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REMOVAL SUPPORT TEAM 2
EPA CONTRACT EP-W-06-072

September 13, 2013

Mr. Paul Kahn, On-Scene Coordinator
U.S. Environmental Protection Agency, Region II
Response and Prevention Branch
2890 Woodbridge Avenue
Edison, NJ 08837

EPA CONTRACT No.: EP-W-06-072
TDD No.: TO-0029-0085
DOCUMENT CONTROL No.: RST 2-02-F-2530
SUBJECT: SITE-SPECIFIC UFP-QUALITY ASSURANCE PROJECT PLAN, SCOTT AUTO SALES SITE, NORTHUMBERLAND, SARATOGA COUNTY, NEW YORK

Dear Mr. Kahn,

Enclosed please find the Site-Specific Uniform Federal Policy (UFP) Quality Assurance Project Plan (QAPP) for the potable well sampling to be conducted at the Scott Auto Sales Site located in Northumberland, Saratoga County, New York on September 18 and 19, 2013. If you have any questions or comments, please do not hesitate to contact me at (732) 585-4415.

Sincerely,

Weston Solutions, Inc.

for Aleksandra Mallon
RST 2 Project Manager

Enclosure
cc: TDD File No.: TO-0029-0085

SITE-SPECIFIC QUALITY ASSURANCE PROJECT PLAN

SCOTT AUTO SALES SITE
4724 ROUTE 50
NORTHUMBERLAND, SARATOGA COUNTY, NEW YORK

NON-TIME CRITICAL

Prepared By:

Removal Support Team 2
Weston Solutions, Inc.
East Division
Edison, New Jersey 08837

DC No.: RST 2-02-F-2530
TDD No.: TO-0029-0085
EPA Contract No.: EP-W-06-072

September 2013

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ATTACHMENTS

ATTACHMENT A: Site Location Map
ATTACHMENT B: Sampling SOPs
- EPA/ERT SOP# 2001
- EPA/ERT SOP# 2007

ATTACHMENT C: NYSDEC Potable Water Sampling Guidance

LIST OF ACRONYMS

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

LIST OF ACRONYMS (Concluded)

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

CROSSWALK

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

QAPP Element(s) and Corresponding Section(s) of UFP-QAPP Manual	Required Information	Crosswalk to QAPP Section	Crosswalk to QAPP Worksheet No.
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QAPP Element(s) and Corresponding Section(s) of UFP-QAPP Manual	Required Information	Crosswalk to QAPP Section	Crosswalk to QAPP Worksheet No.
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QAPP Worksheet #1: Title and Approval Page

Title: Site-Specific Quality Assurance Project Plan
Site Name/Project Name: Scott Auto Sales Site
Site Location: 4724 Route 50, Saratoga County, New York
Revision Number: 00
Revision Date: Not Applicable

Weston Solutions, Inc.
Lead Organization

Dipanjali Chavan
Weston Solutions, Inc.
1090 King Georges Post Road, Suite 201
Edison, NJ 08837
Email: Dipanjali.Chavan@westonsolutions.com
Preparer's Name and Organizational Affiliation

13 September 2013
Preparation Date (Day/Month/Year)

Site Project Manager: _____
Signature

for Aleksandra Mallon/Weston Solutions, Inc.
Printed Name/Organization/Date

QA Officer/Technical Reviewer: _____
Signature

Smita Sumbaly/Weston Solutions, Inc.
Printed Name/Organization/Date

EPA, Region II On-Scene Coordinator (OSC): _____
Signature

Paul Kahn/EPA, Region II
Printed Name/Organization/Date

EPA, Region II Quality Assurance Officer (QAO): _____
Signature

Printed Name/Organization/Date

Document Control Number: RST 2-02-F-2530

QAPP Worksheet #2: QAPP Identifying Information

Site Name/Project Name: Scott Auto Sales Site
Site Location: 4724 Route 50, Northumberland, Saratoga County, New York
Operable Unit: 00
Title: Site-Specific Quality Assurance Project Plan
Revision Number: 00
Revision Date: Not Applicable

1. **Identify guidance used to prepare QAPP:** Uniform Federal Policy for Quality Assurance Project Plans. Refer to EPA DESA laboratory Methods.

2. **Identify regulatory program:** EPA, Region II

3. **Identify approval entity:** EPA, Region II

4. **Indicate whether the QAPP is a generic or a Site-specific QAPP.**

5. **List dates of scoping sessions that were held:** September 5, 2013

6. **List dates and titles of QAPP documents written for previous site work, if applicable:**
Site-specific Quality Assurance Project Plan for Scott Auto Sales Site, October 2012 -
DCN: RST 2-02-F-2160

7. **List organizational partners (stakeholders) and connection with lead organization:** None

8. **List data users:** EPA, Region II (see Worksheet #4 for individuals)

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

   Worksheet #22 is not applicable because no field screening instruments will be used during the sampling event (see Worksheet #9 for explanation).

10. **Document Control Number:** RST 2-02-F-2530

QAPP Worksheet #3: Distribution List

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

QAPP Recipient	Title	Organization	Telephone Number	Fax Number	E-mail Address	Document Control Number
Paul Kahn	On-Scene Coordinator	EPA, Region II	(732) 321-6617	(732) 321-4425	Kahn.Paul@epa.gov	RST 2-02-F-2530
Aleksandra Mallon	Site Project Manager	Weston Solutions, Inc., RST 2	(732) 585-4415	(732) 225-7037	Aleksandra.Mallon@westonsolutions.com	RST 2-02-F-2530
Timothy Benton	HSO	Weston Solutions, Inc., RST 2	(732) 585-4425	(732) 225-7037	Tim.Benton@westonsolutions.com	RST 2-02-F-2530
Smita Sumbaly	QA Officer	Weston Solutions, Inc., RST 2	(732) 585-4410	(732) 225-7037	S.Sumbaly@westonsolutions.com	RST 2-02-F-2530
Site TDD File	Site TDD File	Weston Solutions, Inc., RST 2	Not Applicable	Not Applicable	Not Applicable	-

QAPP Worksheet #4: Project Personnel Sign-Off Sheet

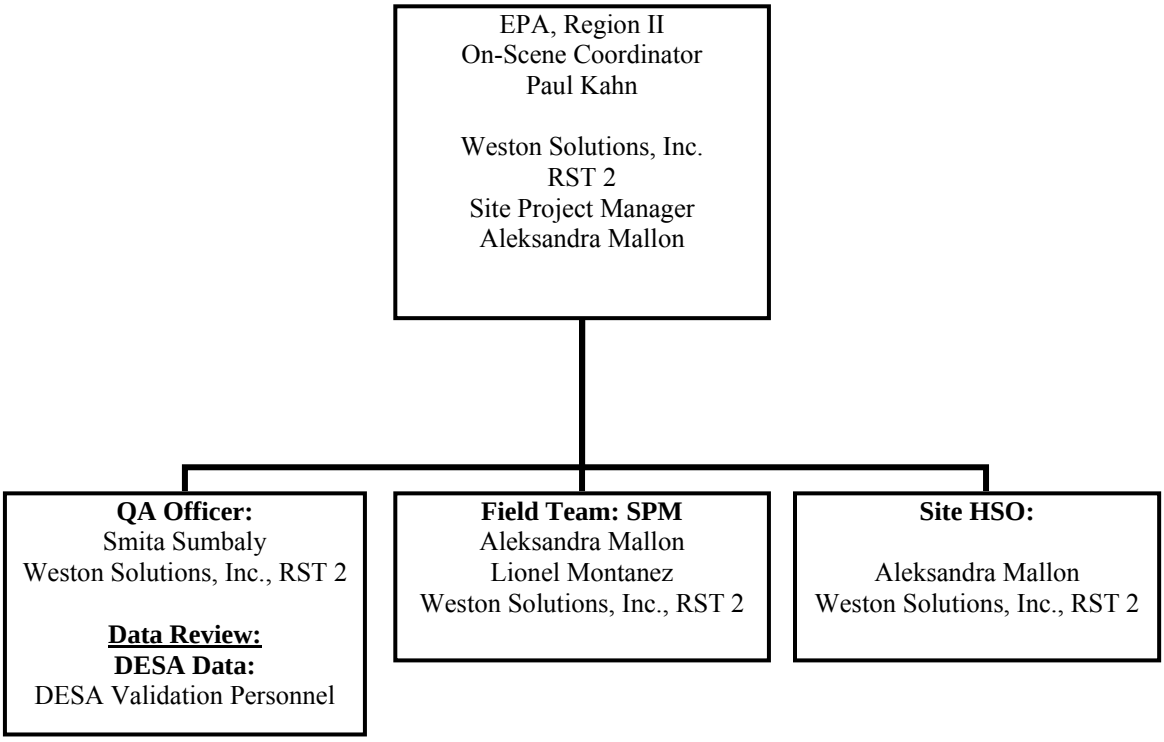
[Copies of this form signed by key project personnel from each organization to indicate that they have read the applicable sections of the QAPP and will perform the tasks as described; add additional sheets as required. Ask each organization to forward signed sheets to the central project file.]

Organization: Weston Solutions, Inc.

Project Personnel	Title	Telephone Number	Signature	Date QAPP Read
Paul Kahn	EPA, Region II, On-Scene Coordinator	(732) 321-6617		
Aleksandra Mallon	Site Project Manager, Field Personnel, RST 2	(732) 585-4415		
Smita Sumbaly	QAO, RST 2	(732) 585-4410		9/13/13
Timothy Benton	HSO, RST 2	(732) 585-4425		9/13/13
Lionel Montanez	Field Personnel, RST 2	(732) 585-4436		

QAPP Worksheet #5: Project Organizational Chart

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



Acronyms:

SPM: Site Project Manager
HSO: Health & Safety Officer

QAPP Worksheet #6: Communication Pathways

Communication Drivers	Responsible Entity	Name	Phone Number	Procedure
Point of contact with EPA OSC	Site Project Manager, Weston Solutions, Inc., RST 2	Aleksandra Mallon, SPM	(732) 585-4415	All technical, QA and decision-making matters in regard to the project (verbal, written or electronic)
Adjustments to QAPP	Site Project Manager, Weston Solutions, Inc., RST 2	Aleksandra Mallon, SPM	(732) 585-4415	QAPP approval dialogue
Health and Safety On-Site Meeting	Site Project Manager, Weston Solutions, Inc., RST 2	Aleksandra Mallon, SPM	(732) 585-4415	Explain Site hazards, personnel protective equipment, hospital location, etc.

OSC: On-Scene Coordinator
SPM: Site Project Manager

QAPP Worksheet #7: Personnel Responsibilities and Qualifications Table

Name	Title	Organizational Affiliation	Responsibilities	Education and Experience Qualifications*
Paul Kahn	EPA On-Scene Coordinator	EPA, Region II	All project coordination, direction and decision making.	NA
Aleksandra Mallon, SPM	Site Project Manager, RST 2	Weston Solutions, Inc.	Implementing and executing the technical, QA and health and safety during sampling event and sample management.	3 years*
Lionel Montanez	Field Personnel, RST 2	Weston Solutions, Inc.	Sample collection and management	8 years*

*All RST 2 members, including subcontractor's resumes are in possession of RST 2 Program Manager, EPA Project Officer and Contracting officers.

QAPP Worksheet #8: Special Personnel Training Requirements Table

Project Function	Specialized Training By Title or Description of Course	Training Provider	Training Date	Personnel / Groups Receiving Training	Personnel Titles / Organizational Affiliation	Location of Training Records / Certificates[1]
[Specify location of training records and certificates for samplers]						
QAPP Training	This training is presented to all RST 2 personnel to introduce the provisions, requirements, and responsibilities detailed in the UFP QAPP. The training presents the relationship between the site-specific QA Project Plans (QAPPs), SOPs, work plans, and the Generic QAPP. QAPP refresher training will be presented to all employees following a major QAPP revision.	Weston Solutions, Inc., QAO	As needed	All RST 2 field personnel upon initial employment and as refresher training	Weston Solutions, Inc.	Weston Solutions, Inc., EHS Database
Health and Safety Training	Health and safety training will be provided to ensure compliance with Occupational Safety and Health Administration (OSHA) as established in 29 CFR 1910.120.	Weston Solutions, Inc., HSO	Yearly at a minimum	All Employees upon initial employment and as refresher training every year	Weston Solutions, Inc.	Weston Solutions, Inc., EHS Database
Others	FORMS II Lite, Scribe, ICS 100 and 200, and Air Monitoring Equipment Trainings provided to all employees	Weston Solutions, Inc., QAO/Group Leader's	Upon initial employment and as needed			
	Dangerous Goods Shipping	Weston Solutions, Inc., HSO	Every 2 years			

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

[1]All RST 2 members, including subcontractor's certifications are in possession of RST 2 HSO.

QAPP Worksheet #9: Project Scoping Session Participants Sheet

Site Name/Project Name: Scott Auto Sales Site
Site Location: 4724 Route 50, Saratoga County, New York
Operable Unit: 00
Date of Session: September 5, 2013
Scoping Session Purpose: To discuss questions, comments, and assumptions regarding technical issues involved with the sampling activities.

Name	Title	Affiliation	Phone #	E-mail Address	*Project Role
Paul Kahn	On-Scene Coordinator	EPA, Region II	(732) 321-6617	Kahn.Paul@epa.gov	OSC
Aleksandra Mallon	Site Project Manager	Weston Solutions, Inc., RST 2	(732) 585-4415	Aleksandra.Mallon@westonsolutions.com	Site Project Management

Comments/Decisions: As part of the Removal Action at the Scott Auto Sales Site (the Site), Weston Solutions, Inc., Removal Support Team 2 (RST 2) has been tasked with conducting potable water sampling from up to 10 residential properties and one business within a ¼ mile radius of the Site. The Removal Action potable water sampling event is scheduled to be conducted on September 18 and 19, 2013 with two team members. Contaminants from the Site are presumed to have possible migrated off-site or into the groundwater. Samples obtained will be analyzed for target compound list (TCL) volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), and target analyte list (TAL) metals, including mercury. Field duplicate and matrix spike/matrix spike duplicate (MS/MSD) samples will be collected at a rate of one per every 20 field samples. All potable water samples will be submitted to the U.S. Environmental Protection Agency, Region II (EPA) Division of Environmental Science and Assessment (DESA) laboratory for analysis.

Action Items: The Contract Laboratory Program (CLP) Request Form was submitted on September 5, 2013.

Consensus Decisions: Sampling to be conducted as part of the Removal Action will begin on September 18, 2013 and last approximately two days.

QAPP Worksheet #10: Problem Definition

PROBLEM DEFINITION

The Site is a former automotive supply store and repair shop located at 4724 Route 50 in Northumberland, Saratoga County, New York. The Site is located in a semi-rural area amidst residential and light commercial properties and is bordered by County Highway Route 50 to the south and an unnamed brook to the north. There are private residences located to the east and west of the Site.

The Site consists of a main garage building and surrounding property which contains labeled and unlabeled drums of automotive chemicals and unknowns including waste oil and other lubricants. The contents of the drums and tanks need to be characterized to determine whether the Site poses a potential threat to human health and/or environment.

On October 2, 2013, RST 2 performed waste sampling and field characterization screening as part of a Removal Assessment of the Site.

In August 2013, the EPA and Emergency Rapid Response Services (ERRS) contractor, Kemron Environmental, mobilized to the Site to conduct a Removal Action. ERRS prepared the repair bays to be used as a staging area for the drums. ERRS posted signs, cleared vegetation surrounding the main building, installed new locks and secured numerous overhead doors with chains. On August 29, 2013, ERRS relocated 49 full drums of waste oil and automotive chemicals from areas on the Site to the repair bays. Approximately 300 gallons of waste oil were collected from storage tanks into poly drums and staged in the repair bays. In addition to the full drums, ERRS relocated 150 containers of chemicals, 5 gallons or less, into the staging area. A total of 35 empty metal/poly drums and aboveground storage tanks (ASTs) were staged at the rear of the main building pending arrangements for recycling. EPA created a floor plan sketch of the drum storage area and submitted a copy to the local Gansevoort Fire Department.

As part of the Removal Action at the Site, RST 2 has been tasked with conducting potable water sampling from up to 10 residential properties and one business within a ¼ mile radius of the Site. Field duplicate and MS/MSD samples will be collected at a rate of one per every 20 field samples. Sampling will begin on September 18, 2013 and last approximately two days.

SITE HISTORY/CONDITIONS

Preliminary observations of the Site revealed the presence of approximately 200 containers of what appears to be waste oil. Containers on-site include 5-gallon pails, 55-gallon drums, and 250-gallon heating oil tanks. In addition, there are containers of automotive chemicals and other chemicals. The Site is owned but has been abandoned by the owner. There is no electricity in the building and no functioning fire or smoke detectors. In addition, there is evidence of drums and other containers buried in an outdoor area adjacent to the brook at the rear of the property.

QAPP Worksheet #10: Problem Definition (Concluded)

PROJECT DECISION STATEMENTS

The analytical data will be compared with applicable New York State Department of Environmental Conservation (NYSDEC) drinking water standards for private well water and will be used to assist the EPA in determining whether further Removal Actions will be necessary.

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

Overall project objectives include: Sampling will be conducted by RST 2 to identify/confirm the presence of any hazardous materials in groundwater within the vicinity of the Site.

Who will use the data? Data will be used by the EPA, Region II On-Scene Coordinator (OSC).

What will the data be used for? Data from this sampling event will be used by the EPA OSC to determine if the groundwater is contaminated.

What types of data are needed?
Matrix: Potable Water
Type of Data: Definitive data
Analytical Techniques: Off-site laboratory analyses
Parameters: TCL VOCs, SVOCs, TAL metals, including mercury

Type of sampling equipments: Appropriate sample jars with the necessary volume. Refer to Worksheet # 19

Access Agreement: Obtained by EPA, Region II OSC

Sampling locations: residential and business properties

How much data are needed? Up to 11 potable water samples, including QA/QC samples, will be collected and analyzed.

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

Where, when, and how should the data be collected/generated? A total of 10 residential homes and one business with private wells fall within a ¼ mile radius of the Site. One sample per potable well will be collected. The sampling event is scheduled to be conducted on September 18 and 19, 2013.

Who will collect and generate the data? The samples will be collected by RST 2. The samples analyzed by the EPA DESA laboratory will be validated in the laboratory prior to release via DESA laboratory's internal procedures.

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

How will the data be reported? All data will be reported by the assigned laboratories (Preliminary, Electronics, and Hard Copy format). The Site Project Manager will provide a Final Report, Status Reports, Maps/Figures, and Analytical Report to the EPA OSC

How will the data be archived? Electronic data deliverables will be archived in a scribe database.

QAPP Worksheet #12: Measurement Performance Criteria Table
Worksheet # 12A: Volatile Organics

Complete this worksheet for each matrix, analytical group, and concentration level. Identify the data quality indicators (DQI), measurement performance criteria (MPC) and QC sample and/or activity used to assess the measurement performance for both the sampling and analytical measurement systems. Use additional worksheets if necessary. If MPC for specific DQI vary within an analytical parameter, i.e., MPC are analyte-specific, then provide analyte-specific MPC on an additional worksheet.

Matrix	Potable Water
Analytical Group	VOA
Concentration Level	Trace

Sampling Procedure	Analytical Method/SOP	Data Quality Indicators (DQIs)	Measurement Performance Criteria	QC Sample and/or Activity Used to Assess Measurement Performance	QC Sample Assesses Error for Sampling (S), Analytical (A) or both (S&A)
ERT SOP # 2007	See worksheets #28/ #23	Precision	% RPD < 20	LCS Duplicate	A
		Accuracy	Average Recovery (80-120%)		
		Accuracy	+/- 40% from the initial/continuing calibration	Internal standards	A
		Accuracy	Limits 70%-130%	Matrix spike	A
		Accuracy	Limits 80%-120%	Surrogate Compounds	A
		Accuracy	< RL	Method Blank	A

QAPP Worksheet #12: Measurement Performance Criteria Table
Worksheet # 12B: Semivolatile Organics

Complete this worksheet for each matrix, analytical group, and concentration level. Identify the data quality indicators (DQI), measurement performance criteria (MPC) and QC sample and/or activity used to assess the measurement performance for both the sampling and analytical measurement systems. Use additional worksheets if necessary. If MPC for specific DQI vary within an analytical parameter, i.e., MPC are analyte-specific, then provide analyte-specific MPC on an additional worksheet.

Matrix	Potable Water
Analytical Group	Semivolatiles
Concentration Level	Low

Sampling Procedure	Analytical Method/SOP	Data Quality Indicators (DQIs)	Measurement Performance Criteria	QC Sample and/or Activity Used to Assess Measurement Performance	QC Sample Assesses Error for Sampling (S), Analytical (A) or both (S&A)
ERT SOP # 2007	See worksheet #28 & #23	Precision Accuracy	% RPD < 30 Compound Specific (full range: D-262%)	LCS Duplicate	A
		Accuracy	Factor of two(-50% to + 100%) from the initial/continuing calibration	Internal standards	A
		Accuracy	Compound Specific (full range: D-262%)	Matrix spike	A
		Accuracy	Limits 30%-120% for Base Neutrals Limits 20%-120% for Acids	Surrogate Compounds	A
		Accuracy	< RL	Method Blank	A

QAPP Worksheet #12: Measurement Performance Criteria Table
Worksheet # 12C: TAL Metals and Mercury- Inorganics

Complete this worksheet for each matrix, analytical group, and concentration level. Identify the data quality indicators (DQI), measurement performance criteria (MPC) and QC sample and/or activity used to assess the measurement performance for both the sampling and analytical measurement systems. Use additional worksheets if necessary. If MPC for specific DQI vary within an analytical parameter, i.e., MPC are analyte-specific, then provide analyte-specific MPC on an additional worksheet.

Matrix	Potable Water
Analytical Group	Metals/Mercury
Concentration Level	Low

Sampling Procedure	Analytical Method/SOP	Data Quality Indicators (DQIs)	Measurement Performance Criteria	QC Sample and/or Activity Used to Assess Measurement Performance	QC Sample Assesses Error for Sampling (S), Analytical (A) or both (S&A)
ERT SOP # 2007	See #28/ #23	Precision	% RPD < 20	LCS Duplicate	A
		Accuracy	Limits: Average Recovery ± 20%	LCS	A
		Accuracy	± 20% aqueous	Matrix spike	A
		Precision	< RL Except for Al, Fe, Ca, K, Mg and Na	Interference Check Sample(ICP/AES)	A
		Accuracy	< RL	Method Blank	A
		Precision	RPD < 20 %	Serial Dilution Test(ICP/AES)	A
		Accuracy	Range of 0.60-1.87 of the original response in the calibration blank	Internal Standards(ICP-MS)	A

QAPP Worksheet #13: Secondary Data Criteria and Limitations Table

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

Secondary Data	Data Source (Originating Organization, Report Title, and Date)	Data Generator(s) (Originating Org., Data Types, Data Generation/ Collection Dates)	How Data May Be Used (if deemed usable during data assessment stage)	Limitations on Data Use
• Previous Investigation Sampling Results	• NYSDEC supplied information; • Final Removal Assessment Sampling Trip Report- Scott Auto Sales Assessment Site, March 2013 - DCN: RST 2-02-F-2178 by Weston Solutions, Inc. – RST 2	• NYSDEC; • Weston Solutions, Inc. – RST2	The data will be used as background information	NA

QAPP Worksheet #14: Summary of Project Tasks

Sampling Tasks:

RST 2 will collect up to 12 potable water samples from up to 10 residential properties and one business. All samples will be submitted for TCL VOC, SVOC, and TAL metal, including mercury, analyses. In addition, one QA/QC samples will be collected.

Analysis Tasks:

Potable Water - TCL VOCs - DESA Method No. DW-1
Potable Water - TCL SVOCs - DESA Method No. C-90
Potable Water – TAL Metals, including Mercury - DESA Method Nos. C-109 and C-110

Quality Control Tasks:

Samples will be collected for Definitive Data QA Objective. QA/QC samples will include the collection of one Matrix Spike/ Matrix Spike Duplicate (MS/MSD) analyses at the ratio of 1 per 20 samples and 1 per matrix.

Data Management Tasks:

Activities under this project will be reported in status and trip reports and other deliverables (e.g., analytical reports, final reports) described herein. Activities will also be summarized in appropriate format for inclusion in monthly and annual reports.

The following deliverables will be provided under this project:

Trip Report: A trip report will be prepared to provide a detailed accounting of what occurred during each sampling mobilization. The trip report will be prepared within two weeks of the last day of each sampling mobilization. Information will be provided on time of major events, dates, and personnel on-site (including affiliations).

Maps/Figures: Maps depicting site layout, contaminant source areas, and sample locations will be included in the trip report, as appropriate.

Analytical Report: An analytical report will be prepared for samples analyzed under this plan. Information regarding the analytical methods or procedures employed, sample results, QA/QC results, chain-of-custody documentation, laboratory correspondence, and raw data will be provided within this deliverable.

Data Review: A review of the data generated under this plan will be undertaken. The assessment of data acceptability or usability will be provided separately, or as part of the analytical report.

QAPP Worksheet #14: Summary of Project Tasks (Continued)

Documentation and Records:

All sample documents will be completed legibly, in ink. Any corrections or revisions will be made by lining through the incorrect entry and by initialing the error.

Field Logbook: The field logbook is essentially a descriptive notebook detailing site activities and observations so that an accurate account of field procedures can be reconstructed in the writer's absence. Field logbook will be bound and paginated. All entries will be dated and signed by the individuals making the entries, and should include (at a minimum) the following

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

* The description of the sample location will be noted in such a manner as to allow the reader to reproduce the location in the field at a later date.

Sample Labels: Sample labels will clearly identify the particular sample, and should include the following:

1. Site/project number.
2. Sample identification number.
3. Sample collection date and time.
4. Designation of sample (grab or composite).
5. Sample preservation.
6. Analytical parameters.
7. Name of sampler.

Sample labels will be written in indelible ink and securely affixed to the sample container. Tie-on labels can be used if properly secured.

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

QAPP Worksheet #14: Summary of Project Tasks (Concluded)

Assessment/Audit Tasks:

No performance audit of field operations is anticipated at this time. If conducted, performance and system audit will be in accordance with the project plan.

Data Review Tasks:

All data will be validated by the EPA DESA Laboratory.

Laboratory analytical results will be assessed by the data reviewer for compliance with required precision, accuracy, completeness, representativeness, and sensitivity.

Screening data with definitive confirmation need only be evaluated for holding time, calibration, and detection limits criterion.

QAPP Worksheet #15A: Reference Limits and Evaluation Table

Matrix: Potable Water

Analytical Group: Target Compound List Volatile Organic Compounds

Concentration Level: Trace & Low

Analyte	CAS Number	NYSDEC Drinking Water Standards (µg/L)*	Project Quantitation Limit (µg/L)	Method CRQLs (µg/L)	Achievable Laboratory (DESA) Limits MDL (µg/L)	Achievable Laboratory (DESA) Limits RL (µg/L)
Dichlorodifluoromethane	75-71-8	TBD	0.5	0.5	0.11	0.5
Chloromethane	74-87-3	TBD	0.5	0.5	0.07	0.5
Vinyl Chloride	75-01-4	TBD	0.5	0.5	0.12	0.5
Bromomethane	74-83-9	TBD	0.5	0.5	0.14	0.5
Chloroethane	75-00-3	TBD	0.5	0.5	0.14	0.5
Trichlorofluoromethane	75-69-4	TBD	0.5	0.5	0.11	0.5
1,1-Dichloroethene	75-35-4	TBD	0.5	0.5	0.10	0.5
1,1,2-Trichloro-1,2,2-trifluoroethane	76-13-1	TBD	0.5	0.5	-	0.5
Carbon Disulfide	75-15-0	TBD	0.5	0.5	0.10	0.5
Acetone	67-64-1	TBD	0.5	5.0	0.36	5.0
Methyl Acetate	79-20-9	TBD	0.5	0.5	-	0.5
Methylene Chloride	75-09-2	TBD	0.5	0.5	0.18	0.5
trans-1,2-Dichloroethene	156-60-5	TBD	0.5	0.5	0.09	0.5
cis-1,2-Dichloroethene	156-59-2	TBD	0.5	0.5	0.06	0.5
Methyl tert-Butyl Ether	1634-04-4	TBD	0.5	0.5	0.03	0.5
1,1-Dichloroethane	75-34-3	TBD	0.5	0.5	0.08	0.5
2-Butanone	78-93-3	TBD	0.5	5.0	0.21	5.0
Chloroform	67-66-3	TBD	0.5	0.5	0.07	0.5
1,2-Dichloroethane	107-06-2	TBD	0.5	0.5	0.09	0.5
1,1,1-Trichloroethane	71-55-6	TBD	0.5	0.5	0.09	0.5
Cyclohexane	110-82-7	TBD	0.5	0.5	-	0.5
Carbon Tetrachloride	56-23-5	TBD	0.5	0.5	0.10	0.5
Benzene	71-43-2	TBD	0.5	0.5	0.07	0.5
Trichloroethene	79-01-6	TBD	0.5	0.5	0.08	0.5
Methylcyclohexane	108-87-2	TBD	0.5	0.5	-	0.5
1,2-Dichloropropane	78-87-5	TBD	0.5	0.5	0.04	0.5
Bromodichloromethane	75-27-4	TBD	0.5	0.5	0.06	0.5
cis-1,3-Dichloropropene	10061-01-5	TBD	0.5	0.5	0.05	0.5
trans-1,3-Dichloropropene	10061-02-6	TBD	0.5	0.5	0.04	0.5
1,1,2-Trichloroethane	79-00-5	TBD	0.5	0.5	0.08	0.5
Dibromochloromethane	124-48-1	TBD	0.5	0.5	0.03	0.5
4-Methyl-2-Pentanone	108-10-1	TBD	0.5	0.5	0.10	0.5

For detailed references, see Footnotes below.

QAPP Worksheet #15A: Reference Limits and Evaluation Table (Concluded)

Matrix: Potable Water
Analytical Group: Target Compound List Volatile Organic Compounds
Concentration Level: Trace & Low

Analyte	CAS Number	NYSDEC Drinking Water Standards (µg/L)*	Project Quantitation Limit (µg/L)	Method CRQLs (µg/L)	Achievable Laboratory (DESA) Limits MDL (µg/L)	Achievable Laboratory (DESA) Limits RL (µg/L)
1,1,2-Trichloroethane	79-00-5	TBD	0.5	0.5	0.04	0.5
Tetrachloroethene	127-18-4	TBD	0.5	0.5	0.06	0.5
2-Hexanone	591-78-6	TBD	0.5	0.5	0.09	0.5
Dibromochloromethane	124-48-1	TBD	0.5	5.0	0.11	5.0
1,2-Dibromoethane	106-93-4	TBD	0.5	0.5	0.06	0.5
Chlorobenzene	108-90-7	TBD	0.5	0.5	0.13	0.5
Ethylbenzene	100-41-4	TBD	0.5	0.5	0.05	0.5
Xylenes (total)	1330-20-7	TBD	0.5	0.5	0.03	0.5
Styrene	100-42-5	TBD	0.5	0.5	0.07	0.5
Bromoform	75-25-2	TBD	0.5	0.5	0.06	0.5
Isopropylbenzene	98-82-8	TBD	0.5	0.5	0.05	0.5
1,1,2,2-Tetrachloroethane	79-34-5	TBD	0.5	0.5	0.05	0.5
1,3-Dichlorobenzene	541-73-1	TBD	0.5	0.5	0.03	0.5
1,4-Dichlorobenzene	106-46-7	TBD	0.5	0.5	0.04	0.5
1,2-Dichlorobenzene	95-50-1	TBD	0.5	0.5	0.18	0.5
1,2-Dibromo-3-chloropropane	96-12-8	TBD	0.5	0.5	0.06	0.5
1,2,4-Trichlorobenzene	120-82-1	TBD	0.5	0.5	0.05	0.5
1,2,3-Trichlorobenzene	87-61-6	TBD	0.5	0.5	0.10	0.5

*EPA OSC will determine the appropriate NYSDEC drinking water standards for private well water to be used.

QAPP Worksheet #15B: Reference Limits and Evaluation Table

Matrix: Potable Water
Analytical Group: Semivolatile Organic Compounds
Concentration Level: Low

Analyte	CAS Number	NYSDEC Drinking Water Standards (µg/L)*	Project (PRP) Quantitation Limit [3]	Method QLs	Achievable Laboratory (DESA) Limits MDLs µg/L	RLs
BENZALDEHYDE	100-52-7	TBD	--	5 µg/L	0.10	5 µg/L
PHENOL	108-95-2	TBD	--	5 µg/L	1.36	5 µg/L
BIS(2-CHLOROETHYL)ETHER	111-44-4	TBD	--	5 µg/L	1.38	5 µg/L
2-CHLOROPHENOL	95-57-8	TBD	--	5 µg/L	1.43	5 µg/L
2-METHYLPHENOL	95-48-7	TBD	--	5 µg/L	0.99	5 µg/L
BIS(2-CHLOROISOPROPYL)ETHER	108-60-1	TBD	--	5 µg/L	1.23	5 µg/L
ACETOPHENONE	98-86-2	TBD	--	5 µg/L	0.9	5 µg/L
4-METHYLPHENOL	106-44-5	TBD	--	5 µg/L	0.81	5 µg/L
N-NITROSO-DI-N-PROPYLAMINE	621-64-7	TBD	--	5 µg/L	0.99	5 µg/L
HEXACHLOROETHANE	67-72-1	TBD	--	5 µg/L	1.35	5 µg/L
NITROBENZENE	98-95-3	TBD	--	5 µg/L	1.13	5 µg/L
ISOPHORONE	78-59-1	TBD	--	5 µg/L	0.76	5 µg/L
2-NITROPHENOL	88-75-5	TBD	--	5 µg/L	1.08	5 µg/L
2,4-DIMETHYLPHENOL	105-67-9	TBD	--	5 µg/L	1.81	5 µg/L
BIS(2-CHLOROETHOXY)METHANE	111-91-1	TBD	--	5 µg/L	0.97	5 µg/L
2,4-DICHLOROPHENOL	120-83-2	TBD	--	5 µg/L	0.94	5 µg/L
NAPHTHALENE	91-20-3	TBD	--	5 µg/L	1.05	5 µg/L
4-CHLOROANILINE	106-47-8	TBD	--	5 µg/L	0.42	5 µg/L
HEXACHLOROBUTADIENE	87-68-3	TBD	--	5 µg/L	1.02	5 µg/L
CAPROLACTAM	105-60-2	TBD	--	5 µg/L	1.0	5 µg/L
4-CHLORO-3-METHYLPHENOL	59-50-7	TBD	--	5 µg/L	0.62	5 µg/L
2-METHYL NAPHTHALENE	91-57-6	TBD	--	5 µg/L	0.88	5 µg/L
HEXACHLOROCYCLOPENTADIENE	77-47-4	TBD	--	5 µg/L	0.92	5 µg/L
1,2,4,5-TETRACHLOROBENZENE	95-94-3	TBD	--	5 µg/L	0.8	5 µg/L
2,4,6-TRICHLOROPHENOL	88-06-2	TBD	--	5 µg/L	0.55	5 µg/L
2,4,5-TRICHLORPHENOL	95-95-4	TBD	--	5 µg/L	0.76	5 µg/L
1,1'-BIPHENYL	92-52-4	TBD	--	5 µg/L	1.0	5 µg/L
2-CHLORONAPHTHALENE	91-58-7	TBD	--	5 µg/L	0.80	5 µg/L
2-NITROANILINE	88-74-4	TBD	--	10 µg/L	0.70	5 µg/L
DIMETHYL PHTHALATE	131-11-3	TBD	--	5 µg/L	0.47	5 µg/L
ACENAPHTHYLENE	208-96-8	TBD	--	10 µg/L	0.77	5 µg/L
2,6-DINITROTOLUENE	606-20-2	TBD	--	5 µg/L	0.79	5 µg/L
3-NITROANILINE	99-09-2	TBD	--	10 µg/L	0.76	5 µg/L
ACENAPHTHENE	83-32-9	TBD	--	5 µg/L	0.72	5 µg/L
2,4-DINITROPHENOL	51-28-5	TBD	--	10 µg/L	0.33	20 µg/L
4-NITROPHENOL	100-02-7	TBD	--	10 µg/L	0.35	10 µg/L

QAPP Worksheet #15B: Reference Limits and Evaluation Table (Concluded)

Matrix: Potable Water
Analytical Group: Semivolatile Organic Compounds
Concentration Level: Low

Analyte	CAS Number	NYSDEC Drinking Water Standards (µg/L)*	Project (PRP) Quantitation Limit [3]	Method QLs	Achievable Laboratory (DESA) Limits MDLs µg/L	RLs µg/L
DIBENZOFURAN	132-64-9	TBD	--	5 µg/L	0.72	5 µg/L
2,4-DINITROTOLUENE	121-14-2	TBD	--	5 µg/L	0.48	5 µg/L
2,3,4,6-TETRACHLOROPHENOL	58-90-2	TBD	--	5 µg/L	--	5 µg/L
FLUORENE	86-73-7	TBD	--	5 µg/L	0.61	5 µg/L
DIETHYLPHTHALATE	84-66-2	TBD	--	5 µg/L	0.39	5 µg/L
4-CHLOROPHENYL PHENYL ETHER	7005-72-3	TBD	--	5 µg/L	0.57	5 µg/L
4-NITROANILINE	100-01-6	TBD	--	10 µg/L	0.34	5 µg/L
4,6-DINITRO-2-METHYLPHENOL	534-52-1	TBD	--	10 µg/L	0.85	10 µg/L
N-NITROSODIPHENYLAMINE	86-30-6	TBD	--	5 µg/L	0.61	5 µg/L
4-BROMOPHENYL PHENYL ETHER	101-55-3	TBD	--	5 µg/L	0.58	5 µg/L
HEXACHLOROBENZENE	118-74-1	TBD	--	5 µg/L	0.49	5 µg/L
ATRAZINE	1912-24-9	TBD	--	5 µg/L	1.5	5 µg/L
PENTACHLOROPHENOL	87-86-5	TBD	--	10 µg/L	0.91	10 µg/L
PHENANTHRENE	85-01-8	TBD	--	5 µg/L	0.47	5 µg/L
ANTHRACENE	120-12-7	TBD	--	5 µg/L	0.58	5 µg/L
CARBAZOLE	86-74-8	TBD	--	5 µg/L	1.2	5 µg/L
DI-N-BUTYL PHTHALATE	84-74-2	TBD	--	5 µg/L	0.48	5 µg/L
FLUORANTHENE	206-44-0	TBD	--	5 µg/L	0.51	5 µg/L
PYRENE	129-00-0	TBD	--	5 µg/L	0.53	5 µg/L
BUTYLBENZYLPHTHALATE	85-68-7	TBD	--	5 µg/L	0.49	5 µg/L
3,3-DICHLOROBENZIDINE	91-94-1	TBD	--	5 µg/L	0.4	5 µg/L
BENZO(A)ANTHRACENE	56-55-3	TBD	--	5 µg/L	0.58	5 µg/L
CHRYSENE	218-01-9	TBD	--	5 µg/L	0.53	5 µg/L
BIS(2-ETHYLHEXYL)PHTHALATE	117-81-7	TBD	--	5 µg/L	0.68	5 µg/L
DI-N-OCTYL PHTHALATE	117-84-0	TBD	--	5 µg/L	0.57	5 µg/L
BENZO(B)FLUORANTHENE	205-99-2	TBD	--	5 µg/L	0.41	5 µg/L
BENZO(K)FLUORANTHENE	207-08-9	TBD	--	5 µg/L	0.60	5 µg/L
BENZO(A)PYRENE	50-32-8	TBD	--	5 µg/L	0.55	5 µg/L
INDENO(1,2,3-CD)PYRENE	193-39-5	TBD	--	5 µg/L	0.50	5 µg/L
DIBENZO(A,H)ANTHRCENE	53-70-6-3	TBD	--	5 µg/L	0.42	5 µg/L
BENZO(G,H,I)PERYLENE	191-24-2	TBD	--	5 µg/L	0.35	5 µg/L
**1,4-DIOXANE	--	TBD	--	--	--	2 µg/L

*EPA OSC will determine the appropriate NYSDEC drinking water standards for private well water to be used.
** MDL study is being performed.

QAPP Worksheet #15C: Reference Limits and Evaluation Table

Matrix: Potable Water
Analytical Group: Metals, including mercury
Concentration Level: Low

Analyte	CAS Number	NYSDEC Drinking Water Standards (µg/L)*	Project (PRP) Quantitation Limit [3]	Method CRQLs µg/l	Achievable Laboratory (DESA) Limits[2] MDLs µg/l	RLs µg/l
Aluminum	7429-90-5	TBD	--	200	93.9	200
Antimony	7440-36-0	TBD	--	60	0.71	20
Arsenic	7440-38-2	TBD	--	10	2.26	8
Barium	7440-39-3	TBD	--	200	0.83	6
Beryllium	7440-41-7	TBD	--	5	0.24	5
Cadmium	7440-43-9	TBD	--	5	0.11	4
Calcium	7440-70-2	TBD	--	5000	68.0	1000
Chromium	7440-47-3	TBD	--	10	0.22	6
Cobalt	7440-48-4	TBD	--	50	0.18	8
Copper	7440-50-8	TBD	--	25	5.89	10
Iron	7439-89-6	TBD	--	100	35.6	100
Lead	7439-92-1	TBD	--	10	1.18	7
Magnesium	7439-95-4	TBD	--	5000	30..5	1000
Manganese	7439-96-5	TBD	--	15	0.07	5
Mercury	7439-97-6	TBD	--	0.2	.017	0.2
Nickel	7440-02-0	TBD	--	40	0.46	5
Potassium	7440-09-7	TBD	--	5000	53.3	1000
Selenium	7782-49-2	TBD	--	35	1.34	7
Silver	7440-22-4	TBD	--	10	.030	6
Sodium	7440-23-5	TBD	--	5000	161	1000
Thallium	7440-28-0	TBD	--	25	1.62	20
Vanadium	7440-62-2	TBD	--	50	2.14	10
Zinc	7440-66-6	TBD	--	60	4.84	8

*EPA OSC will determine the appropriate NYSDEC drinking water standards for private well water to be used.

QAPP Worksheet #16: Project Schedule/Timeline Table

Activities	Organization	Dates (MM/DD/YY)		Deliverable	Deliverable Due Date
		Anticipated Date(s) of Initiation	Anticipated Date of Completion		
Preparation of QAPP	RST 2 Contractor Site Project Manager	Prior to sampling date	9/13/13	QAPP	9/16/13
Review of QAPP	RST 2 Contractor QAO and/or Group Leader	9/12/13	9/13/13	Approved QAPP	9/16/13
Preparation of Health and Safety Plan	RST 2 Contractor Site Project Manager	Prior to sampling date	9/6/13	HASP	9/16/13
Procurement of Field Equipment	RST 2 Contractor Site Project Manager and/or Equipment Officer	Prior to sampling date	NA	NA	NA
Laboratory Request	RST 2 Contractor Site Project Manager and/or QAO	Prior to sampling date	9/5/2013	CLP Request Forms	NA
Field Reconnaissance/Access	RST 2 Contractor Site Project Manager; or EPA Region 2 OSC	NA	NA	NA	NA
Collection of Field Samples	RST 2 Contractor Site Project Manager	9/18/13	9/19/13	NA	NA
Laboratory Electronic Data Received	EPA Region 2 DESA	14 Days After Sampling	14 Days After Sampling	Preliminary Data	14 Days After Sampling
Laboratory Package Received	EPA Region 2 DESA	21 Days After Sampling	21 Days After Sampling	Hard Copy Data Package	21 Days After Sampling
Validation of Laboratory Results	EPA Region 2 DESA	42 Days After Sampling	10/30/13	Validated Data	10/30/13
Data Evaluation/ Preparation of Final Report	RST 2 Contractor Site Project Manager	11/13/13	11/13/13	Final Report	11/13/13

QAPP Worksheet #17: Sampling Design and Rationale

RST 2 will collect approximately 12 aqueous samples, including one field duplicates, and one trip blanks from up to 11 properties, for TCL VOC, SVOCs, and TAL metal, including mercury, analyses.

This sampling design is based on information currently available and may be modified onsite in light of field-screening results and other acquired information.

All sampling activities will be performed by RST 2, under the direction of the EPA OSC. At each of the 11 properties, one sample will be collected by opening the any accessible cold water tap in appropriate sample containers. Refer to Work Sheet # 19 for number and type of sample containers.

The following laboratories will provide the analyses indicated:

Lab Name/Location	Sample Type	Parameters
EPA DESA Laboratory 2890 Woodbridge Ave. Bldg. 209, MS-230 Edison, NJ 08837 Tel.: (732) 906-6886	Aqueous	TCL VOCs, TCL SVOCs, and TAL Metals. including mercury

Refer to Worksheet #20 for QA/QC samples, sampling methods and SOP.

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

Matrix	Sampling Location(s)	Units	Analytical Group(s)	Concentration Level	No. of Samples (identify field duplicates)	Sampling SOP Reference	Rationale for Sampling Location
Aqueous	11 private wells	ug/L	TCL VOCs, TCL SVOCs, TAL Metals, including Mercury	Trace & Low	1	SOP No.: 2001 and 2007	To Be Determined by the OSC

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

QAPP Worksheet #19: Analytical SOP Requirements Table

Matrix	No. of Samples*	Analytical Group	Concentration Level	Analytical and Preparation Method/SOP Reference[1]	Sample Volume	Containers (number, size, and type)	Preservation Requirements (chemical, temperature, light protected)	Maximum Holding Time (preparation/ analysis)
Potable Water	12	TCL VOCs	Trace	DW-1 (*Ref: EPA 524.2)*	3 X40ml 6 X 40ml (QC)	VOA vial with Teflon-lined septum	Cool, 4ºC ; HCL to pH < 2 $Na_2S_2O_3$, if Res CL present	Preserved w/HCL: 14 days: Unpreserved: 7 days
Potable Water	12	TCL SVOCs	Low	C-90 *(Ref: EPA 625)*	2 X 1000ml 2 X1000 ml(QC)	Amber Glass	Cool, 4ºC ; $Na_2S_2O_3$, if Res CL present	To extraction: 7 days; 40 days to analysis
Potable Water	12	TAL Metals/Mercury	Low	C-109, and C- 110	1 X 500ml 1 X 250ml(QC)	Rigid Plastic	HNO3 to pH <2	6 months, Hg- 28 days

*Includes one (1) field duplicate sample.

QAPP Worksheet #20: Field Quality Control Sample Summary Table

Matrix	Analytical Group	Concentration Level	Analytical and Preparation SOP Reference	No. of Sampling Locations/ No. of Samples	No. of Field Duplicate Pairs	No. of Extra Volume Laboratory QC (e.g., MS/MSD) Samples	No. of Trip. Blanks	No of Perf. Evaluation Samples	Total No. of Samples to Lab
Potable Water	TCL VOCs	Trace	DW-1	11	1/20 samples per matrix	NR	1	NR	13
Potable Water	TCL SVOCs	Low	C-90	11	1/20 samples per matrix	1/20 samples per matrix	NR	NR	12
Potable Water	TAL Metals and Hg	Low	C-109, and C- 110	11	1/20 samples per matrix	1/20 samples per matrix	NR	NR	12

NR – Not Required;

QAPP Worksheet #21: Project Sampling SOP References Table

Reference Number	Title, Revision Date and/or Number	Originating Organization	Equipment Type	Modified for Project Work? (Y/N)	Comments
SOP#2001	General Field Sampling Guidelines (all media); Rev. 0.0 August 1994	EPA/OSWER/ERT	Site Specific	N	None
SOP#2007	Groundwater Well Sampling; Rev. 0.0 January 1995	EPA/OSWER/ERT	Site Specific	N	None
N/A	*NYSDEC Potable Water Sampling Guidance March 2001	NYSDEC	Site Specific	N	-

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

QAPP Worksheet #23: Analytical SOP References Table

Reference Number	Title, Revision Date, and/or Number	Definitive or Screening Data	Analytical Group	Instrument	Organization Performing Analysis	Modified for Project Work? (Y/N)
DW-1	Volatile Organics in Drinking Water by Purge and Trap by GC/MS, Rev 2.0, 3/07	Definite	TCL Volatiles (Trace)	GC-MS	DESA LAB	N
C-90	Analysis of Base/Neutral and Acid Compounds in Aqueous, Soil/Sediment and Waste Oil/Waste Organic Solvent Samples, Rev 2.0, 3/07	Definite	TCL Semivolatiles	GC-MS	DESA LAB	N
C-109	Determination of Trace Elements in Aqueous Trace Metals in Aqueous, Soil/Sediment/Sludge- ICP-AES, Rev 2.0, 3/07	Definite	TAL Metals	ICP-AES	DESA LAB	N
C-110	Mercury Analysis in Water and Soil/Sediments By CVAAS, Rev 2.0, 3/07	Definite	Mercury	CVAA	DESA LAB	N

QAPP Worksheet #24: Analytical Instrument Calibration Table

Instrument	Calibration Procedure	Frequency of Calibration	Acceptance Criteria	Corrective Action (CA)	Person Responsible for CA	SOP Reference[1]
ICP-AES	See SOP C-109	See SOP C-109	See SOP C-109	See SOP C-109	Assigned Lab personnel	SOP C-109
CVAAS	See SOP C-110	See SOP C-110	See SOP C-110	See SOP C-110	Assigned Lab personnel	SOP C-110
GC-MS	See SOP C- 90, C-89, DW-1	See SOP C- 90, C-89, DW-1	See SOP C- 90, C-89, DW-1	See SOP C- 90, C-89, DW-1	Assigned Lab personnel	SOP C- 90, C-89, DW-1

[1]Specify the appropriate reference letter or number from the Analytical SOP References table (Worksheet #23). Details can be found in Equipment Calibration SOP # C-19

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[1]
See list of Instrument given in Worksheet #24	See LQMP, G-10, G-11, G-12, G-19	See LQMP, G-10, G-11, G-12, G-19	See LQMP, G-10, G-11, G-12, G-19	See LQMP, G-10, G-11, G-12, G-19	See LQMP, G-10, G-11, G-12, G-19	See LQMP, G-10, G-11, G-12, G-19	See LQMP, G-10, G-11, G-12, G-19	See LQMP, G-10, G-11, G-12, G-19

[1] Specify the appropriate reference letter or number from the Analytical SOP References table (Worksheet #23).

QAPP Worksheet #26: Sample Handling System

SAMPLE COLLECTION, PACKAGING, AND SHIPMENT
Sample Collection (Personnel/Organization): RST 2 Site Project Manager, Weston Solutions, Inc., Region II
Sample Packaging (Personnel/Organization): RST 2 Site Project Manager and sampling team members, Weston Solutions, Inc., Region II
Coordination of Shipment (Personnel/Organization): RST 2 Site Project Manager, sampling team members, Weston Solutions, Inc., Region II
Type of Shipment/Carrier: RST 2 Hand-Delivered
SAMPLE RECEIPT AND ANALYSIS
Sample Receipt (Personnel/Organization): EPA DESA LAB
Sample Custody and Storage (Personnel/Organization): EPA DESA LAB
Sample Preparation (Personnel/Organization): EPA DESA LAB
Sample Determinative Analysis (Personnel/Organization): EPA DESA LAB
SAMPLE ARCHIVING
Field Sample Storage (No. of days from sample collection): Samples will be hand-delivered to the DESA laboratory within 48 hours (2day) after last sample is collected.
Sample Extract/Digestate Storage (No. of days from extraction/digestion): As per analytical methodology; see Worksheet #19
Biological Sample Storage (No. of days from sample collection): N/A
SAMPLE DISPOSAL
Personnel/Organization: Sample Technicians, EPA DESA Laboratory
Number of Days from Analysis: Until analysis and QA/QC checks are completed; as per analytical methodology; see Worksheet #19.

QAPP Worksheet #27: Sample Custody Requirements

Sample Identification Procedures: Each sample will be labeled with the site identification code and a sample type letter code and number that depicts a specific location. Depending on the type of sample, additional information such as depth, sampling round, date, etc. will be added. Examples of matrices are: DW = Drinking Water.

Example sample locations are:

Drinking water samples will be designated as: P0002-DW01-001 (Property P0002, Drinking water sample number DW01, field sample 001)

Trip Blanks will be designated as: TB_{DATE}

Location of the sample collected will be recorded in the project database and site logbook. A duplicate sample will be identified in the same manner as other samples and will be distinguished and documented in the field logbook. Depending on the type of sample, additional information such as sampling round, date, etc. will be added.

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

QAPP Worksheet #27: Sample Custody Requirements (Concluded)

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

Laboratory Sample Custody Procedures (receipt of samples, archiving, and disposal): A sample custodian at the laboratory will accept custody of the shipped samples, and check them for discrepancies, proper preservation, integrity, etc. If noted, issues will be forwarded to the laboratory manager for corrective action. The sample custodian will relinquish custody to the appropriate department for analysis. At this time, no samples will be archived at the laboratory. Disposal of the samples will occur only after analyses and QA/QC checks are completed.

Note: Refer to Contract Laboratory Program Guidance for Field Samplers, EPA-540-R-07-06, January 2011 at:
http://www.epa.gov/superfund/programs/clp/download/sampler/clp_sampler_guidance.pdf

QAPP Worksheet #28: QC Samples Table
Worksheet # 28A: Volatile Organics

Matrix	Aqueous
Analytical Group	VOC
Concentration Level	Trace/Low
Sampling SOP	EPA/ERT SOP No. 2007
Analytical Method/ SOP Reference	DW-1 (Ref: EPA 524.2)
Sampler's Name	RST 2
Field Sampling Organization	Weston Solutions, Inc.
Analytical Organization	EPA DESA Lab
No. of Sample Locations	11

QC Sample:	Frequency/Number	Method/SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria
Tuning	12 hr period	Pass all PBFB tune criteria	Check Instrument Reanalyze, Retune	Lab personnel	Sensitivity	Pass all PBFB tune criteria
Initial Calibration	SOP DW-1	% RSD +/- 20% Not more than 10% of total analytes failure	Check Instrument, Reanalyze	Lab personnel	Accuracy/ Precision	% RSD +/- 20% Not more than 10% of total analytes failure
Continuing Calibration Check Standard (Alternate check standard)	1 per analytical batch	Max %D RRF +/- 30% Not more than 10% of total analytes failure	Reanalyze, Qualify data	Lab personnel	Accuracy	Max %D RRF +/- 30% Not more than 10% of total analytes failure
Method Blank	1 per extraction batch	< RL	Investigate source of contamination	Lab personnel	Sensitivity Contamination	< RL
Trip Blank	1 per cooler containing VOC samples	Client Defined	Investigate source of contamination	Lab personnel	Sensitivity Contamination	NS

QAPP Worksheet #28: QC Samples Table
Worksheet # 28A: Volatile Organics (Concluded)

Matrix	Aqueous
Analytical Group	VOC
Concentration Level	Trace/Low
Sampling SOP	EPA/ERT SOP No. 2007
Analytical Method/ SOP Reference	DW-1 (Ref: EPA 524.2)
Sampler's Name	RST 2
Field Sampling Organization	Weston Solutions, Inc.
Analytical Organization	EPA DESA Lab
No. of Sample Locations	11

QC Sample:	Frequency/Number	Method/SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria
LCS/LFB	2 per extraction batch	Limits: Average Recovery 70-130% % RPD < 20	Qualify data unless high recovery and/or Not Detected)	Lab personnel	Accuracy/ Precision	Limits: Average Recovery 70-130% RPD 20%
Laboratory Matrix spikes	1 per extraction batch	Limits 70-130%	Qualify data unless high recovery and/or Not Detected)	Lab personnel	Accuracy	Limits 70-130%
Internal Standards	Each sample, standard, blank	+/- 40% from the initial/continuing calibration	Check Instrument Analyse / Qualify data	Lab personnel	Quantitation	+/- 40% from the initial/continuing calibration
Surrogates	Each sample, standard, blank	Limits 80%-120%	Reinject, Qualify data	Lab personnel	Extraction efficiency, Accuracy	Limits 80%-120%

QAPP Worksheet #28: QC Samples Table
Worksheet # 28B: Semivolatile Organics

Matrix	Aqueous
Analytical Group	TCL SVOCs
Concentration Level	Low
Sampling SOP	EPA/ERT SOP No. 2007
Analytical Method/ SOP Reference	C-90
Sampler's Name	Weston Solutions, Inc.
Field Sampling Organization	RST 2
Analytical Organization	EPA DESA Laboratory
No. of Sample Locations	11

QC Sample:	Frequency/Number	Method/SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria
Tuning	12 hr period	Pass all DFTPP tune criteria	Check Instrument Reanalyze, Retune	Lab personnel	Sensitivity	Pass all DFTPP tune criteria
Initial Calibration	SOP C-90	% RSD +/- 35% Allowed to fail 10% of total number of analytes but % RSD not be more than 60%	Check Instrument, Reanalyze	Lab personnel	Accuracy/ Precision	% RSD +/- 35% Allowed to fail 10% of total number of analytes but % RSD not be more than 60%
Continuing Calibration Check Standard (Alternate check standard)	1 per analytical batch of $\leq$ 20 samples	Min RRF 0.05 Max %D +/- 20% 10% of total analytes allowed to fail but not more than 60%	Reanalyze, Qualify data	Lab personnel	Accuracy	Min RRF 0.05 Max %D RRF +/- 20% 10% of total analytes allowed to fail but not more than 60%
Method Blank	1 per extraction batch of $\leq$ 20 samples	< RL	Investigate source of contamination	Lab personnel	Sensitivity Contamination	< RL

QAPP Worksheet #28: QC Samples Table
Worksheet # 28B: Semivolatile Organics (Concluded)

Matrix	Aqueous
Analytical Group	TCL SVOCs
Concentration Level	Low
Sampling SOP	EPA/ERT SOP No. 2007
Analytical Method/ SOP Reference	C-90
Sampler's Name	Weston Solutions, Inc.
Field Sampling Organization	RST 2
Analytical Organization	EPA DESA Laboratory
No. of Sample Locations	11

QC Sample:	Frequency/Number	Method/SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria
LCS/LFB	2 per extraction batch of ≤ 20 samples	Limits listed in Table3 in SOP C-90 for aqueous, manufacture's limits for soil % RPD < 30	Qualify data unless high recovery and/or Not Detected)	Lab personnel	Accuracy/ Precision	Limits listed in Table3 in SOP C-90 for aqueous, manufacture's limits for soil % RPD < 30
Laboratory Matrix spikes	1 per extraction batch of ≤ 20 samples	Limits listed in Table3 in SOP C-90	Qualify data unless high recovery and/or Not Detected)	Lab personnel	Accuracy	Limits listed in Table3 in SOP C-90
Internal Standards	Each sample, standard, blank	Factor of two (-50% to -100%)	Check Instrument Analyse / Qualify data	Lab personnel	Quantitation	Factor of two (-50% to -100%)
Surrogates	Each sample, standard, blank	30%-120% for Base Neutrals 20-120% for Acids	Reinject, Qualify data as per SOP C-90	Lab personnel	Extraction efficiency, Accuracy	30%-120% for Base Neutrals 20-120% for Acids

QAPP Worksheet #28: QC Samples Table
Worksheet # 28C: TAL Metals and Mercury– Inorganics

Matrix	Aqueous
Analytical Group	TAL Metals and mercury
Concentration Level	Low
Sampling SOP	EPA/ERT SOP No. 2007
Analytical Method/ SOP Reference	C-109 and C-110
Sampler's Name	Weston Solutions, Inc.
Field Sampling Organization	RST 2
Analytical Organization	EPA DESA Laboratory
No. of Sample Locations	11

QC Sample:	Frequency/Number	Method/SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria
Tuning/System Stability(ICP-MS)	As per C-112	Pass all the tune/stability criteria	Check Instrument Reanalyze, Retune	Lab personnel	Sensitivity	Pass all the tune/stability criteria
Initial Calibration Verification	Immediately following each calibration ,after every 10 samples and at the end of each analytical run	90%-110%	Check Instrument, Reanalyze	Lab personnel	Accuracy	90%-110%
Continuing Calibration Check Standard (Alternate check standard)	Every 10 samples and at the end of each analytical run	80%-120%	Reanalyze, Qualify data	Lab personnel	Accuracy	80%-120%
Initial Calibration Blank(ICB)	After ICV	< RL	Investigate source of contamination	Lab personnel	Sensitivity Contamination	< RL
Continuing Calibration Blank(CCB)	After every CCV	< RL	Investigate source of contamination	Lab personnel	Sensitivity Contamination	< RL
Low Level Check Standard	At Beginning and end of each analytical run	± 30% of the true value	Check Instrument, Re-calibrate	Lab personnel	Accuracy	± 30% of the true value

QAPP Worksheet #28: QC Samples Table
Worksheet # 28C: TAL Metals and Mercury– Inorganics (Concluded)

Matrix	Aqueous
Analytical Group	TAL Metals and mercury
Concentration Level	Low
Sampling SOP	EPA/ERT SOP No. 2007
Analytical Method/ SOP Reference	C-109 and C-110
Sampler's Name	Weston Solutions, Inc.
Field Sampling Organization	RST 2
Analytical Organization	EPA DESA Laboratory
No. of Sample Locations	11

QC Sample:	Frequency/Number	Method/SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria
Interference Check Sample(ICP-200.7)	At Beginning and end of each analytical run	< RL Except Al ,Fe, Ca, K, Mg and Na	As per C-109	Lab personnel	Precision	< RL Except Al ,Fe, Ca, K, Mg and Na
Method blank	1 per extraction batch of ≤ 20 samples	< RL	Investigate source of contamination	Lab personnel	Sensitivity Contamination	< RL
LCS/LFB	2 per extraction batch of ≤ 20 samples	Limits: Average Recovery ± 20% aqueous, ± 25% Soil) % RPD < 20(Aq), % RPD <25(Soil)	Qualify data	Lab personnel	Accuracy/ Precision	Limits: Average Recovery ± 20% aqueous, ± 25% Solids) % RPD < 20(Aq), % RPD <25(Soil
Laboratory Matrix spikes	1 per extraction batch of ≤ 20 samples	Limits ± 20% aqueous, ± 25% Soil)	Qualify data	Lab personnel	Accuracy	Limits ± 20% aqueous, ± 25% Soil)
Serial Dilution Test(ICP-200.7)	Matrix spike sample	RPD < 20 %	Qualify data	Lab personnel	Precision	RPD < 20 %
Internal Standards(ICP-MS 200.8)	Each sample, standard, blank	Range of 0.60-1.87 of the original response in the calibration blank	Check Instrument Analyse / Qualify data	Lab personnel	Quantitation	Range of 0.60-1.87 of the original response in the calibration blank

QAPP Worksheet #29: Project Documents and Records Table

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

QAPP Worksheet #30: Analytical Services Table

Matrix	Analytical Group	Concentration Level	Analytical SOP	Data Package Turnaround Time	Laboratory/Organization (Name and Address, Contact Person and Telephone Number)	Backup Laboratory/Organization (Name and Address, Contact Person and Telephone Number)
Aqueous	TCL VOCs	Trace	DW-1	14 days preliminary	EPA DESA Laboratory 2890 Woodbridge Ave. Bldg. 209, MS-230 Edison, NJ 08837 Tel.: (732) 906-6886	NA
	TCL SVOCs	Low	C-90	14 days preliminary		NA
	TAL Metals, and mercury	Low	C-109, C-110	14 days preliminary		NA

QAPP Worksheet #31: Planned Project Assessments Table

Assessment Type	Frequency	Internal or External	Organization Performing Assessment	Person(s) Responsible for Performing Assessment (Title and Organizational Affiliation)	Person(s) Responsible for Responding to Assessment Findings (Title and Organizational Affiliation)	Person(s) Responsible for Identifying and Implementing Corrective Actions (CA) (Title and Organizational Affiliation)	Person(s) Responsible for Monitoring Effectiveness of CA (Title and Organizational Affiliation)
PT	Semiannually	External	NELAC	PT provider	Lab Personnel	Lab Personnel	Lab QA Officer
NELAC	Every two years	External	NELAC	Florida DOH	Lab QA Officer	Lab Personnel	Florida DOH
INTERNAL AUDIT	Monthly	Internally	DESA Lab	Lab QA Officer	Lab Personnel	Lab Personnel	Lab QA Officer

QAPP Worksheet #32: Assessment Findings and Corrective Action Responses

Assessment Type	Nature of Deficiencies Documentation	Individual(s) Notified of Findings (Name, Title, Organization)	Timeframe of Notification	Nature of Corrective Action Response Documentation	Individual(s) Receiving Corrective Action Response (Name, Title, Org.)	Timeframe for Response
Project Readiness Review	Checklist or logbook entry	RST 2 Site Project Manager, Weston Solutions, Inc.	Immediately to within 24 hours of review	Checklist or logbook entry	RST 2 Site Project Leader	Immediately to within 24 hours of review
Field Observations/ Deviations from Work Plan	Logbook	RST 2 Site Project Manager, Weston Solutions, Inc. and EPA OSC	Immediately to within 24 hours of deviation	Logbook	RST 2 Site Project Manager and EPA OSC	Immediately to within 24 hours of deviation
Proficiency Testing (PT)	Letter with PT failure indicated	Lab QA Officer	30 days after the audit	Investigate the reason for the PT failure	Lab QA Officer	45 days after the CA report
NELAC	Audit Report with Non-conformance to QAPP, SOPs, NELAC+LQMP	Lab Management	30 days after the audit	Investigate and have a corrective action plan for the deficiencies	Florida DOH	30 days after receiving notification
INTERNAL	Audit Report with Non-conformance to QAPP, SOPs, NELAC Regulations	Lab Management	30 days after the audit	Investigate and have a corrective action plan for the deficiencies	Lab QA Officer	45 days after the CA report

QAPP Worksheet #33: QA Management Reports Table

Type of Report	Frequency (daily, weekly, monthly, quarterly, annually, etc.)	Projected Delivery Date(s)	Person(s) Responsible for Report Preparation (Title and Organizational Affiliation)	Report Recipient(s) (Title and Organizational Affiliation)
EPA DESA Laboratory Data (Preliminary)	As performed	14 days from the sampling date	EPA DESA Laboratory	EPA OSC and Site Project Manager
EPA DESA Laboratory Data (Validated)	As performed	Up to 21 days after receipt of preliminary data	EPA DESA Laboratory	EPA OSC and Site Project Manager
On-Site Field Inspection	As performed	7 calendar days after completion of the inspection	Weston Site Project Manager	Site Project Leader
Field Change Request	As required per field change	Three days after identification of need for field change	Weston Site Project Manager	EPA OSC
Final Report	As performed	2 weeks after receipt of EPA approval of data package	Weston Site Project Manager	EPA OSC

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

Verification Input	Description	Internal/ External	Responsible for Verification (Name, Organization)
Site/field logbooks	Field notes will be prepared daily by the RST 2 Site Project Manager and will be complete, appropriate, legible and pertinent. Upon completion of field work, logbooks will be placed in the project files.	I	RST 2 Site Project Manager
Chain of Custody	Chain-of-custody forms will be verified against the sample cooler they represent. Sample Acceptance Checklist is completed. The OSCAR staff supervisor utilizes the analyses request information and the external COC to review the accuracy and completeness of LIMS log-in entries, as reflected on the LIMS Sample Receipt Form Details can be found in Laboratory Quality Management Plan, SOP G-25	I	OSCAR Personnel DESA LAB
Sampling Trip Reports	STRs will be prepared for each week of field sampling [for which samples are sent to DESA LAB.] Information in the STR will be reviewed against the COC forms, and potential discrepancies will be discussed with field personnel to verify locations, dates, etc.	I	RST 2 Site Project Manager
Laboratory analytical data package	Data packages will be reviewed/verified internally by the laboratory performing the work for completeness and technical accuracy prior to submittal.	E	EPA DESA LAB
Analytical Data Package/ Final Report	The procedures for data review : 1- Data reduction/review by Primary Analyst. 2- Review complete data package (raw data) by independent Peer Reviewer 3- The Sample Project Coordinator reviews the project documentation for completeness followed by a QA review by the QAO 4- Final review by Branch Chief/Section Chief prior to release, this review is to ensure completeness and general compliance with the objectives of the project. This final review typically does not include a review of raw data. Details can be found in Laboratory Quality Management Plan.	I	Primary Analyst, Peer Reviewer, Sample Project Coordinator, Quality Assurance Officer, Section Chief/ Branch Chief. DESA LAB
Final Sample Report	The project data results will be compiled in a sample report for the project. Entries will be reviewed/verified against hardcopy information.	I	RST 2 Site Project Manager

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

Step IIa/IIb	Validation Input	Description	Responsible for Validation (Name, Organization)
IIa	SOPs	Ensure that the sampling methods/procedures outlined in QAPP were followed, and that any deviations were noted/approved.	RST 2 Site Project Manager
IIb	SOPs	Determine potential impacts from noted/approved deviations, in regard to PQOs.	RST 2 Site Project Manager
IIa	Chain of Custody	Chain-of-custody forms will be verified against the sample cooler they represent. Sample Acceptance Checklist is completed. The OSCAR staff supervisor utilizes the analyses request information and the external COC to review the accuracy and completeness of LIMS log-in entries, as reflected on the LIMS Sample Receipt Form Details can be found in Laboratory Quality Management Plan, SOP G-25	OSCAR Personnel DESA LAB
IIa/b	Analytical Data Package/ Final Report	The procedures for data review : 1- Data reduction/review by Primary Analyst. 2- Review complete data package (raw data) by independent Peer Reviewer 3- The Sample Project Coordinator reviews the project documentation for completeness followed by a QA review by the QAO 4- Final review by Branch Chief/Section Chief prior to release, this review is to ensure completeness and general compliance with the objectives of the project. This final review typically does not include a review of raw data. Details can be found in Laboratory Quality Management Plan.	Primary Analyst, Peer Reviewer, Sample Project Coordinator, Quality Assurance Officer, Section Chief/ Branch Chief. DESA LAB
IIb	Field duplicates	Compare results of field duplicate (or replicate) analyses with RPD criteria	EPA DESA LAB

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

Step IIa/IIb	Matrix	Analytical Group	Concentration Level	Validation Criteria	Data Validator (title and organizational affiliation)
IIa / IIb	Aqueous	TCL VOCs, TCL SVOCs, and TAL Metals, including mercury	Trace/Low	Data Validation SOP for Organic Analysis of Trace Concentration under DESA SOP DW-1, C-90, C-109, C-110, and SOP # G-26 Guidance for Laboratory data review.	DESA Data Validation Personnel, EPA, Region II

QAPP Worksheet #37: Usability Assessment

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

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

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

QAPP Worksheet #37: Usability Assessment- (Concluded)

The analytical data will be compared with applicable NYSDEC drinking water standards for private well water and will be used to assist the EPA in determining whether further Removal Actions will be required.

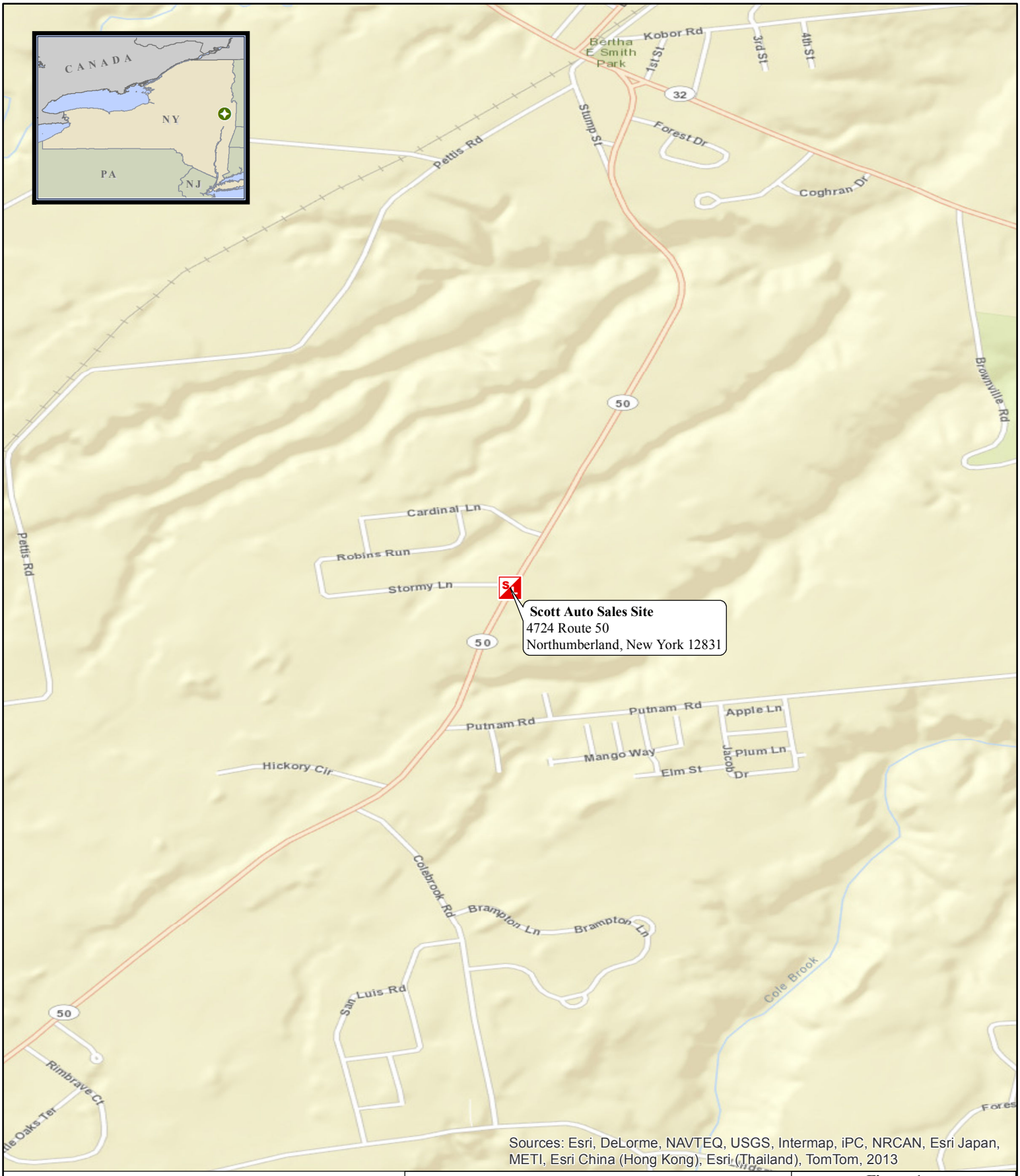
Identify the personnel responsible for performing the usability assessment: Site Project Management Team, Data Validation Personnel, and EPA Region 2 OSC

Describe the documentation that will be generated during usability assessment and how usability assessment results will be presented so that they identify trends, relationships (correlations), and anomalies:

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

Attachment A

Figure 1 – Site Location Map



Legend

S1 Site Location

N

0 833.5 1,667 3,334 Feet

Weston Solutions, Inc.
Northeast Division

In Association With
Avatar Environmental, LLC.,
H & S Environmental, Inc. and
Scientific and Environmental Associates, Inc.

Figure 1:
Site Location Map

SCOTT AUTO SALES
NORTHUMBERLAND, NEW YORK

U.S. ENVIRONMENTAL PROTECTION AGENCY
REMOVAL SUPPORT TEAM 2
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Attachment B

Sampling Standard Operating Procedures (SOPs)

EPA/ERT SOP No.: 2001 - General Field Sampling Guidelines
EPA/ERT SOP No.: 2007 - Groundwater Well Sampling

GENERAL FIELD SAMPLING GUIDELINES

SOP#: 2001
DATE: 08/11/94
REV. #: 0.0

1.0 SCOPE AND APPLICATION

The purpose of this Standard Operating Procedure (SOP) is to provide general field sampling guidelines that will assist REAC personnel in choosing sampling strategies, location, and frequency for proper assessment of site characteristics. This SOP is applicable to all field activities that involve sampling.

These are standard (i.e., typically applicable) operating procedures which may be varied or changed as required, dependent on site conditions, equipment limitations or limitations imposed by the procedure. In all instances, the ultimate procedures employed should be documented and associated with the final report.

Mention of trade names or commercial products does not constitute U.S. EPA endorsement or recommendation for use.

2.0 METHOD SUMMARY

Sampling is the selection of a representative portion of a larger population, universe, or body. Through examination of a sample, the characteristics of the larger body from which the sample was drawn can be inferred. In this manner, sampling can be a valuable tool for determining the presence, type, and extent of contamination by hazardous substances in the environment.

The primary objective of all sampling activities is to characterize a hazardous waste site accurately so that its impact on human health and the environment can be properly evaluated. It is only through sampling and analysis that site hazards can be measured and the job of cleanup and restoration can be accomplished effectively with minimal risk. The sampling itself must be conducted so that every sample collected retains its original physical form and chemical composition. In this way, sample integrity is insured, quality assurance standards are maintained, and the sample can accurately represent the larger body of material under investigation.

The extent to which valid inferences can be drawn from a sample depends on the degree to which the sampling effort conforms to the project's objectives. For example, as few as one sample may produce adequate, technically valid data to address the project's objectives. Meeting the project's objectives requires thorough planning of sampling activities, and implementation of the most appropriate sampling and analytical procedures. These issues will be discussed in this procedure.

3.0 SAMPLE PRESERVATION, CONTAINERS, HANDLING, AND STORAGE

The amount of sample to be collected, and the proper sample container type (i.e., glass, plastic), chemical preservation, and storage requirements are dependent on the matrix being sampled and the parameter(s) of interest. Sample preservation, containers, handling, and storage for air and waste samples are discussed in the specific SOPs for air and waste sampling techniques.

4.0 INTERFERENCES AND POTENTIAL PROBLEMS

The nature of the object or materials being sampled may be a potential problem to the sampler. If a material is homogeneous, it will generally have a uniform composition throughout. In this case, any sample increment can be considered representative of the material. On the other hand, heterogeneous samples present problems to the sampler because of changes in the material over distance, both laterally and vertically.

Samples of hazardous materials may pose a safety threat to both field and laboratory personnel. Proper health and safety precautions should be implemented when handling this type of sample.

Environmental conditions, weather conditions, or non-target chemicals may cause problems and/or interferences when performing sampling activities or when sampling for a specific parameter. Refer to the specific SOPs for sampling techniques.

5.0 EQUIPMENT/APPARATUS

The equipment/apparatus required to collect samples must be determined on a site specific basis. Due to the wide variety of sampling equipment available, refer to the specific SOPs for sampling techniques which include lists of the equipment/apparatus required for sampling.

6.0 REAGENTS

Reagents may be utilized for preservation of samples and for decontamination of sampling equipment. The preservatives required are specified by the analysis to be performed. Decontamination solutions are specified in ERT SOP #2006, Sampling Equipment Decontamination.

7.0 PROCEDURE

7.1 Types of Samples

In relation to the media to be sampled, two basic types of samples can be considered: the environmental sample and the hazardous sample.

Environmental samples are those collected from streams, ponds, lakes, wells, and are off-site samples that are not expected to be contaminated with hazardous materials. They usually do not require the special handling procedures typically used for concentrated wastes. However, in certain instances, environmental samples can contain elevated concentrations of pollutants and in such cases would have to be handled as hazardous samples.

Hazardous or concentrated samples are those collected from drums, tanks, lagoons, pits, waste piles, fresh spills, or areas previously identified as contaminated, and require special handling procedures because of their potential toxicity or hazard. These samples can be further subdivided based on their degree of hazard; however, care should be taken when handling and shipping any wastes believed to be concentrated regardless of the degree.

The importance of making the distinction between environmental and hazardous samples is two-fold:

(1) Personnel safety requirements: Any sample thought to contain enough hazardous materials to pose a safety threat should be designated as hazardous and handled in a manner which ensures the safety of both field and laboratory personnel.

(2) Transportation requirements: Hazardous samples must be packaged, labeled, and shipped according to the International Air Transport Association (IATA) Dangerous Goods Regulations or Department of Transportation (DOT) regulations and U.S. EPA guidelines.

7.2 Sample Collection Techniques

In general, two basic types of sample collection techniques are recognized, both of which can be used for either environmental or hazardous samples.

Grab Samples

A grab sample is defined as a discrete aliquot representative of a specific location at a given point in time. The sample is collected all at once at one particular point in the sample medium. The representativeness of such samples is defined by the nature of the materials being sampled. In general, as sources vary over time and distance, the representativeness of grab samples will decrease.

Composite Samples

Composites are nondiscrete samples composed of more than one specific aliquot collected at various sampling locations and/or different points in time. Analysis of this type of sample produces an average value and can in certain instances be used as an alternative to analyzing a number of individual grab samples and calculating an average value. It should be noted, however, that compositing can mask problems by diluting isolated concentrations of some hazardous compounds below detection limits.

Compositing is often used for environmental samples and may be used for hazardous samples under certain conditions. For example, compositing of hazardous waste is often performed after compatibility tests have

been completed to determine an average value over a number of different locations (group of drums). This procedure generates data that can be useful by providing an average concentration within a number of units, can serve to keep analytical costs down, and can provide information useful to transporters and waste disposal operations.

For sampling situations involving hazardous wastes, grab sampling techniques are generally preferred because grab sampling minimizes the amount of time sampling personnel must be in contact with the wastes, reduces risks associated with compositing unknowns, and eliminates chemical changes that might occur due to compositing.

7.3 Types of Sampling Strategies

The number of samples that should be collected and analyzed depends on the objective of the investigation. There are three basic sampling strategies: random, systematic, and judgmental sampling.

Random sampling involves collection of samples in a nonsystematic fashion from the entire site or a specific portion of a site. Systematic sampling involves collection of samples based on a grid or a pattern which has been previously established. When judgmental sampling is performed, samples are collected only from the portion(s) of the site most likely to be contaminated. Often, a combination of these strategies is the best approach depending on the type of the suspected/known contamination, the uniformity and size of the site, the level/type of information desired, etc.

7.4 QA Work Plans (QAWP)

A QAWP is required when it becomes evident that a field investigation is necessary. It should be initiated in conjunction with, or immediately following, notification of the field investigation. This plan should be clear and concise and should detail the following basic components, with regard to sampling activities:

- Objective and purpose of the investigation.
- Basis upon which data will be evaluated.
- Information known about the site including location, type and size of the facility, and length of operations/abandonment.
- Type and volume of contaminated material, contaminants of concern (including concentration), and basis of the information/data.
- Technical approach including media/matrix to be sampled, sampling equipment to be used, sample equipment decontamination (if necessary), sampling design and rationale, and SOPs or description of the procedure to be implemented.
- Project management and reporting, schedule, project organization and responsibilities, manpower and cost projections, and required deliverables.
- QA objectives and protocols including tables summarizing field sampling and QA/QC analysis and objectives.

Note that this list of QAWP components is not all-inclusive and that additional elements may be added or altered depending on the specific requirements of the field investigation. It should also be recognized that although a detailed QAWP is quite important, it may be impractical in some instances. Emergency responses and accidental spills are prime examples of such instances where time might prohibit the development of site-specific QAWPs prior to field activities. In such cases, investigators would have to rely on general guidelines and personal judgment, and the sampling or response plans might simply be a strategy based on preliminary information and finalized on site. In any event, a plan of action should be developed, no matter how concise or informal, to aid investigators in maintaining a logical and consistent order to the implementation of their task.

7.5 Legal Implications

The data derived from sampling activities are often introduced as critical evidence during litigation of a hazardous waste site cleanup. Legal issues in which sampling data are important may include cleanup cost recovery, identification of pollution sources and responsible parties, and technical validation of remedial design methodologies. Because of the potential for involvement in legal actions, strict adherence to technical and administrative SOPs is essential during both the development and implementation of sampling activities.

Technically valid sampling begins with thorough planning and continues through the sample collection and analytical procedures. Administrative requirements involve thorough, accurate

GROUNDWATER WELL SAMPLING

SOP#: 2007
DATE: 01/26/95
REV. #: 0.0

1.0 SCOPE AND APPLICATION

The objective of this standard operating procedure (SOP) is to provide general reference information on sampling of ground water wells. This guideline is primarily concerned with the collection of water samples from the saturated zone of the subsurface. Every effort must be made to ensure that the sample is representative of the particular zone of water being sampled. These procedures are designed to be used in conjunction with analyses for the most common types of ground water contaminants (e.g., volatile and semi-volatile organic compounds, pesticides, metals, biological parameters).

These are standard (i.e., typically applicable) operating procedures which may be varied or changed as required, dependent upon site conditions, equipment limitations or limitations imposed by the procedure. In all instances, the ultimate procedures employed should be documented and associated with the final report.

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2.0 METHOD SUMMARY

In order to obtain a representative groundwater sample for chemical analysis it is important to remove stagnant water in the well casing and the water immediately adjacent to the well before collection of the sample. This may be achieved with one of a number of instruments. The most common of these are the bailer, submersible pump, non-contact gas bladder pump, inertia pump and suction pump. At a minimum, three well volumes should be purged, if possible. Equipment must be decontaminated prior to use and between wells. Once purging is completed and the correct laboratory-cleaned sample containers have been prepared, sampling may proceed. Sampling may be conducted with any of the above instruments, and need not be the same as the device used for purging. Care should be taken when choosing the sampling device as some will affect the integrity of the sample. Sampling should occur in a progression from the least to most contaminated well, if this information is known.

The growing concern over the past several years over low levels of volatile organic compounds in water supplies has led to the development of highly sophisticated analytical methods that can provide detection limits at part per trillion levels. While the laboratory methods are extremely sensitive, well controlled and quality assured, they cannot compensate for a poorly collected sample. The collection of a sample should be as sensitive, highly developed and quality assured as the analytical procedures.

3.0 SAMPLE PRESERVATION, CONTAINERS, HANDLING, AND STORAGE

The type of analysis for which a sample is being collected determines the type of bottle, preservative, holding time, and filtering requirements. Samples should be collected directly from the sampling device into appropriate laboratory cleaned containers. Check that a Teflon liner is present in the cap, if required. Attach a sample identification label. Complete a field data sheet, a chain of custody form, and record all pertinent data in the site logbook.

Samples shall be appropriately preserved, labelled, logged, and placed in a cooler to be maintained at 4EC. Samples must be shipped well before the holding time is up and ideally should be shipped within 24 hours of sample collection. It is imperative that samples be shipped or delivered daily to the analytical laboratory in order to maximize the time available for the laboratory to perform the analyses. The bottles should be shipped with adequate packing and cooling to ensure that they arrive intact.

Sample retrieval systems suitable for the valid collection of volatile organic samples are: positive displacement bladder pumps, gear driven submersible pumps, syringe samplers and bailers (Barcelona, 1984; Nielsen, 1985). Field conditions and other constraints will limit the choice of appropriate systems. The focus of concern must remain to provide a valid sample for analysis, one which has been subjected to the least amount of turbulence possible.

Treatment of the sample with sodium thiosulfate preservative is required only if there is residual chlorine in the water that could cause free radical chlorination and change the identity of the original contaminants. It should not be used if there is no chlorine in the water.

Holding time for volatiles analysis is seven days. It is imperative that the sample be shipped or delivered daily to the analytical laboratory. The bottles must be shipped on their sides to aid in maintaining the airtight seal during shipment, with adequate packing and cooling to ensure that they arrive intact.

For collection of volatile organic samples, refer to the work plan to ensure that 40 mL glass sample vials with Teflon lined septa are ordered and in sufficient numbers. Check sampling supplies; field kit for chlorine, preservatives, Parafilm, foam sleeves and coolers. Due to the extreme trace levels at which volatile organics are detectable, cross contamination and introduction of contaminants must be avoided. Trip blanks are incorporated into the shipment package to provide a check against cross contamination.

4.0 INTERFERENCES AND POTENTIAL PROBLEMS

4.1 General

The primary goal in performing ground water sampling is to obtain a representative sample of the ground water body. Analysis can be compromised by field personnel in two primary ways: (1) taking an unrepresentative sample, or (2) by incorrect handling of the sample. There are numerous ways of introducing foreign contaminants into a sample, and these must be avoided by following strict sampling procedures and utilizing trained field personnel.

4.2 Purging

In a nonpumping well, there will be little or no vertical mixing of the water, and stratification will occur. The well water in the screened section will mix with the ground water due to normal flow patterns, but the well water above the screened section will remain isolated, become stagnant, and may lack the contaminants representative of the ground water. Persons sampling should realize that stagnant water may contain foreign material inadvertently or deliberately introduced from the surface, resulting in an unrepresentative sample. To safeguard against collecting nonrepresentative stagnant water, the following guidelines and techniques should be adhered to during sampling:

1. As a general rule, all monitor wells should be pumped or bailed prior to sampling. Purge water should be containerized on site or handled as specified in the site specific project plan. Evacuation of a minimum of one volume of water in the well casing, and preferably three to five volumes, is recommended for a representative sample. In a high-yielding ground water formation and where there is no stagnant water in the well above the screened section, evacuation prior to sample withdrawal is not as critical. However, in all cases where the monitoring data is to be used for enforcement actions, evacuation is recommended.

2. When purging with a pump (not a bailer), the pump should be set at the screened interval, or if the well is an open-rock well, it should be set at the same depth the sample will be collected. When sampling a screened well, the sample should also be collected from the same depth the pump was set at.

3. The well should be sampled as soon as possible after purging.

4. Analytical parameters typically dictate whether the sample should be collected through the purging device, or through a separate sampling instrument.

5. For wells that can be pumped or bailed to dryness with the equipment being used, the well should be evacuated and allowed to recover prior to collecting a sample. If the recovery rate is fairly rapid and time allows, evacuation of more than one volume of water

is preferred. If recovery is slow, sample the well upon recovery after one evacuation.

6. A non-representative sample can also result from excessive pre-pumping of the monitoring well. Stratification of the leachate concentration in the ground water formation may occur, or heavier-than-water compounds may sink to the lower portions of the aquifer. Excessive pumping can dilute or increase the contaminant concentrations from what is representative of the sampling point of interest.

4.3 Materials

Materials of construction for samplers and evacuation equipment (bladders, pump, bailers, tubing, etc.) should be limited to stainless steel, Teflon^{R}, and glass in areas where concentrations are expected to be at or near the detection limit. The tendency of organics to leach into and out of many materials make the selection of materials critical for trace analyses. The use of plastics, such as PVC or polyethylene, should be avoided when analyzing for organics. However, PVC may be used for evacuation equipment as it will not come in contact with the sample, and in highly contaminated wells, disposable equipment (i.e., polypropylene bailers) may be appropriate to avoid cross-contamination.

Materials of construction (bladders/ pumps, bailers, tubing, etc.) suitable for collecting and handling Volatile Organic Samples should be limited to stainless steel, Teflon and glass in areas which detection limit range concentrations are expected. The tendency of organics to leach into and out of many materials, make the selection of materials critical for these trace analyses. The use of plastics, e.g., PVC etc., should be avoided. There are numerous ways of introducing foreign contaminants into a sample, and these must be avoided by following strict sampling procedures and utlization of trained personnel.

4.4 Advantages/Disadvantages of Certain Equipment

4.4.1 Bailers

Advantages

C Only practical limitations on size and materials

C No power source needed

C Portable

C Inexpensive, so it can be dedicated and hung in a well, thereby reducing the chances of cross contamination

C Minimal outgassing of volatile organics while sample is in bailer

C Readily available

C Removes stagnant water first

C Rapid, simple method for removing small volumes of purge water

Disadvantages

C Time-consuming to flush a large well of stagnant water

C Transfer of sample may cause aeration

C Stoppers at the bottom of the bailer usually leak thus the bailer must be brought to the surface rapidly

C If the bailer is allowed to hit the bottom of the well boring, gravel can displace the ball valve not allowing the bailer to hold water

4.4.2 Submersible Pumps

Advantages

C Portable and can be transported to several wells

C Depending upon the size of the pump and the pumping depths, relatively high pumping rates are possible

C Generally very reliable and does not require priming

Disadvantages

- Potential for effects on analysis of trace organics
- Heavy and cumbersome to deal with, particularly in deeper wells
- Expensive
- Power source needed
- Sediment in water may cause problems with the pumps
- Impractical in low yielding or shallow wells

4.4.3 Non-Contact Gas Bladder Pumps

Advantages

- Maintains integrity of sample
- Easy to use
- Can sample from discrete locations within the monitor well

Disadvantages

- Difficulty in cleaning, though dedicated tubing and bladder may be used
- Only useful to about 100 feet
- Supply of gas for operation, gas bottles and/or compressors are often difficult to obtain and are cumbersome
- Relatively low pumping rates
- Requires air compressor or pressurized gas source and control box

4.4.4 Suction Pumps

Advantages

- Portable, inexpensive, and readily available

Disadvantages

- Restricted to areas with water levels within 20 to 25 feet of the ground surface
- Vacuum can cause loss of dissolved gasses and volatile organics
- Pump must be primed and vacuum is often difficult to maintain during initial stages of pumping

4.4.5 Inertia Pumps

Advantages

- Portable, inexpensive, and readily available
- Offers a rapid method for purging relatively shallow wells

Disadvantages

- Restricted to areas with water levels within 70 feet of the ground surface
- May be time consuming to purge wells with these manual pumps
- Labor intensive
- WaTerra pumps are only effective in 2-inch diameter wells

5.0 EQUIPMENT APPARATUS

5.1 Equipment Checklist

5.1.1 General

- Water level indicator
  - electric sounder
  - steel tape
  - transducer
  - reflection sounder
  - airline
- Depth sounder
- Appropriate keys for well cap locks
- Steel brush
- HNU or OVA (whichever is most appropriate)
- Logbook
- Calculator
- Field data sheets and samples labels
- Chain of custody records and seals
- Sample containers
- Engineer's rule

- C Sharp knife (locking blade)
- C Tool box (to include at least: screwdrivers, pliers, hacksaw, hammer, flashlight, adjustable wrench)
- C Leather work gloves
- C Appropriate Health & Safety gear
- C 5-gallon pail
- C Plastic sheeting
- C Shipping containers
- C Packing materials
- C Bolt cutters
- C Ziploc plastic bags
- C Containers for evacuation liquids
- C Decontamination solutions
- C Tap water
- C Non phosphate soap
- C Several brushes
- C Pails or tubs
- C Aluminum foil
- C Garden sprayer
- C Preservatives
- C Distilled or deionized water
- C Fire extinguisher (if using a generator for your power source)

5.1.2 Bailers

- C Clean, decontaminated bailers of appropriate size and construction material
- C Nylon line, enough to dedicate to each well
- C Teflon coated bailer wire
- C Sharp knife
- C Aluminum foil (to wrap clean bailers)
- C Five gallon bucket

5.1.3 Submersible Pump

- C Pump(s)
- C Generator (110, 120, or 240 volt) or 12 volt battery if inaccessible to field vehicle - amp meter is useful
- C 1" black PVC coil tubing - enough to dedicate to each well
- C Hose clamps
- C Safety cable
- C Tool box supplement
  - pipe wrenches
  - wire strippers
  - electrical tape
  - heat shrink
  - hose connectors
  - Teflon tape
- C Winch, pulley or hoist
- C Gasoline for generator/gas can
- C Flow meter with gate valve
- C 1" nipples and various plumbing (i.e., pipe connectors)
- C Control box (if necessary)

5.1.4 Non-Gas Contact Bladder Pump

- C Non-gas contact bladder pump
- C Compressor or nitrogen gas tank
- C Batteries and charger
- C Teflon tubing - enough to dedicate to each well
- C Swagelock fitting
- C Toolbox supplements - same as submersible pump
- C Control box (if necessary)

5.1.5 Suction Pump

- C Pump
- C 1" black PVC coil tubing - enough to dedicate to each well
- C Gasoline - if required
- C Toolbox
- C Plumbing fittings
- C Flow meter with gate valve

5.1.6 Inertia Pump

- C Pump assembly (WaTerra pump, piston pump)
- C Five gallon bucket

6.0 REAGENTS

Reagents may be utilized for preservation of samples and for decontamination of sampling equipment. The preservatives required are specified by the analysis to be performed. Decontamination solutions are specified in ERT SOP #2006, Sampling Equipment Decontamination.

7.0 PROCEDURE

7.1 Preparation

1. Determine the extent of the sampling effort, the sampling methods to be employed, and the types and amounts of equipment and

supplies needed (i.e, diameter and depth of wells to be sampled).

2. Obtain necessary sampling and monitoring equipment, appropriate to type of contaminant being investigated. For collection of volatile organic samples, refer to the work plan to ensure that 40 mL glass sample vials with Teflon lined septa are ordered and in sufficient numbers. Check sampling supplies; field kit for chlorine, preservatives, Parafilm, foam sleeves and coolers. Due to extreme trace levels at which volatile organics are detectable, cross contamination and introduction of contaminants must be avoided. Trip blanks are incorporated into the shipment package to provide a check against cross contamination.

3. Decontaminate or preclean equipment, and ensure that it is in working order.

4. Prepare scheduling and coordinate with staff, clients, and regulatory agency, if appropriate.

5. Perform a general site survey prior to site entry in accordance with the site specific Health and Safety Plan.

6. Identify and mark all sampling locations.

7.2 Field Preparation

1. Start at the least contaminated well, if known.

2. Lay plastic sheeting around the well to minimize likelihood of contamination of equipment from soil adjacent to the well.

3. Remove locking well cap, note location, time of day, and date in field notebook or appropriate log form.

4. Remove well casing cap.

5. Screen headspace of well with an appropriate monitoring instrument to determine the presence of volatile organic compounds and record in site logbook.

6. Lower water level measuring device or equivalent (i.e., permanently installed transducers or airline) into well until water surface is encountered.

7. Measure distance from water surface to reference measuring point on well casing or protective barrier post and record in site logbook. Alternatively, if no reference point, note that water level measurement is from top of steel casing, top of PVC riser pipe, from ground surface, or some other position on the well head.

   If floating organics are of concern, this can be determined by measuring the water level with an oil/water interface probe which measures floating organics.

8. Measure total depth of well (at least twice to confirm measurement) and record in site logbook or on field data sheet.

9. Calculate the volume of water in the well and the volume to be purged using the calculations in Section 8.0.

10. Select the appropriate purging and sampling equipment.

11. If residual chlorine is suspected, use the Hach Field Test Kit for chlorine to determine if there is residual chlorine in the water to be sampled. If there is, treat the sample vial with a crystal of sodium thiosulfate prior to sample collection.

7.3 Purging

The amount of flushing a well receives prior to sample collection depends on the intent of the monitoring program as well as the hydrogeologic conditions. Programs where overall quality determination of water resources are involved may require long pumping periods to obtain a sample that is representative of a large volume of that aquifer. The pumped volume can be determined prior to sampling so that the sample is a collected after a known volume of the water is evacuated from the aquifer, or the well can be pumped until the stabilization of parameters such as temperature, electrical conductance, pH, or turbidity has occurred.

However, monitoring for defining a contaminant plume requires a representative sample of a small volume of the aquifer. These circumstances require that the well be pumped enough to remove the stagnant water but not enough to induce flow from other areas. Generally, three well volumes are considered effective, or calculations can be made to determine, on the basis of the aquifer parameters and well dimensions, the appropriate volume to remove prior to sampling.

During purging, water level measurements may be taken regularly at 15-30 second intervals. This data may be used to compute aquifer transmissivity and other hydraulic characteristics. The following well evacuation devices are most commonly used. Other evacuation devices are available, but have been omitted in this discussion due to their limited use.

7.3.1 Bailers

Bailers are the simplest purging device used and have many advantages. They generally consist of a rigid length of tube, usually with a ball check-valve at the bottom. A line is used to lower the bailer into the well and retrieve a volume of water. The three most common types of bailer are PVC, Teflon, and stainless steel.

This manual method of purging is best suited to shallow or narrow diameter wells. For deep, larger diameter wells which require evacuation of large volumes of water, other mechanical devices may be more appropriate.

7.3.1.1 Operation

Equipment needed will include a clean decontaminated bailer, Teflon or nylon line, a sharp knife, and plastic sheeting.

1. Determine the volume of water to be purged as described in 8.0, calculations.

2. Lay plastic sheeting around the well to prevent contamination of the bailer line with foreign materials.

3. Attach the line to the bailer and slowly lower until the bailer is completely submerged, being careful not to drop the bailer to the water, causing turbulence and the possible loss of volatile organic contaminants.

4. Pull bailer out ensuring that the line either falls onto a clean area of plastic sheeting or never touches the ground.

5. Empty the bailer into a pail until full to determine the number of bails necessary to achieve the required purge volume.

6. Thereafter, pour the water into a container and dispose of purge waters as specified in the site specific sampling plan.

7.3.2 Submersible Pumps

The use of submersible pumps for sample collection is permissible provided they are constructed of suitably noncontaminating materials. The chief drawback, however, is the difficulty avoiding cross-contamination between wells. Although some units can be disassembled easily to allow surfaces contacted by contaminants to be cleaned, field decontamination may be difficult and require solvents that can affect sample analysis. The use of submersible pumps in multiple well-sampling programs, therefore, should be carefully considered against other sampling mechanisms (bailers, bladder pumps). In most cases, a sample can be collected by bailer after purging with a submersible pump, however, submersible pumps may be the only practical sampling device for extremely deep wells (greater than 300 feet of water). Under those conditions, dedicated pump systems should be installed to eliminate the potential for cross-contamination of well samples.

Submersible pumps generally use one of two types of power supplies, either electric or compressed gas or air. Electric powered pumps can run off a 12 volt DC rechargeable battery, or a 110 or 220 volt AC power supply. Those units powered by compressed air normally use a small electric or gas-powered air compressor. They may also utilize compressed gas (i.e., nitrogen) from bottles. Different size pumps are available for different depth or diameter monitoring wells.

7.3.2.1 Operation

1. Determine the volume of water to be purged as described in 8.0 Calculations.

2. Lay plastic sheeting around the well to prevent contamination of pumps, hoses or lines with foreign materials.

3. Assemble pump, hoses and safety cable, and lower the pump into the well. Make sure the pump is deep enough so all the water is not evacuated. (Running the pump without water may cause damage.)

4. Attach flow meter to the outlet hose to measure the volume of water purged.

5. Use a ground fault circuit interrupter (GFCI) or ground the generator to avoid possible electric shock.

6. Attach power supply, and purge the well until the specified volume of water has been

evacuated (or until field parameters, such as temperature, pH, conductivity, etc, have stabilized). Do not allow the pump to run dry. If the pumping rate exceeds the well recharge rate, lower the pump further into the well, and continue pumping.

7. Collect and dispose of purge waters as specified in the site specific sampling plan.

7.3.3 Non-Contact Gas Bladder Pumps

For this procedure, an all stainless-steel and Teflon Middleburg-squeeze bladder pump (e.g., IEA, TIMCO, Well Wizard, Geoguard, and others) is used to provide the least amount of material interference to the sample (Barcelona, 1985). Water comes into contact with the inside of the bladder (Teflon) and the sample tubing, also Teflon, that may be dedicated to each well. Some wells may have permanently installed bladder pumps, (i.e., Well Wizard, Geoguard), that will be used to sample for all parameters.

7.3.3.1 Operation

1. Assemble Teflon tubing, pump and charged control box.

2. Procedure for purging with a bladder pump is the same as for a submersible pump (Section 7.3.2.1).

3. Be sure to adjust flow rate to prevent violent jolting of the hose as sample is drawn in.

7.3.4 Suction Pumps

There are many different types of suction pumps. They include: centrifugal, peristaltic and diaphragm. Diaphragm pumps can be used for well evacuation at a fast pumping rate and sampling at a low pumping rate. The peristaltic pump is a low volume pump that uses rollers to squeeze the flexible tubing thereby creating suction. This tubing can be dedicated to a well to prevent cross contamination. Peristaltic pumps, however, require a power source.

7.3.4.1 Operation

1. Assembly of the pump, tubing, and power source if necessary.

2. Procedure for purging with a suction pump is exactly the same as for a submersible pump (Section 7.3.2.1).

7.3.5 Inertia Pumps

Inertia pumps such as the WaTerra pump and piston pump, are manually operated. They are most appropriate to use when wells are too deep to bail by hand, or too shallow or narrow (or inaccessible) to warrant an automatic (submersible, etc.) pump. These pumps are made of plastic and may be either decontaminated or discarded.

7.3.5.1 Operation

1. Determine the volume of water to be purged as described in 8.0, Calculations.

2. Lay plastic sheeting around the well to prevent contamination of pumps or hoses with foreign materials.

3. Assemble pump and lower to the appropriate depth in the well.

4. Begin pumping manually, discharging water into a 5 gallon bucket (or other graduated vessel). Purge until specified volume of water has been evacuated (or until field parameters such as temperature, pH, conductivity, etc. have stabilized).

5. Collect and dispose of purge waters as specified in the site specific project plan.

7.4 Sampling

Sample withdrawal methods require the use of pumps, compressed air, bailers, and samplers. Ideally, purging and sample withdrawal equipment should be completely inert, economical to manufacture, easily cleaned, sterilized, reusable, able to operate at remote sites in the absence of power resources, and capable of delivering variable rates for sample collection.

There are several factors to take into consideration when choosing a sampling device. Care should be taken when reviewing the advantages or disadvantages of any one device. It may be appropriate to use a different device to sample than that which was used to purge. The most common example of this is the use of a submersible pump to purge and a bailer to sample.

7.4.1 Bailers

The positive-displacement volatile sampling bailer is perhaps the most appropriate for collection of water samples for volatile analysis. Other bailer types (messenger, bottom fill, etc.) are less desirable, but may be mandated by cost and site conditions.

7.4.1.1 Operation

1. Surround the monitor well with clean plastic sheeting. If using the GPI bailer, insert a vial into the claim and assemble the unit.

2. Attach a line to a clean decontaminated bailer.

3. Lower the bailer slowly and gently into the well, taking care not to shake the casing sides or to splash the bailer into the water. Stop lowering at a point adjacent to the screen.

4. Allow bailer to fill and then slowly and gently retrieve the bailer from the well avoiding contact with the casing, so as not to knock flakes of rust or other foreign materials into the bailer. If using the GPI bailer for collecting volatile organic samples, once at the surface, remove the bailer from the cable. Carefully open the GPI bailer unit and remove the vial. Begin slowly pouring from the bailer, and collect the duplicate samples from the midstream sample.

5. Remove the cap from the sample container and place it on the plastic sheet or in a location where it won't become contaminated. See Section 7.7 for special considerations on VOA samples.

6. Begin slowly pouring from the bailer.

7. Filter and preserve samples as required by sampling plan.

8. Cap the sample container tightly and place prelabeled sample container in a carrier.

9. Replace the well cap.

10. Log all samples in the site logbook and on field data sheets and label all samples.

11. Package samples and complete necessary

paperwork.

12. Transport sample to decontamination zone for preparation for transport to analytical laboratory.

7.4.2 Submersible Pumps

Although it is recommended that samples not be collected with a submersible pump due to the reasons stated in Section 4.4.2, there are some situations where they may be used.

7.4.2.1 Operation

1. Allow the monitor well to recharge after purging, keeping the pump just above screened section.

2. Attach gate valve to hose (if not already fitted), and reduce flow of water to a manageable sampling rate.

3. Assemble the appropriate bottles.

4. If no gate valve is available, run the water down the side of a clean jar and fill the sample bottles from the jar.

5. Cap the sample container tightly and place prelabeled sample container in a carrier.

6. Replace the well cap.

7. Log all samples in the site logbook and on the field data sheets and label all samples.

8. Package samples and complete necessary paperwork.

9. Transport sample to decontamination zone for preparation for transport to the analytical laboratory.

10. Upon completion, remove pump and assembly and fully decontaminate prior to setting into the next sample well. Dedicate the tubing to the hole.

7.4.3 Non-Contact Gas Bladder Pumps

The use of a non-contact gas positive displacement bladder pump is often mandated by the use of dedicated pumps installed in wells. These pumps are also suitable for shallow (less than 100 feet) wells. They are somewhat difficult to clean, but may be used with dedicated sample tubing to avoid cleaning. These pumps require a power supply and a compressed gas supply (or compressor). They may be operated at variable flow and pressure rates making them ideal for both purging and sampling.

Barcelona (1984) and Nielsen (1985) report that the non-contact gas positive displacement pumps cause the least amount of alteration in sample integrity as compared to other sample retrieval methods.

7.4.3.1 Operation

1. Allow well to recharge after purging.

2. Assemble the appropriate bottles.

3. Turn pump on, increase the cycle time and reduce the pressure to the minimum that will allow the sample to come to the surface.

4. Cap the sample container tightly and place prelabeled sample container in a carrier.

5. Replace the well cap.

6. Log all samples in the site logbook and on field data sheets and label all samples.

7. Package samples and complete necessary paperwork.

8. Transport sample to decontamination zone for preparation for transport to analytical laboratory.

9. On completion, remove the tubing from the well and either replace the Teflon tubing and bladder with new dedicated tubing and bladder or rigorously decontaminate the existing materials.

10. Nonfiltered samples shall be collected directly from the outlet tubing into the sample bottle.

11. For filtered samples, connect the pump outlet tubing directly to the filter unit. The pump

pressure should remain decreased so that the pressure build up on the filter does not blow out the pump bladder or displace the filter. For the Geotech barrel filter, no actual connections are necessary so this is not a concern.

7.4.4 Suction Pumps

In view of the limitations of these type pumps, they are not recommended for sampling purposes.

7.4.5 Inertia Pumps

Inertia pumps may be used to collect samples. It is more common, however, to purge with these pumps and sample with a bailer (Section 7.4.1).

7.4.5.1 Operation

1. Following well evacuation, allow the well to recharge.

2. Assemble the appropriate bottles.

3. Since these pumps are manually operated, the flow rate may be regulated by the sampler. The sample may be discharged from the pump outlet directly into the appropriate sample container.

4. Cap the sample container tightly and place prelabeled sample container in a carrier.

5. Replace the well cap.

6. Log all samples in the site logbook and on field data sheets and label all samples.

7. Package samples and complete necessary paperwork.

8. Transport sample to decontamination zone for preparation for transport to the analytical laboratory.

9. Upon completion, remove pump and decontaminate or discard, as appropriate.

7.4.6. Sample Retrieval - Syringe

A limited number of commercial syringe type samplers are available, (IEA, TIMCO, etc.) some are homemade devices. These devices are claimed to provide good quality samples for volatile analysis, but are severly limited in sample volume and are specific to sampling for volatiles. Essentially, they operated with an evacuated chamber that is lowered down the well, and allowed to fill with the pressure of the water. The entire mechanism is then brought to the surface with the sample. The sample may then be transferred to a sample vial, or the entire unit may be sent as the sample container.

1. Evacuate the syringe if necessary, and lower the sampling device to just below the well screen.

2. Remove the constriction from the device and allow the sample to fill the syringe, apply slight suction as necessary.

3. Bring unit to the surface. If necessary, transfer the sample to vials, as outlined in steps 2 through 7 above.

7.5 Filtering

For samples requiring filtering, such as total metals analysis, the filter must be decontaminated prior to and between uses. Filters work by two methods. A barrel filter such as the "Geotech" filter works with a bicycle pump, used to build up positive pressure in the chamber containing the sample which is then forced through the filter paper (minimum size 0.45 µm) into a jar placed underneath. The barrel itself is filled manually from the bailer or directly via the hose of the sampling pump. The pressure must be maintained up to 30 lbs/in^2 by periodic pumping.

A vacuum type filter involves two chambers; the upper chamber contains the sample and a filter (minimum size 0.45 µm) divides the chambers. Using a hand pump or a Gilian type pump, air is withdrawn from the lower chamber, creating a vacuum and thus causing the sample to move through the filter into the lower chamber where it is drained into a sample jar. Repeated pumping may be required to drain all the sample into the lower chamber. If preservation of the sample is necessary, this should be done after filtering.

7.6 Post Operation

After all samples are collected and preserved, the sampling equipment should be decontaminated prior to sampling another well to prevent cross-contamination of equipment and monitor wells between locations.

1. Decontaminate all equipment.

2. Replace sampling equipment in storage containers.

3. Prepare and transport ground water samples to the laboratory. Check sample documentation and make sure samples are properly packed for shipment.

7.7 Special Considerations for VOA Sampling

The proper collection of a sample for volatile organics requires minimal disturbance of the sample to limit volatilization and therefore a loss of volatiles from the sample.

Sample retrieval systems suitable for the valid collection of volatile organic samples are: positive displacement bladder pumps, gear driven submersible pumps, syringe samplers and bailers (Barcelona, 1984; Nielsen, 1985). Field conditions and other constraints will limit the choice of appropriate systems. The focus of concern must be to provide a valid sample for analysis, one which has been subjected to the least amount of turbulence possible.

The following procedures should be followed:

1. Open the vial, set cap in a clean place, and collect the sample during the middle of the cycle. When collecting duplicates, collect both samples at the same time.

2. Fill the vial to just overflowing. Do not rinse the vial, nor excessively overflow it. There should be a convex meniscus on the top of the vial.

3. Check that the cap has not been contaminated (splashed) and carefully cap the vial. Place the cap directly over the top and screw down firmly. Do not overtighten and break the cap.

4. Invert the vial and tap gently. Observe vial for at least ten (10) seconds. If an air bubble appears, discard the sample and begin again. It is imperative that no entrapped air is in the sample vial.

5. Immediately place the vial in the protective foam sleeve and place into the cooler, oriented so that it is lying on its side, not straight up.

6. The holding time for VOAs is seven days. Samples should be shipped or delivered to the laboratory daily so as not to exceed the holding time. Ensure that the samples remain at 4EC, but do not allow them to freeze.

8.0 CALCULATIONS

If it is necessary to calculate the volume of the well, utilize the following equation:

$$\textit{Well volume} \quad ' \quad nr^2h\ (cf) \qquad [\textit{Equation}\ 1]$$

where:

n	=	pi
r	=	radius of monitoring well (feet)
h	=	height of the water column (feet) [This may be determined by subtracting the depth to water from the total depth of the well as measured from the same reference point.]
cf	=	conversion factor (gal/ft^3) = 7.48 gal/ft^3 [In this equation, 7.48 gal/ft^3 is the necessary conversion factor.]

Monitor well diameters are typically 2", 3", 4", or 6". Knowing the diameter of the monitor well, there are a number of standard conversion factors which can be used to simplify the equation above.

The volume, in gallons per linear foot, for various standard monitor well diameters can be calculated as follows:

$$v(gal/ft) \quad ' \quad nr^2\ (cf) \qquad [\textit{Equation}\ 2]$$

where:

n	=	pi
r	=	radius of monitoring well (feet)
cf	=	conversion factor (7.48 gal/ft^3)

For a 2" diameter well, the volume per linear foot can be calculated as follows:

$$\textit{vol/linear ft} = nr^2 (cf) \quad [\textit{Equation } 2]$$
$$= 3.14\ (1/12\ ft)^2\ \ 7.48\ gal/ft^3$$
$$= 0.1632\ gal/ft$$

Remember that if you have a 2" diameter well, you must convert this to the radius in feet to be able to use the equation.

The conversion factors for the common size monitor wells are as follows:

Well diameter	2"	3"	4"	6"
Volume (gal/ft.)	0.1632	0.3672	0.6528	1.4688

If you utilize the conversation factors above, Equation 1 should be modified as follows:

$$\textit{Well volume} = (h)(cf) \quad [\textit{Equation } 3]$$

where:

h	=	height of water column (feet)
cf	=	the conversion factor calculated from Equation 2

The well volume is typically tripled to determine the volume to be purged.

9.0 QUALITY ASSURANCE/ QUALITY CONTROL

There are no specific quality assurance (QA) activities which apply to the implementation of these procedures. However, the following general QA procedures apply:

1. All data must be documented on field data sheets or within site logbooks.

2. All instrumentation must be operated in accordance with operating instructions as supplied by the manufacturer, unless otherwise specified in the work plan. Equipment checkout and calibration activities must occur prior to sampling/operation and they must be documented.

3. The collection of rinsate blanks is recommended to evaluate potential for cross contamination from the purging and/or sampling equipment.

4. Trip blanks are required if analytical parameters include VOAs.

10.0 DATA VALIDATION

This section is not applicable to this SOP.

11.0 HEALTH AND SAFETY

When working with potentially hazardous materials, follow U.S. EPA, OSHA or REAC health and safety guidelines. More specifically, depending upon the site specific contaminants, various protective programs must be implemented prior to sampling the first well. The site health and safety plan should be reviewed with specific emphasis placed on the protection program planned for the well sampling tasks. Standard safe operating practices should be followed such as minimizing contact with potential contaminants in both the vapor phase and liquid matrix through the use of respirators and disposable clothing.

When working around volatile organic contaminants:

1. Avoid breathing constituents venting from the well.

2. Pre-survey the well head-space with an FID/PID prior to sampling.

3. If monitoring results indicate organic constituents, sampling activities may be conducted in Level C protection. At a minimum, skin protection will be afforded by disposable protective clothing.

Physical hazards associated with well sampling:

1. Lifting injuries associated with pump and bailers retrieval; moving equipment.

2. Use of pocket knives for cutting discharge hose.

3. Heat/cold stress as a result of exposure to extreme temperatures and protective clothing.

4. Slip, trip, fall conditions as a result of pump discharge.

5. Restricted mobility due to the wearing of protective clothing.

6. Electrical shock associated with use of submersible pumps is possible. Use a GFCI or a copper grounding stake to avoid this problem.

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documentation of all sampling activities. Documentation requirements include maintenance of a chain of custody, as well as accurate records of field activities and analytical instructions. Failure to observe these procedures fully and consistently may result in data that are questionable, invalid and non-defensible in court, and the consequent loss of enforcement proceedings.

8.0 CALCULATIONS

Refer to the specific SOPs for any calculations which are associated with sampling techniques.

9.0 QUALITY ASSURANCE/ QUALITY CONTROL

Refer to the specific SOPs for the type and frequency of QA/QC samples to be analyzed, the acceptance criteria for the QA/QC samples, and any other QA/QC activities which are associated with sampling techniques.

10.0 DATA VALIDATION

Refer to the specific SOPs for data validation activities that are associated with sampling techniques.

11.0 HEALTH AND SAFETY

When working with potentially hazardous materials, follow U.S. EPA, OSHA, and corporate health and safety procedures.

ATTACHMENT C

NYSDEC Potable Water Sampling Guidance

SAMPLING GUIDELINES AND PROTOCOLS

Technological Background and Quality Control/Quality Assurance
For NYS DEC Spill Response Program

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BUREAU OF SPILL PREVENTION AND RESPONSE

DIVISION OF WATER

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

MARCH 1991

Sampling Guidelines and Protocols

Notes on currency of information:

- Caution should be exercised in use of data from Tables that may be outdated, such as the data from Tables A-1, A-2 and A-3.

- For volatile organic compound (VOC) testing referenced in Section 7.0: It is now recommended to use capillary column GC methods (502.2, 8021, 8260, 524.2). Use of the packed column methods are no longer recommended (503.1, 8020, 8240 and 524.1).

- Consult SW-846, EPA, NYS DOH, ASTM, NIOSH, etc. for most recent updates of referenced test methods.

PREFACE

This information has been prepared to acquaint spill response personnel with certain procedures they should consider and follow to perform quality sampling. This document is intended to complement the existing guidelines in the Department and is not meant as a replacement.

Section 1.0 gives an introduction of chemical classifications according to the system established by the U.S. Department of Transportation. Also included are the environmental media of soil, water and air. The interrelation among the media and factors affecting sampling are reviewed. Section 2.0 reviews five different petroleum products from crude oil. Their specifications, characteristic compositions, chromatograms, and fate after being spilled are explained. Section 3.0 describes various types of equipment for different medium sampling. Section 4.0, Equipment and Container Cleaning Procedures, and Section 5.0, Sampling Procedures, are two important procedures which a sampling personnel should follow to provide good sample quality control/quality assurance. Section 6.0, Sampling Interval and Number of Samples, provides techniques for determining sampling interval and number of samples based on the consideration of statistical concepts and the possible impact of human and/or environmental resources. Section 7.0, Analytical Methods, presents information on analytical methodologies which have been established by either the New York State Department of Health or the U.S. Environmental Protection Agency. They are in a form where appropriate analytical method can be chosen to perform proper analyses and provide reliable information.

Constructive suggestions for improvement in the coverage, contents and format of the information should be sent to the Spill Response Section.

Sampling Guidelines and Protocols – Technological Background and Quality Control/Quality Assurance for NYS DEC Spill Response Program

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5.6 SAMPLING OF POTABLE WATER SUPPLIES

5.6.1 General

When sampling potable water supplies, utmost care must be taken to insure that samples are representative of the water supply being sampled. This is important not only from a technical and public health perspective, but also from a public relations standpoint. Poor sampling techniques may result in incorrect results (either not detecting a compound which is present or by contaminating the sample and falsely indicating a compound which is not present). If incorrect results are disclosed to the public, it may be very difficult to change public opinion when correct results are reported.

5.6.2 Sampling Site Selection/Sampling Techniques

Even though the same care and techniques used in groundwater, etc., sampling (including thorough documentation of location, date, time, etc.) are used by sampling personnel in potable water supply sampling, there are certain additional special procedures which shall be used.

When water samples are collected from wells, either by mechanical or hand pumping, the wells must be purged before the sample is collected (see Section 5.5 for groundwater sampling methods). This procedure insures that water in the well field is sampled, not the standing water in the pump or holding tank. As a rule of thumb, at least one volume of water in the well casing and storage tank should be evacuated (see Section 5.5.5.4 for more details). This also insures that any contaminants that might have entered the area of the tap from external sources are flushed away (19).

Potable water samples shall be representative of the water quality within a given amount of the distribution network. Taps selected for sample collection should be supplied with water from a service pipe connected directly to a water main in the segment of interest and should not be separated from the segment of interest by a storage tank. The sampling tap must be protected from exterior contamination associated with being too close to the sink bottom or to the ground. Contaminated water or soil from the faucet exterior may enter the bottle during the collecting procedure since it is difficult to place a bottle under a low tap without grazing the neck interior against the outside faucet surface. Leaking taps that allow water to flow out from around the stem of the valve handle and down the outside of the faucet, or taps in which water tends to run up on the outside of the lip, are to be avoided as sampling locations. Aerator, strainer, and hose attachments on the tap must be removed before sampling. These devices can harbor a bacterial population if they are not cleaned routinely or replaced when worn or cracked. Whenever a steady stream of water cannot be obtained from taps, after such devices are removed, a more suitable tap shall be sought. Taps where the water flow is not steady should be avoided because temporary fluctuation in line pressure may cause sheets of microbial growth that are lodged in some pipe section or faucet connection to break loose and contaminate the sample. The cold water tap should be opened for two or three minutes or for sufficient time to permit clearing of the service line. A smooth-flowing water stream at moderate pressure without splashing should be obtained. Then, without changing the water flow which could dislodge some particles in the faucet, the samples can be collected (19).

Regardless of the type of sample bottle being used, the bottle cap should not be placed on the ground or in a pocket. Instead, hold the bottle in one hand and the cap in the other, keeping the bottle cap right side up (threads down) and using care not to touch the inside of the cap. Exercise care not to lose the Teflon liner in certain bottle caps. Avoid contaminating the sample bottle with fingers or permitting the faucet to touch the inside of the bottle. When sampling for bacterial content, the bottle should not be rinsed before use. This may not only contaminate the bottle, but also remove the thiosulfate dechlorinating agent (if used). When filling any container, care should be taken so splashed drops of water from the ground or sink do not enter into either the bottle or cap. In order to avoid dislodging particles in the pipe or valve, do not adjust the stream flow while sampling.

When sampling at a water treatment plant, samples should be collected both from the raw water supply and after chlorination.

Duplicate samples will always be collected for VOA and bacterial analyses. Single samples may be collected for extractable organic compounds, metals, phenol, cyanide, and conventional parameter analyses. The procedures given in Section 5.2.9 (Special Precautions for Trace Contamination Sampling) and in the Section 5.6.2.1 below (Purgeable Organic Compounds Sample Collection) shall always be followed when potable water supplies are sampled.

DEC BSPR or contractor shall always obtain the name(s) of the resident or water supply owner/operator and the resident's exact mailing address, as well as the resident's home and work telephone numbers. The information is required so that the residents or water supply owner/operators can be informed of the results of the sampling program.

5.6.2.1 Purgeable Organic Compounds Analyses (VOA) - Samples to be analyzed for purgeable organic compounds should be stored in 40 ml septum vials with screw caps that have a Teflon lined silicone disk in the cap to prevent contamination and loss of the sample through the cap. The disks should be placed in the caps (Teflon in contact with the sample) in the laboratory prior to the beginning of the sampling program.

When sampling for purgeable organic compounds, duplicate samples should always be collected from each location. The investigator should determine if the water to be sampled contains chlorine. If the water contains no chlorine, two 40-ml vials containing four drops of concentrated HCl should be filled with the sample and labeled PA (preserved acid). If the sample contains no chlorine and only if it will be analyzed within 24 hours, the HCl preservation is not necessary. If the water contains chlorine, the following sampling and preservation procedure should be followed:

- Fill a 4-ounce (120 ml) soil VOA sampling container containing 0.008 percent sodium thiosulfate with the water sample. Cap and mix thoroughly but gently by swirling to eliminate residual chlorine. Transfer the sample to two 40-ml VOA vials containing four drops of concentrated HCl*. Label 40-ml vials - PTA (preserved/sodium thiosulfate/acid).

* The sodium thiosulfate preservatives must be added in this order and in two separate steps because HCl reacts with sodium thiosulfate.

The purgeable organics vials (40-ml) should be completely filled to prevent volatilization, and extreme caution should be exercised when filling a vial to avoid any turbulence which could also produce volatilization. The sample should be carefully poured down the side of the vial to minimize turbulence. As a rule, it is best to gently pour the last few drops into the vial so that surface tension holds the water in a "convex meniscus". The cap is then applied and some overflow is lost, but air space in the bottle is eliminated. After capping, turn the bottle over and tap it to check for bubbles; if any are present, repeat the procedure.

Sampling and preservation containers should be prelabeled (i.e., PA, PT, or PTA) prior to any field activities. This will reduce the chances of confusion during sampling activities by the investigation team.

5.6.3 Sampling Equipment/Specific Sampling Equipment Quality Assurance Techniques

Sampling equipment and specific equipment quality assurance techniques are contained in Section 5.5 (Groundwater Sampling).