UNIFORM FEDERAL POLICY

GENERIC QUALITY ASSURANCE PROJECT PLAN

FOR CHEMICAL MEASUREMENTS

Submitted by
Weston Solutions, Inc., RST 2

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LIST OF ACRONYMS

ADR Automated Data Review
ANSETS Analytical Services Tracking System
AOC Acknowledgment of Completion
ASTM American Society for Testing and Materials
CEO Chief Executive Officer
CERCLA Comprehensive Environmental Response, Compensation, and Liability Act
CLP Contract Laboratory Program
CFM Contract Financial Manager
CO Contract Officer
COI Conflict of Interest
COO Chief Operations Officer
CRDL Contract Required Detection Limit
CRTL Core Response Team Leader
CRQL Contract Required Quantitation Limit
CQLOSS Corporate Quality Leadership and Operations Support Services
CWA Clean Water Act
DCN Document Control Number
DESA Division of Environmental Science and Assessment
DI Deionized Water
DPO Deputy Project Officer
DQI Data Quality Indicator
DQO Data Quality Objective
EM Equipment Manager
EDD Electronic Data deliverable
ENVL Environmental Unit Leader
EPA Environmental Protection Agency
ERT Environmental Response Team
FASTAC Field and Analytical Services Teaming Advisory Committee
GC/ECD Gas Chromatography/Electron Capture Detector
GC/MS Gas Chromatography/Mass Spectrometry
HASP Health and Safety Plan
HRS Hazard Ranking System
HSO Health and Safety Officer
ITM Information Technology Manager
LEL Lower Explosive Limit
MSA Mine Safety Appliances
MS/MSD Matrix Spike/Matrix Spike Duplicate
NELAC National Environmental Laboratory Accreditation Conference
NELAP National Environmental Laboratory Accreditation Program
NIOSH National Institute for Occupational Safety and Health
NIST National Institute of Standards and Technology
OSC On-Scene Coordinator
OSHA Occupational Safety and Health Administration
OSWER Office of Solid Waste and Emergency Response

LIST OF ACRONYMS - Continued

PARCCS Precision, Accuracy, Representativeness, Completeness, Comparability, Sensitivity
PAH Polynuclear Aromatic Hydrocarbons
PCB Polychlorinated Biphenyls
PIO Public Information Officer
PM Program Manager
PO Project Officer
PRP Potentially Responsible Party
PT Proficiency Testing
QA Quality Assurance
QAL Quality Assurance Leader
QAPP Quality Assurance Project Plan
QMP Quality Management Plan
QA/QC Quality Assurance/Quality Control
QC Quality Control
RC Readiness Coordinator
RCRA Resource Conservation and Recovery Act
RPD Relative Percent Difference
RSCC Regional Sample Control Coordinator
RST Removal Support Team
SARA Superfund Amendments and Reauthorization Act
SEDD Staged Electronic Data Deliverable
SOP Standard Operating Practice
SOW Statement of Work
SPM Site Project Manager
START Superfund Technical Assessment and Response Team
STR Sampling Trip Report
TAL Target Analyte List
TCL Total Compound List
TDD Technical Direction Document
TDL Technical Direction Letter
TO Task Order
TQM Total Quality Management
TSCA Toxic Substances Control Act
UFP Uniform Federal Policy
VOA Volatile Organic Analysis

CROSSWALK

The following table provides a "cross-walk" between the QAPP elements outlined in the Uniform Federal Policy for Quality Assurance Project Plans (UFP-QAPP Manual), the necessary information, and the location of the information within the text document and corresponding QAPP Worksheet. Any QAPP elements and required information that are not applicable to the project are circled.

QAPP Element(s) and Corresponding Section(s) of UFP-QAPP Manual	Required Information	Crosswalk to QAPP Section	Crosswalk to QAPP Worksheet No.
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2.5 Project Planning/Problem Definition 2.5.1 Project Planning (Scoping) 2.5.2 Problem Definition, Site History, and Background	- Project Planning Session Documentation (including Data Needs tables) - Project Scoping Session Participants Sheet - Problem Definition, Site History, and Background - Site Maps (historical and present)	1	9 10

CROSSWALK

2.6 Project Quality Objectives and Measurement Performance Criteria 2.6.1 Development of Project Quality Objectives Using the Systematic Planning Process 2.6.2 Measurement Performance Criteria	- Site-Specific PQOs - Measurement Performance Criteria	3	11 12
2.7 Secondary Data Evaluation	- Sources of Secondary Data and Information - Secondary Data Criteria and Limitations	1 2	13
2.8 Project Overview and Schedule 2.8.1 Project Overview 2.8.2 Project Schedule	- Summary of Project Tasks - Reference Limits and Evaluation - Project Schedule/Timeline	4	14 15 16
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3.1 Sampling Tasks 3.1.1 Sampling Process Design and Rationale 3.1.2 Sampling Procedures and Requirements 3.1.2.1 Sampling Collection Procedures 3.1.2.2 Sample Containers, Volume, and Preservation 3.1.2.3 Equipment/Sample Containers Cleaning and Decontamination Procedures 3.1.2.4 Field Equipment Calibration, Maintenance, Testing, and Inspection Procedures 3.1.2.5 Supply Inspection and Acceptance Procedures 3.1.2.6 Field Documentation Procedures	- Sampling Design and Rationale - Sample Location Map - Sampling Locations and Methods/SOP Requirements - Analytical Methods/SOP Requirements - Field Quality Control Sample Summary - Sampling SOPs - Project Sampling SOP References - Field Equipment Calibration, Maintenance, Testing, and Inspection	5	17 18 19 20 21 22

CROSSWALK

3.2 Analytical Tasks 3.2.1 Analytical SOPs 3.2.2 Analytical Instrument Calibration Procedures 3.2.3 Analytical Instrument and Equipment Maintenance, Testing, and Inspection Procedures 3.2.4 Analytical Supply Inspection and Acceptance Procedures	- Analytical SOPs - Analytical SOP References - Analytical Instrument Calibration - Analytical Instrument and Equipment Maintenance, Testing, and Inspection	6	23 24 25
3.3 Sample Collection Documentation, Handling, Tracking, and Custody Procedures 3.3.1 Sample Collection Documentation 3.3.2 Sample Handling and Tracking System 3.3.3 Sample Custody	- Sample Collection Documentation Handling, Tracking, and Custody SOPs - Sample Container Identification - Sample Handling Flow Diagram - Example Chain-of-Custody Form and Seal	7	27 26
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CROSSWALK

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QAPP Worksheet #1: Title and Approval Page

Title: Organic and Inorganic Chemical Measurement –Generic Quality Assurance Project Plan
Site Name/Project Name: [ ]
Site Location: [ ]
Revision Number: [ ]
Revision Date: DD/MM/Year

[Name of Organization]

Lead Organization
e.g., [Contractor Project Manager's Name; or EPA Region 2 DESA Sampler Lead Name]
[Contractor Project Manager's phone #; or EPA Region2 DESA Sampler Lead phone #]
[Contractor Project Manager's e-mail; or EPA Region 2 DESA Sampler Lead e-mail]

Preparer's Name and Organizational Affiliation

Preparer's Address, Telephone Number, and E-mail Address
[Date]

Preparation Date (Day/Month/Year)

Environmental Unit Leader:

Signature

Printed Name/Organization/Date
Planning Section Chief:

Signature

Printed Name/Organization/Date
Operations Section Chief:

Signature

Printed Name/Organization/Date

Document Control Number: [ ]

QAPP Worksheet #2: QAPP Identifying Information

Site Name/Project Name: [ ]
Site Location: [ ]
Operable Unit: [ ]
Title: Quality Assurance Project Plan
Revision Number: [ ]
Revision Date: [ ]

1. Identify guidance used to prepare QAPP: Uniform Federal Policy for Quality Assurance Project Plans. Refer to CLP, SW 846, EPA, NIOSH and ASTM Methods

2. Identify regulatory program: [Insert EPA Region 2 , Appropriate Target Agency, and Emergency Response Authority]

3. Identify approval entity: EPA Region 2 or Incident Management Team (IMT)

4. Indicate whether the QAPP is a generic or a project-specific QAPP. (Generic QAPP)

5. List dates of scoping sessions that were held: DD/MM/YY

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

7. List organizational partners (stakeholders) and connection with lead organization: **e.g.,** NYSDEC, NYSDOH, NJDEP, DOE, FBI]

8. List data users:
EPA Region 2, Appropriate Target Agency, and Emergency Response Authority (see Worksheet #4 for individuals)

9. If any required QAPP elements and required information are not applicable to the project, then provide an explanation for their exclusion below:

- [Worksheet No. XX not applicable because…]. This worksheet will be completed in site-specific QAPP for each project. Project team members will complete all the required information and identify which Worksheets are not required for the current project.

10. Document Control Number:
[ ]

QAPP Worksheet #3: Distribution List

[List those entities to which copies of the approved QAPP, subsequent QAPP revisions, addenda, and amendments are sent]

QAPP Recipient	Title	Organization	Telephone Number	Fax Number	E-mail Address	Document Control Number
[Project Manager Name]	Contractor Project Manager; and EPA Region 2 Remedial Project Manager, Brownfields Project Manager or On-Scene Coordinator	Name of Organization	[ ]	[ ]	[Name]@e-mail address	[Repeat DCN throughout]
[QAO Name]	Contractor QA Officer; and EPA Region 2 QAO	Name of Organization	[ ]	[ ]	[Name]@e-mail address	
[Lead Sampler's Name]	Contractor Project Manager	Name of Organization	[ ]	[ ]	[Name]@e-mail address	
[ENVL Name]	Environmental Unit Leader	Name of Organization	[ ]	[ ]	[Name]@e-mail address	
	Operation Section Chief	Name of Organization	[ ]	[ ]	[Name]@e-mail address	

QAPP Worksheet #4: Project Personnel Sign-Off Sheet

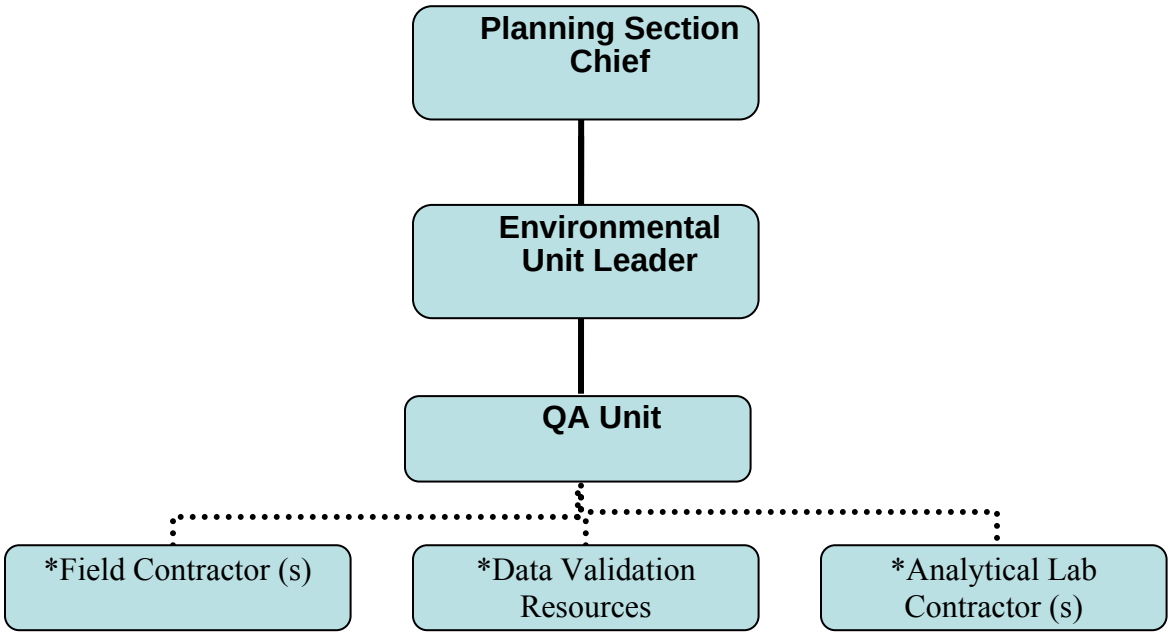
[Copies of this form signed by key project personnel from each organization to indicate that they have read the applicable sections of the QAPP and will perform the tasks as described; add additional sheets as required. Ask each organization to forward signed sheets to the central project file.]

Organization: Name of Organization

Project Personnel	Title	Telephone Number	Signature	Date QAPP Read
[Project Manager Name]	Contractor Project Manager; or EPA Region 2 Remedial Project Manager, Brwonfields Project Manager or On-Scene Coordinator	[ ]		
[QAO Name]	Contractor QAO EPA Region 2 QAO	[ ]		
[Lead Sampler's Name]	Contractor Project Manager	[ ]		
[Assistant Sampler]	Field Support	[ ]		
[Assistant Sampler]	Field Support	[ ]		
[If applicable]	Hydrogeologist	[ ]		
[If applicable]	Risk Assessor	[ ]		
[If applicable]	Environmental Unit Leader	[ ]		
[If applicable]	Operation Section Chief	[ ]		

QAPP Worksheet #5: Project Organizational Chart

Identify reporting relationship between all organizations involved in the project, including the lead organization and all contractor and subcontractor organizations. Identify the organizations providing field sampling, on-site and off-site analysis, and data review services, including the names and telephone numbers of all project managers, project team members, and/or project contacts for each organization.



*** Not part of the ICS- only provides ancillary suppor**

QAPP Worksheet #6: Communication Pathways

Communication Drivers	Responsible Entity	Name	Phone Number	Procedure (Timing, pathways, etc.)
Preparation of QAPP	Sampling and Monitoring Plan Coordinator			Preparing QAPP, approval of the QAPP from EPA OSC. All technical, QA and decision-making matters in regard to the project (written or electronic).
Approval of QAPP	Environmental Unit Leader/Quality Assurance Coordinator			Approval of the QAPP and all technical/ QA/QC changes to QAPP. Provide guidance as required.
Modification to Site QAPP due to field Changes.	Sampling and Monitoring Plan Coordinator			Modification to QAPP and all technical, QA/QC, changes to field work, and other issues related to site.
Health and Safety Plan and On-Site Field Inspection	Safety Officer			Assign site safety responsibility, characterize site hazards, established control zones, assess site-specific training requirements for responders, ensure safety briefings, establish decontamination stations, and emergency medical plan.
Data Review and Recommendation to stop work (due to H & S)	Data Assessment and Interpretation Coordinator			Develop and recommend measures for ensuring personnel safety, and assess and anticipate hazardous and unsafe situations. Notifies all environmental unit teams of any corrections to analytical data.
Procurement of Field Services	Assistant Environmental Unit Leader			Arrange for use of special equipment (e.g., GPS equipment, boats, and helicopters)
Procurement of Analytical Services	Analytical Coordinator/Contractor Organization PM			Soliciting and obtaining laboratories, resolve sampling and analysis problems, distributing preliminary and/or final data.

QAPP Worksheet #6: Communication Pathways

Communication Drivers	Responsible Entity	Name	Phone Number	Procedure (Timing, pathways, etc.)
Distribution of lab results to Analytical Coordinator	Laboratory Manager			Submit all analytical data, check for completeness and appropriate level of validation before submittal to Analytical Coordinator for QA review.
Data Assessment: QA Coordinator distribution of results to Environmental Unit Leader, Environmental Unit Leader distribution of results to IC and general staff	QA Coordinator and Environmental Unit Leader			Provide summary reports in coordination with the PIO, EPA Office of Research and Development (ORD) and other inquiries as approved by the IC. Summarize data for public health reports; work with headquarters and regional environmental units if established. Maintain daily, weekly, monthly and response activity logs.

QAPP Worksheet #7: Personnel Responsibilities and Qualifications Table

Name	Title	Organizational Affiliation	Responsibilities	Education and Experience Qualifications
	Environmental Unit Leader (ENVL)		Responsible for Environmental matters associated with the response, including strategic assessment, modeling, and environmental monitoring and permitting. Provide reports to PIO, EPA ORD, IC commander and other inquiries.	
	Assistant Environmental Unit Leader		Ensure that quality assurance is fully integrated into the entire response; Provide oversight of data assessment and interpretation; Establish procedures to ensure integration of sampling data and analytical results; and Arrange for use of special equipment.	
	Analytical Coordinator		Schedule all environmental sample analyses, utilize EPA and other federal, state, academic, and private laboratories as necessary. Maintain COCs throughout project; and receive all analytical data. Check for completeness, appropriate level of validation before submittal to the QA coordinator for QA review.	
	Quality Assurance Coordinator		Review and approve all QAPP and SOPs, advise Unit Leader, division/group supervisors and Incident Command on quality assurance issue and limitations on the use of their data; Resolve QA issues with outside laboratories and sampling team, Review data package as appropriate.	
	Sampling and Monitoring Plan Coordinator		Develop and review Sampling Plans for all phases of the Incident as requested by the IC and/or Operations Section Chief; Initial sampling procedures, Ensure sampling team are trained in use of SCRIBE.	

QAPP Worksheet #7: Personnel Responsibilities and Qualifications Table

Name	Title	Organizational Affiliation	Responsibilities	Education and Experience Qualifications
	Data Assessment and Interpretation Coordinator		Assemble assessment team with technical expertise appropriate to the project; Provide preliminary assessments of environmental data regarding implications to human health and the environment, consult with experts in other agencies and outside of government when appropriate and prepare data for internal use and public consumption.	
	Safety Officer		Responsible for the overall safety of the incident within the scope of the Incident Management Team (IMT). The safety officer's function is to develop and recommend measures for ensuring personnel safety, and to assess and anticipate hazardous and unsafe situations.	
	Laboratory Manager		Maintain an Information database on chemical parameters. Coordinate with other agencies and organizations (e.g., EPA NYSDOH, NJDEP, DOE, ORD, HHS/CDC/ATSDR)	

QAPP Worksheet #8: Special Personnel Training Requirements Table

Project Function	Specialized Training By Title or Description of Course	Training Provider	Training Date	Personnel / Groups Receiving Training	Personnel Titles / Organizational Affiliation	Location of Training Records / Certificates[1]
[Specify location of training records and certificates for samplers]						
QAPP Training	This training is presented to new OSCs to introduce the provisions, requirements, and responsibilities detailed in the UFP. The training presents the relationship between the site-specific QA Project Plans (QAPPs), SOPs, work plans, and the QAPP. QAPP refresher training will be presented to all employees following a major QAPP revision.	EPA Region 2 DESA	As needed	ALL OSCs upon initial employment and as refresher training	EPA Region 2	Within Division
Health and Safety Training	Health and safety training will be provided to ensure compliance with Occupational Safety and Health Administration (OSHA) as established in 29 CFR 1910.120.	Health and Safety Officer	Yearly at a minimum	ALL Employee upon initial employment and as refresher training every year	EPA Region 2	Within Division
Others	FORMS II Lite, Scribe, ICS 100 and 200, and Air Monitoring Equipment Trainings provided to all employees	EPA DESA – FORMS II Lite and EPA ERT – all other trainings	Upon initial employment and as needed			
	Dangerous Goods Shipping	JJ Keller Corporation	Every 3 years			

All team members are trained in the concepts and procedures in recognizing opportunities for continual improvement, and the approaches required to improve procedures while maintaining conformance with legal, technical, and contractual obligations.

[1]If training records and/or certificates are on file elsewhere; document their location in this column. If training records and/or certificates do not exist or are not available, then this should be noted.

QAPP Worksheet #9: Project Scoping Session Participants Sheet

Site Name/Project Name: [ ]
Site Location: [ ]
Operable Unit: [ ]
Date of Session: [ ]
Scoping Session Purpose: To discuss questions, comments and assumptions regarding technical issues involved with the project

Name	Title	Affiliation	Phone #	E-mail Address	*Project Role
[Name]	ENVL			[Name]@e-mail address	
	QA Coordinator			[Name]@e	
	Analytical Coordinator			[Name]@e	
	OSC	EPA Region 2		[Name]@e	

Comments/Decisions: _____

Action Items: _____

Consensus Decisions: _____

Note: This worksheet will be completed in the site specific QAPP for each project session held. Project team members will be identified who are responsible for planning the project.

* Refer to Worksheet #6 and #7

QAPP Worksheet #10: Problem Definition

PROBLEM DEFINITION

Purpose and Reason for this sampling event, QA objectives and goals. An organizational structure to implement the QA objectives, mechanisms to establish standards for performance, audit mechanisms to evaluate performance and corrective action mechanisms to address identified problems, documentation protocols to demonstrate a level of performance.

SITE HISTORY/CONDITIONS

SITE LOCATION

A generic QAPP will be used as a basis for all site-specific sampling plans. [Brief description of the site and sampling locations and how they were chosen] For example, "Residential drinking water wells in Edison have shown increasing level of Benzene".

PROJECT DESCRIPTION

The Environmental question being asked: For example, "What is the source of the Benzene contamination in the drinking water wells of Edison, NJ?

OBSERVATION FROM ANY SITE RECONNAISSANCE REPORT

Observe present site condition (e.g., evident soil staining and the presence of free product materials, odors, and other known hazards), physical evidence (e.g., metallic debris, drums, known safety hazards), transportation accident, existing reports (e.g., monitoring report, remedial investigation/.remedial action reports).

PROJECT DECISION STATEMENTS: for example,

1. If the mean perchloroethylene (PCE) concentration of each downgradient well is greater than the PCE concentration in an upgradient well, then further assessment and response is required; otherwise, no further evaluation is necessary.

2. If the level of benzene in residential soil is greater than 3.0ppm, then determine the additional remediation actions required to reduce the concentrations to comply with applicable and/or relevant and appropriate standards.

Note: This worksheet will be completed to define the problem and the environmental questions that should be answered for the current investigation and to develop the current project decision "If…., then…" statement(s) to be included in the site specific QAPP.

Refer to action level guidelines for: NY Remedial Program Soil Cleanup Objectives, Subpart 375-6
http://www.dec.ny.gov/regs/15507.html#15513

NJ Soil Cleanup Criteria http://www.nj.gov/dep/srp/guidance/scc/
National Primary Drinking Water Regulations National Primary Drinking Water Regulations

QAPP Worksheet # 11: Project Quality Objectives/Systematic Planning Process Statement

Overall project objectives include: This approach encourages optimal data usability across EPA program lines and reduces the need for repetitive sampling. The DQO approach includes defined steps, including: 1) stating the site problem (source/location of contamination); 2) identifying the decision (which may require additional data); 3) identifying the needed inputs for the decision (data needed for the decision); 4) defining the site boundaries (area and time- frame for study); 5) developing a decision rule (logical "if...then" statement); and 6) specifying limits on decision errors (acceptable error limits).

Who will use the data?
Data will be used by EPA Region 2 ERRD (RPM and/or OSC); Incident Commander, Environmental Unit Leader, and Technical Specialist, Public Information Officers, and/or other agencies.

What will the data be used for?
Explain the ultimate use of data: e.g., to determine potential risk to human health; contamination in drinking water from benzene exceeding regulatory limit; to determine the location of the leading edge of the contaminated plume

What types of data are needed?

Sampling type and matrix: Drinking water, soil/sediment, surface wipe, air, drum.
Definitive or Screening data
Analytical Techniques: Field screening, on-site and/or off-site laboratory analyses
Parameters: e.g., VOCs, PAH, TCE, TAL Metals
Type of sampling equipments: augar, spoons, sample jars
Access Agreement, if applicable:
Sampling locations: On-site/Off-site

How much data are needed?
The numbe of sample needed for each analytical group, matrix, and concentration level.

How "good" does the data need to be in order to support the environmental decision?
Establish project sampling/analytical measurement performance criteria for PARCC parameters. Refer to Worksheet#12, criteria for performance measurement for screening and definitive data.

Where, when, and how should the data be collected/generated?
Access agreement, if applicable; existing locations; the number of samples needed for each analytical group, matrix, and concentration level. Site map; refer to sampling SOPs for procedures on how samples will be collected.

Who will collect and generate the data?
e.g., Lead organization, IMT, Contractor organizations, and others

How will the data be reported?
The data will be reported by the field personnel and the assigned laboratory (Preliminary, Electronic, and Hardcopy format) and provided to environmental unit leader and IMT.

How will the data be archived?
Analytical Coordinator will archive Electronic data deliverables in database and ensure security and archival of all data.

Note: This worksheet will be completed to develop PQOs in term of type, quantity, and quality of data determined using a systematic planning process in the site-specific QAPP.

QAPP Worksheet #12: Measurement Performance Criteria Table
Worksheet # 12A: Volatile - Organics/TO-15

(UFP-QAPP Manual Section 2.6.2)

Complete this worksheet for each matrix, analytical group, and concentration level. Identify the data quality indicators (DQI), measurement performance criteria (MPC) 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 specific DQI vary within an analytical parameter, i.e., MPC are analyte-specific, then provide analyte-specific MPC on an additional worksheet.

Matrix	Gas
Analytical Group	Volatile Organics
Concentration Level	Low (ppbv)

Sampling Procedure[1]	Analytical Method/SOP[2]	Data Quality Indicators (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)
	TO-15	Precision (field)	± 25 % D*	Field Duplicate	S & A
		Accuracy (field)	No analyte > CRQL*	Field Blank	S & A
		Precision (laboratory)	± 25 % D*	Laboratory Replicate Sample	A
		Accuracy (laboratory)	70-130 %R*	Laboratory Audit Standard	A
		Accuracy (laboratory)	No analyte > CRQL*	Laboratory Method Blank	A

[1]Reference number from QAPP Worksheet #21.
[2]Reference number from QAPP Worksheet #23.
*Reference Compendium Method TO-15 Determination of Volatile Organic Compounds (VOCs) in Air Collected in Specially-Prepared Canisters and Analyzed by GC/MS, 2nd Edition, January 1999; http://www.epa.gov/ttnamti1/files/ambient/airtox/to-15r.pdf and Table 3 "Summary of Internal Quality Control Procedures for VOCs by EPA method TO-15, Revision 01/21/2000. http://www.epa.gov/region09/qa/pdfs/dqi/vocs_gc.pdf

QAPP Worksheet #12: Measurement Performance Criteria Table
Worksheet # 12B: Volatile - Organics/CLP SAV01.X

(UFP-QAPP Manual Section 2.6.2)

Complete this worksheet for each matrix, analytical group, and concentration level. Identify the data quality indicators (DQI), measurement performance criteria (MPC) 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 specific DQI vary within an analytical parameter, i.e., MPC are analyte-specific, then provide analyte-specific MPC on an additional worksheet.

Matrix	Gas
Analytical Group	Volatile Organics
Concentration Level	Low (ppv)

Sampling Procedure[1]	Analytical Method/SOP[2]	Data Quality Indicators (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)
	CLP SAV01.X	Precision (field)	≤ 25 % RPD*	Field Duplicate	S & A
		Accuracy (field)	No analyte > CRQL*	Field Blank	S & A
		Precision (laboratory)	± 25% RPD*	Laboratory Control Sample/CCV	A
		Accuracy (laboratory)	±30%R*	Laboratory Control Sample	A
		Accuracy (laboratory)	No analyte > ½ CRQL*	Method Blank	A

[1]Reference number from QAPP Worksheet #21.
[2]Reference number from QAPP Worksheet #23.
*Reference USEPA Contract Laboratory Program Statement of Work for Volatile Organic Analysis in Air, SAV01.X, Draft, February 2007: http://www.epa.gov/superfund/programs/clp/sav1.htm

QAPP Worksheet #12: Measurement Performance Criteria Table
Worksheet # 12C: Trace Volatile - Organics/CLP SOMO1.2

(UFP-QAPP Manual Section 2.6.2)
Complete this worksheet for each matrix, analytical group, and concentration level. Identify the data quality indicators (DQI), measurement performance criteria (MPC) 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 specific DQI vary within an analytical parameter, i.e., MPC are analyte-specific, then provide analyte-specific MPC on an additional worksheet.

Matrix	Aqueous
Analytical Group	TCL Volatile Organics
Concentration Level	Trace (ug/L)

Sampling Procedure[1]	Analytical Method/SOP[2]	Data Quality Indicators (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)
	SOM01.2	Precision (field)	Project-Specific %RPD	Field Duplicate	S & A
		Accuracy (field)	No analyte > CRQL*	Field Blank	S & A
		Precision (laboratory)	Project-Specific %RPD; List compound specific RPD	Field Duplcate; MS/MSD**	S & A
		Accuracy (laboratory)	List compound specific %R	***DMCs; MS/MSD**	A

[1]Reference number from QAPP Worksheet #21.
[2]Reference number from QAPP Worksheet #23.
*Reference USEPA Region 2 SOP No. 34/Trace VOA - Blank Type Criteria Table: http://www.epa.gov/region02/qa/qa_documents/SOP%20HWSS-34.pdf
****Optional** MS/MSD – Reference CLP SOM01.2, Exhibit D, Table 6 for Criteria:
***Deuterated Monitoring Compounds (DMCs) – Reference CLP SOM01.2, Exhibit D, Table 5 for Criteria: http://www.epa.gov/superfund/programs/clp/som1.htm

QAPP Worksheet #12: Measurement Performance Criteria Table
Worksheet # 12D: Volatile - Organics/CLP SOMO1.2

(UFP-QAPP Manual Section 2.6.2)
Complete this worksheet for each matrix, analytical group, and concentration level. Identify the data quality indicators (DQI), measurement performance criteria (MPC) 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 specific DQI vary within an analytical parameter, i.e., MPC are analyte-specific, then provide analyte-specific MPC on an additional worksheet.

Matrix	Aqueous
Analytical Group	TCL Volatile Organics
Concentration Level	Low/Medium (ug/L)

Sampling Procedure[1]	Analytical Method/SOP[2]	Data Quality Indicators (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)
	SOM01.2	Precision (field)	Project-Specific %RPD	Field Duplicate	S & A
		Accuracy (field)	No analyte > CRQL*	Field Blank	S & A
		Precision (laboratory)	Project-Specific %RPD; List compound specific RPD	Field Duplicate; MS/MSD**	S & A
		Accuracy (laboratory)	List compound specific %R	***DMCs; MS/MSD**	A

[1]Reference number from QAPP Worksheet #21.
[2]Reference number from QAPP Worksheet #23.
*Reference USEPA Region 2 SOP No. 33/Low/Medium VOA - Blank Type Criteria Table: http://www.epa.gov/region02/qa/qa_documents/SOP%20HWSS-33VOA.pdf
****Optional** MS/MSD – Reference CLP SOM01.2, Exhibit D, Table 6 for Criteria
*****Deuterated Monitoring Compounds (DMCs) – Reference CLP SOM01.2, Exhibit D, Table 5 for Criteria: http://www.epa.gov/superfund/programs/clp/som1.htm

QAPP Worksheet #12: Measurement Performance Criteria Table
Worksheet # 12E: Semivolatile - Organics/CLP SOMO1.2

(UFP-QAPP Manual Section 2.6.2)
Complete this worksheet for each matrix, analytical group, and concentration level. Identify the data quality indicators (DQI), measurement performance criteria (MPC) 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 specific DQI vary within an analytical parameter, i.e., MPC are analyte-specific, then provide analyte-specific MPC on an additional worksheet.

Matrix	Aqueous
Analytical Group	TCL Semivolatiles
Concentration Level	Low/Medium (ug/L)

Sampling Procedure[1]	Analytical Method/SOP[2]	Data Quality Indicators (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)
	SOM01.2	Precision (field)	Project-Specific %RPD	Field Duplicate	S & A
		Accuracy (field)	No analyte > CRQL*	Field Blank	S & A
		Precision (laboratory)	Project-Specific %RPD; List compound specific RPD	Field Duplicate; MS/MSD**	S & A
		Accuracy (laboratory)	List compound specific %R	***DMCs; MS/MSD**	A

[1]Reference number from QAPP Worksheet #21.
[2]Reference number from QAPP Worksheet #23.
*Reference USEPA Region 2 SOP No. 35/Low/Medium Semivolatile - Blank Type Criteria Table: http://www.epa.gov/region02/qa/qa_documents/SOP%20HWSS-35.pdf
****Optional** MS/MSD – Reference CLP SOM01.2, Exhibit D, Table 6 for Criteria
*****Deuterated Monitoring Compounds (DMCs) – Reference CLP SOM01.2, Exhibit D, Table 5 for Criteria: http://www.epa.gov/superfund/programs/clp/som1.htm

QAPP Worksheet #12: Measurement Performance Criteria Table
Worksheet # 12F: Pestcide - Organics/CLP SOMO1.2

(UFP-QAPP Manual Section 2.6.2)
Complete this worksheet for each matrix, analytical group, and concentration level. Identify the data quality indicators (DQI), measurement performance criteria (MPC) 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 specific DQI vary within an analytical parameter, i.e., MPC are analyte-specific, then provide analyte-specific MPC on an additional worksheet.

Matrix	Aqueous
Analytical Group	TCL Pesticides
Concentration Level	Low/Medium (ug/L)

Sampling Procedure[1]	Analytical Method/SOP[2]	Data Quality Indicators (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)
	SOM01.2	Precision (field)	Project-Specific %RPD	Field Duplicate	S & A
		Accuracy (field)	No analyte > CRQL*	Field Blank	S & A
		Precision (laboratory)	Project-Specific %RPD; List compound specific RPD	Field Duplicate; MS/MSD**	S & A; A
		Accuracy (laboratory)	List compound specific %R	***LCS; MS/MSD**	A

[1]Reference number from QAPP Worksheet #21.
[2]Reference number from QAPP Worksheet #23.
*Reference USEPA Region 2 SOP No. 36/Low/Medium Pesticide - Blank Type Criteria Table:
http://www.epa.gov/region02/qa/qa_documents/SOP%20HWSS-36.pdf
**MS/MSD – Reference CLP SOM01.2, Exhibit D, Table 3 for Criteria
***Laboratory Control Sample (LCS) – Reference CLP SOM01.2, Exhibit D, Table 2 for Criteria: http://www.epa.gov/superfund/programs/clp/som1.htm

QAPP Worksheet #12: Measurement Performance Criteria Table
Worksheet # 12G: PCBs - Organics/CLP SOMO1.2

(UFP-QAPP Manual Section 2.6.2)
Complete this worksheet for each matrix, analytical group, and concentration level. Identify the data quality indicators (DQI), measurement performance criteria (MPC) 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 specific DQI vary within an analytical parameter, i.e., MPC are analyte-specific, then provide analyte-specific MPC on an additional worksheet.

Matrix	Aqueous
Analytical Group	TCL Aroclors (PCBs)
Concentration Level	Low/Medium (ug/L)

Sampling Procedure[1]	Analytical Method/SOP[2]	Data Quality Indicators (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)
	SOM01.2	Precision (field)	Project-Specific %RPD	Field Duplicate	S & A
		Accuracy (field)	No analyte > CRQL*	Field Blank	S & A
		Precision (laboratory)	Project-Specific %RPD; List compound specific RPD	Field Duplicate; MS/MSD**	S & A
		Accuracy (laboratory)	List compound specific %R	***LCS; MS/MSD**	A

[1]Reference number from QAPP Worksheet #21.
[2]Reference number from QAPP Worksheet #23.
*Reference USEPA Region 2 SOP No. 37/Low/Medium Aroclor - Blank Type Criteria Table: http://www.epa.gov/region02/qa/qa_documents/SOP%20HWSS-37.pdf
**MS/MSD – Reference CLP SOM01.2, Exhibit D, Table 1 for Criteria
***Laboratory Control Sample (LCS) – Reference CLP SOM01.2, Exhibit D, Table 2 for Criteria: http://www.epa.gov/superfund/programs/clp/som1.htm

QAPP Worksheet #12: Measurement Performance Criteria Table
Worksheet # 12H: Volatile - Organics/CLP SOMO1.2

(UFP-QAPP Manual Section 2.6.2)
Complete this worksheet for each matrix, analytical group, and concentration level. Identify the data quality indicators (DQI), measurement performance criteria (MPC) 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 specific DQI vary within an analytical parameter, i.e., MPC are analyte-specific, then provide analyte-specific MPC on an additional worksheet.

Matrix	Soil
Analytical Group	TCL Volatiles
Concentration Level	Low/Medium (ug/kg)

Sampling Procedure[1]	Analytical Method/SOP[2]	Data Quality Indicators (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)
	SOM01.2	Precision (field)	Project-Specific %RPD	Field Duplicate	S & A
		Accuracy (field)	No analyte > CRQL*	Field Blank	S & A
		Precision (laboratory)	Project-Specific %RPD; List compound specific RPD	Field Duplicate; MS/MSD**	S & A
		Accuracy (laboratory)	List compound specific %R	***DMCs; MS/MSD**	A

[1]Reference number from QAPP Worksheet #21.
[2]Reference number from QAPP Worksheet #23.
*Reference USEPA Region 2 SOP No. 33/Trace VOA - Blank Type Criteria Table:
http://www.epa.gov/region02/qa/qa_documents/SOP%20HWSS-33VOA.pdf
****Optional** MS/MSD – Reference CLP SOM01.2, Exhibit D, Table 6 for Criteria
***Deuterated Monitoring Compounds (DMCs) – Reference CLP SOM01.2, Exhibit D, Table 5 for Criteria:
http://www.epa.gov/superfund/programs/clp/som1.htm

QAPP Worksheet #12: Measurement Performance Criteria Table
Worksheet # 12I: Semivolatile - Organics/CLP SOMO1.2

(UFP-QAPP Manual Section 2.6.2)
Complete this worksheet for each matrix, analytical group, and concentration level. Identify the data quality indicators (DQI), measurement performance criteria (MPC) 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 specific DQI vary within an analytical parameter, i.e., MPC are analyte-specific, then provide analyte-specific MPC on an additional worksheet.

Matrix	Soil
Analytical Group	TCL Semivolatiles
Concentration Level	Low/Medium (ug/kg)

Sampling Procedure[1]	Analytical Method/SOP[2]	Data Quality Indicators (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)
	SOM01.2	Precision (field)	Project-Specific %RPD	Field Duplicate	S & A
		Accuracy (field)	No analyte > CRQL*	Field Blank	S & A
		Precision (laboratory)	Project-Specific %RPD; List compound specific RPD	Field Duplicate; MS/MSD**	S & A
		Accuracy (laboratory)	List compound specific %R	***DMCs; MS/MSD**	A

[1]Reference number from QAPP Worksheet #21.
[2]Reference number from QAPP Worksheet #23.
*Reference USEPA Region 2 SOP No. 35/Low/Medium Semivolatile - Blank Type Criteria Table:
http://www.epa.gov/region02/qa/qa_documents/SOP%20HWSS-35.pdf
****Optional** MS/MSD – Reference CLP SOM01.2, Exhibit D, Table 6 for Criteria
*****Deuterated Monitoring Compounds (DMCs) – Reference CLP SOM01.2, Exhibit D, Table 5 for Criteria:
http://www.epa.gov/superfund/programs/clp/som1.htm

QAPP Worksheet #12: Measurement Performance Criteria Table
Worksheet # 12J: Pesticide - Organics/CLP SOMO1.2

(UFP-QAPP Manual Section 2.6.2)
Complete this worksheet for each matrix, analytical group, and concentration level. Identify the data quality indicators (DQI), measurement performance criteria (MPC) 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 specific DQI vary within an analytical parameter, i.e., MPC are analyte-specific, then provide analyte-specific MPC on an additional worksheet.

Matrix	Soil
Analytical Group	TCL Pesticides
Concentration Level	Low/Medium (ug/kg)

Sampling Procedure[1]	Analytical Method/SOP[2]	Data Quality Indicators (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)
	SOM01.2	Precision (field)	Project-Specific %RPD	Field Duplicate	S & A
		Accuracy (field)	No analyte > CRQL*	Field Blank	S & A
		Precision (laboratory)	Project-Specific %RPD; List compound specific RPD	Field Duplicate; MS/MSD**	S & A
		Accuracy (laboratory)	List compound specific %R	***LCS; MS/MSD**	A

[1]Reference number from QAPP Worksheet #21.
[2]Reference number from QAPP Worksheet #23.
*Reference USEPA Region 2 SOP No. 36/Low/Medium Pesticide - Blank Type Criteria Table: http://www.epa.gov/region02/qa/qa_documents/SOP%20HWSS-36.pdf
**MS/MSD – Reference CLP SOM01.2, Exhibit D, Table 3 for Criteria
***Laboratory Control Sample (LCS) – Reference CLP SOM01.2, Exhibit D, Table 2 for Criteria: http://www.epa.gov/superfund/programs/clp/som1.htm

QAPP Worksheet #12: Measurement Performance Criteria Table
Worksheet # 12K: PCBs - Organics/CLP SOMO1.2

(UFP-QAPP Manual Section 2.6.2)
Complete this worksheet for each matrix, analytical group, and concentration level. Identify the data quality indicators (DQI), measurement performance criteria (MPC) 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 specific DQI vary within an analytical parameter, i.e., MPC are analyte-specific, then provide analyte-specific MPC on an additional worksheet.

Matrix	Soil
Analytical Group	TCL Aroclors (PCBs)
Concentration Level	Low/Medium (ug/kg)

Sampling Procedure[1]	Analytical Method/SOP[2]	Data Quality Indicators (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)
	SOM01.2	Precision (field)	Project-Specific %RPD	Field Duplicate	S & A
		Accuracy (field)	No analyte > CRQL*	Field Blank	S & A
		Precision (laboratory)	Project-Specific %RPD; List compound specific RPD	Field Duplicate; MS/MSD**	S & A
		Accuracy (laboratory)	List compound specific %R	***LCS; MS/MSD**	A

[1]Reference number from QAPP Worksheet #21.
[2]Reference number from QAPP Worksheet #23.
*Reference USEPA Region 2 SOP No. 37/Low/Medium Aroclor - Blank Type Criteria Table: http://www.epa.gov/region02/qa/qa_documents/SOP%20HWSS-37.pdf
**MS/MSD – Reference CLP SOM01.2, Exhibit D, Table 3 for Criteria
***Laboratory Control Sample (LCS) – Reference CLP SOM01.2, Exhibit D, Table 2 for Criteria: http://www.epa.gov/superfund/programs/clp/som1.htm

QAPP Worksheet #12: Measurement Performance Criteria Table
Worksheet # 12L: TAL Metals - Inorganics/CLP ILMO5.4

(UFP-QAPP Manual Section 2.6.2)
Complete this worksheet for each matrix, analytical group, and concentration level. Identify the data quality indicators (DQI), measurement performance criteria (MPC) 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 specific DQI vary within an analytical parameter, i.e., MPC are analyte-specific, then provide analyte-specific MPC on an additional worksheet.

Matrix	Aqueous
Analytical Group	TAL Metals
Concentration Level	ICP-AES (ug/L)

Sampling Procedure[1]	Analytical Method/SOP[2]	Data Quality Indicators (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)
	ILM05.4	Precision (field)	≤ 20% RPD*	Field Duplicate	S & A
		Accuracy (field)	No analyte > CRQL*	Field Blank	S & A
		Precision (laboratory)	≤ 20% RPD*	Duplicate Sample **	A
		Accuracy (laboratory)	75–125%; 80–120 %	*** Matrix Spike; LCSW****	A A

[1]Reference number from QAPP Worksheet #21.
[2]Reference number from QAPP Worksheet #23.
*Reference USEPA Region 2 SOP No. HW-2, Revision 13/Evaluation of Metals Data for CLP - (include absolute difference criteria): http://www.epa.gov/region02/qa/qa_documents/SOP%20HWSS-2.pdf
**Reference USEPA CLP ILM05.4, Exhibit D of ICP-AES for Duplicate Sample Criteria - (include absolute difference criteria)
***Reference USEPA CLP ILM05.4, Exhibit D of ICP-AES for Spike Sample Criteria
****Reference USEPA CLP ILM05.4, Exhibit D of ICP-AES for aqueous Laboratory Control Sample (LCSW) Criteria w/exception of Ag and Sb http://www.epa.gov/superfund/programs/clp/ilm5.htm

QAPP Worksheet #12: Measurement Performance Criteria Table
Worksheet # 12M: TAL Metals - Inorganics/CLP ILMO5.4

(UFP-QAPP Manual Section 2.6.2)
Complete this worksheet for each matrix, analytical group, and concentration level. Identify the data quality indicators (DQI), measurement performance criteria (MPC) 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 specific DQI vary within an analytical parameter, i.e., MPC are analyte-specific, then provide analyte-specific MPC on an additional worksheet.

Matrix	Aqueous
Analytical Group	TAL Metals
Concentration Level	ICP-MS (ug/L)

Sampling Procedure[1]	Analytical Method/SOP[2]	Data Quality Indicators (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)
	ILM05.4	Precision (field)	≤20% RPD*	Field Duplicate	S & A
		Accuracy (field)	No analyte > CRQL*	Field Blank	S & A
		Precision (laboratory)	≤20% RPD*	Duplicate Sample **	A
		Accuracy (laboratory)	75–125%; 80–120 %	*** Matrix Spike; LCSW****	A A

[1]Reference number from QAPP Worksheet #21.
[2]Reference number from QAPP Worksheet #23.
*Reference USEPA Region 2 SOP No. HW-2, Revision 13/Evaluation of Metals Data for CLP - (include absolute difference criteria): http://www.epa.gov/region02/qa/qa_documents/SOP%20HWSS-2.pdf
**Reference USEPA CLP ILM05.4, Exhibit D of ICP-MS for Duplicate Sample Criteria - - (include absolute difference criteria)
***Reference USEPA CLP ILM05.4, Exhibit D of ICP-MS for Spike Sample Criteria
****Reference USEPA CLP ILM05.4, Exhibit D of ICP-MS for LCSW Criteria: http://www.epa.gov/superfund/programs/clp/ilm5.htm

QAPP Worksheet #12: Measurement Performance Criteria Table
Worksheet # 12N: Total Mercury - Inorganics/CLP ILMO5.4

(UFP-QAPP Manual Section 2.6.2)
Complete this worksheet for each matrix, analytical group, and concentration level. Identify the data quality indicators (DQI), measurement performance criteria (MPC) 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 specific DQI vary within an analytical parameter, i.e., MPC are analyte-specific, then provide analyte-specific MPC on an additional worksheet.

Matrix	Aqueous
Analytical Group	TAL –Total Mercury
Concentration Level	Cold Vapor Atomic Absorption (CVAA)

Sampling Procedure[1]	Analytical Method/SOP[2]	Data Quality Indicators (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)
	ILM05.4	Precision (field)	≤20% RPD*	Field Duplicate	S & A
		Accuracy (field)	No analyte > CRQL*	Field Blank	S & A
		Precision (laboratory)	≤20% RPD*	Duplicate Sample **	A
		Accuracy (laboratory)	75–125%;	*** Matrix Spike;	A

[1]Reference number from QAPP Worksheet #21.
[2]Reference number from QAPP Worksheet #23.
*Reference USEPA Region 2 SOP No. HW-2, Revision 13/Evaluation of Metals Data for CLP - (include absolute difference criteria): http://www.epa.gov/region02/qa/qa_documents/SOP%20HWSS-2.pdf
**Reference USEPA CLP ILM05.4, Exhibit D of ICP-MS for Duplicate Sample Criteria - - (include absolute difference criteria)
***Reference USEPA CLP ILM05.4, Exhibit D of ICP-MS for Spike Sample Criteria: http://www.epa.gov/superfund/programs/clp/ilm5.htm

QAPP Worksheet #12: Measurement Performance Criteria Table
Worksheet # 12O: Total Cyanide - Inorganics/CLP ILMO5.4

(UFP-QAPP Manual Section 2.6.2)
Complete this worksheet for each matrix, analytical group, and concentration level. Identify the data quality indicators (DQI), measurement performance criteria (MPC) 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 specific DQI vary within an analytical parameter, i.e., MPC are analyte-specific, then provide analyte-specific MPC on an additional worksheet.

Matrix	Aqueous
Analytical Group	TAL –Total Cyanide
Concentration Level	Colorimeter or Spectrophotometer

Sampling Procedure[1]	Analytical Method/SOP[2]	Data Quality Indicators (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)
	ILM05.4	Precision (field)	≤20% RPD*	Field Duplicate	S & A
		Accuracy (field)	No analyte > CRQL*	Field Blank	S & A
		Precision (laboratory)	≤20% RPD*	Duplicate Sample **	A
		Accuracy (laboratory)	75–125%;	*** Matrix Spike	A

[1]Reference number from QAPP Worksheet #21.
[2]Reference number from QAPP Worksheet #23.
*Reference USEPA Region 2 SOP No. HW-2, Revision 13/Evaluation of Metals Data for CLP- (include absolute difference criteria): http://www.epa.gov/region02/qa/qa_documents/SOP%20HWSS-2.pdf
**Reference USEPA CLP ILM05.4, Exhibit D of ICP-MS for Duplicate Sample Criteria - (include absolute difference criteria)
***Reference USEPA CLP ILM05.4, Exhibit D of ICP-MS for Spike Sample Criteria: http://www.epa.gov/superfund/programs/clp/ilm5.htm

QAPP Worksheet #12: Measurement Performance Criteria Table
Worksheet # 12P: TAL Metals - Inorganics/CLP ILMO5.4

(UFP-QAPP Manual Section 2.6.2)
Complete this worksheet for each matrix, analytical group, and concentration level. Identify the data quality indicators (DQI), measurement performance criteria (MPC) 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 specific DQI vary within an analytical parameter, i.e., MPC are analyte-specific, then provide analyte-specific MPC on an additional worksheet.

Matrix	Soil
Analytical Group	TAL Metals
Concentration Level	ICP-AES (mg/kg)

Sampling Procedure[1]	Analytical Method/SOP[2]	Data Quality Indicators (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)
	ILM05.4	Precision (field)	≤ 35% RPD*	Field Duplicate	S & A
		Accuracy (field)	No analyte > CRQL*	Field Blank	S & A
		Precision (laboratory)	≤ 35% RPD*	Duplicate Sample **	A
		Accuracy (laboratory)	75–125%;	*** Matrix Spike; LCSS****	A

[1]Reference number from QAPP Worksheet #21.
[2]Reference number from QAPP Worksheet #23.
*Reference USEPA Region 2 SOP No. HW-2, Revision 13/Evaluation of Metals Data for CLP - (include absolute difference criteria): http://www.epa.gov/region02/qa/qa_documents/SOP%20HWSS-2.pdf
**Reference USEPA CLP ILM05.4, Exhibit D of ICP-AES for Duplicate Sample Criteria
***Reference USEPA CLP ILM05.4, Exhibit D of ICP-AES for Spike Sample Criteria
****Reference USEPA CLP ILM05.4, Exhibit D of ICP-AES for solid Laboratory Control Sample (LCSS) **Note: Control Limits established by USEPA for LCSS:** http://www.epa.gov/superfund/programs/clp/ilm5.htm

QAPP Worksheet #12: Measurement Performance Criteria Table
Worksheet # 12Q: Total Mercury - Inorganics/CLP ILMO5.4

(UFP-QAPP Manual Section 2.6.2)
Complete this worksheet for each matrix, analytical group, and concentration level. Identify the data quality indicators (DQI), measurement performance criteria (MPC) 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 specific DQI vary within an analytical parameter, i.e., MPC are analyte-specific, then provide analyte-specific MPC on an additional worksheet.

Matrix	Soil
Analytical Group	TAL –Total Mercury
Concentration Level	Cold Vapor Atomic Absorption (CVAA)

Sampling Procedure[1]	Analytical Method/SOP[2]	Data Quality Indicators (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)
	ILM05.4	Precision (field)	≤ 35% RPD*	Field Duplicate	S & A
		Accuracy (field)	No analyte > CRQL*	Field Blank	S & A
		Precision (laboratory)	≤ 35% RPD*	Duplicate Sample **	A
		Accuracy (laboratory)	75–125%;	*** Matrix Spike; LCSS****	A

[1]Reference number from QAPP Worksheet #21.
[2]Reference number from QAPP Worksheet #23.
*Reference USEPA Region 2 SOP No. HW-2, Revision 13/Evaluation of Metals Data for CLP – (include absolute difference criteria): http://www.epa.gov/region02/qa/qa_documents/SOP%20HWSS-2.pdf
**Reference USEPA CLP ILM05.4, Exhibit D of ICP-AES for Duplicate Sample Criteria
Reference USEPA CLP ILM05.4, Exhibit D of ICP-AES for Spike Sample Criteria*Reference USEPA CLP ILM05.4, Exhibit D of ICP-AES for solid Laboratory Control Sample (LCSS) Note: Control Limits established by USEPA for LCSS: http://www.epa.gov/superfund/programs/clp/ilm5.htm

QAPP Worksheet #12: Measurement Performance Criteria Table
Worksheet # 12R: Total Cyanide - Inorganics/CLP ILMO5.4

(UFP-QAPP Manual Section 2.6.2)
Complete this worksheet for each matrix, analytical group, and concentration level. Identify the data quality indicators (DQI), measurement performance criteria (MPC) 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 specific DQI vary within an analytical parameter, i.e., MPC are analyte-specific, then provide analyte-specific MPC on an additional worksheet.

Matrix	Soil
Analytical Group	TAL –Total Cyanide
Concentration Level	Colorimeter or Spectrophotometer

Sampling Procedure[1]	Analytical Method/SOP[2]	Data Quality Indicators (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)
	ILM05.4	Precision (field)	≤35% RPD*	Field Duplicate	S & A
		Accuracy (field)	No analyte > CRQL*	Field Blank	S & A
		Precision (laboratory)	≤35% RPD*	Duplicate Sample **	A
		Accuracy (laboratory)	75–125%;	*** Matrix Spike; LCSS****	A

[1]Reference number from QAPP Worksheet #21.
[2]Reference number from QAPP Worksheet #23.
*Reference USEPA Region 2 SOP No. HW-2, Revision 13/Evaluation of Metals Data for CLP – (include absolute difference criteria): http://www.epa.gov/region02/qa/qa_documents/SOP%20HWSS-2.pdf
**Reference USEPA CLP ILM05.4, Exhibit D of ICP-AES for Duplicate Sample Criteria
Reference USEPA CLP ILM05.4, Exhibit D of ICP-AES for Spike Sample Criteria*Reference USEPA CLP ILM05.4, Exhibit D of ICP-AES for solid Laboratory Control Sample (LCSS) Note: Control Limits established by USEPA for LCSS: http://www.epa.gov/superfund/programs/clp/ilm5.htm

QAPP Worksheet #12: Measurement Performance Criteria Table
Worksheet # 12S: Volatiles - Organics/SW 846, Method 8260B

Matrix	Aqueous/Soil/Waste
Analytical Group	VOA
Concentration Level	Low/Medium/High

Sampling Procedure[1]	Analytical Method/SOP[2]	Data Quality Indicators (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)
	SW-846, Method 8260B and SOP No.: HW-24 See worksheets #28 and No. #23	Precision Accuracy	% RPD < 20 Average Recovery 70-130%	LCS	A
		Accuracy	Factor of two(-50% to + 100%) from the initial/continuing calibration	Internal standards	A
		Accuracy Precision	Compound Specific average range: 70 - 130% % RPD < 20	Matrix spike/Matrix Spike Duplicate RPD	A
		Accuracy	Limits 80%-120%(Aqueous); 70%-130% (soil/sediment)	Surrogate Compounds	A
		Precision	% RPD < 20	Field Duplicate	A
		Accuracy	< RL	Method Blank	A

[1] Reference number from QAPP Worksheet #21

[2] Reference number from QAPP Worksheet #23 and #28

[*] Reference USEPA Region 2 SOP No. 24/VOA Analysis by Gas Chromatography/Mass Spectrometry SW-846 Method 8260B

Refer to SW 846 methods on http://www.epa.gov/waste/hazard/testmethods/sw846/online/index.htm

QAPP Worksheet #12: Measurement Performance Criteria Table
Worksheet # 12T: Semivolatiles - Organics/SW 846, Method 8270D

Matrix	Aqueous/Soil/Waste
Analytical Group	Semivolatiles
Concentration Level	Low/Medium/High

Sampling Procedure[1]	Analytical Method/SOP[2]	Data Quality Indicators (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)
	SW-846, Method 8270D and SOP No. HW-22 See worksheet # 28 and #23	Precision Accuracy	% RPD < 30 Compound Specific (Full range: D-262%)	LCS Duplicate	A
		Accuracy	Factor of two(-50% to + 100%) from the initial/continuing calibration	Internal standards	A
		Accuracy	Compound Specific (Full range: D-262%)	Matrix Spike	A
		Accuracy	Compound specific	Surrogate Compounds	A
		Accuracy	< RL	Method Blank	A

[1] Reference number from QAPP Worksheet #21
[2] Reference number from QAPP Worksheet #23
* Reference USEPA Region 2 SOP No. 22/SVOA Analysis by Gas Chromatography/Mass Spectrometry SW-846 Method 8270D

Refer to SW 846 methods on http://www.epa.gov/waste/hazard/testmethods/sw846/online/index.htm

QAPP Worksheet #12: Measurement Performance Criteria Table
Worksheet # 12U-1: Pesticide - Organics/SW 846, Method 8081B
Worksheet # 12U-2: PCBs - Organics/SW 846, Method 8082A

Matrix	Aqueous/Soil/Waste
Analytical Group	Pest/PCB
Concentration Level	Low/Medium/High

Sampling Procedure[1]	Analytical Method/SOP[2]	Data Quality Indicators (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)
	SW-846, Method 8081B-Pesticide, 8082A-PCBs and SOP No.: HW-44-Pesticide and SOP No.: HW-45 PCBs See worksheets #28 and #23	Accuracy	Average Recovery 30-150%	LCS	A
		Accuracy	Compound Specific (average range: 23-139%)	Matrix Spike	A
		Accuracy	Limits 30%-150%	Surrogate Compounds	A
		Accuracy	< CRQL	Method Blank	A
		Precision	RPD 0 - 27%	Matrix Spike Duplicate	A

[1] Reference number from QAPP Worksheet #21
[2] Reference number from QAPP Worksheet #23
* Reference USEPA Region 2 SOP No. 44/Pesticide and SOP No. 45/PCBs Analyses by Gas Chromatography SW-846 Method 8081B (pesticide) and 8082A(PCBS)

Refer to SW 846 methods on http://www.epa.gov/waste/hazard/testmethods/sw846/online/index.htm

QAPP Worksheet #12: Measurement Performance Criteria Table
Worksheet # 12V: Herbicides - Organics/SW 846, Method 8151A

Matrix	Aqueous/Soil/Waste
Analytical Group	Herbicides
Concentration Level	Low/Medium/High

Sampling Procedure[1]	Analytical Method/SOP[2]	Data Quality Indicators (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)
	SW-846, Method 8151A and SOP No. HW-17 See worksheets #28 and #23	Precision Accuracy	% RPD < 30 Average Recovery 70-130%	LCS Duplicate	A
		Accuracy	Compound Specific (average range: 70-130%)	Matrix spike/Matrix Spike Duplicate	A
		Accuracy	Limits 70%-130%	Surrogate Compounds	A
		Accuracy	< RL	Method Blank	A

[1] Reference number from QAPP Worksheet #21
[2] Reference number from QAPP Worksheet #23
* Reference USEPA Region 2 SOP No. 17/Herbicides Analysis by Gas Chromatography SW-846 Method 8151A

Refer to SW 846 methods on http://www.epa.gov/waste/hazard/testmethods/sw846/online/index.htm

QAPP Worksheet #12: Measurement Performance Criteria Table
Worksheet # 12W: TAL Metals and Mercury - Inorganics/SW 846, Method 6010C/7471

Matrix	Aqueous/Soil/Waste
Analytical Group	Metals/Mercury
Concentration Level	Low/Medium/High

Sampling Procedure[1]	Analytical Method/SOP[2]	Data Quality Indicators (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)
	SW-846, Method 6010C-Metals, 7471-Mercury soil 7470A-Mercury-liquid and SOP No. HW-2 See Worksheet #28 and #23	Accuracy	No constituent > RL	Preparation Blank	A
		Accuracy	Limits: Average Recovery ± 20%	LCS	A
		Accuracy	75 – 125%	Matrix spike	A
		Sensitivity	Within ± 2 times CRQL of true value or ± 20% of true value, whichever is greater Except for Al, Fe, Ca, K, Mg and Na	Interference Check Sample(ICP/AES)	A
		Precision	RPD < 20%	Duplicate	A
		Precision	%D < 10 %	Serial Dilution Test(ICP/AES)	A
		Accuracy	Limits: Average Recovery ± 20%	Post-Digestion Spike	A
		Accuracy	*Limits: 60 -125% RI	Internal Standard (ICP-MS)	A

[1] Reference number from QAPP Worksheet #21
[2] Reference number from QAPP Worksheet #23
* Reference Principals outline in USEPA Region 2 SOP No. 2/Metals based on SOW ILMO5.3 (SOP Revision 13)

Refer to SW 846 methods on http://www.epa.gov/waste/hazard/testmethods/sw846/online/index.htm

QAPP Worksheet #12: Measurement Performance Criteria Table
Worksheet # 12X: Total Cyanide - Inorganics/SW 846, Method 9012B

Matrix	Aqueous/Soil/Waste
Analytical Group	TAL – Total Cyanide
Concentration Level	Colorimeter or Spectrophotometer

Sampling Procedure[1]	Analytical Method/SOP[2]	Data Quality Indicators (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)
	SW-846, Method 9012B and SOP No. HW-2	Precision (field)	≤ 20% RPD	Field Duplicate	S & A
		Accuracy (field)	No analyte > CRQL*	Field Blank	S & A
		Precision (laboratory)	≤ 20% RPD	Duplicate Sample**	A
		Accuracy (laboratory)	75 – 125 %;	***Matrix Spike	A

1 Reference number from QAPP Worksheet #21
2 Reference number from QAPP Worksheet #23
* Reference USEPA Region 2 SOP No. 2/Metals based on SOW ILMO5.3 (SOP Revision 13)

Refer to SW 846 methods on http://www.epa.gov/waste/hazard/testmethods/sw846/online/index.htm

QAPP Worksheet #13: Secondary Data Criteria and Limitations Table

Any data needed for project implementation or decision making that are obtained from non-direct measurement sources such as computer databases, background information, technologies and methods, environmental indicator data, publications, photographs, topographical maps, literature files and historical data bases will be compared to the DQOs for the project to determine the acceptability of the data. Thus, for example, analytical data from historical surveys will be evaluated to determine whether they satisfy the validation criteria for the project and to determine whether sufficient data was provided to allow an appropriate validation to be done. If not, then a decision to conduct additional sampling for the site may be necessary.

Secondary Data	**Data Source (Originating Organization, Report Title, and Date)**	**Data Generator(s) (Originating Org., Data Types, Data Generation/ Collection Dates)**	**How Data May Be Used (if deemed usable during data assessment stage)**	**Limitations on Data Use**
Previous Investigation Sampling Results	[Document with results, e.g., ER Removal Action Report, dated 'x']	[Who collected data and when]	[What was purpose of previous sampling]	[Reason for additional sampling, ie data gaps, and discussions on comparability issues, incomplete data sets as well as qualified data]

QAPP Worksheet #14: Summary of Project Tasks

Sampling Tasks: Samples to be collected, i.e. 10 ground water samples from monitoring wells, 15 soil samples from 0 – 6 inches, etc.

Analysis Tasks: [Analysis requested by media]
e.g., TCL VOA – Soil – CLP SOW SOMO1.2
TAL Metals-Water-CLP SOW ILMO5.4

Quality Control Tasks: All matrces will have QC samples to be collected (e.g., field duplicate, MS/MSD, PE, blank, etc). All analytical method will perform: Initial calibration, continuing calibration, LCS, and all other applicable QC defined in the method.

Data Management Tasks: Should include: The data collected for the sampling activities will be organized, analyzed, and summarized in a final project report that will be submitted to the RPM/BPM or OSC according to the Project Schedule. The report will be prepared by the project officer and include appropriate data quality assessment. Standard methods and references will be used as guidelines for data reduction and reporting.

Documentation and Records: Should include: Field notebook, sample labels, custody seals, chain of custody, sample logs, etc.

Assessment/Audit Tasks: No performance audit of field operations is anticipated at this time. If conducted, performance and systems audits will be in accordance with the project plan. Review sampling SOPs.

Data Review Tasks: Each laboratory performing analysis of samples will verify that all data are complete for samples received. The QAC will resolve QA issues, state limitations on the use of the data from the sampling team and/or outside laboratories, and review the data packages as appropriate. Measurement performance criteria set in the QAPP will be checked and data inputted to the database, onto charts, tables and/or graphs. The assessment of data acceptability or usability may be provided separately or as part of the analytical report.

The Data Assessment and Interpretation Coordinator will assemble an assessment team with technical expertise appropriate to the project in order to provide preliminary assessments of environmental data regarding implications to human health and the environment, to compare data with benchmarks, standards, or appropriate background level and to prepare data for internal use and for public consumption.

All CLP data will be validated by EPA Region 2 DESA/HWSB/HWSS in accordance with latest SOW. Data generated outside of the CLP program will be validated by EPA Region 2 and its contractor in accordance with the Region 2 data validation SOP if available, or with the applicable measurement performance criteria provided in QAPP worksheet #12 and method specific criteria.

Note: This worksheet will be completed in site-specific QAPP for each project activities.

QAPP Worksheet #15: Reference Limits and Evaluation Table

Matrix: Gas
Analytical Group: Volatile Organic Compounds
Concentration Level: Low

Analyte	CAS Number	U.S. EPA Reg. 3 Risk Based Conc. Ambient Air*				Analytical Method TO-15				Project Quantiation Limit		Achievable Laboratory Limits			
		Soil Gas		Indoor Air		Scan		SIM				MDLs		QLs	
		ppbv	µg/m^3	ppbv	µg/m^3	ppbv	µg/m^3	ppbv	µg/m^3	ppbv	µg/m^3				
Acetone	67-64-1	13892	33,000	1389	3300	0.5	1.2	0.07	0.23			TBD	TBD	TBD	TBD
Benzene	71-43-2	0.72	2.3	0.07	0.23	0.5	1.6	0.07	0.22			TBD	TBD	TBD	TBD
Bromodichloromethane	75-27-4	0.16	1.0	0.016	0.1	0.5	3.4	0.07	0.47			TBD	TBD	TBD	TBD
4-Bromofluorobenzene	460-00-4					0.5	0.47	0.07	0.5			TBD	TBD	TBD	TBD
Bromoform	75-25-2	1.6	16	0.16	1.6	0.5	5.2	0.07	0.72			TBD	TBD	TBD	TBD
Bromomethane	74-83-9	13	51	1.3	5.1	0.5	1.9	0.07	0.27			TBD	TBD	TBD	TBD
1,3-Butadiene	106-99-0	0.28	0.63	0.03	0.06	0.5	1.11	0.07	0.16			TBD	TBD	TBD	TBD
2-Butanone	78-93-3	17,295	51,000	1729	5100	0.5	1.5	0.07	0.21			TBD	TBD	TBD	TBD
Carbon Disulfide	75-15-0	2344	7300	234	730	0.5	1.6	0.07	0.22			TBD	TBD	TBD	TBD
Carbon Tetrachloride	56-23-5	0.19	1.2	0.02	0.12	0.5	3.2	0.07	0.44			TBD	TBD	TBD	TBD
Chlorobenzene	108-90-7	118	510	11.8	51	0.5	2.3	0.07	0.32			TBD	TBD	TBD	TBD
Chloroethane	75-00-3	8.3	22	0.83	2.2	0.5	1.3	0.07	0.18			TBD	TBD	TBD	TBD
Chloroform	67-66-3	0.16	0.77	0.02	0.08	0.5	2.4	0.07	0.34			TBD	TBD	TBD	TBD
Chloromethane	74-87-3	460	950	46	95	0.5	1.03	0.07	0.14			TBD	TBD	TBD	TBD
alpha-Chlorotoluene	100-44-7	0.07	0.37	0.007	0.037	0.5	2.59	0.07	0.36			TBD	TBD	TBD	TBD
Cumene	98-92-8	814	4000	81	400	0.5	2.5	0.07	0.34			TBD	TBD	TBD	TBD
Cyclohexane	110-82-7	18,012	62,000	1801	6200	0.5	1.7	0.07	0.24			TBD	TBD	TBD	TBD
Dibromochloromethane	124-48-1	0.1	0.75	0.01	0.08	0.5	4.3	0.07	0.596			TBD	TBD	TBD	TBD
1,2-Dibromoethane	106-93-4	0.004	0.03	0.0004	0.003	0.5	3.84	0.07	0.54			TBD	TBD	TBD	TBD
1,2-Dichlorobenzene	95-50-1	250	1500	25	150	0.5	3.01	0.07	0.42			TBD	TBD	TBD	TBD
1,3-Dichlorobenzene	541-73-1	18.3	110	1.8	11	0.5	3.01	0.07	0.42			TBD	TBD	TBD	TBD
1,4-Dichlorobenzene	106-46-7	0.46	2.8	0.05	0.28	0.5	3.01	0.07	0.42			TBD	TBD	TBD	TBD
1,1-Dichloroethane	75-34-3	1259	5100	126	510	0.5	2.02	0.07	0.28			TBD	TBD	TBD	TBD
1,2-Dichloroethane	107-06-2	0.17	0.69	0.02	0.07	0.5	2.02	0.07	0.28			TBD	TBD	TBD	TBD
1,2-Dichloroethane-d4	107-07-0					0.5	2.11	0.07	0.29			TBD	TBD	TBD	TBD

*EPA Region 3 Risk Based Concentrations for Ambient Air dated April 6, 2007 [Use the most recent version]

QAPP Worksheet #15: Reference Limits and Evaluation Table

Matrix: Gas
Analytical Group: Volatile Organic Compounds – Continued
Concentration Level: Low

Analyte	CAS Number	U.S. EPA Reg. 3 Risk Based Conc. Ambient Air *				Analytical Method TO-15				Project Quantiation Limit		Achievable Laboratory Limits			
		Soil Gas		Indoor Air		Scan		SIM		ppbv	µg/m^3	MDLs		QLs	
1,1-Dichloroethene	75-35-4	555	2200	55	220	0.5	2.02	0.07	0.28			TBD	TBD	TBD	TBD
cis-1,2-Dichloroethene	156-59-2	93	370	9.3	37	0.5	1.98	0.07	0.28			TBD	TBD	TBD	TBD
trans-1,2-Dichloroethene	156-60-5	156	620	15.6	62	0.5	1.98	0.07	0.28			TBD	TBD	TBD	TBD
1,2-Dichloropropane	78-87-5	0.2	0.92	0.02	0.09	0.5	2.27	0.07	0.32			TBD	TBD	TBD	TBD
cis-1,2-Dichloropropene	10061-01-5					0.5	2.27	0.07	0.32			TBD	TBD	TBD	TBD
trans-1,2-Dichloropropene	10061-02-6					0.5	2.27	0.07	0.32			TBD	TBD	TBD	TBD
cis-1,3-Dichloropropene	100-610-15					0.5	2.27	0.07	0.32			TBD	TBD	TBD	TBD
trans-1,3-Dichloropropene	10061-02-6					0.5	2.27	0.07	0.32			TBD	TBD	TBD	TBD
1,4-Dioxane	123-91-1	1.6	5.7	0.16	0.57	0.5	1.8	0.07	0.25			TBD	TBD	TBD	TBD
Ethanol	64-17-5					0.5	0.94	0.07	0.13			TBD	TBD	TBD	TBD
Ethylbenzene	100-41-4	2533	11,000	253	1100	0.5	2.17	0.07	0.30			TBD	TBD	TBD	TBD
4-Ethyltoluene	622-96-8					0.5	2.46	0.07	0.34			TBD	TBD	TBD	TBD
Freon 11	75-69-4	1299.2	7300	129.9	730	0.5	2.81	0.07	0.39			TBD	TBD	TBD	TBD
Freon 12	75-71-8	363.9	1800	36.4	180	0.5	2.47	0.07	0.35			TBD	TBD	TBD	TBD
Freon 113	76-13-1	40,447.7	310,000	4044.8	31,000	0.5	3.83	0.07	0.54			TBD	TBD	TBD	TBD
Freon 114	76-14-2					0.5	3.50	0.07	0.49			TBD	TBD	TBD	TBD
Heptane	142-82-5					0.5	2.05	0.07	0.29			TBD	TBD	TBD	TBD
Hexachlorobutadiene	87-68-3	0.08	0.80	0.008	0.08	0.5	5.33	0.07	0.75			TBD	TBD	TBD	TBD
Hexane	110-54-3	2071	7300	207	730	0.5	1.76	0.07	0.25			TBD	TBD	TBD	TBD
2-Hexanone	591-78-6					0.5	2.05	0.07	0.29			TBD	TBD	TBD	TBD
Hydrogen Sulfide	7783-06-4	151	210	1.5	2.1	0.5	0.70	0.07	0.10			TBD	TBD	TBD	TBD
Methane	74-82-8					0.5	0.33	0.07	0.05			TBD	TBD	TBD	TBD
Methylene Chloride	75-09-2	11	38	1.1	3.8	0.5	1.74	0.07	0.24			TBD	TBD	TBD	TBD
4-Methyl-2-pentanone	108-10-1	7567	31000	757	3100	0.5	2.05	0.07	0.29			TBD	TBD	TBD	TBD
Methyl tert-butyl ether	1634-04-4	4.4	16	0.44	1.6	0.5	1.80	0.07	0.25			TBD	TBD	TBD	TBD
2-Propanol	67-63-0					0.5	1.23	0.07	0.17			TBD	TBD	TBD	TBD
Propylbenzene	103-65-1					0.5	2.46	0.07	0.34			TBD	TBD	TBD	TBD

*EPA Region 3 Risk Based Concentrations for Ambient Air dated April 6, 2007. [Use the most recent version]

QAPP Worksheet #15: Reference Limits and Evaluation Table

Matrix: Gas
Analytical Group: Volatile Organic Compounds – Continued
Concentration Level: Low

Analyte	CAS Number	U.S. EPA Reg. 3 Risk Based Conc. Ambient Air *				Analytical Method TO-15				Project Quantiation Limit		Achievable Laboratory Limits			
		Soil Gas		Indoor Air		Scan		SIM		ppbv	µg/m^3	MDLs		QLs	
		ppbv	µg/m^3	ppbv	µg/m^3	ppbv	µg/m^3	ppbv	µg/m^3						
Styrene	100-42-5	2347	10000	235	1000	0.5	2.13	0.07	0.30			TBD	TBD	TBD	TBD
1,1,2,2-Tetrachloroethane	79-34-5	0.04	0.31	0.004	0.03	0.5	3.43	0.07	0.48			TBD	TBD	TBD	TBD
Tetrachloroethene**	127-18-4	0.46	3.1	0.05	0.31	0.5	3.39	0.07	0.47			TBD	TBD	TBD	TBD
Tetrahydrofuran	109-99-9	3.1	9.2	0.31	0.92	0.5	1.47	0.07	0.21			TBD	TBD	TBD	TBD
Toluene	108-88-3	13,534	51,000	1353	5100	0.5	1.88	0.07	0.26			TBD	TBD	TBD	TBD
Toulene-d8	2037-26-5					0.5	2.05	0.07	0.29			TBD	TBD	TBD	TBD
1,2,4-Trichlorobenzene	120-82-1	50	370	5.0	37	0.5	3.71	0.07	0.52			TBD	TBD	TBD	TBD
1,1,1-Trichloroethane (TCA)	71-55-6	1833	10,000	183	1000	0.5	2.73	0.07	0.38			TBD	TBD	TBD	TBD
1,1,2-Trichloroethane	79-00-5	0.20	1.1	0.02	0.11	0.5	2.73	0.07	0.38			TBD	TBD	TBD	TBD
Trichloroethene (TCE)**	79-01-6	0.03	0.16	0.003	0.016	0.5	2.69	0.07	0.38			TBD	TBD	TBD	TBD
1,3,5-Trimethylbenzene	108-67-8					0.5	2.46	0.07	0.38			TBD	TBD	TBD	TBD
1,2,4-Trimethylbenzene	95-63-6					0.5	2.46	0.07	0.34			TBD	TBD	TBD	TBD
Vinyl Chloride	75-01-4	0.27	0.72	0.03	0.07	0.5	1.28	0.07	0.18			TBD	TBD	TBD	TBD
p-Xylene	106-42-3	253	1100	25	110	0.5	2.17	0.07	0.30			TBD	TBD	TBD	TBD
m-Xylene	108-38-3	253	1100	25	110	0.5	2.17	0.07	0.30			TBD	TBD	TBD	TBD
o-Xylene	95-47-6	253	1100	25	110	0.5	2.17	0.07	0.30			TBD	TBD	TBD	TBD

*EPA Region 3 Risk Based Cncentrations for Ambient Air dated 4/6/2007. [Use the most recent version]
** EPA Region 2 risk assessors have derived the following risk based concentrations for TCE and PCE: TCE is 5.0 µg/m^3 for indoor air and 50 µg/m^3 for sub-slab air and PCE is 100 µg/m^3 for indoor air and 1000 µg/m^3 for sub-slab air.

QAPP Worksheet #15: Reference Limits and Evaluation Table

Matrix: Soil, Sediment **
Analytical Group: Target Compound List Volatile Organic Compounds
Concentration Level: Low and Medium

Analyte	CAS Number	NJDEP Soil Cleanup Criteria (mg/kg)*			NYSDEC 6NYCRR Part 375 (mg/kg)***	Project Quantiation Limit (mg/kg)	Analytical Method – SOM01.2 (Low) Quantitation Limits (mg/kg)	Analytical Method – SOM01.2 (Medium) Quantitation Limits (mg/kg)
		Residential	Non-Residential	Impact to GW				
Dichlorodifluoromethane	75-71-8						0.005	0.25
Chloromethane	74-87-3	520	1000	10			0.005	0.25
Vinyl Chloride	75-01-4	2.0	7.0	10	0.02		0.005	0.25
Bromomethane	74-83-9	79	1000	1.0			0.005	0.25
Chloroethane	75-00-3						0.005	0.25
Trichlorofluoromethane	75-69-4						0.005	0.25
1,1-Dichloroethene	75-35-4	8.0	150	10	0.33		0.005	0.25
1,1,2-Trichloro-1,2,2-trifluoroethane	76-13-1						0.005	0.25
Acetone	67-64-1	1000	1000	100	0.05		0.01	0.5
Carbon Disulfide	75-15-0						0.005	0.25
Methyl Acetate	79-20-9						0.005	0.25
Methylene Chloride	75-09-2	49	210	1.0	0.05		0.005	0.25
trans-1,2-Dichloroethene	156-60-5	1000	1000	50	0.19		0.005	0.25
Methyl tert-Butyl Ether	1634-04-4				0.93		0.005	0.25
1,1-Dichloroethane	75-34-3	570	1000	10			0.005	0.25
cis-1,2-Dichloroethene	156-59-2	79	1000	1.0	0.25		0.005	0.25
2-Butanone	78-93-3	1000	1000	50			0.01	0.5
Chloroform	67-66-3	19	28	1.0	0.37		0.005	0.25
1,1,1-Trichloroethane	71-55-6	210	1000	50	0.68		0.005	0.25
Cyclohexane	110-82-7						0.005	0.25
Carbon Tetrachloride	56-23-5	2.0	4.0	1.0	0.76		0.005	0.25
Benzene	71-43-2	3.0	13	1.0	0.06		0.005	0.25
1,2-Dichloroethane	107-06-2	6.0	24	1.0	0.02		0.005	0.25
Trichloroethene	79-01-6	23	54	1.0			0.005	0.25
Methylcyclohexane	108-87-2						0.005	0.25
1,2-Dichloropropane	78-87-5	10	43				0.005	0.25
Bromodichloromethane	75-27-4	11	46	1.0			0.005	0.25
cis-1,3-Dichloropropene	10061-01-5	4.0	5.0	1.0			0.005	0.25
4-Methyl-2-Pentanone	108-10-1	1000	1000	50			0.01	0.5

For detailed references, see Footnotes below.

QAPP Worksheet #15: Reference Limits and Evaluation Table

Matrix: Soil, Sediment **
Analytical Group: Target Compound List Volatile Organic Compounds - Continued
Concentration Level: Low and Medium

Analyte	CAS Number	NJDEP Soil Cleanup Criteria (mg/kg)*			NYSDEC 6NYCRR Part 375 (mg/kg)***	Project Quantiation Limit (mg/kg)	Analytical Method – SOM01.2 (Low) Quantitation Limits (mg/kg)	Analytical Method – SOM01.2 (Medium) Quantitation Limits (mg/kg)
		Residential	Non-Residential	Impact to GW				
Toluene	108-88-3	1000	1000	500	0.7		0.005	0.25
trans-1,3-Dichloropropene	10061-02-6	4.0	5.0	1.0			0.005	0.25
1,1,2-Trichloroethane	79-00-5	22	420	1.0			0.005	0.25
Tetrachloroethene	127-18-4	4.0	6.0	1.0	1.3		0.005	0.25
2-Hexanone	591-78-6						0.01	0.5
Dibromochloromethane	124-48-1	110	1000	1.0			0.005	0.25
1,2-Dibromoethane	106-93-4						0.005	0.25
Chlorobenzene	108-90-7	37	680	1.0	1.1		0.005	0.25
Ethylbenzene	100-41-4	1000	1000	100	1		0.005	0.25
Xylenes (total)	1330-20-7	410	1000	67	0.26		0.005	0.25
Styrene	100-42-5	23	97	100			0.005	0.25
Bromoform	75-25-2	86	370	1.0			0.005	0.25
Isopropylbenzene	98-82-8						0.005	0.25
1,1,2,2-Tetrachloroethane	79-34-5	34	70	1.0			0.005	0.25
1,3-Dichlorobenzene	541-73-1	5100	10,000	100	2.4		0.005	0.25
1,4-Dichlorobenzene	106-46-7	570	10,000	100	1.8		0.005	0.25
1,2-Dichlorobenzene	95-50-1	5100	10,000	50	1.1		0.005	0.25
1,2-Dibromo-3-chloropropane	96-12-8						0.005	0.25
1,2,4-Trichlorobenzene	120-82-1	68	1200	100			0.005	0.25

*New Jersey Department of Environmental Protection (NJDEP) - Direct Contact Soil Cleanup Criteria, May 12, 1999. [Use the most recent version]. http://www.nj.gov/dep/srp/guidance/scc/

** For sediment guidance values refer to the NJDEP Guidance for Sediment Quality Evaluations, November 1998.

***New York Department of Environmental Conservation (NYSDEC), December 2006, 6 NYCRR Part 375 Environmental Remediation Programs, Subpart 375-6: Remedial Program Soil Cleanup Objectives (SCOs). Value listed from Table 375-6.8(a) for Unrestricted Use SCOs. The SCOs for unrestricted use were capped at a maximum value of 100 ppm. http:/www.dec.ny.gov/regs/15507.html

QAPP Worksheet #15: Reference Limits and Evaluation Table

Matrix: Soil, Sediment **

Analytical Group: Target Compound List – Semi-Volatile Organic Compounds

Concentration Level: Low and Medium

Analyte	CAS Number	NJDEP Soil Cleanup Criteria (mg/kg)*			NYSDEC 6NYCRR Part 375 (mg/kg)***	Project Quantiation Limit (mg/kg)	Analytical Method – SOM01.2 (Low) Quantitation Limits (mg/kg)	Analytical Method – SOM01.2 (Medium) Quantitation Limits (mg/kg)
		Residential	Non-Residential	Impact to GW				
1,1'-Biphenyl	92-52-4						0.17	5.0
2,2'-oxybis(1-Chloropropane)	108-60-1						0.17	5.0
2,4,5-Trichlorophenol	95-95-4	5600	10,000	50			0.17	5.0
2,4,6-Trichlorophenol	88-06-2	62	270	10			0.17	5.0
2,4-Dichlorophenol	120-83-2	170	3100	10			0.17	5.0
2,4-Dimethylphenol	105-67-9	1100	10,000	10			0.17	5.0
2,4-Dinitrophenol	51-28-5	110	2100	10			0.33	10
2,4-Dinitrotoluene	121-14-2	1	4	10			0.17	5.0
2,6-Dinitrotoluene	606-20-2	1	4	10			0.17	5.0
2-Chloronaphthalene	91-58-7						0.17	5.0
2-Chlorophenol	95-57-8	280	5200	10			0.17	5.0
2-Methylnaphthalene	91-57-6						0.17	5.0
2-Methylphenol (o-cresol)	95-48-7	2800	10000		0.33		0.17	5.0
2-Nitroaniline	88-74-4						0.33	10
2-Nitrophenol	88-75-5						0.17	5.0
3,3'-Dichlorobenzidine	91-94-1	2	6	100			0.17	5.0
3-Nitroaniline	99-09-2						0.33	10
4,6-Dinitro-2-methylphenol	534-52-1						0.33	10
4-Bromophenyl-phenylether	101-55-3						0.17	5.0
4-Chloro-3-methylphenol	59-50-7	10,000	10,000	100			0.17	5.0
4-Chloroaniline	106-47-8	230	4200				0.17	5.0
4-Chlorophenyl-phenyl ether	7005-72-3						0.17	5.0
4-Methylphenol (p-cresol)	106-44-5	2800	10,000		0.33		0.17	5.0
4-Nitroaniline	100-01-6						0.33	10
4-Nitrophenol	100-02-7						0.33	10
Acenaphthene	83-32-9	3400	10,000	100	20		0.17	5.0
Acenaphthylene	208-96-8				100		0.17	5.0
Acetophenone	98-86-2						0.17	5.0
Anthracene	120-12-7	10,000	10,000	100	100		0.17	5.0

For detailed references, see Footnotes below.

QAPP Worksheet #15: Reference Limits and Evaluation Table

Matrix: Soil, Sediment **

Analytical Group: Target Compound List – Semi-Volatile Organic Compounds - Continued

Concentration Level: Low and Medium

Analyte	CAS Number	NJDEP Soil Cleanup Criteria (mg/kg)*			NYSDEC 6NYCRR Part 375 (mg/kg)***	Project Quantiation Limit (mg/kg)	Analytical Method – SOM01.2 (Low) Quantitation Limits (mg/kg)	Analytical Method – SOM01.2 (Medium) Quantitation Limits (mg/kg)
		Residential	Non-Residential	Impact to GW				
Atrazine	1912-24-9						0.17	5.0
Benzaldehyde	100-52-7						0.17	5.0
Benzo(a)anthracene	56-55-3	0.9	4	500	1		0.17	5.0
Benzo(a)pyrene	50-32-8	0.66	0.66	100	1		0.17	5.0
Benzo(b)fluoranthene	205-99-2	0.9	4	50	1		0.17	5.0
Benzo(g,h,i)perylene	191-24-2				100		0.17	5.0
Benzo(k)fluoranthene	207-08-9	0.9	4	500	0.8		0.17	5.0
Bis(2-Chloroethoxy)methane	111-91-1						0.17	5.0
Bis-(2-Chloroethyl) ether	111-44-4	0.66	3	10			0.17	5.0
bis(2-Ethylhexyl)phthalate	117-81-7	49	210	100			0.17	5.0
Butylbenzylphthalate	85-68-7	1100	10,000	100			0.17	5.0
Caprolactam	105-60-2						0.17	5.0
Carbazole	86-74-8						0.17	5.0
Chrysene	218-01-9	9	40	500	1		0.17	5.0
Dibenzo(a,h)anthracene	53-70-3	0.66	0.66	100	0.33		0.17	5.0
Dibenzofuran	132-64-9						0.17	5.0
Diethylphthalate	84-66-2	10,000	10,000	50			0.17	5.0
Dimethylphthalate	131-11-3	10,000	10,000	50			0.17	5.0
Di-n-butylphthalate	84-74-2	5700	10,000	100			0.17	5.0
Di-n-octylphthalate	117-84-0	1100	10,000	100			0.17	5.0
Fluoranthene	206-44-0	2300	10,000	100	100		0.17	5.0
Fluorene	86-73-7	2300	10,000	100	30		0.17	5.0
Hexachlorobenzene	118-74-1	0.66	2	100			0.17	5.0
Hexachlorobutadiene	87-68-3	1	21	100			0.17	5.0
Hexachlorocyclopentadiene	77-47-4	400	7300	100			0.17	5.0
Hexachloroethane	67-72-1	6	100	100			0.17	5.0
Indeno(1,2,3-cd)pyrene	193-39-5	0.9	4	500	0.5		0.17	5.0

For detailed references, see Footnotes below.

QAPP Worksheet #15: Reference Limits and Evaluation Table

Matrix: Soil, Sediment**
Analytical Group: Target Compound List – Semi-Volatile Organic Compounds - Continued
Concentration Level: Low and Medium

Analyte	CAS Number	NJDEP Soil Cleanup Criteria (mg/kg)*			NYSDEC 6NYCRR Part 375 (mg/kg)***	Project Quantiation Limit (mg/kg)	Analytical Method – SOM01.2 (Low) Quantitation Limits (mg/kg)	Analytical Method – SOM01.2 (Medium) Quantitation Limits (mg/kg)
		Residential	Non-Residential	Impact to GW				
Isophorone	78-59-1	1100	10,000	50			0.17	5.0
Naphthalene	91-20-3	230	4200	100	12		0.17	5.0
Nitrobenzene	98-95-3	28	520	10			0.17	5.0
N-Nitrosodiphenylamine	86-30-6	140	600	100			0.17	5.0
N-Nitroso-di-n-propylamine	621-64-7	0.66	0.66	10			0.17	5.0
Pentachlorophenol	87-86-5	6	24	100	0.8		0.33	10
Phenanthrene	85-01-8				100		0.17	5.0
Phenol	108-95-2	10,000	10,000	50	0.33		0.17	5.0
Pyrene	129-00-0	1700	10,000	100	100		0.17	5.0

*New Jersey Department of Environmental Protection (NJDEP) - Direct Contact Soil Cleanup Criteria, May 12, 1999. [Use the most recent version]. http://www.nj.gov/dep/srp/guidance/scc/
** For sediment guidance values refer to the NJDEP Guidance for Sediment Quality Evaluations, November 1998.
***New York Department of Environmental Conservation (NYSDEC), December 2006, 6 NYCRR Part 375 Environmental Remediation Programs, Subpart 375-6: Remedial Program Soil Cleanup Objectives (SCOs). Values listed from Table 375-6.8(a) for Uunrestricted Use SCOs. The SCOs for unrestricted use were capped at a maximum value of 100 ppm. http://www.dec.ny.gov/regs/15507.html

QAPP Worksheet #15: Reference Limits and Evaluation Table

Matrix: Soil, Sediment **
Analytical Group: Target Compound List Pesticides
Concentration Level: Low

Analyte	CAS Number	NJDEP Soil Cleanup Criteria (mg/kg)*			NYSDEC 6NYCRR Part 375 (mg/kg)***	Project Quantiation Limit (mg/kg)	Analytical Method – SOM01.2 Quantitation Limits (mg/kg)
		Residential	Non-Residential	Impact to GW			
alpha-BHC	319-84-6				0.02		0.0017
beta-BHC	319-85-7				0.036		0.0017
delta-BHC	319-86-8				0.04		0.0017
gamma-BHC (Lindane)	58-89-9	0.52	2.2	50	0.1		0.0017
Heptachlor	76-44-8	0.15	0.65	50	0.042		0.0017
Aldrin	309-00-2	0.04	0.17	50			0.0017
Heptachlor epoxide	1024-57-3						0.0017
Endosulfan I	959-98-8				2.4		0.0017
Dieldrin	60-57-1	0.042	0.18	50	0.005		0.0033
4,4'-DDE	72-55-9	2	9	50	0.0033		0.0033
Endrin	72-20-8	17	310	50	0.014		0.0033
Endosulfan II	33213-65-9				2.4		0.0033
4,4'-DDD	72-54-8	3	12	50	0.0033		0.0033
Endosulfan sulfate	1031-07-8				2.4		0.0033
4,4'-DDT	50-29-3	2	9	500	0.0033		0.0033
Methoxychlor	72-43-5	280	5200	50			0.017
Endrin ketone	53494-70-5						0.0033
Endrin aldehyde	7421-93-4						0.0033
alpha-Chlordane	5103-71-9				0.094		0.0017
gamma-Chlordane	5103-74-2						0.0017
Toxaphene	8001-35-2	0.10	0.2	50			0.17

*New Jersey Department of Environmental Protection (NJDEP) - Direct Contact Soil Cleanup Criteria, May 12, 1999. [Use the most recent version]. http://www.nj.gov/dep/srp/guidance/scc/
** For sediment guidance values refer to the NJDEP Guidance for Sediment Quality Evaluations, November 1998.
***New York Department of Environmental Conservation (NYSDEC), December 2006, 6 NYCRR Part 375 Environmental Remediation Programs, Subpart 375-6: Remedial Program Soil Cleanup Objectives (SCOs). Values listed from Table 375-6.8(a) for Uunrestricted Use SCOs. The SCOs for unrestricted use were capped at a maximum value of 100 ppm. http://www.dec.ny.gov/regs/15507.html

QAPP Worksheet #15: Reference Limits and Evaluation Table

Matrix: Soil, Sediment**
Analytical Group: Target Compound List Aroclors (PCBs)
Concentration Level: Low

Analyte	CAS Number	NJDEP Soil Cleanup Criteria (mg/kg)*			NYSDEC 6NYCRR Part 375 (mg/kg)***	Project Quantiation Limit (mg/kg)	Analytical Method – SOM01.2 Quantitation Limits (mg/kg)
		Residential	Non-Residential	Impact to GW			
Aroclor-1016	12674-11-2	0.49	2	50	0.1		0.033
Aroclor-1221	11104-28-2	0.49	2	50	0.1		0.033
Aroclor-1232	11141-16-5	0.49	2	50	0.1		0.033
Aroclor-1242	53469-21-9	0.49	2	50	0.1		0.033
Aroclor-1248	12672-29-6	0.49	2	50	0.1		0.033
Aroclor-1254	11097-69-1	0.49	2	50	0.1		0.033
Aroclor-1260	11096-82-5	0.49	2	50	0.1		0.033
Aroclor-1262	37324-23-5	0.49	2	50	0.1		0.033
Aroclor-1268	11100-14-4	0.49	2	50	0.1		0.033

*New Jersey Department of Environmental Protection (NJDEP) - Direct Contact Soil Cleanup Criteria, May 12, 1999. [Use the most recent version]. http://www.nj.gov/dep/srp/guidance/scc/
** For sediment guidance values refer to the NJDEP Guidance for Sediment Quality Evaluations, November 1998.
***New York Department of Environmental Conservation (NYSDEC), December 2006, 6 NYCRR Part 375 Environmental Remediation Programs, Subpart 375-6: Remedial Program Soil Cleanup Objectives (SCOs). Values listed from Table 375-6.8(a) for Uunrestricted Use SCOs. The SCOs for unrestricted use were capped at a maximum value of 100 ppm. http://www.dec.ny.gov/regs/15507.html

QAPP Worksheet #15: Reference Limits and Evaluation Table

Matrix: Soil, Sediment**
Analytical Group: Target Analyte List Inorganics (Mercury and Cyanide)
Concentration Level: Low

Analyte	CAS Number	NJDEP Soil Cleanup Criteria (mg/kg)*		NYSDEC 6NYCRR Part 375 (mg/kg)***	Project Quantiation Limit (mg/kg)	Analytical Method – SOM01.2 Quantitation Limits (mg/kg)
		Residential	Non-Residential			
Aluminum	7429-90-5					20
Antimony	7440-36-0	14	340			6
Arsenic	7440-38-2	20	20	13		1
Barium	7440-39-3	700	47,000	350		20
Beryllium	7440-41-7	2	2	7.2		0.5
Cadmium	7440-43-9	39	100	2.5		0.5
Calcium	7440-70-2					500
Chromium	7440-47-3					1
Cobalt	7440-48-4					5
Copper	7440-50-8	600	600	50		2.5
Iron	7439-89-6					10
Lead	7439-92-1	400	600	63		1
Magnesium	7439-95-4					500
Manganese	7439-96-5			1600		1.5
Mercury	7439-97-6	14	270	0.18		0.1
Nickel	7440-02-0	250	2400	30		4
Potassium	7440-09-7					500
Selenium	7782-49-2	63	3100	3.9		3.5
Silver	7440-22-4	110	4100	2		1
Sodium	7440-23-5					500
Thallium	7440-28-0	2	2			2.5
Vanadium	7440-62-2	370	7100			5
Zinc	7440-66-6	1500	1500	109		6
Cyanide	57-12-5	1100	21,000	27		2.5

*New Jersey Department of Environmental Protection (NJDEP) - Direct Contact Soil Cleanup Criteria, May 12, 1999. [Use the most recent version].
** For sediment guidance values refer to the NJDEP Guidance for Sediment Quality Evaluations, November 1998. http://www.nj.gov/dep/srp/guidance/scc/
***New York Department of Environmental Conservation (NYSDEC), December 2006, 6 NYCRR Part 375 Environmental Remediation Programs, Subpart 375-6: Remedial Program Soil Cleanup Objectives (SCOs). Values listed from Table 375-6.8(a) for Uunrestricted Use SCOs. The SCOs for unrestricted use were capped at a maximum value of 100 ppm. http://www.dec.ny.gov/regs/15507.html

QAPP Worksheet #15: Reference Limits and Evaluation Table

Matrix: Groundwater, Surface Water**/***
Analytical Group: Target Compound List Volatile Organic Compounds
Concentration Level: Trace & Low

Analyte	CAS Number	NJAC Groundwater Quality Standards* (ug/L)	NYS Groundwater Quality Standards (ug/L)***	Project Quantiation Limit (ug/L)	Analytical Method – SOM01.2 Trace Quantitation Limits (ug/L)	Analytical Method – SOM01.2 Low Quantitation Limits (ug/L)
Dichlorodifluoromethane	75-71-8	1000	5		0.5	5
Chloromethane (Methyl Chloride)	74-87-3		5		0.5	5
Vinyl Chloride	75-01-4	1	2		0.5	5
Bromomethane	74-83-9	10	5		0.5	5
Chloroethane	75-00-3		5		0.5	5
Trichlorofluoromethane	75-69-4	2000	5		0.5	5
1,1-Dichloroethene	75-35-4	1	5		0.5	5
1,1,2-Trichloro-1,2,2-trifluoroethane	76-13-1		5		0.5	5
Acetone (2-Propanone)	67-64-1	6000			5	10
Carbon Disulfide	75-15-0	700	60		0.5	5
Methyl Acetate	79-20-9	7000			0.5	5
Methylene Chloride	75-09-2	3.0	5		0.5	5
trans-1,2-Dichloroethene	156-60-5	100	5		0.5	5
Methyl tert-Butyl Ether	1634-04-4	70	10		0.5	5
1,1-Dichloroethane	75-34-3	50	5		0.5	5
cis-1,2-Dichloroethene	156-59-2	70	5		0.5	5
2-Butanone (Methyl Ethyl Ketone)	78-93-3	300	50		5	10
Bromochloromethane	74-97-5		5		0.5	5
Chloroform	67-66-3	70	7		0.5	5
1,1,1-Trichloroethane	71-55-6	30	5		0.5	5
Cyclohexane	110-82-7				0.5	5
Carbon Tetrachloride	56-23-5	1	5		0.5	5
Benzene	71-43-2	1	1		0.5	5
1,2-Dichloroethane	107-06-2	2	0.6		0.5	5
Trichloroethene	79-01-6	1	5		0.5	5
Methylcyclohexane	108-87-2				0.5	5
1,2-Dichloropropane	78-87-5	1	1		0.5	5
Bromodichloromethane	75-27-4	1			0.5	5
cis-1,3-Dichloropropene	10061-01-5	1	0.4		0.5	5
4-Methyl-2-Pentanone	108-10-1				5	10
Toluene	108-88-3	600	5		0.5	5
trans-1,3-Dichloropropene	10061-02-6	1	0.4		0.5	5

For detailed references, see Footnotes below.

QAPP Worksheet #15: Reference Limits and Evaluation Table

Matrix: Groundwater, Surface Water**/***
Analytical Group: Target Compound List Volatile Organic Compounds – Continued
Concentration Level: Trace & Low

Analyte	CAS Number	NJAC Groundwater Quality Standards* (ug/L)	NYS Groundwater Quality Standards (ug/L)***	Project Quantiation Limit (ug/L)	Analytical Method – SOM01.2 Trace Quantitation Limits (ug/L)	Analytical Method – SOM01.2 Low Quantitation Limits (ug/L)
1,1,2-Trichloroethane	79-00-5	3	1		0.5	5
Tetrachloroethene	127-18-4	1	5		0.5	5
2-Hexanone	591-78-6				5	10
Dibromochloromethane	124-48-1	1			0.5	5
1,2-Dibromoethane	106-93-4				0.5	5
Chlorobenzene	108-90-7	50	5		0.5	5
Ethylbenzene	100-41-4	700	5		0.5	5
Xylenes (total)	1330-20-7	1000	5		0.5	5
Styrene	100-42-5	100	5		0.5	5
Bromoform	75-25-2	4			0.5	5
Isopropylbenzene	98-82-8		5		0.5	5
1,1,2,2-Tetrachloroethane	79-34-5	1	5		0.5	5
1,3-Dichlorobenzene	541-73-1	600	3		0.5	5
1,4-Dichlorobenzene	106-46-7	75	3		0.5	5
1,2-Dichlorobenzene	95-50-1	600	3		0.5	5
1,2-Dibromo-3-chloropropane	96-12-8	0.02	0.04		0.5	5
1,2,4-Trichlorobenzene	120-82-1	9	5		0.5	5
1,2,3-Trichlorobenzene	87-61-6		5		0.5	5

*NJDEP N.J.A.C. 7:9C, Ground Water Quality Standards (GWQS) dated November 7, 2005. [Use the most recent version]
http://www.nj.gov/dep/wms/bwqsa/gwqs.htm
** For surface water use NJDEP NJAC 7:9B Surface Water Quality Standards, October 2006
***NYSDEC NYCRR Title 6, Parts 700-706: Water Quality Regulations; Part 703: SurfaceWater and Groundwater Quality Standards and Groundwater Effluent Limitations, Amended August 1999; and Division of Water StandardsTechnical and Operational Guidance Series (TOGS 1.1.1), Ambient Water Quality Standards and Guuidance Values and Groundwater Effluent Limitations, June 1998 [Use the most recent version] http://www.dec.ny.gov/regs/4590.html

QAPP Worksheet #15: Reference Limits and Evaluation Table

Matrix: Groundwater, Surface Water**/***

Analytical Group: Target Compound List - Semi-Volatile Organic Compounds

Concentration Level: Low

Analyte	CAS Number	NJAC Groundwater Quality Standards* (ug/L)	NYS GW Quality Standards (ug/L)***	Project Quantiation Limit (ug/L)	Analytical Method – SOM01.2 Quantitation Limits (ug/L)
1,1'-Biphenyl	92-52-4	400	5		5
1,2,4,5 Tetrachlorobenzene	95-94-3		5		5
2,2'-oxybis(1-Chloropropane)	108-60-1				5
2,4,5-Trichlorophenol	95-95-4	700			5
2,4,6-Trichlorophenol	88-06-2	20			5
2,4-Dichlorophenol	120-83-2	20	1		5
2,4-Dimethylphenol	105-67-9	100	1		5
2,4-Dinitrophenol	51-28-5	40	1		10
2,4-Dinitrotoluene	121-14-2	10	5		5
2,6-Dinitrotoluene	606-20-2	10	5		5
2-Chloronaphthalene	91-58-7	6000			5
2-Chlorophenol	95-57-8	40			5
2-Methylnaphthalene	91-57-6				5
2-Methylphenol	95-48-7				5
2-Nitroaniline	88-74-4		5		10
2-Nitrophenol	88-75-5				5
3,3'-Dichlorobenzidine	91-94-1	30	5		5
3-Nitroaniline	99-09-2		5		10
4,6-Dinitro-2-methylphenol	534-52-1				10
4-Bromophenyl-phenylether	101-55-3				5
4-Chloro-3-methylphenol	59-50-7				5
4-Chloroaniline	106-47-8	30	5		5
4-Chlorophenyl-phenyl ether	7005-72-3				5
4-Methylphenol	106-44-5				5
4-Nitroaniline	100-01-6		5		10
4-Nitrophenol	100-02-7				10
Acenaphthene	83-32-9	400			5
Acenaphthylene	208-96-8				5
Acetophenone	98-86-2	700			5
Anthracene	120-12-7	2000			5
Atrazine	1912-24-9	3	7.5		5
Benzaldehyde	100-52-7				5

*NJDEP N.J.A.C. 7:9C, Ground Water Quality Standards (GWQS) dated November 7, 2005. [Use the most recent version]

** For surface water use NJDEP NJAC 7:9B Surface Water Quality Standards, October 2006; **For NYSDEC Criteria- See VOC ***Footnote**

QAPP Worksheet #15: Reference Limits and Evaluation Table

Matrix: Groundwater, Surface Water**/***
Analytical Group: Target Compound List - Semi-Volatile Organic Compounds - Continued
Concentration Level: Low

Analyte	CAS Number	NJAC Groundwater Quality Standards (ug/L)*	NYS GW Quality Standards (ug/L)***	Project Quantiation Limit (ug/L)	Analytical Method – SOM01.2 Quantitation Limits (ug/L)
Benzo(a)anthracene	56-55-3	0.1			5
Benzo(a)pyrene	50-32-8	0.1			5
Benzo(b)fluoranthene	205-99-2	0.2			5
Benzo(g,h,i)perylene	191-24-2				5
Benzo(k)fluoranthene	207-08-9	0.5			5
Bis(2-Chloroethoxy)methane	111-91-1		5		5
Bis-(2-Chloroethyl) ether	111-44-4	7	1		5
bis(2-Ethylhexyl)phthalate	117-81-7	3	5		5
Butylbenzylphthalate	85-68-7	100			5
Caprolactam	105-60-2				5
Chrysene	218-01-9	5			5
Dibenzo(a,h)anthracene	53-70-3	0.3			5
Dibenzofuran	132-64-9				5
Diethylphthalate	84-66-2	6000			5
Dimethylphthalate	131-11-3				5
Di-n-butylphthalate	84-74-2	700	50		5
Di-n-octylphthalate	117-84-0	100			5
Fluoranthene	206-44-0	300			5
Fluorene	86-73-7	300			5
Hexachlorobenzene	118-74-1	0.02	0.04		5
Hexachlorobutadiene	87-68-3	1	0.5		5
Hexachlorocyclopentadiene	77-47-4	40	5		5
Hexachloroethane	67-72-1	7	5		5
Indeno(1,2,3-cd)pyrene	193-39-5	0.2			5
Isophorone	78-59-1	40			5
Naphthalene	91-20-3				5
Nitrobenzene	98-95-3	300	0.4		5
N-Nitrosodiphenylamine	86-30-6	10			5
N-Nitroso-di-n-propylamine	621-64-7	10			5
Pentachlorophenol	87-86-5	0.3	1		10
Phenanthrene	85-01-8				5
Phenol	108-95-2	2000	1		5
Pyrene	129-00-0	200			5

*NJDEP N.J.A.C. 7:9C, Ground Water Quality Standards (GWQS) dated November 7, 2005. [Use the most recent version]
** For surface water use NJDEP NJAC 7:9B Surface Water Quality Standards, October 2006; **For NYSDEC Criteria-See VOC ***Footnote**

QAPP Worksheet #15: Reference Limits and Evaluation Table

Matrix: Groundwater, Surface Water**/***
Analytical Group: Target Compound List – Pesticides
Concentration Level: Low

Analyte	CAS Number	NJAC Groundwater Quality Standards (ug/L)*	NYS Groundwater Quality Standards (ug/L)***	Project Quantiation Limit (ug/L)	Analytical Method – SOM01.2 Quantitation Limits (ug/L)
alpha-BHC	319-84-6	0.02			0.05
beta-BHC	319-85-7	0.04			0.05
delta-BHC	319-86-8				0.05
gamma-BHC (Lindane)	58-89-9	0.03			0.05
Heptachlor	76-44-8	0.05	0.04		0.05
Aldrin	309-00-2	0.04			0.05
Heptachlor epoxide	1024-57-3	0.2	0.03		0.05
Endosulfan I	959-98-8	40			0.05
Dieldrin	60-57-1	0.03	0.004		0.1
4,4'-DDE	72-55-9	0.1	0.2		0.1
Endrin	72-20-8	2			0.1
Endosulfan II	33213-65-9	0.4			0.1
4,4'-DDD	72-54-8	0.1	0.3		0.1
Endosulfan sulfate	1031-07-8	40			0.1
4,4'-DDT	50-29-3	0.1	0.2		0.1
Methoxychlor	72-43-5	40	35		0.5
Endrin ketone	53494-70-5		5		0.1
Endrin aldehyde	7421-93-4		5		0.1
alpha-Chlordane	5103-71-9				0.05
gamma-Chlordane	5103-74-2				0.05
Toxaphene	8001-35-2	2	0.06		5

*NJDEP N.J.A.C. 7:9C, Ground Water Quality Standards (GWQS) dated November 7, 2005. [Use the most recent version] http://www.nj.gov/dep/wms/bwqsa/gwqs.htm
** For surface water use NJDEP NJAC 7:9B Surface Water Quality Standards, October 2006
***NYSDEC NYCRR Title 6, Parts 700-706: Water Quality Regulations; Part 703: SurfaceWater and Groundwater Quality Standards and Groundwater Effluent Limitations, Amended August 1999; and Division of Water StandardsTechnical and Operational Guidance Series (TOGS 1.1.1), Ambient Water Quality Standards and Guuidance Values and Groundwater Effluent Limitations, June 1998 [Use the most recent version] http://www.dec.ny.gov/regs/4590.html

QAPP Worksheet #15: Reference Limits and Evaluation Table

Matrix: Groundwater, Surface Water**/***
Analytical Group: Target Compound List Aroclors (PCBs)
Concentration Level: Low

Analyte	CAS Number	NJAC Groundwater Quality Standards (ug/L)*	NYS Groundwater Quality Standards (ug/L)***	Project Quantiation Limit (ug/L)	Analytical Method – SOM01.2 Quantitation Limits (ug/L)
Aroclor-1016	12674-11-2	0.5	0.09		1
Aroclor-1221	11104-28-2	0.5	0.09		1
Aroclor-1232	11141-16-5	0.5	0.09		1
Aroclor-1242	53469-21-9	0.5	0.09		1
Aroclor-1248	12672-29-6	0.5	0.09		1
Aroclor-1254	11097-69-1	0.5	0.09		1
Aroclor-1260	11096-82-5	0.5	0.09		1
Aroclor-1262	37324-23-5	0.5	0.09		1
Aroclor-1268	11100-14-4	0.5	0.09		1

*NJDEP N.J.A.C. 7:9C, Ground Water Quality Standards (GWQS) dated November 7, 2005. [Use the most recent version] http://www.nj.gov/dep/wms/bwqsa/gwqs.htm
** For surface water use NJDEP NJAC 7:9B Surface Water Quality Standards, October 2006
***NYSDEC NYCRR Title 6, Parts 700-706: Water Quality Regulations; Part 703: SurfaceWater and Groundwater Quality Standards and Groundwater Effluent Limitations, Amended August 1999; and Division of Water StandardsTechnical and Operational Guidance Series (TOGS 1.1.1), Ambient Water Quality Standards and Guuidance Values and Groundwater Effluent Limitations, June 1998 [Use the most recent version] http://www.dec.ny.gov/regs/4590.html

QAPP Worksheet #15: Reference Limits and Evaluation Table

Matrix: Groundwater, Surface Water**/***
Analytical Group: Target Analyte List Inorganics (metals and cyanide)
Concentration Level: Low – ICP-AES and ICP-MS

Analyte	CAS Number	NJAC Groundwater Quality Standards (ug/L)*	NYS GW Quality Standards (ug/L)***	Project Quantiation Limit (ug/L)	Analytical Method – ILMO5.4 ICP-AES Quantitation Limits (ug/L)	Analytical Method – ILMO5.4 ICP-MS Quantitation Limits (ug/L)
Aluminum	7429-90-5	200			200	--
Antimony	7440-36-0	6	3		60	2
Arsenic	7440-38-2	3	25		10	1
Barium	7440-39-3	6000	1000		200	10
Beryllium	7440-41-7	1			5	1
Cadmium	7440-43-9	4	5		5	1
Calcium	7440-70-2				5000	--
Chromium	7440-47-3	70	50		10	2
Cobalt	7440-48-4				50	1
Copper	7440-50-8	1300	200		25	2
Iron	7439-89-6	300	300		100	--
Lead	7439-92-1	5	25		10	1
Magnesium	7439-95-4				5000	--
Manganese	7439-96-5	50	300		15	1
Mercury	7439-97-6	2	0.7		0.2	--
Nickel	7440-02-0	100	100		40	1
Potassium	2023695				5000	--
Selenium	7782-49-2	40	10		35	5
Silver	7440-22-4	40	50		10	1
Sodium	7440-23-5	50000	20000		5000	--
Thallium	7440-28-0	2			25	1
Vanadium	7440-62-2				50	5
Zinc	7440-66-6	2000			60	2
Cyanide	57-12-5	100	200		10	--

*NJDEP N.J.A.C. 7:9C, Ground Water Quality Standards (GWQS) dated November 7, 2005. [Use the most recent version] http://www.nj.gov/dep/wms/bwqsa/gwqs.htm

** For surface water use NJDEP NJAC 7:9B Surface Water Quality Standards, October 2006

***NYSDEC NYCRR Title 6, Parts 700-706: Water Quality Regulations; Part 703: SurfaceWater and Groundwater Quality Standards and Groundwater Effluent Limitations, Amended August 1999; and Division of Water StandardsTechnical and Operational Guidance Series (TOGS 1.1.1), Ambient Water Quality Standards and Guuidance Values and Groundwater Effluent Limitations, June 1998 [Use the most recent version] http://www.dec.ny.gov/regs/4590.html

QAPP Worksheet #16: Project Schedule/Timeline Table

Activities	Organization	Dates (MM/DD/YY)		Deliverable	Deliverable Due Date
		Anticipated Date(s) of Initiation	Anticipated Date of Completion		
Preparation of QAPP	TBD	Prior to sampling date	TBD	QAPP	TBD
Review of QAPP	TBD	Prior to sampling date	TBD	Approved QAPP	TBD
Preparation of Health and Safety Plan	TBD	Prior to sampling date	TBD	HASP	TBD
Procurement of Field Equipment	TBD	Prior to sampling date	TBD	N/A	TBD
Laboratory Request	TBD	Prior to sampling date	TBD	Analytical/CLP Request Form	TBD
Field Reconnaissance/Access	TBD	TBD	TBD	N/A	N/A
Collection of Field Samples	TBD	TBD	TBD	N/A	N/A
Preliminary Lasboratory Results	TBD	TBD	TBD	Email/Fax Draft results	TBD
Laboratory Package Received		TBD	TBD	Unvalidated data package	TBD
Validation of Laboratory Results	TBD	TBD	TBD	Validated data Packages	TBD
Data Evaluation/ Preparation of Final Report	TBD	TBD	TBD	Final Report	TBD

QAPP Worksheet #17: Sampling Design and Rationale

Collect approximately [number and type] samples from [location]. The [type] samples will be analyzed by [laboratory]. Include map, QA/QC samples, sampling methods and SOPs, Refer to Worksheet #20-Field Quality Control Sample Summary Table.

The site-specific QAPP will provide sufficient detail to allow the rationale for and provide a historical perspective for the sampling event. It will state the problem to be solved or decision to be made. In addition, the site-specific QAPP will describe the measurements that will be made during the course of the project; maps, tables, or geographic locations; applicable technical regulations; program-specific quality standards criteria and objectives; any special personnel and equipment requirements; assessment tools needed; a schedule of the work to be performed; and project and quality control records required, including the type of reports required.

-Include project team's rationale for choosing the sampling design. (e.g., grid system, biased statistical approach)
-Identify critical vs. background locations
-Decision tree that documents the critical decision points of the location process (especially onsite screening techniques used to identify locations)
-The criteria for selecting "hot-spots," If biased or judgmental sampling performed
-Attached SOP for GIS/GPS and other references

QAPP Worksheet #18: Sampling Locations and Methods/SOP Requirements Table (Example)

Matrix	Sampling Location(s)	Units	Analytical Group(s)	Concentration Level	No. of Samples (identify field duplicates)	Sampling SOP Reference	Rationale for Sampling Location
Gas		ug/m^3	VOCs	Low - Scan	e.g., 15	SOP#1704	
Soil		Mg/kg	SVOCs	Low	e.g., 12	SOP#2012	
Sediment		Mg/kg	Pesticide	Low	e.g., 12	SOP#2016	
		Mg/kg	Pesticide	Medium	e.g., 12	SOP#2016	
Groundwater		Ug/L	VOCs	Trace	e.g., 12	SOP#2007	
		Ug/L	Metals	ICP/AES	e.g., 12	SOP#2007	
		Ug/L	Metals	ICP/MS	e.g., 19	SOP#2007	
Surface Water		Ug/L	VOCs	Trace	e.g., 12	SOP#2013	
		Ug/L	SVOCs	Low	e.g., 12	SOP#2013	
		Ug/L	Pesticides	Low	e.g., 12	SOP#2013	
		Ug/L	PCBs	Low	e.g., 12	SOP#2013	
		Ug/L	Metals	ICP/AES	e.g., 19	SOP#2013	

The website for EPA-ERT SOPs is: http://www.ert.org/mainContent.asp?section=Products&subsection=List

QAPP Worksheet #19: Analytical SOP Requirements Table

Matrix	No. of Samples	Analytical Group [Lab Assignment]	Concentration Level	Analytical and Preparation Method/SOP Reference	Sample Volume	Containers (number, size, and type)	Preservation Requirements	Maximum Holding Time (preparation/ analysis)
Gas		Soil Gas [ ]	Low	TO-15 scan	6 L	SUMMA canister	NA	30 days
		Indoor Air	Low	TO-15 SIM	6 L	SUMMA canister	NA	30 days
Soil		TCL Volatile Organics [CLP]	Low	SOM01.2	15 grams	(3) EnCore Samplers	Cool to 4°C	48 hours (from time of sample collection)
		Percent Moisture [CLP]	NA	SOM01.2	50 grams	(1) 4 oz. jar	NA	NA
		TCL Semi-Volatile Organic Compounds [CLP]	Low	SOM01.2	100 grams	(1) 8 oz. glass jar w/Teflon lined cap	Cool to 4°C	14 days extract; 40 days analyze
		TCL Pesticide Compounds [CLP]	Low	SOM01.2	100 grams	(1) 8 oz. glass jar w/Teflon lined cap	Cool to 4°C	14 days extract; 40 days analyze
		TCL PCB Compounds [CLP]	Low	SOM01.2	100 grams	Included with Pesticides	Cool to 4°C	14 days extract; 40 days analyze
		TAL Metals+ Hg [CLP]	Low	ILM05.4	250 grams	(1) 8 oz. glass jar w/Teflon lined cap	Cool to 4°C	180 days (Hg-28 days)
		Cyanide	Low	ILM05.4	250 grams	Included with TAL Metals	Cool to 4°C	14 days

QAPP Worksheet #19: Analytical SOP Requirements Table

Matrix	No. of Samples	Analytical Group [Lab Assignment]	Concentration Level	Analytical and Preparation Method/SOP Reference	Sample Volume	Containers (number, size, and type)	Preservation Requirements	Maximum Holding Time (preparation/ analysis)
Aqueous		Low Concentration Volatile Organics [CLP]	Trace or Low	SOM01.2	120 ml	(3) 40 ml VOA vials w/Teflon lined septum	1:1 HCl to pH<2; cool to 4°C	14 days; 7 days, if not preserved
		Semi-Volatile Organics [CLP]	Low	SOM01.2	1000 ml	(2) 1L amber glass bottles w/Teflon lined cap	Cool to 4°C	7 days extract, 40 days analyze
		Pesticide Compounds [CLP]	Low	SOM01.2	1000 ml	(2) 1L amber glass bottle w/Teflon lined cap	Cool to 4°C	7 days extract, 40 days analyze
		PCB Compounds [CLP]	Low	SOM01.2	1000 ml	Included with pesticides	Cool to 4°C	7 days extract, 40 days analyze
		TAL Metals+ Hg [CLP]	Low	ILM05.4	250 ml	(1) 1 L HDPE	HNO_3 to pH<2; cool to 4°C	6 months (Hg-28 days)
		Cyanide	Low	ILM05.4	250 ml	(1) 1 L HDPE	NaOH to pH>12; cool to 4°C	14 days
Equipment Blanks		Trace Concentration Volatile Organics [CLP]	Low	SOM01.2	120 ml	(3) 40 ml VOA vials w/Teflon lined septum	1:1 HCl to pH<2; cool to 4°C	10 days
		Semi-Volatile Organics [CLP]	Low	SOM01.2	1000 ml	(2) 1L amber glass bottles w/Teflon lined cap	Cool to 4°C	7 days extract, 40 days analyze
		Pesticide Compounds [CLP]	Low	SOM01.2	1000 ml	(2) 1L amber glass bottle w/Teflon lined cap	Cool to 4°C	7 days extract, 40 days analyze
		PCB Compounds [CLP]	Low	SOM01.2	1000 ml	Included with Pesticides	Cool to 4°C	7 days extract, 40 days analyze
		TAL Metals [CLP]	Low	ILM05.4	250 ml	(1) 1 L PE	HNO_3 to pH<2; cool to 4°C	6 months (Hg-28 days)
Trip Blanks		Trace Concentration Volatile Organics [CLP / DESA]	Low	SOM01.2	120 ml	(4) 40 ml VOA vials w/Teflon lined septum	1:1 HCl to pH<2; cool to 4°C	10 days

QAPP Worksheet #20: Field Quality Control Sample Summary Table

Matrix	Analytical Group	Concentration Level	Analytical and Preparation SOP Reference	No. of Sampling Locations	No. of Field Duplicate Pairs	No. of Extra Volume Laboratory QC (e.g., MS/MSD) Samples	No. of Equipment Blanks	No. of Trip. Blanks	No of PE Samples	Total No. of Samples to Lab
Soil Gas	Soil Gas	Low	TO-15 scan	TBD	1/20 samples per matrix	1/20 samples per matrix	As per equipment type	NR	As required	TBD
	Indoor Air	Low	TO-15 SIM	TBD						
Soil	TCL Volatile Organics	Low	SOM01.2	TBD	1/20 samples per matrix	1/20 samples per matrix	As per equipment type	NR	As required	TBD
	Percent Moisture	NA	SOM01.2	TBD		1/20 samples per matrix	As per equipment type	NR	As required	TBD
	TCL Semi-Volatile Organic Compounds	Low	SOM01.2	TBD		1/20 samples per matrix	As per equipment type	NR	As required	TBD
	TCL Pesticide Compounds	Low	SOM01.2	TBD		1/20 samples per matrix	As per equipment type	NR	As required	TBD
	TCL PCB Compounds	Low	SOM01.2	TBD		1/20 samples per matrix	As per equipment type	NR	As required	TBD
	TAL Metals	Low	ILM05.4	TBD		1/20 samples per matrix	As per equipment type	NR	As required	TBD
Aqueous	Trace Concentration Volatile Organics	Low	SOM01.2	TBD	1/20 samples per matrix	1/20 samples per matrix	As per equipment type	As required	As required	TBD
	Semi-Volatile Organics	Low	SOM01.2	TBD		1/20 samples per matrix	As per equipment type	NR	As required	TBD
	Pesticide Compounds	Low	SOM01.2	TBD		1/20 samples per matrix	As per equipment type	NR	As required	TBD
	PCB Compounds	Low	SOM01.2	TBD		1/20 samples per matrix	As per equipment type	NR	As required	TBD
	TAL Metals	Low	ILM05.4	TBD		1/20 samples per matrix	As per equipment type	NR	As required	TBD

NR – not required

QAPP Worksheet #20
Field Quality Control Sample Summary Table

(SW-846)

Matrix	Analytical Group	Conc. Level	Analytical and Preparation SOP Reference[1]	No. of Sampling Locations	No. of Field Duplicate Pairs[1]	No. of MS/MSD[1]	No. of Field Blanks[2]	No. of PT Samples	Total No. of Samples to Lab
Soil	TCL Volatile Organics	Low	SW 846, Method 8260B		1/20 Samples per matrix	1/20 Samples per matrix	As per equipment type	As Required	
	TCL Semi-Volatiles Organic Compounds	Low	SW 846, Method 8270C						
	TCL Pesticide Compounds	Low	SW 846, Method 8081B						
	TCL PCB Compounds	Low	SW 846, Method 8082A						
	Herbicides	Low	SW 846, Method 8151A						
	TAL Metals, Mercury, and Cyanide	Low	SW 846, Method 6010B, 7471, and 9012B						
Aqueous	Trace Concentration Volatile Organics	Low	SW 846, Method 8260B		1/20 Samples per matrix	1/20 Samples per matrix	As per equipment type	As Required	
	Semi-Volatiles Organic Compounds	Low	SW 846, Method 8270C						
	Pesticide Compounds	Low	SW 846, Method 8081A						
	PCB Compounds	Low	SW 846, Method 8082A						
	TAL Metals, Mercury, and Cyanide	Low	SW 846, Method 6010B, 7470, and 9012B						

1 MS/MSD and field duplicate samples will be collected for each matrix at a ratio of 1 per 20 samples.
2 Field/Rinsate Blank samples will be collected based on non-dedicated or dedicated equipment is used.
* Refer to Worksheet #28

QAPP Worksheet #21: Project Sampling SOP References Table
(Example for EPA Region 2 DESA/HWSB/SST)

Reference Number	Title, Revision Date and/or Number	Originating Organization	Equipment Type	Modified for Project Work? (Y/N)	Comments
SST-01	Field Oversight (including split sampling and duplicates); Performing Oversight of CERCLA Field Operations Rev. 0, February 2007	EPA/DESA/HWSB/SST	N/A		
SST-02	Field Portable X-Ray Fluorescence Spectrometry for the Determination of Elemental Concentrations in Soil and Sediment Rev. 0 February 2007	EPA/DESA/HWSB/SST	XRF meter and accessories		
SST-04	Soil Gas Sampling: Slam Bar/Power Hammer Technique Rev. 0 February 2007	EPA/DESA/HWSB/SST	Soil Gas kit with 3' rods and hammer drill, Teflon lined tubing, Tedlar bags and vaccuum box, pump,		
SST-06	Photo-Ionization Detector SOP Rev 1 June 2007	EPA/DESA/HWSB/SST	PID meter and calibration equipment		
SST-07	Groundwater Sampling Procedure: Low Stress (Low flow) Purging and Sampling Rev 0 February 2007	EPA/DESA/HWSB/SST	Submersible, bladder or peristaltic (inorganic only) pump, Teflon lined tubing, water level meter, parameter meter, power source		
SST-08	Indoor Air Sampling with SUMMA Canisters Rev 3 February 2007	EPA/DESA/HWSB/SST	SUMMA Canisters with pressure gauge, wrench, Teflon tubing		
SST-09	Potable Well Sampling Rev 1 February 2007	EPA/DESA/HWSB/SST	Hoses, buckets, wrench		
SOP #2016	Sediment Sampling from Compendium of ERT Surface Water and Sediment Sampling Procedures January 1991	EPA/OSWER/ERT	Flags, stainless steel bowls, scoops and augers, dredge, coring device		
SOP #2013	Surface Water Sampling from Compendium of ERT Surface Water and Sediment Sampling Procedures January 1991	EPA/OSWER/ERT	Flags, stainless steel bowls, scoops and augers, dredge, coring device		
SOP #2012	Soil Sampling from the Compendium of ERT Soil Sampling and Surface Geophysics Procedures.	EPA/OSWER/ERT	Stainless steel bowls, scoops and augers		

QAPP Worksheet #21: Project Sampling SOP References Table
(Example for EPA ERT SOPs)

Reference Number	Title, Revision Date and / or Number	Originating Organization	Equipment Type	Modified for Project Work? (Y/N)	Comments
SOP#1703	SUMMA Canisters Cleaning Procedure	EPA/OSWER/ERT	SUMMA Canisters		
SOP#1704	SUMMA Canisters Sampling	EPA/OSWER/ERT	SUMMA Canister with pressure gauge, wrench, Teflon tubing		
SOP#1706	SUMMA Canisters Field Standards	EPA/OSWER/ERT	SUMMA Canister, certified gas standard		
SOP#2114	Photo-Ionization Detector (PID) HNu	EPA/OSWER/ERT	PID meter and calibration equipment		
SOP#2008	General Air Sampling Guidelines, Rev. 0.0 November 1994	EPA/OSWER/ERT	FID, PID, RAM, CGI, Colorimetric Tubes, Meteorological Station		
SOP#2015	Asbestos Sampling, Rev. 0.0 November 1994	EPA/OSWER/ERT	Sampling Pumps, Sample Canisters		
SOP#2102	Tedlar Bag Sampling, Rev. 0.0 October 1994	EPA/OSWER/ERT	Tedlar Bags, Vacuum Pump(s)		
SOP#2103	Charcoal Tube Sampling in Ambient Air, Rev. 0.0 October 1994	EPA/OSWER/ERT	Charcoal Tubes, Personal Sampling Pump		
SOP#2104	Tenax/CMS Tube Sampling, Rev. 0.0 October 1994	EPA/OSWER/ERT	Tenax/CMS Tubes, Sampling Pump		
SOP#2119	Air Sampling of Metals (NIOSH Method 7300, Elements);	EPA/OSWER/ERT	Air Pumps, MCE Filter Cassette		
SOP#2121	High Volume Polyurethane Foam Sampling; Rev. 0.0 August 1995	EPA/OSWER/ERT	PUF Samplers, Manometer, Sampling Pumps		
SOP#2001	General Field Sampling Guidelines (all media); Rev. 0.0 August 1994	EPA/OSWER/ERT	Site Specific		
SOP#2006	Sampling Equipment Decontamination (all media); Rev 0.0 August 1994	EPA/OSWER/ERT	Non-phosphate Detergent, Tap Water. Distilled/Deionized Water, 10% Nitric Acid, Solvent Rinse (Pesticide Grade)		
SOP#2007	Groundwater Well Sampling	EPA/OSWER/ERT	Water Level Indicator, Bailer, Submersible Pump or Similar, Water Meters		
SOP#2009	Drum Sampling; Rev 0.0 November 1994	EPA/OSWER/ERT	Drum Thief or Coliwasa		
SOP#2010	Tank Sampling	EPA/OSWER/ERT	Bailer, Glass Thief, Coliwasa. Sludge Judge or Similar		

QAPP Worksheet #21: Project Sampling SOP References Table
(Example for EPA ERT SOPs)

Reference Number	Title, Revision Date and / or Number	Originating Organization	Equipment Type	Modified for Project Work? (Y/N)	Comments
SOP#2011	Chip, Wipe, and Sweep Sampling	EPA/OSWER/ERT	Hammer and Chisel, Solvent wetted Gauze Pad, Dedicated Brush and Pan		
SOP#2017	Waste Pile Sampling	EPA/OSWER/ERT	Scoop, Shovel, Bucket Auger, or Similar		

Note: The website for EPA-ERT SOPs is: www.ert.org/mainContent.asp?section=Products&subsection=List

QAPP Worksheet #22: Field Equipment Calibration, Maintenance, Testing, and Inspection Table

Field Equipment	Calibration Activity	Maintenance Activity	Testing/ Inspection Activity	Frequency	Acceptance Criteria	Corrective Action	Responsible Person	SOP Reference
Alpha Beta Sample Counter Model 3030 #1 and # 2	Annual manufacturer calibration	AC is primary power. Keep Internal trickle-charged battery with an approximate life of 8 hours.	Visually inspect the unit	Yearly	Follow equipment instruction	Replace batteries or replace unit if not working correctly	Equipment Vendor	
AP2Ce #1 # 2, Chemical Warfare Agent Detector	Check with a confidence test before each use	Need 7.3V lithium battery pack.	Extract the battery slide unit from the body of the AP2C.	Yearly	Follow equipment instruction	Replace batteries or replace unit if not working correctly	Equipment Vendor	
AP4C #1and #2								
APD 2000	(Self Calibrating)	Keep extra "C" batteries (6)	Check with "G" and "H" canisters provided	Yearly	NA	Replace batteries or replace unit if not working correctly	Equipment Vendor	
MultiRAE Plus Multiple Gases	Calibrate with Zero Air; span gas of 58% LEL 15% O_2 10 ppm H_2S CH_4	Check/ replace battery/ Clean tip or bulb if necessary	Bump Test	Prior to day's activities; anytime anomaly suspected	LEL 52% - 64% (5%) O_2 13% - 17% (5%) H_2S 9 – 12 ppm (1ppm) CH_4 . NA	Replace battery or Replace Unit	Equipment Vendor	
MultiRAE Plus PID	Calibrate with Zero air; span gas of 100 ppm Isobutylene	Check/ replace battery/ Clean tip or bulb if necessary	Bump Test	Prior to day's activities; anytime anomaly suspected	+/- 5 units	Replace battery, or Replace Unit	Equipment Vendor	
CDS KIT	No calibration is necessary	NA	Leak test on pump and reset pump counter to zero	Flush the pump with fresh air after each use to clear out remaining vapor.	See specific tubes for details	NA	Equipment Vendor	
CDS - 1	No calibration is necessary	NA	Leak test on pump and reset pump counter to zero	Flush the pump with fresh air after each use to clear out remaining vapor.	See specific tubes for details	NA	Equipment Vendor	

Field Equipment	Calibration Activity	Maintenance Activity	Testing/ Inspection Activity	Frequency	Acceptance Criteria	Corrective Action	Responsible Person	SOP Reference
CDS -V	No calibration is necessary	NA	Leak test on pump and reset pump counter to zero	Flush the pump with fresh air after each use to clear out remaining vapor.	See specific tubes for details	NA	Equipment Vendor	

QAPP Worksheet #22: Field Equipment Calibration, Maintenance, Testing, and Inspection Table

Field Equipment	Calibration Activity	Maintenance Activity	Testing/ Inspection Activity	Frequency	Acceptance Criteria	Corrective Action	Responsible Person	SOP Reference
CMS KIT	No calibration is required	Four alkaline AA batteries are required.	NA	Yearly	Various depending on individuals chemicals.	Replace battery, or Replace Unit	Equipment Vendor	
DataRAM 4	Select auto 0/initiailize	Change Dust Filter	NA	Annual factory cleaning and calibration required	NA	Change Sensor or Factory Service and Calibration	Equipment Vendor	
Geiger Counter 14c	NA	Two alkaline "D" batteries or Ni-Cd rechargeable bettries		Yearly	NA	Replace battery, or Replace Unit	Equipment Vendor	
Haz-cat Kit	NA	NA	NA	NA	NA	NA	Site Personnel	
Jerome 431-X	Factory calibration	Nickel-Cadmium battery	Mercury functional test to check calibration of the instrument	Monthly	NA	Factory calibration monthly	Equipment Vendor	
Lumex Hg Vapor Analyzer #1	Performs auto-calibration every time it's turned on.	Rechargeble Ni-Cd battery	Factory calibration	NA	NA	Replace battery, or Replace Unit	Equipment Vendor	
MultiRAE Plus PID	Calibrate with Zero air; span gas of 100 ppm Isobutylene	Check/ replace battery/ Clean tip or bulb if necessary	Bump Test	Prior to day's activities; anytime anomaly suspected	+/- 5 units	Replace battery, or Replace Unit	Equipment Vendor and	
Neutron Counter Model 15	Calibration Annualy by manufacturer	Two D-cell alkaline batteries	Bump test	Yearly	NA	Replace battery, or Replace Unit	Equipment Vendor and	
Personal Data Ram, PDR-1000	Calibration Annualy by manufacturer	Nine volt alkaline battery or rechargeable battery	Calibration performed by Manufacturer	Yearly	NA	Replace battery, or Replace Unit	Equipment Vendor and	

QAPP Worksheet #22: Field Equipment Calibration, Maintenance, Testing, and Inspection Table

Field Equipment	Calibration Activity	Maintenance Activity	Testing/ Inspection Activity	Frequency	Acceptance Criteria	Corrective Action	Responsible Person	SOP Reference
Photovac MicroFID	Calibrate with zero air, then span gas of 100 ppm methane	Check hydrogen remaining Check Internal Filter	Bump Test	Prior to day's activities; anytime anomaly suspected	+/- 5%	Refill Hydrogen canister or Replace Unit	Equipment Vendor	
Ludlum Model Micro 19	Annual manufacturer calibration	Two alkaline "D" Cell batteries	Check for operation: CS 137 PO 210 CO 60 SR 90	Yearly	NA	Check batteries or call Service Technician	Equipment Vendor	
TVA – 1000B (PID/FID Combo)	Annual Manufacturer calibration	Check calibration date on tag or stiker.. Need rechargeable ni0Cd battery	NA	Prior to day's activities; anytime anomaly suspected	FID: Zero = <5000 counts Span counts = 175-250 per ppm methane PID: Zero = <2000 counts Span counts = 3500-6000 per ppm isobutylene (RESPONSE FACTORS)	Check batteries, bulb, and filters. Service if needed	Equipment Vendor	
Universal Sampler Pump	Connect to Bios DryCal DC-Lite Primary Flow Meter	Battery Check	NA	Prior to day's activities; anytime anomaly suspected	NA	Replace batteries or pump if not working properly	Equipment Vendor	
Trimble® GeoXT™ handheld								

QAPP Worksheet #22: Field Equipment Calibration, Maintenance, Testing, and Inspection Table

Field Equipment	Calibration Activity	Maintenance Activity	Testing/ Inspection Activity	Frequency	Acceptance Criteria		Corrective Action	Responsible Person	SOP Reference
RADeCO High Volume Air Sampler	Requires re-calibration with Model C-828	9 VDC used for back-up.	NA	NA	+/- 5 %		Check batteries, bulb, and filters. Service if needed	Equipment Vendor	
Summa Canisters and flow regulators	Done by Laboratory before receipt	NA	NA	NA	NA		Check Vacuum periodically during operation	Site personnel	1706*
YSI or equivalent	Calibrate with standard solutions	NA	NA	Prior to day's activities; end of day's activities; anytime anomaly suspected	pH Meter	+/- 0.1 units	Clean probe, replace battery, replace membrane, replace probe	Contractor Project Leader	
					Dissolved Oxygen	± 3%			
					Specific Conductivity	± 1%			
					Temperature	± 0.1 °C			
					Turbidity	± 2 NTU			
					Temperature	± 0.1 °C			
					Turbidity	± 2 NTU			
Water Level Indicator or Interface Probe	NA	NA	Visual inspection	Prior to day's activities	No defects noted		Replace	Contractor Project Leader	
Innove X-XRF Manual_ch5S-v21, Soil Analysis	Utilize Empirical Calibration Method using site-specific standards.	Change batteries, keep clean and install protective cap over Kapton sampling window when not in use.	Visual inspection	Prior to day's activities	Pb: 400 ppm		Check the batteries, and iPAQ	Contractor Project Leader	

QAPP Worksheet #23: Analytical SOP References Table

Reference Number	Title, Revision Date, and/or Number	Definitive or Screening Data	Analytical Group	Instrument	Organization Performing Analysis	Modified for Project Work? (Y/N)*
TO-15	Determination Of Volatile Organic Compounds (VOCs) In Air Collected In Specially-Prepared Canisters And Analyzed By Gas Chromatography/Mass Spectrometry (GC/MS)	Definitive	Gases	GC/MS	National Non-RAS Laboratory	
SOM01.2	USEPA Contract Laboratory Program Statement of Work for Multi-Media, Multi-Concentration Organic Analysis,; October 2006	Definitive	Target Compound List Volatile Organics	GC/MS	CLP RAS Laboratory	
SOM01.2	USEPA Contract Laboratory Program Statement of Work for Multi-Media, Multi-Concentration Organic Analysis,; October 2006	Definitive	Trace Concentration Volatile Organics	GC/MS	CLP RAS Laboratory	
SOM01.2	USEPA Contract Laboratory Program Statement of Work for Multi-Media, Multi-Concentration Organic Analysis,; October 2006	Definitive	Target Compound List Semi-Volatile Organics	GC/MS	CLP RAS Laboratory	
SOM01.2	USEPA Contract Laboratory Program Statement of Work for Multi-Media, Multi-Concentration Organic Analysis,; October 2006	Definitive	Target Compound List Pesticides	GC/ECD	CLP RAS Laboratory	

- If yes, explain the modification

QAPP Worksheet #23: Analytical SOP References Table

Reference Number	Title, Revision Date, and/or Number	Definitive or Screening Data	Analytical Group	Instrument	Organization Performing Analysis	Modified for Project Work? (Y/N)*
SOM01.2	USEPA Contract Laboratory Program Statement of Work for Multi-Media, Multi-Concentration Organic Analysis,; October 2006	Definitive	Target Compound List PCBs	GC/ECD	CLP RAS Laboratory	
ILM05.4	USEPA Contract Laboratory Program Statement of Work for Multi-Media, Multi-Concentration Inorganic Analysis,; December 2006	Definitive	Target Analyte List Metals	ICP-AES / ICP-MS	CLP RAS Laboratory	

If yes, explain the modification

Note: Note: See Worksheet #30B for additional chemical, drinking water, and asbestos methods.

QAPP Worksheet #24: Analytical Instrument Calibration Table

Instrument	Calibration Procedure	Frequency of Calibration	Acceptance Criteria	Corrective Action (CA)	Person Responsible for CA	SOP Reference
GC/MS	See TO-15	Initial calibration: upon award of the contract, whenever the laboratory takes corrective action which may change or affect the initial calibration criteria (e.g., ion source cleaning or repair, column replacement, etc.), or if the continuing calibration acceptance criteria have not been met. Continuing calibration: Following initial calibration verification, once every 12 hours, end of run. GC/MS Tuning with 4-Bromoflurobenzene (BFB): Beginning of each 12 hour period during which standards and samples are analyzed. Retention Time Evaluation: each analysis.	Initial calibration/ Continuing calibration: relative response factor (RRF) greater than or equal to minimum acceptable response factor listed in Table 5 of procedure; %RSD must be less than or equal to value listed in Table 5 of procedure. GC/MS Tuning: See ion abundance table in TO-15. Retention Time Evaluation: +/- 0.50 minute of the internal standard retention time in the associated calibration check verification	Initial calibration: inspect system for problems (e.g., clean ion source, change the column, service the purge and trap device), correct problem, re-calibrate. Continuing calibration: inspect system, recalibrate the instrument, reanalyze samples. GC/MS Tuning: inspect the system, identify problem. MS tune criteria must be met before calibration Retention time evaluation: re-calibrate and verify, re-analyze samples back to the last good calibration check verification	EPA National Non-RAS Laboratory GC/MS Technician; Subcontractor Laboratory GC/MS Technician	TO-15

QAPP Worksheet #24: Analytical Instrument Calibration Table

Instrument	Calibration Procedure	Frequency of Calibration	Acceptance Criteria	Corrective Action (CA)	Person Responsible for CA	SOP Reference
GC/MS	See SOM01.2	Initial calibration: upon award of the contract, whenever the laboratory takes corrective action which may change or affect the initial calibration criteria (e.g., ion source cleaning or repair, column replacement, etc.), or if the continuing calibration acceptance criteria have not been met. Continuing calibration: Once every 12 hours	Initial calibration/ Continuing calibration: relative response factor (RRF) greater than or equal to minimum acceptable response factor listed in Table 5 of procedure; %RSD must be less than or equal to value listed in Table 5 of procedure.	Initial calibration: inspect system for problems (e.g., clean ion source, change the column, service the purge and trap device), correct problem, re-calibrate. Continuing calibration: inspect system, recalibrate the instrument, and reanalyze samples.	EPA CLP RAS Laboratory GC/MS Technician	SOM01.2
GC/ECD	See SOM01.2	Initial calibration: upon award of the contract, whenever major instrument maintenance or modification is performed or if the calibration verification technical acceptance criteria have not been met. Calibration verification: Once every 12 hours	Initial calibration/ Calibration verification: resolution between two adjacent peaks must be greater than or equal to 60.0 percent, single components must be greater than or equal to 90.0 percent resolved, RTs within the RT window, %D must be greater than or equal to -25 percent and less than or equal to 25 percent, %RSD must be less than or equal to 20.0 percent.	Initial calibration: inspect the system (e.g., change the column, bake out the detector, clean the injection port) , correct problem, re-calibrate. Calibration verification: inspect system, recalibrate the instrument, and reanalyze samples.	EPA CLP RAS Laboratory GC/ECD Technician	SOM01.2

QAPP Worksheet #24: Analytical Instrument Calibration Table

Instrument	Calibration Procedure	Frequency of Calibration	Acceptance Criteria	Corrective Action (CA)	Person Responsible for CA	SOP Reference
ICP-AES / ICP-MS	See ILM05.4; as per instrument manufacturer's recommended procedures	ICP-AES or ICP-MS Initial calibration: daily or once every 24 hours and each time the instrument is set up. ICP-AES or ICP-MS Continuing calibration: beginning and end of run, and frequency of 10% or every 2 hours during an analysis run.	ICP-AES: As per instrument manufacturer's recommended procedures, with at least 2 standards. ICP-MS: As per instrument manufacturer's recommended procedures, with at least 2 standards. A minimum of three replicate integrations are required for data acquisition.	ICP-AES or ICP-MS: inspect the system, correct problem, re-calibrate, and re-analyze samples.	EPA CLP RAS Laboratory ICP-AES / ICP-MS Technician	ILM05.4
YSI	Calibrate with standard solutions; as per instrument manufacturer's recommended procedures	Prior to day's activities; end of day's activities; anytime anomaly suspected	+/- 0.1 units	Clean probe, replace battery, replace membrane, replace probe	Site Project Leader	Manufacturer's Instructions
La Motte Turbidity Meter	Calibrate with standard solutions; as per instrument manufacturer's recommended procedures	Prior to day's activities; end of day's activities; anytime anomaly suspected	Test vials should be clean, scratch freeand in same position for test.	Replace battery, replace standards, replace bottle, replace lightbulb	Site Project Leader	Manufacturer's Instructions

QAPP Worksheet #25: Analytical Instrument and Equipment Maintenance, Testing, and Inspection Table

Instrument/ Equipment	Maintenance Activity	Testing/Inspection Activity	Frequency	Acceptance Criteria	Corrective Action	Responsible Person	SOP Reference[1]
GC/MS	See TO-15; as per instrument manufacturer's recommendations	See TO-15; as per instrument manufacturer's recommendations	See TO-15; as per instrument manufacturer's recommendations	Acceptable re-calibration; see TO-15	Inspect the system, correct problem, re-calibrate and/or reanalyze samples.	EPA National Non-RAS Laboratory GC/MS Technician	TO-15
GC/MS	See SOM01.2; as per instrument manufacturer's recommendations	See SOM01.2; as per instrument manufacturer's recommendations	See SOM01.2; as per instrument manufacturer's recommendations	Acceptable re-calibration; see SOM01.2	Inspect the system, correct problem, re-calibrate and/or reanalyze samples.	EPA CLP RAS Laboratory GC/MS Technician	SOM01.2
GC/ECD	See SOM01.2; as per instrument manufacturer's recommendations	See SOM01.2; as per instrument manufacturer's recommendations	See SOM01.2; as per instrument manufacturer's recommendations	Acceptable re-calibration; see SOM01.2	Inspect the system, correct problem, re-calibrate and/or reanalyze samples.	EPA CLP RAS Laboratory GC/ECD Technician	SOM01.2
ICP-AES / ICP-MS	As per instrument manufacturer's recommendations	As per instrument manufacturer's recommendations; check connections	As per instrument manufacturer's recommendations	Acceptable re-calibration; see ILM05.4	Inspect the system, correct problem, re-calibrate and/or reanalyze samples.	EPA CLP RAS Laboratory ICP-AES / ICP-MS Technician	ILM05.4
YSI Multi-parameter meter	Check/replace battery	Visual inspection	Prior to day's activities; anytime anomaly suspected	No visual defects; +/- 0.1 units	Replace battery; replace probe	Site Project Leader	Manufacturer's Instructions
LaMotte Turbidity Meter	Check/replace battery	Visual inspection	Prior to day's activities; anytime anomaly suspected	Test vials should be clean, scratch freeand in same position for test.	Replace battery; replace light bulb	Site Project Leader	Manufacturer's Instructions

QAPP Worksheet #26A: Sample Handling System
(CLP-RAS and Non-RAS Laboratory)

SAMPLE COLLECTION, PACKAGING, AND SHIPMENT
Sample Collection (Personnel/Organization): [ ]
Sample Packaging (Personnel/Organization): [ ]
Coordination of Shipment (Personnel/Organization): [ ]
Type of Shipment/Carrier: Federal Express; UPS; etc.
SAMPLE RECEIPT AND ANALYSIS
Sample Receipt (Personnel/Organization): Sample Custodian, EPA CLP RAS Laboratory//National Non-RAS Laboratory
Sample Custody and Storage (Personnel/Organization): Sample Custodian, EPA CLP RAS Laboratory//National Non-RAS Laboratory
Sample Preparation (Personnel/Organization): Sample Technicians, EPA CLP RAS Laboratory//National Non-RAS Laboratory
Sample Determinative Analysis (Personnel/Organization): Sample Technicians, EPA CLP RAS Laboratory//National Non-RAS Laboratory
SAMPLE ARCHIVING
Field Sample Storage (No. of days from sample collection): Samples to be shipped within [ ], and arrive at laboratory within 24 hours (1 day) of sample shipment
Sample Extract/Digestate Storage (No. of days from extraction/digestion): As per analytical methodology; see Worksheet #19
SAMPLE DISPOSAL
Personnel/Organization: Sample Technicians, EPA CLP RAS Laboratory/ National Non-RAS Laboratory
Number of Days from Analysis: Until analysis and QA/QC checks are completed; as per analytical methodology; see Worksheet #19.

QAPP Worksheet #27: Sample Custody Requirements

Sample Identification Procedures: **E**ach sample will be labeled with the site identification code and a sample type letter code and number that depicts a specific location. Each sample will also be labeled with a CLP or Non-CLP assigned number. Depending on the type of sample, additional information such as depth, sampling round, date, etc. will be added.

Field Sample Custody Procedures (sample collection, packaging, shipment, and delivery to laboratory): Each sample will be individually identified and labeled after collection, then sealed with custody seals and enclosed in a plastic cooler. The sample information will be recorded on chain-of custody (COC) forms, and the samples shipped to the appropriate laboratory via overnight delivery service or courier. Chain-of-custody records must be prepared in Scribe or FORMS II Lite to accompany samples from the time of collection and throughout the shipping process. Each individual in possession of the samples must sign and date the sample COC Record. The chain-of-custody record will be considered completed upon receipt at the laboratory. A traffic report and chain-of-custody record will be maintained from the time the sample is taken to its final deposition. Every transfer of custody must be noted and signed for, and a copy of this record kept by each individual who has signed. When samples are not under direct control of the individual responsible for them, they must be stored in a locked container sealed with a custody seal. Specific information regarding custody of the samples projected to be collected on the weekend will be noted in the field logbook. The chain-of-custody record should include (at minimum) the following: 1) Sample identification number; 2) Sample information; 3) Sample location; 4) Sample date; 5) Sample Time; 6) Sample Type Matrix; 7) Sample Container Type; 8) Sample Analysis Requested; 9) Name(s) and signature(s) of sampler(s); and 10) Signature(s) of any individual(s) with custody of samples.

A separate chain-of-custody form must accompany each cooler for each daily shipment. The chain-of-custody form must address all samples in that cooler, but not address samples in any other cooler. This practice maintains the chain-of-custody for all samples in case of mis-shipment.

Laboratory Sample Custody Procedures (receipt of samples, archiving, and disposal): Within the laboratory, the person responsible for sample receipt must sign and date the chain-of-custody form; verify that custody seals are intact on shipping containers; compare samples received against those listed on the chain-of-custody form; examine all samples for possible shipping damage and improper sample preservation; note on the chain-of-custody record that specific samples were damaged; notify sampling personnel as soon as possible so that appropriate samples may be regenerated; verify that sample holding times have not been exceeded; maintain laboratory chain-of-custody documentation; and place the samples in the appropriate laboratory storage. At this time, no samples will be archived at the laboratory. Disposal of the samples will occur only after analyses and QA/QC checks are completed.

Note: Refer to Contract Laboratory Program Guidance for Field Samplers, EPA-540-R-07-06, July 2007 at:
http://www.epa.gov/superfund/programs/clp/download/sampler/clp_sampler_guidance.pdf

QAPP Worksheet #28: QC Samples Table
Worksheet # 28A: Volatile - Organics/TO-15

(UFP-QAPP Manual 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 limit exceed the measurement performance criteria, the data obtained may be unusable for making project decisions.

Matrix	Gas/Air
Analytical Group	Volatile Compounds
Concentration Level	Low (ppbv)
Sampling SOP(s)	
Analytical Method/SOP Reference	TO-15
Sampler's Name	
Field Sampling Organization	Weston Solutions, Inc.
Analytical Organization	
No. of Sample Locations	

Lab QC Sample:	Frequency/ Number	Method/SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria
Laboratory Method Blank	1 per ≤ 20 samples	No analyte >CRQL	Suspend analysis unit source recertified	National Non-RAS Laboratory Technician	Accuracy	No analyte > CRQL
Laboratory Replicate Sample	1 per ≤ 20 samples	± 25%D	± 25%D	National Non-RAS Laboratory Technician	Precision	± 25%RPD
Laboratory Control Sample	1 per ≤ 20 samples	±30% R	Flag outliers	National Non-RAS Laboratory Technician	Accuracy	±30% R
Trip Blank	1 per ≤ 20 samples	No analyte >CRQL	Suspend analysis unit source recertified	National Non-RAS Laboratory Technician	Accuracy	No analyte > CRQL

Lab QC Sample:	Frequency/ Number	Method/SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria
Field Duplicate	1 per ≤ 20 samples	± 25%D	± 25%D	National Non-RAS Laboratory Technician	Precision	± 25%RPD

QAPP Worksheet #28: QC Samples Table
Worksheet # 28B: Volatile - Organics/CLP SAV01.X

(UFP-QAPP Manual 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 limit exceed the measurement performance criteria, the data obtained may be unusable for making project decisions.

Matrix	Gas
Analytical Group	Volatile Compounds
Concentration Level	Low (ppbv)
Sampling SOP(s)	
Analytical Method/SOP Reference	CLP SAV01.X
Sampler's Name	
Field Sampling Organization	
Analytical Organization	
No. of Sample Locations	

Lab QC Sample:	**Frequency/ Number**	**Method/SOP QC Acceptance Limits**	**Corrective Action**	**Person(s) Responsible for Corrective Action**	**Data Quality Indicator (DQI)**	**Measurement Performance Criteria**
Laboratory Method Blank	1 per ≤ 20 samples	No analyte > ½ CRQL	Suspend analysis unit source recertified	National Non-RAS Laboratory Technician	Accuracy	No analyte > ½ CRQL
Laboratory Replicate Sample	1 per ≤ 20 samples	± 25%RPD	± 25%RPD	National Non-RAS Laboratory Technician	Precision	± 25%RPD
Laboratory Control Sample	1 per ≤ 20 samples	± 30%R	Flag outliers	National Non-RAS Laboratory Technician	Accuracy	± 30%R

QAPP Worksheet #28: QC Samples Table
Worksheet # 28C: Trace Volatile - Organics/CLP SOMO1.2

(UFP-QAPP Manual 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 limit exceed the measurement performance criteria, the data obtained may be unusable for making project decisions.

Matrix	Aqueous
Analytical Group	Target Compund List Trace Concentration Volatile Organics
Concentration Level	Trace (ug/L)
Sampling SOP(s)	
Analytical Method/SOP Reference	SOM01.2
Sampler's Name	
Field Sampling Organization	
Analytical Organization	EPA CLP RAS Laboratory
No. of Sample Locations	

Lab QC Sample:	Frequency/ Number	Method/SOP QC Acceptance Limits		Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria	
Method Blank	1 every 12 hours	No analyte > CRQL*		Suspend analysis unit source recertified	EPA CLP RAS Laboratory GC/MS Technician	Accuracy	No analyte > CRQL*	
Matrix Spike (Not Required)	1 per ≤ 20 samples; if requested	1,1-Dichloroethene	61-145 %R	Flag outliers	EPA CLP RAS Laboratory GC/MS Technician	Accuracy	1,1-Dichloroethene	61-145 %R
		Benzene	76-127 %R				Benzene	76-127 %R
		Trichloroethene	71-120 %R				Trichloroethene	71-120 %R
		Toluene	76-125 %R				Toluene	76-125 %R
		Chlorobenzene	75-130 %R				Chlorobenzene	75-130 %R
Matrix Spike Duplicate (Not Required)	1 per ≤ 20 samples; if requested	1,1-Dichloroethene	0-14 %RPD	Flag outliers	EPA CLP RAS Laboratory GC/MS Technician	Precision	1,1-Dichloroethene	0-14 %RPD
		Benzene	0-11 %RPD				Benzene	0-11 %RPD
		Trichloroethene	0-14 %RPD				Trichloroethene	0-14 %RPD
		Toluene	0-13 %RPD				Toluene	0-13 %RPD
		Chlorobenzene	0-13 %RPD				Chlorobenzene	0-13 %RPD
Deuterated Monitoring Compounds	all samples	Vinyl chloride-d3	65-131 %R	Check calculations and instruments, reanalyze affected samples	EPA CLP RAS Laboratory GC/MS Technician	Accuracy	Vinyl chloride-d3	65-131 %R
		Chloroethane-d5	71-131 %R				Chloroethane-d5	71-131 %R

*with the exception of methylene chloride, 2-butanone and acetone which can be up to 2 times the CRQL, or in some situations may require these compunds be up to 4 times the CRQL.

QAPP Worksheet #28: QC Samples Table
Worksheet # 28C: Trace Volatile - Organics/CLP SOMO1.2 [cont'd]

(UFP-QAPP Manual 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 limit exceed the measurement performance criteria, the data obtained may be unusable for making project decisions.

Matrix	Aqueous
Analytical Group	Target Compund List Trace Concentration Volatile Organics [cont'd]
Concentration Level	Trace (ug/L)
Sampling SOP(s)	
Analytical Method/SOP Reference	SOM01.2
Sampler's Name	
Field Sampling Organization	
Analytical Organization	EPA CLP RAS Laboratory
No. of Sample Locations	

Lab QC Sample:	**Frequency/ Number**	**Method/SOP QC Acceptance Limits**		**Corrective Action**	**Person(s) Responsible for Corrective Action**	**Data Quality Indicator (DQI)**	**Measurement Performance Criteria**	
Deuterated Monitoring Compounds [cont'd]	all samples	1,1-Dichloroethene-d2	55-104 %R	Check calculations and instruments, reanalyze affected samples; up to 3 DMCs per sample may fail to meet recovery limits	EPA CLP RAS Laboratory GC/MS Technician	Accuracy	1,1-Dichloroethene-d2	55-104 %R
		2-Butanone-d5	49-155 %R				2-Butanone-d5	49-155 %R
		Chloroform-d	78-121 %R				Chloroform-d	78-121 %R
		1,2-Dichloroethane-d4	78-129 %R				1,2-Dichloroethane-d4	78-129 %R
		Benzene-d6	77-124 %R				Benzene-d6	77-124 %R
		1,2-Dichloropropane-d6	79-124 %R				1,2-Dichloropropane-d6	79-124 %R
		Toluene-d8	77-121 %R				Toluene-d8	77-121 %R
		trans-1,3-Dichloropropene-d4	73-121 %R				trans-1,3-Dichloropropene-d4	73-121 %R
		2-Hexanone-d5	28-135 %R				2-Hexanone-d5	28-135 %R
		1,4-Dioxane-d8	50-150 %R				1,4-Dioxane-d8	50-150 %R
		1,1,2,2-Tetrachloroethane-d2	73-125 %R				1,1,2,2-Tetrachloroethane-d2	73-125 %R

QAPP Worksheet #28: QC Samples Table
Worksheet # 28C: Trace Volatile - Organics/CLP SOMO1.2 [cont'd]

(UFP-QAPP Manual 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 limit exceed the measurement performance criteria, the data obtained may be unusable for making project decisions.

Matrix	Aqueous
Analytical Group	Target Compund List Trace Concentration Volatile Organics [cont'd]
Concentration Level	Trace (ug/L)
Sampling SOP(s)	
Analytical Method/SOP Reference	SOM01.2
Sampler's Name	
Field Sampling Organization	
Analytical Organization	EPA CLP RAS Laboratory
No. of Sample Locations	

Lab QC Sample:	**Frequency/ Number**	**Method/SOP QC Acceptance Limits**		**Corrective Action**	**Person(s) Responsible for Corrective Action**	**Data Quality Indicator (DQI)**	**Measurement Performance Criteria**	
Deuterated Monitoring Compounds [cont'd]	all samples	1,2-Dichlorobenzene-d4	80-131 %R	Check calculations and instruments, reanalyze affected samples; up to 3 DMCs per sample may fail to meet recovery limits	EPA CLP RAS Laboratory GC/MS Technician	Accuracy	1,2-Dichlorobenzene-d4	80-131 %R
Internal Standards	all samples	60-140%		Check calculations and instruments, reanalyze affected samples	EPA CLP RAS Laboratory GC/MS Technician	Accuracy	± 40 % of response area, ± 20 sec retention time shift	

QAPP Worksheet #28: QC Samples Table
Worksheet # 28D: Volatile - Organics/CLP SOMO1.2

(UFP-QAPP Manual 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 limit exceed the measurement performance criteria, the data obtained may be unusable for making project decisions.

Matrix	Aqueous
Analytical Group	Target Compund List Volatile Organics
Concentration Level	Low (ug/L)
Sampling SOP(s)	
Analytical Method/SOP Reference	SOM01.2
Sampler's Name	
Field Sampling Organization	
Analytical Organization	EPA CLP RAS Laboratory
No. of Sample Locations	

Lab QC Sample:	**Frequency/ Number**	**Method/SOP QC Acceptance Limits**		**Corrective Action**	**Person(s) Responsible for Corrective Action**	**Data Quality Indicator (DQI)**	**Measurement Performance Criteria**	
Method Blank	1 every 12 hours	No analyte > CRQL*		Suspend analysis unit source recertified	EPA CLP RAS Laboratory GC/MS Technician	Accuracy	No analyte > CRQL*	
Matrix Spike (Not Required)	1 per ≤ 20 samples; if requested	1,1-Dichloroethene	61-145 %R	Flag outliers	EPA CLP RAS Laboratory GC/MS Technician	Accuracy	1,1-Dichloroethene	61-145 %R
		Benzene	76-127 %R				Benzene	76-127 %R
		Trichloroethene	71-120 %R				Trichloroethene	71-120 %R
		Toluene	76-125 %R				Toluene	76-125 %R
		Chlorobenzene	75-130 %R				Chlorobenzene	75-130 %R
Matrix Spike Duplicate (Not Required)	1 per ≤ 20 samples; if requested	1,1-Dichloroethene	0-14 %RPD	Flag outliers	EPA CLP RAS Laboratory GC/MS Technician	Precision	1,1-Dichloroethene	0-14 %RPD
		Benzene	0-11 %RPD				Benzene	0-11 %RPD
		Trichloroethene	0-14 %RPD				Trichloroethene	0-14 %RPD
		Toluene	0-13 %RPD				Toluene	0-13 %RPD
		Chlorobenzene	0-13 %RPD				Chlorobenzene	0-13 %RPD
Deuterated Monitoring Compounds	all samples	Vinyl chloride-d3	65-131 %R	Check calculations and instruments, reanalyze affected samples; see asterisk below	EPA CLP RAS Laboratory GC/MS Technician	Accuracy	Vinyl chloride-d3	65-131 %R
		Chloroethane-d5	71-131 %R				Chloroethane-d5	71-131 %R

*with the exception of methylene chloride, 2-butanone and acetone which can be up to 2 times the CRQL.

QAPP Worksheet #28: QC Samples Table
Worksheet # 28D: Volatile - Organics/CLP SOMO1.2 [cont'd]

(UFP-QAPP Manual 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 limit exceed the measurement performance criteria, the data obtained may be unusable for making project decisions.

Matrix	Aqueous
Analytical Group	Target Compound List Volatile Organics [cont'd]
Concentration Level	Low (ug/L)
Sampling SOP(s)	
Analytical Method/SOP Reference	ILM05.4
Sampler's Name	
Field Sampling Organization	
Analytical Organization	EPA CLP RAS Laboratory
No. of Sample Locations	

Lab QC Sample:	Frequency/ Number	Method/SOP QC Acceptance Limits		Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria	
Deuterated Monitoring Compounds [cont'd]	all samples	1,1-Dichloroethene-d2	55-104 %R	Check calculations and instruments, reanalyze affected samples; *up to 3 DMCs per sample may fail to meet recovery limits	EPA CLP RAS Laboratory GC/MS Technician	Accuracy	1,1-Dichloroethene-d2	55-104 %R
		2-Butanone-d5	49-155 %R				2-Butanone-d5	49-155 %R
		Chloroform-d	78-121 %R				Chloroform-d	78-121 %R
		1,2-Dichloroethane-d4	78-129 %R				1,2-Dichloroethane-d4	78-129 %R
		Benzene-d6	77-124 %R				Benzene-d6	77-124 %R
		1,2-Dichloropropane-d6	79-124 %R				1,2-Dichloropropane-d6	79-124 %R
		Toluene-d8	77-121 %R				Toluene-d8	77-121 %R
		trans-1,3-Dichloropropene-d4	73-121 %R				trans-1,3-Dichloropropene-d4	73-121 %R
		2-Hexanone-d5	28-135 %R				2-Hexanone-d5	28-135 %R
		1,4-Dioxane-d8	50-150 %R				1,4-Dioxane-d8	50-150 %R
		1,1,2,2-Tetrachloroethane-d2	73-125 %R				1,1,2,2-Tetrachloroethane-d2	73-125 %R

QAPP Worksheet #28: QC Samples Table
Worksheet # 28D: Volatile - Organics/CLP SOMO1.2 [cont'd]

(UFP-QAPP Manual 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 limit exceed the measurement performance criteria, the data obtained may be unusable for making project decisions.

Matrix	Aqueous
Analytical Group	Target Compound List Volatile Organics [cont'd]
Concentration Level	Low (ug/L)
Sampling SOP(s)	
Analytical Method/SOP Reference	SOM01.2
Sampler's Name	
Field Sampling Organization	
Analytical Organization	EPA CLP RAS Laboratory
No. of Sample Locations	

Lab QC Sample:	**Frequency/ Number**	**Method/SOP QC Acceptance Limits**		**Corrective Action**	**Person(s) Responsible for Corrective Action**	**Data Quality Indicator (DQI)**	**Measurement Performance Criteria**	
Deuterated Monitoring Compounds [cont'd]	all samples	1,2-Dichlorobenzene-d4	80-131 %R	Check calculations and instruments, reanalyze affected samples; *up to 3 DMCs per sample may fail to meet recovery limits	EPA CLP RAS Laboratory GC/MS Technician	Accuracy	1,2-Dichlorobenzene-d4	80-131 %R
Internal Standards	all samples	60-140%		Check calculations and instruments, reanalyze affected samples	EPA CLP RAS Laboratory GC/MS Technician	Accuracy	± 40 % of response area, ± 20 sec retention time shift	

QAPP Worksheet #28: QC Samples Table
Worksheet # 28E: Semivolatile - Organics/CLP SOMO1.2

(UFP-QAPP Manual 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 limit exceed the measurement performance criteria, the data obtained may be unusable for making project decisions.

Matrix	Aqueous
Analytical Group	Target Compound List Semivolatile Organics
Concentration Level	Low/Medium (ug/L)
Sampling SOP(s)	
Analytical Method/SOP Reference	SOM01.2
Sampler's Name	
Field Sampling Organization	
Analytical Organization	EPA CLP RAS Laboratory
No. of Sample Locations	

Lab QC Sample:	**Frequency / Number**	**Method/SOP QC Acceptance Limits**		**Corrective Action**	**Person(s) Responsible for Corrective Action**	**Data Quality Indicator (DQI)**	**Measurement Performance Criteria**	
Method Blank	1 per ≤ 20 samples OR whenever samples extracted	No analyte > CRQL*		Suspend analysis unit source recertified	EPA CLP RAS Laboratory GC/MS Technician	Accuracy	No analyte > CRQL	
Matrix Spike (Not Required)	1 per ≤ 20 samples; if requested	Phenol	12-110 %R	Flag outliers	EPA CLP RAS Laboratory GC/MS Technician	Accuracy	Phenol	12-110 %R
		2-Chlorophenol	27-123 %R				2-Chlorophenol	27-123 %R
		N-Nitroso-di-n-propylamine	41-116 %R				N-Nitroso-di-n-propylamine	41-116 %R
		4-Chloro-3-methylphenol	23-97 %R				4-Chloro-3-methylphenol	23-97 %R
		Acenaphthene	46-118 %R				Acenaphthene	46-118 %R
		4-Nitrophenol	29-94 %R				4-Nitrophenol	29-94 %R
		2,4-Dinitrotoluene	24-96 %R				2,4-Dinitrotoluene	24-96 %R
		Pentachlorophenol	9-103 %R				Pentachlorophenol	9-103 %R
		Pyrene	26-127 %R				Pyrene	26-127 %R

*with the exception of bis (2-Etheylhexyl) phthalate which can be up to 5 times the CRQL. (USEPA CLP Nat'l Fuctional Guidelines, Final, July 2007)

QAPP Worksheet #28: QC Samples Table
Worksheet # 28E: Semivolatile - Organics/CLP SOMO1.2 [cont'd]

(UFP-QAPP Manual 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 limit exceed the measurement performance criteria, the data obtained may be unusable for making project decisions.

Matrix	Aqueous
Analytical Group	Target Compound List Semivolatile Organics [cont'd]
Concentration Level	Low/Medium (ug/L)
Sampling SOP(s)	
Analytical Method/SOP Reference	SOM01.2
Sampler's Name	
Field Sampling Organization	
Analytical Organization	EPA CLP RAS Laboratory
No. of Sample Locations	

Lab QC Sample:	**Frequency / Number**	**Method/SOP QC Acceptance Limits**		**Corrective Action**	**Person(s) Responsible for Corrective Action**	**Data Quality Indicator (DQI)**	**Measurement Performance Criteria**	
Matrix Spike Duplicate (Not Required)	1 per ≤ 20 samples; if requested	Phenol	0-42 %RPD	Flag outliers	EPA CLP RAS Laboratory GC/MS Technician	Precision	Phenol	0-42 %RPD
		2-Chlorophenol	0-40 %RPD				2-Chlorophenol	0-40 %RPD
		N-Nitroso-di-n-propylamine	0-38 %RPD				N-Nitroso-di-n-propylamine	0-38 %RPD
		4-Chloro-3-methylphenol	0-42 %RPD				4-Chloro-3-methylphenol	0-42 %RPD
		Acenaphthene	0-31 %RPD				Acenaphthene	0-31 %RPD
		4-Nitrophenol	0-50 %RPD				4-Nitrophenol	0-50 %RPD
		2,4-Dinitrotoluene	0-38 %RPD				2,4-Dinitrotoluene	0-38 %RPD
		Pentachlorophenol	0-50 %RPD				Pentachlorophenol	0-50 %RPD
		Pyrene	0-31 %RPD				Pyrene	0-31 %RPD
Deuterated Monitoring Compounds	all samples	Phenol-d5	39-106 %R	Check calculations and instruments, reanalyze affected samples; up to 4 DMCs may fail to meet recovery limits	EPA CLP RAS Laboratory GC/MS Technician	Accuracy	Phenol-d5	39-106 %R
		Bis(2-chloroethyl)ether-d8	40-105 %R				Bis(2-chloroethyl)ether-d8	40-105 %R
		2-Chlorophenol-d4	41-106 %R				2-Chlorophenol-d4	41-106 %R

QAPP Worksheet #28: QC Samples Table
Worksheet # 28E: Semivolatile - Organics/CLP SOMO1.2 [cont'd]

(UFP-QAPP Manual 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 limit exceed the measurement performance criteria, the data obtained may be unusable for making project decisions.

Matrix	Aqueous
Analytical Group	Target Compound List Semivolatile Organics [cont'd]
Concentration Level	Low/Medium (ug/L)
Sampling SOP(s)	
Analytical Method/SOP Reference	SOM01.2
Sampler's Name	
Field Sampling Organization	
Analytical Organization	EPA CLP RAS Laboratory
No. of Sample Locations	

Lab QC Sample:	**Frequency / Number**	**Method/SOP QC Acceptance Limits**		**Corrective Action**	**Person(s) Responsible for Corrective Action**	**Data Quality Indicator (DQI)**	**Measurement Performance Criteria**	
Deuterated Monitoring Compounds [cont'd]	all samples	4-Methylphenol-d8	25-111 %R	Check calculations and instruments, reanalyze affected samples; up to 4 DMCs may fail to meet recovery limits	EPA CLP RAS Laboratory GC/MS Technician	Accuracy	4-Methylphenol-d8	25-111 %R
		Nitrobenzene-d5	43-108 %R				Nitrobenzene-d5	43-108 %R
		2-Nitrophenol-d4	40-108 %R				2-Nitrophenol-d4	40-108 %R
		2,4-Dichlorophenol-d3	37-105 %R				2,4-Dichlorophenol-d3	37-105 %R
		4-Chloroaniline-d4	1-145 %R				4-Chloroaniline-d4	1-145 %R
		Dimethylphthalate-d6	47-114 %R				Dimethylphthalate-d6	47-114 %R
		Acenaphthylene-d8	41-107 %R				Acenaphthylene-d8	41-107 %R
		4-Nitrophenol-d4	33-116 %R				4-Nitrophenol-d4	33-116 %R
		Fluorene-d10	42-111 %R				Fluorene-d10	42-111 %R
		4,6-Dinitro-2-methylphenol-d2	22-104 %R				4,6-Dinitro-2-methylphenol-d2	22-104 %R
		Anthracene-d10	44-110 %R				Anthracene-d10	44-110 %R
		Pyrene-d10	52-119 %R				Pyrene-d10	52-119 %R

QAPP Worksheet #28: QC Samples Table
Worksheet # 28E: Semivolatile - Organics/CLP SOMO1.2 [cont'd]

(UFP-QAPP Manual 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 limit exceed the measurement performance criteria, the data obtained may be unusable for making project decisions.

Matrix	Aqueous
Analytical Group	Target Compound List Semivolatile Organics [cont'd]
Concentration Level	Low/Medium (ug/L)
Sampling SOP(s)	
Analytical Method/SOP Reference	SOM01.2
Sampler's Name	
Field Sampling Organization	
Analytical Organization	EPA CLP RAS Laboratory
No. of Sample Locations	

Lab QC Sample:	**Frequency / Number**	**Method/SOP QC Acceptance Limits**		**Corrective Action**	**Person(s) Responsible for Corrective Action**	**Data Quality Indicator (DQI)**	**Measurement Performance Criteria**	
Deuterated Monitoring Compounds [cont'd]	all samples	Benzo(a)pyrene-d12	32-121 %R	Check calculations and instruments, reanalyze affected samples; up to 4 DMCs may fail to meet recovery limits	EPA CLP RAS Laboratory GC/MS Technician	Accuracy	Benzo(a)pyrene-d12	32-121 %R
Internal Standards	all samples	50-100% of area, ± 20 sec retention time shift		Check calculations and instruments, reanalyze affected samples	EPA CLP RAS Laboratory GC/MS Technician	Accuracy	50-100% of area, ± 20 sec retention time shift	

QAPP Worksheet #28: QC Samples Table
Worksheet # 28F: Pesticide - Organics/CLP SOMO1.2

(UFP-QAPP Manual 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 limit exceed the measurement performance criteria, the data obtained may be unusable for making project decisions.

Matrix	Aqueous
Analytical Group	Target Compound List Pesticides
Concentration Level	Low/Medium (ug/L)
Sampling SOP(s)	
Analytical Method/SOP Reference	SOM01.2
Sampler's Name	
Field Sampling Organization	
Analytical Organization	EPA CLP RAS Laboratory
No. of Sample Locations	

Lab QC Sample:	Frequency/Number	Method/SOP QC Acceptance Limits		Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria	
Method Blank	1 per ≤ 20 samples OR whenever samples extracted	No analyte > CRQL		Suspend analysis unit source recertified	EPA CLP RAS Laboratory GC/ECD Technician	Accuracy	No analyte > CRQL	
Matrix Spike	1 per ≤ 20 samples; if requested	gamma-BHC (Lindane)	56-123 %R	Flag outliers	EPA CLP RAS Laboratory GC/ECD Technician	Accuracy	gamma-BHC (Lindane)	56-123 %R
		Heptachlor	40-131 %R				Heptachlor	40-131 %R
		Aldrin	40-120 %R				Aldrin	40-120 %R
		Dieldrin	52-126 %R				Dieldrin	52-126 %R
		Endrin	56-121 %R				Endrin	56-121 %R
		4,4'-DDT	38-127 %R				4,4'-DDT	38-127 %R
Matrix Spike Duplicate	1 per ≤ 20 samples; if requested	gamma-BHC	0-15 %RPD	Flag outliers	EPA CLP RAS Laboratory GC/ECD Technician	Precision	gamma-BHC	0-15 %RPD
		Heptachlor	0-20 %RPD				Helptachlor	0-20 %RPD
		Aldrin	0-22 %RPD				Aldrin	0-22 %RPD
		Dieldrin	0-18 %RPD				Dieldrin	0-18 %RPD
		Endrin	0-21 %RPD				Endrin	0-21 %RPD
		4,4'-DDT	0-27 %RPD				4,4'-DDT	0-27 %RPD
Laboratory Control Sample	1 per ≤ 20 samples	gamma-BHC	50-120 %R	Check calculations and instruments, reanalyze affected samples	EPA CLP RAS Laboratory GC/ECD Technician	Accuracy	gamma-BHC	50-120 %R

QAPP Worksheet #28: QC Samples Table
Worksheet # 28F: Pesticide - Organics/CLP SOMO1.2 [cont'd]

(UFP-QAPP Manual 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 limit exceed the measurement performance criteria, the data obtained may be unusable for making project decisions.

Matrix	Aqueous
Analytical Group	Target Compound List Pesticides [cont'd]
Concentration Level	Low/Medium (ug/L)
Sampling SOP(s)	
Analytical Method/SOP Reference	SOM01.2
Sampler's Name	
Field Sampling Organization	
Analytical Organization	EPA CLP RAS Laboratory
No. of Sample Locations	

Lab QC Sample:	**Frequency/Number**	**Method/SOP QC Acceptance Limits**		**Corrective Action**	**Person(s) Responsible for Corrective Action**	**Data Quality Indicator (DQI)**	**Measurement Performance Criteria**	
Laboratory Control Sample [cont'd]	1 per ≤ 20 samples	Heptachlor epoxide	50-150 %R	Check calculations and instruments, reanalyze affected samples	EPA CLP RAS Laboratory GC/ECD Technician	Accuracy	Helpachlor epoxide	50-150 %R
Laboratory Control Sample [cont'd]	1 per ≤ 20 samples	Dieldrin	30-130 %R	Check calculations and instruments, reanalyze affected samples	EPA CLP RAS Laboratory GC/ECD Technician	Accuracy	Dieldrin	30-130 %R
		4,4'-DDE	50-150 %R				4,4'-DDE	50-150 %R
		Endrin	50-120 %R				Endrin	50-120 %R
		Endosulfan sulfate	50-120 %R				Endosulfan sulfate	50-120 %R
		gamma-Chlordane	30-130 %R				gamma-Chlordane	30-130 %R
Surrogate	all samples		30-150 %R	Check calculations and instruments, reanalyze affected samples	EPA CLP RAS Laboratory GC/ECD Technician	Accuracy		30-150 %R

QAPP Worksheet #28: QC Samples Table
Worksheet # 28G: PCBs - Organics/CLP SOMO1.2

(UFP-QAPP Manual 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 limit exceed the measurement performance criteria, the data obtained may be unusable for making project decisions.

Matrix	Aqueous
Analytical Group	Target Compound List PCBs
Concentration Level	Low/Medium (ug/L)
Sampling SOP(s)	
Analytical Method/SOP Reference	SOM01.2
Sampler's Name	
Field Sampling Organization	
Analytical Organization	EPA CLP RAS Laboratory
No. of Sample Locations	

Lab QC Sample:	Frequency/Number	Method/SOP QC Acceptance Limits		Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria	
Method Blank	1 per ≤ 20 samples OR whenever samples extracted	No analyte > CRQL		Suspend analysis unit source recertified	EPA CLP RAS Laboratory GC/ECD Technician	Accuracy	No analyte > CRQL	
Matrix Spike	1 per ≤ 20 samples; if requested	Aroclor-1016	29-135 %R	Flag outliers	EPA CLP RAS Laboratory GC/ECD Technician	Accuracy	Aroclor-1016	29-135 %R
		Aroclor-1260	29-135 %R				Aroclor-1260	29-135 %R
Matrix Spike Duplicate	1 per ≤ 20 samples; if requested	Aroclor-1016	0-15 %RPD	Flag outliers	EPA CLP RAS Laboratory GC/ECD Technician	Precision	Aroclor-1016	0-15 %RPD
		Aroclor-1260	0-20 %RPD				Aroclor-1260	0-20 %RPD
Laboratory Control Sample	1 per ≤ 20 samples	Aroclor-1016	50-150 %R	Check calculations and instruments, reanalyze affected samples	EPA CLP RAS Laboratory GC/ECD Technician	Accuracy	Aroclor-1016	50-150 %R
		Aroclor-1260	50-150 %R				Aroclor-1260	50-150 %R
Surrogate	all samples		30-150 %R	Check calculations and instruments, reanalyze affected samples	EPA CLP RAS Laboratory GC/ECD Technician	Accuracy		30-150 %R

QAPP Worksheet #28: QC Samples Table
Worksheet # 28H: Volatile - Organics/CLP SOMO1.2

(UFP-QAPP Manual 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 limit exceed the measurement performance criteria, the data obtained may be unusable for making project decisions.

Matrix	Soil
Analytical Group	Target Compound List Volatile Organics
Concentration Level	Low/Medium (mg/kg)
Sampling SOP(s)	
Analytical Method/SOP Reference	SOM01.2
Sampler's Name	
Field Sampling Organization	
Analytical Organization	EPA CLP RAS Laboratory
No. of Sample Locations	

Lab QC Sample:	Frequency/ Number	Method/SOP QC Acceptance Limits		Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria	
Method Blank	1 every 12 hours	No analyte > CRQL*		Suspend analysis unit source recertified	EPA CLP RAS Laboratory GC/MS Technician	Accuracy	No analyte > CRQL*	
Matrix Spike (Not Required)	1 per ≤ 20 samples; if requested	1,1-Dichloroethene	59-172 %R	Flag outliers	EPA CLP RAS Laboratory GC/MS Technician	Accuracy	1,1-Dichloroethene	59-172 %R
		Trichloroethene	62-137 %R				Trichloroethene	62-137 %R
		Benzene	66-142 %R				Benzene	66-142 %R
		Toluene	59-139 %R				Toluene	59-139 %R
		Chlorobenzene	60-133 %R				Chlorobenzene	60-133 %R
Matrix Spike Duplicate (Not Required)	1 per ≤ 20 samples; if requested	1,1-Dichloroethene	0-22 %RPD	Flag outliers	EPA CLP RAS Laboratory GC/MS Technician	Precision	1,1-Dichloroethene	0-22 %RPD
		Trichloroethene	0-24 %RPD				Trichloroethene	0-24 %RPD
		Benzene	0-21 %RPD				Benzene	0-21 %RPD
		Toluene	0-21 %RPD				Toluene	0-21 %RPD
		Chlorobenzene	0-21 %RPD				Chlorobenzene	0-21 %RPD
Deuterated Monitoring Compounds	all samples	Vinyl chloride-d3	68-122 %R	Check calculations and instruments, reanalyze affected samples up to 3 DMCs per sample may fail to meet necessary limits (Section 11.3.4, Page D45/SOM01.2)	EPA CLP RAS Laboratory GC/MS Technician	Accuracy	Vinyl chloride-d3	68-122 %R
		Chloroethane-d5	61-130 %R				Chloroethane-d5	61-130 %R

*with the exception of methylene chloride, 2-butanone & acetone which can be up to 2 times the CRQL. (USEPA CLP Nat'l Fuctional Guidelines, Final, July 2007)

QAPP Worksheet #28: QC Samples Table
Worksheet # 28H: Volatile - Organics/CLP SOMO1.2 [cont'd]

(UFP-QAPP Manual 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 limit exceed the measurement performance criteria, the data obtained may be unusable for making project decisions.

Matrix	Soil
Analytical Group	Target Compound List Volatile Organics [cont'd]
Concentration Level	Low/Medium (mg/kg)
Sampling SOP(s)	
Analytical Method/SOP Reference	SOM01.2
Sampler's Name	
Field Sampling Organization	
Analytical Organization	EPA CLP RAS Laboratory
No. of Sample Locations	

Lab QC Sample:	**Frequency/ Number**	**Method/SOP QC Acceptance Limits**		**Corrective Action**	**Person(s) Responsible for Corrective Action**	**Data Quality Indicator (DQI)**	**Measurement Performance Criteria**	
Deuterated Monitoring Compounds [cont'd]	all samples	1,1-Dichloroethene-d2	45-132 %R	Check calculations and instruments, reanalyze affected samples; up to 3 DMCs per sample may fail to meet necessary limits (Section 11.3.4, Page D45 of SOM01.2)	EPA CLP RAS Laboratory GC/MS Technician	Accuracy	1,1-Dichloroethene-d2	45-132 %R
		2-Butanone-d5	20-182 %R				2-Butanone-d5	20-182 %R
		Chloroform-d	72-123 %R				Chloroform-d	72-123 %R
		1,2-Dichloroethane-d4	79-122 %R				1,2-Dichloroethane-d4	79-122 %R
		Benzene-d6	80-121 %R				Benzene-d6	80-121 %R
		1,2-Dichloropropane-d6	74-124 %R				1,2-Dichloropropane-d6	74-124 %R
		Toluene-d8	78-121 %R				Toluene-d8	78-121 %R
		trans-1,3-Dichloropropene-d4	72-130 %R				trans-1,3-Dichloropropene-d4	72-130 %R
		2-Hexanone-d5	17-184 %R				2-Hexanone-d5	17-184 %R
		1,4-Dioxane-d8	50-150 %R				1,4-Dioxane-d8	50-150 %R
		1,1,2,2-Tetrachloroethane-d2	56-161 %R				1,1,2,2-Tetrachloroethane-d2	56-161 %R

QAPP Worksheet #28: QC Samples Table
Worksheet # 28H: Volatile - Organics/CLP SOMO1.2 [cont'd]

(UFP-QAPP Manual 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 limit exceed the measurement performance criteria, the data obtained may be unusable for making project decisions.

Matrix	Soil
Analytical Group	Target Compound List Volatile Organics [cont'd]
Concentration Level	Low/Medium (mg/kg)
Sampling SOP(s)	
Analytical Method/SOP Reference	SOM01.2
Sampler's Name	
Field Sampling Organization	
Analytical Organization	EPA CLP RAS Laboratory
No. of Sample Locations	

Lab QC Sample:	Frequency/ Number	Method/SOP QC Acceptance Limits		Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria	
Deuterated Monitoring Compounds [cont'd]	all samples	1,2-Dichlorobenzene-d4	70-131 %R	Check calculations and instruments, reanalyze affected samples; up to 3 DMCs per sample may fail to meet necessary limits (Section 11.3.4, Page D45/VOC of SOM01.2)	EPA CLP RAS Laboratory GC/MS Technician	Accuracy	1,2-Dichlorobenzene-d4	70-131 %R
Internal Standards	all samples	50-200% of area, ± 30 sec retention time shift		Check calculations and instruments, reanalyze affected samples; up to 3 DMCs per sample may fail to meet necessary limits (Section 11.3.4, Page D45/VOC of SOM01.2)	EPA CLP RAS Laboratory GC/MS Technician	Accuracy	50-100% of area, ± 30 sec retention time shift	

QAPP Worksheet #28: QC Samples Table
Worksheet # 28I: Semivolatile - Organics/CLP SOMO1.2

(UFP-QAPP Manual 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 limit exceed the measurement performance criteria, the data obtained may be unusable for making project decisions.

Matrix	Soil
Analytical Group	Target Compound List Semivolatile Organics
Concentration Level	Low/Medium (mg/kg)
Sampling SOP(s)	
Analytical Method/SOP Reference	SOM01.2
Sampler's Name	
Field Sampling Organization	
Analytical Organization	EPA CLP RAS Laboratory
No. of Sample Locations	

Lab QC Sample:	Frequency/ Number	Method/SOP QC Acceptance Limits		Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria	
Method Blank	1 per ≤ 20 samples or whenever samples extracted	No analyte > CRQL*		Suspend analysis unit source recertified	EPA CLP RAS Laboratory GC/MS Technician	Accuracy	No analyte > CRQL*	
Matrix Spike (Not Required)	1 per ≤ 20 samples; if requested	Phenol	26-90 %R	Flag outliers	EPA CLP RAS Laboratory GC/MS Technician	Accuracy	Phenol	26-90 %R
		2-Chlorophenol	25-102 %R				2-Chlorophenol	25-102 %R
		N-Nitroso-di-n-propylamine	41-126 %R				N-Nitroso-di-n-propylamine	41-126 %R
		4-Chloro-3-methylphenol	26-103 %R				4-Chloro-3-methylphenol	26-103 %R
		Acenaphthene	31-137 %R				Acenaphthene	31-137 %R
		4-Nitrophenol	11-114 %R				4-Nitrophenol	11-114 %R
		2,4-Dinitrotoluene	28-89 %R				2,4-Dinitrotoluene	28-89 %R
		Pentachloro-phenol	17-109 %R				Pentachloro-phenol	17-109 %R
		Pyrene	35-142 %R				Pyrene	35-142 %R
Matrix Spike Duplicate (Not Required)	1 per ≤ 20 samples; if requested	Phenol	0-35 %RPD	Flag outliers	EPA CLP RAS Laboratory GC/MS Technician	Precision	Phenol	0-35 %RPD
		2-Chlorophenol	0-50 %RPD				2-Chlorophenol	0-50 %RPD
		N-Nitroso-di-n-propylamine	0-38 %RPD				N-Nitroso-di-n-propylamine	0-38 %RPD

*with the exception of bis (2-Etheylhexyl) phthalate which can be up to 5 times the CRQL. (USEPA CLP Nat'l Fuctional Guidelines, Final, July 2007)

QAPP Worksheet #28: QC Samples Table
Worksheet # 28I: Semivolatile - Organics/CLP SOMO1.2 [cont'd]

(UFP-QAPP Manual 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 limit exceed the measurement performance criteria, the data obtained may be unusable for making project decisions.

Matrix	Soil
Analytical Group	Target Compound List Semivolatile Organics [cont'd]
Concentration Level	Low/Medium (mg/kg)
Sampling SOP(s)	
Analytical Method/SOP Reference	SOM01.2
Sampler's Name	
Field Sampling Organization	
Analytical Organization	EPA CLP RAS Laboratory
No. of Sample Locations	

Lab QC Sample:	**Frequency/ Number**	**Method/SOP QC Acceptance Limits**		**Corrective Action**	**Person(s) Responsible for Corrective Action**	**Data Quality Indicator (DQI)**	**Measurement Performance Criteria**	
Matrix Spike Duplicate (Not Required) [cont'd]	1 per ≤ 20 samples; if requested	4-Chloro-3-methylphenol	0-33 %RPD	Flag outliers	EPA CLP RAS Laboratory GC/MS Technician	Precision	4-Chloro-3-methylphenol	0-33 %RPD
		Acenaphthene	0-19 %RPD				Acenaphthene	0-19 %RPD
		4-Nitrophenol	0-50 %RPD				4-Nitrophenol	0-50 %RPD
		2,4-Dinitrotoluene	0-47 %RPD				2,4-Dinitrotoluene	0-47 %RPD
		Pentachloro-phenol	0-47 %RPD				Pentachloro-phenol	0-47 %RPD
		Pyrene	0-36 %RPD				Pyrene	0-36 %RPD
Deuterated Monitoring Compounds	all samples	Phenol-d5	17-103 %R	Check calculations and instruments, reanalyze affected samples; up to 4 DMCs may fail to meet recovery limits (Section 11.3.4, Page D48/SVOC of SOM01.2)	EPA CLP RAS Laboratory GC/MS Technician	Accuracy	Phenol-d5	17-103 %R
		Bis(2-chloroethyl)ether-d8	12-98 %R				Bis(2-chloroethyl)ether-d8	12-98 %R
		2-Chlorophenol-d4	13-101 %R				2-Chlorophenol-d4	13-101 %R
		4-Methylphenol-d8	8-100 %R				4-Methylphenol-d8	8-100 %R
		Nitrobenzene-d5	16-103 %R				Nitrobenzene-d5	16-103 %R
		2-Nitrophenol-d4	16-104 %R				2-Nitrophenol-d4	16-104 %R

QAPP Worksheet #28: QC Samples Table
Worksheet # 28I: Semivolatile Organics/CLP SOMO1.2 [contn'd]

(UFP-QAPP Manual 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 limit exceed the measurement performance criteria, the data obtained may be unusable for making project decisions.

Matrix	Soil
Analytical Group	Target Compound List Semivolatile Organics [cont'd]
Concentration Level	Low/Medium (mg/kg)
Sampling SOP(s)	
Analytical Method/SOP Reference	SOM01.2
Sampler's Name	
Field Sampling Organization	
Analytical Organization	EPA CLP RAS Laboratory
No. of Sample Locations	

Lab QC Sample:	**Frequency/ Number**	**Method/SOP QC Acceptance Limits**		**Corrective Action**	**Person(s) Responsible for Corrective Action**	**Data Quality Indicator (DQI)**	**Measurement Performance Criteria**	
Deuterated Monitoring Compounds [cont'd]	all samples	2,4-Dichlorophenol-d3	23-104 %R	Check calculations and instruments, reanalyze affected samples; up to 4 DMCs may fail to meet recovery limits (Section 11.3.4, Page D48/SVOC of SOM01.2)	EPA CLP RAS Laboratory GC/MS Technician	Accuracy	2,4-Dichlorophenol-d3	23-104 %R
		4-Chloroaniline-d4	1-145 %R				4-Chloroaniline-d4	1-145 %R
		Dimethylphthalate-d6	43-111 %R				Dimethylphthalate-d6	43-111 %R
		Acenaphthylene-d8	20-97 %R				Acenaphthylene-d8	20-97 %R
		4-Nitrophenol-d4	16-166 %R				4-Nitrophenol-d4	16-166 %R
		Fluorene-d10	40-108 %R				Fluorene-d10	40-108 %R
		4,6-Dinitro-2-methylphenol-d2	1-121 %R				4,6-Dinitro-2-methylphenol-d2	1-121 %R
		Anthracene-d10	22-98 %R				Anthracene-d10	22-98 %R
		Pyrene-d10	51-120 %R				Pyrene-d10	51-120 %R
		Benzo(a)pyrene-d12	43-111 %R				Benzo(a)pyrene-d12	43-111 %R

QAPP Worksheet #28: QC Samples Table
Worksheet # 28I: Semivolatile Organics/CLP SOMO1.2 [cont'd]

(UFP-QAPP Manual 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 limit exceed the measurement performance criteria, the data obtained may be unusable for making project decisions.

Matrix	Soil
Analytical Group	Target Compound List Semivolatile Organics [cont'd]
Concentration Level	Low/Medium (mg/kg)
Sampling SOP(s)	
Analytical Method/SOP Reference	SOM01.2
Sampler's Name	
Field Sampling Organization	
Analytical Organization	EPA CLP RAS Laboratory
No. of Sample Locations	

Lab QC Sample:	Frequency/ Number	Method/SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria
Internal Standards	all samples	50-200% of area, ± 30 sec retention time shift	Check calculations and instruments, reanalyze affected samples	EPA CLP RAS Laboratory GC/MS Technician	Accuracy	50-200% of area, ± 30 sec retention time shift

QAPP Worksheet #28: QC Samples Table
Worksheet # 28J: Pesticide - Organics/CLP SOMO1.2

(UFP-QAPP Manual 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 limit exceed the measurement performance criteria, the data obtained may be unusable for making project decisions.

Matrix	Soil
Analytical Group	Target Compound List Pesticides
Concentration Level	Low/Medium (mg/kg)
Sampling SOP(s)	
Analytical Method/SOP Reference	SOM01.2
Sampler's Name	
Field Sampling Organization	
Analytical Organization	EPA CLP RAS Laboratory
No. of Sample Locations	

Lab QC Sample:	**Frequency/ Number**	**Method/SOP QC Acceptance Limits**		**Corrective Action**	**Person(s) Responsible for Corrective Action**	**Data Quality Indicator (DQI)**	**Measurement Performance Criteria**	
Method Blank	1 per ≤ 20 samples or whenever samples extracted	No analyte > CRQL		Suspend analysis unit source recertified	EPA CLP RAS Laboratory GC/ECD Technician	Accuracy	No analyte > CRQL	
Matrix Spike	1 per ≤ 20 samples	gamma-BHC (Lindane)	46-127 %R	Flag outliers	EPA CLP RAS Laboratory GC/ECD Technician	Accuracy	gamma-BHC (Lindane)	46-127 %R
		Heptachlor	35-130 %R				Heptachlor	35-130 %R
		Aldrin	34-132 %R				Aldrin	34-132 %R
		Dieldrin	31-134 %R				Dieldrin	31-134 %R
		Endrin	42-139 %R				Endrin	42-139 %R
		4,4-DDT	23-134 %R				4,4-DDT	23-134 %R
Matrix Spike Duplicate	1 per ≤ 20 samples	gamma-BHC	0-50 %RPD	Flag outliers	EPA CLP RAS Laboratory GC/ECD Technician	Precision	gamma-BHC	0-50 %RPD
		Heptachlor	0-31 %RPD				Heptachlor	0-31 %RPD
		Aldrin	0-43 %RPD				Aldrin	0-43 %RPD
		Dieldrin	0-38 %RPD				Dieldrin	0-38 %RPD
		Endrin	0-45 %RPD				Endrin	0-45 %RPD
		4,4-DDT	0-50 %RPD				4,4-DDT	0-50 %RPD

QAPP Worksheet #28: QC Samples Table
Worksheet # 28J: Pesticide - Organics/CLP SOMO1.2 [cont'd]

(UFP-QAPP Manual 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 limit exceed the measurement performance criteria, the data obtained may be unusable for making project decisions.

Matrix	Soil
Analytical Group	Target Compound List Pesticides [cont'd]
Concentration Level	Low/Medium (mg/kg)
Sampling SOP(s)	
Analytical Method/SOP Reference	SOM01.2
Sampler's Name	
Field Sampling Organization	
Analytical Organization	EPA CLP RAS Laboratory
No. of Sample Locations	

Lab QC Sample:	**Frequency/ Number**	**Method/SOP QC Acceptance Limits**		**Corrective Action**	**Person(s) Responsible for Corrective Action**	**Data Quality Indicator (DQI)**	**Measurement Performance Criteria**	
Laboratory Control Sample	all samples	gamma-BHC	50-120 %R	Check calculations and instruments, reanalyze affected samples	EPA CLP RAS Laboratory GC/ECD Technician	Accuracy	gamma-BHC	50-120 %R
		Heptachlor epoxide	50-150 %R				Heptachlor epoxide	50-150 %R
		Dieldrin	30-130 %R				Dieldrin	30-130 %R
		4,4'-DDE	50-150 %R				4,4'-DDE	50-150 %R
		Endrin	50-120 %R				Endrin	50-120 %R
		Endosulfan sulfate	50-120 %R				Endosulfan sulfate	50-120 %R
		gamma-Chlordane	30-130 %R				gamma-Chlordane	30-130 %R
Surrogate	all samples		30–150 %R	Check calculations and instruments, reanalyze affected samples	EPA CLP RAS Laboratory GC/ECD Technician	Accuracy		30-150 %R

QAPP Worksheet #28: QC Samples Table
Worksheet # 28K: PCBs - Organics/CLP SOMO1.2

(UFP-QAPP Manual 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 limit exceed the measurement performance criteria, the data obtained may be unusable for making project decisions.

Matrix	Soil
Analytical Group	Target Compound List PCBs
Concentration Level	Low/Medium (mg/kg)
Sampling SOP(s)	
Analytical Method/SOP Reference	SOM01.2
Sampler's Name	
Field Sampling Organization	
Analytical Organization	EPA CLP RAS Laboratory
No. of Sample Locations	

Lab QC Sample:	**Frequency/ Number**	**Method/SOP QC Acceptance Limits**		**Corrective Action**	**Person(s) Responsible for Corrective Action**	**Data Quality Indicator (DQI)**	**Measurement Performance Criteria**	
Method Blank	1 per ≤ 20 samples or whenever samples extracted	No analyte > CRQL		Suspend analysis unit source recertified	EPA CLP RAS Laboratory GC/ECD Technician	Accuracy	No analyte > CRQL	
Matrix Spike	1 per ≤ 20 samples	Aroclor-1016	29-135 %R	EPA CLP RAS Laboratory GC/ECD Technician	EPA CLP RAS Laboratory GC/ECD Technician	Accuracy	Aroclor-1016	29-135 %R
		Aroclor-1260	29-135 %R				Aroclor-1260	29-135 %R
Matrix Spike Duplicate	1 per ≤ 20 samples	Aroclor-1016	0-15 %RPD	EPA CLP RAS Laboratory GCECD Technician	EPA CLP RAS Laboratory GC/ECD Technician	Precision	Aroclor-1016	0-15 %RPD
		Aroclor-1260	0-20 %RPD				Aroclor-1260	0-20 %RPD
Laboratory Control Sample	all samples	Aroclor-1016	50-150 %R	EPA CLP RAS Laboratory GC/ECD Technician	EPA CLP RAS Laboratory GC/ECD Technician	Accuracy	Aroclor-1016	50-150 %R
		Aroclor-1260	50-150 %R				Aroclor-1260	50-150 %R
Surrogate	all samples		30-150%R	EPA CLP RAS Laboratory GC/ECD Technician	EPA CLP RAS Laboratory GC/ECD Technician	Accuracy		30-150%R

QAPP Worksheet #28: QC Samples Table
Worksheet # 28L and 28M: TAL Metals – Inorganics/CLP ILMO5.4

(UFP-QAPP Manual 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 limit exceed the measurement performance criteria, the data obtained may be unusable for making project decisions.

Matrix	Aqueous
Analytical Group	Target Analyte List Inorganics Metals
Concentration Level	Low/Medium (ug/L)
Sampling SOP(s)	
Analytical Method/SOP Reference	ILM05.4
Sampler's Name	
Field Sampling Organization	
Analytical Organization	EPA CLP RAS Laboratory
No. of Sample Locations	

Lab QC Sample:	Frequency/Number	Method/SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria
Preparation Blank	1 per ≤ 20 samples	No constituent > CRQL	Suspend analysis until source rectified; redigest and reanalyze affected samples	EPA CLP RAS Laboratory ICP-AES/ICP-MS Technician	Accuracy	No constituent > CRQL
Spike	1 per ≤ 20 samples	75-125%R*	Flag outliers	EPA CLP RAS Laboratory ICP-AES/ICP-MS Technician	Accuracy	75-125%R*
Duplicate	1 per ≤ 20 samples	± 20% RPD**	Flag outliers	EPA CLP RAS Laboratory ICP-AES/ICP-MS Technician	Precision	± 20% RPD**
Post-Digestion Spike	after any analyte (except Ag and Hg) fails spike %R	75-125%R	Flag outliers	EPA CLP RAS Laboratory ICP-AES/ICP-MS Technician	Accuracy	75-125%R
Interference Check Sample [ICP Analysis Only]	beginning, end and periodically (not less than once per 20 samples)	± 2 times CRQL of true value or ± 20% of true value, whichever is greater	Check calculations and instruments, reanalyze affected samples	EPA CLP RAS Laboratory ICP-AES/ICP-MS Technician	Sensitivity	± 2 times CRQL of true value or ± 20% of true value, whichever is greater

*except when the sample concentration is greater than 4 times the spike concentration, then disregrard the recoveries; no data validation action taken
**Reference USEPA Region 2 SOP No. HW-2, Revision 13/Evaluation of Metals Data for CLP - (include absolute difference criteria)
**except when the sample and/or duplicate concentration is less than 5 times the CRQL, then ± CRQL.

QAPP Worksheet #28: QC Samples Table
Worksheet # 28L and 28M: TAL Metals – Inorganics/CLP ILMO5.4 [cont'd]

(UFP-QAPP Manual 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 limit exceed the measurement performance criteria, the data obtained may be unusable for making project decisions.

Matrix	Aqueous
Analytical Group	Target Analyte List Inorganics Metals [cont'd]
Concentration Level	Low/Medium (ug/L)
Sampling SOP(s)	
Analytical Method/SOP Reference	ILM05.4
Sampler's Name	
Field Sampling Organization	
Analytical Organization	EPA CLP RAS Laboratory
No. of Sample Locations	

Lab QC Sample:	Frequency/Number	Method/SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria
Laboratory Control Sample	1 per ≤ 20 samples	80-120%R (except Ag and Sb)	Suspend analysis until source rectified; redigest and reanalyze affected samples	EPA CLP RAS Laboratory ICP-AES/ICP-MS Technician	Accuracy	80-120%R (except Ag and Sb)

QAPP Worksheet #28: QC Samples Table
Worksheet # 28N: Total Mercury – Inorganics/CLP ILMO5.4

(UFP-QAPP Manual 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 limit exceed the measurement performance criteria, the data obtained may be unusable for making project decisions.

Matrix	Aqueous
Analytical Group	Target Analyte List Inorganics – Total Mercury
Concentration Level	Low/Medium (ug/L)
Sampling SOP(s)	
Analytical Method/SOP Reference	ILM05.4 – Cold Vapor Atomic Absorption (CVAA)
Sampler's Name	
Field Sampling Organization	
Analytical Organization	EPA CLP RAS Laboratory
No. of Sample Locations	

Lab QC Sample:	Frequency/Number	Method/SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria
Preparation Blank (PB)	1 per ≤ 20 samples	No analyte > CRQL	Suspend analysis; redigest and reanalyze	EPA CLP RAS Laboratory Technician	Accuracy	No analyte > CRQL
Duplicate Sample	1 per ≤ 20 samples	± 20% RPD*	Flag outliers	EPA CLP RAS Laboratory Technician	Precision	± 20% RPD
Spike Sample	1 per ≤ 20 samples	75 – 125 %R	Flag outliers	EPA CLP RAS Laboratory Technician	Accuracy	75 – 125 %R

*Reference USEPA Region 2 SOP No. HW-2, Revision 13/Evaluation of Metals Data for CLP - (include absolute difference criteria)

QAPP Worksheet #28: QC Samples Table
Worksheet # 28O: Total Cyanide – Inorganics/CLP ILMO5.4

(UFP-QAPP Manual 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 limit exceed the measurement performance criteria, the data obtained may be unusable for making project decisions.

Matrix	Aqueous
Analytical Group	Target Analyte List Inorganics - Total Cyanide
Concentration Level	Low/Medium (ug/L)
Sampling SOP(s)	
Analytical Method/SOP Reference	ILM05.4 – Colorimeter or Spectrophotometer
Sampler's Name	
Field Sampling Organization	
Analytical Organization	EPA CLP RAS Laboratory
No. of Sample Locations	

Lab QC Sample:	Frequency/Number	Method/SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria
Preparation Blank (PB)	1 per ≤ 20 samples	No analyte > CRQL	Suspend analysis; redistill and reanalyze	EPA CLP RAS Laboratory Technician	Accuracy	No analyte > CRQL
Duplicate Sample	1 per ≤ 20 samples	± 20% RPD*	Flag outliers	EPA CLP RAS Laboratory Technician	Precision	± 20% RPD
Spike Sample	1 per ≤ 20 samples	75 – 125 %R	Flag outliers	EPA CLP RAS Laboratory Technician	Accuracy	75 – 125 %R

*Reference USEPA Region 2 SOP No. HW-2, Revision 13/Evaluation of Metals Data for CLP - (include absolute difference criteria)

QAPP Worksheet #28: QC Samples Table
Worksheet # 28P: TAL Metals – Inorganics/CLP ILMO5.4

(UFP-QAPP Manual 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 limit exceed the measurement performance criteria, the data obtained may be unusable for making project decisions.

Matrix	Soil
Analytical Group	Target Analyte List Inorganics – Metals
Concentration Level	Low/Medium (mg/kg)
Sampling SOP(s)	
Analytical Method/SOP Reference	ILM05.4
Sampler's Name	
Field Sampling Organization	
Analytical Organization	EPA CLP RAS Laboratory
No. of Sample Locations	

Lab QC Sample:	Frequency/Number	Method/SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria
Preparation Blank	1 per ≤ 20 samples	No constituent > CRQL	Suspend analysis until source rectified; redigest and reanalyze affected samples	EPA CLP RAS Laboratory ICP-AES/ICP-MS Technician	Accuracy	No constituent > CRQL
Spike	1 per ≤ 20 samples	75-125%R*	Flag outliers	EPA CLP RAS Laboratory ICP-AES/ICP-MS Technician	Accuracy	75-125%R*
Duplicate	1 per ≤ 20 samples	± 20% RPD**	Flag outliers	EPA CLP RAS Laboratory ICP-AES/ICP-MS Technician	Precision	± 20% RPD**
Post-Digestion Spike	after any analyte (except Ag and Hg) fails spike %R	75-125%R	Flag outliers	EPA CLP RAS Laboratory ICP-AES/ICP-MS Technician	Accuracy	75-125%R
Interference Check Sample [ICP Analysis Only]	beginning, end and periodically during run (2 times every 8 hours)	Within ± 2 times CRQL of true value or ± 20% of true value, whichever is greater	Check calculations and instruments, reanalyze affected samples	EPA CLP RAS Laboratory ICP-AES/ICP-MS Technician	Sensitivity	Within ± 2 times CRQL of true value or ± 20% of true value, whichever is greater

*except when the sample concentration is greater than 4 times the spike concentration, then disregrard the recoveries; no data validation action taken
**Reference USEPA Region 2 SOP No. HW-2, Revision 13/Evaluation of Metals Data for CLP - (include absolute difference criteria)
**except when the sample and/or duplicateconcentration is less than 5 times the CRQL, then ± CRQL.

QAPP Worksheet #28: QC Samples Table
Worksheet # 28P: TAL Metals – Inorganics/CLP ILMO5.4 [cont'd]

(UFP-QAPP Manual 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 limit exceed the measurement performance criteria, the data obtained may be unusable for making project decisions.

Matrix	Soil
Analytical Group	Target Analyte List Inorganics- Metals [cont'd]
Concentration Level	Low/Medium (mg/kg)
Sampling SOP(s)	
Analytical Method/SOP Reference	ILM05.4
Sampler's Name	
Field Sampling Organization	
Analytical Organization	EPA CLP RAS Laboratory
No. of Sample Locations	

Lab QC Sample:	Frequency/Number	Method/SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria
Laboratory Control Sample	1 per ≤ 20 samples	Control limits established by EPA*	Suspend analysis until source rectified; redigest and reanalyze affected samples	EPA CLP RAS Laboratory ICP-AES/ICP-MS Technician	Accuracy	Control limits established by EPA*

* If the EPA LCS is unavailable, other EPA QC samples or other certified materials may be used. In such cases, control limits for the LCS must be documnetd and provided.

QAPP Worksheet #28: QC Samples Table
Worksheet # 28Q: Total Mercury – Inorganics/CLP ILMO5.4

(UFP-QAPP Manual 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 limit exceed the measurement performance criteria, the data obtained may be unusable for making project decisions.

Matrix	Soil
Analytical Group	Target Analyte List Inorganics –Total Mercury
Concentration Level	Low/Medium (mg/kg)
Sampling SOP(s)	
Analytical Method/SOP Reference	ILM05.4 – Cold Vapor Atomic Absorption (CVAA)
Sampler's Name	
Field Sampling Organization	
Analytical Organization	EPA CLP RAS Laboratory
No. of Sample Locations	

Lab QC Sample:	Frequency/Number	Method/SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria
Preparation Blank (PB)	1 per ≤ 20 samples	No analyte > CRQL	Suspend analysis; redigest and reanalyze	EPA CLP RAS Laboratory Technician	Accuracy	No analyte > CRQL
Duplicate Sample	1 per ≤ 20 samples	± 20% RPD	Flag outliers	EPA CLP RAS Laboratory Technician	Precision	± 20% RPD
Spike Sample	1 per ≤ 20 samples	75 – 125 %R	Flag outliers	EPA CLP RAS Laboratory Technician	Accuracy	75 – 125 %R
Laboratory Control Sample	1 ≤ 20 samples	Control limits established by EPA*	Flag outliers	EPA CLP RAS Laboratory Technician	Accuracy	Control limits established by EPA*

* If the EPA LCS is unavailable, other EPA QC samples or other certified materials may be used. In such cases, control limits for the LCS must be documnetd and provided.

QAPP Worksheet #28: QC Samples Table
Worksheet # 28R: Total Cyanide – Inorganics/CLP ILMO5.4

(UFP-QAPP Manual 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 limit exceed the measurement performance criteria, the data obtained may be unusable for making project decisions.

Matrix	Soil
Analytical Group	Target Analyte List Inorganics – Total Cyanide
Concentration Level	Low/Medium (mg/kg)
Sampling SOP(s)	
Analytical Method/SOP Reference	ILM05.4 – Colorimeter or Spectrophotometer
Sampler's Name	
Field Sampling Organization	
Analytical Organization	EPA CLP RAS Laboratory
No. of Sample Locations	

Lab QC Sample:	Frequency/Number	Method/SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria
Preparation Blank (PB)	1 per ≤ 20 samples	No analyte > CRQL	Suspend analysis; redigest and reanalyze	EPA CLP RAS Laboratory Technician	Accuracy	No analyte > CRQL
Duplicate Sample	1 per ≤ 20 samples	± 20% RPD	Flag outliers	EPA CLP RAS Laboratory Technician	Precision	± 20% RPD
Spike Sample	1 per ≤ 20 samples	75 – 125 %R	Flag outliers	EPA CLP RAS Laboratory Technician	Accuracy	75 – 125 %R
Laboratory Control Sample	1 ≤ 20 samples	Control limits established by EPA*	Flag outliers	EPA CLP RAS Laboratory Technician	Accuracy	Control limits established by EPA*

* If the EPA LCS is unavailable, other EPA QC samples or other certified materials may be used. In such cases, control limits for the LCS must be documnetd and provided.

QAPP Worksheet #28: QC Samples Table
Worksheet # 28S: Volatile – Organics/SW 846 Method 8260B

(UFP-QAPP Manual 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 limit exceed the measurement performance criteria, the data obtained may be unusable for making project decisions.

Matrix	Soil/Waste samples
Analytical Group	Target Compound List Volatile Organics
Concentration Level	Low/Medium/High (mg/kg)
Sampling SOP(s)	
Analytical Method/SOP Reference	SW 846 Method 8260B/SOP# HW-24, Rev. 2
Sampler's Name	
Field Sampling Organization	Weston Solutions, Inc.
Analytical Organization	Subcontracted NELAC Laboratory
No. of Sample Locations	

Lab QC Sample:	Frequency/ Number	Method/SOP QC Acceptance Limits		Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria	
Method Blank	1 every 12 hours	No analyte > CRQL*		Suspend analysis unit source recertified	Subcontracted RAS Laboratory GC/MS Technician	Accuracy	No analyte > CRQL*	
* Matrix Spike (Not Required)	1 per ≤ 20 samples; if requested	1,1-Dichloroethene	70-130 %R	Flag outliers, conjunction with other QC criteria.	Subcontracted RAS/non-RAS Laboratory GC/MS Technician	Accuracy	1,1-Dichloroethene	70-130 %R
		Trichloroethene	70-130 %R				Trichloroethene	70-130 %R
		Benzene	70-130 %R				Benzene	70-130 %R
		Toluene	70-130 %R				Toluene	70-130 %R
* Matrix Spike Duplicate (Not Required)	1 per ≤ 20 samples; if requested	1,1-Dichloroethene	0-20 %RPD	Flag outliers, conjunction with other QC criteria.	Subcontracted RAS/non-RAS Laboratory GC/MS Technician	Precision	1,1-Dichloroethene	0-20 %RPD
		Trichloroethene	0-20 %RPD				Trichloroethene	0-20 %RPD
		Benzene	0-20 %RPD				Benzene	0-20 %RPD
		Toluene	0-20 %RPD				Toluene	0-20 %RPD
Surrogate Recovery	All Samples	4-Bromofluorobenzene	70-130 %R	Check calculations and instruments, reanalyze affected samples; up to 3 DMCs per sample may fail to meet necessary limits (follow SOP: HW-24 for qualifications)	Subcontracted RAS/non-RAS Laboratory GC/MS Technician	Accuracy	4-Bromofluorobenzene	70-130 %R
		Dibromofluoromethane	70-130 %R				Dibromofluoromethane	70-130 %R
		Toluene-d8	70-130 %R				Toluene-d8	70-130 %R
		Dichloroethane-d4	70-130 %R				Dichloroethane-d4	70-130 %R

* Laboratory spike entire list of compounds, but at the minimum, above compounds are require. For MS/MSD and LCS Laboratory can also use in house performance criteria

QAPP Worksheet #28: QC Samples Table – Continued
Worksheet # 28S: Volatile – Organics/SW 846 Method 8260B [cont'd]

Matrix	Soil/Waste Samples
Analytical Group	Target Compound List Volatile Organics (cont'd)
Concentration Level	Low/Medium/High (mg/kg)
Sampling SOP(s)	
Analytical Method/SOP Reference	SW 846 Method 8260B/SOP# HW-24, Rev. 2
Sampler's Name	
Field Sampling Organization	Weston Solutions, Inc.
Analytical Organization	Subcontracted NELAC Laboratory
No. of Sample Locations	

Lab QC Sample:	Frequency/ Number	Method/SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria
Internal Standards	all samples	50-100% of area, ± 30 sec retention time shift	Check calculations and instruments, reanalyze affected samples; up to 3 DMCs per sample may fail to meet necessary limits (Section 11.3.4, Page D45/VOC of SOM01.2)	Subcontracted RAS/non-RAS Laboratory GC/MS Technician	Accuracy	50-100% of area, ± 30 sec retention time shift
LCS	1 per ≤ 20 samples; if requested	70-130 %R %RPD < 20	Flag outliers	Subcontracted RAS/non-RAS Laboratory GC/MS Technician	Accuracy Precision	70-130 %R %RPD < 20
Field Duplicate	1 per ≤ 20 samples; if requested	%RPD < 20	Check calculation, and Flag outliers	Subcontracted RAS/non-RAS Laboratory GC/MS Technician	Accuracy	% RPD < 20

* Laboratory spike entire list of compounds, but at the minimum, above compounds are require. FOR MS/MSD and LCS Laboratory can also use in house performance criteria

QAPP Worksheet #28: QC Samples Table
Worksheet # 28S: Volatile – Organics/SW 846 Method 8260B [cont'd]

Matrix	Water
Analytical Group	Target Compound List Volatile Organics
Concentration Level	Low/Medium (mg/L)
Sampling SOP(s)	
Analytical Method/SOP Reference	SW 846 Method 8260B/SOP# HW-24, Rev. 2
Sampler's Name	
Field Sampling Organization	Weston Solutions, Inc.
Analytical Organization	Subcontracted NELAC Laboratory
No. of Sample Locations	

Lab QC Sample:	**Frequency/ Number**	**Method/SOP QC Acceptance Limits**		**Corrective Action**	**Person(s) Responsible for Corrective Action**	**Data Quality Indicator (DQI)**	**Measurement Performance Criteria**	
Method Blank	1 every 12 hours	No analyte > CRQL*		Suspend analysis unit source recertified	Subcontracted RAS Laboratory GC/MS Technician	Accuracy	No analyte > CRQL*	
* Matrix Spike and Laboratory Control Sample/ (Not Required)	1 per ≤ 20 samples; if requested	1,1-Dichloroethene	70-130 %R	Flag outliers, conjunction with other QC criteria.	Subcontracted RAS/non-RAS Laboratory GC/MS Technician	Accuracy	1,1-Dichloroethene	70-130 %R
		Trichloroethene	70-130 %R				Trichloroethene	70-130 %R
		Benzene	70-130 %R				Benzene	70-130 %R
		Toluene	70-130 %R				Toluene	70-130 %R
* Matrix Spike Duplicate/Laboratory Control Sample (Not Required)	1 per ≤ 20 samples; if requested	1,1-Dichloroethene	0-20 %RPD	Flag outliers, conjunction with other QC criteria.	Subcontracted RAS/non-RAS Laboratory GC/MS Technician	Precision	1,1-Dichloroethene	0-20 %RPD
		Trichloroethene	0-20 %RPD				Trichloroethene	0-20 %RPD
		Benzene	0-20 %RPD				Benzene	0-20 %RPD
		Toluene	0-20 %RPD				Toluene	0-20 %RPD

QAPP Worksheet #28: QC Samples Table – Continued
Worksheet # 28S: Volatile – Organics/SW 846 Method 8260B [cont'd]

Matrix	Water
Analytical Group	Target Compound List Volatile Organics (cont'd)
Concentration Level	Low/Medium (mg/L)
Sampling SOP(s)	
Analytical Method/SOP Reference	SW 846 Method 8260B/SOP# HW-24, Rev. 2
Sampler's Name	
Field Sampling Organization	Weston Solutions, Inc.
Analytical Organization	Subcontracted NELAC Laboratory
No. of Sample Locations	

Lab QC Sample:	**Frequency/ Number**	**Method/SOP QC Acceptance Limits**		**Corrective Action**	**Person(s) Responsible for Corrective Action**	**Data Quality Indicator (DQI)**	**Measurement Performance Criteria**	
Surrogate Recovery	All Samples	4-Bromofluorobenzene	80-120 %R	Check calculations and instruments, reanalyze affected samples; up to 3 DMCs per sample may fail to meet necessary limits (follow SOP: HW-24 for qualifications)	Weston Subcontracted RAS/non-RAS Laboratory GC/MS Technician	Accuracy	4-Bromofluorobenzene	80-120 %R
		Dibromofluoromethane	80-120 %R				Dibromofluoromethane	80-120 %R
		Toluene-d8	80-120 %R				Toluene-d8	80-120 %R
		Dichloroethane-d4	80-120 %R				Dichloroethane-d4	80-120 %R
(Internal Standards	all samples	50-200% of area, ± 30 sec retention time shift		Check calculations and instruments, reanalyze affected samples; up to 3 DMCs per sample may fail to meet necessary limits (Section 11.3.4, Page D45/VOC of SOM01.2)	Weston Subcontracted RAS/non-RAS Laboratory GC/MS Technician	Accuracy	50-100% of area, ± 30 sec retention time shift	

* Laboratory spike entire list of compounds, but at the minimum, above compounds are require. FOR MS/MSD and LCS Laboratory can also use in house performance criteria.

QAPP Worksheet #28: QC Samples Table
Worksheet # 28T: Semi-Volatile – Organics/SW 846 Method 8270D

(UFP-QAPP Manual 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 limit exceed the measurement performance criteria, the data obtained may be unusable for making project decisions.

Matrix	Water/Soil/Waste samples
Analytical Group	Target Compound List Semi-Volatile Organics
Concentration Level	Low/Medium/High (mg/kg or mg/l)
Sampling SOP(s)	
Analytical Method/SOP Reference	SW 846 Method 8270D/SOP# HW-22, Rev. 3
Sampler's Name	
Field Sampling Organization	Weston Solutions, Inc.
Analytical Organization	Subcontracted nelac Laboratory
No. of Sample Locations	

Lab QC Sample:	**Frequency/ Number**	**Method/SOP QC Acceptance Limits**		**Corrective Action**	**Person(s) Responsible for Corrective Action**	**Data Quality Indicator (DQI)**	**Measurement Performance Criteria**	
Method Blank	1 per ≤ 20 samples or whenever samples extracted	No analyte > CRQL*		Suspend analysis unit source recertified	Weston Subcontracted RAS/non-RAS Laboratory GC/MS Technician	Accuracy	No analyte > CRQL*	
Matrix Spike (Not Required)	1 per ≤ 20 samples; if requested	Phenol	In House MS/MSD Recovery Or (See SW 846 Method 8270D, Table 6)	No action is taken on MS/MSD data alone. Qualify data in conjunction with other QC criteria	Weston Subcontracted RAS/non-RAS Laboratory GC/MS Technician	Accuracy	Phenol	In House MS/MSD Recovery Or (See SW 846 Method 8270D, Table 6
		2-Chlorophenol					2-Chlorophenol	
		N-Nitroso-di-n-propylamine					N-Nitroso-di-n-propylamine	
		4-Chloro-3-methylphenol					4-Chloro-3-methylphenol	
		Acenaphthene					Acenaphthene	
		4-Nitrophenol					4-Nitrophenol	
		2,4-Dinitrotoluene					2,4-Dinitrotoluene	
		Pentachloro-phenol					Pentachloro-phenol	
		1,2,4-Trichlorobenzene					1,2,4-Trichlorobenzene	
		1,4-Dichlorobenzene					1,4-Dichlorobenzene	
		2-Chlorophenol					2-Chlorophenol	
		Pyrene					Pyrene	
Matrix Spike Duplicate (Not Required)	1 per ≤ 20 samples; if requested	Phenol		Flag outliers	Weston Subcontracted RAS/non-RAS Laboratory GC/MS Technician	Precision	Phenol	0-35 %RPD
		2-Chlorophenol					2-Chlorophenol	0-50 %RPD
		N-Nitroso-di-n-propylamine					N-Nitroso-di-n-propylamine	0-38 %RPD

QAPP Worksheet #28: QC Samples Table
Worksheet # 28T: Semi-Volatile – Organics/SW 846 Method 8270D [cont'd]

(UFP-QAPP Manual 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 limit exceed the measurement performance criteria, the data obtained may be unusable for making project decisions.

Matrix	Water/Soil/Waste samples
Analytical Group	Target Compound List Semi-Volatile Organics [cont'd]
Concentration Level	Low/Medium (mg/kg or mg/l)
Sampling SOP(s)	
Analytical Method/SOP Reference	SW 846 Method 8270D/SOP# HW-22, Rev. 3
Sampler's Name	
Field Sampling Organization	Weston Solutions, Inc.
Analytical Organization	Subcontracted nelac Laboratory
No. of Sample Locations	

Lab QC Sample:	**Frequency/ Number**	**Method/SOP QC Acceptance Limits**		**Corrective Action**	**Person(s) Responsible for Corrective Action**	**Data Quality Indicator (DQI)**	**Measurement Performance Criteria**	
Matrix Spike Duplicate (Not Required) [cont'd]	1 per ≤ 20 samples; if requested	4-Chloro-3-methylphenol	In House MS/MSD Recovery Or (See SW 846 Method 8270D, Table 6)	No antion is taken on MS/MSD data alone. Qualify data in conjunction with other QC criteria	Weston Subcontracted RAS/non-RAS Laboratory GC/MS Technician	Precision	4-Chloro-3-methylphenol	0-33 %RPD
		Acenaphthene					Acenaphthene	0-19 %RPD
		4-Nitrophenol					4-Nitrophenol	0-50 %RPD
		2,4-Dinitrotoluene					2,4-Dinitrotoluene	0-47 %RPD
		Pentachloro-phenol					Pentachloro-phenol	0-47 %RPD
		1,2,4-Trichlorobenzene						
		1,4-Dichlorobenzene						
		2-Chlorophenol						
		Pyrene					Pyrene	0-36 %RPD
Surrogate Compounds	all samples	Phenol-d5	Lab In House recovery limit or SW 846 Method 8270B-43; 8000C-24	Check calculations and instruments, reanalyze affected samples; (follow SOP: HW-22 for qualifications)	Weston Subcontracted RAS/non-RAS Laboratory GC/MS Technician	Accuracy	Phenol-d5	17-103 %R
		2-Fluorophenol					Bis(2-chloroethyl)ether-d8	12-98 %R
		2-Fluorobiphenyl					2-Chlorophenol-d4	13-101 %R
		2,4,6-Tribromophenol					4-Methylphenol-d8	8-100 %R
		Nitrobenzene-d5					Nitrobenzene-d5	16-103 %R
		Terphenyl-d14					2-Nitrophenol-d4	16-104 %R

QAPP Worksheet #28: QC Samples Table
Worksheet # 28T: Semi-Volatile – Organics/SW 846 Method 8270D [cont'd]

(UFP-QAPP Manual 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 limit exceed the measurement performance criteria, the data obtained may be unusable for making project decisions.

Matrix	Water/Soil/Waste samples
Analytical Group	Target Compound List Semi-Volatile Organics [cont'd]
Concentration Level	Low/Medium (mg/kg or mg/l)
Sampling SOP(s)	
Analytical Method/SOP Reference	SW 846 Method 8270D/SOP# HW-22, Rev. 3
Sampler's Name	
Field Sampling Organization	Weston Solutions, Inc.
Analytical Organization	Subcontracted nelac Laboratory
No. of Sample Locations	

Lab QC Sample:	Frequency/Number	Method/SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria
Internal Standards	all samples	50-100% of area, ± 30 sec retention time shift	Check calculations and instruments, reanalyze affected samples	Weston Subcontracted RAS/non-RAS Laboratory GC/MS Technician	Accuracy	50-100% of area, ± 30 sec retention time shift

QAPP Worksheet #28: QC Samples Table
Worksheet # 28U-1: Pesticide – Organics/SW 846 Method 8081B

(UFP-QAPP Manual 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 limit exceed the measurement performance criteria, the data obtained may be unusable for making project decisions.

Matrix	Soil/Waste samples
Analytical Group	Target Compound List Pesticides
Concentration Level	Low/Medium (mg/kg)
Sampling SOP(s)	
Analytical Method/SOP Reference	SW 846 Method 8081B/SOP# HW-44, Rev. 1
Sampler's Name	
Field Sampling Organization	Weston Solutions, Inc.
Analytical Organization	Subcontracted nelac Laboratory
No. of Sample Locations	

Lab QC Sample:	**Frequency/ Number**	**Method/SOP QC Acceptance Limits**		**Corrective Action**	**Person(s) Responsible for Corrective Action**	**Data Quality Indicator (DQI)**	**Measurement Performance Criteria**	
Method Blank	1 per ≤ 20 samples or whenever samples extracted	No analyte > CRQL		Suspend analysis unit source recertified	Weston Subcontracted RAS/non-RAS Laboratory GC/ECD Technician	Accuracy	No analyte > CRQL	
Matrix Spike	1 per ≤ 20 samples	gamma-BHC (Lindane)	46-127 %R	Flag outliers	Weston Subcontracted RAS/non-RAS Laboratory GC/ECD Technician	Accuracy	gamma-BHC (Lindane)	46-127 %R
		Heptachlor	35-130 %R				Heptachlor	35-130 %R
		Aldrin	34-132 %R				Aldrin	34-132 %R
		Dieldrin	31-134 %R				Dieldrin	31-134 %R
		Endrin	42-139 %R				Endrin	42-139 %R
		4,4-DDT	23-134 %R				4,4-DDT	23-134 %R
Matrix Spike Duplicate	1 per ≤ 20 samples	gamma-BHC	0-50 %RPD	Flag outliers	Weston Subcontracted RAS/non-RAS Laboratory GC/ECD Technician	Precision	gamma-BHC	0-50 %RPD
		Heptachlor	0-31 %RPD				Heptachlor	0-31 %RPD
		Aldrin	0-43 %RPD				Aldrin	0-43 %RPD
		Dieldrin	0-38 %RPD				Dieldrin	0-38 %RPD
		Endrin	0-45 %RPD				Endrin	0-45 %RPD
		4,4-DDT	0-50 %RPD				4,4-DDT	0-50 %RPD

QAPP Worksheet #28: QC Samples Table
Worksheet # 28U: Pesticide – Organics/SW 846 Method 8081B [cont'd]

(UFP-QAPP Manual 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 limit exceed the measurement performance criteria, the data obtained may be unusable for making project decisions.

Matrix	Soil/Waste samples
Analytical Group	Target Compound List Pesticides [cont'd]
Concentration Level	Low/Medium (mg/kg)
Sampling SOP(s)	
Analytical Method/SOP Reference	SW 846 Method 8081B/SOP# HW-44, Rev. 1
Sampler's Name	
Field Sampling Organization	Weston Solutions, Inc.
Analytical Organization	Subcontracted nelac Laboratory
No. of Sample Locations	

Lab QC Sample:	**Frequency/ Number**	**Method/SOP QC Acceptance Limits**		**Corrective Action**	**Person(s) Responsible for Corrective Action**	**Data Quality Indicator (DQI)**	**Measurement Performance Criteria**	
Laboratory Control Sample	all samples	gamma-BHC	50-120 %R	Check calculations and instruments, reanalyze affected samples	Weston Subcontracted RAS/non-RAS Laboratory GC/ECD Technician	Accuracy	gamma-BHC	50-120 %R
		Heptachlor epoxide	50-150 %R				Heptachlor epoxide	50-150 %R
		Dieldrin	30-130 %R				Dieldrin	30-130 %R
		4,4'-DDE	50-150 %R				4,4'-DDE	50-150 %R
		Endrin	50-120 %R				Endrin	50-120 %R
		Endosulfan sulfate	50-120 %R				Endosulfan sulfate	50-120 %R
		gamma-Chlordane	30-130 %R				gamma-Chlordane	30-130 %R
Surrogate	all samples		30–150 %R	Check calculations and instruments, reanalyze affected samples	Weston Subcontracted RAS/non-RAS Laboratory GC/ECD Technician	Accuracy		30-150 %R

QAPP Worksheet #28: QC Samples Table
Worksheet # 28U: Pesticide – Organics/SW 846 Method 8081B [cont'd]

(UFP-QAPP Manual 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 limit exceed the measurement performance criteria, the data obtained may be unusable for making project decisions.

Matrix	Water/Waste samples
Analytical Group	Target Compound List Pesticides
Concentration Level	Low/Medium (ug/l)
Sampling SOP(s)	
Analytical Method/SOP Reference	SW 846 Method 8081B/SOP# HW-44, Rev. 1
Sampler's Name	
Field Sampling Organization	Weston Solutions, Inc.
Analytical Organization	Subcontracted nelac Laboratory
No. of Sample Locations	

Lab QC Sample:	Frequency/Number	Method/SOP QC Acceptance Limits		Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria	
Method Blank	1 per ≤ 20 samples OR whenever samples extracted	No analyte > CRQL		Suspend analysis unit source recertified	EPA CLP RAS Laboratory GC/ECD Technician	Accuracy	No analyte > CRQL	
Matrix Spike	1 per ≤ 20 samples; if requested	gamma-BHC (Lindane)	56-123 %R	Flag outliers	EPA CLP RAS Laboratory GC/ECD Technician	Accuracy	gamma-BHC (Lindane)	56-123 %R
		Heptachlor	40-131 %R				Heptachlor	40-131 %R
		Aldrin	40-120 %R				Aldrin	40-120 %R
		Dieldrin	52-126 %R				Dieldrin	52-126 %R
		Endrin	56-121 %R				Endrin	56-121 %R
		4,4'-DDT	38-127 %R				4,4'-DDT	38-127 %R
Matrix Spike Duplicate	1 per ≤ 20 samples; if requested	gamma-BHC	0-15 %RPD	Flag outliers	EPA CLP RAS Laboratory GC/ECD Technician	Precision	gamma-BHC	0-15 %RPD
		Heptachlor	0-20 %RPD				Helptachlor	0-20 %RPD
		Aldrin	0-22 %RPD				Aldrin	0-22 %RPD
		Dieldrin	0-18 %RPD				Dieldrin	0-18 %RPD
		Endrin	0-21 %RPD				Endrin	0-21 %RPD
		4,4'-DDT	0-27 %RPD				4,4'-DDT	0-27 %RPD
Laboratory Control Sample	1 per ≤ 20 samples	gamma-BHC	50-120 %R	Check calculations and instruments, reanalyze affected samples	EPA CLP RAS Laboratory GC/ECD Technician	Accuracy	gamma-BHC	50-120 %R

QAPP Worksheet #28: QC Samples Table
Worksheet # 28U: Pesticide – Organics/SW 846 Method 8081B [cont'd]

(UFP-QAPP Manual 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 limit exceed the measurement performance criteria, the data obtained may be unusable for making project decisions.

Matrix	Water/Waste samples
Analytical Group	Target Compound List Pesticides (cont'd)
Concentration Level	Low/Medium (ug/l)
Sampling SOP(s)	
Analytical Method/SOP Reference	SW 846 Method 8081B/SOP# HW-44, Rev. 1
Sampler's Name	
Field Sampling Organization	Weston Solutions, Inc.
Analytical Organization	Subcontracted nelac Laboratory
No. of Sample Locations	

Lab QC Sample:	**Frequency/Number**	**Method/SOP QC Acceptance Limits**		**Corrective Action**	**Person(s) Responsible for Corrective Action**	**Data Quality Indicator (DQI)**	**Measurement Performance Criteria**	
Laboratory Control Sample [cont'd]	1 per ≤ 20 samples	Heptachlor epoxide	50-150 %R	Check calculations and instruments, reanalyze affected samples	EPA CLP RAS Laboratory GC/ECD Technician	Accuracy	Helpachlor epoxide	50-150 %R
Laboratory Control Sample [cont'd]	1 per ≤ 20 samples	Dieldrin	30-130 %R	Check calculations and instruments, reanalyze affected samples	EPA CLP RAS Laboratory GC/ECD Technician	Accuracy	Dieldrin	30-130 %R
		4,4'-DDE	50-150 %R				4,4'-DDE	50-150 %R
		Endrin	50-120 %R				Endrin	50-120 %R
		Endosulfan sulfate	50-120 %R				Endosulfan sulfate	50-120 %R
		gamma-Chlordane	30-130 %R				gamma-Chlordane	30-130 %R
Surrogate	all samples		30-150 %R	Check calculations and instruments, reanalyze affected samples	EPA CLP RAS Laboratory GC/ECD Technician	Accuracy		30-150 %R

QAPP Worksheet #28: QC Samples Table
Worksheet # 28U-2: PCBs – Organics/SW 846 Method 8082A

(UFP-QAPP Manual 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 limit exceed the measurement performance criteria, the data obtained may be unusable for making project decisions.

Matrix	Water/Soil/Waste samples
Analytical Group	Target Compound List PCBs
Concentration Level	Low/Medium/High (mg/kg or mg/l)
Sampling SOP(s)	
Analytical Method/SOP Reference	SW 846 Method 8082A/SOP# HW-45, Rev. 1
Sampler's Name	
Field Sampling Organization	Weston Solutions, Inc.
Analytical Organization	Subcontracted nelac Laboratory
No. of Sample Locations	

Lab QC Sample:	**Frequency/ Number**	**Method/SOP QC Acceptance Limits**		**Corrective Action**	**Person(s) Responsible for Corrective Action**	**Data Quality Indicator (DQI)**	**Measurement Performance Criteria**	
Method Blank	1 per ≤ 20 samples or whenever samples extracted	No analyte > CRQL		Suspend analysis unit source recertified	Weston Subcontracted RAS/non-RAS Laboratory GC/ECD Technician	Accuracy	No analyte > CRQL	
Matrix Spike	1 per ≤ 20 samples	Aroclor-1016	29-135 %R	EPA CLP RAS Laboratory GC/ECD Technician	Weston Subcontracted RAS/non-RAS Laboratory GC/ECD Technician	Accuracy	Aroclor-1016	29-135 %R
		Aroclor-1260	29-135 %R				Aroclor-1260	29-135 %R
Matrix Spike Duplicate	1 per ≤ 20 samples	Aroclor-1016	0-15 %RPD	EPA CLP RAS Laboratory GCECD Technician	Weston Subcontracted RAS/non-RAS Laboratory GC/ECD Technician	Precision	Aroclor-1016	0-15 %RPD
		Aroclor-1260	0-20 %RPD				Aroclor-1260	0-20 %RPD
Laboratory Control Sample	all samples	Aroclor-1016	50-150 %R	EPA CLP RAS Laboratory GC/ECD Technician	Weston Subcontracted RAS/non-RAS Laboratory GC/ECD Technician	Accuracy	Aroclor-1016	50-150 %R
		Aroclor-1260	50-150 %R				Aroclor-1260	50-150 %R
Surrogate	all samples		30-150%R	EPA CLP RAS Laboratory GC/ECD Technician	Weston Subcontracted RAS/non-RAS Laboratory GC/ECD Technician	Accuracy		30-150%R

QAPP Worksheet #28: QC Samples Table
Worksheet # 28V: Herbicide – Organics/SW 846 Method 8151A

(UFP-QAPP Manual 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 limit exceed the measurement performance criteria, the data obtained may be unusable for making project decisions.

Matrix	Water/Soil/Waste samples
Analytical Group	Herbicides
Concentration Level	Low/Medium (ug/l or mg/kg)
Sampling SOP(s)	
Analytical Method/SOP Reference	SW 846 Method 8151A/SOP# HW-17, Rev. 2
Sampler's Name	
Field Sampling Organization	Weston Solutions, Inc.
Analytical Organization	Subcontracted nelac Laboratory
No. of Sample Locations	

Lab QC Sample:	Frequency/Number	Method/SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria
Method Blank	1 per ≤ 20 samples OR whenever samples extracted	No analyte > CRQL	Suspend analysis unit source recertified	EPA CLP RAS Laboratory GC/ECD Technician	Accuracy	No analyte > CRQL
Matrix Spike	1 per ≤ 20 samples; if requested	70-130 %R	Flag outliers	EPA CLP RAS Laboratory GC/ECD Technician	Accuracy	70-130 %R
Matrix Spike Duplicate	1 per ≤ 20 samples; if requested	70-130 %R	Flag outliers	EPA CLP RAS Laboratory GC/ECD Technician	Precision	70-130 %R
Laboratory Control Sample	1 per ≤ 20 samples	70-130 %R	Check calculations and instruments, reanalyze affected samples	EPA CLP RAS Laboratory GC/ECD Technician	Accuracy	70-130 %R
Surrogate	all samples	70-130 %R		EPA CLP RAS Laboratory GC/ECD Technician	Accuracy	70-130 %R

Note: Data reviewer will examined and follow In-house QC limit to qualify the data, if in-house limits not developed, then above QC limits will be use.

QAPP Worksheet #28: QC Samples Table
Worksheet # 28W: TAL Metals and Mercury – Inorganics/SW 846 Method 6010C/7471

Matrix	Soil/Waste samples
Analytical Group	Target Analyte List Inorganic – Metals
Concentration Level	Low/Medium (mg/kg)
Sampling SOP(s)	
Analytical Method/SOP Reference	SW 846 Method 6010C/SOP# HW-2, Rev. 13
Sampler's Name	
Field Sampling Organization	Weston Solutions, Inc.
Analytical Organization	Subcontracted nelac Laboratory
No. of Sample Locations	

Lab QC Sample:	Frequency/Number	Method/SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria
Preparation Blank	1 per ≤ 20 samples	No constituent > RL	Suspend analysis until source rectified; redigest and reanalyze affected samples	Weston Subcontracted RAS/non-RAS Laboratory ICP-AES/ICP-MS Technician	Accuracy	No constituent > RL
Matrix Spike	1 per ≤ 20 samples	75-125%R*	Flag outliers		Accuracy	75-125%R*
Duplicate	1 per ≤ 20 samples	± 20% RPD**	Flag outliers	Weston Subcontracted RAS/non-RAS Laboratory ICP-AES/ICP-MS Technician	Precision	± 20% RPD**
Post-Digestion Spike	after any analyte (except Ag and Hg) fails spike %R	80-120%R	Flag outliers	Weston Subcontracted RAS/non-RAS Laboratory ICP-AES/ICP-MS Technician	Accuracy	80-120%R
ICP Serial Dilution	1 per ≤ 20 samples	< 10% D**	Flag outliers		Accuracy	< 10% D**
Interference Check Sample [ICP Analysis Only]	beginning, end and periodically during run (2 times every 8 hours)	Within ± 2 times CRQL of true value or ± 20% of true value, whichever is greater	Check calculations and instruments, reanalyze affected samples	Weston Subcontracted RAS/non-RAS Laboratory ICP-AES/ICP-MS Technician	Sensitivity	Within ± 2 times CRQL of true value or ± 20% of true value, whichever is greater***

*except when the sample concentration is greater than 4 times the spike concentration, then disregrard the recoveries; no data validation action taken
**Reference Principal outline in USEPA Region 2 SOP No. HW-2, Revision 13/Evaluation of Metals Data for CLP – (include absolute difference criteria)
ICP serial dilution required only when initial concentration is ≥ 50 X MDL
***except when the sample and/or duplicate concentration is less than 5 times the CRQL, then ± CRQL.

QAPP Worksheet #28: QC Samples Table
Worksheet # 28W: TAL Metals and Mercury – Inorganics/SW 846 Method 6010C/7471 [cont'd]

(UFP-QAPP Manual 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 limit exceed the measurement performance criteria, the data obtained may be unusable for making project decisions.

Matrix	Soil/Waste samples
Analytical Group	Target Analyte List Inorganics – Metals (con'd)
Concentration Level	Low/Medium (mg/kg)
Sampling SOP(s)	
Analytical Method/SOP Reference	SW 846 Method 6010C/SOP# HW-2, Rev. 13
Sampler's Name	
Field Sampling Organization	Weston Solutions, Inc.
Analytical Organization	Subcontracted nelac Laboratory
No. of Sample Locations	

Lab QC Sample:	Frequency/Number	Method/SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria
Laboratory Control Sample	1 per ≤ 20 samples	Control limits 80 - 120% R or established by EPA*	Suspend analysis until source rectified; redigest and reanalyze affected samples	Weston Subcontracted RAS/non-RAS Laboratory ICP-AES/ICP-MS Technician	Accuracy	Control limits 80 - 120% R or established by EPA*
Internal Standard (ICP-MS)	All Samples	60 – 125% RI	Flag outliers	Weston Subcontracted RAS/non-RAS Laboratory ICP-AES/ICP-MS Technician	Accuracy	60 – 125% RI

* If the EPA LCS is unavailable, other EPA QC samples or other certified materials may be used. In such cases, control limits for the LCS must be documented and provided.

QAPP Worksheet #28: QC Samples Table
Worksheet # 28W: TAL Metals and Mercury – Inorganics/SW 846 Method 6010C/7471[cont'd]

(UFP-QAPP Manual 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 limit exceed the measurement performance criteria, the data obtained may be unusable for making project decisions.

Matrix	Aqueous
Analytical Group	Soil/Waste samples
Concentration Level	Target Analyte List Inorganics – Metals
Sampling SOP(s)	Low/Medium (mg/l)
Analytical Method/SOP Reference	
Sampler's Name	SW 846 Method 6010C/SOP# HW-2, Rev. 13
Field Sampling Organization	Weston Solutions, Inc.
Analytical Organization	Subcontracted nelac Laboratory
No. of Sample Locations	

Lab QC Sample:	Frequency/Number	Method/SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria
Preparation Blank	1 per ≤ 20 samples	No constituent > RL	Suspend analysis until source rectified; redigest and reanalyze affected samples	Weston Subcontracted RAS/non-RAS Laboratory ICP-AES/ICP-MS Technician	Accuracy	No constituent > CRQL
Spike	1 per ≤ 20 samples	75-125%R*	Flag outliers	Weston Subcontracted RAS/non-RAS Laboratory ICP-AES/ICP-MS Technician	Accuracy	75-125%R*
Duplicate	1 per ≤ 20 samples	± 20% RPD**	Flag outliers	Weston Subcontracted RAS/non-RAS Laboratory ICP-AES/ICP-MS Technician	Precision	± 20% RPD**
Post-Digestion Spike	after any analyte (except Ag and Hg) fails spike %R	75-125%R	Flag outliers	Weston Subcontracted RAS/non-RAS Laboratory ICP-AES/ICP-MS Technician	Accuracy	75-125%R
Interference Check Sample [ICP Analysis Only]	beginning, end and periodically (not less than once per 20 samples)	± 2 times CRQL of true value or ± 20% of true value, whichever is greater	Check calculations and instruments, reanalyze affected samples	Weston Subcontracted RAS/non-RAS Laboratory ICP-AES/ICP-MS Technician	Sensitivity	± 2 times CRQL of true value or ± 20% of true value, whichever is greater

*except when the sample concentration is greater than 4 times the spike concentration, then disregards the recoveries; no data validation action taken
**Reference USEPA Region 2 SOP No. HW-2, Revision 13/Evaluation of Metals Data for CLP - (include absolute difference criteria)
** except when the sample and/or duplicate concentration is less than 5 times the CRQL.

QAPP Worksheet #28: QC Samples Table
Worksheet # 28W: TAL Metals – Inorganics/SW 846 Method 6010C [cont'd]

(UFP-QAPP Manual 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 limit exceed the measurement performance criteria, the data obtained may be unusable for making project decisions.

Matrix	Aqueous
Analytical Group	Target Analyte List Inorganics – Metals
Concentration Level	Low/Medium (mg/l)
Sampling SOP(s)	
Analytical Method/SOP Reference	SW 846 Method 6010C/SOP# HW-2, Rev. 13
Sampler's Name	
Field Sampling Organization	Weston Solutions, Inc.
Analytical Organization	Subcontracted nelac Laboratory
No. of Sample Locations	

Lab QC Sample:	Frequency/Number	Method/SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria
Laboratory Control Sample	1 per ≤ 20 samples	80-120%R (except Ag and Sb)	Suspend analysis until source rectified; redigest and reanalyze affected samples	Weston Subcontracted RAS/non-RAS Laboratory ICP-AES/ICP-MS Technician	Accuracy	80-120%R (except Ag and Sb)
ICP Serial Dilution	1 per ≤ 20 samples	< 10% D**	Flag outliers		Accuracy	< 10%D**
Internal Standard (ICP-MS)	All Samples	60 – 125% RI	Flag outliers		Accuracy	60 – 125% RI

**Reference Principal outline in USEPA Region 2 SOP No. HW-2, Revision 13/Evaluation of Metals Data for CLP – (include absolute difference criteria)
ICP serial dilution required only when initial concentration is ≥ 50 X MDL

QAPP Worksheet #28: QC Samples Table
Worksheet # 28W: Total Mercury – Inorganics/SW 846 Method 7471[cont'd]

(UFP-QAPP Manual 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 limit exceed the measurement performance criteria, the data obtained may be unusable for making project decisions.

Matrix	Soil/Waste samples
Analytical Group	Target Analyte List Inorganics – Total Mercury
Concentration Level	Low/Medium (ug/L or mg/kg)
Sampling SOP(s)	
Analytical Method/SOP Reference	Cold Vapor Atomic Absorption (CVAA)
Sampler's Name	
Field Sampling Organization	Weston Solutions, Inc.
Analytical Organization	Subcontracted nelac Laboratory
No. of Sample Locations	

Lab QC Sample:	Frequency/Number	Method/SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria
Preparation Blank (PB)	1 per $\leq$ 20 samples	No analyte > CRQL	Suspend analysis; redigest and reanalyze	Weston Subcontracted RAS/non-RAS Laboratory ICP-AES/ICP-MS Technician	Accuracy	No analyte > CRQL
Duplicate Sample	1 per $\leq$ 20 samples	$\pm$ 20% RPD*	Flag outliers	Weston Subcontracted RAS/non-RAS Laboratory ICP-AES/ICP-MS Technician	Precision	$\pm$ 20% RPD
Field Duplicate Sample	1 per $\leq$ 20 samples	$\pm$ 20% RPD*	Flag outliers	Weston Subcontracted RAS/non-RAS Laboratory ICP-AES/ICP-MS Technician	Precision	$\pm$ 20% RPD
Spike Sample	1 per $\leq$ 20 samples	75 – 125 %R	Flag outliers	Weston Subcontracted RAS/non-RAS Laboratory ICP-AES/ICP-MS Technician	Accuracy	75 – 125 %R

*Reference USEPA Region 2 SOP No. HW-2, Revision 13/Evaluation of Metals Data for CLP - (include absolute difference criteria)

QAPP Worksheet #28: QC Samples Table
Worksheet # 28X: Total Cyanide – Inorganics/SW 846 Method 9012B

Matrix	Soil/Waste samples
Analytical Group	Target Analyte List Inorganics - Total Cyanide
Concentration Level	Low/Medium (ug/L or mg/kg)
Sampling SOP(s)	
Analytical Method/SOP Reference	Colorimeter or Spectrophotometer
Sampler's Name	
Field Sampling Organization	Weston Solutions, Inc.
Analytical Organization	Subcontracted nelac Laboratory
No. of Sample Locations	

Lab QC Sample:	Frequency/Number	Method/SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria
Preparation Blank (PB)	1 per $\leq$ 20 samples	No analyte > CRQL	Suspend analysis; redistill and reanalyze	Weston Subcontracted RAS/non-RAS Laboratory ICP-AES/ICP-MS Technician	Accuracy	No analyte > CRQL
Duplicate Sample	1 per $\leq$ 20 samples	$\pm$ 20% RPD*	Flag outliers	Weston Subcontracted RAS/non-RAS Laboratory ICP-AES/ICP-MS Technician	Precision	$\pm$ 20% RPD
Spike Sample	1 per $\leq$ 20 samples	75 – 125 %R	Flag outliers	Weston Subcontracted RAS/non-RAS Laboratory ICP-AES/ICP-MS Technician	Accuracy	75 – 125 %R

*Reference USEPA Region 2 SOP No. HW-2, Revision 13/Evaluation of Metals Data for CLP - (include absolute difference criteria)

QAPP Worksheet #29A: Project Documents and Records Table

Sample Collection Documents and Records	Analysis Documents and Records	Data Assessment Documents and Records	Other
• Site and field logbooks • Boring logs • Well construction diagrams • COC forms • Well Data Sheets • Field Data Sheets • GIS map for sampling locations • Incident Action plan	• Sample receipt logs • Internal and external COC forms • Equipment calibration logs • Sample preparation worksheets/logs • Sample analysis worksheets/run logs • Telephone/email logs • Corrective action documentation	• Data validation reports • Field inspection checklist(s) • Laboratory Audit checklist (if performed) • Review forms for electronic entry of data into database • Corrective action documentation • Laboratory Final Data	CLP/non-CLP request form

QAPP Worksheet #30A: Analytical Services Table

Matrix	Analytical Group	Concentration Level	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 Gas	TO-15 Scan VOCs	Low	TO-15	TBD	EPA Non-RAS Air Program	NA
Indoor Air Gas	TO-15 SIM VOCs	Low	TO-15	TBD	EPA Non-RAS Air Program	NA
Aqueous	Trace Concentration VOCs	Low	SOM01.2	TBD	EPA CLP RAS or non-RASLaboratory	NA
	Low Conc. VOCs	Low	SOM01.2	TBD		NA
	SVOCs	Low	SOM01.2	TBD		
	PCBs	Low	SOM01.2	TBD		
	Pesticides	Low	SOM01.2	TBD		
	TAL Metals and Cyanide	Low	ILM05.4	TBD		
Soil	TCL VOCs	Low	SOM01.2	TBD	EPA CLP RAS or non-RASLaboratory	NA
	TCL SVOCs	Low	SOM01.2	TBD		NA
	TCL PCBs	Low	SOM01.2	TBD		NA
	TCL Pesticides	Low	SOM01.2	TBD		NA
	TAL Total Metals	Low	ILM05.4	TBD		NA

QAPP Worksheet #30B: Source of Chemical Methods

Name	Publisher	Reference
SW-846 Test Methods for Evaluating Solid Waste, Physical/Chemical Methods	Environmental Protection Agency	http://www.epa.gov/waste/hazard/testmethods/sw846/online/index.htm
Compendium of Methods for the determination of Toxic Organic Compounds in Ambient Air, Second Edition. EPA/625/R-96/010b	Center of Environmental Research Information, Office of Research and Development, USEPA, January 1999	http://www.epa.gov/ttnamti1/files/ambient/airtox/to-15r.pdf
Drinking Water Methods	Office of Research and Development	http://www.epa.gov/nerlcwww/ordmeth.htm
Method 435: Determination of Asbestos Content of Serpentine Aggregate Adopted: June 6, 1991	California Environmental Protection Agency, Air Resource Board	http://www.arb.ca.gov/testmeth/vol3/m_435.pdf
Standardized Analytical Methodsfor Environmental Restoration Following Homeland Security Events REVISION 5.0. EPA/600/R-04/126E	United State Environmental Protection Agency September 29, 2008	http://www.epa.gov/nhsrc/pubs/600r04126e.pdf
Annual Book of ASTM Standards, Vol. 11.02*	ASTM International	http://www.astm.org
Standard Methods for the Examination of Water and Wastewater, 21st Edition, 2005*	APHA, AWWA, and WEF	http://www.standardmethods.org

* Subscription and/or purchase is required from the ASTM and the Standard Methods

QAPP Worksheet #31: Planned Project Assessments Table

Assessment Type	Frequency	Internal or External	Organization Performing Assessment	Person(s) Responsible for Performing Assessment (Title and Organizational Affiliation)	Person(s) Responsible for Responding to Assessment Findings (Title and Organizational Affiliation)	Person(s) Responsible for Identifying and Implementing Corrective Actions (Title and Organizational Affiliation)	Person(s) Responsible for Monitoring Effectiveness of Corrective Actions (Title and Organizational Affiliation)
Laboratory Technical Systems	Every Year	External	Regulatory Agency	Regulatory Agency	Non-CLP (NELAC) Laboratory	Non-CLP (NELAC) Laboratory	EPA or other Regulatory Agency
Performance Audit*		External	Regulatory Agency	Regulatory Agency	Non-CLP (NELAC) Laboratory	Non-CLP (NELAC) Laboratory	EPA or other Regulatory Agency
Performance Evaluation Samples**	NA	External	Regulatory Agency	Regulatory Agency	Non-CLP (NELAC) Laboratory	Non-CLP (NELAC) Laboratory	EPA or other Regulatory Agency
NELAC	Every two years	External	NELAC	Florida DOH	Lab QA Officer	Lab Personnel	Florida DOH
On-Site Field Inspection	Project Specific	Internal	Weston Solutions, Inc.	Regulatory Agency	Sampling and Monitoring Plan Coordinator	Safety Officer	EPA or other Regulatory Agency
Data Assessment	Project Specific	External	Regulatory Agency	Regulatory Agency	EPA OSC, RST 2 SPM	Laboratory Personnel	EPA or other Regulatory Agency

Refer to Appendix A for list of Laboratories

QAPP Worksheet #32: Assessment Findings and Corrective Action Responses

Assessment Type	Nature of Deficiencies Documentation	Individual(s) Notified of Findings (Name, Title, Organization)	Timeframe of Notification	Nature of Corrective Action Response Documentation	Individual(s) Receiving Corrective Action Response (Name, Title, Org.)	Timeframe for Response
Project Readiness Review	Checklist or logbook entry summary	Sampling and Monitoring Plan Coordinator	Immediately to within 24 hours of review	Checklist or logbook entry	ENVL/QAC	X days after receiving notification
Field Observations/ Deviations from Work Plan	Logbook	Sampling and Monitoring Plan Coordinator	Immediately to within 24 hours of deviation	Logbook	ENVL/QAC M	X days after receiving notification
Laboratory Technical Systems/ Performance Audits	Written Report	Laboratory QAO	30 days	Letter	Analytical Coordinatoe/QAC	X days after receiving notification
On-Site Field Inspection	Written Report	Safety Officer	7 calendar days after completion of the audit	Letter/Internal Memorandum	ENVL/QAC	X days after receiving notification
Performance Evaluation Samples	Electronic Report	Analytical Coordinatoe/QAC	30 days	Letter or Written Report	Analytical Coordinatoe/QAC	X days after receiving notification

QAPP Worksheet #33: QA Management Reports Table

Type of Report	Frequency (daily, weekly, monthly, quarterly, annually, etc.)	Projected Delivery Date(s)	Person(s) Responsible for Report Preparation (Title and Organizational Affiliation)	Report Recipient(s) (Title and Organizational Affiliation)
Site Specific QAPP	As performed	Prior to sampling date	Sampling and Monitoring Plan Coordinator	ENVL, Incident/Unified Command Leader
Health and Safety Plan	As performed	Prior to sampling date	Safety Officer	ENVL, Incident/Unified Command Leader
On-Site Field Inspection	As performed	7 calendar days after completion of the inspection	Safety Officer	ENVL, Incident/Unified Command Leader
Field Change Request	As required per field change	Three days after identification of need for field change	Data Assessment and Interpretation Coordinator	ENVL, Incident/Unified Command Leader
Laboratory Data (Preliminary)	As performed	ASAP after receipt of preliminary data	Analytical Coordinator	Quality Assurance Coordinator
Final Report	Project Specified	2 to 4 weeks after receipt of EPA approval of data package	Quality Assurance Coordinator and Environmental Unit Leader	Incident/Unified Command Leader and General staff

QAPP Worksheet #34: Verification (Step I) Process Table

Verification Input	Description	Internal/ External	[1]Responsible for Verification (Name, Organization)
Site/field logbooks	Field notes will be prepared daily by the EPA Sample Leader and will be complete, appropriate, legible and pertinent. Upon completion of field work, logbooks will be placed in the project files.	I	
Chains of custody	COC forms will be reviewed against the samples packed in the specific cooler prior to shipment. The reviewer will initial the form. An original COC will be sent with the samples to the laboratory, while copies are retained for (1) the Sampling Trip Report and (2) the project files.	I	
Sampling Trip Reports	STRs will be prepared for each week of field sampling [for which samples are sent to an EPA CLP RAS laboratory.] Information in the STR will be reviewed against the COC forms, and potential discrepancies will be discussed with field personnel to verify locations, dates, etc.	I	
Laboratory Preliminary Data	Preliminary data – limited review for either contract compliance or technical compliance.	I/E	
Laboratory analytical data package	Data packages will be reviewed/verified internally by the laboratory performing the work for completeness and technical accuracy prior to submittal.	I/E	
Laboratory analytical data package	Data packages will be reviewed as to content and sample information upon receipt by EPA.	I/E	
Final Sample Report	The project data results will be compiled in a sample report for the project. Entries will be reviewed/verified against hardcopy information.	I/E	

[1] Responsible for verifications, and their name and organization will be added.

QAPP Worksheet #35: Validation (Steps IIa and IIb) Process Table

Step IIa/IIb	Validation Input	Description	Responsible for Validation (Name, Organization)
IIa	SOPs	Ensure that the sampling methods/procedures outlined in QAPP were followed, and that any deviations were noted/approved.	Sampling and Monitoring Plan Coordinator and Quality Assurance Coordinator
IIb	SOPs	Determine potential impacts from noted/approved deviations, in regard to PQOs.	Environmental Unit Leader
IIa	Chains of custody	Examine COC forms against QAPP and laboratory contract requirements (e.g., analytical methods, sample identification, etc.).	Analytical Coordinator
IIa	Laboratory data package	Examine packages against QAPP and laboratory contract requirements, and against COC forms (e.g., holding times, sample handling, analytical methods, sample identification, data qualifiers, QC samples, etc.).	Quality Assurance Coordinator
IIb	Laboratory data package	Determine potential impacts from noted/approved deviations, in regard to PQOs. Examples include PQLs and QC sample limits (precision/accuracy).	Quality Assurance Coordinator and Assistant Environmental Unit Leader
IIb	Field duplicates*	Compare results of field duplicate (or replicate) analyses with RPD criteria	Quality Assurance Coordinator

* Site-specific QAPP may contain additional data validation inputs as required by the project objectives.

QAPP Worksheet #36: Validation (Steps IIa and IIb) Summary Table

Step IIa/IIb	Matrix	Analytical Group	Concentration Level	Validation Criteria	Data Validator (title and organizational affiliation)
IIa / IIb	Soil/Sediment/ Aqueous	VOCs	Trace	Data Validation SOP for Organic Analysis of Trace Concentration VOCs under SOW SOM01.2	ESAT Data Validation Personnel, EPA Region 2 Data Validation Personnel,
IIa / IIb	Soil/Sediment/ Aqueous	VOCs	Low and Medium	Data Validation SOP for Organic Analysis of Low/Medium Concentration VOCs under SOW SOM01.2	ESAT Data Validation Personnel, EPA Region 2 Data Validation Personnel
IIa / IIb	Soil/Sediment/ Aqueous	SVOCs	Low and Medium	Data Validation SOP for Organic Analysis of Low/Medium Concen. SVOCs under SOW SOM01.2	ESAT Data Validation Personnel, EPA Region 2 Data Validation Personnel,
IIb	Soil/Sediment/ Aqueous	Pesticides	Low and Medium	Data Validation SOP for Organic Analysis of Low/Medium Concentration Pesticides under SOW SOM01.2	ESAT Data Validation Personnel, EPA Region 2 Data Validation Personnel,

QAPP Worksheet #36: Validation (Steps IIa and IIb) Summary Table (Example)

Step IIa/IIb	Matrix	Analytical Group	Concentration Level	[1]Validation Criteria	Data Validator (title and organizational affiliation)
IIa / IIb	Soil/Sediment/ Aqueous	PCBs	Low and Medium	Data Validation SOP for Organic Analysis of Low/Medium Concentration Aroclors under SOW SOM01.2	ESAT Data Validation Personnel, EPA Region 2 Data Validation Personnel,
IIa / IIb	Air	VOCs	Low	Validating Volatile Organic Analysis of Ambient Air in canister by Method TO-15 October 2006	ESAT Data Validation Personnel, EPA Region 2 Data Validation Personnel
IIa / IIb	Soil/Sediment/ Aqueous	SVOCs	Low and Medium	Data Validation SOP for Organic Analysis of Low/Medium Concen. SVOCs under SOW SOM01.2	ESAT Data Validation Personnel, EPA Region 2 Data Validation Personnel,
IIb	Soil/Sediment/ Aqueous	Pesticides	Low and Medium	Data Validation SOP for Organic Analysis of Low/Medium Concentration Pesticides under SOW SOM01.2	ESAT Data Validation Personnel, EPA Region 2 Data Validation Personnel,

[1]Refer to Worksheet #12 and appendix B for data validation sops.

QAPP Worksheet #37: Usability Assessment

Summarize the usability assessment process and all procedures, including interim steps and any statistics, equations, and computer algorithms that will be used: Data, whether generated in the field or by the laboratory, are tabulated and reviewed for Precision, Accuracy, Representativeness, Completeness, and Comparability (PARCCS) by the SPM for field data or the data validator for laboratory data. The review of the PARCC Data Quality Indicators (DQI) will compare with the DQO detailed in the site-specific QAPP, the analytical methods used and impact of any qualitative and quantitative trends will be examined to determine if bias exists. A hard copy of field data is maintained in a designated field or site logbook. Laboratory data packages are validated, and final data reports are generated. All documents and logbooks are assigned unique and specific control numbers to allow tracking and management.

Questions about Non-CLP data, as observed during the data review process, are resolved by contacting the respective site personnel and laboratories as appropriate for resolution. All communications are documented in the data validation record with comments as to the resolution to the observed deficiencies.

Where applicable, the following documents will be followed to evaluate data for fitness in decision making: EPA QA/G-4, *Guidance on Systematic Planning using the Data Quality Objectives Process,* EPA/240/B-06/001, February 2006, and EPA QA/G-9R, *Guidance for Data Quality Assessment*, A reviewer's Guide EPA/240/B-06/002, February 2006.

Describe the evaluative procedures used to assess overall measurement error associated with the project:

As delineated in the ***Uniform Federal Policy for Implementing Environmental Quality Systems: Evaluating, Assessing and Documenting Environmental Data Collection and Use Programs Part 1: UFP-QAPP (EPA-505-B-04-900A, March 2005); Part 2A: UFP-QAPP Workbook (EPA-505-B-04-900C, March 2005); Part 2B: Quality Assurance/Quality Control Compendium: Non-Time Critical QA/QC Activities (EPA-505-B-04-900B, March 2005);*** "Graded Approach" will be implemented for data collection activities that are either exploratory or small in nature or where specific decisions cannot be identified, since this guidance indicates that the formal DQO process is not necessary.

The data will be evaluated to determine whether they satisfy the PQO for the project. The validation process determines if the data satisfy the QA criteria. After the data pass the data validation process, comparison results with the PQO is done. For example,

if the PQO specify that the data are to be compared to New Jersey Soil Cleanup Criteria for an extent of contamination study at a site, the results can then be used to determine if additional sampling is necessary to complete the extent of contamination.

Identify the personnel responsible for performing the usability assessment: Site Project Management Team, Environmental Unit Leader, Data Validation Personnel, and EPA Region 2 OSC

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:

A copy of the most current approved QAPP, including any graphs, maps and text reports developed will be provided to all personnel identified on the distribution list.

Attachment A: List of Laboratories

Agency/Lab	Name	Location	Phone	Cell	E-mail
EPA Region 2					
EPA Region 2 Laboratory	John Bourbon	2890 Woodbridge Ave, MS 230 Edison, NJ 08837	732-321-4469	732-604-1253	bourbon.john@epa.gov
EPA Region 2 Drinking Water Section	Bruce Kiselica	290 Broadway New York, NY 10007	212-637-3879	973-519-5512	kiselica.bruce@epa.gov
EPA Regional ER Team	Jeff Catanzarite		732-906-6929		catanzarite.jeff@epa.gov
National Air and Radiation Environmental Laboratory	Cindy Pierson	5 South Morris Avenue Montgomery, AL 36115-2601	334.270.3400		pierson.cindy@epa.gov
State of New Jersey and New York					
New Jersey Department of Health and Senior Services, Environmental and Chemical Laboratory Services (ECLS)	Stephen Jennies, Director	P. O. Box 360, Trenton, NJ 08625-0360	609-530-2820 (609) 292-7837 Toll-free in NJ: 1-800-367-6543		
NYSDOH Inorganic and Nuclear Chem. Lab	Dr. Liaquat Husain	Wadsworth Center Empire State Plaza D224 Albany NY 12237	518-473-4854		
CLP Laboratories	http://www.epa.gov/superfund/programs/clp/download/lablist.pdf				
NELAP Labs	http://www.nelac-institute.org/docs/Sorted_by_Lab_name_04-09-08.pdf				

Attachment B: References

http://www.epa.gov/fedfac/pdf/ufp_qapp_v1_0305.pdf Intergovernmental Data Quality Task Force, Uniform Federal Policy for Quality Assurance Project Plans; Publication Numbers: EPA: EPA-505-B-04-900A, DOD: DTIC ADA 427785, March 2005

Solid Waste and Emergency Response

Office of Solid Waste Methods Team - including *SW-846 On-line Test Methods for Evaluating Solid Waste Physical/ChemicalMethods*
Contract Laboratory Program (CLP) Methods
http://www.epa.gov/superfund/programs/clp/index.htm Superfund Analytical Services / Contract Laboratory Program/Analytical Services/Methods

EPA Method Collections

Air and Radiation

- Source Emission Methods
- Source Continuous Emission Monitoring Performance Specifications
- Ambient Monitoring Methods
- Mobile Source Methods

Sampling Methods

- Emergency Response Team and On-Scene Coordinators (Methods and Sampling)
- RCRA Waste Sampling

Water

- Drinking Water Methods
- Wastewater Methods

Research and Development

- Biological & Microbiological Methods, Chemical Methods
- Endocrine Disruptors
- Models, Methods and Databases
- http://www.epa.gov/nhsrc/pubs/600r04126e.pdf
- Recently Developed Methods

- The Manual of Manuals: Laboratory Analytical Chemistry Methods Manuals
- Drinking Water Methods and Marine Water Methods (NERL)

Analytical and Sampling Method Sources

- EPA Test Method Index– April 2003 revised edition; update in preparation by the EPA Region I library acting under contract to the U.S. EPA
- Sources for EPA Test Methods
- Microbial Methods via the EPA Microbiology Home Page
- Compilation of Air Pollutant Emission Factors (AP 42), Volume I
- Survey and Monitoring Designs and Analyses
- OPPTS Harmonized Test Guidelines

Analytical Methods from non-EPA sites

- National Institute of Occupational Safety and Health methods
- Occupational Safety and Health Administration methods
- National Environmental Methods Index (primarily water)

Analytical Methods sold by non-EPA, non-governmental organizations

- *Standard Methods for the Examination of Water and Wastewater* EXIT Disclaimer
- AOAC International *Official Methods of Analysis*, 18th Edition EXIT Disclaimer
- ASTM International EXIT Disclaimer

If You Need Help with EPA Test Methods Program Contacts

- **Drinking Water Methods** – call Drinking Water Hotline, (800) 426-4791
- **Clean Water Act Methods** – "Solutions to Analytical Chemistry Problems with Clean Water Act Methods" at http://www.epa.gov/waterscience/methods/ (revised "Pumpkin Book"); EPA Office of Water email: OSTCWAMethods@epa.gov
- **MICE line** - Methods Information Communications Exchange for technical questions or comments on SW-846. Basic information available 24 hours via recorded message. Phone (703) 676-4690; fax (703) 318-4682; e-mail mice@cpmx.saic.com; Internet: http://www.epa.gov/SW-846/mice.htm
- Emission Measurement Center Specific Questions/Answers

- **Region 2** – call (212) 637-3660; Email: R2_Web_Inquiry@epamail.epa.gov; or Internet: http://www.epa.gov/region02/contactr2.htm

Guidance Documents:

Contract Laboratory Program Guidance for Field Samplers EPA-540-R-07-06, July 2007:
http://www.epa.gov/superfund/programs/clp/download/sampler/clp_sampler_guidance.pdf

Introduction to the Contract Laboratory Program, EPA 540-R-07-02, January 2007:
http://www.epa.gov/superfund/programs/clp/download/clpintro.pdf

Region 2 DESA/HWSS Data Validatio SOPs:
http://www.epa.gov/region02/qa/documents.htm

USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review EPA-540-R-08-01, June 2008:
http://www.epa.gov/superfund/programs/clp/download/somnfg.pdf

USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, OSWER 9240.1-45, EPA 540-R-04-004, October 2004:
http://www.epa.gov/superfund/programs/clp/download/inorgfg10-08-04.pdf

USEPA Contract Laboratory Program National Functional Guidelines for Chlorinated Dioxin/Furan Data Review EPA-540-R-05-001, September 2005:
http://www.epa.gov/superfund/programs/clp/download/dlm/dlm2nfg.pdf