Environmental Data Management Best Practices

Choosing an Analytical Laboratory

This ITRC web-based document explains considerations to keep in mind when choosing an analytical laboratory. This subtopic sheet is meant to provide you with:

- a general understanding of the importance of setting up an analytical program to meet your project objectives
- key questions to consider when choosing an analytical laboratory
- communication and coordination tips for efficiency and success.

Overview

Identifying, coordinating, and choosing an analytical laboratory that can meet data quality requirements are important elements of an analytical program. This document does not mean to address all details pertinent to laboratory analysis, method verification, or auditing, but it does contain information on key data quality considerations in laboratory selection and coordination. This document also provides specific questions to ask during analytical laboratory selection and identifies important considerations for communication with the laboratory regarding the analytical program.

Determine the Analytical Program Requirements

After you have defined the objectives associated with your data collection, and if you are collecting analytical data, you need to determine the requirements of your analytical program. This is a crucial step to making sure that the data collected will meet your project, program, or regulatory needs, as well as any future requirements related to validation, data usability review, and overall data quality. Planning for the analytical program and clearly defining the requirements that surround laboratory usage, coordination, and key reporting aspects allows for a proactive approach to obtaining your data and is the best defense to preventing data quality issues later in the project/program and data lifecycle. Ensuring proper set up of the parameters surrounding data analysis, compound list requirements, data package and electronic data deliverable (EDD) formatting, as well as other key aspects related to an analytical program, are crucial to obtaining analytical data that align with the objectives of the project/program or data collection activity and support its end use. The following discussion is prepared to help you ask the key questions of the analytical laboratory and identify those areas that require consideration when selecting an analytical laboratory. Clear communication of the analytical program and guidance early in the process can help to support a smoother execution of the analytical program needs and eventual data receipt.

Initial Questions to Ask the Laboratory

Similar to identifying your project data objectives, which is discussed in the Environmental Data Management White Paper and Data Quality Overview Fact Sheet, there are some key questions (Table 1) to ask yourself when identifying the appropriate analytical laboratory for sample analysis. It is important to understand both the needs for the data and the

requirements and data dimensions associated with those data needs when identifying a laboratory to appropriately and successfully meet those objectives. See the ITRC EDM subtopic sheet Using Data Quality Dimensions to Assess and Manage Data Quality for additional information. These questions are primarily focused on the data quality dimensions of correctness, consistency, and completeness, as well as documentation of methods, timeliness, results, and performance. Laboratory capacity and timeliness are important not only for data quality (that is, completion of analyses within holding times) but also to meet management constraints such as budgets and schedule.

Table 1: Initiating the Analytical Laboratory—Questions to Consider	
✓	Does the laboratory perform the methods required by your project, program, or regulatory requirement, and on the sample matrix you will be collecting?
✓	Is the laboratory accredited, and is it appropriate for the state in which the sample collection is taking place, for the methods, and sample matrix?
✓	Can the laboratory meet the compound list requirements? Remember that many compound names have synonyms. For this reason providing the laboratory with a compound CAS number can ensure that the analytical laboratory is in sync with your request.
✓	Can the laboratory meet the detection limits and the identified laboratory quality control (QC) requirements as defined in the project quality assurance project plan (QAPP) or detailed as part of project planning?
✓	Can the laboratory meet required extraction and analysis hold times? (Note: Keep in mind sample shipment logistics and timing as well as laboratory location when determining this requirement.)
✓	Can the laboratory provide the needed level of QC/data package for the intended data use and data review?
✓	Can the laboratory provide the needed EDD in the appropriate format for your data requirements?
✓	Does the laboratory have the capacity to meet this analysis (in terms of number of samples, sample type, and method)?
✓	Are there any cost implications to be considered? (There are typically surcharges when the analysis turnaround time is shorter and with additional data package complexity. These contribute to overall cost and decisions should be weighed with the overall project needs and intended data usage in mind.)
✓	Do you have a clear point of contact at the laboratory who can assist you with laboratory capacity and identify and troubleshoot issues? Ensure that this contact understands your data needs and is responsive. Remember, they are your voice in the lab.
✓	Does the laboratory provide sample confirmation receipts? This is an important step in managing your analysis and allows you to see what was logged in to the laboratory management system so that errors in entry or understanding can be corrected prior to the analysis being run or a report being issued.

Overflow and Subcontract Laboratories

Even if the decision on laboratory use is already established, it is still important to understand these key questions and the laboratory's ability to meet the project's data quality objectives. If the need arises for an "overflow lab" or "subcontract lab," the same process should be followed and questions asked to ensure the quality of that laboratory's capabilities and the ability of that laboratory to meet the data quality requirements. These items should be detailed in the project planning steps, identified in the QAPP if one has been developed, and communicated to appropriate persons.

Coordination and Communication

When ensuring data quality while using an analytical laboratory, an aspect that is often overlooked is the importance of creating defined procedures as well as clear roles and responsibilities surrounding laboratory coordination and communication. Identifying key personnel at the front end of a project and in project planning stages will help guide successful interactions. Proactively determining processes for sharing of information, communicating with personnel, and handling of issues and key project details allows for the best outcome when coordinating with the laboratory and communicating with key stakeholders and end users. Additional laboratory coordination and communication best practices should include:

- identifying the point of contact for communications
- ensuring clearly defined needs are conveyed regarding sample bottle ware
- planning for communication of sample receipt and chain-of-custody discrepancies
- conveying project requirements: sharing a project QAPP, key regulatory requirements, project requirements regarding laboratory QC or data package needs for validation
- identifying how communication on performance issues or delays will be handled and with what project personnel
- confirming the report distribution process
- identifying/conveying EDD requirements, including valid values, format, and quality control information needs
- identifying sample retention or storage needs for samples and records

Outlining these paths of communication and coordination protocols will help to ensure that details are not missed. Identification of the appropriate key individuals as points of contact and clearly identifying communication pathways will provide the best chance for efficiency and success in this area. For additional discussion relating to analytical data and review and validation of analytical data, see the Electronic Data Deliverables and Data Exchange Fact Sheet and Analytical Data Quality Review: Verification, Validation, and Usability subtopic sheet.

Related Links

- For more information and useful links about EDM best practices, go to http://www.itrcweb.org/.