



10.4 QUALITY CONTROL

Field and laboratory QC samples and measurements must be used to verify that analytical data meet project-specific QA objectives. Field QC samples and measurements are used to assess how the sampling activities and measurements influence data quality. Similarly, laboratory QC samples are used to assess how a laboratory's analytical program influences data quality. How well a laboratory's QC program is set up, its past performance in implementing that program, and how well QC goals have been met also play a critical role in laboratory selection. The project-specific QAPP will provide a description of QC samples to be analyzed during the investigation for (1) each field and laboratory environmental measurement method and (2) each sample matrix type.

All laboratories that perform analytical work for investigations performed by or reviewed by the HEER Office must adhere to a QA program that is used to monitor and control all laboratory QC activities. Each laboratory must have a written QA manual that describes the QA program in detail. The laboratory QA manager is responsible for ensuring that all laboratory internal QC checks are conducted according to the laboratory's QA manual, and the requirements included within a project-specific QAPP or SAP. The most common (and default for projects conducted and reviewed by the HEER Office) QA/QC procedures are those outlined in the United States Environmental Protection Agency's (USEPA's) publication entitled: "Test Methods for Evaluating Solid Waste, SW-846" (USEPA, 2008a), and laboratory standard operating procedures (SOPs). Investigators should consult the USEPA SW-846 website under the following circumstances:

- During project planning to determine the most recent edition of any analytical method or SOP to cite in the work plan or QAPP.
- During selection of the analytical laboratory to ensure that they are employing the most recent method or SOP cited in the SAP or QAPP.
- If the investigation is utilizing multiple analytical laboratories.
- When significant time has elapsed between project planning and field investigation or between stages of field



investigation to ensure that a previously cited or utilized method or SOP has not been modified or superseded.

For particulate (e.g., soil or sediment) samples, laboratories should follow the USEPA lab sub-sampling guidance (USEPA, 2003b) to ensure that representative lab sub-samples are obtained for subsequent analysis..

Many of the laboratory QC procedures and requirements are described in USEPA-approved analytical methods, laboratory method SOPs, and method guidance documents. If, however, laboratory QC requirements are not specified in an analytical method, or if additional requirements beyond those included in an analytical method are necessary to ensure that project QA objectives and DQO are met, the project-specific QAPP should identify the additional laboratory QC checks to be performed. The following types of information should be included:

- Laboratory analytical method(s) to which the internal QC check applies
- Complete procedures for conducting the internal QC check
- QC samples and QC measurements involved in the internal QC check
- Complete collection and preparation procedures for the QC samples
- Spiking analytes and concentrations
- Control limits for the internal QC check
- Corrective action procedures to be followed if the internal QC check is not done properly or results are outside control limits. Description of example instances that may require corrective action is presented in Subsection 10.8.

Laboratory QC procedures and requirements may include the preparation and analysis of sub-sampling replicates, method blanks, LCS, surrogate spikes, matrix duplicates, MS and MSD samples, and standard reference materials or independent check standards. Subsections 10.6 and 10.7 describe field and laboratory QC procedures respectfully. Subsection 10.7.7 includes information on data that the analytical laboratory should include in project analytical reports.