Defensible Data Begins with Proper Field Protocols

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Quality Assurance (QA) Program

- Project Control Documents
- Training
- Quality Control Samples
- Auditing
Project Control Documents

- Critical for proper planning
  - Standard Operating Procedures (SOP)
  - Quality Assurance Project Plan (QAPP)
  - Sampling and Analysis Plan (SAP)
  - Analytical Request Forms (ARF)
SOP

- Written instructions for activities such as:
  - Analytical request procedures
  - Collection and documentation of field data
  - Field QA/QC sample collection and frequency
  - Sample handling
  - Decontamination of equipment
Establishes an overall QA Program

- Sample naming convention
- General quality objectives
- Analyses
- Data generation
- Data reduction
- Reporting activities
• Instructs sampling personnel on proper procedures and analytical requirements
  • Project background
  • Personnel training requirements
  • Data quality objectives
  • Sampling scope
  • Schedule
  • Field and laboratory QA/QC requirements
Ensures proper analytical request planning

- Operational purpose
- Analytical laboratory
- Applicable SAP
- Contact information for key personnel
- Approximate number of samples
- Sample Containers
- Data delivery requirements
Analytical Request Form (ARF)

ARF Number: .001
Revision Number: 0

Analytical Information:

<table>
<thead>
<tr>
<th>Material</th>
<th>Compound List or Parameter</th>
<th>Analytical Method</th>
<th>Sample Container Type and Preservation Requirements</th>
<th>Quality Control (QC)</th>
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Field Lead/Task Coordinator (FTL/TC) Information:

FTL/TC: James Smith
Organization: Environmental Samplers, Inc.
E-mail: janith@esamplers.com
Alternate Contact Person and Information:

Analytical Data Requestor (ADR) Information:

FTL/TC: Mike Donahue
Organization: RP Inc.
E-mail: mike.donahue@rp.com
Alternate Contact Person and Information:

Analytical Data Interpreter (ADI) Information:

FTL/TC: Dr. Sally Wall
Organization: Analytical Minds
E-mail: SallyW@analyticalminds.com
Alternate Contact Person and Information:

Analytical Laboratory Information:

Laboratory 1
Name: ABC Laboratory
Contact: Sherry Donner
Phone: 555-555-4000
E-mail: donner@abc.labs.com
Address: 1234 Chemist Street

Laboratory 2
Name: High Tech Laboratory
Contact: David Doodle
Phone: 555-555-6200
E-mail: doddle@hi-tech.com
Address: 234 Main Street

Data Package Requirements and Data Type:

Electronic Deliverables (EDDs) Emailed to: EDD@envstd.com

Limited Data Package Emailed to:
E-mail: Deliverables@envstd.com
E-mail: mike.donahue@rp.com

Full Data Package Emailed to:
E-mail: EDD@envstd.com
E-mail: Deliverables@envstd.com
E-mail: mike.donahue@rp.com

Long-Distance Reporting:

Electronic Deliverables:
E-mail: EDD@envstd.com
E-mail: Deliverables@envstd.com
E-mail: mike.donahue@rp.com

Lab Certification Required: ☐ NO ☑ YES
US EPA Method: ☐ NO ☑ YES
Quality Control Procedure: ☐ NO ☑ YES

Important Dates:

Turn-Around-Time Requirements:
Is expedited TAT required? ☐ NO ☑ YES
If YES: TAT 5 days ☐ NO ☑ YES
Case-by-Case Call Date:

If YES is checked to any of the above, explain the requirement or provide detail in the next section.

Additional Requests and Additional Laboratory Instructions:

The laboratory should provide Batch QC including laboratory method blanks, laboratory controls, and quality assurance audits. All excess sample mass/volume must be retained in their original containers. Excess raw sediment samples must be stored at 5°C but not frozen. All SVOA excess sample mass/volume must be destroyed until further notification is provided.
“By failing to prepare, you are preparing to fail.”
— Benjamin Franklin
Training

- Specific to duties assigned
- Most current versions of documents
- Training Coordinator
  - Training matrix
  - Training documentation
Training

- Classroom-type
- Daily safety meetings
- Computer based
- Individual
- Combination of above
Auditing

- Ensures proper implementation of field protocols
- Independent verification
- Allows for deficiencies to be addressed real time
- Provides stakeholders with a defense
Auditing

- Checklist
  - Key information from project control documents
  - Reference for auditor

- Scheduled vs unannounced

- Debrief meeting
Auditing

- **Schedule**
  - Upon initiation of a sampling event
  - Regular intervals
    - Allows for deficiencies to be followed-up on by the auditor
QA/QC Samples

- Study objectives met?
- Samples collected to evaluate the accuracy and precision of chemical analyses and to evaluate the quality of both sample collection procedures and laboratory procedures.
QA/QC Samples

- Trip Blank
- Field Blank
- Equipment Blank
- Field Duplicate
- Matrix Spike/
  Matrix Spike
  Duplicate
QA/QC Samples

- **Trip Blank**
  - **Purpose**
    - Were VOCs introduced into the bottles or the samples during shipping from/to the lab?

- **Sample**
  - Originate from lab
  - Shipped with sample bottles and accompany the bottles/samples through the entire sampling process
  - Returned unopened to the lab with the samples for VOC analysis
QA/QC Samples

- **Field Blank**
  - **Purpose**
    - To evaluate the potential for cross-contamination during sampling due to ambient atmospheric conditions

- **Sample**
  - Pouring reagent-grade water (supplied by lab) into a sample bottle to expose it to the atmosphere during sampling activities
  - Analyzed for the same parameters as the investigation samples
QA/QC Samples

- **Equipment Blank**
  - **Purpose**
    - To evaluate the potential for cross-contamination during sampling by assessing the effectiveness of decontamination procedures.
  - **Sample**
    - Pour reagent-grade water (supplied by lab) through the sampling equipment after decontamination (for reusable equipment) or prior to use (for disposable equipment) and then into sample bottles
    - Analyzed for the same parameters as investigation samples
QA/QC Samples

- **Field Duplicate**
  - **Purpose**
    - To evaluate the reproducibility of lab results
  - **Sample**
    - Collected simultaneously with the parent investigation sample
    - Analyzed for same parameters as parent investigation sample
QA/QC Samples

- **Field Duplicate Sampling**
  - **Aqueous matrix**
    - Sample bottles are filled in thirds, alternating between investigation sample and duplicate sample by parameter
  - **Solid matrix**
    - Homogenized first
    - Then field duplicate and investigation sample are completely filled
- **VOC sample methods are not collected in this manner**
QA/QC Samples

- **Matrix Spike/Matrix Spike Duplicate (MS/MSD)**
  - **Purpose**
    - Evaluates how well the analytical method recovers compounds of interest from the sample matrices, to determine if matrix interferences are present
  - **Sample**
    - MS/MSD samples are duplicate samples collected concurrently with the parent investigation sample
    - Analyzed for same parameters as parent investigation sample
    - Samples are spiked with compounds of known concentrations by the lab then analyzed
QA/QC Samples

- **MS/MSD Sampling**
  - Collected similarly to a Field Duplicate sample, except it is collected in triplicate volume
  - **Aqueous matrix**
    - Sample bottles are filled in thirds, alternating between sample bottles
  - **Solid matrix**
    - Homogenized first
    - Then sample bottles are filled completely one at a time
  - **VOC sample methods are not collected in this manner**
Conclusion

- Project Control Documents
- Training
- Quality Control
- Auditing
- Samples

QA Program