytical issues that may potentially affect data quality in the RI/FS report.

QAPP WORKSHEET #15
REFERENCE LIMITS AND EVALUATION TABLE

(UFP QAPP Section 2.8.1)
Complete this worksheet for each matrix.
Identify the target analytes/contaminants of concern and project-required action limits. Next, determine the QLs that must be met to achieve the PQOs. Finally, list the published and achievable detection and QLs for each analyte.

Reference Limits Table – Soil

Analytical Group	Analyte	CAS Number	Project Action Limit - Soil (mg/kg)[1]	CRQL - Soil (mg/kg)
VOA/CLP	Dichlorodifluoromethane	75-71-8	1.9E+02	5.0E-03
VOA/CLP	Chloromethane	74-87-3	1.2E+02	5.0E-03
VOA/CLP	Vinyl chloride	75-01-4	6.0E+02	5.0E-03
VOA/CLP	1,2,4-Trichlorobenzene	120-82-1	8.7E+01	5.0E-03
VOA/CLP	Trichlorofluoromethane	75-69-4	8.0E+02	5.0E-03
VOA/CLP	Bromomethane	74-83-9	7.9	5.0E-03
VOA/CLP	Chloroethane	75-00-3	1.5E+04	5.0E-03
VOA/CLP	Trichlorofluoromethane	75-69-4	8.0E+02	5.0E-03
VOA/CLP	1,1-Dichloroethene	75-35-4	2.5E+02	5.0E-03
VOA/CLP	1,1,2-Trichloro-1,2,2-trifluoroethane	76-13-1	4.3E+04	5.0E-03
VOA/CLP	Acetone	67-64-1	6.1E+04	1.0E-02
VOA/CLP	Carbon disulfide	75-15-0	6.7E+02	5.0E-03
VOA/CLP	Methyl acetate	79-20-9	7.8E+04	5.0E-03
VOA/CLP	Methylene chloride	75-09-2	1.1E+01	5.0E-03
VOA/CLP	Trans-1,2-Dichloroethene	156-60-5	1.1E+01	5.0E-03
VOA/CLP	Methyl tert-butyl ether	1634-04-4	3.9E+01	5.0E-03
VOA/CLP	1,1-Dichloroethane	75-34-3	3.4	5.0E-03
VOA/CLP	Cis-1,2-Dichloroethene	156-59-2	7.8E+02	5.0E-03
VOA/CLP	2-Butanone	78-93-3	2.8E+04	1.0E-02
VOA/CLP	Bromochloroform	74-97-5	NC	5.0E-03
VOA/CLP	Chloroform	67-66-3	3.0E-01	5.0E-03
VOA/CLP	1,1,1-Trichloroethane	71-55-6	9.0E+03	5.0E-03

QAPP WORKSHEET #15 (CONTINUED)
REFERENCE LIMITS AND EVALUATION TABLE

Analytical Group	Analyte	CAS Number	Project Action Limit - Soil (mg/kg)[1]	CRQL - Soil (mg/kg)
VOA/CLP	Cyclohexane	110-82-7	7.2E+03	5.0E-03
VOA/CLP	Carbon tetrachloride	56-23-5	2.5E-01	5.0E-03
VOA/CLP	Benzene	71-43-2	1.1	5.0E-03
VOA/CLP	1,2-Dichloroethane	107-06-2	4.5E-01	5.0E-03
VOA/CLP	1,4-Dioxane	123-91-1	4.4E+01	1.0E-01
VOA/CLP	TCE	79-01-6	2.8	5.0E-03
VOA/CLP	Methylcyclohexane	108-87-2	NC	5.0E-03
VOA/CLP	1,2-Dichloropropane	78-87-5	3.4E-01	5.0E-03
VOA/CLP	Bromodichloromethane	75-27-4	9.3E-01	5.0E-03
VOA/CLP	Cis-1,3-Dichloropropene	26952-23-8	1.7	5.0E-03
VOA/CLP	4-Methyl-2-pentanone	108-10-1	5.3E+03	1.0E-02
VOA/CLP	Toluene	108-88-3	5.0E+03	5.0E-03
VOA/CLP	Trans-1,3-Dichloropropene	10061-02-6	1.7	5.0E-03
VOA/CLP	1,1,2-Trichloroethane	79-00-5	1.1	5.0E-03
VOA/CLP	Tetrachloroethene	127-18-4	5.7E-01	5.0E-03
VOA/CLP	2-Hexanone	591-78-6	NC	1.0E-02
VOA/CLP	Dibromochloromethane	124-48-1	7.0E-01	5.0E-03
VOA/CLP	1,2-Dibromoethane	106-93-4	3.4E-02	5.0E-03
VOA/CLP	Chlorobenzene	108-90-7	3.1E+02	5.0E-03
VOA/CLP	Ethylbenzene	100-41-4	5.7	5.0E-03
VOA/CLP	o-Xylene	95-47-6	5.3E+03	5.0E-03
VOA/CLP	m-Xylene	108-38-3	5.3E+03	5.0E-03
VOA/CLP	p-Xylene	106-42-3	4.7E+03	5.0E-03
VOA/CLP	Styrene	100-42-5	6.5E+03	5.0E-03
VOA/CLP	Bromoform	75-25-2	6.1E+01	5.0E-03
VOA/CLP	Isopropylbenzene	98-82-8	NC	5.0E-03
VOA/CLP	1,1,2,2-Tetrachloroethane	630-20-6	2.0	5.0E-03
VOA/CLP	1,3-Dichlorobenzene	95-50-1	NC	5.0E-03
VOA/CLP	1,4-Dichlorobenzene	106-46-7	2.6	5.0E-03
VOA/CLP	1,2-Dichlorobenzene	95-50-1	2.0E+03	5.0E-03
VOA/CLP	1,2-Dibromo-3-chloropropane	96-12-8	5.6E-03*	5.0E-03
VOA/CLP	1,2,4-Trichlorobenzene	120-82-1	8.7E+01	5.0E-03
VOA/CLP	1,2,3-Trichlorobenzene	87-61-6	NC	5.0E-03

QAPP WORKSHEET #15 (CONTINUED)
REFERENCE LIMITS AND EVALUATION TABLE

Analytical Group	Analyte	CAS Number	Project Action Limit - Soil (mg/kg)[1]	CRQL - Soil (mg/kg)
SVOA/CLP	Phenol	108-95-2	1.8E+04	1.7E-01
SVOA/CLP	Bis (2-Chloroethyl) ether	111-44-4	1.9E-01	1.7E-01
SVOA/CLP	2-Chlorophenol	95-57-8	3.9E+02	1.7E-01
SVOA/CLP	2-Methylphenol	95-48-7	3.5E+02	1.7E-01
SVOA/CLP	Bis(2-chloro-1-methylethyl)ether	108-60-1	3.5	1.7E-01
SVOA/CLP	Acetophenone	98-86-2	7.8E+03	1.7E-01
SVOA/CLP	4-Methylphenol	106-44-5	3.1E+02	1.7E-01
SVOA/CLP	N-Nitrosodi-N-propylamine	621-64-7	6.9E-02*	1.7E-01
SVOA/CLP	Hexachloroethane	67-72-1	3.5E+01	1.7E-01
SVOA/CLP	Nitrobenzene	98-95-3	4.4	1.7E-01
SVOA/CLP	Isophorone	78-59-1	5.1E+02	1.7E-01
SVOA/CLP	2-Nitrophenol	88-75-5	NC	1.7E-01
SVOA/CLP	2,4-Dimethylphenol	105-67-9	1.2E+03	1.7E-01
SVOA/CLP	Bis (2-Chloroethoxy) methane	111-91-1	1.8E+02	1.7E-01
SVOA/CLP	2,4-Dichlorophenol	120-83-2	1.8E+02	1.7E-01
SVOA/CLP	Naphthalene	91-20-3	3.9	1.7E-01
SVOA/CLP	4-Chloroaniline	106-47-8	2.4	1.7E-01
SVOA/CLP	Hexachlorobutadiene	87-68-3	6.2	1.7E-01
SVOA/CLP	Caprolactam	105-60-2	3.1E+04	1.7E-01
SVOA/CLP	4-Chloro-3-methylphenol	59-50-7	NC	1.7E-01
SVOA/CLP	2-Methylnaphthalene	91-57-6	3.1E+02	1.7E-01
SVOA/CLP	Hexachlorocyclopentadiene	77-47-4	3.7E+02	1.7E-01
SVOA/CLP	2,4,6-Trichlorophenol	88-06-2	4.4E+01	1.7E-01
SVOA/CLP	2,4,5-Trichlorophenol	95-95-4	6.1E+03	1.7E-01
SVOA/CLP	1,1-Biphenyl	92-52-4	3.9E+03	1.7E-01
SVOA/CLP	2-Chloronaphthalene	91-58-7	6.3E+03	1.7E-01
SVOA/CLP	2-Nitroaniline	88-74-4	1.8E+02	3.30E-01
SVOA/CLP	Dimethyl phthalate	131-11-3	NC	1.7E-01
SVOA/CLP	2,6-Dinitrotoluene	606-20-2	6.1E+01	1.7E-01
SVOA/CLP	Acenaphthylene	208-96-8	NC	1.7E-01
SVOA/CLP	3-Nitroaniline	99-09-2	NC	3.30E-01
SVOA/CLP	Acenaphthene	83-32-9	3.4E+03	1.7E-01
SVOA/CLP	2,4-Dinitrophenol	51-28-5	1.2E+02	3.30E-01

QAPP WORKSHEET #15 (CONTINUED)
REFERENCE LIMITS AND EVALUATION TABLE

Analytical Group	Analyte	CAS Number	Project Action Limit - Soil (mg/kg)[1]	CRQL - Soil (mg/kg)
SVOA/CLP	Dibenzofuran	132-64-9	NC	1.7E-01
SVOA/CLP	2,4-Dinitrotoluene	121-14-2	1.6	1.7E-01
SVOA/CLP	Diethylphthalate	84-66-2	4.9E+04	1.7E-01
SVOA/CLP	Fluorene	86-73-7	2.3E+03	1.7E-01
SVOA/CLP	4-Chlorophenyl-phenyl ether	7005-72-3	NC	1.7E-01
SVOA/CLP	4-Nitroaniline	100-01-6	2.4E+01	3.30E-01
SVOA/CLP	2-Methyl-4,6-dinitro phenol	534-52-1	6.1	3.30E-01
SVOA/CLP	N-Nitrosodiphenylamine	86-30-6	9.9E+01	1.7E-01
SVOA/CLP	1,2,4,5-Tetrachlorobenzene	95-94-3	1.8E+01	1.7E-01
SVOA/CLP	4-Bromophenyl-phenylether	101-55-3	NC	1.7E-01
SVOA/CLP	Hexachlorobenzene	118-74-1	3.0E-01	1.7E-01
SVOA/CLP	Atrazine	1912-24-9	2.1	1.7E-01
SVOA/CLP	Pentachlorophenol	87-86-5	3.0	3.30E-01
SVOA/CLP	Phenanthrene	85-01-8	NC	1.7E-01
SVOA/CLP	Anthracene	120-12-7	1.7E+04	1.7E-01
SVOA/CLP	Carbazole	86-74-8	NC	1.7E-01
SVOA/CLP	Di-n-butylphthalate	84-74-2	6.1E+03	1.7E-01
SVOA/CLP	Fluoranthene	206-44-0	2.3E+03	1.7E-01
SVOA/CLP	Pyrene	129-00-0	1.7E+03	1.7E-01
SVOA/CLP	Butylbenzylphthalate	85-68-7	2.6E+02	1.7E-01
SVOA/CLP	3,3'-dichlorobenzidine	91-94-1	1.1	1.7E-01
SVOA/CLP	Benzo(a)anthracene	56-55-3	1.5E-01*	1.7E-01
SVOA/CLP	Benzo(b)fluoranthene	205-99-2	1.5E-01*	1.7E-01
SVOA/CLP	Benzo(k)fluoranthene	207-08-9	1.5	1.7E-01
SVOA/CLP	Chrysene	218-01-9	1.5E+01	1.7E-01
SVOA/CLP	Bis(2-ethylhexyl)phthalate	117-81-7	3.5E+01	1.7E-01
SVOA/CLP	Di-n-octylphthalate	117-84-0	NC	1.7E-01
SVOA/CLP	Benzo(a) pyrene	50-32-8	1.5E-02	1.7E-01
SVOA/CLP	Indeno(1,2,3,-cd)pyrene	193-39-5	1.5E-01	1.7E-01
SVOA/CLP	Dibenzo(a,h)anthracene	53-70-3	1.5E-02*	1.7E-01
SVOA/CLP	Benzo(g,h,i)perylene	191-24-2	NC	1.7E-01
SVOA/CLP	2,3,4,6-Tetrachlorophenol	58-90-2	1.8E+03	1.7E-01

QAPP WORKSHEET #15 (CONTINUED)
REFERENCE LIMITS AND EVALUATION TABLE

Analytical Group	Analyte	CAS Number	Project Action Limit - Soil (mg/kg)[1]	CRQL - Soil (mg/kg)
PCBs/CLP	Aroclor-1016[2]	12674-11-2	3.9	3.3E-02
PCBs/CLP	Aroclor-1221	11104-28-2	1.7E-01	3.3E-02
PCBs/CLP	Aroclor-1232	11141-16-5	1.7E-01	3.3E-02
PCBs/CLP	Aroclor-1242	53469-21-9	2.2E-02	3.3E-02
PCBs/CLP	Aroclor-1248	12672-29-6	2.2E-02	3.3E-02
PCBs/CLP	Aroclor-1254[3]	11097-69-1	2.2E-02	3.3E-02
PCBs/CLP	Aroclor-1260	11096-82-5	2.2E-02	3.3E-02
PCBs/CLP	Aroclor-1268	11100-14-4	NC	3.3E-02
Pesticides/CLP	alpha-BHC	319-84-6	7.7E-02	1.7E-03
Pesticides/CLP	Beta-BHC	319-85-7	2.7E-01	1.7E-03
Pesticides/CLP	delta-BHC	319-86-8	NC	1.7E-03
Pesticides/CLP	gamma-BHC (Lindane)	58-89-9	5.2E-01	1.7E-03
Pesticides/CLP	Heptachlor	76-44-8	1.1E-01	1.7E-03
Pesticides/CLP	Aldrin	309-00-2	2.9E-02	1.7E-03
Pesticides/CLP	Heptachlor epoxide	1024-57-3	5.3E-02	1.7E-03
Pesticides/CLP	Endosulfan I	115-29-7	3.7E+02	1.7E-03
Pesticides/CLP	Dieldrin	60-57-1	3.0E-02	3.3E-03
Pesticides/CLP	4,4'-DDE	72-55-9	1.4	3.3E-03
Pesticides/CLP	Endrin	72-20-8	1.8E+01	3.3E-03
Pesticides/CLP	Endosulfan II	115-29-7	3.7E+02	3.3E-03
Pesticides/CLP	4,4'-DDD	72-54-8	2.0	3.3E-03
Pesticides/CLP	4,4'-DDT	50-29-3	1.7	3.3E-03
Pesticides/CLP	Endosulfan sulfate	1031-07-8	NC	3.3E-03
Pesticides/CLP	Methoxychlor	72-43-5	3.1E+02	1.7E-02
Pesticides/CLP	Endrin ketone	72-20-8	1.8E+01	3.3E-03
Pesticides/CLP	Endrin aldehyde	72-20-8	1.8E+01	3.3E-03
Pesticides/CLP	alpha-Chlordane	5103-71-9	1.6	1.7E-03
Pesticides/CLP	gamma-Chlordane	5103-74-2	1.6	1.7E-03
Pesticides/CLP	Toxaphene	8001-35-2	4.4E-01	1.7E-01

TAL Metals/CLP	Aluminum	7429-90-5	7.7E+04	20.0
TAL Metals/CLP	Antimony	7440-36-0	3.1E+01	6.0
TAL Metals/CLP	Arsenic	7440-38-2	3.9E-01*	1.0
TAL Metals/CLP	Barium	7440-39-3	1.5E+04	20.0
TAL Metals/CLP	Beryllium	7440-41-7	1.6E+02	0.5
TAL Metals/CLP	Cadmium	7440-43-9	7.0E+01	0.5
TAL Metals/CLP	Calcium	17852-99-2	NC	500.0
TAL Metals/CLP	Chromium	7440-47-3	2.8E+02	1.0
TAL Metals/CLP	Cobalt	7440-48-4	2.3E+01	5.0
TAL Metals/CLP	Copper	7440-50-8	3.1E+03	2.5
TAL Metals/CLP	Iron	7439-89-6	5.5E+04	10.0
TAL Metals/CLP	Lead	7439-92-1	4.0E+02 [4]	1.0
TAL Metals/CLP	Magnesium	7439-95-4	NC	500.0
TAL Metals/CLP	Manganese	7439-96-5	1.8E+03	1.5
TAL Metals/CLP	Mercury	7439-97-6	2.3E+01	0.1
TAL Metals/CLP	Nickel	7440-02-0	1.3E+03	4.0
TAL Metals/CLP	Potassium	7440-22-4	NC	500.0
TAL Metals/CLP	Selenium	7782-49-2	3.9E+02	3.5
TAL Metals/CLP	Silver	7440-22-4	3.9E+02	1.0
TAL Metals/CLP	Sodium	7440-23-5	NC	500.0
TAL Metals/CLP	Thallium	7440-28-0	5.1	2.5
TAL Metals/CLP	Vanadium	7440-62-2	5.5E+02	5.0
TAL Metals/CLP	Zinc	7440-66-6	2.3E+03	6.0

Notes:
Because organic data are being collected for informational purposes only and no regulatory decisions will be made based on organic data, no project action limits are included for water.

* Laboratory quantitation limits are above screening limits for these compounds; however these compounds are not chemicals of concerns in this investigation.
CAS Chemical Abstract Services
CRQL Contract-required quantitation limit
mg/kg Milligram per kilogram
NC No criteria

1 Region 9 Regional Screening Level Table April 2009
2 PCBs (unspeciated mixture, low risk; for example, Aroclor 1016)
3 PCBs (unspeciated mixture, high risk; for example, Aroclor 1254)
4 The Superfund Lead Contaminated Residential Sites Handbook (EPA 2003b), defines 400 mg/kg as the lowest surface soil lead concentration where a long-term remedial action may be merited

QAPP WORKSHEET #16
PROJECT SCHEDULE/TIMELINE TABLE

(UFP QAPP Section 2.8.2)
List all project activities as well as the QA assessments that will be performed during the course of the project. Include the anticipated start and completion dates.

Activity	Organization	Date		Deliverable	Deliverable Due Date
		Anticipated Date of Initiation	Anticipated Date of Completion		
Phase I Field Sampling	SulTRAC	December 2009	January 2010	Site Management Plan Phase I FSP Phase I QAPP Data Management Plan Health and Safety Plan	30 days after Phase I work plan approval
Technical Memorandum	SulTRAC	February 2010	February/March 2010	Phase I Technical Memorandum: Phase I Investigation	45 days after receipt of Phase I validated data
Screening Level Human Health Risk Assessment (SLHHRA)	SulTRAC	TBD after review of Phase I investigation results	TBD after review of Phase I investigation results	SLHHRA Letter Report	Draft - TBD Final - 10 days after receipt of comments
Screening Level Ecological Risk Assessment (SLERA)	SulTRAC	TBD after review of Phase I investigation results	TBD after review of Phase I investigation results	SLERA Letter Report	Draft - TBD Final - 10 days after receipt of comments
Human Health Risk Assessment (HHRA)	SulTRAC	TBD after review of Phase I investigation results	TBD after review of Phase I investigation results	HHRA Report	Draft - TBD Final - 21 days after receipt of comments
Ecological Risk Assessment (ERA)	SulTRAC	TBD after review of Phase I investigation results	TBD after review of Phase I investigation results	ERA Report	Draft - TBD Final - 21 days after receipt of comments

RI Report	SulTRAC	TBD after review of Phase I investigation results	TBD after review of Phase I investigation results	RI Report	Draft - 30 days after completion of HHRA or ERA Final – 21 days after receipt of comments
USS Lead Remedial Alternatives Screening	SulTRAC	TBD after review of Phase I investigation results	TBD after review of Phase I investigation results	Remedial Alternatives Screening Report	TBD
USS Lead Remedial Alternatives Evaluations	SulTRAC	TBD after review of Phase I investigation results	TBD after review of Phase I investigation results	Remedial Alternatives Evaluation Report	TBD
Feasibility Study	SulTRAC	TBD after review of Phase I investigation results	TBD after review of Phase I investigation results	Feasibility Study Report	Draft -TBD Final -21 days after receipt of comments
Work Assignment Completion Report (WACR)	SulTRAC	TBD after review of Phase I investigation results	TBD after review of Phase I investigation results	WACR	45 days after receipt of the Work Assignment Closeout Notification (WACN)

QAPP WORKSHEET #17
SAMPLING DESIGN AND RATIONALE

(UFP QAPP Section 3.1.1)
Describe the project sampling approach. Provide the rationale for selecting sample locations and matrices for each analytical group and concentration level.

Describe the sampling design and rationale in terms of what matrices will be sampled, what analytical groups will be analyzed and at what concentration levels, the sampling locations (including QC, critical, and background samples), the number of samples to be collected, and the sampling frequency (including seasonal considerations). (May refer to map or Worksheet #18 for details).

The field sampling approach will be performed in two phases. Phase 1 of the investigation will determine the lateral and vertical extent of lead-contaminated soils at residences, vacant lots, parks, and schools, determine if other contaminants are associated with lead-contaminated soils, and provide a good estimate of the number of homes or properties that will require removal or remediation. The development of Phase 2 will be determined by the results of the Phase 1 sampling data.

SulTRAC has used the city blocks as a basis to delineate the lateral extent of lead contaminations. SulTRAC will collect samples from properties on each side of each block for a total of approximately 3 sites per block. Exact sampling locations are dependent on property access. Approximately 30 residential blocks will be sampled during this phase. In addition to residential properties in this area, vacant lots, the Carrie Gosh Elementary School, and four parks will be sampled.

In Phase I, an extensive XRF soil screening investigation in residential properties, parks, vacant lots, and school yards will be performed (approximately 1,230 composite soils samples and an unknown number of grab soil samples from gardens and play areas). Soil samples from 10% of the total properties will be sent to CLP laboratory for VOC, SVOC, PCB, pesticide, and metals analysis; soil samples from 5% of the total properties will be submitted to CLP laboratory for sieve analysis followed by separate metals analysis on the coarse and fine fractions. 20% of the total soil samples collected at USS Lead will also be sent to CLP laboratory for metals analysis.

Composite soil samples will be collected at different depth intervals to determine the vertical extent of contamination. The depth intervals that composite soil samples will be collected from are 0-6, 6-12, 12-18, and 18-24 inches bgs. The Superfund Lead-Contaminated Residential Sites Handbook (US EPA 2003a) recommends limiting the depth of investigation to 2 feet bgs.

Residential properties and vacant lots will have composite soil samples collected at each depth interval in both the front and back yards. The composite will be collected from five locations in each yard, in an X-shaped pattern with one sample from each end point of the X and one sample from the center. If there are side yards, the 5-point composite will include locations from the side yards. Composite samples will also be collected from below drip lines and at gutter outfalls. In addition, grab soil samples will be collected from four depth intervals from each play area, vegetable, or flower garden at residences.

School yards and parks will be divided into quadrants, and one 5-point composite soil sample will be collected from all four depth intervals in each quadrant. In addition, grab soil samples will be collected from four depth intervals from each play area at parks and schools.

QAPP WORKSHEET #18
SAMPLING LOCATIONS/IDS, SAMPLE DEPTHS, SAMPLE ANALYSES AND SAMPLING PROCEDURES TABLE

(UFP QAPP Section 3.1.1)

List all locations that will be sampled, indicating the sample identification (ID) number or sample location. Specify sample matrix and depth at which samples will be taken. List all analytes the samples will be analyzed for.

Specify the appropriate SOP or specific section in the SAP that describes the sample collection procedure.

Sampling Location[1]/ ID Number	**Matrix**	**Depth (inches bgs)**	**Analytical Group**	**Sampling SOP Reference[2]**
1,230 locations, composite samples from four depths	Soil[3]	0-6 6-12 12-18 18-24	Lead by XRF field analysis (1230 samples)	S-1, S-2, S-3
12 locations, four depth intervals sampled	Soil[3]	0-6 6-12 12-18 18-24	CLP SOW SOM01.2 (VOCs, SVOCs, PCBs, pesticides) CLP SOW ILM05.4 (metals)	S-1, S-3
6 locations, four depth intervals sampled	Soil[3]	0-6 6-12 12-18 18-24	Modified Analysis (MA) CLP SOW ILM05.4—includes sieve analysis before fine and coarse particle metals analysis	S-1, S-3
246 locations, composite samples from four depths	Soil[3]	0-6 6-12 12-18 18-24	CLP SOW ILM05.4	S-1, S-3

Notes:

ID Identification

1 See Figure B-1 for residential portion of study area.
2 See Worksheet #21 for a list of sampling methods S-1 through S-3
3 Samples will be collected from hand-augered soil borings.

QAPP WORKSHEET #19
ANALYTICAL METHODS, CONTAINERS, PRESERVATIVES, AND HOLDING TIMES TABLE

(UFP QAPP Section 3.1.1)
For each matrix and analytical group, list the analytical and preparation method and associated container specifications, preservation requirements, and maximum holding time.

Matrix	Analytical Group	Analytical and Preparation Method	Containers (number, size, type)	Preservation Requirements (chemical, temperature, etc.)	Maximum Holding Time (preparation/analysis)[1]
Soil	VOCs	CLP SOW SOM01.2	Three 40-mL glass containers with PTFE-lined septa and open-top screw caps, pre-weighed and containing magnetic stir bars and one container of sample filled with no headspace for determination of moisture content OR At least three coring tools used as transport devices (for example, 5-gram samplers) and one container of sample filled with no headspace for determination of moisture content	Cool to 4 °C ± 2 °C immediately after collection Frozen (-7 ºC to -15 ºC)	48 hours to preservation at laboratory/14 days for analysis following preservation OR 48 hours (frozen) to preservation at laboratory for analysis after preservation
Soil	SVOCs	CLP SOW SOM01.2	Two 4-ounce or one 8-ounce wide-mouth glass jar	Cool to 4 °C ± 2 °C immediately after collection	14 days/40 days
Soil	PCBs	CLP SOW SOM01.2	Two 4-ounce or one 8-ounce wide-mouth glass jar	Cool to 4 °C ± 2 °C immediately after collection	14 days/30 days
Soil	Pesticides	CLP SOW SOM01.2	Two 4-ounce or one 8-ounce wide-mouth glass jar	Cool to 4 °C ± 2 °C immediately after collection	14 days/40 days
Soil	Metals	CLP SOW ILM05.4	Two 4-ounce or one 8-ounce wide-mouth glass jar	Cool to 4 °C ± 2 °C immediately after collection	NA/6 months (28 days for mercury)

QAPP WORKSHEET #19 (CONTINUED)
ANALYTICAL METHODS, CONTAINERS, PRESERVATIVES, AND HOLDING TIMES TABLE

Matrix	Analytical Group	Analytical and Preparation Method	Containers (number, size, type)	Preservation Requirements (chemical, temperature, etc.)	Maximum Holding Time (preparation/analysis)1
Water	VOCs	CLP SOW SOM01.2	Three 40-mL glass vials with PTFE-lined septa and open-top screw caps	No headspace Cool to 4 ºC ± 2 ºC Adjust pH to less than 2 with HCl	7 days/14 days
Water	Metals	CLP SOW ILM05.4	One 1-liter high-density polyethylene bottle	HNO_3 to pH < 2 and cool to 4 ˚C (±2 ˚C) immediately after collection	NA/6 months (28 days for mercury)

Notes:
HCl Hydrochloric acid
HNO_3 Nitric acid
mL Milliliter
NA Not applicable
PTFE Polytetrafluoroethylene

1 Holding time is applicable from validated time of sample receipt and is measured to time of sample extraction and analysis.

QAPP WORKSHEET #20
FIELD QUALITY CONTROL SAMPLE SUMMARY TABLE

(UFP QAPP Section 3.1.1)
Summarize by matrix and analytical group.

Matrix	Analytical Group	Analytical and Preparation SOP Reference[1]	No. of Samples	No. of Field Duplicates[2]	No. of MS/MSDs[3]	No. of Trip Blanks[4]	No. of Equipment Rinsates[5]	Total No. of Samples to Laboratory
Soil	VOA/CLP	A-1	12	2	1	2	0	14
Soil	SVOA/CLP	A-1	12	2	1	0	0	14
Soil	PCBs/CLP	A-2	12	2	1	0	0	14
Soil	Pesticides/CLP	A-2	12	2	1	0	0	14
Soil	Metals/CLP	A-3	258	26	13	0	0	297
Soil	Sieve and Metals/CLP	A-4	6	1	1	0	0	8
Rinsate Water	TAL Metals, Mercury/CLP	A-3	0	0	0	0	8	8

Notes:
Sample numbers in this table reflect field QC samples collected during each sampling event.

1 Analytical and preparation SOPs are listed in Worksheet #23.
2 Field duplicates are collected at a rate of 1 per 10 investigative samples of the same matrix.
3 MS/MSD samples are collected at a rate of 1 per 20 investigative samples of the same matrix.
4 A trip blank will be provided with each shipping container to be analyzed for VOCs.
5 Equipment Rinsates will be collected at the frequency of 1 rinsate per piece of equipment per week.
6 Each sieve and metals analysis sample will consist of a single sample to sieve followed by CLP metals analysis of both the fine and coarse fractions.

QAPP WORKSHEET #21
PROJECT SAMPLING SOP REFERENCES TABLE

(UFP Section 3.1.2)
List all SOPs associated with project sampling including, but not limited to, sample collection, sample preservation, equipment cleaning and decontamination, equipment testing, inspection and maintenance, supply inspection and acceptance, and sample handling and custody. Include copies of the SOPs as attachments or reference all in the QAPP. Sequentially number sampling SOP references in the Reference Number column. The Reference Number can be used throughout the QAPP to refer to a specific SOP.

Reference Number	Title, Revision, Date and/or Number	Originating Organization	Equipment Type	Modified for Project Work? (Y/N)	Comments
S-1	Soil Sampling, Revision No. 2, June 2009, SOP 005	Tetra Tech EM Inc.	Spoon or spatulas, trowel, split-spoon sampler, coring tools	N	None
S-2	Field Portable Innov-X XRF Spectrometry for the Determination of Elemental Concentrations in Soil, Revision 3, February, 2007, XRF SOP	EPA	Field Portable Innov-X XRF Analyzer	N	None
S-3	General Equipment Decontamination, Revision No. 3, June 2009, SOP 002	Tetra Tech EM Inc.	Scrub brushes, large wash tubs or buckets, Alconox, distilled water	N	None

QAPP WORKSHEET #22
FIELD EQUIPMENT CALIBRATION, MAINTENANCE, TESTING, AND INSPECTION TABLE

(UFP QAPP Section 3.1.2.4)
Identify all field equipment/instruments that require calibration, maintenance, testing, or inspection activities. Specify the frequency of each activity, acceptance criteria, and corrective action requirements. Provide the SOP reference number for each type of equipment, if available.

Field Equipment	Calibration Activity[1]	Frequency	Acceptance Criteria	CA	Responsible Person	SOP Reference	Comments
Innov-X XRF Analyzer[2]	Per manufacturer's instructions	Daily before first field measurement	Standard results must be within ± 30% of true value	Repeat calibration; correct measurements for drift if necessary	Field team leader or field team members	F-6 (X-ray Fluorescence Spectrometry for the determination of Elemental Concentrations in Soil, Revision No.3, February 2007)	None

Notes:

ppm Part per million

1 The field equipment will be calibrated per manufacturer's instructions.
2 Instrument accuracy will be verified using manufacturer supplied calibration blanks..

QAPP WORKSHEET #23
ANALYTICAL SOP REFERENCES TABLE

(UFP QAPP Section 3.2.1)
List all SOPs that will be used to perform on-site or off-site analysis. Indicate whether the procedure produces screening or definitive data. Sequentially number analytical SOP references in the Reference Number column. The Reference Number can be used throughout the QAPP to refer to a specific SOP. Include copies of the SOPs as attachments or reference in the QAPP.

Reference Number	Title, Revision, Date, and/or Number	Definitive or Screening Data	Analytical Group	Instrument	Organization Performing Analysis	Modified for Project Work?
A-1	CLP SOW SOM01.2 for Organics Analysis, Multi-Media, Multi-Concentration	Definitive	VOA, SVOA	Gas chromatography (GC)/mass spectroscopy	CLP Laboratory	No
A-1	CLP SOW SOM01.2 for Organics Analysis, Multi-Media, Multi-Concentration	Definitive	PCB, pesticide	GC/electron capture detector	CLP Laboratory	No
A-2	CLP SOW ILM05.4 for Inorganic Analysis, Multi-Media, Multi-Concentration	Definitive	Metals	ICP/AES ICP/mass spectroscopy Cold vapor atomic absorption	CLP Laboratory	No
A-2	Modified Analysis (MA) CLP SOW ILM05.4 for Inorganic Analysis, Multi-Media, Multi-Concentration following sieve analysis and division of fine (<250 µm) and coarse (>250 µm) particle fractions.	Definitive	Metals (fractional)	ICP/AES ICP/mass spectroscopy Cold vapor atomic absorption	CLP Laboratory	Yes

Notes:

AES Atomic emission spectroscopy
ICP Inductively coupled plasma
NA Not applicable

QAPP WORKSHEET #24
ANALYTICAL INSTRUMENT CALIBRATION TABLE

(UFP Section 3.2.2)
Identify all analytical instrumentation that requires calibration and provide the SOP Reference Number for each. In addition, document the frequency, acceptance criteria, and corrective action requirements on the worksheet.

Instrument	Calibration Procedure	Frequency of Calibration	Acceptance Criteria	Corrective Action (CA)	Person Responsible for CA	SOP Reference[1]
GC/Mass Spectroscopy	**VOCs:** Run five calibration standard solutions and a blank. **SVOCs:** Run five calibration standard solutions and a blank.	12-hour continuing calibration acceptance criteria	Always, relative response factor (RRF) ≥ 0.010 or per SOP Initial, RSD ≤ 20% or 40%, depending on compound. Continuing, %D ≤ 25 or 40 depending on compound	Inspect the system for problems, clean the ion source, change the column, service the purge and trap device, and take CAs to achieve the technical acceptance criteria.	CLP Laboratory Analyst	A-1
GC/Electron Capture Detector	**Pesticides:** Run five calibration standard solutions and a blank. **PCBs:** Run five calibration standard solutions and a blank.	12-hour continuing calibration acceptance criteria	Always, resolution per SOP. Initial, CF RSD ≤ 20%. Continuing, CF %D ≤ 15 for opening and ≤ 50 for closing.	Inspect the system for problems, change the column, bake out the detector, clean the injection port, and take other CAs to achieve the acceptance criteria.	CLP Laboratory Analyst	A-1
ICP/AES	Run five calibration mixed standard solutions and a blank	Each CCV analyzed shall reflect the conditions of analysis of all associated analytical samples (the preceding 10 analytical samples or the preceding analytical samples up to the previous CCV)	Deviation from the initial calibration verification: metals 90-110%	Inspect the system for problems, clean the system, verify operating conditions, and take CAs to achieve the technical acceptance criteria.	CLP Laboratory Analyst	A-2

QAPP WORKSHEET #24 (CONTINUED)
ANALYTICAL INSTRUMENT CALIBRATION TABLE

Instrument	Calibration Procedure	Frequency of Calibration	Acceptance Criteria	Corrective Action (CA)	Person Responsible for CA	SOP Reference[1]
ICP/Mass Spectroscopy	Run at least six calibration standard solutions and three blanks	Each CCV analyzed shall reflect the conditions of analysis of all associated analytical samples (the preceding 10 analytical samples or the preceding analytical samples up to the previous CCV)	Deviation from the initial calibration verification: metals 90-110%	Inspect the system for problems, clean the system, verify operating conditions, and take CAs to achieve the technical acceptance criteria.	CLP Laboratory Analyst	A-2

Notes:

%D Percent difference
CCV Continuing calibration verification
CF Calibration factor
RRF Relative response factor
RSD Relative standard deviation

1 See Worksheet #23 for analytical methods.

QAPP WORKSHEET #25
ANALYTICAL INSTRUMENT AND EQUIPMENT MAINTENANCE TESTING, AND INSPECTION TABLE

(UFP QAPP Section 3.2.2)
Identify all analytical instrumentation that requires maintenance, testing, or inspection and provide the SOP reference number for each. In addition, document the frequency, acceptance criteria, and corrective action requirements on the worksheet.

Instrument/ Equipment	Maintenance Activity	Inspection Activity	Frequency	Acceptance Criteria	Corrective Action	Responsible Person	SOP Reference[1]
GC/Mass Spectroscopy	Daily Check, Instrument tune (4-bromofluorobenzene or decafluorotriphenylphosphine)	Injector syringe, injector septum, injector liner/seal, injector port, guard column, column splitter, analytical column, ion source, detector, traps, and gas supply	See A-1	See A-1	Inspect the system for problems, clean the ion source, change the column, and service the purge and trap device.	CLP Laboratory Analyst	A-1
GC/Electron Capture Detector	Daily Check, Initial Calibration Verification	Injector syringe, injector septum, injector liner/seal, injector port, guard column, column splitter, analytical column, ion source, detector, traps, and gas supply	See A-1	See A-1	Inspect the system for problems, change the column, bake out the detector, and clean the injection port.	CLP Laboratory Analyst	A-1
ICP/AES	Daily Check, Initial Calibration Verification	Nebulizer, injection tube, flame optimization, gas supply, and detector	See A-2	See A-2	Inspect the system for problems, clean the system, verify operating conditions, and take CAs to achieve the technical acceptance criteria	CLP Laboratory Analyst	A-2

QAPP WORKSHEET #25 (CONTINUED)
ANALYTICAL INSTRUMENT AND EQUIPMENT MAINTENANCE TESTING, AND INSPECTION TABLE

Instrument/ Equipment	Maintenance Activity	Inspection Activity	Frequency	Acceptance Criteria	Corrective Action	Responsible Person	SOP Reference[1]
ICP/Mass Spectroscopy	Daily Check, Initial Calibration Verification	Nebulizer, injection tube, plasma optimization, gas supply, and detector	See A-2	See A-2	Inspect the system for problems, clean the system, verify operating conditions, and take CAs to achieve the technical acceptance criteria.	CLP Laboratory Analyst	A-2

Note:

1 See Worksheet #23 for identification of analytical methods.

QAPP WORKSHEET #26
SAMPLE HANDLING SYSTEM

(UFP QAPP Appendix A)
Record personnel, and their organizational affiliations, who are primarily responsible for ensuring proper handling, custody, and storage of field samples from the time of collection, to laboratory delivery, to final sample disposal. Indicate the number of days field samples and their extracts/digestates will be archived prior to disposal.

SAMPLE COLLECTION, PACKAGING, AND SHIPMENT
Sample Collection (Personnel/Organization): Field sampling personnel/SulTRAC
Sample Packaging (Personnel/Organization): Field sampling personnel/SulTRAC
Coordination of Shipment (Personnel/Organization): Field sampling personnel/SulTRAC
Type of Shipment/Carrier: Cooler packed with ice and packing material such as bubble wrap/FedEx or other overnight courier
SAMPLE RECEIPT AND ANALYSIS
Sample Receipt (Personnel/Organization): Laboratory personnel/CLP laboratory
Sample Custody and Storage (Personnel/Organization): Laboratory personnel/CLP laboratory
Sample Preparation (Personnel/Organization): Laboratory personnel/CLP laboratory
Sample Determinative Analysis (Personnel/Organization): Laboratory personnel/CLP laboratory
SAMPLE ARCHIVING
Field Sample Storage (No. of days from sample collection): See Worksheet #27
SAMPLE DISPOSAL
Personnel/Organization: Laboratory personnel/CLP laboratory
Number of Days from Analysis: To be determined (or in accordance with individual laboratory SOP)

QAPP WORKSHEET #27
SAMPLE CUSTODY REQUIREMENTS

(UFP Appendix A)
Describe the procedures that will be used to maintain sample custody and integrity. Include examples of chain-of-custody forms, traffic reports, sample identification, custody seals, laboratory sample receipt forms, and laboratory sample transfer forms. Attach or reference applicable SOPs.

Field Sample Custody Procedures (sample collection, packaging, shipment, and delivery to the laboratory): SulTRAC will use EPA's Field Operations and Records Management System (FORMS II Lite) software to manage sample collection, documentation, chain-of-custody, and reporting. Field personnel will input data into FORMS II Lite and then use the software to generate sample labels, bottle tags, and chain-of-custody forms to track samples from the field to the laboratory. Because FORMS II Lite captures sample management information electronically, the information is easily exportable to databases or various reporting formats.

Chain-of-custody forms will be signed in ink by the samplers and the individual relinquishing custody. SulTRAC will then follow the sample packaging and shipment procedures summarized below to ensure that samples arrive at the laboratory with the chain of custody intact.

1- Immediately after sample collection, sample containers will be labeled with the appropriate identifiers. Clear tape will be placed over the sample container's labels to prevent smearing.

2- The samples will be placed in Ziploc plastic bags and then in a cooler containing double-sealed bags of ice and maintained at 4 ^{o}C. The cooler will remain in a secured area or in view of the sampler until it is properly sealed for shipment to the laboratory.

3- Prior to shipping, the chain-of-custody forms, airbills, and all other relevant documents will be completed. Chain-of-custody forms will be sealed in plastic bags and taped to the inside of the cooler lid. Cushioning material, such as bubble-wrap, will be placed in the cooler.

4- A temperature blank consisting of a jar or vial containing water will be included in every cooler to be used by the laboratory to determine the cooler temperature at the time of sample receipt.

5- The shipping cooler will then be sealed with tape and custody seals in a manner that will indicate whether the cooler was opened. The preferred procedure includes placement of custody seals at diagonally opposite corners of the cooler. The custody seals will be covered with clear plastic tape or strapping tape.

The field sampler is personally responsible for the care and custody of the samples until they are transferred to other personnel or properly dispatched to an overnight carrier or directly to a laboratory. When transferring possession of the samples, the individuals relinquishing and receiving the samples sign, date, and note the time of transfer on the chain-of-custody form. Commercial carriers are not required to sign off on the chain-of-custody form as long as the form is sealed inside the sample cooler and the custody seals remain intact.

Laboratory Sample Custody Procedures (receipt of samples, archiving, disposal): The laboratory sample custodian will receive all incoming samples and indicate receipt by signing the accompanying custody forms and retaining copies of the signed forms as permanent records. The laboratory sample custodian will record all pertinent information concerning the sample, including the persons delivering and receiving the sample, the date and time received, the method by which the sample was transmitted to the laboratory, sample condition at the time of receipt (sealed, unsealed, or broken container; temperature; or other relevant remarks), the sample identification number, and any unique laboratory identification number associated with the sample. This information should be entered into a computerized laboratory information management system (LIMS).

The laboratory will provide a secure storage area, restricted to authorized personnel, for all samples. Only the custodian can distribute samples to laboratory personnel authorized to conduct the required analyses. Laboratory analytical personnel are responsible for the care and custody of the sample upon receipt.

At the completion of sample analysis, any unused portion of the sample, together with all identifying labels, will be returned to the custodian. The returned tagged sample will be retained in secure storage until the custodian receives permission to dispose of the sample. Sample disposal will occur only on the order of the laboratory project manager in consultation with EPA or SulTRAC or when it is certain that the information is no longer required or the samples have deteriorated. Likewise, laboratory records will be maintained until the information is no longer required and final disposition is ordered by the laboratory project manager in consultation with EPA or SulTRAC.

Sample Identification Procedures: Sample identification will be as described in Section 8.2 of the FSP. Each sample will also be assigned an identifying number by CLP FORMS II Lite software. Samples will be identified using in the field using a unique sample ID number. The identifier will have the following format:

Street – sequential number – yard/quadrant – depth – sample type

Sample identifiers will consist of the first three letters of street name (e.g., DRU for Drummond, 151 for 151st Street); a sequential number will follow (e.g., "001" for the first sample collected); a yard or quadrant designator (F for front yard facing street, B for back yard, and A, B, C, or D for quadrants); a depth designator ("0-6" for zero to 6 inches); and a suffix designating sample type ("D" for duplicate sample, "V" for vegetable garden, "F" for flower garden, "P" for play area sample, "R" for rinsate sample). For example, a sample collected from the 12- to 18-inch depth from a play area in the back yard at 4856 Drummond Street that is the 231st sample collected by the sample team would be designated as DRU231-B-12-18-P. A duplicate sample collected from 18 to 24 inch depth in quadrant C at Carrie Gosh school located at 455 E 148th Street that is the 119th sample collect by the sample team would be designated 148119-C-18-24-D.

When the laboratory receives a sample shipment, its LIMS will generate the in-house identification numbers in accordance with its sample receipt and chain-of-custody SOPs.

QAPP WORKSHEET #28
QC SAMPLES TABLE

(UFP QAPP Section 3.4)
Complete a separate worksheet for each sampling technique, analytical method/SOP, matrix, analytical group, and concentration level. If method/SOP QC acceptance limits exceed the measurement performance criteria, the data obtained may be unusable for making project decisions.

Matrix	Soil/Solid
Analytical Group	VOA/CLP
Concentration Level	Low concentration
Sampling SOP	S-1, S-3
Analytical Method/ SOP Reference	A-1
Sampler's Name/ Organization	Cheryl Gorman/ SulTRAC
Analytical Organization	CLP Laboratory
No. of Sampling Locations	See Worksheet #18

QC Sample	Frequency/ Number	CA	Person(s) Responsible for CA	DQI	Measurement Performance Criteria
Method Blank	1 per extraction batch of 20 samples maximum	If sufficient volume is available, extract and reanalyze samples in affected batch. If sufficient volume is not available, reanalyze affected extracts.	Laboratory Analyst	Accuracy/Bias Contamination	No target compounds > QL
MS/MSD	1 per extraction batch of 20 samples maximum	If sufficient volume is available, extract and reanalyze samples in affected batch. Otherwise, analyze laboratory control sample to see if problem is analysis or sample.	Laboratory Analyst	Accuracy and Precision	%R and RPD as presented in Worksheet #12

Deuterated Monitoring Compounds	All samples	Reanalyze sample. If upon reanalysis, the monitoring compound meets criteria, report reanalysis results. If upon reanalysis, the monitoring compound does not meet criteria, the results are reported in the narrative.	Laboratory Analyst	Accuracy	%R as presented Worksheet #12

QAPP WORKSHEET #28 (CONTINUED)
QC SAMPLES TABLE

Matrix	Soil/Solid[1]
Analytical Group	SVOA/CLP
Concentration Level	Low concentration
Sampling SOP	S-1, S-3
Analytical Method/ SOP Reference	A-1
Sampler's Name/ Organization	Cheryl Gorman/ SulTRAC
Analytical Organization	CLP Laboratory
No. of Sampling Locations	See Worksheet #18

QC Sample	Frequency/ Number	CA	Person(s) Responsible for CA	DQI	Measurement Performance Criteria
Method Blank	1 per extraction batch of 20 samples maximum	If sufficient volume is available, extract and reanalyze samples in affected batch. If sufficient volume is not available, reanalyze affected extracts.	Laboratory Analyst	Accuracy/Bias-Contamination	No target compounds > QL
MS/MSD	1 per extraction batch of 20 samples maximum	If sufficient volume is available, extract and reanalyze samples in affected batch. Otherwise, analyze laboratory control sample to see if problem is analysis or sample.	Laboratory Analyst	Accuracy and Precision	%R and RPD as presented in Worksheet #12
Deuterated monitoring compounds	All samples	Reanalyze sample. If upon reanalysis, the monitoring compound meets criteria, report reanalysis results. If upon reanalysis, the monitoring compound does not meet criteria, results are reported in narrative.	Laboratory Analyst	Accuracy	%R as presented in Worksheet #12

QAPP WORKSHEET #28 (CONTINUED)
QC SAMPLES TABLE

Matrix	Soil/Solid
Analytical Group	PCBs/CLP
Concentration Level	Not applicable
Sampling SOP	S-1, S-3
Analytical Method/ SOP Reference	A-1
Sampler's Name/ Organization	Cheryl Gorman/SulTRAC
Analytical Organization	CLP Laboratory
No. of Sampling Locations	See Worksheet #18

QC Sample	Frequency/ Number	CA	Person(s) Responsible for CA	DQI	Measurement Performance Criteria
Method Blank	1 per extraction batch of 20 samples maximum	If sufficient volume is available, extract and reanalyze samples in affected batch. If sufficient volume is not available, reanalyze affected extracts.	Laboratory Analyst	Accuracy/Bias-Contamination	No target compounds > QL
MS/MSD	1 per extraction batch of 20 samples maximum	If sufficient volume is available, extract and reanalyze samples in affected batch. Otherwise, analyze laboratory control sample to see if problem is analysis or sample.	Laboratory Analyst	Accuracy and Precision	%R and RPD as presented in Worksheet #12
Surrogate Spike	All samples	Reanalyze sample. If upon reanalysis, the surrogate meets criteria, report reanalysis results. If upon reanalysis, the surrogate does not meet criteria, the results are reported in the narrative.	Laboratory Analyst	Accuracy	30-150 %R

QAPP WORKSHEET #28 (CONTINUED)
QC SAMPLES TABLE

Matrix	Soil/Solid
Analytical Group	Pesticides/CLP
Concentration Level	Not applicable
Sampling SOP	S-1, S-3
Analytical Method/ SOP Reference	A-1
Sampler's Name/ Organization	Cheryl Gorman/ SulTRAC
Analytical Organization	CLP Laboratory
No. of Sampling Locations	See Worksheet #18

QC Sample	Frequency/ Number	CA	Person(s) Responsible for CA	DQI	Measurement Performance Criteria
Method Blank	1 per extraction batch of 20 samples maximum	If sufficient volume is available, extract and reanalyze samples in affected batch. If sufficient volume is not available, reanalyze affected extracts.	Laboratory Analyst	Accuracy/Bias-Contamination	No target compounds > QL
MS/MSD	1 per extraction batch of 20 samples maximum	If sufficient volume is available, extract and reanalyze samples in affected batch. Otherwise, analyze laboratory control sample to see if problem is analysis or sample.	Laboratory Analyst	Accuracy and Precision	%R and RPD as presented in Worksheet #12
Surrogates	All samples	Reanalyze sample. If upon reanalysis, the surrogate meets criteria, report reanalysis results. If upon reanalysis, the surrogate does not meet criteria, the results are reported in the narrative.	Laboratory Analyst	Accuracy	30-150 %R

QAPP WORKSHEET #28 (CONTINUED)
QC SAMPLES TABLE

Matrix	Soil/Solid
Analytical Group	TAL Metals
Concentration Level	Multi-concentration
Sampling SOP	S-1, S-3
Analytical Method/ SOP Reference	A-2
Sampler's Name/ Organization	Cheryl Gorman/ SulTRAC
Analytical Organization	CLP Laboratory
No. of Sampling Locations	See Worksheet #18

QC Sample	Frequency/ Number	CA	Person(s) Responsible for CA	DQI	Measurement Performance Criteria
Method Blank	1 per extraction batch of 20 samples maximum	If sufficient volume is available, extract and reanalyze samples in affected batch. If sufficient volume is not available, reanalyze affected extracts.	Laboratory Analyst	Sensitivity/ Contamination	No target compounds > QL
MS	1 per extraction batch of 20 samples maximum	If sufficient volume is available, extract and reanalyze samples in affected batch. Otherwise, analyze laboratory control sample to see if problem is analysis or sample.	Laboratory Analyst	Accuracy/Bias	75-125 %R
Laboratory Duplicate	1 per extraction batch of 20 samples maximum	If sufficient volume is available, extract and reanalyze samples in affected batch. Otherwise, analyze laboratory control sample to see if problem is analysis or sample.	Laboratory Analyst	Precision	<20% RPD

QAPP WORKSHEET #28 (CONTINUED)
QC SAMPLES TABLE

Matrix	Water
Analytical Group	VOA/CLP
Concentration Level	Low concentration
Sampling SOP	S-3
Analytical Method/ SOP Reference	A-1
Sampler's Name/ Organization	Cheryl Gorman/ SulTRAC
Analytical Organization	CLP Laboratory
No. of Sampling Locations	See Worksheet #18

QC Sample	**Frequency/ Number**	**CA**	**Person(s) Responsible for CA**	**DQI**	**Measurement Performance Criteria**
Method Blank	1 per extraction batch samples maximum	If sufficient volume is available, extract and reanalyze samples in affected batch. If sufficient volume is not available, reanalyze affected extracts.	Laboratory Analyst	Accuracy/Bias Contamination	No target compounds > QL_1
MS/MSD	1 per extraction batch samples maximum	If sufficient volume is available, extract and reanalyze samples in affected batch. Otherwise, analyze laboratory control sample to see if problem is analysis or sample.	Laboratory Analyst	Accuracy and Precision	%R and RPD as presented in Worksheet #12
Deuterated Monitoring Compounds	All samples	Reanalyze sample. If upon reanalysis, the monitoring compound meets criteria, report reanalysis results. If upon reanalysis, the monitoring compound does not meet criteria, the results are reported in the narrative.	Laboratory Analyst	Accuracy	%R as presented in Worksheet #12

QAPP WORKSHEET #28 (CONTINUED)
QC SAMPLES TABLE

Matrix	Water
Analytical Group	SVOA/CLP
Concentration Level	Low concentration
Sampling SOP	S-3
Analytical Method/ SOP Reference	A-1
Sampler's Name/ Organization	Cheryl Gorman/ SulTRAC
Analytical Organization	CLP Laboratory
No. of Sampling Locations	See Worksheet #18

QC Sample	Frequency/ Number	CA	Person(s) Responsible for CA	DQI	Measurement Performance Criteria
Method Blank	1 per extraction batch samples maximum	If sufficient volume is available, extract and reanalyze samples in affected batch. If sufficient volume is not available, reanalyze affected extracts.	Laboratory Analyst	Accuracy/Bias-Contamination	No target compounds > QL
MS/MSD	1 per extraction batch of 20 samples maximum	If sufficient volume is available, extract and reanalyze samples in affected batch. Otherwise, analyze laboratory control sample to see if problem is analysis or sample.	Laboratory Analyst	Accuracy and Precision	%R and RPD as presented in Worksheet #12
Deuterated monitoring compounds	All samples	Reanalyze sample. If upon reanalysis, the monitoring compound meets criteria, report reanalysis results. If upon reanalysis, the monitoring compound does not meet criteria, the results are reported in the narrative.	Laboratory Analyst	Accuracy	%R as presented in Worksheet #12

QAPP WORKSHEET #28 (CONTINUED)
QC SAMPLES TABLE

Matrix	Water
Analytical Group	PCBs/CLP
Concentration Level	Not applicable
Sampling SOP	S-3
Analytical Method/ SOP Reference	A-1
Sampler's Name/ Organization	Cheryl Gorman/ SulTRAC
Analytical Organization	CLP Laboratory
No. of Sampling Locations	See Worksheet #18

QC Sample	Frequency/ Number	CA	Person(s) Responsible for CA	DQI	Measurement Performance Criteria
Method Blank	1 per extraction batch of 20 samples maximum	If sufficient volume is available, extract and reanalyze samples in affected batch. If sufficient volume is not available, reanalyze affected extracts.	Laboratory Analyst	Accuracy/Bias-Contamination	No target compounds > QL
MS/MSD	1 per extraction batch of 20 samples maximum	If sufficient volume is available, extract and reanalyze samples in affected batch. Otherwise, analyze laboratory control sample to see if problem is analysis or sample.	Laboratory Analyst	Accuracy and Precision	%R and RPD as presented in Worksheet #12
Surrogate Spike	All samples	Reanalyze sample. If upon reanalysis, the surrogate meets criteria, report reanalysis results. If upon reanalysis, the surrogate does not meet criteria, the results are reported in the narrative.	Laboratory Analyst	Accuracy	30-150 %R

QAPP WORKSHEET #28 (CONTINUED)
QC SAMPLES TABLE

Matrix	Water
Analytical Group	Pesticides/CLP
Concentration Level	Not applicable
Sampling SOP	S-3
Analytical Method/ SOP Reference	A-1
Sampler's Name/ Organization	Cheryl Gorman/ SulTRAC
Analytical Organization	CLP Laboratory
No. of Sampling Locations	See Worksheet #18

QC Sample	Frequency/ Number	CA	Person(s) Responsible for CA	DQI	Measurement Performance Criteria
Method Blank	1 per extraction batch samples maximum	If sufficient volume is available, extract and reanalyze samples in affected batch. If sufficient volume is not available, reanalyze affected extracts.	Laboratory Analyst	Accuracy/Bias-Contamination	No target compounds > QL
MS/MSD	1 per extraction batch of 20 samples maximum	If sufficient volume is available, extract and reanalyze samples in affected batch. Otherwise, analyze laboratory control sample to see if problem is analysis or sample.	Laboratory Analyst	Accuracy and Precision	%R and RPD as presented in Worksheet #12
Surrogate spike	All samples	Reanalyze sample. If upon reanalysis, the surrogate meets criteria, report reanalysis results. If upon reanalysis, the surrogate does not meet criteria, the results are reported in the narrative.	Laboratory Analyst	Accuracy	30-150 %R

QAPP WORKSHEET #28 (CONTINUED)
QC SAMPLES TABLE

Matrix	Water
Analytical Group	TAL Metals/CLP
Concentration Level	Multi-concentration
Sampling SOP	S-3
Analytical Method/ SOP Reference	A-2
Sampler's Name/ Organization	Cheryl Gorman/ SulTRAC
Analytical Organization	CLP Laboratory
No. of Sampling Locations	See Worksheet #18

QC Sample	Frequency/ Number	CA	Person(s) Responsible for CA	DQI	Measurement Performance Criteria
Method Blank	1 per extraction batch samples maximum	If sufficient volume is available, extract and reanalyze samples in affected batch. If sufficient volume is not available, reanalyze affected extracts.	Laboratory Analyst	Accuracy/Bias-Contamination	No target compounds > QL
MS	1 per extraction batch of 20 samples maximum	If sufficient volume is available, extract and reanalyze samples in affected batch. Otherwise, analyze laboratory control sample to see if problem is analysis or sample.	Laboratory Analyst	Accuracy/Bias	75-125 %R
Laboratory duplicate	1 per extraction batch of 20 samples maximum	If sufficient volume is available, extract and reanalyze samples in affected batch. Otherwise, analyze laboratory control sample to see if problem is analysis or sample.	Laboratory Analyst	Precision	<20% RPD

QAPP WORKSHEET #29
PROJECT DOCUMENTS AND RECORDS TABLE

(UFP QAPP Section 3.5.1)
Identify the documents and records that will be generated for all aspects of the project including, but not limited to, sample collection and field measurement, on-site and off-site analysis, and data assessment. Identify where each document will be maintained.

Document	**Where Maintained**
Field notes/logbook	Project file (field data), SulTRAC offices
Chain of custody forms	Project file (laboratory data), SulTRAC offices
Laboratory raw data package	EPA for CLP laboratory data; project file (laboratory data)
Laboratory equipment calibration logs	EPA for CLP laboratory
Validated data	Project file (laboratory data), SulTRAC offices

QAPP WORKSHEET #30
ANALYTICAL SERVICES TABLE

(UFP QAPP Section 3.5.2.3)
Identify all laboratories or organizations that will provide analytical services for the project, including on-site screening, on-site definitive, and off-site laboratory analytical work. Group by matrix, analytical group, concentration, and sample location or ID number. If applicable, identify the subcontractor laboratories and backup laboratory or organization that will be used if the primary laboratory or organization cannot be used.

Matrix	Analytical Group	Concentration Level	Sampling Location/ ID Number	Analytical SOP	Data Package Turnaround Time	Laboratory/Organization (Name and Address, Contact Person, and Telephone Number)	Backup Laboratory/Organization (Name and Address, Contact Person and Telephone Number)
Soil/Solid[1]	VOA	Low concentration	Sample identifiers will consist of the first three letters of street name (e.g., 151 for 151st Street, DRU for Drummond); a sequential number will follow (e.g., "001" for the first sample collected); a yard or quadrant designator (F for front yard facing street; B for back yard; A, B, C, or D for quadrants); a depth designator ("0-6" for zero to 6 inches); and a suffix designating sample type ("D" for duplicate sample, "V" for vegetable garden, "F" for flower garden, "P" for play area sample).	A-1	21 days	CLP laboratory identified by EPA Region 5	CLP laboratory identified by EPA Region 5
	SVOA	Low concentration		A-1	21 days		
	PCBs	N/A		A-1	21 days		
	Pesticides	N/A		A-1	21 days		
	TAL Metals	Multi-concentration		A-2	21 days		

Water	VOA TAL Metals	Low concentration Multi-concentration	Sample identifiers will consist of the first three letters of street name (e.g., 151 for 151st Street, DRU for Drummond); a sequential number will follow (e.g., "001" for the first sample collected); a yard or quadrant designator (F for front yard facing street, B for back yard; A, B, C, or D for quadrants); a depth designator ("0-6" for zero to 6 inches); and a suffix R designating Rinsate sample.	A-1 A-2	21 days 21 days	CLP Laboratory identified by EPA Region 5	CLP Laboratory identified by EPA Region 5

QAPP WORKSHEET #31
PLANNED PROJECT ASSESSMENTS TABLE

(UFP QAPP Section 4.1.1)
Identify the type, frequency, and responsible parties of planned assessment activities that will be performed for the project.

Assessment Type	Frequency	Internal or External	Organization Performing Assessment	Person(s) Responsible for Performing Assessment (Title and Organization)	Person(s) Responsible for Responding to Assessment Findings (Title and Organization)	Person(s) Responsible for Identifying and Implementing CAs (Title and Organization)	Person(s) Responsible for Monitoring Effectiveness of CAs (Title and Organization)
No assessments are planned	NA	NA	NA	NA	NA	NA	NA

Note: No assessments are planned for this project.

QAPP WORKSHEET #32
ASSESSMENT FINDINGS AND CORRECTIVE ACTION RESPONSES

(UFP QAPP Section 4.1.2)
For each type of assessment, describe procedures for handling QAPP and project deviations encountered during the planned project assessments.

Assessment Type	Nature of Deficiencies Documentation	Individual(s) Notified of Findings (Name, Title, Organization)	Timeframe of Notification	Nature of CA Response Documentation	Individual(s) Receiving CA Response (Name, Title, Organization)	Timeframe for Response
No assessments are planned	NA	NA	NA	NA	NA	NA

Note: No assessments are planned for this project.

QAPP WORKSHEET #33
QA MANAGEMENT REPORTS TABLE

(UFP QAPP Section 4.2)
Identify the frequency and type of planned QA Management Reports, the project delivery dates, the personnel responsible for report preparation, and the report recipients.

Type of Report	Frequency (daily, weekly, monthly, quarterly, annually, etc.)	Projected Delivery Date(s)	Person(s) Responsible for Report Preparation (Name, Title, Organization)	Report Recipient(s) (Title and Organization)
Phase 1: Technical Memorandum	Once for field sampling Phase 1	45 days after receipt of Phase 1 validated analytical results from laboratory	Rik Lantz, SulTRAC, Project Manager	Michael Berkoff WAM, EPA Region 5

QAPP WORKSHEET #34
VERIFICATION (STEP I) PROCESS TABLE

(UFP QAPP Section 5.2.1)
Describe the processes that will be followed to verify project data. Describe how each item will be verified, when the activity will occur, and what documentation is necessary, and identify the person responsible. *Internal* or *external* is in relation to the data generator.

Verification Input	**Description**	**Internal/ External**	**Responsible for Verification (Name, Organization)**
Chain-of-custody forms	Chain-of-custody forms will be reviewed internally upon their completion and verified against the packed sample coolers they represent. The shipper's signature on the chain-of-custody form should be initialed by the reviewer, a copy of the chain-of-custody form should be retained in the project file, and the original and remaining copies should be taped inside the cooler for shipment.	Internal	Cheryl Gorman, SulTRAC
Field notes/ logbook	Field notes will be reviewed internally and placed in the project file. A copy of the field notes will be attached to the final report.	Internal	Rik Lantz, SulTRAC
Laboratory data	All laboratory data packages will be verified internally by the laboratory performing the work for completeness and technical accuracy prior to submittal. All received data packages will be verified externally in accordance with the data validation procedures specified in Worksheet #35.	Internal External	CLP Laboratory Tiffany Angus, SulTRAC

QAPP WORKSHEET #35
VALIDATION (STEPS IIA AND IIB) PROCESS TABLE

(UFP QAPP Section 5.2.2)
Describe the processes that will be followed to validate project data. Validation inputs include items such as those listed in Table 9 of the UFP-QAPP Manual (Section 5.1). Describe how each item will be validated, when the activity will occur, what documentation is necessary, and identify the person responsible. Differentiate between steps IIa and IIb of validation.

Step IIa/IIb	Validation Input	Description	Responsible for Validation (Name, Organization)[1]
IIa	Chain of custody	Examine traceability of samples from sample collection to sample analysis	EPA (CADRE), Analytical Coordinator, SulTRAC
IIa	Holding time	Confirm that holding time requirements are met	EPA (CADRE), Chemist, SulTRAC
IIa	Instrument calibration	Confirm that instrument calibration requirements are met	EPA (CADRE), Chemist, SulTRAC
IIa	Analytical method	Confirm that analytical methods specified in QAPP have been used for sample analysis	EPA (CADRE), Chemist, SulTRAC
IIb	Performance criteria	Confirm that QC samples meet specified performance criteria; document any deviations in data evaluation summary report	EPA (CADRE), Chemist, SulTRAC

Note:

1 EPA is responsible for conducting computer-aided data review and evaluation (CADRE) of analytical data generated by the CLP laboratory. EPA review will be conducted in accordance with CLP National Functional Guidelines (NFG) for data validation. EPA will provide SulTRAC with a summary data review report.

QAPP WORKSHEET #36
VALIDATION (STEPS IIA AND IIB) SUMMARY TABLE

(UFP QAPP Section 5.2.2)
Identify the matrices, analytical groups, and concentration levels that each entity performing validation will be responsible for, as well as criteria that will be used to validate those data.

Step IIa/IIb	Matrix	Analytical Group	Concentration Level	Validation Criteria	Data Validator (Title and Organization)[1]
IIa	Soil, Rinsate	VOCs	Low	CADRE criteria and NFG	CADRE validation (EPA) and review of case narrative by SulTRAC
IIa	Soil, Rinsate	SVOCs	Low	CADRE criteria and NFG	CADRE validation (EPA) and review of case narrative by SulTRAC
IIa	Soil, Rinsate	PCBs	Not applicable	CADRE criteria and NFG	CADRE validation (EPA) and review of case narrative by SulTRAC
IIa	Soil, Rinsate	Pesticides	Not applicable	CADRE criteria and NFG	CADRE validation (EPA) and review of case narrative by SulTRAC
IIa	Soil, Rinsate	TAL Metals	Multi	CADRE criteria and NFG	CADRE validation (EPA) and review of case narrative by SulTRAC

Note:

[1] EPA is responsible for conducting computer-aided data review and evaluation (CADRE) of analytical data generated by the CLP laboratories. EPA review will be conducted in accordance with CLP National Functional Guidelines (NFG) for data validation. EPA will provide SulTRAC with a summary data review report. The SulTRAC analytical coordinator will review this report to verify that project-specific QC criteria have been met.

QAPP WORKSHEET #37
USABILITY ASSESSMENT

(UFP QAPP Section 5.2.3)
Describe the procedures/methods/activities that will be used to determine whether data are of the right type, quality, and quantity to support environmental decision-making for the project. Describe how data quality issues will be addressed and how limitations on the use of the data will be handled.

Summarize the usability assessment process and all procedures, including interim steps and any statistics, equations, and computer algorithms that will be used: A team of SulTRAC personnel will perform the data usability assessment. SulTRAC's project manager will be responsible for information in the usability assessment. The project manager will also be responsible for assigning task work to the individual task members who will be supporting the data usability assessment. Note that the data usability assessment will be conducted on validated data. The results of the data usability assessment will be presented in the final project report.

Precision – Results of laboratory duplicates will be presented separately in tabular format. For each duplicate pair, the RPD will be calculated for each analyte whose original and duplicate values are both greater than or equal to the QL. The RPDs will be checked against the measurement performance criteria presented in Worksheet #12. The RPDs exceeding criteria will be identified in the tables. Additionally, the RPD of each analyte will be averaged across all duplicate pairs whose original and duplicate values are both greater than or equal to the QL, and the combined overall average RPD for each analysis will be calculated for the laboratory duplicates. A discussion will follow summarizing the laboratory precision results. Any conclusions about the precision of the analyses will be drawn, and any limitations on the use of the data will be described.

Accuracy/Bias – Results for laboratory method blanks and instrument blanks will be presented separately in tabular format for each analysis. The results for each analyte will be checked against the measurement performance criteria presented in Worksheet #12. Results for analytes that exceed criteria will be identified in the tables. A discussion will follow summarizing the laboratory accuracy/bias results. Any conclusions about the accuracy/bias of the analyses based on blank contamination will be drawn, and any limitations on the use of the data will be described.

Overall Accuracy/Bias – The results will be presented in tabular format to allow comparison of these results to the sample batch they apply to. These results will be compared to the requirements listed in Worksheet #12. A discussion will follow summarizing overall accuracy/bias results. Any conclusions about the overall accuracy/bias of the analyses will be drawn, and any limitations on the use of the data will be described.

Sensitivity – Results for all laboratory-fortified blanks will be presented separately in tabular format for each analysis. The results for each analyte will be checked against the measurement performance criteria presented in Worksheet #12 and cross-checked against the QLs presented in Worksheet #15. Results for analytes that exceed criteria will be identified on the tables. A discussion will follow summarizing the laboratory sensitivity results. Any conclusions about the sensitivity of the analyses will be drawn, and any limitations on the use of the data will be described.

Representativeness – The large numbers of samples collected are considered representative of site conditions, as long as completeness

criteria in Worksheet #12 are met. **Comparability** – The results of this study will be used as a benchmark for determining comparability for data collected during any potential future sampling events using the same or similar sampling and analytical SOPs. **Completeness** – A completeness check will be performed on all data generated by the laboratory. Completeness criteria are presented in Worksheet #12. Completeness will be calculated for each analyte as follows. For each analyte, completeness will be calculated as the number of data points for each analyte and individual matrix that meet the measurement performance criteria for precision, accuracy/bias, and sensitivity, divided by the total number of data points for each analyte. A discussion will follow summarizing the calculation of data completeness. Any conclusions about the completeness of the data for each analyte will be drawn, and any limitations on the use of the data will be described.
Describe the evaluative procedures used to assess overall measurement error associated with the project: NA
Identify the personnel responsible for performing the usability assessment: SulTRAC's analytical coordinator will review analytical data and the CADRE data review report to assess usability of the data. SulTRAC's project manager will review RPDs for samples and assess the overall usability of the data set in close consultation with the EPA WAM.
Describe the documentation that will be generated during usability assessment and how usability assessment results will be presented so that they identify trends, relationships (correlations), and anomalies: The usability assessment will be documented in the data validation letter report, which will be generated 45 days after Phase 1 analytical results are received from the CLP laboratory.

REFERENCES

SulTRAC. 2009. Work Plan for Remedial Investigation/Feasibility Study, USS Lead Company, Lake County, Indiana. August.

STN Environmental JV, a joint venture between Sullivan International Group, Inc. and TN & Associates. 2007. Draft Site Assessment Letter Report, USS Lead Site November.

Technical Review Workgroup for Lead (TRW). 2000. TRW Recommendations for Sampling and Analysis of Soil at Lead (Pb) Sites. August.

U.S. Environmental Protection Agency (EPA). 2002. EPA Guidance for Quality Assurance Project Plans. EPA QA/G-5. December.

EPA. 2003a. Superfund Lead-Contaminated Residential Sites Handbook. OSWER 9285.7-50. August.

EPA. 2003b. Final Report on X-Ray Fluorescence Field Study of Selected Properties in Vicinity of Former USS Lead Refinery Facility, East Chicago, Indiana. November.

EPA. 2004. Draft Characterization of Lead and Other Metals in Soil in the Vicinity of the USS Lead Site, East Chicago, Indiana. April.

EPA. 2005a. Uniform Federal Policy for Implementing Environmental Quality Systems. March.

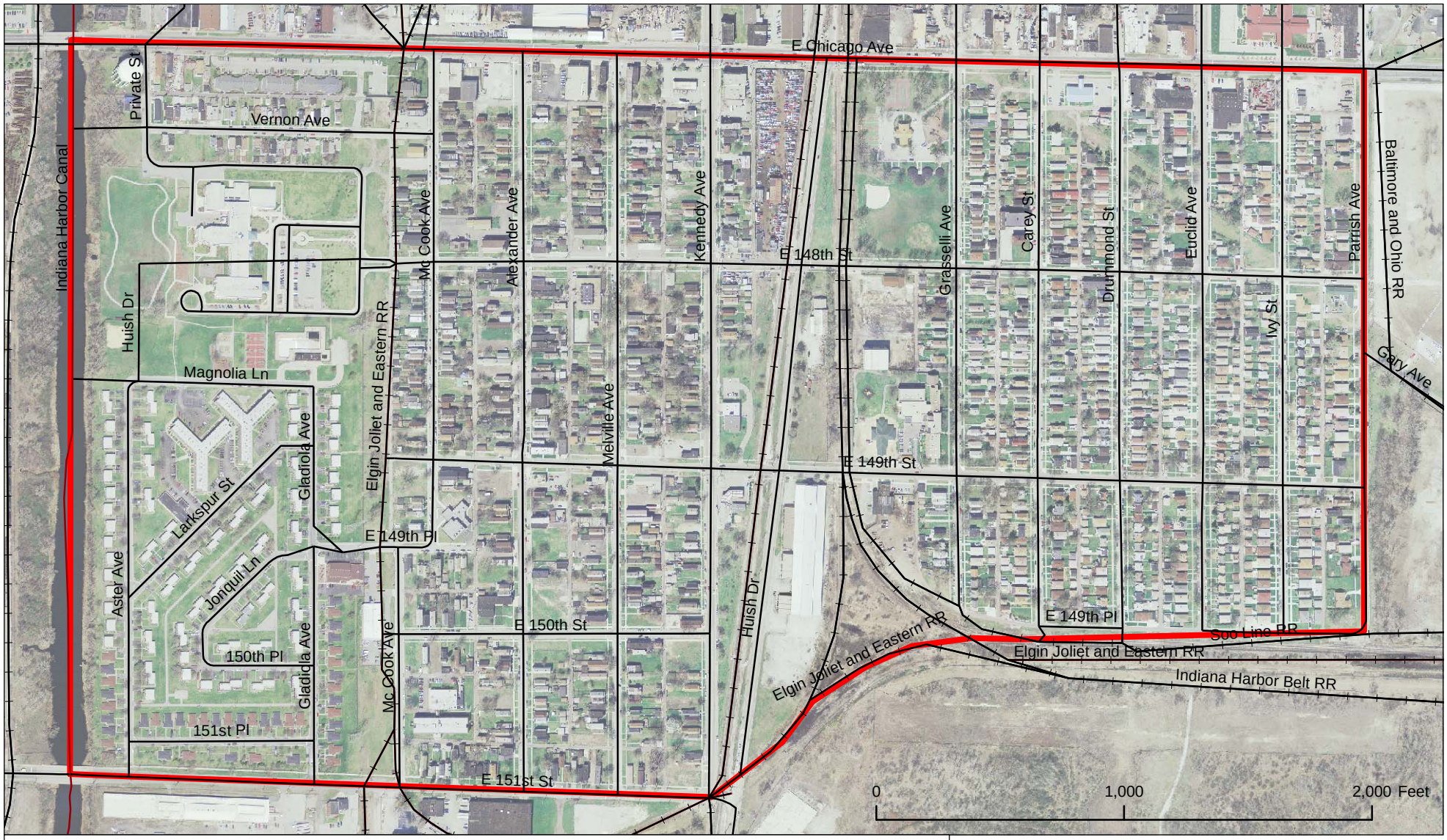
EPA. 2005b. Superfund Analytical Services/Contract Laboratory Program (CLP), Multi-Media, Multi-Concentration Organic Analysis SOM01.2." May. On-line Address: http://www.epa.gov/superfund/programs/clp/olm4.htm

EPA. 2007. Superfund Analytical Services/Contract Laboratory Program (CLP), Multi-Media, Multi-Concentration Inorganic Analysis ILM05.3/ILM05.4. March. On-line Address: http://www.epa.gov/superfund/programs/clp/olm4.htm

EPA. 2009. RAC II Region 5 Statement of Work for Remedial Investigation/Feasibility Study (RI/FS), USS Lead Superfund Site, Lake County, Indiana. June 19.

FIGURE

(One Page)



Legend

Roads

Railroads

Site boundary

Imagery source:
ISDP (Indiana Spatial Data Portal)

N

US SMELTER & LEAD REFINERY
LAKE COUNTY, EAST CHICAGO, INDIANA

QUALITY ASSURANCE PROJECT PLAN

FIGURE B-1

USS LEAD SITE LOCATION MAP

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SulTRAC