

## **8 SYSTEMS AND PERFORMANCE AUDITS**

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### **8.1 SYSTEM AUDITS**

At least one system audit of the analytical laboratory, field, and testing activities, and the QA program will be conducted during the RI. The systems audit will focus on the acceptability of project organization, staff, facilities, equipment, and methods. The audit will cover, in general, verification that approved procedures, a calibration program, and organization structure are in place and are used. The audit also will ensure that personnel responsibilities are clearly defined; a training program for personnel, chain-of-custody program, and records retention program are in place and are current; and corrective action of variances taken by laboratory and field personnel is responsive and timely. The audit will be conducted under the direction of the Project QA Manager and/or QC Manager, by their staff members, or by an independent third party.

#### **8.1.1 ANALYTICAL LABORATORIES**

Internal system audits will be performed by the Laboratory QA Manager, as described in the Operations Procedures Manual of the laboratory. Systems audits involve laboratory comparison of project performance (as documented by protocols and procedures) to validate data. Results of the audits will be retained as a project record and made available to the Foster Wheeler QA Manager and/or QC Manager on request for use during the laboratory systems audit.

#### **8.1.2 FIELD SAMPLING**

After field systems are operational, the Project QA Manager or designee will conduct at least one technical systems audit of field sampling, covering the following:

- Organization and responsibilities to determine whether the QA organization is operational;
- The collection of samples to ensure that written procedures are available and are being followed;
- Chain-of-custody program to ensure that the appropriate steps have been followed in the traceability of sample origin;
- The implementation of the operational procedures to ensure that the appropriate QC checks are being made in the field and records are maintained of these checks;
- Determination of whether the specified equipment is available, calibrated, and in proper working order;
- Technical training to ensure that sampling crews are adequately trained;

- Records to ensure that recordkeeping procedures are operational and that field notebooks, logsheets, bench sheets, and tracking forms are properly prepared and maintained;
- Corrective action to verify that the appropriate chain-of-command is followed in responding to variances.
- Audit reports will be sent to the Foster Wheeler Project Manager and will be retained as a project record.

## **8.2 SURVEILLANCE**

### **8.2.1 CONSTANT SURVEILLANCE**

Constant surveillance of field sampling and testing activities will be performed by the FOLs as approved by the Technical Leads and Project Manager.

### **8.2.2 PERIODIC SURVEILLANCE BY LABORATORIES**

Laboratory activities, which are subject to periodic review by internal laboratory QC personnel, include the following:

- Review and approval of the Laboratory QA Plan
- Parameter and/or laboratory notebooks
- Instrument logs
- Sample log-in, dispensing, and labeling for analysis
- Updating of QC criteria for spike recoveries
- Final approval of data from each sample lot (field group)
- Control of chemicals with limited shelf life

These periodic surveillance activities will be conducted as described in the Laboratory QA Plan.

### **8.2.3 ON-SITE PERIODIC SURVEILLANCE**

The FOLs or designee will perform periodic surveillance during the performance of field activities. Results of each surveillance will be recorded in the site logbook.

Acceptance of services performed will be documented by the FOLs signing and dating the appropriate documents, including forms, logs, maps, charts, drawings, test results, checklists, computer printouts, test evaluations, and receipts.

## **8.3 PERFORMANCE AUDITS**

Performance audits evaluate the actual performance of a laboratory. Audits are conducted periodically to determine the accuracy of the total measurement system(s) or

parts thereof, typically against known Performance Evaluation (PE) standards. These standards can be blind PEs, provided by Foster Wheeler or external third party, or known internal standards such as surrogates or matrix spikes. Blind PEs will be submitted at the discretion of the QC Manager. The source of these PEs may include NIST, or other third-party vendors. In addition, the use of state accredited laboratories will ensure that performance audits have been previously conducted and passed by these subcontractors.

## **8.4 RESOLUTION OF DISCREPANCIES**

If there are any discrepancies, deficiencies, or indeterminate results in the field or laboratory, the individual who discovers the discrepancy will take the necessary action to require appropriate corrective actions. If resolution cannot be reached immediately, the individual will bring the problems to the attention of the Project Manager, QA Manager, or QC Manager to initiate corrective action. If the problem cannot be rectified to the satisfaction of all concerned, the QA Manager will stop work until the situation is resolved.

The QA Manager will evaluate the problems, provide direction, and verify implementation of solutions before allowing the activity to resume.

Specifically, the following procedures will be implemented:

- Bench technicians will verify that the Laboratory Information Management Systems (LIMS) output is correct, and follow the SOP if output is found to be out of compliance.
- Laboratory supervisors (or equivalent) will review all preliminary reports and submit any discrepancies to the Bench Technician for review and possible corrections following the SOP.
- Foster Wheeler QC Manager (or designated staff) will review all preliminary and final reports, and if obvious errors or discrepancies are identified, the QC Manager will contact the laboratory and direct corrective actions.

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