



## Department of Energy

Portsmouth/Paducah Project Office  
1017 Majestic Drive, Suite 200  
Lexington, Kentucky 40513  
(859) 219-4000

Mr. Wm. Turpin Ballard  
Remedial Project Manager  
U.S. Environmental Protection Agency, Region 4  
61 Forsyth Street  
Atlanta, Georgia 30303

PPPO-02-1825834-13

Mr. Todd Mullins, FFA Manager  
Kentucky Department for Environmental Protection  
Division of Waste Management  
200 Fair Oaks Lane, 2<sup>nd</sup> Floor  
Frankfort, Kentucky 40601

Dear Mr. Ballard and Mr. Mullins:

**TRANSMITTAL OF THE PADUCAH GASEOUS DIFFUSION PLANT  
PROGRAMMATIC QUALITY ASSURANCE PROJECT PLAN  
(DOE/LX/07-1269&D2/R1)**

Please find enclosed for your review the D2/R1 *Paducah Gaseous Diffusion Plant Programmatic Quality Assurance Project Plan, Paducah, Kentucky, DOE/LX/07-1269&D2/R1 (QAPP)*. The document has been revised in response to informal comments provided on the D2 document by the U.S. Environmental Protection Agency. Changes in response to these informal comments were agreed to by the Agency via email on February 12, 2013. The Kentucky Department for Environmental Protection did not have any comments on the D1 document per an e-mail received July 10, 2012.

Once approved, this document will be used as a template for developing project-specific QAPPs.

If you have any questions or require additional information, please contact Rich Bonczek at (859) 219-4051.

Sincerely,

A handwritten signature in black ink, appearing to read "Rachel H. Blumenfeld".

Rachel H. Blumenfeld  
Acting Paducah Site Lead  
Portsmouth/Paducah Project Office

Enclosures:

1. Clean D2 QAPP
2. Redline D2 QAPP

e-copy w/enclosures:

ballard.turpin@epamail.epa.gov, EPA/Atlanta  
brandy.mitchell@lataky.com, LATA/Kevil  
christie.lamb@lataky.com, LATA/Kevil  
craig.jones@lataky.com, LATA/Kevil  
jennifer.woodard@lex.doe.gov, PPPO/PAD  
joseph.towarnicky@lataky.com, LATA/Kevil  
mark.duff@lataky.com, LATA/Kevil  
myrna.redfield@lataky.com, LATA/Kevil  
pad.dmc@swiftstaley.com, SST/Kevil  
rachel.blumenfeld@lex.doe.gov, PPPO/PAD  
reinhard.knerr@lex.doe.gov, PPPO/PAD  
rich.bonczek@lex.doe.gov, PPPO/LEX  
rob.seifert@lex.doe.gov, PPPO/PAD  
todd.mullins@ky.gov, KDEP/Frankfort  
tufts.jennifer@epamail.epa.gov, EPA/Atlanta

**Paducah Gaseous Diffusion Plant  
Programmatic Quality Assurance  
Project Plan**



**CLEARED FOR PUBLIC RELEASE**



**Paducah Gaseous Diffusion Plant  
Programmatic Quality Assurance  
Project Plan**

Date Issued—February 2013

U.S. DEPARTMENT OF ENERGY  
Office of Environmental Management

Prepared by  
LATA ENVIRONMENTAL SERVICES OF KENTUCKY, LLC  
managing the  
Environmental Remediation Activities at the  
Paducah Gaseous Diffusion Plant  
under contract DE-AC30-10CC40020

**CLEARED FOR PUBLIC RELEASE**

**THIS PAGE INTENTIONALLY LEFT BLANK**

# CONTENTS

QAPP WORKSHEETS .....	iii
ACRONYMS .....	v
INTRODUCTION .....	1

## QAPP WORKSHEETS

QAPP Worksheet #1 Title Page.....	5
QAPP Worksheet #2 QAPP Identifying Information .....	6
QAPP Worksheet #3 Minimum Distribution List.....	11
QAPP Worksheet #4 Project Personnel Sign-Off Sheet .....	13
QAPP Worksheet #5 Project Contractor Organizational Chart .....	14
QAPP Worksheet #6 Communication Pathways .....	15
QAPP Worksheet #7 Personnel Responsibility and Qualifications Table.....	17
QAPP Worksheet #8 Special Personnel Training Requirements Table.....	18
QAPP Worksheet #9 Project Scoping Session Participant Sheet .....	19
QAPP Worksheet #10 Problem Definition .....	20
QAPP Worksheet #11 Project Quality Objectives/Systematic Planning Process Statements .....	21
QAPP Worksheet #12-A Measurement Performance Criteria Table.....	22
QAPP Worksheet #12-B Measurement Performance Criteria Table.....	23
QAPP Worksheet #12-C Measurement Performance Criteria Table.....	24
QAPP Worksheet #12-D Measurement Performance Criteria Table.....	25
QAPP Worksheet #12-E Measurement Performance Criteria Table .....	26
QAPP Worksheet #12-F Measurement Performance Criteria Table .....	27
QAPP Worksheet #12-G Measurement Performance Criteria Table.....	28
QAPP Worksheet #12-H Measurement Performance Criteria Table.....	29
QAPP Worksheet #12-I Measurement Performance Criteria Table .....	30
QAPP Worksheet #12-J Measurement Performance Criteria Table.....	31
QAPP Worksheet #12-K Measurement Performance Criteria Table.....	32
QAPP Worksheet #12-L Measurement Performance Criteria Table .....	33
QAPP Worksheet #12-M Measurement Performance Criteria Table.....	34
QAPP Worksheet #12-N Measurement Performance Criteria Table.....	35
QAPP Worksheet #12-O Measurement Performance Criteria Table.....	36
QAPP Worksheet #12-P Measurement Performance Criteria Table .....	37
QAPP Worksheet #12-Q Measurement Performance Criteria Table.....	38
QAPP Worksheet #13 Secondary Data Criteria and Limitations Table .....	39
QAPP Worksheet #14 Summary of Project Tasks.....	40
QAPP Worksheet #15-A Reference Limits and Evaluation Table .....	41
QAPP Worksheet #15-B Reference Limits and Evaluation Table .....	43
QAPP Worksheet #15-C Reference Limits and Evaluation Table .....	45
QAPP Worksheet #15-D Reference Limits and Evaluation Table .....	46
QAPP Worksheet #15-E Reference Limits and Evaluation Table.....	47
QAPP Worksheet #15-F Reference Limits and Evaluation Table.....	50
QAPP Worksheet #15-G Reference Limits and Evaluation Table .....	51

QAPP Worksheet #15-H Reference Limits and Evaluation Table .....	52
QAPP Worksheet #15-I Reference Limits and Evaluation Table.....	54
QAPP Worksheet #15-J Reference Limits and Evaluation Table .....	56
QAPP Worksheet #16 Project Schedule/Timeline Table.....	58
QAPP Worksheet #17 Sampling Design and Rationale .....	59
QAPP Worksheet #18 Sampling Locations and Methods/Standard Operating Procedure Requirements Table for Screening Samples .....	60
QAPP Worksheet #19 Analytical SOP Requirements Table.....	61
QAPP Worksheet #20 Field Quality Control Sample Summary Table .....	63
QAPP Worksheet #21 Project Sampling SOP References Table .....	64
QAPP Worksheet #22 Field Equipment Calibration, Maintenance, Testing, and Inspection Table.....	66
QAPP Worksheet #23 Analytical SOP References Table .....	69
QAPP Worksheet #24 Analytical Instrument Calibration Table .....	70
QAPP Worksheet #25 Analytical Instrument and Equipment Maintenance, Testing, and Inspection Table.....	71
QAPP Worksheet #26 Sample Handling System .....	73
QAPP Worksheet #27 Sample Custody Requirements.....	74
QAPP Worksheet #28 QC Samples Table.....	75
QAPP Worksheet #29 Project Documents and Records Table.....	77
QAPP Worksheet #30 Analytical Services Table.....	78
QAPP Worksheet #31 Planned Project Assessments Table .....	79
QAPP Worksheet #32 Assessment Findings and Corrective Action Responses .....	80
QAPP Worksheet #33 QA Management Reports Table .....	81
QAPP Worksheet #34 Verification (Step I) Process Table .....	82
QAPP Worksheet #35 Validation (Steps IIa and IIb) Process Table.....	83
QAPP Worksheet #36 Validation (Steps IIa and IIb) Summary Table.....	84
QAPP Worksheet #37 Usability Assessment.....	85

## ACRONYMS

CAS	Chemical Abstracts Service
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
<i>CFR</i>	<i>Code of Federal Regulations</i>
COPC	chemical of potential concern
DOE	U.S. Department of Energy
DOECAP	DOE Consolidated Audit Program
DQI	Data Quality Indicator
DQO	data quality objective
ECD	electron capture detector
EDD	Electronic Data Deliverable
EPA	U.S. Environmental Protection Agency
FFA	Federal Facility Agreement
FID	flame ionization detector
FIDLER	field instrument for detection of low energy
FSP	field sampling plan
GS	gas chromatography
GS-MS	gas chromatography mass spectrometer
GPS	Global Positioning System
ICP-AES	inductively coupled plasma atomic emission spectroscopy
KDEP	Kentucky Department for Environmental Protection
LATA Kentucky	LATA Environmental Services of Kentucky, LLC
MBWA	management by walking around
MCL	maximum contaminant limit
MDA	minimum detectable activity
MDC	minimum detectable concentration
MDL	method detection limit
MS	matrix spike
NAL	no action level
NDIRD	nondispersive infrared detector
OREIS	Paducah Oak Ridge Environmental Information System
PARCCS	precision, accuracy, representativeness, comparability, completeness, and sensitivity
PCB	polychlorinated biphenyl
PGDP	Paducah Gaseous Diffusion Plant
PQL	practical quantitation limit
PT	proficiency testing
QA	quality assurance
QAPP	Quality Assurance Project Plan
QC	quality control
RPD	relative percent difference
SOP	standard operating procedure
TOC	total organic carbon
UFP	Uniform Federal Policy
VOC	volatile organic compound
XRF	X-ray fluorescence

**THIS PAGE INTENTIONALLY LEFT BLANK**

## INTRODUCTION

This Programmatic Quality Assurance Project Plan (QAPP) has been prepared by LATA Environmental Services of Kentucky, LLC, (LATA Kentucky) based on the *Uniform Federal Policy for Quality Assurance Project Plans* (UFP-QAPP Manual) guidelines for QAPPs (Publication # DoD DTIC ADA 427785). Additional text has been added to some of the worksheets for ease of transition and to provide detail that the UFP worksheets may not include.

The Paducah Gaseous Diffusion Plant (PGDP) Site has numerous field sampling activities described by individual field sampling plans (FSPs) and project-specific quality assurance (QA) plans. The goal of this programmatic QAPP is to streamline the systematic planning process and provide uniformity of data collection and laboratory services dictated by subsequent project-specific FSPs. This programmatic QAPP follows the Uniform Federal Policy for QAPPs developed by U.S. Environmental Protection Agency (EPA), U.S. Department of Defense, and U.S. Department of Energy (DOE) in 2005. This programmatic QAPP provides a basis for development of future project-specific QAPPs and FSPs.

This programmatic QAPP was written to address elements of data collection that do not materially change from project to project [e.g., the requirement to use current standard operating procedures (SOPs), the cleanup criteria, the use of data validation]. The programmatic QAPP will be used as a template to develop a project-specific QAPP to include project-specific information [e.g., data quality objectives (DQOs), schedules, number and type of samples]. The QAPP will require use of the most current SOPs that will be made available through submission of the project-specific QAPP.

To provide uniformity, this programmatic QAPP does the following:

- Refers to the SOPs already developed for the site and in place;
- Establishes routinely available analytical limits;
- Incorporates the *Data and Documents Management and Quality Assurance Plan for Paducah Environmental Management and Enrichment Facilities*, DOE/OR/07-1595&D2 (DOE 1998); and
- Standardizes data validation processes by linking the process to SOPs (see Worksheet #21).

This document is not a substitute for the development of FSPs and the decisions on DQOs, type of analyses, number of samples, type of samples, project schedule, etc. Those systematic planning decisions are included in the project-specific FSPs and QAPPs.

This programmatic QAPP focuses on fixed laboratory methods. Field methods [e.g., X-ray fluorescence (XRF), bioassay, colorimetric methods for polychlorinated biphenyls (PCBs), radionuclide surveys] that may be contemplated for specific projects shall be detailed in a project-specific FSP including field instrument limits.

Table 1 provides a guide for the worksheets and specifies whether the individual worksheet will likely be in the programmatic QAPP or the project-specific QAPP included with a project-specific FSP. FSPs will include, as an attachment, the project-specific QAPP worksheets identified in Table 1, if applicable.

**Table 1. Guide to Programmatic vs. Project-Specific QAPP Worksheets**

<b>Worksheet Title</b>	<b>Programmatic</b>	<b>Project Specific</b>	<b>Typically Programmatic<sup>a</sup></b>	<b>Comments</b>
#1 Title Page	X			
#2 QAPP Identifying Information	X			
#3 Distribution List	X			
#4 Project Personnel Sign-Off Sheet		X		
#5 Project Contractor Organizational Chart	X			
#6 Communication Pathways	X			
#7 Personnel Responsibility and Qualifications Table	X			
#8 Special Personnel Training Requirements Table	X			
#9 Project Scoping Session Participant Sheet		X		
#10 Problem Definition		X		
#11 Project Quality Objectives/Systematic Planning Process Statements		X		
#12 Measurement Performance Criteria Table			X	Only include if project-specific FSP dictates different methods, limits, or analytes
#13 Secondary Data Criteria and Limitations Table	X			
#14 Summary of Project Tasks		X		
#15-A Reference Limits and Evaluation Table			X	Only include if project-specific FSP dictates different limits or analytes
#15-B Reference Limits and Evaluation Table			X	Only include if project-specific FSP dictates different limits or analytes
#15-C Reference Limits and Evaluation Table			X	Only include if project-specific FSP dictates different limits or analytes

**Table 1. Guide to Programmatic vs. Project-Specific QAPP Worksheets (Continued)**

Worksheet Title	Programmatic	Project Specific	Typically Programmatic <sup>a</sup>	Comments
#15-D Reference Limits and Evaluation Table			X	Only include if project-specific FSP dictates different limits or analytes
#15-E Reference Limits and Evaluation Table			X	Only include if project-specific FSP dictates different limits or analytes
#15-F Reference Limits and Evaluation Table			X	Only include if project-specific FSP dictates different limits or analytes
#15-G Reference Limits and Evaluation Table			X	Only include if project-specific FSP dictates different limits or analytes
#15-H Reference Limits and Evaluation Table			X	
#15-I Reference Limits and Evaluation Table			X	
#16 Project Schedule/Timeline Table		X		FSP will included project-specific schedule
#17 Sampling Design and Rationale		X		
#18 Sampling Locations and Methods/Standard Operating Procedure Requirements Table for Screening Samples		X		
#19 Analytical SOP Requirements Table			X	Only include if project-specific FSP dictates different methods
#20 Field Quality Control Sample Summary Table	X			
#21 Project Sampling SOP References Table	X			
#22 Field Equipment Calibration, Maintenance, Testing, and Inspection Table			X	Only if project-specific FSP specifies equipment not listed on table
#23 Analytical SOP References Table		X		
#24 Analytical Instrument Calibration Table		X		

**Table 1. Guide to Programmatic vs. Project-Specific QAPP Worksheets (Continued)**

Worksheet Title	Programmatic	Project Specific	Typically Programmatic <sup>a</sup>	Comments
#25 Analytical Instrument and Equipment Maintenance, Testing, and Inspection Table	X			
#26 Sample Handling System	X			
#27 Sample Custody Requirements	X			
#28 QC Samples Table			X	Only if project-specific FSP specifies alternate QC criteria
#29 Project Documents and Records Table	X			
#30 Analytical Services Table			X	Only if project-specific FSP requires alternate analytical services
#31 Planned Project Assessments Table	X			
#32 Assessment Findings and Corrective Action Responses	X			
#33 QA Management Reports Table	X			
#34 Verification (Step I) Process Table	X			
#35 Validation (Steps IIa and IIb) Process Table	X			
#36 Validation (Steps IIa and IIb) Summary Table	X			
#37 Usability Assessment	X			

NOTE: The color-coding on this table was carried throughout the programmatic QAPP. Each worksheet coded **green** generally will require few or minor changes when applied on a project-specific basis. Each worksheet coded **yellow** generally will vary substantially when filled out for individual project-specific FSPs.

<sup>a</sup>The Programmatic QAPP presents worksheets colored in **blue**; however, there may be instances when a project-specific FSP includes alternative analytical methods, field procedures, detection limits, or data quality objectives (DQOs) that may require modification of these sheets.

The programmatic document is presented with names of the current position holders. The document will be maintained but not resubmitted if the position is filled by a different individual. The project-specific QAPP will include the current position holders. In the event the contractor changes, DOE will notify EPA and the Kentucky Department for Environmental Protection (KDPEP) of the change and the status of the programmatic QAPP.

**QAPP Worksheet #1**  
**Title Page**

---

**Document Title:** *Paducah Gaseous Diffusion Plant Programmatic Quality Assurance Project Plan*

---

**Lead Organization:** DOE

---

**Preparer's Name and Organizational Affiliation:**, Todd Struttman, P.E., LATA Environmental Services of Kentucky, LLC (LATA Kentucky)

---

**Preparer's Address, Telephone Number, and E-mail Address:** 761 Veterans Avenue, Kevil, KY, 42053, Phone (270) 441-5000, todd.struttman@lataky.com

---

**Preparation Date (Month/Year):** 02/2013

---

**Document Control Number:** DOE/LX/07-1269&D2/R1

---

LATA Kentucky  
Environmental Remediation  
Project Manager

\_\_\_\_\_

Signature  
Mark J. Duff

Date: \_\_\_\_\_

LATA Kentucky Regulatory  
Manager

\_\_\_\_\_

Signature  
Myrna Espinosa Redfield

Date: \_\_\_\_\_

LATA Kentucky  
Sample/Data  
Management Manager

\_\_\_\_\_

Signature  
Lisa Crabtree

Date: \_\_\_\_\_

**NOTE:** The programmatic document is presented with the names of the current position holders. The document will be maintained but not resubmitted if the designated position is filled by a different individual. The project-specific QAPP will include the current position holders. In the event the contractor changes, DOE will notify EPA and KDEP of the change and the status of the programmatic QAPP.

**QAPP Worksheet #2**  
**QAPP Identifying Information**

**Site Name/Project Name:** Paducah Gaseous Diffusion Plant  
**Site Location:** Paducah, Kentucky  
**Site Number/Code:** KY8890008982  
**Contractor Name:** LATA Kentucky  
**Contractor Number:** DE-AC30-10CC40020  
**Contract Title:** Paducah Gaseous Diffusion Plant Paducah Environmental Remediation Project  
**Work Assignment Number:** N/A

1. Identify guidance used to prepare QAPP:

Intergovernmental Data Quality Task Force, March 2005. The Uniform Federal Policy for Implementing Environmental Quality Systems, Version 2.0, 126 pages.

Intergovernmental Data Quality Task Force, March 2005. The Uniform Federal Policy for Quality Assurance Project Plans: Part 1 UFP QAPP Manual, Version 1.0, 177 pages (DTIC ADA 427785 or EPA-505-B-04-900A).

Intergovernmental Data Quality Task Force, March 2005. The Uniform Federal Policy for Quality Assurance Project Plans: Part 2A UFP QAPP Worksheets, Version 1.0, 44 pages.

Intergovernmental Data Quality Task Force, March 2005. The Uniform Federal Policy for Quality Assurance Project Plans: Part 2B Quality Assurance/Quality Control Compendium: Minimum QA/QC activities, Version 1.0, 76 pages.

2. Identify regulatory program: Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and *Federal Facility Agreement for the Paducah Gaseous Diffusion Plant*, DOE/OR/07-1707 (FFA)
3. Identify approval entity: DOE, EPA Region 4, and KDEP
4. Indicate whether the QAPP is a generic or a project-specific QAPP (circle one).
5. List dates of scoping sessions that were held: December 2010–February 2011—General scoping sessions: Programmatic QAPP preparation

**QAPP Worksheet #2 (Continued)**  
**QAPP Identifying Information**

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

<b>Title:</b>	<b>Approval Date:</b>
<i>Data and Documents Management and Quality Assurance Plan for Paducah Environmental Management and Enrichment Facilities, DOE/OR/07-1595&amp;D2 (DOE 1998)</i>	10/5/1998

***NOTE:** This programmatic QAPP is developed for future documents, individual site-specific FSPs, and associated project-specific QAPPs that are approved will stand as is. Future project-specific FSPs and associated project-specific QAPPs will follow this programmatic QAPP (after approval of the programmatic QAPP); therefore, other QAPPs at the site are not referenced.*

7. List organizational partners (stakeholders) and connection with lead organization:  
 EPA Region 4, KDEP
8. List data users: DOE, LATA Kentucky, subcontractors, EPA Region 4, Commonwealth of Kentucky
9. If any required QAPP elements and required information are not applicable to the project, then indicate the omitted QAPP elements and required information on the attached table. Provide an explanation for their exclusion here.

The programmatic QAPP includes all 37 worksheets that are required based on UFP-QAPP guidance. Some worksheets are project specific and contain no programmatic level information (e.g., Worksheet 16). These worksheets, along with any additional updates that may be needed, will be included as attachments to project-level FSPs, as applicable.

**QAPP Worksheet #2 (Continued)**  
**QAPP Identifying Information**

**NOTE:** Information is entered only in the “Crosswalk to Related Documents” if the information is not contained in the QAPP worksheets, as indicated in first two columns. Additionally, if the required QAPP element fulfills other quality requirements, that requirement is noted in the “Crosswalk to Related Documents” column.

<b>Required QAPP Element(s) and Corresponding QAPP Section(s)</b>	<b>Required Information</b>	<b>Worksheet No.</b>	<b>Crosswalk to Related Documents</b>
2.1 Title and Approval Page	• Title and Approval Page	1	
2.2 Document Format and Table of Contents 2.2.1 Document Control Format 2.2.2 Document Control Numbering System 2.2.3 Table of Contents 2.2.4 QAPP Identifying Information	• Table of Contents • QAPP Identifying Information	2	
2.3 Distribution List and Project Personnel Signoff Sheet 2.3.1 Distribution List 2.3.2 Project Personnel Sign-Off Sheet	• Distribution List • Project Personnel Sign-Off Sheet	3 4	
2.4 Project Organization 2.4.1 Project Organizational Chart 2.4.2 Communication Pathways 2.4.3 Personnel Responsibilities and Qualifications 2.4.4 Special Training Requirements and Certification	• Project Organizational Chart • Communication Pathways • Personnel Responsibilities and Qualifications Table • Special Personnel Training Requirements Table	5 6 7 8	
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)	9 10	
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 Project Quality Objectives • Measurement Performance Criteria Table	11 12	
2.7 Secondary Data Evaluation	• Sources of Secondary Data and Information • Secondary Data Criteria and Limitations Table	13	

**QAPP Worksheet #2 (Continued)**  
**QAPP Identifying Information**

Required QAPP Element(s) and Corresponding QAPP Section(s)	Required Information	Worksheet No.	Crosswalk to Related Documents
2.8 Project Overview and Schedule 2.8.1 Project Overview 2.8.2 Project Schedule	<ul style="list-style-type: none"> <li>• Summary of Project Tasks</li> <li>• Reference Limits and Evaluation Table</li> <li>• Project Schedule/Timeline Table</li> </ul>	14 15 16	
<b>Measurement/Data Acquisition</b>			
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	<ul style="list-style-type: none"> <li>• Sampling Design and Rationale</li> <li>• Sample Location Map</li> <li>• Sampling Locations and Methods/SOP Requirements Table</li> <li>• Analytical Methods/SOP Requirements Table</li> <li>• Field Quality Control Sample Summary Table</li> <li>• Sampling SOPs</li> <li>• Project Sampling SOP References Table</li> <li>• Field Equipment Calibration, Maintenance, Testing, and Inspection Table</li> </ul>	17/18/19/20    21 22	
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	<ul style="list-style-type: none"> <li>• Analytical SOPs</li> <li>• Analytical SOP References Table</li> <li>• Analytical Instrument Calibration Table</li> <li>• Analytical Instrument and Equipment Maintenance, Testing, and Inspection Table</li> </ul>	23  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	<ul style="list-style-type: none"> <li>• Sample Collection Documentation Handling, Tracking, and Custody SOPs</li> <li>• Sample Container Identification</li> <li>• Sample Handling Flow Diagram</li> <li>• Example Chain-of-Custody Form and Seal</li> </ul>	26  27	

**QAPP Worksheet #2 (Continued)**  
**QAPP Identifying Information**

<b>Required QAPP Element(s) and Corresponding QAPP Section(s)</b>	<b>Required Information</b>	<b>Worksheet No.</b>	<b>Crosswalk to Related Documents</b>
3.4 Quality Control Samples 3.4.1 Sampling Quality Control Samples 3.4.2 Analytical Quality Control Samples	<ul style="list-style-type: none"> <li>• QC Samples Table</li> <li>• Screening/Confirmatory Analysis Decision Tree</li> </ul>	28	
3.5 Data Management Tasks 3.5.1 Project Documentation and Records 3.5.2 Data Package Deliverables 3.5.3 Data Reporting Formats 3.5.4 Data Handling and Management 3.5.5 Data Tracking and Control	<ul style="list-style-type: none"> <li>• Project Documents and Records Table</li> <li>• Analytical Services Table</li> <li>• Data Management SOPs</li> </ul>	29 30	
<b>Assessment/Oversight</b>			
4.1 Assessments and Response Actions 4.1.1 Planned Assessments 4.1.2 Assessment Findings and Corrective Action Responses	<ul style="list-style-type: none"> <li>• Assessments and Response Actions</li> <li>• Planned Project Assessments Table</li> <li>• Audit Checklists</li> <li>• Assessment Findings and Corrective Action Responses Table</li> </ul>	31 32	
4.2 QA Management Reports	<ul style="list-style-type: none"> <li>• QA Management Reports Table</li> </ul>	33	
4.3 Final Project Report			
<b>Data Review</b>			
5.1 Overview			
5.2 Data Review Steps 5.2.1 Step I: Verification 5.2.2 Step II: Validation 5.2.2.1 Step IIa Validation Activities 5.2.2.2 Step IIb Validation Activities 5.2.3 Step III: Usability Assessment 5.2.3.1 Data Limitations and Actions from Usability Assessment 5.2.3.2 Activities	<ul style="list-style-type: none"> <li>• Verification (Step I) Process Table</li> <li>• Validation (Steps IIa and IIb) Process Table</li> <li>• Validation (Steps IIa and IIb) Summary Table</li> <li>• Usability Assessment</li> </ul>	34 35 36 37	
5.3 Streamlining Data Review 5.3.1 Data Review Steps To Be Streamlined 5.3.2 Criteria for Streamlining Data Review 5.3.3 Amounts and Types of Data Appropriate for Streamlining			

DOE = U.S. Department of Energy  
 QC = quality control

QA = quality assurance  
 SOP = standard operating procedure

QAPP = Quality Assurance Project Plan

**QAPP Worksheet #3**  
**Minimum Distribution List**

Controlled copies of the QAPP will be distributed according to the distribution list below. This list will be updated, as needed, and kept by the LATA Kentucky Records Management Department. Each person receiving a controlled copy also will receive any updates/revisions. If uncontrolled copies are distributed, it will be the responsibility of the person distributing the uncontrolled copy to provide updates/revisions.

<b>Position Title</b>	<b>Organization</b>	<b>QAPP Recipients</b>	<b>Current Telephone Number</b>	<b>Current E-mail Address</b>	<b>Document Control Number</b>
Paducah Site Lead	DOE	Reinhard Knerr	(270) 441-6825	reinhard.knerr@lex.doe.gov	1
Project Manager	DOE	Dave Dollins	(270) 441-6819	dave.dollins@lex.doe.gov	2
Environmental Remediation Project Manager	LATA Kentucky	Mark Duff	(270) 441-5030	mark.duff@lataky.com	3
Regulatory Manager	LATA Kentucky	Myrna Redfield	(270) 441-5113	myrna.redfield@lataky.com	4
Project Integration and Operations Manager	LATA Kentucky	Craig Jones	(270) 441-5114	craig.jones@lataky.com	5
FFA Manager	KDEP	Todd Mullins	(502) 564-6716	todd.mullins@ky.gov	6
FFA Manager	EPA	Turpin Ballard	(404) 562-8553	ballard.turpin@epamail.epa.gov	7
Remedial Project Manager	EPA	Jennifer Tufts	(404) 562-8513	tufts.jennifer@epamail.epa.gov	8
Risk Assessment Manager	LATA Kentucky	Joe Towarnicky	(270) 441-5134	joseph.towarnicky@lataky.com	9
FFA Manager	LATA Kentucky	Jana White	(270) 441-5185	jana.white@lataky.com	10
Quality Assurance Manager	LATA Kentucky	Michelle Dudley	(270) 462-4544	michelle.dudley@lataky.com	11
Environmental Monitoring and Reporting Program Manager	LATA Kentucky	Kelly Layne	(270) 441-5217	kelly.layne@lataky.com	12
Environment, Safety, and Health Manager	LATA Kentucky	Eddie Magness	(270) 441-5404	eddie.magness@lataky.com	13
Regulatory Compliance Manager	LATA Kentucky	Michael Gerle	(270) 441-5069	michael.gerle@lataky.com	14
Sample/Data Management Manager	LATA Kentucky	Lisa Crabtree	(270) 441-5135	lisa.crabtree@lataky.com	15

**QAPP Worksheet #3 (Continued)**  
**Minimum Distribution List**

Distribution is based on the position title. A change in the individual within an organization will not trigger a resubmission of the programmatic QAPP. DOE may choose to update the sheet and submit changes to the programmatic document holders. This change will not require a review by FFA stakeholders as it is not a substantive change. These managers will be responsible for distribution to their staff assigned to project-specific FSPs.

**QAPP Worksheet #4**  
**Project Personnel Sign-Off Sheet**

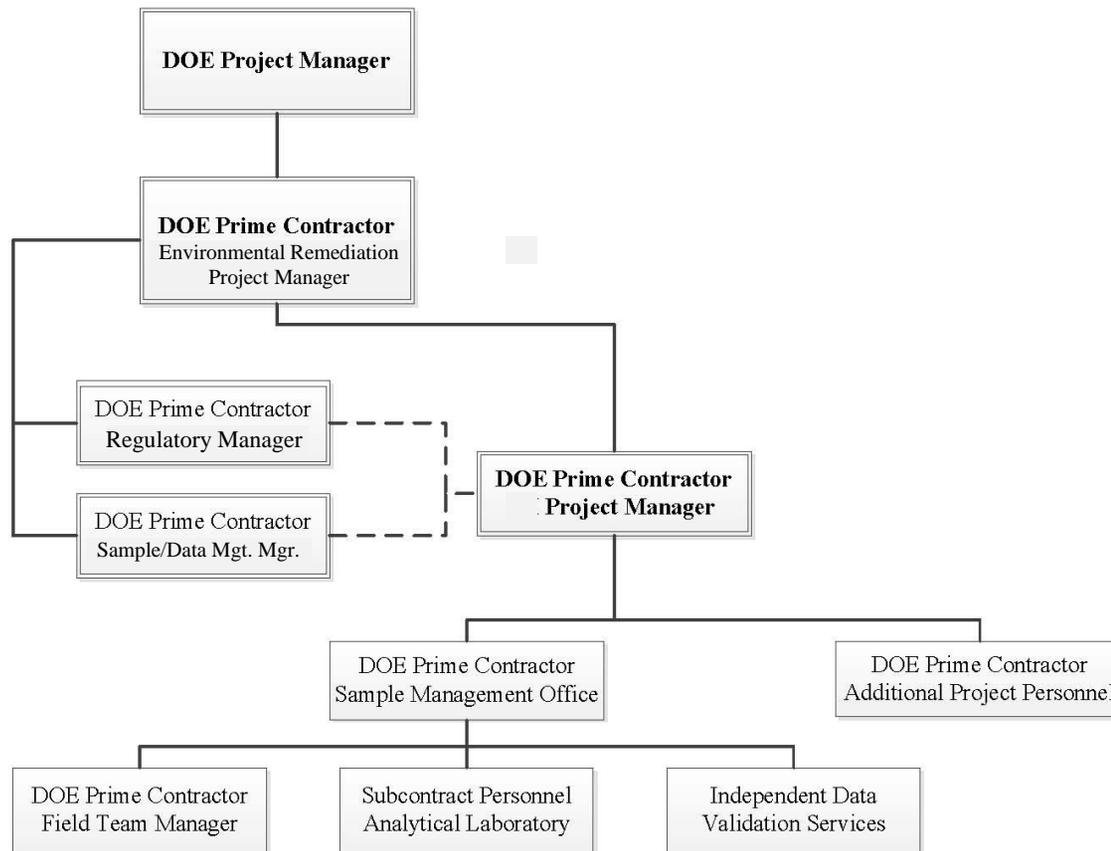
Personnel actively engaged in sample collection, data analysis, and data validation for the projects are required to read applicable sections of this programmatic QAPP and sign a Personnel Sign-off Sheet. The master list of signatures will be kept by the Environmental Monitoring and Reporting Program Manager or designee and will be made available upon request. Additional sign-offs for project-specific worksheets will be handled in a similar manner.

<b>Project Position Title</b>	<b>Organization</b>	<b>Signature</b>	<b>Date</b>

**QAPP Worksheet #5**  
**Project Contractor Organizational Chart**

This portion of the QAPP addresses the project organization as it provides for QA/Quality Control (QC) coordination and responsibilities. Project-specific FSPs will follow this generic project-level organizational chart.

**Project Level Organizational Chart**



**QAPP Worksheet #6**  
**Communication Pathways**

**NOTE:** Formal communication across company or regulatory boundaries occurs via letter. Other forms of communication, such as e-mail, meetings, etc., will occur throughout the project.

<b>Communication Drivers</b>	<b>Organizational Affiliation</b>	<b>Position Title Responsible</b>	<b>Procedure</b>
Federal Facility Agreement DOE/OR/07-1707	DOE Paducah Site Lead	Paducah Site Lead	All formal communication among DOE, EPA, and KDEP.
Federal Facility Agreement DOE/OR/07-1707	DOE Paducah	DOE Project Manager	All formal communication between DOE and contractor for Environmental Remediation Projects.
All project requirements	LATA Kentucky	Environmental Remediation Project Manager	All formal communication between the project, the Site Lead, and the DOE Project Manager.
All project requirements	LATA Kentucky	Project Manager	All communication between the project and the LATA Kentucky Environmental Remediation Project Manager.
Project QA requirements	LATA Kentucky	Quality Assurance Manager	All project quality related communication between the QA department and LATA Kentucky project personnel.
FFA Compliance	LATA Kentucky	Regulatory Manager	All internal communication regarding FFA compliance with the LATA Kentucky Project Manager.

Roles presented above are at the program level. If there are additional communication requirements at the project-specific level, they will be addressed in a project-specific FSP through a worksheet or a section of the FSP.

**QAPP Worksheet #6 (Continued)**  
**Communication Pathways**

<b>Communication Drivers</b>	<b>Organizational Affiliation</b>	<b>Position Title Responsible</b>	<b>Organizational Department Manager</b>	<b>Procedure</b>
Sampling Requirements	LATA Kentucky	Sampling Lead	Project and Operations Manager	All internal communication regarding field sampling with the LATA Kentucky Project Manager.
Analytical Laboratory Interface	LATA Kentucky	Laboratory Coordinator	Project and Operations Manager	All communication between LATA Kentucky and analytical laboratory.
Waste Management Requirements	LATA Kentucky	Waste Coordinator	Project and Operations Manager	All internal communication regarding project waste management with LATA Kentucky Project Manager.
Environmental Compliance Requirements	LATA Kentucky	Compliance Manager	Regulatory Manager	All internal correspondence regarding environmental requirements and compliance with the LATA Kentucky Project Manager.
Subcontractor Requirements (if applicable)	LATA Kentucky	Subcontract Administrator	Business Manager	All correspondence between the project and subcontractors, if applicable.
Health and Safety Requirements	LATA Kentucky	Environment, Safety, and Health Manager	Environment, Safety, and Health Manager	All internal communication regarding safety and health requirements with the LATA Kentucky Project Manager.

NOTE: The programmatic document is position based with names of the current position holders. The document will not be updated if the designated position described is filled by a different individual. In the event the contractor changes, DOE will notify EPA and KDEP of the change, but not request approval of the report.

**QAPP Worksheet #7**  
**Personnel Responsibility and Qualifications Table**

<b>Position Title Responsible</b>	<b>Organization Affiliation</b>	<b>Responsibilities</b>	<b>Education and Experience Qualifications<sup>1</sup></b>
Project Manager	LATA Kentucky	Overall project responsibility	> 4 years relevant work experience
Environmental Engineer	LATA Kentucky	Project sampling and analysis plan	Bachelor of Science plus > 1 year relevant work experience
Environmental Compliance Manager	LATA Kentucky	Project environmental compliance responsibility	Bachelor degree plus > 4 years work experience
FFA Manager	LATA Kentucky	Project compliance with the FFA	> 4 years work relevant experience
Environmental Monitoring and Reporting Program Manager	LATA Kentucky	Support project on sampling and reporting activities	> 4 years relevant work experience
Sample/Data Management Manager	LATA Kentucky	Project sample and data management	> 1 year relevant work experience
Health and Safety Representative	LATA Kentucky	Project safety and health responsibility	Bachelor degree plus > 1 year relevant experience
Waste Coordinator	LATA Kentucky	Overall project waste management responsibility	> 4 years relevant experience
Data Validator	Independent third party contractor	Performing data validation according to specified procedures	Bachelor degree plus relevant experience
Analytical Laboratory Project Manager	Analytical Laboratory	Sample analysis and data reporting	Bachelor degree plus relevant experience

---

<sup>1</sup> Candidates who do not have a certificate or required degree but demonstrate additional “equivalent relevant work experience” can be considered when evaluating qualifications. This assessment will be conducted by the PM as he/she assembles the appropriate team for the project.

**QAPP Worksheet #8**

**Special Personnel Training Requirements Table**

Personnel are trained in the safe and appropriate performance of their assigned duties in accordance with requirements of work to be performed. This QAPP has been developed as a generalized programmatic quality plan. There are no special training requirements other than what normally is required for work at the PGDP site. QAPP development uses a graded approach. Work control packages generated for a project-specific FSP will list specific project-level training requirements.

<b>Project Function</b>	<b>Specialized Training— Title or Description of Course</b>	<b>Training Provider</b>	<b>Training Date</b>	<b>Personnel/Groups Receiving Training</b>	<b>Personnel Titles/ Organizational Affiliation</b>	<b>Location of Training Records/Certificates*</b>
Project Tasks	There will be no specialized training required for this program other than what normally is required for site work at PGDP. The contractor will evaluate specific tasks and personnel will be assigned training as necessary to perform those tasks. Training may address health and safety aspects of specific tasks as well as contractor-specific, site-specific, and task-specific requirements.	TBD	TBD	TBD	LATA Kentucky staff, subcontractors	Training files are maintained by the LATA Kentucky training organization. A training database is utilized to manage and track training.

\* Training records are maintained by the LATA Kentucky training department. If training records and/or certificates do not exist or are not available, then this should be noted.  
 TBD = to be determined

**QAPP Worksheet #9**

**Project Scoping Session Participant Sheet**

Project scoping is the key to the success of any project and is part of the systematic planning process. For the programmatic QAPP, this included review of past documents produced, planning meetings to establish the objectives of the programmatic QAPP followed by intermediate and final review of this programmatic document within LATA Kentucky. The objective of the programmatic QAPP was to produce an overarching document that applies to the site projects to provide sitewide consistency and streamlining of project-specific QAPPs. The programmatic QAPP is consistent with the Data Management Plan (DOE 1998) developed for the FFA. The worksheet below was completed as part of the scoping of the programmatic QAPP.

Project-specific QAPPs developed in association with FSPs will follow same systematic planning process. The type and frequency of scoping sessions and the type and number of persons who participate in scoping sessions are related to the size and complexity of the project, technical components of the project, and the number of organizations involved. For example, small projects may use project teams that consist of only two or three people who convene via teleconference. A typical scoping component is a kickoff meeting to establish and define the roles and responsibilities of each team member, set out performance requirements for response times and project execution, and build a project team. QAPP Worksheet #9 will be completed for subsequent project-specific QAPPs.

19

<b>Name of Project:</b> Programmatic QAPP development					
<b>Date of Session:</b> December 10, 2010, January 13, 2011, February 4, 2011					
<b>Scoping Session Purpose:</b> Kickoff meeting, progress meetings, review and finalization of draft QAPP					
<b>Position Title</b>	<b>Affiliation</b>	<b>Name</b>	<b>Phone #</b>	<b>E-mail Address</b>	<b>Project Role</b>
Regulatory Manager	LATA Kentucky	Myrna Redfield	270-441-5113	myrna.redfield@lataky.com	Document preparation
Project Chemist/QA/QC	LATA Kentucky	James Moore	614-508-1200	jmoore@lata.com	Programmatic QAPP subject matter expert
Sample/Data Management Manager	LATA Kentucky	Lisa Crabtree	270-441-5315	lisa.crabtree@lataky.com	Laboratory requirements
Environmental Monitoring and Reporting Program Manager	LATA Kentucky	Kelly Layne	270-441-5217	kelly.layne@lataky.com	Review of QAPP
QA Specialist	LATA Kentucky	Suzanne Shidal	270-462-4697	suzanne.shidal@lataky.com	Document review

**QAPP Worksheet #10**  
**Problem Definition**

This QAPP has been developed as a programmatic quality plan. QAPP Worksheet #10 will be used as an outline for the problem discussion in subsequent project-specific QAPPs. The project team developing the project-specific FSP and associated project-specific QAPP may choose to include this information in the body of the report rather than populating this worksheet.

**The problem to be addressed by the project:**

**The environmental questions being asked:**

**Observations from any site reconnaissance reports:**

**A synopsis of secondary data or information from site reports:**

**The possible classes of contaminants and the affected matrices:**

**The rationale for inclusion of chemical and nonchemical analyses:**

**Information concerning various environmental indicators:**

**Project decision conditions (“If..., then...” statements):**

This sheet is a summary of the project and will be described in the project-specific FSP problem definition information. The project manager will ensure these components are part of the FSP. Completion of a separate Worksheet #10 to identify where these components are located in the FSP is at the discretion of the project manager.

**QAPP Worksheet #11**

**Project Quality Objectives/Systematic Planning Process Statements**

This programmatic QAPP has been prepared to detail the minimum standards, particularly for field and analytical data quality. Analytical data will be generated by DOE Consolidated Audit Program (CAP) laboratories utilizing approved laboratory test methods. The overall project quality objectives are to develop and implement procedures for field sampling, chain-of-custody, laboratory analysis, and reporting that will provide results that are legally defensible in a court of law. Specific procedures for sampling, chain-of-custody, instrument calibration/preventive maintenance, chemical analysis, internal QC, reporting data, audits, and corrective actions are described in other sections of this programmatic QAPP.

This QAPP has been developed as a programmatic quality plan. QAPP Worksheet #11 will be utilized for subsequent project-specific FSPs to document the project quality objectives developed through the systematic planning process.

**Who will use the data?** DOE, LATA Kentucky, subcontractor, Commonwealth of Kentucky, and EPA.

**What will the data be used for?**

**What type of data is needed? (target analytes, analytical groups, field screening, on-site analytical or off-site laboratory techniques, sampling techniques)**

**How “good” do the data need to be in order to support the environmental decision?** Data needs to meet the measurement quality objective and data quality indicators established by the systematic planning process consistent with procedure PAD-ENM-5003, *Quality Assured Data*, and PAD-ENM-1003, *Developing, Implementing, and Maintaining Data Management Implementation Plans*.

**Where, when, and how should the data be collected/generated?**

**Who will collect and generate the data?**

**How will the data be reported?** Field data will be recorded on chain-of-custody forms, in field logbooks, and field data sheets. The fixed-base laboratory will provide data in an Electronic Data Deliverable (EDD). Project data following verification assessment and validation will be placed into and reported from the Paducah Oak Ridge Environmental Information System (OREIS).

**How will the data be archived?** Electronic data will be archived in OREIS in accordance with Section 8.5 (Data and Records Archival) of the Data and Documents Management and Quality Assurance Plan.

**NOTE:** The above worksheet is completed partially with items that will be consistent across all project-specific FSPs. The project-specific FSPs will need to populate the balance of this worksheet.

**QAPP Worksheet #12-A**  
**Measurement Performance Criteria Table**

Sampling will follow the standard operating procedures referenced in the FSP. The following table provides the measurement performance criteria and establishes a template for the projects to use. QAPP Worksheet #12 will be utilized for subsequent project-specific QAPPs. Updates to Worksheet #12 will be made in project-specific FSPs to incorporate analytes that are not currently on the list, or to update an analytical limit when a project-specific FSP calls for a lower limit.

<b>Matrix</b>	Soil/Sediment				
<b>Analytical Group<sup>1</sup></b>	Volatile Organic Compounds				
<b>Concentration Level</b>	Low				
<b>Sampling Procedure<sup>2</sup></b>	<b>Analytical Method/SOP<sup>3,4</sup></b>	<b>Data Quality Indicators (DQIs)</b>	<b>Measurement Performance Criteria</b>	<b>QC Sample and/or Activity Used to Assess Measurement Performance</b>	<b>QC Sample Assesses Error for Sampling (S), Analytical (A) or both (S&amp;A)</b>
	SW-846-8260	Precision–Lab	RPD < 22%	Laboratory Duplicates	A
		Precision	RPD < 50%	Field Duplicates	S
		Accuracy/Bias	% recovery <sup>6</sup>	Laboratory Sample Spikes	A
		Accuracy/Bias-Contamination	No target compounds > PQL	Method Blanks/Instrument Blanks	A
		Accuracy/Bias Contamination	No target compounds > PQL	Field Blanks	S
		Accuracy/Bias Contamination	No target compounds > PQL	Trip Blanks	S
		Accuracy/Bias Contamination	No target compounds > PQL	Equipment Rinseates	S
		Completeness <sup>5</sup>	90%	Data completeness check	S&A

PQL = practical quantitation limit; RPD = Relative Percent Difference;

<sup>1</sup> If information varies within an analytical group, separate by individual analyte.

<sup>2</sup> Reference number from QAPP Worksheet #21.

<sup>3</sup> Reference number from QAPP Worksheet #23.

<sup>4</sup> The most current version of the method will be used.

<sup>5</sup> Completeness is calculated as the number of samples planned to be collected divided by the number of sample results that were rejected.

<sup>6</sup> Percent recovery is laboratory-specific, calculated from studies performed every six months. Percent recovery ranges will be provided in the laboratory data packages based on the most current study.

**QAPP Worksheet #12-B**  
**Measurement Performance Criteria Table**

<b>Matrix</b>	Soil/Sediment				
<b>Analytical Group<sup>1</sup></b>	Metals (aluminum, antimony, arsenic, barium, beryllium, boron, cadmium, chromium, cobalt, copper, iron, lead, manganese, molybdenum, nickel, selenium, silver, thallium, uranium, vanadium, and zinc)				
<b>Concentration Level</b>	Low				
<b>Sampling Procedure<sup>2</sup></b>	<b>Analytical Method/SOP<sup>3,4</sup></b>	<b>Data Quality Indicators (DQIs)</b>	<b>Measurement Performance Criteria</b>	<b>QC Sample and/or Activity Used to Assess Measurement Performance</b>	<b>QC Sample Assesses Error for Sampling (S), Analytical (A) or both (S&amp;A)</b>
	200.8/ SW846-6010/6020	Precision–Lab	RPD ≤ 35%	Laboratory Duplicates	A
		Precision	RPD ≤ 35%	Field Duplicates	S
		Accuracy/Bias	% recovery <sup>6</sup>	Laboratory Sample Spikes	A
		Accuracy/Bias-Contamination	No target compounds > PQL	Method Blanks/Instrument Blanks	A
		Accuracy/Bias-Contamination	No target compounds > PQL	Field Blanks	S
		Accuracy/Bias-Contamination	No target compounds > PQL	Equipment Rinseates	S
		Completeness <sup>5</sup>	90%	Data completeness check	S&A

PQL = practical quantitation limit; RPD = Relative Percent Difference;

<sup>1</sup> If information varies within an analytical group, separate by individual analyte.

<sup>2</sup> Reference number from QAPP Worksheet #21.

<sup>3</sup> Reference number from QAPP Worksheet #23.

<sup>4</sup> The most current version of the method will be used.

<sup>5</sup> Completeness is calculated as the number of samples planned to be collected divided by the number of sample results that were rejected.

<sup>6</sup> Percent recovery is laboratory-specific, calculated from studies performed every six months. Percent recovery ranges will be provided in the laboratory data packages based on the most current study.

**QAPP Worksheet #12-C**  
**Measurement Performance Criteria Table**

<b>Matrix</b>	Soil/Sediment				
<b>Analytical Group<sup>1</sup></b>	Metals (Mercury)				
<b>Concentration Level</b>	Low				
<b>Sampling Procedure<sup>2</sup></b>	<b>Analytical Method/SOP<sup>3,4</sup></b>	<b>Data Quality Indicators (DQIs)</b>	<b>Measurement Performance Criteria</b>	<b>QC Sample and/or Activity Used to Assess Measurement Performance</b>	<b>QC Sample Assesses Error for Sampling (S), Analytical (A) or both (S&amp;A)</b>
	SW846-7471	Precision–Lab	RPD ≤ 35%	Laboratory Duplicates	A
		Precision	RPD ≤ 35%	Field Duplicates	S
		Accuracy/Bias	% recovery <sup>6</sup>	Laboratory Sample Spikes	A
		Accuracy/Bias-Contamination	No target compounds > PQL	Method Blanks/Instrument Blanks	A
		Accuracy/Bias-Contamination	No target compounds > PQL	Field Blanks	S
		Accuracy/Bias-Contamination	No target compounds > PQL	Equipment Rinseates	S
		Completeness <sup>5</sup>	90%	Data completeness check	S&A

PQL = practical quantitation limit; RPD = Relative Percent Difference;

<sup>1</sup> If information varies within an analytical group, separate by individual analyte.

<sup>2</sup> Reference number from QAPP Worksheet #21.

<sup>3</sup> Reference number from QAPP Worksheet #23.

<sup>4</sup> The most current version of the method will be used.

<sup>5</sup> Completeness is calculated as the number of samples planned to be collected divided by the number of sample results that were rejected.

<sup>6</sup> Percent recovery is laboratory-specific, calculated from studies performed every six months. Percent recovery ranges will be provided in the laboratory data packages based on the most current study.

**QAPP Worksheet #12-D**  
**Measurement Performance Criteria Table**

<b>Matrix</b>	Soil/Sediment				
<b>Analytical Group<sup>1</sup></b>	PCBs				
<b>Concentration Level</b>	Low				
<b>Sampling Procedure<sup>2</sup></b>	<b>Analytical Method/SOP<sup>3,4</sup></b>	<b>Data Quality Indicators (DQIs)</b>	<b>Measurement Performance Criteria</b>	<b>QC Sample and/or Activity Used to Assess Measurement Performance</b>	<b>QC Sample Assesses Error for Sampling (S), Analytical (A) or both (S&amp;A)</b>
	SW846-8082	Precision-Lab	RPD ≤ 43%	Laboratory Duplicates	A
		Precision	RPD ≤ 43%	Field Duplicates	S
		Accuracy/Bias	% recovery <sup>6</sup>	Laboratory Sample Spikes	A
		Accuracy/Bias-Contamination	No target compounds > PQL	Method Blanks/Instrument Blanks	A
		Accuracy/Bias-Contamination	No target compounds > PQL	Field Blanks	S
		Accuracy/Bias-Contamination	No target compounds > PQL	Equipment Rinseates	S
		Completeness <sup>5</sup>	90%	Data completeness check	S&A

PQL = practical quantitation limit; RPD = Relative Percent Difference;

<sup>1</sup> If information varies within an analytical group, separate by individual analyte.

<sup>2</sup> Reference number from QAPP Worksheet #21.

<sup>3</sup> Reference number from QAPP Worksheet #23.

<sup>4</sup> The most current version of the method will be used.

<sup>5</sup> Completeness is calculated as the number of samples planned to be collected divided by the number of sample results that were rejected.

<sup>6</sup> Percent recovery is laboratory-specific, calculated from studies performed every six months. Percent recovery ranges will be provided in the laboratory data packages based on the most current study.

**QAPP Worksheet #12-E**  
**Measurement Performance Criteria Table**

<b>Matrix</b>	Soil/Sediment				
<b>Analytical Group<sup>1</sup></b>	Radionuclides (uranium-234, uranium-235, uranium-238)				
<b>Concentration Level</b>	Low				
<b>Sampling Procedure<sup>2</sup></b>	<b>Analytical Method/SOP<sup>3,4</sup></b>	<b>Data Quality Indicators (DQIs)</b>	<b>Measurement Performance Criteria</b>	<b>QC Sample and/or Activity Used to Assess Measurement Performance</b>	<b>QC Sample Assesses Error for Sampling (S), Analytical (A) or both (S&amp;A)</b>
	Alpha spectroscopy	Precision–Lab	RPD ≤ 25%	Laboratory Duplicates	A
		Precision	RPD ≤ 50%	Field Duplicates	S
		Accuracy/Bias	% recovery <sup>6</sup>	Laboratory Sample Spikes	A
		Accuracy/Bias-Contamination	No target compounds > MDA	Method Blanks/Instrument Blanks	A
		Accuracy/Bias Contamination	No target compounds > MDA	Field Blanks	S
		Accuracy/Bias Contamination	No target compounds > MDA	Equipment Rinseates	S
		Completeness <sup>5</sup>	90%	Data completeness check	S&A

MDA = minimum detectable activity; RPD = Relative Percent Difference;

<sup>1</sup> If information varies within an analytical group, separate by individual analyte.

<sup>2</sup> Reference number from QAPP Worksheet #21.

<sup>3</sup> Reference number from QAPP Worksheet #23.

<sup>4</sup> The most current version of the method will be used.

<sup>5</sup> Completeness is calculated as the number of samples planned to be collected divided by the number of sample results that were rejected.

<sup>6</sup> Percent recovery is laboratory-specific, calculated from studies performed every six months. Percent recovery ranges will be provided in the laboratory data packages based on the most current study.

**QAPP Worksheet #12-F**  
**Measurement Performance Criteria Table**

<b>Matrix</b>	Soil/Sediment				
<b>Analytical Group<sup>1</sup></b>	Radionuclides (americium-241, neptunium-237, plutonium-238, plutonium-239/240, thorium-230)				
<b>Concentration Level</b>	Low				
<b>Sampling Procedure<sup>2</sup></b>	<b>Analytical Method/SOP<sup>3,4</sup></b>	<b>Data Quality Indicators (DQIs)</b>	<b>Measurement Performance Criteria</b>	<b>QC Sample and/or Activity Used to Assess Measurement Performance</b>	<b>QC Sample Assesses Error for Sampling (S), Analytical (A) or both (S&amp;A)</b>
	Alpha spectroscopy	Precision–Lab	RPD ≤ 50%	Laboratory Duplicates	A
		Precision	RPD ≤ 50%	Field Duplicates	S
		Accuracy/Bias	% recovery <sup>6</sup>	Laboratory Sample Spikes	A
		Accuracy/Bias-Contamination	No target compounds > MDA	Method Blanks/Instrument Blanks	A
		Accuracy/Bias Contamination	No target compounds > MDA	Field Blanks	S
		Accuracy/Bias Contamination	No target compounds > MDA	Equipment Rinseates	S
		Completeness <sup>5</sup>	90%	Data completeness check	S&A

MDA = minimum detectable activity; RPD = Relative Percent Difference;

<sup>1</sup> If information varies within an analytical group, separate by individual analyte.

<sup>2</sup> Reference number from QAPP Worksheet #21.

<sup>3</sup> Reference number from QAPP Worksheet #23.

<sup>4</sup> The most current version of the method will be used.

<sup>5</sup> Completeness is calculated as the number of samples planned to be collected divided by the number of sample results that were rejected.

<sup>6</sup> Percent recovery is laboratory-specific, calculated from studies performed every six months. Percent recovery ranges will be provided in the laboratory data packages based on the most current study.

**QAPP Worksheet #12-G**  
**Measurement Performance Criteria Table**

<b>Matrix</b>	Soil/Sediment				
<b>Analytical Group<sup>1</sup></b>	Radionuclides (cesium-137, cobalt-60)				
<b>Concentration Level</b>	Low				
<b>Sampling Procedure<sup>2</sup></b>	<b>Analytical Method/SOP<sup>3,4</sup></b>	<b>Data Quality Indicators (DQIs)</b>	<b>Measurement Performance Criteria</b>	<b>QC Sample and/or Activity Used to Assess Measurement Performance</b>	<b>QC Sample Assesses Error for Sampling (S), Analytical (A) or both (S&amp;A)</b>
	Gamma spectroscopy	Precision–Lab	RPD–≤ 50%	Laboratory Duplicates	A
		Precision	RPD–≤ 50%	Field Duplicates	S
		Accuracy/Bias Contamination	No target compounds > MDA	Field Blanks	S
		Accuracy/Bias Contamination	No target compounds > MDA	Equipment Rinseates	S
		Completeness <sup>5</sup>	90%	Data completeness check	S&A

MDA = minimum detectable activity; RPD = Relative Percent Difference;

<sup>1</sup> If information varies within an analytical group, separate by individual analyte.

<sup>2</sup> Reference number from QAPP Worksheet #21.

<sup>3</sup> Reference number from QAPP Worksheet #23.

<sup>4</sup> The most current version of the method will be used.

<sup>5</sup> Completeness is calculated as the number of samples planned to be collected divided by the number of sample results that were rejected.

**QAPP Worksheet #12-H**  
**Measurement Performance Criteria Table**

<b>Matrix</b>	Soil/Sediment				
<b>Analytical Group<sup>1</sup></b>	Radionuclides (technetium-99)				
<b>Concentration Level</b>	Low				
<b>Sampling Procedure<sup>2</sup></b>	<b>Analytical Method/SOP<sup>3,4</sup></b>	<b>Data Quality Indicators (DQIs)</b>	<b>Measurement Performance Criteria</b>	<b>QC Sample and/or Activity Used to Assess Measurement Performance</b>	<b>QC Sample Assesses Error for Sampling (S), Analytical (A) or both (S&amp;A)</b>
	Liquid scintillation	Precision–Lab	RPD–≤ 50%	Laboratory Duplicates	A
		Precision	RPD–≤ 50%	Field Duplicates	S
		Accuracy/Bias	% recovery <sup>6</sup>	Laboratory Sample Spikes	A
		Accuracy/Bias-Contamination	No target compounds > MDA	Method Blanks/Instrument Blanks	A
		Accuracy/Bias Contamination	No target compounds > MDA	Field Blanks	S
		Accuracy/Bias Contamination	No target compounds > MDA	Equipment Rinseates	S
		Completeness <sup>5</sup>	90%	Data completeness check	S&A

MDA = minimum detectable activity; RPD = Relative Percent Difference;

<sup>1</sup> If information varies within an analytical group, separate by individual analyte.

<sup>2</sup> Reference number from QAPP Worksheet #21.

<sup>3</sup> Reference number from QAPP Worksheet #23.

<sup>4</sup> The most current version of the method will be used.

<sup>5</sup> Completeness is calculated as the number of samples planned to be collected divided by the number of sample results that were rejected.

<sup>6</sup> Percent recovery is laboratory-specific, calculated from studies performed every six months. Percent recovery ranges will be provided in the laboratory data packages based on the most current study.

**QAPP Worksheet #12-I**  
**Measurement Performance Criteria Table**

<b>Matrix</b>	Soil/Sediment				
<b>Analytical Group<sup>1</sup></b>	Semivolatile Organic Compounds				
<b>Concentration Level</b>	Low				
<b>Sampling Procedure<sup>2</sup></b>	<b>Analytical Method/SOP<sup>3,4</sup></b>	<b>Data Quality Indicators (DQIs)</b>	<b>Measurement Performance Criteria</b>	<b>QC Sample and/or Activity Used to Assess Measurement Performance</b>	<b>QC Sample Assesses Error for Sampling (S), Analytical (A) or both (S&amp;A)</b>
	SW846-8270	Precision–Lab	RPD < 30%	Laboratory Duplicates	A
		Precision	RPD < 30%	Field Duplicates	S
		Accuracy/Bias	% recovery <sup>6</sup>	Laboratory Sample Spikes	A
		Accuracy/Bias-Contamination	No target compounds > PQL	Method Blanks/Instrument Blanks	A
		Accuracy/Bias Contamination	No target compounds > PQL	Field Blanks	S
		Accuracy/Bias Contamination	No target compounds > PQL	Trip Blanks	S
		Accuracy/Bias Contamination	No target compounds > PQL	Equipment Rinseates	S
		Completeness <sup>5</sup>	90%	Data completeness check	S&A

PQL = practical quantitation limit; RPD = Relative Percent Difference;

<sup>1</sup> If information varies within an analytical group, separate by individual analyte.

<sup>2</sup> Reference number from QAPP Worksheet #21.

<sup>3</sup> Reference number from QAPP Worksheet #23.

<sup>4</sup> The most current version of the method will be used.

<sup>5</sup> Completeness is calculated as the number of samples planned to be collected divided by the number of sample results that were rejected.

<sup>6</sup> Percent recovery is laboratory-specific, calculated from studies performed every six months. Percent recovery ranges will be provided in the laboratory data packages based on the most current study.

**QAPP Worksheet #12-J**  
**Measurement Performance Criteria Table**

<b>Matrix</b>	Water				
<b>Analytical Group<sup>1</sup></b>	Semivolatile Organic Compounds				
<b>Concentration Level</b>	Low				
<b>Sampling Procedure<sup>2</sup></b>	<b>Analytical Method/SOP<sup>3,4</sup></b>	<b>Data Quality Indicators (DQIs)</b>	<b>Measurement Performance Criteria</b>	<b>QC Sample and/or Activity Used to Assess Measurement Performance</b>	<b>QC Sample Assesses Error for Sampling (S), Analytical (A) or both (S&amp;A)</b>
	SW846-8270	Precision–Lab	RPD—< 25%	Laboratory Duplicates	A
		Precision	RPD—< 25%	Field Duplicates	S
		Accuracy/Bias	% recovery <sup>6</sup>	Laboratory Sample Spikes	A
		Accuracy/Bias-Contamination	No target compounds > PQL	Method Blanks/Instrument Blanks	A
		Accuracy/Bias Contamination	No target compounds > PQL	Field Blanks	S
		Accuracy/Bias Contamination	No target compounds > PQL	Trip Blanks	S
		Accuracy/Bias Contamination	No target compounds > PQL	Equipment Rinseates	S
		Completeness <sup>5</sup>	90%	Data completeness check	S&A

PQL = practical quantitation limit; RPD = Relative Percent Difference;

<sup>1</sup> If information varies within an analytical group, separate by individual analyte.

<sup>2</sup> Reference number from QAPP Worksheet #21.

<sup>3</sup> Reference number from QAPP Worksheet #23.

<sup>4</sup> The most current version of the method will be used.

<sup>5</sup> Completeness is calculated as the number of samples planned to be collected divided by the number of sample results that were rejected.

<sup>6</sup> Percent recovery is laboratory-specific, calculated from studies performed every six months. Percent recovery ranges will be provided in the laboratory data packages based on the most current study.

**QAPP Worksheet #12-K**  
**Measurement Performance Criteria Table**

<b>Matrix</b>	Water/Groundwater				
<b>Analytical Group<sup>1</sup></b>	Volatile Organic Compounds				
<b>Concentration Level</b>	Low				
<b>Sampling Procedure<sup>2</sup></b>	<b>Analytical Method/SOP<sup>3,4</sup></b>	<b>Data Quality Indicators (DQIs)</b>	<b>Measurement Performance Criteria</b>	<b>QC Sample and/or Activity Used to Assess Measurement Performance</b>	<b>QC Sample Assesses Error for Sampling (S), Analytical (A) or both (S&amp;A)</b>
	SW846-8260	Precision–Lab	RPD ≤ 25%	Laboratory Duplicates	A
		Precision	RPD ≤ 25%	Field Duplicates	S
		Accuracy/Bias	% recovery <sup>6</sup>	Laboratory Sample Spikes	A
		Accuracy/Bias-Contamination	No target compounds > PQL	Method Blanks/Instrument Blanks	A
		Accuracy/Bias Contamination	No target compounds > PQL	Field Blanks	S
		Accuracy/Bias Contamination	No target compounds > PQL	Trip Blanks	S
		Accuracy/Bias Contamination	No target compounds > PQL	Equipment Rinseates	S
		Completeness <sup>5</sup>	90%	Data completeness check	S&A

PQL = practical quantitation limit; RPD = Relative Percent Difference;

<sup>1</sup> If information varies within an analytical group, separate by individual analyte.

<sup>2</sup> Reference number from QAPP Worksheet #21.

<sup>3</sup> Reference number from QAPP Worksheet #23.

<sup>4</sup> The most current version of the method will be used.

<sup>5</sup> Completeness is calculated as the number of samples planned to be collected divided by the number of sample results that were rejected.

<sup>6</sup> Percent recovery is laboratory-specific, calculated from studies performed every six months. Percent recovery ranges will be provided in the laboratory data packages based on the most current study.

**QAPP Worksheet #12-L**  
**Measurement Performance Criteria Table**

<b>Matrix</b>	Water/Groundwater				
<b>Analytical Group<sup>1</sup></b>	Metals (aluminum, antimony, arsenic, barium, beryllium, boron, cadmium, chromium, cobalt, copper, iron, lead, manganese, molybdenum, nickel, selenium, silver, thallium, uranium, vanadium, and zinc)				
<b>Concentration Level</b>	Low				
<b>Sampling Procedure<sup>2</sup></b>	<b>Analytical Method/SOP<sup>3,4</sup></b>	<b>Data Quality Indicators (DQIs)</b>	<b>Measurement Performance Criteria</b>	<b>QC Sample and/or Activity Used to Assess Measurement Performance</b>	<b>QC Sample Assesses Error for Sampling (S), Analytical (A) or both (S&amp;A)</b>
	200.8/ SW846-6010/6020	Precision–Lab	RPD–≤ 25%	Laboratory Duplicates	A
		Precision	RPD–≤ 25%	Field Duplicates	S
		Accuracy/Bias	% recovery <sup>6</sup>	Laboratory Sample Spikes	A
		Accuracy/Bias-Contamination	No target compounds > PQL	Method Blanks/Instrument Blanks	A
		Accuracy/Bias-Contamination	No target compounds > PQL	Field Blanks	S
		Accuracy/Bias-Contamination	No target compounds > PQL	Equipment Rinseates	S
		Completeness <sup>5</sup>	90%	Data completeness check	S&A

PQL = practical quantitation limit; RPD = Relative Percent Difference;

<sup>1</sup> If information varies within an analytical group, separate by individual analyte.

<sup>2</sup> Reference number from QAPP Worksheet #21.

<sup>3</sup> Reference number from QAPP Worksheet #23.

<sup>4</sup> The most current version of the method will be used.

<sup>5</sup> Completeness is calculated as the number of samples planned to be collected divided by the number of sample results that were rejected.

<sup>6</sup> Percent recovery is laboratory-specific, calculated from studies performed every six months. Percent recovery ranges will be provided in the laboratory data packages based on the most current study.

**QAPP Worksheet #12-M**  
**Measurement Performance Criteria Table**

<b>Matrix</b>	Water/groundwater				
<b>Analytical Group<sup>1</sup></b>	Metals (Mercury)				
<b>Concentration Level</b>	Low				
<b>Sampling Procedure<sup>2</sup></b>	<b>Analytical Method/SOP<sup>3,4</sup></b>	<b>Data Quality Indicators (DQIs)</b>	<b>Measurement Performance Criteria</b>	<b>QC Sample and/or Activity Used to Assess Measurement Performance</b>	<b>QC Sample Assesses Error for Sampling (S), Analytical (A) or both (S&amp;A)</b>
	SW846-7470	Precision–Lab	RPD ≤ 25%	Laboratory Duplicates	A
		Precision	RPD ≤ 25%	Field Duplicates	S
		Accuracy/Bias	% recovery <sup>6</sup>	Laboratory Sample Spikes	A
		Accuracy/Bias-Contamination	No target compounds > PQL	Method Blanks/Instrument Blanks	A
		Accuracy/Bias-Contamination	No target compounds > PQL	Field Blanks	S
		Accuracy/Bias-Contamination	No target compounds > PQL	Equipment Rinseates	S
		Completeness <sup>5</sup>	90%	Data completeness check	S&A

PQL = practical quantitation limit; RPD = Relative Percent Difference;

<sup>1</sup> If information varies within an analytical group, separate by individual analyte.

<sup>2</sup> Reference number from QAPP Worksheet #21.

<sup>3</sup> Reference number from QAPP Worksheet #23.

<sup>4</sup> The most current version of the method will be used.

<sup>5</sup> Completeness is calculated as the number of samples planned to be collected divided by the number of sample results that were rejected.

<sup>6</sup> Percent recovery is laboratory-specific, calculated from studies performed every six months. Percent recovery ranges will be provided in the laboratory data packages based on the most current study.

**QAPP Worksheet #12-N**  
**Measurement Performance Criteria Table**

<b>Matrix</b>	Water/groundwater				
<b>Analytical Group<sup>1</sup></b>	PCBs				
<b>Concentration Level</b>	Low				
<b>Sampling Procedure<sup>2</sup></b>	<b>Analytical Method/SOP<sup>3,4</sup></b>	<b>Data Quality Indicators (DQIs)</b>	<b>Measurement Performance Criteria</b>	<b>QC Sample and/or Activity Used to Assess Measurement Performance</b>	<b>QC Sample Assesses Error for Sampling (S), Analytical (A) or both (S&amp;A)</b>
	SW846-8082	Precision-Lab	RPD $\leq$ 25%	Laboratory Duplicates	A
		Precision	RPD $\leq$ 25%	Field Duplicates	S
		Accuracy/Bias	% recovery <sup>6</sup>	Laboratory Sample Spikes	A
		Accuracy/Bias-Contamination	No target compounds > PQL	Method Blanks/Instrument Blanks	A
		Accuracy/Bias-Contamination	No target compounds > PQL	Field Blanks	S
		Accuracy/Bias-Contamination	No target compounds > PQL	Equipment Rinseates	S
		Completeness <sup>5</sup>	90%	Data completeness check	S&A

PQL = practical quantitation limit; RPD = Relative Percent Difference;

<sup>1</sup> If information varies within an analytical group, separate by individual analyte.

<sup>2</sup> Reference number from QAPP Worksheet #21.

<sup>3</sup> Reference number from QAPP Worksheet #23.

<sup>4</sup> The most current version of the method will be used.

<sup>5</sup> Completeness is calculated as the number of samples planned to be collected divided by the number of sample results that were rejected.

<sup>6</sup> Percent recovery is laboratory-specific, calculated from studies performed every six months. Percent recovery ranges will be provided in the laboratory data packages based on the most current study.

**QAPP Worksheet #12-O**  
**Measurement Performance Criteria Table**

<b>Matrix</b>	Water/groundwater
<b>Analytical Group<sup>1</sup></b>	Radionuclides (americium-241, neptunium-237, plutonium-238, plutonium-239/240, thorium-230, uranium-234, uranium-235, uranium-238)
<b>Concentration Level</b>	Low

<b>Sampling Procedure<sup>2</sup></b>	<b>Analytical Method/SOP<sup>3,4</sup></b>	<b>Data Quality Indicators (DQIs)</b>	<b>Measurement Performance Criteria</b>	<b>QC Sample and/or Activity Used to Assess Measurement Performance</b>	<b>QC Sample Assesses Error for Sampling (S), Analytical (A) or both (S&amp;A)</b>
	Alpha spectroscopy	Precision–Lab	RPD–≤ 25%	Laboratory Duplicates	A
		Precision	RPD–≤ 25%	Field Duplicates	S
		Accuracy/Bias	% recovery <sup>6</sup>	Laboratory Sample Spikes	A
		Accuracy/Bias-Contamination	No target compounds > MDA	Method Blanks/Instrument Blanks	A
		Accuracy/Bias Contamination	No target compounds > MDA	Field Blanks	S
		Accuracy/Bias Contamination	No target compounds > MDA	Equipment Rinseates	S
		Completeness <sup>5</sup>	90%	Data completeness check	S&A

MDA = minimum detectable activity; RPD = Relative Percent Difference;

<sup>1</sup> If information varies within an analytical group, separate by individual analyte.

<sup>2</sup> Reference number from QAPP Worksheet #21.

<sup>3</sup> Reference number from QAPP Worksheet #23.

<sup>4</sup> The most current version of the method will be used.

<sup>5</sup> Completeness is calculated as the number of samples planned to be collected divided by the number of sample results that were rejected.

<sup>6</sup> Percent recovery is laboratory-specific, calculated from studies performed every six months. Percent recovery ranges will be provided in the laboratory data packages based on the most current study.

**QAPP Worksheet #12-P**  
**Measurement Performance Criteria Table**

<b>Matrix</b>	Water/groundwater				
<b>Analytical Group<sup>1</sup></b>	Radionuclides (cesium-137, cobalt-60)				
<b>Concentration Level</b>	Low				
<b>Sampling Procedure<sup>2</sup></b>	<b>Analytical Method/SOP<sup>3,4</sup></b>	<b>Data Quality Indicators (DQIs)</b>	<b>Measurement Performance Criteria</b>	<b>QC Sample and/or Activity Used to Assess Measurement Performance</b>	<b>QC Sample Assesses Error for Sampling (S), Analytical (A) or both (S&amp;A)</b>
	Gamma spectroscopy	Precision–Lab	RPD ≤ 25%	Laboratory Duplicates	A
		Precision	RPD ≤ 25%	Field Duplicates	S
		Accuracy/Bias Contamination	No target compounds > MDA	Field Blanks	S
		Accuracy/Bias Contamination	No target compounds > MDA	Equipment Rinseates	S
		Completeness <sup>5</sup>	90%	Data completeness check	S&A

MDA = minimum detectable activity; RPD = Relative Percent Difference;

<sup>1</sup> If information varies within an analytical group, separate by individual analyte.

<sup>2</sup> Reference number from QAPP Worksheet #21.

<sup>3</sup> Reference number from QAPP Worksheet #23.

<sup>4</sup> The most current version of the method will be used.

<sup>5</sup> Completeness is calculated as the number of samples planned to be collected divided by the number of sample results that were rejected.

**QAPP Worksheet #12-Q**  
**Measurement Performance Criteria Table**

<b>Matrix</b>	Water/groundwater				
<b>Analytical Group<sup>1</sup></b>	Radionuclides (technetium-99)				
<b>Concentration Level</b>	Low				
<b>Sampling Procedure<sup>2</sup></b>	<b>Analytical Method/SOP<sup>3,4</sup></b>	<b>Data Quality Indicators (DQIs)</b>	<b>Measurement Performance Criteria</b>	<b>QC Sample and/or Activity Used to Assess Measurement Performance</b>	<b>QC Sample Assesses Error for Sampling (S), Analytical (A) or both (S&amp;A)</b>
	Liquid scintillation	Precision–Lab	RPD–≤ 25%	Laboratory Duplicates	A
		Precision	RPD–≤ 25%	Field Duplicates	S
		Accuracy/Bias	% recovery <sup>6</sup>	Laboratory Sample Spikes	A
		Accuracy/Bias-Contamination	No target compounds > MDA	Method Blanks/Instrument Blanks	A
		Accuracy/Bias Contamination	No target compounds > MDA	Field Blanks	S
		Accuracy/Bias Contamination	No target compounds > MDA	Equipment Rinseates	S
		Completeness <sup>5</sup>	90%	Data completeness check	S&A

MDA = minimum detectable activity; RPD = Relative Percent Difference;

<sup>1</sup> If information varies within an analytical group, separate by individual analyte.

<sup>2</sup> Reference number from QAPP Worksheet #21.

<sup>3</sup> Reference number from QAPP Worksheet #23.

<sup>4</sup> The most current version of the method will be used.

<sup>5</sup> Completeness is calculated as the number of samples planned to be collected divided by the number of sample results that were rejected.

<sup>6</sup> Percent recovery is laboratory-specific, calculated from studies performed every six months. Percent recovery ranges will be provided in the laboratory data packages based on the most current study.

**QAPP Worksheet #13**  
**Secondary Data Criteria and Limitations Table**

<b>Secondary Data</b>	<b>Data Source (Originating Organization, Report Title, and Date)</b>	<b>Data Generator(s) (Originating Org., Data Types, Data Generation/Collection Dates)</b>	<b>How Data Will Be Used</b>	<b>Limitations on Data Use</b>
OREIS Database	Various	Various	Data will be used to determine the nature and extent of soil, sediment, surface water, and groundwater contamination.	Data have been verified, assessed, and validated (if validation is required). Rejected data will not be used.
Historical Documentation	Various	Various	Information will be used as guidance on related project work.	Information from historical documents will be limited to the available documentation as it relates to a specific project. Use of historical data may be limited based on how long ago the data were collected and whether site conditions have changed since data collection.

**QAPP Worksheet #14**  
**Summary of Project Tasks\***

QAPP Worksheet #14 will be utilized for subsequent project-specific FSPs.

**Sampling Tasks:** Project-specific

**Analysis Tasks:** Project-specific

**Quality Control Tasks:** QC will be per QAPP worksheets as follows:

- QC samples—Worksheets #20 and #28
- Equipment calibration—Worksheets #22 and #24
- Data review/validation—Worksheets #34, #35, #36, and #37

**Secondary Data:** See Worksheet #13

**Data Management Tasks:** Data management will be per procedures PAD-ENM-5007, *Data Management Coordination*, and PAD-ENM-1003, *Developing, Implementing, and Maintaining Data Management Implementation Plans*.

**Documentation and Records:** Documentation and records will be per procedure PAD-DOC-1009, *Records Management, Administrative Records, and Document Control*.

**Assessment/Audit Tasks:** Assessments and audits will be per procedure PAD-QAP-1420, *Conduct of Assessments*.

**Data Review Tasks:** Data review tasks will be per procedure PAD-ENM-5003, *Quality Assured Data*.

\* It is understood that SOPs are contractor specific.

**QAPP Worksheet #15-A**  
**Reference Limits and Evaluation Table**

This QAPP has been developed as a generalized programmatic quality plan. QAPP Worksheet #15 will be utilized for subsequent project-specific QAPPs if and only when the limits specified by the project are different from those listed in the table below. For the analytes provided in Worksheet #12, the following are applicable reference limits and evaluation table information.

**Matrix:** Water  
**Analyte Group:** VOCs

VOCs	CAS Number	Project Action Limit/NAL <sup>d</sup> (µg/L)	Project Action Limit Reference <sup>a</sup>	Site COPC? <sup>b</sup>	Laboratory-Specific	
					PQLs (µg/L)	MDLs <sup>c</sup> (µg/L)
Acrylonitrile	107-13-1	0.045/0.0477	Tap water <sup>c</sup> /NAL	Yes	10	
Benzene	71-43-2	5/0.427	MCL/NAL	Yes	5	
Carbon tetrachloride	56-23-5	5/0.419	MCL/NAL	Yes	5	
Chloroform	67-66-3	80/0.227	MCL/NAL	Yes	5	
1,1-Dichloroethene	75-35-4	7/0.0511	MCL/NAL	Yes	5	
1,2-Dichloroethene	540-59-0	2.24	NAL	Yes	5	
<i>cis</i> -1,2-Dichloroethene	156-59-2	70/1.25	MCL/NAL	Yes	1	
Ethylbenzene	100-41-4	700/1.51	MCL/NAL	Yes	5	
Tetrachloroethene	127-18-4	5/0.0781	MCL/NAL	Yes	5	
Trichloroethene	79-01-6	5/0.0465	MCL/NAL	Yes	1	
Vinyl Chloride	75-01-4	2/0.0725	MCL/NAL	Yes	2	

**QAPP Worksheet #15-A (Continued)**  
**Reference Limits and Evaluation Table**

VOCs	CAS Number	Project Action Limit/NAL (µg/L)	Project Action Limit Reference <sup>a</sup>	Site COPC? <sup>b</sup>	Laboratory-Specific	
					PQLs (µg/L)	MDLs <sup>c</sup> (µg/L)
Total Xylenes	1330-20-7	9.01	NAL	Yes	15	
o-Xylene	95-47-6	48.5	NAL	Yes	15	
m-Xylene	108-38-3	48.3	NAL	Yes	15	
p-Xylene	106-42-3	48.4	NAL	Yes	15	

NOTE: For consistency at a programmatic level, these worksheets will be reviewed and updated for project-specific QAPPs. Worksheet #15 of each project-specific QAPP will have a Project QL column that will be related to action levels deemed appropriate for the specific analytes as a result of three-party project scoping.

CAS = Chemical Abstracts Service  
 COPC = chemical of potential concern  
 MCL = maximum contaminant limit  
 MDL = method detection limit  
 NAL = no action level for child resident scenario from the Risk Methods Document (DOE 2011)  
 PQL = practical quantitation limit  
 VOC = volatile organic compound

<sup>a</sup> This programmatic QAPP references the MCLs (or EPA screening level for tap water if no MCL) to support project planning and identify whether lower reporting limits may be needed for some constituents. The worksheet also lists the NALs established by the Risk Methods Document for the child resident scenario. In some cases, the laboratories may not be able to reach detection limits below the NAL. In these cases, the project team will address this issue in the decision process within the project-specific QAPP.

<sup>b</sup> Analytes marked with COPC are from Table 2.1 of the Risk Methods Document (DOE 2011) and represent the list of chemicals, compounds, and radionuclides compiled from chemicals of potential concern retained as contaminants of concern in risk assessments performed at PGDP between 1990 and 2008.

<sup>c</sup> Tap water—Source: EPA regional screening levels, June 2011.

<sup>d</sup> The analytical laboratory may not be able to meet the child resident scenario no action levels (NALs) established by Methods for Conducting Risk Assessments and Risk Evaluations at PGDP (Risk Methods Document, DOE 2011). For cases where the PQL is above the Project Action Limit/NAL, LATA Kentucky will have the laboratory report to the method detection limit, qualifying the result as estimated. Standard practices for qualifying data will apply for any result reported below the laboratory practical quantitation limit.

<sup>e</sup> MDLs will be provided in project-specific QAPPs once the laboratory has been contracted.

**QAPP Worksheet #15-B**  
**Reference Limits and Evaluation Table**

**Matrix: Water**  
**Analytical Group: Metals**

Metals	CAS Number	Project Action Limit/NAL (mg/L)	Project Action Limit Reference <sup>a</sup>	Site COPC? <sup>b</sup>	Laboratory-Specific	
					PQLs (mg/L)	MDLs <sup>c</sup> (mg/L)
Aluminum	7429-90-5	37/1.04	Tap Water <sup>c</sup> /NAL	Yes	0.200	
Antimony	7440-36-0	0.006/0.000415	MCL/NAL	Yes	0.005	
Arsenic	7440-38-2	0.010/0.0000380	MCL/NAL	Yes	0.001	
Barium	7440-39-3	2/0.206	MCL/NAL	Yes	0.005	
Beryllium	7440-41-7	0.004/0.0000112	MCL/NAL	Yes	0.001	
Boron	7440-42-8	7.3/0.208	Tap Water <sup>c</sup> /NAL	Yes	0.200	
Cadmium	7440-43-9	0.005/0.000146	MCL/NAL	Yes	0.001	
Chromium (total)	7440-47-3	0.1/1.47	MCL/NAL	Yes	0.010	
Chromium VI	18540-29-9	0.000103	NAL	Yes	0.010	
Cobalt	7440-48-4	0.011/0.000313	Tap Water <sup>c</sup> /NAL	Yes	0.001	
Copper	7440-50-8	1.3/0.0417	MCL/NAL	Yes	0.020	
Iron	7439-89-6	26/0.729	Tap Water <sup>c</sup> /NAL	Yes	0.100	
Lead	7439-92-1	0.015/0.0150	MCL <sup>c</sup> /NAL	Yes	0.0013	
Manganese	7439-96-5	0.88/0.0245	Tap Water <sup>c</sup> /NAL	Yes	0.005	

**QAPP Worksheet #15-B (Continued)**  
**Reference Limits and Evaluation Table**

**Matrix: Water**  
**Analytical Group: Metals**

Metals	CAS Number	Project Action Limit/ NAL (mg/L)	Project Action Limit Reference <sup>a</sup>	Site COPC? <sup>b</sup>	Laboratory-Specific	
					PQLs (mg/L)	MDLs <sup>c</sup> (mg/L)
Mercury	7439-97-6	0.002/0.000309	MCL/NAL	Yes	0.0002	
Molybdenum	7439-98-7	0.18/0.00521	Tap Water <sup>c</sup> /NAL	Yes	0.001	
Nickel	7440-02-0	0.73/0.0208	Tap Water <sup>c</sup> /NAL	Yes	0.005	
Selenium	7782-49-2	0.05/0.00521	MCL/NAL	Yes	0.005	
Silver	7440-22-4	0.00515	NAL	Yes	0.001	
Thallium	7440-28-0	0.002/0.0000834	MCL/NAL	Yes	0.002	
Uranium	7440-61-1	0.03/0.00313	MCL/NAL	Yes	0.001	
Vanadium	7440-62-2	0.0000706	NAL	Yes	0.020	
Zinc	7440-66-6	11/0.313	Tap Water <sup>c</sup> /NAL	Yes	0.020	

NOTE: For consistency at a programmatic level, these worksheets will be reviewed and updated for project-specific QAPPs. Worksheet #15 of each project-specific QAPP will have a Project QL column that will be related to action levels deemed appropriate for the specific analytes as a result of three-party project scoping.

CAS = Chemical Abstracts Service  
 COPC = chemical of potential concern  
 MCL = maximum contaminant limit  
 MDL = method detection limit  
 NAL = no action level for child resident scenario from the Risk Methods Document (DOE 2011)  
 PQL = practical quantitation limit

<sup>a</sup> This programmatic QAPP references the MCLs (or EPA screening level for tap water if no MCL) to support project planning and identify whether lower reporting limits may be needed for some constituents. The worksheet also lists the NALs established by the Risk Methods Document for the child resident scenario. In some cases, the laboratories may not be able to reach detection limits below the NAL. In these cases, the project team will address this issue in the decision process within the project-specific QAPP.

<sup>b</sup> Analytes marked with COPC are from Table 2.1 of the Risk Methods Document (DOE 2011) and represent the list of chemicals, compounds, and radionuclides compiled from chemicals of potential concern retained as contaminants of concern in risk assessments performed at PGDP between 1990 and 2008.

<sup>c</sup> Tap water—Source: EPA regional screening levels, June 2011.

<sup>d</sup> The analytical laboratory may not be able to meet the child resident scenario no action levels (NALs) established by Methods for Conducting Risk Assessments and Risk Evaluations at PGDP (Risk Methods Document, DOE 2011). For cases where the PQL is above the Project Action Limit/NAL, LATA Kentucky will have the laboratory report to the method detection limit, qualifying the result as estimated. Standard practices for qualifying data will apply for any result reported below the laboratory practical quantitation limit.

<sup>e</sup> MDLs will be provided in project-specific QAPPs once the laboratory has been contracted.

<sup>f</sup> The MCL established by the EPA for lead is based on a treatment technique action level of 0.015 mg/L.

**QAPP Worksheet #15-C**  
**Reference Limits and Evaluation Table**

**Matrix: Water**  
**Analytical Group: PCBs**

PCBs	CAS Number	Project Action Limit (µg/L)	Project Action Limit Reference <sup>a</sup>	Site COPC? <sup>b</sup>	Laboratory-Specific	
					PQLs (µg/L)	MDLs <sup>c</sup> (µg/L)
Aroclor-1016	12674-11-2	0.0199	NAL	Yes	0.17	
Aroclor-1221	11104-28-2	0.0673	NAL	Yes	0.18	
Aroclor-1232	11141-16-5	0.0673	NAL	Yes	0.14	
Aroclor-1242	53469-21-9	0.0159	NAL	Yes	0.1	
Aroclor-1248	12672-29-6	0.0149	NAL	Yes	0.12	
Aroclor-1254	11097-69-1	0.00187	NAL	Yes	0.07	
Aroclor-1260	11096-82-5	0.00172	NAL	Yes	0.05	
Aroclor-1268	11100-14-4	0.5	MCL	Unknown	0.09	

NOTE: For consistency at a programmatic level, these worksheets will reviewed and updated for project-specific QAPPs. Worksheet #15 of each project-specific QAPP will have a Project QL column that will be related to action levels deemed appropriate for the specific analytes as a result of three-party project scoping.

- CAS = Chemical Abstracts Service
- COPC = chemical of potential concern
- MCL = maximum contaminant limit
- MDL = method detection limit
- NAL = no action level for child resident scenario from the Risk Methods Document (DOE 2011)
- PCB = polychlorinated biphenyl
- PQL = practical quantitation limit

<sup>a</sup> This programmatic QAPP references the MCLs (or EPA screening level for tap water if no MCL) to support project planning and identify whether lower reporting limits may be needed for some constituents. The worksheet also lists the NALs established by the Risk Methods Document for the child resident scenario. In some cases, the laboratories may not be able to reach detection limits below the NAL. In these cases, the project team will address this issue in the decision process within the project-specific QAPP.

<sup>b</sup> Analytes marked with COPC are from Table 2.1 of the Risk Methods Document (DOE 2011) and represent the list of chemicals, compounds, and radionuclides compiled from chemicals of potential concern retained as contaminants of concern in risk assessments performed at PGDP between 1990 and 2008.

<sup>c</sup> Tap water—Source: EPA regional screening levels, June 2011.

<sup>d</sup> The analytical laboratory may not be able to meet the child resident scenario no action levels (NALs) established by Methods for Conducting Risk Assessments and Risk Evaluations at PGDP (Risk Methods Document, DOE 2011). For cases where the PQL is above the Project Action Limit/NAL, LATA Kentucky will have the laboratory report to the method detection limit, qualifying the result as estimated. Standard practices for qualifying data will apply for any result reported below the laboratory practical quantitation limit.

<sup>e</sup> MDLs will be provided in project-specific QAPPs once the laboratory has been contracted.

**QAPP Worksheet #15-D**  
**Reference Limits and Evaluation Table**

**Matrix:** Water  
**Analytical Group:** Radionuclides

Radionuclides	CAS Number	Project Action Limit (pCi/L)	Project Action Limit Reference <sup>a</sup>	Site COPC? <sup>b</sup>	Laboratory-Specific
					MDAs (pCi/L)
Americium-241	14596-10-2	0.906	NAL	Yes	3
Cesium-137	10045-97-3	3.10	NAL	Yes	60
Cobalt-60	10198-40-0	6.00	NAL	Yes	50
Neptunium-237	13994-20-2	1.40	NAL	Yes	3
Plutonium-238	13981-16-3	0.719	NAL	Yes	4
Plutonium-239/240	15117-48-3/14119-33-6	0.698	NAL	Yes	3
Technetium-99	14133-76-7	4 mRem/year-dose (34.3 pCi/L)	MCL (NAL)	Yes	25
Thorium-230	14269-63-7	1.04	NAL	Yes	50
Uranium-234	13966-29-5	1.33	NAL	Yes	30
Uranium-235	15117-96-1	1.31	NAL	Yes	30
Uranium-238	24678-82-8	1.08	NAL	Yes	30

NOTE: For consistency at a programmatic level, these worksheets will be reviewed and updated for project-specific QAPPs. Worksheet #15 of each project-specific QAPP will have a Project QL column that will be related to action levels deemed appropriate for the specific analytes as a result of three-party project scoping.

CAS = Chemical Abstract Service                      COPC = chemical of potential concern  
NA = not applicable; analyte not identified as a site COPC      MDA = minimum detectable activity  
NAL = no action level for child resident scenario from the Risk Methods Document (DOE 2011)

<sup>a</sup> This programmatic QAPP references the MCLs (or EPA screening level for tap water if no MCL) to support project planning and identify whether lower reporting limits may be needed for some constituents. The worksheet also lists the NALs established by the Risk Methods Document for the child resident scenario. In some cases, the laboratories may not be able to reach detection limits below the NAL. In these cases, the project team will address this issue in the decision process within the project-specific QAPP.

<sup>b</sup> Analytes marked with COPC are from Table 2.1 of the Risk Methods Document (DOE 2011) and represent the list of chemicals, compounds, and radionuclides compiled from chemicals of potential concern retained as contaminants of concern in risk assessments performed at PGDP between 1990 and 2008.

<sup>c</sup> Tap water—Source: EPA regional screening levels, June 2011.

<sup>d</sup> The analytical laboratory may not be able to meet the child resident scenario no action levels (NALs) established by Methods for Conducting Risk Assessments and Risk Evaluations at PGDP (Risk Methods Document, DOE 2011). For cases where the PQL is above the Project Action Limit/NAL, LATA Kentucky will have the laboratory report to the method detection limit, qualifying the result as estimated. Standard practices for qualifying data will apply for any result reported below the laboratory practical quantitation limit.

**QAPP Worksheet #15-E**  
**Reference Limits and Evaluation Table**

**Matrix:** Soil/Sediment  
**Analytical Group:** Metals

Metals	CAS Number	Project Action Limit (mg/kg)	Project Action Limit Reference <sup>a</sup>	Site COPC? <sup>b</sup>	Laboratory-Specific	
					PQLs (mg/kg)	MDLs <sup>c</sup> (mg/kg)
Aluminum	7429-90-5	4,410	NAL	Yes	20	
Antimony	7440-36-0	0.552	NAL	Yes	10	
Arsenic	7440-38-2	0.238	NAL	Yes	1	
Barium	7440-39-3	140	NAL	Yes	2.5	
Beryllium	7440-41-7	0.00567	NAL	Yes	0.5	
Boron	7440-42-8	918	NAL	Yes	100	
Cadmium	7440-43-9	0.811	NAL	Yes	0.5	
Chromium (total)	7440-47-3	15.6	NAL	Yes	2.5	
Chromium VI	18540-29-9	0.0486	NAL	Yes	2.5	
Cobalt	7440-48-4	1.37	NAL	Yes	1	
Copper	7440-50-8	184	NAL	Yes	2.5	
Iron	7439-89-6	3,220	NAL	Yes	20	
Lead	7439-92-1	400	NAL	Yes	1	

**QAPP Worksheet #15-E (Continued)**  
**Reference Limits and Evaluation Table**

**Matrix: Soil/Sediment**  
**Analytical Group: Metals**

Metals	CAS Number	Project Action Limit (mg/kg)	Project Action Limit Reference <sup>a</sup>	Site COPC? <sup>b</sup>	Laboratory-Specific	
					PQLs (mg/kg)	MDLs <sup>c</sup> (mg/kg)
Manganese	7439-96-5	419	NAL	Yes	2.5	
Mercury	7439-97-6	0.213	NAL	Yes	0.02	
Molybdenum	7439-98-7	23.0	NAL	Yes	5	
Nickel	7440-02-0	10.4	NAL	Yes	5	
Selenium	7782-49-2	23.0	NAL	Yes	1	
Silver	7440-22-4	2.61	NAL	Yes	2.5	
Thallium	7440-28-0	0.368	NAL	Yes	2	
Uranium	7440-61-1	13.8	NAL	Yes	1	
Vanadium	7440-62-2	0.0365	NAL	Yes	2.5	
Zinc	7440-66-6	1,380	NAL	Yes	20	

NOTE: For consistency at a programmatic level, these worksheets will be reviewed and updated for project-specific QAPPs. Worksheet #15 of each project-specific QAPP will have a Project QL column that will be related to action levels deemed appropriate for the specific analytes as a result of three-party project scoping.

CAS = Chemical Abstracts Service

COPC = chemical of potential concern

MDL = method detection limit

NAL = no action level for child resident scenario from the Risk Methods Document (DOE 2011)

PCB = polychlorinated biphenyl

PQL = practical quantitation limit

TBD = to be determined

<sup>a</sup> This programmatic QAPP references the MCLs (or EPA screening level for tap water if no MCL) to support project planning and identify whether lower reporting limits may be needed for some constituents. The worksheet also lists the NALs established by the Risk Methods Document for the child resident scenario. In some cases, the laboratories may not be able to reach detection limits below the NAL. In these cases, the project team will address this issue in the decision process within the project-specific QAPP.

<sup>b</sup> Analytes marked with COPC are from Table 2.1 of the Risk Methods Document (DOE 2011) and represent the list of chemicals, compounds, and radionuclides compiled from chemicals of potential concern retained as contaminants of concern in risk assessments performed at PGDP between 1990 and 2008.

<sup>c</sup> Tap water—Source: EPA regional screening levels, June 2011.

<sup>d</sup> The analytical laboratory may not be able to meet the child resident scenario no action levels (NALs) established by Methods for Conducting Risk Assessments and Risk Evaluations at PGDP (Risk Methods Document, DOE 2011). For cases where the PQL is above the Project Action Limit/NAL, LATA Kentucky will have the laboratory report to the method detection limit, qualifying the result as estimated. Standard practices for qualifying data will apply for any result reported below the laboratory practical quantitation limit.

<sup>e</sup> MDLs will be provided in project-specific QAPPs once the laboratory has been contracted.

**QAPP Worksheet #15-F**  
**Reference Limits and Evaluation Table**

**Matrix: Soil/Sediment**  
**Analytical Group: PCBs**

PCBs	CAS Number	Project Action Limit (mg/kg)	Project Action Limit Reference <sup>a</sup>	Site COPC? <sup>b</sup>	Laboratory-Specific	
					PQLs (mg/kg)	MDLs <sup>c</sup> (mg/kg)
Aroclor-1016	12674-11-2	0.0633	NAL	Yes	0.13	
Aroclor-1221	11104-28-2	0.0437	NAL	Yes	0.13	
Aroclor-1232	11141-16-5	0.0437	NAL	Yes	0.13	
Aroclor-1242	53469-21-9	0.0644	NAL	Yes	0.13	
Aroclor-1248	12672-29-6	0.0682	NAL	Yes	0.13	
Aroclor-1254	11097-69-1	0.0501	NAL	Yes	0.13	
Aroclor-1260	11096-82-5	0.0662	NAL	Yes	0.13	
Aroclor-1268	11100-14-4	Not calculated	none	Unknown	0.13	

NOTE: For consistency at a programmatic level, these worksheets will be reviewed and updated for project-specific QAPPs. Worksheet #15 of each project-specific QAPP will have a Project QL column that will be related to action levels deemed appropriate for the specific analytes as a result of three-party project scoping.

CAS = Chemical Abstracts Service  
COPC = chemical of potential concern  
MDL = method detection limit  
NAL = no action level for child resident scenario from the Risk Methods Document (DOE 2011)  
PCB = polychlorinated biphenyl  
PQL = practical quantitation limit

<sup>a</sup> This programmatic QAPP references the MCLs (or EPA screening level for tap water if no MCL) to support project planning and identify whether lower reporting limits may be needed for some constituents. The worksheet also lists the NALs established by the Risk Methods Document for the child resident scenario. In some cases, the laboratories may not be able to reach detection limits below the NAL. In these cases, the project team will address this issue in the decision process within the project-specific QAPP.

<sup>b</sup> Analytes marked with COPC are from Table 2.1 of the Risk Methods Document (DOE 2011) and represent the list of chemicals, compounds, and radionuclides compiled from chemicals of potential concern retained as contaminants of concern in risk assessments performed at PGDP between 1990 and 2008.

<sup>c</sup> Tap water—Source: EPA regional screening levels, June 2011.

<sup>d</sup> The analytical laboratory may not be able to meet the child resident scenario no action levels (NALs) established by Methods for Conducting Risk Assessments and Risk Evaluations at PGDP (Risk Methods Document, DOE 2011). For cases where the PQL is above the Project Action Limit/NAL, LATA Kentucky will have the laboratory report to the method detection limit, qualifying the result as estimated. Standard practices for qualifying data will apply for any result reported below the laboratory practical quantitation limit.

<sup>e</sup> MDLs will be provided in project-specific QAPPs once the laboratory has been contracted.

**QAPP Worksheet #15-G**  
**Reference Limits and Evaluation Table**

**Matrix:** Soil/Sediment  
**Analytical Group:** Radionuclides

Radionuclides	CAS Number	Project Action Limit (pCi/g)	Project Action Limit Reference <sup>a</sup>	Site COPC? <sup>b</sup>	Laboratory-Specific
					MDAs (pCi/g)
Americium-241	14596-10-2	1.50	NAL	Yes	0.05
Cesium-137	10045-97-3	0.0267	NAL	Yes	0.1
Cobalt-60	10198-40-0	0.00547	NAL	Yes	0.05
Neptunium-237	13994-20-2	0.0839	NAL	Yes	0.05
Plutonium-238	13981-16-3	3.21	NAL	Yes	0.05
Plutonium-239/240	15117-48-3/ 14119-33-6	3.15/ 3.16	NAL	Yes	0.05
Technetium-99	14133-76-7	101	NAL	Yes	1.0
Thorium-230	14269-63-7	4.10	NAL	Yes	0.05
Uranium-234	13966-29-5	5.47	NAL	Yes	0.15
Uranium-235	15117-96-1	0.122	NAL	Yes	0.05
Uranium-238	24678-82-8	0.517	NAL	Yes	0.15

NOTE: For consistency at a programmatic level, these worksheets will be reviewed and updated for project-specific QAPPs. Worksheet #15 of each project-specific QAPP will have a Project QL column that will be related to action levels deemed appropriate for the specific analytes as a result of three-party project scoping.

CAS = Chemical Abstracts Service

COPC = chemical of potential concern

NAL = no action level for child resident scenario from the Risk Methods Document (DOE 2011)

MDA = minimum detectable activity

<sup>a</sup> This programmatic QAPP references the MCLs (or EPA screening level for tap water if no MCL) to support project planning and identify whether lower reporting limits may be needed for some constituents. The worksheet also lists the NALs established by the Risk Methods Document for the child resident scenario. In some cases, the laboratories may not be able to reach detection limits below the NAL. In these cases, the project team will address this issue in the decision process within the project-specific QAPP.

<sup>b</sup> Analytes marked with COPC are from Table 2.1 of the Risk Methods Document (DOE 2011) and represent the list of chemicals, compounds, and radionuclides compiled from chemicals of potential concern retained as contaminants of concern in risk assessments performed at PGDP between 1990 and 2008.

<sup>c</sup> Tap water—Source: EPA regional screening levels, June 2011.

<sup>d</sup> The analytical laboratory may not be able to meet the child resident scenario no action levels (NALs) established by Methods for Conducting Risk Assessments and Risk Evaluations at PGDP (Risk Methods Document, DOE 2011). For cases where the PQL is above the Project Action Limit/NAL, LATA Kentucky will have the laboratory report to the method detection limit, qualifying the result as estimated. Standard practices for qualifying data will apply for any result reported below the laboratory practical quantitation limit.

**QAPP Worksheet #15-H**  
**Reference Limits and Evaluation Table**

**Matrix:** Soil/Sediment  
**Analytical Group:** VOCs

VOCs	CAS Number	Project Action Limit (µg/kg)	Project Action Limit Reference <sup>a</sup>	Site COPC? <sup>b</sup>	Laboratory-Specific	
					PQLs (µg/kg)	MDLs <sup>c</sup> (µg/kg)
1,1-Dichloroethene	75-35-4	23.7	NAL	Yes	10	
1,2-Dichloroethene	540-59-0	1240	NAL	Yes	10	
<i>cis</i> -1,2-Dichloroethene	156-59-2	1050	NAL	Yes	10	
Acrylonitrile	107-13-1	74.3	NAL	Yes	10	
Benzene	71-43-2	333	NAL	Yes	10	
Carbon Tetrachloride	56-23-5	239	NAL	Yes	10	
Chloroform	67-66-3	122	NAL	Yes	10	
Ethylbenzene	100-41-4	1580	NAL	Yes	10	
Tetrachloroethene	127-18-4	113	NAL	Yes	10	
Trichloroethene	79-01-6	23.4	NAL	Yes	10	
Vinyl chloride	75-01-4	82.4	NAL	Yes	10	
Total Xylenes	1330-20-7	7960	NAL	Yes	15	
p-xylene	106-42-3	47,500	NAL	Yes	15	
m-xylene	108-38-3	46,700	NAL	Yes	15	
o-xylene	95-47-6	53,500	NAL	Yes	15	

NOTE: For consistency at a programmatic level, these worksheets will be reviewed and updated for project-specific QAPPs. Worksheet #15 of each project-specific QAPP will have a Project QL column that will be related to action levels deemed appropriate for the specific analytes as a result of three-party project scoping.

CAS = Chemical Abstracts Service

COPC = chemical of potential concern

NAL = no action level for child resident scenario from the Risk Methods Document (DOE 2011)

MDL = method detection limit

PQL = practical quantitation limit

<sup>a</sup> This programmatic QAPP references the MCLs (or EPA screening level for tap water if no MCL) to support project planning and identify whether lower reporting limits may be needed for some constituents. The worksheet also lists the NALs established by the Risk Methods Document for the child resident scenario. In some cases, the laboratories may not be able to reach detection limits below the NAL. In these cases, the project team will address this issue in the decision process within the project-specific QAPP.

<sup>b</sup> Analytes marked with COPC are from Table 2.1 of the Risk Methods Document (DOE 2011) and represent the list of chemicals, compounds, and radionuclides compiled from chemicals of potential concern retained as contaminants of concern in risk assessments performed at PGDP between 1990 and 2008.

<sup>c</sup> Tap water—Source: EPA regional screening levels, June 2011.

**QAPP Worksheet #15-H (Continued)**  
**Reference Limits and Evaluation Table**

<sup>d</sup>The analytical laboratory may not be able to meet the child resident scenario no action levels (NALs) established by Methods for Conducting Risk Assessments and Risk Evaluations at PGDP (Risk Methods Document, DOE 2011). For cases where the PQL is above the Project Action Limit/NAL, LATA Kentucky will have the laboratory report to the method detection limit, qualifying the result as estimated. Standard practices for qualifying data will apply for any result reported below the laboratory practical quantitation limit.

<sup>e</sup>MDLs will be provided in project-specific QAPPs once the laboratory has been contracted.

**QAPP Worksheet #15-I**  
**Reference Limits and Evaluation Table**

**Matrix:** Soil/Sediment  
**Analytical Group:** SVOCs

SVOCs	CAS Number	Project Action Limit (µg/kg)	Project Action Limit Reference <sup>a</sup>	Site COPC? <sup>b</sup>	Laboratory-Specific	
					PQLs (µg/kg)	MDLs <sup>c</sup> (µg/kg)
Acenaphthene	83-32-9	117,000	NAL	Yes	660	
Acenaphthylene	208-96-8	Not calculated	NAL	Yes	660	
Anthracene	210-12-7	747,000	NAL	Yes	660	
Carbazole	86-74-8	8,720	NAL	Yes	660	
Dieldrin	60-57-1	10.6	NAL	Yes	20	
Fluoranthene	206-44-0	109,000	NAL	Yes	660	
Hexachlorobenzene	118-74-1	49.2	NAL	Yes	660	
Naphthalene	91-20-3	1,150	NAL	Yes	660	
2-nitroaniline	88-74-4	296	NAL	Yes	660	
N-nitroso-di-n-propylamine	621-64-7	18.9	NAL	Yes	660	
Phenanthrene	85-01-8	Not calculated	NAL	Yes	660	
Pyrene	129-00-0	81,200	NAL	Yes	660	
Total PAHs	50-32-8	19.7	NAL	Yes	660	

NOTE: For consistency at a programmatic level, these worksheets will be reviewed and updated for project-specific QAPPs. Worksheet #15 of each project-specific QAPP will have a Project QL column that will be related to action levels deemed appropriate for the specific analytes as a result of three-party project scoping.

CAS = Chemical Abstracts Service  
COPC = chemical of potential concern  
MDL = method detection limit  
NAL = no action level for child resident scenario for the Risk Methods Document (DOE 2011)  
PAH = polyaromatic hydrocarbon  
PQL = practical quantitation limit  
SVOC = semivolatile organic compound

**QAPP Worksheet #15-I (Continued)**  
**Reference Limits and Evaluation Table**

<sup>a</sup> This programmatic QAPP references the MCLs (or EPA screening level for tap water if no MCL) to support project planning and identify whether lower reporting limits may be needed for some constituents. The worksheet also lists the NALs established by the Risk Methods Document for the child resident scenario. In some cases, the laboratories may not be able to reach detection limits below the NAL. In these cases, the project team will address this issue in the decision process within the project-specific QAPP.

<sup>b</sup> Analytes marked with COPC are from Table 2.1 of the Risk Methods Document (DOE 2011) and represent the list of chemicals, compounds, and radionuclides compiled from chemicals of potential concern retained as contaminants of concern in risk assessments performed at PGDP between 1990 and 2008.

<sup>c</sup> Tap water—Source: EPA regional screening levels, June 2011.

<sup>d</sup> The analytical laboratory may not be able to meet the child resident scenario no action levels (NALs) established by Methods for Conducting Risk Assessments and Risk Evaluations at PGDP (Risk Methods Document, DOE 2011). For cases where the PQL is above the Project Action Limit/NAL, LATA Kentucky will have the laboratory report to the method detection limit, qualifying the result as estimated. Standard practices for qualifying data will apply for any result reported below the laboratory practical quantitation limit.

<sup>e</sup> MDLs will be provided in project-specific QAPPs once the laboratory has been contracted.

**QAPP Worksheet #15-J**  
**Reference Limits and Evaluation Table**

**Matrix: Water**  
**Analytical Group: SVOCs**

SVOCs	CAS Number	Project Action Limit (µg/L)	Project Action Limit Reference <sup>a</sup>	Site COPC? <sup>b</sup>	Laboratory-Specific	
					PQLs (µg/L)	MDLs <sup>c</sup> (µg/L)
Acenaphthene	83-32-9	13.8	NAL	Yes	5	
Acenaphthylene	208-96-8	Not calculated	NAL	Yes	5	
Anthracene	210-12-7	63.9	NAL	Yes	5	
Carbazole	86-74-8	2.05	NAL	Yes	10	
Dieldrin	60-57-1	0.00187	NAL	Yes	5	
Fluoranthene	206-44-0	14.4	NAL	Yes	5	
Hexachlorobenzene	118-74-1	0.00774	NAL	Yes	5	
Naphthalene	91-20-3	0.176	NAL	Yes	5	
2-nitroaniline	88-74-4	10.2	NAL	Yes	5	
N-nitroso-di-n-propylamine	621-64-7	0.00803	NAL	Yes	5	
Phenanthrene	85-01-8	Not calculated	NAL	Yes	5	
Pyrene	129-00-0	5.81	NAL	Yes	5	
Total PAHs	50-32-8	0.000863	NAL	Yes	5	

NOTE: For consistency at a programmatic level, these worksheets will be reviewed and updated for project-specific QAPPs. Worksheet #15 of each project-specific QAPP will have a Project QL column that will be related to action levels deemed appropriate for the specific analytes as a result of three-party project scoping.

CAS = Chemical Abstracts Service  
COPC = chemical of potential concern  
MDL = method detection limit  
NAL = no action level for child resident scenario for the Risk Methods Document (DOE 2011)  
PAH = polyaromatic hydrocarbon  
PQL = practical quantitation limit  
SVOC = semivolatile organic compound  
TBD = to be determined

**QAPP Worksheet #15-J (Continued)**  
**Reference Limits and Evaluation Table**

<sup>a</sup> This programmatic QAPP references the MCLs (or EPA screening level for tap water if no MCL) to support project planning and identify whether lower reporting limits may be needed for some constituents. The worksheet also lists the NALs established by the Risk Methods Document for the child resident scenario. In some cases, the laboratories may not be able to reach detection limits below the NAL. In these cases, the project team will address this issue in the decision process within the project-specific QAPP.

<sup>b</sup> Analytes marked with COPC are from Table 2.1 of the Risk Methods Document (DOE 2011) and represent the list of chemicals, compounds, and radionuclides compiled from chemicals of potential concern retained as contaminants of concern in risk assessments performed at PGDP between 1990 and 2008.

<sup>c</sup> Tap water—Source: EPA regional screening levels, June 2011.

<sup>d</sup> The analytical laboratory may not be able to meet the child resident scenario no action levels (NALs) established by Methods for Conducting Risk Assessments and Risk Evaluations at PGDP (Risk Methods Document, DOE 2011). For cases where the PQL is above the Project Action Limit/NAL, LATA Kentucky will have the laboratory report to the method detection limit, qualifying the result as estimated. Standard practices for qualifying data will apply for any result reported below the laboratory practical quantitation limit.

<sup>e</sup> MDLs will be provided in project-specific QAPPs once the laboratory has been contracted.

**QAPP Worksheet #16**  
**Project Schedule/Timeline Table**

The project-specific FSP and associated project-specific QAPP will include a project-specific schedule with the minimum of the information included in Worksheet #16. The table will not need to be included as a worksheet so long as a schedule is included with the site-specific FSP.

Activities	Organization	Dates (MM/DD/YY)		Deliverable	Deliverable Due Date
		Anticipated Date(s) of Initiation	Anticipated Date of Completion		

**QAPP Worksheet #17**  
**Sampling Design and Rationale**

Site-specific sampling process design and rationale will be outline in an FSP developed for projects. The FSP will provide the sampling and analysis requirements for each project, sampling locations, frequencies, rationale for selection, and analytical parameters for each location. It should be noted that the exact sample locations and the total number of samples might change from those described, depending on field conditions encountered. The purpose of the sampling process design is to describe all relevant components of the investigation design; define the key parameters to be investigated; indicate the number and type of samples to be collected; and describe where, when, and how the samples are to be collected.

QAPP Worksheet #17 will be utilized as a guide for subsequent project-specific FSPs.

**Describe and provide a rationale for choosing the sampling approach (e.g., grid system, biased statistical approach):** Describe in the project-specific FSP, or describe in this worksheet for simple projects.

**Describe the sampling design and rationale in terms of which matrices will be sampled:** A description of the analyses, methods, and the method detection limits should be provided. The choice of methods and method detection limits should be justified, especially regarding screening levels that will not be attained.

- **What analyses will be performed and at what analytical limits?**
- **Where the sampling locations (including QC, critical, and background samples)?**
- **How many samples to be taken?**
- **What is the sampling frequency (including seasonal considerations)? (May refer to map or Worksheet #18 for details.)**

This sheet is a summary of the project and will be described in the project-specific FSP sampling design and rationale information. The project manager will ensure these components are part of the FSP. Completion of a separate Worksheet #17 to identify where these components are located in the FSP is at the discretion of the project manager.

**QAPP Worksheet #18**

**Sampling Locations and Methods/Standard Operating Procedure Requirements Table for Screening Samples**

This QAPP has been developed as a generalized programmatic quality plan. QAPP Worksheet #18 will be utilized for subsequent project-specific FSPs. Below are examples of information pertaining to soils sampling that may be applicable to a project-specific FSP.

Sampling Location/ID Number	Matrix	Depth (units)	Analytical Group	Concentration Level <sup>a</sup>	Number of Samples (Identify Field Duplicates)	Sampling SOP Reference <sup>b</sup>	Rationale for Sampling Location
TBD	Soil	Surface/subsurface	Metals 6200 by XRF	Unknown	TBD (minimum of 5%)	See Worksheet #21	See Worksheet #17
TBD	Soil	Surface/subsurface	PCB by Hach Pocket Colorimeter™ II Test Kit (or equivalent)	Unknown	TBD (minimum of 5%)	See Worksheet #21	See Worksheet #17
TBD	Soil	Surface/subsurface	Gamma radiation by sodium iodide detector (or equivalent)	Unknown	N/A	N/A	See Worksheet #17
TBD	Soil	Surface/subsurface	Metals	Unknown	TBD (minimum of 5%)	See Worksheet #21	See Worksheet #17
TBD	Soil	Surface/subsurface	PCBs	Unknown	TBD (minimum of 5%)	See Worksheet #21	See Worksheet #17

<sup>a</sup> If historic data provide information on anticipated concentration, that information will be populated on this sheet.

<sup>b</sup> See Analytical SOP References Table (Worksheet #23).

N/A = not applicable  
 PCB = polychlorinated biphenyl  
 SOP = standard operating procedure  
 TBD = to be determined  
 XRF = X-ray fluorescence

**QAPP Worksheet #19**  
**Analytical SOP Requirements Table**

<b>Matrix</b>	<b>Analytical Group</b>	<b>Concentration Level</b>	<b>Analytical and Preparation Method/SOP Reference *</b>	<b>Sample Volume</b>	<b>Containers (number, size, and type)</b>	<b>Preservation Requirements (chemical, temperature, light protected)</b>	<b>Maximum Holding Time (preparation/analysis)</b>
Water	VOC	See Worksheet #18	624/8260B	120 mL	3 x 40 mL Glass VOA Vial	HCl; cool to < 4°C	14 days for preserved
Water	Metals	See Worksheet #18	6010B/6020/200.8/7470	1 liter	1 liter Plastic	HNO <sub>3</sub> pH < 2, Cool to < 4°C	6 months (28 days for Hg)
Water	PCBs	See Worksheet #18	608/8082	1 liter	1 liter Amber Glass	Cool to < 4°C	N/A <sup>b</sup>
Water	RADs	See Worksheet #18	9310/Gas Proportional Counter/Liquid Scintillation	1 liter	1 liter Plastic	HNO <sub>3</sub> pH < 2, Cool to < 4°C <sup>a</sup>	6 months
Water	RADs	See Worksheet #18	Alpha Spec/Gamma Spec	2 liters	2 x 1 liter Plastic	HNO <sub>3</sub> pH < 2, Cool to < 4°C <sup>a</sup>	6 months

**QAPP Worksheet #19 (Continued)**  
**Analytical SOP Requirements Table**

Matrix	Analytical Group	Concentration Level	Analytical and Preparation Method/SOP Reference*	Sample Volume	Containers (number, size, and type)	Preservation Requirements (chemical, temperature, light protected)	Maximum Holding Time (preparation/analysis)
Soil/sediment	Metals	See Worksheet #18	6010B/6020/7470	100 g	4 oz. Glass	Cool to < 4°C	6 months (28 days for Hg)
Soil/sediment	PCBs	See Worksheet #18	8082	250 g	9 oz. Glass	Cool to < 4°C	N/A <sup>b</sup>
Soil/sediment	RADs	See Worksheet #18	Alpha spec/Gamma spec	250 g	9 oz. Glass	Cool to < 4°C	6 months
Soil/sediment	SVOCs	See Worksheet #18	3550/8270C	8 oz	8-oz. wide-mouth glass jar	Cool to < 4°C	14 days extraction/40 days analysis
Soil/sediment	VOCs	See Worksheet #18	624/8260B	250 g	9 oz. Glass	Cool to < 4°C	14 days

NOTE: Sample volume and container requirements will be specified by the laboratory.

\* See Analytical SOP References table (Worksheet #23).

A project-specific worksheet is not required if the programmatic worksheet includes analytical methods specified in the FSP. If the FSP specifies other methods, a separate Worksheet #19 will be required.

<sup>a</sup> Check with specific laboratory conducting analyses to ensure that acidification will not interfere with laboratory procedures.

<sup>b</sup> A 45-day holding time is an expectation of the laboratory; however, since SW846 does not indicate a holding time for PCBs, any data that exceeds the 45 days will be identified, but not qualified.

HCl = hydrochloric acid

Hg = mercury

HNO<sub>3</sub> = nitric acid

PCB = polychlorinated biphenyl

RAD = radionuclide

VOC = volatile organic compound

**QAPP Worksheet #20**  
**Field Quality Control Sample Summary Table**

This QAPP has been developed as a generalized programmatic quality plan. QAPP Worksheet #20 will be used for subsequent project-specific QAPPs.

Matrix	Analytical Group	Concentration Level	Analytical and Preparation SOP Reference	No. of Sampling Locations*	No. of Field Duplicate Pairs	Inorganic	No. of Field Blanks	No. of Equip. Blanks	No. of PT Samples	Total No. of Samples to Lab*
						No. of MS				
Soil/Sediments	PCBs	Low	See Worksheet #12	See Worksheet #17	5%	5%	5%	5%	A	See Worksheet #17
Soil/Sediment	Metals	Low	See Worksheet #12	See Worksheet #17	5%	5%	5%	5%	A	See Worksheet #17
Soil/Sediment	Radionuclides	Low	See Worksheet #12	See Worksheet #17	5%	5%	5%	5%	A	See Worksheet #17
Soil/Sediment	SVOCs	Low	See Worksheet #12	See Worksheet #17	5%	5%	5%	5%	A	See Worksheet #17
Water	VOCs	Low	See Worksheet #12	See Worksheet #17	5%	5%	5%	5%	A	See Worksheet #17
Water	Metals	Low	See Worksheet #12	See Worksheet #17	5%	5%	5%	5%	A	See Worksheet #17
Water	PCBs	Low	See Worksheet #12	See Worksheet #17	5%	5%	5%	5%	A	See Worksheet #17
Water	Radionuclides	Low	See Worksheet #12	See Worksheet #17	5%	5%	5%	5%	A	See Worksheet #17

\*Work package documents will identify the sampling locations, matrices, number of samples, and sample identification numbers for samples to be submitted to DOE Consolidated Audit Program (CAP)-certified laboratory. This is not applicable for samples analyzed by field methods.

A = PT sample will only be collected when required by a specific project.

MS = matrix spike  
 PCB = polychlorinated biphenyl

PT = proficiency testing  
 VOC = volatile organic compound

**QAPP Worksheet #21**  
**Project Sampling SOP References Table**

Site-specific standard operating procedures (SOPs) have been developed for site sampling activities. This QAPP has been developed as a generalized programmatic quality plan. Below is a list of site sampling procedures that projects will select from for implementing sampling activities. For those elements not identified below, project-specific sampling SOPs will be included in a project-specific FSP.

<b>Reference Number</b>	<b>Title and Number<sup>a</sup></b>	<b>Originating Organization<sup>b</sup></b>	<b>Equipment Type</b>	<b>Modified for Project Work? (Y/N)</b>	<b>Comments</b>
1	PAD-ENM-0023, <i>Composite Sampling</i>	Contractor	Sampling	N	
2	PAD-ENM-2300, <i>Collection of Soil Samples</i>	Contractor	Sampling	N	
3	PAD-ENM-0017, <i>Paint Chip Sampling</i>	Contractor	Sampling	N	
4	PAD-ENM-0026, <i>Wet Chemistry and Miscellaneous Analyses Data Verification and Validation</i>	Contractor	N/A	N	
5	PAD-ENM-0811, <i>ROACI Pesticide and PCB Data Verification and Validation</i>	Contractor	N/A	N	
6	PAD-ENM-1001, <i>Transmitting Data to the Paducah Oak Ridge Environmental Information System (OREIS)</i>	Contractor	N/A	N	
7	PAD-ENM-2002, <i>Sampling of Structural Elements and Miscellaneous Surfaces</i>	Contractor	Sampling	N	
8	PAD-ENM-2100, <i>Groundwater Level Measurement</i>	Contractor	Sampling	N	
9	PAD-ENM-2101, <i>Groundwater Sampling</i>	Contractor	Sampling		
10	PAD-ENM-2203, <i>Surface Water Sampling</i>	Contractor	Sampling	N	
11	PAD-ENM-2300 <i>Collection of Soil Samples</i>		Sampling	N	
12	PAD-ENM-2302, <i>Collection of Sediment Samples Associated with Surface Water</i>	Contractor	Sampling	N	
13	PAD-ENM-2303, <i>Borehole Logging</i>	Contractor	Sampling	N	
14	PAD-ENM-2700, <i>Logbooks and Data Forms</i>	Contractor	N/A	N	
15	PAD-ENM-2702, <i>Decontamination of Sampling Equipment</i>	Contractor	Sampling	N	
16	PAD-ENM-2704, <i>Trip, Equipment, and Field Blank</i>	Contractor	N/A	N	
17	PAD-ENM-2708, <i>Chain-of-Custody Forms, Field Sample Logs, Sample Labels, and Custody Seals</i>	Contractor	N/A	N	

QAPP Worksheet #21

Project Sampling SOP References Table (Continued)

Reference Number	Title and Number <sup>a</sup>	Originating Organization <sup>b</sup>	Equipment Type	Modified for Project Work? (Y/N)	Comments
18	PAD-ENM-5003, <i>Quality Assured Data</i>	Contractor	N/A	N	
19	PAD-ENM-5004, <i>Sample Tracking, Lab Coordination, and Sample Handling Guidance</i>	Contractor	N/A	N	
20	PAD-ENM-5007, <i>Data Management Coordination</i>	Contractor	N/A	N	
21	PAD-ENM-5102, <i>Radiochemical Data Verification and Validation</i>	Contractor	N/A	N	
22	PAD-ENM-5103, <i>Polychlorinated Dibenzodioxins-Polychlorinated Dibenzofurans Verification and Validation</i>	Contractor	N/A	N	
23	PAD-ENM-5105, <i>ROACI Volatile and Semivolatile Data Verification and Validation</i>	Contractor	N/A	N	
24	PAD-ENM-5107, <i>Inorganic Data Validation and Verification</i>	Contractor	N/A	N	
25	PAD-ENR-0020, <i>Direct Push Technology Sampling</i>	Contractor	Sampling	N	
26	PAD-ENR-0021, <i>Tree Tissue Core Sample Collection</i>	Contractor	Sampling	N	
27	PAD-ENR-0023, <i>Downhole Video Camera Inspection</i>	Contractor	Sampling	N	
28	PAD-SO-0034, <i>PCB Spill Management</i>	Contractor	Sampling	N	
29	PAD-ENM-1003, <i>Developing, Implementing, and Maintaining Data Management Implementation Plans.</i>	Contractor	N/A	N	

<sup>a</sup> SOPs are posted to the LATA Kentucky intranet Web site. External FFA parties can access this site using remote access with privileges upon approval.

<sup>b</sup> The work will be conducted by LATA Kentucky staff or a subcontractor. In either case, SOPs listed will be followed.

N/A = not applicable

**QAPP Worksheet #22**

**Field Equipment Calibration, Maintenance, Testing, and Inspection Table**

This QAPP has been developed as a generalized programmatic quality plan listing the common field equipment used at the site. A project-specific worksheet is not required if the programmatic worksheet includes the field equipment listed below. If the FSP and project-specific QAPP specify other field testing equipment, a separate Worksheet #22 will be required.

<b>Field Equipment*</b>	<b>Calibration Activity</b>	<b>Maintenance Activity</b>	<b>Testing Activity</b>	<b>Inspection Activity</b>	<b>Frequency</b>	<b>Acceptance Criteria</b>	<b>Corrective Action</b>	<b>Responsible Person</b>	<b>SOP Reference</b>
MiniRAE Photoionization Detector (PID) Toxic Gas Monitor with 10.5 eV Lamp or Similar Meter	Calibration checked at the beginning and end of the day	As needed in the field; semi-annually by the supplier	Measure known concentration of isobutylene 100 ppm (calibration gas)	Upon receipt, successful operation	Calibrate am, check pm	± 10% of the calibrated value	Manually zero meter or service as necessary and recalibrate	Field Team Leader	Manufacturers specifications
Water Quality Meter	Calibrate at the beginning of the day	Performed monthly and as needed	Measure solutions with known values (National Institute for Standards and Technology traceable buffers and conductivity calibration solutions)	Upon receipt, successful operation	Daily before each use	pH: ± 0.1 s.u. Specific Conductivity: ± 3% ORP: ± 10 mV DO: ± 0.3 mg/L Temp.: ± 0.3°C	Recalibrate or service as necessary	Field Team Leader	Manufacturers specifications

**QAPP Worksheet #22 (Continued)**  
**Field Equipment Calibration, Maintenance, Testing, and Inspection Table**

Field Equipment	Calibration Activity	Maintenance Activity	Testing Activity	Inspection Activity	Frequency	Acceptance Criteria	Corrective Action	Responsible Person	SOP Reference*
Turbidity Meter (Nephthelometer)	Calibrate daily before each use	As needed	Measure solutions with known turbidity standards	Upon receipt, successful operation	Daily before each use	N/A (instrument zeroed)	Manually zero meter or service as necessary and recalibrate	Field Team Leader	Manufacturer's specifications
Ferrous Iron Colorimeter	Accuracy check at the beginning and end of the day	Return to instrument rental for replacement	Measure with standard solution	Upon receipt, successful operation	Check daily before each use	Pass/Fail	Return to rental company for replacement	Field Team Leader	Manufacturer's specifications
PCB Colorimeter	Accuracy check at the beginning of each day	As needed	Measure with standards	Upon receipt, successful operation	Check daily before each use	Within range of manufacturer's standard	Service by manufacturer	Field Team Leader	Manufacturer's specifications
Titration (for total residual chlorine)	Calibrate to manufacturer's solution weekly	As needed	Measure with standard solution	Upon receipt, successful operation	Daily before each use	With range of manufacturer's standard	Service by manufacturer	Field Team Leader	Manufacturer's specifications
Global flow meter	Calibrate when replace battery	Check daily as needed prior to use	Spin prop to verify instrument reading	Upon receipt, successful operation	Check daily before each use	Pass/Fail	Service by manufacturer	Field Team Leader	Manufacturer's specifications
Electron Water Level Meter	N/A	None	Check daily before each use	Upon receipt, successful operation	Check daily before each use	Pass/Fail	Return to rental company for replacement	Field Team Leader	Manufacturer's specifications
Hach flow meter	Calibrate to readings on flume	Quarterly or as needed	Measure against flume	Upon receipt, successful operation	Weekly as needed	Pass/Fail	Service by manufacturer	Field Team Leader	Manufacturer's specifications

**QAPP Worksheet #22 (Continued)**

**Field Equipment Calibration, Maintenance, Testing, and Inspection Table**

<b>Field Equipment</b>	<b>Calibration Activity</b>	<b>Maintenance Activity</b>	<b>Testing Activity</b>	<b>Inspection Activity</b>	<b>Frequency</b>	<b>Acceptance Criteria</b>	<b>Corrective Action</b>	<b>Responsible Person</b>	<b>SOP Reference*</b>
Alpha Scintillator	Annually or as specified by manufacturer	Annually or as needed	Daily prior to use	Upon receipt, successful operation	Daily prior to use	Pass/Fail	Return to rental company for replacement	RCT Supervisor	Manufacturer's specifications
Geiger Müller	Annually or as specified by manufacturer	Annually or as needed	Daily prior to use	Upon receipt, successful operation	Daily prior to use	Pass/Fail	Return to rental company for replacement	RCT Supervisor	Manufacturer's specifications
Gamma Scintillator or FIDLER	Annually or as specified by manufacturer	Annually or as needed	Daily prior to use	Upon receipt, successful operation	Daily prior to use	Pass/Fail	Service by manufacturer	RCT Supervisor	Manufacturer's specifications
Field Equipment GPS	Daily check of known point beginning and end of each field day	Per manufacturers specifications	Measure known control points and compare values	Upon receipt, successful operation	Daily prior to use	Pass/Fail	Service by manufacturer	Field Team Leader	Manufacturer's specifications
GPS Gamma Ray Survey Instrumentation	Annually or as specified by manufacturer	Annually or as needed	Daily prior to use	Upon receipt, successful operation	Daily prior to use	Pass/Fail	Return to rental company for replacement	RCT Supervisor	Manufacturer's specifications

\*Additional equipment may be needed: additional equipment will follow manufacturer's specifications for calibration, maintenance, inspection, and testing. Calibration data will be documented in logbooks consistent with PAD-ENM-2700, *Logbooks and Data Forms*.

FIDLER = field instrument for detection of low energy

GPS = Global Positioning System

NA = not applicable

PCB = polychlorinated biphenyl

RCT = radiological control technician

**QAPP Worksheet #23**  
**Analytical SOP References Table**

QAPP Worksheet #23 will be used for subsequent project-specific QAPPs.

<b>Reference Number*</b>	<b>Title, Revision Date, and/or Number</b>	<b>Definitive or Screening Data</b>	<b>Analytical Group</b>	<b>Instrument</b>	<b>Organization Performing Analysis</b>	<b>Modified for Project Work? (Y/N)</b>

\*Information will be based on laboratory used.

**QAPP Worksheet #24**

**Analytical Instrument Calibration Table**

All laboratory equipment and instruments used for quantitative measurements are calibrated in accordance with the laboratory’s formal calibration program. Whenever possible, the laboratory uses recognized procedures for calibration such as those published by EPA or American Society for Testing and Materials. If established procedures are not available, the laboratory develops a calibration procedure based on the type of equipment, stability, characteristics of the equipment, required accuracy, and the effect of operation error on the quantities measured. Whenever possible, physical reference standards associated with periodic calibrations such as weights or certified thermometers with known relationships to nationally recognized standards, are used. Where national reference standards are not available, the basis for the reference standard is documented. Equipment or instruments that fail calibration or become inoperable during use are tagged to indicate they are out of calibration. Such instruments or equipment are repaired and successfully recalibrated prior to reuse. All high resolution mass spectrometer instruments undergo extensive tuning and calibration prior to running each sample set. The calibrations and ongoing instrument performance parameters are recorded and reported as part of the analytical data package.

QAPP Worksheet #24 will be utilized for subsequent project-specific QAPPs.

70

<b>Instrument*</b>	<b>Calibration Procedure</b>	<b>Frequency of Calibration</b>	<b>Acceptance Criteria</b>	<b>Corrective Action (CA)</b>	<b>Person Responsible for CA</b>	<b>SOP Reference</b>

\* The laboratory is responsible for maintaining instrument calibration information per their QA Plan including control charts established for all instrumentation. This information is audited annually by DOECAP. Laboratory(s) contracted will be DOECAP audited. Additional certifications may be needed based on project-specific requirements (e.g., National Environmental Laboratory Accreditation Program, KDEP Drinking Water Laboratory Program). Field survey/sampling instrumentation will be calibrated according to manufacturer’s instructions.

**QAPP Worksheet #25**

**Analytical Instrument and Equipment Maintenance, Testing, and Inspection Table**

Instrument/ Equipment	Maintenance Activity	Testing Activity	Inspection Activity	Frequency	Acceptance Criteria	Corrective Action	Responsible Person	SOP Reference*
GC-MS	Replace/clean ion source; clean injector, replace injector liner, replace/clip capillary column, flush/replace tubing on purge and trap; replace trap	QC standards	Ion source, injector liner, column, column flow, purge lines, purge flow, trap	As needed	Must meet initial and/or continuing calibration criteria	Repeat maintenance activity or remove from service	Laboratory Section Manager	See Worksheet #23
GC	ECD/FID maintenance; replace/clip capillary column	QC standards	ECD, FID, injector, injector liner, column, column flow	As needed	Must meet initial and/or continuing calibration criteria	Repeat maintenance activity or remove from service	Laboratory Section Manager	See Worksheet #23
ICP-AES	Clean plasma torch; clean filters; clean spray and nebulizer chambers; replace pump tubing	Metals	Torch, filters, nebulizer chamber, pump, pump tubing	Perform as needed	Initial and/or continuing calibration criteria must be met	Repeat maintenance activity or remove from service	Laboratory Area Supervisor	See Worksheet #23
ICP-MS	Clean plasma torch; clean filters; clean spray and nebulizer chambers; replace pump tubing	Metals	Torch, filters, nebulizer chamber, pump, pump tubing	As needed	Must meet initial and/or continuing calibration criteria	Repeat maintenance activity or remove from service	Laboratory Area Supervisor	See Worksheet #23

**QAPP Worksheet #25 (Continued)**

**Analytical Instrument and Equipment Maintenance, Testing, and Inspection Table**

Instrument/ Equipment	Maintenance Activity	Testing Activity	Inspection Activity	Frequency	Acceptance Criteria	Corrective Action	Responsible Person	SOP Reference*
pH meter	Clean probe	QC standards	Probe	As needed	The value for each of the certified buffer solutions must be within $\pm 0.05$ pH units of the expected value	Repeat maintenance activity or remove from service	Laboratory Manager	See Worksheet #23
Flash Point	Lid tightness, shutter action, flame position	QC standards	Lid, shutter, flame	As needed	Flash point obtained for chlorobenzene is within the limits ( $82^{\circ} \pm 2^{\circ}\text{F}$ )	Repeat maintenance activity or remove from service	Laboratory Manager	See Worksheet #23
Spectrophotometer	Flush/replace tubing	QC standards	Tubing	As needed	Must meet initial and/or continuing calibration criteria	Repeat maintenance activity or remove from service	Laboratory Manager	See Worksheet #23
TOC Analyzer (NDIRD)	Replace sample tubing, clean sample boat, replace syringe	QC standards	Tubing, sample boat, syringe	As needed	Must meet initial and/or continuing calibration criteria	Repeat maintenance activity or remove from service	Laboratory Manager	See Worksheet #23

\* The laboratory is responsible for maintaining instrument and equipment maintenance, testing, and inspection information per their QA Plan. This information is audited annually by DOECAP. Laboratory(s) contracted will be DOECAP audited. Field survey/sampling instrumentation will be maintained, tested, and inspected according to manufacturer's instructions.

ECD = electron capture detector  
 FID = flame ionization detector  
 GC = gas chromatography  
 GC-MS = gas chromatography mass spectrometer  
 ICP-AES = inductively coupled plasma atomic emission spectroscopy  
 ICP-MS = inductively coupled plasma mass spectrometer  
 NDIRD = nondispersive infrared detector  
 QA = quality control  
 TOC = total organic carbon

**QAPP Worksheet #26**  
**Sample Handling System**

QAPP Worksheet #26 will be utilized for subsequent project-specific QAPPs.

73

<b>SAMPLE COLLECTION, PACKAGING, AND SHIPMENT</b>	
<b>Sample Collection (Personnel/Organization):</b>	Sampling Teams/DOE Prime Contractor and Subcontractors
<b>Sample Packaging (Personnel/Organization):</b>	Sampling Teams/DOE Prime Contractor and Subcontractors
<b>Coordination of Shipment (Personnel/Organization):</b>	Lab Coordinator/DOE Prime Contractor
<b>Type of Shipment/Carrier:</b>	Direct Delivery or Overnight/Federal Express
<b>SAMPLE RECEIPT AND ANALYSIS</b>	
<b>Sample Receipt (Personnel/Organization):</b>	Sample Management/Contracted Laboratory
<b>Sample Custody and Storage (Personnel/Organization):</b>	Sample Management/Contracted Laboratory
<b>Sample Preparation (Personnel/Organization):</b>	Analysts/Contracted Laboratory
<b>Sample Determinative Analysis (Personnel/Organization):</b>	Analysts/Contracted Laboratory
<b>SAMPLE ARCHIVING</b>	
<b>Field Sample Storage (No. of days from sample collection):</b>	The field laboratory is required to analyze samples within 48 hours of collection and those samples are archived until results are screened (same day as analysis). The fixed-based laboratory will archive samples for 4 months or less depending on project-specific requirements.
<b>Sample Extract/Digestate Storage (No. of days from extraction/digestion):</b>	120 Days
<b>Biological Sample Storage (No. of days from sample collection):</b>	Not applicable.
<b>SAMPLE DISPOSAL</b>	
<b>Personnel/Organization:</b>	Waste Disposition/DOE Prime Contractor and Subcontractors
<b>Number of Days from Analysis</b>	6 months

**QAPP Worksheet #27**  
**Sample Custody Requirements\***

Chain-of-custody procedures are comprised of maintaining sample custody and documentation of samples for evidence. To document chain-of-custody, an accurate record of samples must be maintained in order to trace the possession of each sample from the time of collection to its introduction to the laboratory.

**Field Sample Custody Procedures (sample collection, packaging, shipment, and delivery to laboratory):**

Field sample custody requirements will be per DOE Prime Contractor procedures, PAD-ENM-2708, *Chain-of-Custody Forms, Field Sample Logs, Sample Labels, and Custody Seals*; and PAD-ENM-5004, *Sample Tracking, Lab Coordination, and Sample Handling Guidance*.

**Laboratory Sample Custody Procedures (receipt of samples, archiving, disposal):**

Are per the DOECAP-audited laboratory's standard procedures. When the samples are delivered to the laboratory, signatures of the laboratory personnel receiving them and the courier personnel relinquishing them will be completed in the appropriate spaces on the chain-of-custody record, unless the courier is a commercial carrier. This will complete the sample transfer. It will be every laboratory's responsibility to maintain internal logbooks and records that provide custody throughout sample preparation and analysis process.

**Sample Identification Procedures:**

Sample identification requirements will be specified in work package documents.

**Chain-of-custody Procedures:**

Chain-of-custody requirements will be per DOE Prime Contractor procedures, PAD-ENM-2708, *Chain-of-Custody Forms, Field Sample Logs, Sample Labels, and Custody Seals*; and PAD-ENM-5004, *Sample Tracking, Lab Coordination, and Sample Handling Guidance*.

\* It is understood that SOPs are contractor specific.

**QAPP Worksheet #28**  
**QC Samples Table**

This QAPP has been developed as a generalized programmatic quality plan listing common QC criteria. A project-specific worksheet will be required only if the project-specific FSP specifies alternate QC criteria.

<b>Matrix: Aqueous/Soils</b>						
<b>Analytical Group/Concentration Level:</b> VOC, SVOCs, Metals, PCBs, Rads/TBD						
<b>Sampling SOP:</b> See Worksheet #21						
<b>Analytical Method/SOP Reference:</b> 624/8260, 8270, 200.8/6010B/6020/7471, 608/8082, 9310/Alpha Spec, Gamma Spec, Gas Proportional Counter/Liquid Scint.						
<b>Sampler's Name/Field Sampling Organization:</b> TBD						
<b>Analytical Organization:</b> TBD						
<b>No. of Sample Locations:</b> TBD						
<b>QC Sample</b>	<b>Frequency/Number*</b>	<b>Method/SOP QC Acceptance Limits</b>	<b>Corrective Action</b>	<b>Person(s) Responsible for Corrective Action</b>	<b>Data Quality Indicator (DQI)</b>	<b>Measurement Performance Criteria</b>
Field blank	Minimum 5%	≤ CRQL**	Verify results; reanalyze	Project manager or designee	Contamination—Accuracy/bias	See procedure PAD-ENM-5003, <i>Quality Assured Data</i>
Trip blank	1 per cooler containing VOC samples	≤ CRQL	Verify results; reanalyze		Contamination—Accuracy/bias	See procedure PAD-ENM-5003, <i>Quality Assured Data</i>
Equipment blank	Minimum 5%	≤ CRQL	Verify results; reanalyze		Contamination—Accuracy/bias	See procedure PAD-ENM-5003, <i>Quality Assured Data</i>
Internal standards, laboratory spiked blanks or spiked field samples	All samples and standards	See data validation procedures PAD-ENM-5105, 5107, 5103, 5102	Check calculations and instrument; reanalyze affected samples	Laboratory analyst	Accuracy	See procedure PAD-ENM-5003, <i>Quality Assured Data</i>

**QAPP Worksheet #28 (Continued)**  
**QC Samples Table**

<b>QC Sample</b>	<b>Frequency/Number*</b>	<b>Method/SOP QC Acceptance Limits</b>	<b>Corrective Action</b>	<b>Person(s) Responsible for Corrective</b>	<b>Data Quality Indicator (DQI)</b>	<b>Measurement Performance Criteria</b>
Field duplicate	Minimum 5%	None	Data reviewer will place qualifiers on samples affected	Project manager or designee	Homogeneity/ Precision	RPD $\leq$ 50% soils, RPD < 25% aqueous
Laboratory duplicate	Per laboratory procedure	See data validation procedures PAD-ENM-5105, 5107, 5103, 5102	Verify results re-prepare and reanalyze	Laboratory analyst	Precision	See procedure PAD-ENM-5003, <i>Quality Assured Data</i>

\* The number of QC samples is listed on Worksheet #20.  
 \*\* Unless dictated by project-specific parameters,  $\leq$  CRQL.

**QAPP Worksheet #29**  
**Project Documents and Records Table**

All project data and information must be documented in a format that is usable by project personnel. The QAPP describes how project data and information shall be documented, tracked, and managed from generation in the field to final use and storage in a manner that ensures data integrity, defensibility, and retrieval.

<b>Sample Collection Documents and Records</b>	<b>On-site Analysis Documents and Records</b>	<b>Off-site Analysis Documents and Records</b>	<b>Data Assessment Documents and Records*</b>	<b>Other</b>
Data logbooks and associated completed sampling forms; sample chains-of-custody	Laboratory data packages, OREIS database, and associated data packages	OREIS database and associated data packages	PAD-ENM-5003, Att. G, Data Assessment Review Checklist and Comment Form	Form QA-F-0004, Management/Independent Assessment Report

\* It is understood that SOPs are contractor specific.

OREIS = Oak Ridge Environmental Information System

**QAPP Worksheet #30**  
**Analytical Services Table**

This QAPP has been developed as a generalized programmatic quality plan. A project-specific worksheet will be required only if additional analytical services (not listed below) are required by a project-specific FSP.

<b>Matrix</b>	<b>Analytical Group</b>	<b>Concentration Level</b>	<b>Sample Locations/ID Numbers</b>	<b>Analytical SOP*</b>	<b>Data Package Turnaround Time</b>	<b>Laboratory/Organization (Name and Address, Contact Person and Telephone Number)</b>	<b>Backup Laboratory/Organization (Name and Address, Contact Person and Telephone Number)</b>
Soil/Sediment	PCBs	Unknown	See Worksheet #18  For ID Numbers, see Worksheet #26	See Worksheet #23	28-day	TBD	TBD
Soil/Sediment	Metals	Unknown		See Worksheet #23	28-day	TBD	TBD
Soil/Sediment	Radionuclides	Unknown		See Worksheet #23	28-day	TBD	TBD
Soil/Sediment	VOCs	Unknown		See Worksheet #23	28-day	TBD	TBD
Soil/Sediment	SVOCs	Unknown		See Worksheet #23	28-day	TBD	TBD
Water	PCBs	Unknown	See Worksheet #18  For ID Numbers, see Worksheet #26	See Worksheet #23	28-day	TBD	TBD
Water	Metals	Unknown		See Worksheet #23	28-day	TBD	TBD
Water	Radionuclides	Unknown		See Worksheet #23	28-day	TBD	TBD
Water	VOCs	Unknown		See Worksheet #23	28-day	TBD	TBD
Water	SVOCs	Unknown		See Worksheet #23	28-day	TBD	TBD

\* Analytical method SOPs for radiochemistry parameters are laboratory specific.

ID = identification  
PCB = polychlorinated biphenyl  
TBD = to be determined  
VOC = volatile organic compound  
SVOC = semivolatile organic compound

**QAPP Worksheet #31**  
**Planned Project Assessments Table**

LATA Kentucky will ensure that protocol outlined in the QAPP is implemented adequately. Assessment activities help to ensure that the resultant data quality is adequate for its intended use and that appropriate responses are in place to address nonconformances and deviations from the QAPP. Below is a list of assessments project teams may use.

79

<b>Assessment Type</b>	<b>Frequency</b>	<b>Internal or External</b>	<b>Organization Performing Assessment</b>	<b>Person(s) Responsible for Performing Assessment (Title and Organizational Affiliation)</b>	<b>Person(s) Responsible for Responding to Assessment Findings (Title and Organizational Affiliation)</b>	<b>Person(s) Responsible for Identifying and Implementing Corrective Actions (CA) (Title and Organizational Affiliation)</b>	<b>Person(s) Responsible for Monitoring Effectiveness of CA (Title and Organizational Affiliation)</b>
Independent Assessment/ Surveillance	A	Internal	Prime Contractor QA	QA Specialists, Contractor, or Independent Assessor	Project Management, Contractor	Project Management, Contractor	QA Specialist, Contractor
Laboratory Audit	Annual	External	DOE Consolidated Audit Program (DOECAP)	Laboratory Assessor	Laboratory	Laboratory	DOECAP
Management Assessments	Annual	Internal	Prime Contractor Project Management	Regulatory Management, Contractor	Regulatory Management, Contractor	Regulatory Management, Contractor	QA Specialist, Contractor
Management by Walking Around (MBWA)*	B	Internal	Project Management	Project Management	Project Management	Project Management	Project Management
MBWA Follow-up surveillances	Quarterly	Internal	Project Management	Project Management or designee, Contractor	Project Management/Designee, Contractor	Project Management, Contractor	Project Management

A = assessment frequency determined by QA Manager and conducted per PAD-QA-1420, *Conduct of Assessments*.

B = assessment frequency determined by regulatory manager and conducted per PAD-QA-1420.

\* Reference: PAD-QA-1033 *Management by Walking Around (MBWA) Program*.

**QAPP Worksheet #32**  
**Assessment Findings and Corrective Action Responses\***

All provisions shall be taken in the field and laboratory to ensure that any problems that may develop shall be dealt with as quickly as possible to ensure the continuity of the project/sampling events. Field modifications to procedures in the QAPP must be approved before the modifications are implemented and then documented. The process controlling procedure modification is PAD-PD-1107, *Development, Approval, and Change Control for LATA Kentucky Performance Documents*. Field modifications are documented through the work control process per PAD-WC-0021. Corrective action in the field may be necessary when the sampling design is changed. For example, a change in the field may include increasing the number or type of samples or analyses, changing sampling locations, and/or modifying sampling protocol. When this occurs, the project team shall identify any suspected technical or QA deficiencies and note them in the field logbook. Listed in Worksheet #32 is how project teams will address assessment findings.

80

<b>Assessment Type</b>	<b>Nature of Deficiencies Documentation</b>	<b>Individual(s) Notified of Findings (Name, Title, Organization)</b>	<b>Time frame of Notification</b>	<b>Nature of Corrective Action Response Documentation</b>	<b>Individual(s) Receiving Corrective Action Response (Name, Title, Org.)</b>	<b>Time Frame for Response</b>
Management, Independent, and Surveillances	Form QA-F-004, Management/ Independent Assessment Report, and QA-F-0710, Issue Identification Form	Project management, issue owner, contractor	Upon issuance of Form QA-F-004, Management/ Independent Assessment Report, form QA-F-0710, Issue Identification Form, will be completed and attached to the assessment report	QA-F-0710, Issue Identification Form, documents the issue response and/or corrective actions	Action owner as designated by issue owner, contractor	Fifteen days for initial issue response, corrective action schedule determined by issue owner, per PAD-QA-1210

\* It is understood that SOPs are contractor specific.

**QAPP Worksheet #33**  
**QA Management Reports Table**

Reports to management include project status reports, field and/or laboratory audits, and data quality assessments. These reports will be directed to the QA Manager and Project Manager who have ultimate responsibility for assuring that any corrective action response is completed, verified, and documented.

<b>Type of Report</b>	<b>Frequency (daily, weekly monthly, quarterly, annually, etc.)</b>	<b>Projected Delivery Date(s)</b>	<b>Person(s) Responsible for Report Preparation (Title and Organizational Affiliation)</b>	<b>Report Recipient(s) (Title and Organizational Affiliation)</b>
Field Change Requests	As needed	Ongoing	Field staff	QAPP recipients
QAPP Addenda	As needed	Not Applicable	Project Manager	QAPP recipients
Field Audit Report	TBD as determined by QA Manager	30 days after completion of audit	QA Manager	LATA Kentucky Project Manager QA Manager
Corrective Action Plan	As needed	Within 3 weeks of request	Project Manager	QA Manager

TBD = to be determined  
QA = quality assurance

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

This section of the QAPP provides a description of the QA activities that will occur after the data collection phase of the project is completed. Implementation of this section will determine whether the data conforms to the specified criteria satisfying the project objectives.

<b>Verification Input</b>	<b>Description<sup>a</sup></b>	<b>Internal/ External</b>	<b>Responsible for Verification (Name, Organization)</b>
Field Logbooks	Field logbooks are verified per DOE Prime Contractor procedure, PAD-ENM-2700, <i>Logbooks and Data Forms</i> , and PAD-ENM-5003, <i>Quality Assured Data</i> .	Internal	Project Management or designee, Contractor
Chains-of-custody	Chains-of-custody are controlled by DOE Prime Contractor procedure, PAD-ENM-5004, <i>Sample Tracking, Lab Coordination and Sample Handling Guidance</i> . Chains-of-custody will be included in data assessment packages for review as part of data verification and data assessment.	Internal	Sample and Data Management, Project Management, and QA Personnel, Contractor
Field and Laboratory Data	Field and analytical data are verified and assessed per DOE Prime Contractor procedure, PAD-ENM-5003, <i>Quality Assured Data</i> . Data assessment packages will be created per this procedure. The data assessment packages will include field and analytical data, chains-of-custody, data verification and assessment queries, and other project- specific information needed for personnel to review the package adequately. Data assessment packages will be reviewed to document any issues pertaining to the data and to indicate if data met the data quality objectives of the project.	Internal	Sample and Data Management, Project Management, and QA Personnel, <sup>b</sup> Contractor
Sampling Procedures	Evaluate whether sampling procedures were followed with respect to equipment and proper sampling support using audit and sampling reports, field change requests and field logbooks.	Internal	Sample and Data Management, Project Management, and QA Personnel, <sup>b</sup> Contractor
Laboratory Data	All laboratory data will be verified by the laboratory performing the analysis for completeness and technical accuracy prior to submittal to LATA Kentucky. Subsequently, LATA Kentucky will evaluate the data packages for completeness and compliance.	External/ Internal	Laboratory Manager, LATA Kentucky Sample and Data Management
Electronic Data Deliverables (EDDs)	Determine whether required fields and format were provided.	Internal	Sample and Data Management
QAPP	All planning documents will be available to reviewers to allow reconciliation with planned activities and objectives.	Internal	All data users

<sup>a</sup> It is understood that SOPs are contractor specific.

<sup>b</sup> QA specialist performs general QA review.

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

<b>Step IIa/IIb</b>	<b>Validation Input</b>	<b>Description<sup>a</sup></b>	<b>Responsible for Validation (Name, Organization)</b>
IIa	Data Deliverables, Analytes, and Holding Times	The documentation from the contractual screening will be included in the data assessment packages, per DOE Prime Contractor procedure, PAD-ENM-5003, <i>Quality Assured Data</i> .	Sample and Data Management Personnel, Contractor
IIa	Chain-of-Custody, Sample Handling, Sampling Methods and Procedures, and Field Transcription	These items will be validated during the data assessment process as required by DOE Prime Contractor procedure, PAD-ENM-5003, <i>Quality Assured Data</i> , and PAD-ENM-1003, <i>Developing, Implementing, and Maintaining Data Management Implementation Plans</i> . The documentation of this validation will be included in the data assessment packages.	Sample and Data Management Personnel, Contractor
IIa	Analytical Methods and Procedures, Laboratory Data Qualifiers, and Standards	These items will be reviewed during the data validation process as required by DOE Prime Contractor data validation procedures. Data validation will be performed in parallel with data assessment. The data validation report and data validation qualifiers will be considered when the data assessment process is being finalized.	Data Validation Subcontractor, and Sample and Data Management, Project, Contractor
IIa	Audits	The audit reports and accreditation and certification records for the laboratory supporting the projects will be considered in the bidding process.	QA Personnel
IIb	Deviations and qualifiers from Step IIa	Any deviations and qualifiers resulting from Step IIa process will be documented in the data assessment packages.	Sample and Data Management, Project, and QA Personnel, Contractor
IIb	Sampling Plan, Sampling Procedures, Co-located Field Duplicates, Project Quantitation Limits, Confirmatory Analyses, Performance Criteria	These items will be evaluated as part of the data verification and data assessment process per DOE Prime Contractor procedure, PAD-ENM-5003, <i>Quality Assured Data</i> . These items will be considered when evaluating whether the project met their Data Quality Objectives.	Sample and Data Management, Project, and QA Personnel, Contractor

<sup>a</sup> It is understood that SOPs are contractor specific.

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

<b>Step IIa/IIb</b>	<b>Matrix</b>	<b>Analytical Group</b>	<b>Concentration Level</b>	<b>Validation Criteria</b>	<b>Data Validator (title and organizational affiliation)</b>
Step IIa/IIb	Soils/Sediments	All	All	National Functional Guidelines; Worksheets #12, #15, and #28; and PAD-ENM-0026, PAD-ENM-0811, PAD-ENM-5102, PAD-ENM-5105, PAD-ENM-5003, and PAD-ENM-5107	Data Validator <sup>a</sup>
Step IIa/IIb	Water	All	All		Data Validator <sup>a</sup>

<sup>a</sup> Validation is to be conducted by a qualified individual, independent from sampling, laboratory, project management, or other decision making personnel for the task. This could be an outside party or someone within LATA Kentucky who is not involved in the project.

**QAPP Worksheet #37**  
**Usability Assessment\***

LATA Kentucky shall determine the adequacy of data based on the results of validation and verification. The usability step involves assessing whether the process execution and resulting data meet project quality objectives documented in the QAPP.

**Summarize the usability assessment process and all procedures, including interim steps and any statistics, equations, and computer algorithms that will be used:** Field and analytical data are verified and assessed per procedure PAD-ENM-5003, *Quality Assured Data*. Data assessment packages will be created per this procedure. Data assessment packages will include field and analytical data, chains-of-custody, data verification and assessment queries, and other project-specific information needed for personnel to review the package adequately. Data assessment packages will be reviewed to document any issues pertaining to the data and to indicate if data quality objectives of the project were met. For data selected for validation, the following procedures are used: PAD-ENM-0026, PAD-ENM-0811, PAD-ENM-5102, PAD-ENM-5105, and PAD-ENM-5107.

**Describe the evaluative procedures used to assess overall measurement error associated with the project:** PARCCS parameters (precision, accuracy, representativeness, comparability, completeness, and sensitivity) will be evaluated per procedure, PAD-ENM-5003, *Quality Assured Data*. This information will be included in the data assessment packages for review by project personnel. Data assessment also will include documentation of QC exceedances, trends, and/or bias in the data set. Data assessment will document any statistics used.

**Identify the personnel responsible for performing the usability assessment:** Project personnel, as verified by QA personnel.

**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:** Data assessment packages will be created, which will include data assessment comments/questions and laboratory comments. Data verification and assessment queries indicating any historical outliers and background soil exceedances also will be included in the data assessment packages.

\* It is understood that SOPs are contractor specific.

**THIS PAGE INTENTIONALLY LEFT BLANK**