



Laboratory Selection During Emergency Response Actions

Balancing the Need for Quality Data With the Need for Quick Data

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Disasters Happen...



- ...and frequently, chaos ensues.
- Little time for planning before intensive sampling events commence.
- Large volumes of samples need to be converted into meaningful environmental data.
- Data may be subjected to intense scrutiny
 - Imperative that laboratory data are high-quality and defensible.
 - Need for fast data often precludes careful laboratory selection.
 - Laboratories may be selected based on proximity over other aspects





...Are You Prepared?

- Do you have contracts in place directly with analytical service providers?
- Have you prepared Technical Specifications documents?
- Do you know what criteria you will use to select laboratories?
- If not... where will your samples go? And what will be the quality of the data you receive?

A banner image at the top of the slide shows a sunset over a field. The sun is low on the horizon, casting a warm glow across the sky, which is filled with soft, colorful clouds. The foreground shows a dark silhouette of a field or trees.

Objectives

- Identify some of the challenges faced by environmental personnel involved in response.
- Establish criteria for laboratory selection and identify common oversights.
- Discuss balancing volume against turn-around time requirements and capacity limitations.
- Present techniques to ensure good communication.

Challenges Faced by Environmental Personnel

- Lack of organization.
 - Unclear lines of authority and reporting.
 - Responsibility for lab selection left to chance.
- Immediate need for data.
 - Need to know what, how much, and where to begin planning response activities.
 - Data users, management, and regulators ask for data shortly after samples are sent to the lab.



Challenges Faced by Environmental Personnel

- Little time for planning.
 - Sampling and method selection is reactionary.
 - SOPs, QA Plans, and Sampling Plans may not be approved for weeks or months.
 - Data Quality Objectives have not been established.
- Intense scrutiny.
 - Potential for criminal and civil litigation.
 - Management and regulators want to inform the public.
 - Data collected early in response may be used as the framework for planning response actions and in future risk assessment/NRDA activities.

Establishing Criteria for Selecting Labs

Laboratories are not created equally!

- Strengths and weaknesses need to be carefully balanced during the selection phase.

Aspects for careful consideration:

- Location.
- Data quality needs.
- Analytical needs.
- Capacity and redundancy.
- Turn-around time requirements.
- Documentation and data reporting requirements.
- Specialty analyses/technical expertise
- Existing contracts/cost.



Establishing Selection Criteria: Location, Location, Location

- Frequently, local labs are selected because of the convenience factor.
 - Limited transport time for analyses with short holding times.
 - Ability to drop off samples rather than ship.
 - Perceived decrease in data turn-around time.
 - Local facilities are likely to maintain applicable State certifications.
 - Lab has performed well in the past for routine sampling events.
 - Public relations initiatives.

Establishing Selection Criteria: Location, Location, Location

- Local labs may not always meet project needs.
 - Sole-sourcing may lead to an overwhelmed facility.
 - Convenience may encourage lack of planning.
 - Samples dropped off without appropriate documentation or instruction.
 - Labs may be requested to perform analyses outside their areas of expertise.
 - Wastewater labs may not have equipment necessary to appropriately analyze sediment samples.
- Network/full service laboratories offer enhanced flexibility and increased capacity.
- Laboratory service centers/couriers provide some convenience of a local facility.

Establishing Selection Criteria: Evaluating Data Quality Needs

- Some elements of DQO process must be evaluated in setup stages
 - Clear definition of problem
 - Definition of goals
 - Intended use of data
- Different sampling programs may require different levels of quality.
 - Early-phase operational decisions may only require field screening data; monitoring may require definitive data
- Clarifying goals allows an evaluation of laboratories against their ability to meet those goals.

Establishing Selection Criteria: Analytical Needs

- Identify constituents of concern.
 - Is the material well-classified?
- Identify any specific analytical requirements.
 - Regulators may require specific methods or versions of published methods.
- Identify matrices to be sampled.
 - Complex matrices may require special handling or homogenization techniques.
- Identify specialty analyses/services.
 - Laboratory technical expertise or data interpretation assistance may be needed.
 - Fingerprinting or forensics may require specialized labs.



Establishing Selection Criteria: Analytical Needs

- Develop concise technical specifications.
 - Provide clear expectations to the laboratories regarding sample handling, project communications, and roles and responsibilities.
 - Specify reporting requirements (e.g., basis or reporting limits).
 - Define hardcopy and electronic data deliverables.
 - Define long-term sample archival requirements.
- Technical specifications normalize handling and reporting protocol across multiple laboratories.
 - Significantly reduces potential for variability caused by use of multiple labs/facilities.

Establishing Selection Criteria: Capacity Considerations

- Large sample volumes can quickly overwhelm even high-capacity laboratories
 - Multiple laboratories may be needed to meet demand
 - Competing priorities complicate prioritization.
- Redundancy of instrumentation and personnel is necessary to support large-scale projects.
 - Intermittent instrument failures or analyst absence can result in significant backlog of submitted samples during high sample volume periods.
 - Multiple instruments or backup facilities reduce potential for delays to project data.

Establishing Selection Criteria: Turn-around Time Requirements

- Results may be needed shortly after samples are submitted to the laboratory.
- 24 hours is frequently the minimum turn-around time (TAT) for final results.
- Data may be needed in multiple formats at the requested turn-around time.
 - Limited (results-only) deliverables may be provided initially followed by full deliverables and electronic deliverables.
- Labs must be able to provide complete, correct deliverables at the requested TAT.

Establishing Selection Criteria: Documentation/Reporting Requirements

- Deliverables requirements may be dictated by the intended use of the data.
 - Screening-level data may not require full documentation.
- Data initially thought to be screening may need a higher level of reporting.
 - Full documentation required for data subjected to scrutiny during criminal or civil litigation.
- Staged deliverables help support fast data reporting while eventually obtaining full documentation.
 - Requires strong project management support from the laboratory and conscientious tracking by the project team.

Establishing Selection Criteria: Documentation/Reporting Requirements

- Documentation requirements may involve implementation of new systems of software by the laboratory.
 - Labs may not routinely support internal chain-of-custody processes or may have limited electronic deliverables capabilities.
- Laboratories are not all equipped to provide fully documented data packages or complex electronic data deliverables.
 - Evaluate data packages and electronic deliverables during the selection process.

Establishing Selection Criteria: Specialty Analyses/Technical Expertise

- Specialty labs may be required for particular analytical plans.
 - Forensics/Hydrocarbon fingerprinting
 - Biological matrices
 - Toxicity sampling
 - Bench testing/leachate procedures
- Laboratories may be requested to provide technical consultation and guidance in addition to analytical support.
- Laboratory input may be required when developing sampling plans.



Establishing Selection Criteria: Existing Contracts/Pricing

- Existing contracts may be utilized provided adequate technical requirements are in place.
- Incorporating technical specifications into contracts ensures a consistent product for a given price across laboratories.
 - Existing contracts must be carefully reviewed against project-specific requirements.
- Contracting laboratories enables financial penalties in the event that commitments are not met.
 - Provides added assurance to project management that schedules will not be delayed due to laboratory issues.

Balancing Volume Against Turn-around Time Requirements

- Requires open communication with laboratory staff and a clear understanding of capacity.
- Requires knowledge of sampling events across parties that will utilize the lab.
- Multiple sampling events must be assigned priority levels so the laboratory understands which to complete first.
- Sample loading techniques allow maximum use of laboratory resources.
 - Integrates management of project sampling events with management of laboratory capacity.
 - Project team must include a sampling manager working in close contact with the laboratory.

Balancing Volume Against Capacity Limitations

- Evaluation of laboratory capacity against upcoming sampling events.
 - Laboratory may be able to accommodate increased short-term capacity for limited, intensive sample events.
 - Long-term capacity must be sustainable.
- Depending data quality needs, the fixed-based analytical laboratory load may be offset by less traditional options.
 - Project-specific temporary (mobile) labs
 - Real-time in-situ measurements
- Redirecting certain work to screening or field analysis-level models allows fixed-based facilities to focus on work that needs the highest degree of defensibility.

Communications with the Laboratory

- For large, complex projects, communication from a single position is ideal.
 - Sampling manager or equivalent tracks sampling events across groups and works with the laboratory to manage load.
- A sample management facility may be needed to ensure appropriate sample packaging and documentation
 - Laboratories receive the information they need and have a single point of contact when issues arise.
- Laboratories should assign a single project manager to assume responsibility for communications with the project.
- Analytical request documentation may help ensure that all parties are communicating clearly with respect to analyte lists and required deliverables.
- Frequent, regular meetings between project personnel and laboratory personnel keep all parties apprised of issues and upcoming priorities.



In Conclusion...

- Emergency response actions frequently involve intensive sampling with limited planning.
- Meaningful environmental data are needed almost immediately, but laboratory selection tends to be an afterthought.
- Labs are frequently chosen based on proximity without consideration of quality needs, reporting requirements, technical expertise, and capacity.
- Careful evaluation of various aspects of laboratory performance lend to the generation of high-quality, defensible data that meet project needs.
- Prioritization and good communication with the lab helps ensure that data are available in a timely manner.

Thank You



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