QUALITY MANAGEMENT PLAN

ANCHOR QEA, LLC

Prepared for

McGinnes Industrial Maintenance Corporation

International Paper Corporation

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LIST OF ACRONYMS AND ABBREVIATIONS

DQA	Data Quality Assessment
DRA	Document Retention Administrator
DRC	Document Retention Center
DRP	Document Retention Policy
DRS	Document Retention Schedule
DQO	Data Quality Objectives
FSP	Field Sampling Plan
GIS	Geographic Information Systems
HASP	Health and Safety Plan
IT	Information Technology
MSR	Management System Review
QA	Quality Assurance
QAPP	Quality Assurance Project Plan
QC	Quality Control
QMP	Quality Management Plan
RTSL	Records Transfer Storage List
SMP	Software Management Policy
SOP	Standard Operating Procedure
TR	Technical Review

1 MANAGEMENT AND ORGANIZATION

The purpose of this section of the Anchor QEA Quality Management Plan (QMP) is to provide a statement of the company's quality assurance (QA) policy, give an overview of company organization (both general and QA), and discuss the roles and responsibilities of management and employees in implementing the QMP.

1.1 Quality Assurance Policy

Anchor QEA, LLC (Anchor QEA) is an environmental science and engineering consulting firm that focuses on shoreline and river projects, and provides solutions to complex environmental problems facing industrial as well as federal, state, and municipal government agency clients. The company uses it expertise to address issues related to sediment management, environmental review, natural resources, and coastal, waterway, and geotechnical engineering. To ensure that Anchor QEA provides exceptional services to our clients, the company has a strong commitment to the QA program described in this QMP.

1.1.1 Objectives and Goals

The company, including management and employees, is fully committed to achieving the primary objective of the Anchor QEA QA program, which is to provide client service that without exception exceeds our client's expectations. To achieve this goal, it is the policy of Anchor QEA upper management that the company's QA program is sufficient to ensure that our internal and external products (e.g., collected data, data analyses, computer modeling analyses, engineering designs) are: scientifically valid, of known precision and accuracy, acceptably complete, and representative. Upper management at Anchor QEA (see Figure 1) is committed to the implementation, maintenance, and updating of the QMP described here. Continual quality improvement is an integral part of our QA program, and upper management is dedicated to ensuring that all employees strive to continually improve the quality of their work and our products.

1.1.2 Allocation of Resources

Achieving the QA goals discussed above requires that Anchor QEA upper management commit the necessary resources. Internal funding is made available for development and

implementation of the QA program, as well as training activities. In addition, funding for external QA activities, and other personnel training, is available as needed.

Achieving these goals requires that all Anchor QEA personnel understand and apply the various procedures that compose the QA program described in the QMP. Two other components of equal importance to the formal QA program presented here are the informal QA activities that continually occur at Anchor QEA and the underlying commitment to excellence by all of our employees.

1.2 Organizational Structure

The overall organization of the company is shown in Figure 1. The QA Manager is Dr. C. Kirk Ziegler, P.E., who is a Principal Engineer. Dr. Ziegler has primary responsibility for development and implementation of the QMP and QA program. He has authority to ensure that the QA objectives are met and procedures are followed throughout the company. As the principal leader of the company Quality Assurance Program, Dr. Ziegler has full independence in executing the policies described in the QMP.

Implementation of the QMP occurs at three different levels within the company: (1) upper management; (2) Project Managers; and (3) technical and business administration staff. Descriptions of the roles and responsibilities of these different levels are presented in Section 1.3.

The QA Committee, composed of the QA Manager and other employees (including Principals), oversees the development and application of the QA program. At the present time, the QA Committee has the following members: Ed Berschinski, John Edwards, Carl Stivers, Kevin Russell, Ram Mohan, John Verduin, Ann Costanza, and Peter Hummel - all are either principals or senior associates of the company. Additional committee members are added as needed.

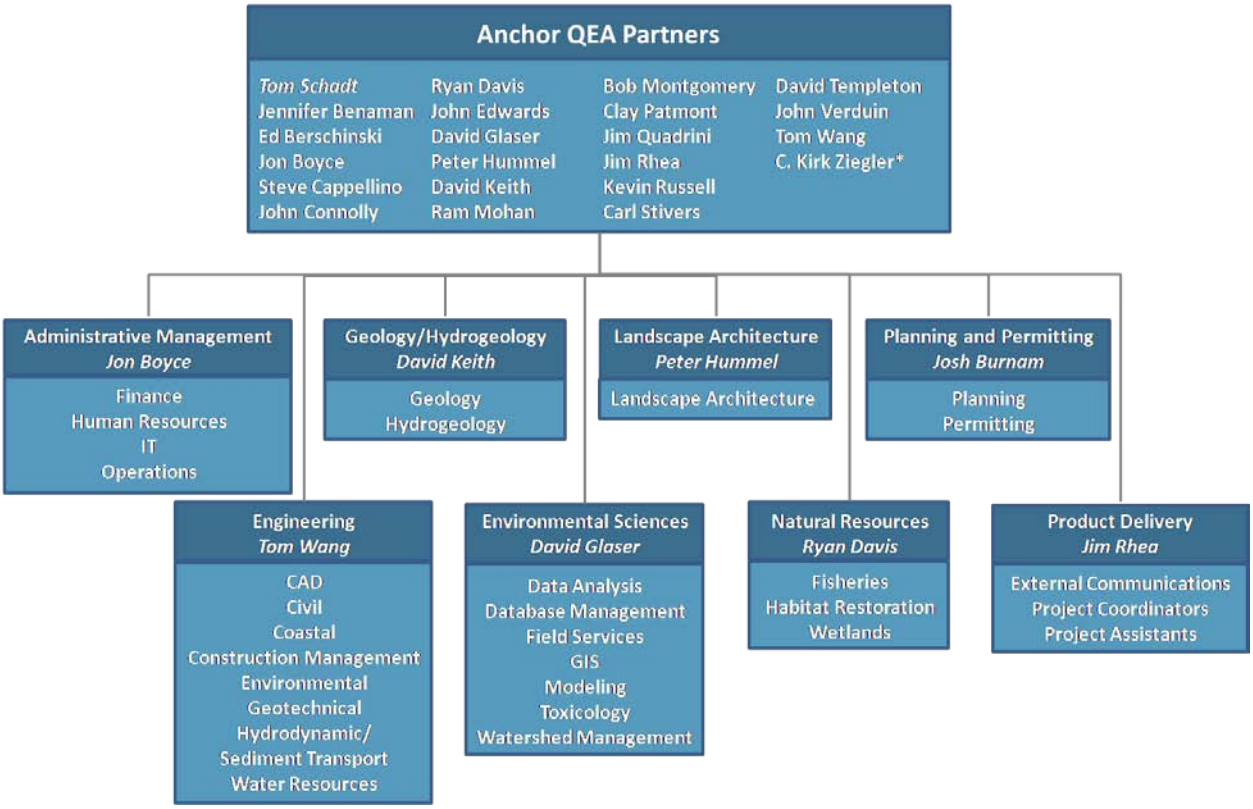

Figure 1. Company Organization

**Kirk Ziegler serves as Anchor QEA's Quality Assurance Manager.*

1.3 Roles and Responsibilities

As noted in Section 1.2, the QA Manager has primary responsibility for development and implementation of the QMP and QA program. The QA Manager works with the QA Committee, and other employees, to ensure that appropriate QA procedures and methods are developed and applied, consistent with the QMP, so that the company's quality objectives are achieved. Prevention of errors or other quality problems, and should an error occur, evaluating cause and developing methods to prevent their reoccurrence, is the primary responsibility of the QA Manager. The QA Manager will work with the necessary mix of upper management, Project Managers, technical staff, and QA Committee members to prevent, evaluate, solve, and prevent reoccurrences of quality problems. The QA Manager is also responsible for ensuring that adequate QA training is provided for all employees. Anchor QEA practices an open-door policy for all employees; all employees are encouraged to bring questions suggestions and complaints to their supervisor's attention. In addition, QA

staff has the right and responsibility to communicate QA issues and policies to all levels of the company.

1.3.1 Upper Management

Upper management bears the final responsibility for ensuring that QA goals are met for all project-related work. This responsibility means that upper management personnel in charge of a specific project assures that required and appropriate portions of the QMP have been applied to that project. Furthermore, upper management personnel in charge of a project are ultimately responsible for errors or other quality defects that might occur on the project. In addition, upper management will ensure that the Project Managers properly meet all of their QA responsibilities.

1.3.2 Project Managers

Project Managers are responsible for applying the required and appropriate QA procedures to each project. A Project Manager works with upper management and technical staff to identify the QA requirements of a specific project. If necessary, new QA procedures will be developed for an individual project. Project Manager responsibilities include: (1) assigning properly qualified and available staff to projects; (2) ensuring that the technical staff is adequately trained and properly applying QA procedures; (3) conducting QA reviews to check for errors or other quality problems; and (4) developing and applying methods to correct errors or quality problems that may occur; (5) sharing "lessons learned" in quality procedures with others.

1.3.3 Technical and Business Administration Staff

Members of the technical and business administration staff are responsible for properly applying required and appropriate QA procedures to the various tasks on which they are working. Staff members are given the necessary resources, guidance, and supervision to properly perform their work but are also responsible for errors or quality problems originating from their work products. "Quality" is one of the company core values and part of our employee evaluation program.

1.3.4 Internal Communication and Coordination

The main role of the QA Committee is two-fold: (1) to oversee the implementation of the quality program to prevent errors; and (2) to identify areas that need quality improvement and then develop appropriate QA methods or procedures for those areas. This process is usually accomplished using a cooperative approach between the committee members, Project Managers, and staff members involved with the area that is being considered. The QA Committee also: (1) assists the QA Manager with training activities; (2) works with Project Managers and staff on implementation of new QA procedures and tools; and (3) conducts QA seminars.

All disputes regarding the implementation of the QMP or QA program shall be referred to the QA Manager or QA Committee. The QA Manager has the final authority in the resolution of any QA-related dispute.

Whenever Anchor QEA chooses to out-source any process that may affect the quality of its client services, Anchor QEA shall ensure quality control over that process. Control of out-sourced processes is described in Section 4 of the QMP.

1.4 Scope of the Quality Management Plan

The purpose of this QMP is to provide the framework for development and implementation of an effective QA program within Anchor QEA. The QA program is to be applied to all activities within the company; with employees striving to produce error-free work in all tasks and at all levels. Specific quality management that is incorporated into this QMP is focused on technical activities including:

- Field studies (data collection)
- Laboratory analysis
- Data validation
- Database management
- Data analysis
- Engineering calculations
- Engineering design and drawings
- Engineering construction document preparation
- Construction management

- Planning and permitting
- Computer software development
- Computer modeling and analysis
- Graphics development and application
- Report preparation

2 QUALITY SYSTEM COMPONENTS

A quality system serves as the framework for the development, implementation, and assessment of work performed by Anchor QEA and for fulfilling the required QA and QC. Anchor QEA facilitates company-wide compliance to the quality system through the identification of tools and procedures. This section describes the quality system components and procedures for their implementation.

2.1 Description and Principal Components of the Quality System

The quality system at Anchor QEA is supported by a QA staff (i.e., QA Manager and QA Committee) that interacts with managers and staff to implement various QA processes and procedures in order to meet the quality objectives of the company. Various managers and staff members have specific roles and responsibilities within the QA program to ensure that the processes and procedures are correctly implemented. The quality system has been designed so that work product quality is thoroughly evaluated with the goal of producing error-free products for our clients. In addition to QA procedures and processes, assignment of roles and responsibilities within the QA program are included within the quality system.

Anchor QEA has identified a number of components essential for a successful QA program. The principal components include:

- Written quality guidelines
- Quality system documentation
- Systematic planning of projects
- Project-specific quality documentation
- Training
- Annual reviews and planning
- Client surveys
- Management assessments
- Project and data assessments
- Strategic and operational plans

Specific descriptions of these quality system components, and the corresponding responsibilities of management and staff, are discussed in detail in the QMP.

The QA Manager is accountable for the coordination and management of the quality system. All staff members are responsible for adhering to the system and for notifying the QA Manager should requirements developed for a specific project differ.

2.2 Principal Tools and Practices of the Quality Management System

A variety of tools and procedures are employed to implement the components of the quality management system. These tools include, but are not limited to: the QMP, Data Quality Objectives (DQOs), Quality Assurance Project Plans (QAPPs), Standard Operating Procedures (SOPs), employee training, Management System Reviews (MSRs), Technical Reviews (TRs), and performance evaluations. Employees are eligible for spontaneous rewards for exceptional service to clients.

2.2.1 Quality Management Plan

The QMP formally documents the quality system in terms of organizational structure, functional responsibilities of management and staff, lines of authority, and required interfaces for those planning, implementing, and assessing all activities performed. The QA Manager has primary responsibility for developing and implementing the QMP. It serves as a guide for all Anchor QEA QA operations and was developed by individuals at various company levels to reflect the range of activities needed to guarantee company-wide work quality. The QMP is to be followed when developing quality systems specific to projects, as well as other company related documents.

The QMP will be assessed semi-annually; future revisions and updates to the QMP will be prepared by the QA Manager with assistance from the QA Committee. The QA Manager will be responsible for informing staff of the updated QMP. Review of the QMP is discussed in Section 9.1.

2.2.2 Data Quality Objectives

Data Quality Objectives (DQOs) are qualitative and quantitative statements that clarify study objectives, define the appropriate type of data, and specify tolerable levels of potential decision errors that will be used as the basis for establishing the quality and quantity of data

needed to support decisions. They are created during the planning phase of a project. Since DQOs are project specific, the Project Manager shall be responsible for their establishment.

2.2.3 Quality Assurance Procedure Plans

A Quality Assurance Procedure Plan (QAPP) presents the policies and procedures, organization objectives, quality assurance requirements, and quality control activities designed to achieve the type and quality of environmental data necessary to support project objectives and decisions. Additional QAPP details are provided in Section 7. If the project requires the creation of a QAPP, the Project Manager is responsible for documenting all phases of the planning process and data collection activities. During the planning process, the Project Manager will develop a list of project required documentation for a project.

The level of detail included in a QAPP varies according to the nature of the work being performed, and thus, shall be created under the supervision of the Project Manager. It is also the responsibility of the Project Manager to ensure the proper implementation of the QAPP by contracted field staff.

2.2.4 Standard Operating Procedures

The use of Standard Operating Procedures (SOPs) is one method to guarantee uniformity and completeness in the execution of work-related processes. SOPs used in the laboratory are important to ensure comparability among individual environmental data collection projects.

SOPs need to be reviewed and updated periodically. The QA Manager is accountable for updating and reviewing these procedures. It is the responsibility of the Project Manager to ensure that current SOPs are being applied by staff working on a specific project. Current copies of SOPs are readily accessible for reference in the work areas of those individuals performing the activity.

2.2.5 Employee QA Training

Employee QA training is important for assuring that QA procedures are followed on a day-to-day basis. Ongoing QA training is received by all technical staff through a systematic process. Details on Anchor QEA's training program can be found in Section 3.

2.2.6 Management System Reviews

A MSR is an independent assessment of an organization's management practice. The QA Manager is responsible for assembling an internal audit team and coordinating review activities every three to five years. MSRs are discussed further in Section 9.2.

2.2.7 Technical Review

Technical Reviews (TRs) are assessments of project activities and products. They are performed by peers with comparable expertise within the company. Frequency is determined by both the Project Manager and upper management. Section 9.5 describes TRs in more detail.

2.2.8 Performance Evaluations

Two types of performance evaluations are conducted at Anchor QEA to ensure high quality work. Employee evaluations are conducted twice a year, with a comprehensive evaluation at the end of the year. These reviews include peer assessments on the employee's work quality. Results of reviews are discussed with employees and goals and accountabilities for improvement are set for the following year. Anchor QEA's Human Resources department is responsible for initiating the review process and the immediate supervisor is responsible for the employee's review.

The other type of performance evaluation is aimed at products and services conducted by or overseen by Anchor QEA. The products and services include laboratory work done for Anchor QEA and documents published by Anchor QEA. The QA Manager is responsible for overseeing the review. More detail can be found in Section 9.3.

2.2.9 Strategic Planning Group Meeting

The effectiveness of the quality system is reviewed every six months by all upper-level managers during the Strategic Planning Group meeting. The QA Manager is responsible for overseeing any changes to the system, as well as informing staff of modifications and updates.

3 PERSONNEL QUALIFICATIONS AND TRAINING

An important component for implementing the quality system is QA training for staff. This section describes the processes used for identifying, ensuring, and documenting that Anchor QEA personnel have necessary QA-related qualifications and training.

3.1 Qualifications

Hiring procedures at Anchor QEA are designed to ensure that highly-qualified, well-trained people are employed by the company. Application of these procedures results in a managerial and technical staff that is qualified to learn and implement the Anchor QEA QA program. Performance evaluations (see Section 9.3) are a useful tool for identifying and documenting any deficiencies that a specific employee might have regarding quality-related qualifications. The results of performance evaluations, coupled with informal evaluations of direct supervisors and peers, are used to help resolve any deficiencies a staff member might have regarding quality relating qualifications.

3.2 Training

According to company policy, adequate training will be provided so that each employee can: (1) meet regulatory, safety or professional requirements for performing their job; (2) competently perform their duties; and (3) understand and implement the QMP and QA procedures applicable to his/her work. Upper management will provide sufficient resources to ensure that these training objectives are accomplished.

Training at Anchor QEA is separated into three categories: (1) training for new employees; (2) required training to meet regulatory, safety, or professional reasons; and (3) informal and formal continuing education, including QA program and technical training. Upper management has the ultimate responsibility of ensuring that all employees receive the appropriate training and that the company's training policy is enacted. The QA Manager and Human Resources Manager will document the training history of each employee.

Training of a new employee is the responsibility of the Subdiscipline Manager to whom the new employee is initially assigned. The company has developed a training program for new employees. Training for a new employee begins immediately after the person starts working

at Anchor QEA. This training includes, but is not limited to, the following: (1) meeting with the QA Manager to discuss the QA program and its critical details; (2) issuance of an Anchor QEA Standard Operating Procedures Manual and subsequent review of the manual with a member of the QA Committee; (3) specific instruction in QA procedures that are directly applicable to the initial assignments of the employee; and (4) specific training in use of Anchor QEA graphics, modeling and engineering tools.

Determining the need for training due to regulatory, safety, or professional requirements is the responsibility of upper management and Project Managers. Employees can also inform their managers of required training needs. Upper management is committed to ensuring that appropriate training is provided for the employee in a timely manner.

Continuing education is conducted informally and formally at Anchor QEA so that our employees can improve their technical, business, and communication skills. Informal training consists of various activities, including individual instruction by supervisors or peers and seminars. Formal training includes, but is not limited to, conferences, external training seminars (e.g., Geographic Information Systems [GIS] training), and courses at a local university. An employee can request formal training or management can suggest that the employee attend an external activity. Upper management has the final authority in determining the need for formal training and allocating resources for that training.

QA training activities for all employees are primarily conducted in three areas. First, individual employees are instructed, with assistance from the QA Committee, by supervisors or peers. Second, the QA Committee conducts seminars or company meetings to inform and teach employees. Third, company meetings are held, when necessary, to disseminate QA information and provide training in a group environment. The QA Manager and QA Committee are responsible for developing and implementing these QA training activities.

4 PROCUREMENT OF ITEMS AND SERVICES

Anchor QEA uses the services of a number of subcontractors and purchases equipment and supplies in support of environmental and engineering activities. This section describes procurement procedures for services and materials as well as the types of services usually contracted by Anchor QEA. The procedures outlined have been developed to ensure that the vendors and subcontractors are guided by quality systems that are consistent with the QA program established at Anchor QEA.

4.1 Procurement Guidelines

The procurement of goods and services will be controlled and documented to ensure that the agreement fulfills the specified Anchor QEA quality assurance requirements.

4.1.1 Review Process for Services and Equipment

Project Managers and staff will be responsible for the identification and evaluation of the need for services and equipment. Requirements and specifications will be documented and then included or referenced in procurement documents. The acceptability of purchased items and services will be verified and documented by Project Managers. The procurement decision rests solely on the upper-level managers whose project is affected.

4.1.2 Review Process for Procurement Documents

To ensure the accuracy and completeness of contracts and agreements, Anchor QEA uses guidelines such as:

- Maintaining written procedures
- Maintaining a contract hierarchy system to ensure that subcontractors perform in accordance with the terms, conditions, and specifications of their contracts or purchase orders
- Reviewing proposed procurements to avoid the purchase of unnecessary or duplicate items
- Awarding contracts to responsible subcontractors that have demonstrated the ability to fulfill the associated technical and quality requirements of the proposed procurement
- Maintaining records detailing the significant history of a procurement, including but

not limited to:

- Rationale for the method of payment
- Subcontractor selection
- Basis for the contract price
- Adequacy of products and performance

4.1.3 Review Process for Approval of Supplier's Quality Related Documentation

Project Managers will evaluate the prospective subcontractor to ensure that the subcontractor has an acceptable QA system in place. Project Managers will define or evaluate QA systems on a case-by-case basis. When applicable, contractors and subcontractors must submit a QAPP for review and approval by the Project Manager and selected staff before any environmental measurement or data collection activity begins. Guidelines for the review of the QAPP will generally follow those set forth in EPA Requirements for Quality Assurance Project Plans (EPA 2001).

4.1.4 Review and Approval Process for Responses to Solicitations

Anchor QEA is committed to conducting procurement transactions in such a way as to provide full and open competition. If the respective Project Manager should determine adequate justification exists to procure a service or item, identified needs are submitted to upper management who prioritize, rank, and approve the proposed procurement. The Scope of Work developed by the Project Manager is used as a guideline and incorporated into a solicitation package.

The appropriate form of requisition should be prepared, whether that is a Request for Bid, Request for Proposal, Request for Qualifications, or Purchase Order. The Project Manager is ultimately responsible for monitoring the process for purchasing equipment, supplies, or services in a manner that will ensure that quality products and services are secured.

4.1.5 Review Process to Ensure EPA Extramural Agreement Policies Are Satisfied

The Project Manager is responsible for issuing task assignments based on a pre-agreed upon contract to the appropriate subcontractor. The contract clearly describes both the quality system elements for which the supplier is responsible and the item or service needed. The subcontractor shall send all deliverables to the Project Manager for review. If the deliverables are disapproved by either the Project Manager, or designee, the disapproving authority shall contact the subcontractor and request clarification or a change in the deliverable within the amount of time specified in the contract.

In the event that the subcontractor does not perform in accordance with the contract, the Project Manager will include several clauses in the contract such as:

- "Right to Assurance" clause which requires the subcontractor to give a written assurance of intent to perform
- "Termination for Convenience"
- "Termination for Default"
- "Right of Offset" clause upon subcontractor default which allows Anchor QEA to collect additional money from subcontractor if the subcontractor fails to perform in accordance with the contract and Anchor QEA has to engage another firm at a higher cost

Assuming that the subcontractor has executed its contractual obligations, an invoice is generally issued to the Project Manager or designee who authorizes the payment of the invoice.

4.2 Analytical Services

Analytical services currently employed by Anchor QEA in support of environmental activities include:

- Production analytical services
- Special analytical services
- Quality control analytical services

Each of these services is discussed in more detail below.

4.2.1 Production Analytical Services

Production analytical services are routine laboratory analyses conducted in support of baseline water quality, sediment, and other related sampling activities. The selected laboratory should be certified under the National Environmental Laboratory Accreditation Program (NELAP) and if required, by the State Department of Health. When applicable, standard methods such as those published by the U.S. Environmental Protection Agency, the American Public Health Association, the American Society for Testing and Materials, and the National Institute for Occupational Safety and Health for analyses of samples are employed.

Laboratories under consideration are required to submit information on the types of analytical procedures performed, the methods used to perform each analysis, the capacity or size of the laboratory, and their current QMP.

4.2.2 Special Analytical Services

Special analytical services include those laboratory methods that are not routinely performed by the production laboratories or require specialized methods or equipment. Scanning electron microscopy, X-ray diffraction, and metals speciation are examples of special analytical services that may be required to characterize sediment or water samples. Project Managers identifying the need for special analytical services will follow the same general procurement process outlined above except the laboratory does not have to hold NELAP certification.

4.2.3 Quality Control Analytical Services

Quality control (QC) analytical services are performed to provide independent inspection of the quality of work performed by the production laboratories. The functions of the QC laboratories include analyzing samples split with the production laboratory, preparing performance evaluation samples, and evaluating production laboratory data sets for quality assurance purposes and data reliability.

4.3 Equipment

Environmental measurement activities often require the use of various equipment, including automatic samplers and continuous monitoring devices. Technical staff shall develop specifications for equipment and work with vendors to ensure that the equipment meets the specifications. Proper operation, calibration, and maintenance procedures for equipment are to be described in the QAPP and SOP guidelines.

4.4 Other Services

Anchor QEA may require other goods or services not directly related to laboratory analyses or field equipment, but which still have bearing on environmental measurements. Services such as geographic positioning and surveying, and items such as computer programs, would fall under this category. To ensure that the appropriate level of consideration is given to the procurement of these types of goods and services, the Project Manager will review all purchase requisitions not falling under analytical services or sampling/monitoring equipment. If the equipment request or service is justified, the request will be forwarded to the upper-level manager responsible for the project for the ultimate decision.

5 DOCUMENTATION AND RECORDS MANAGEMENT

The Anchor QEA Document Retention Policy (DRP) serves as a vehicle for identifying quality-related documents and records requiring management control. This policy assures that QA documents and records are maintained securely, consistent with legal requirements, and protected from damage and deterioration in a way that facilitates retrieval of information. The DRP also provides adequate preservation of records of business operations necessary to support the mission of Anchor QEA.

5.1 Routine Quality Assurance and Records Management

The Anchor QEA DRP outlines procedures for identifying, preparing, reviewing, approving, revising, collecting, filing, storing, maintaining, retrieving, distributing, and disposing of pertinent Anchor QEA-related documents, including quality-related documents and records. These procedures are applicable to all forms of documents and records, including all paper copy and electronic files, reports and other materials produced or received by Anchor QEA, as part of business operations, consulting, or professional activities.

5.1.1 Routine Quality Assurance

Anchor QEA document control procedures require that documents generated by or obtained by Anchor QEA personnel be assigned an identification code that is unique to each Anchor QEA project or business activity. This unique identification code is applied to all aspects of the project or business activity, including electronic records, technical reports and memoranda, office notes, custody tags, field notes, and analytical records. Each document is required to have a project name, project identification number, date, and the initials of the Anchor QEA personnel responsible for maintaining the document.

Project or business-related documents in electronic form are stored in the Anchor QEA computer network. These electronic documents include, but are not limited to: data reports, databases, engineering designs, model codes, pre- and post-processing procedures, visualization tools, and financial records. Current versions of these electronic documents are maintained in a central location to assure that the most up-to-date and valid versions of these files are accessed and used by appropriate Anchor QEA personnel. Paper documents and records are maintained in a similar fashion; these documents are stored in the office of the

Anchor QEA personnel performing the work or in the Document Retention Center (DRC). The roles and responsibilities for management and staff for handling these documents are outlined in the DRP and are listed below.

All employees are expected to follow the DRP on an ongoing basis. At all times, all Anchor QEA documents are to be in compliance with the DRP. Personal records are to be maintained separately from Anchor QEA materials.

The Project Manager overseeing each project or Anchor QEA activity are responsible for identifying documents, including quality-related documents and records, and making decisions concerning retention and destruction of materials pertaining to individual projects and Anchor QEA functions, or for delegating that responsibility. He/she is also responsible for declaring projects to be complete.

The Office Manager is responsible for retaining or destroying documents that are under his/her control in compliance with the DRP, except for project-related correspondence and reports; destruction and retention of these materials is to be performed by office services personnel under specific instructions from the Project Manager.

The Business Manager is responsible for retaining or destroying documents that are under his/her control in compliance with the DRP.

The Document Retention Administrator (DRA) is responsible for placing documents in the DRC, retrieving them upon request, and returning them. The DRA is also responsible for proposing resolutions to questions or problems that may arise concerning the DRP or its implementation, and reporting those proposed resolutions to upper management.

5.1.2 Records Management

Each Anchor QEA office utilizes a DRC. This may be located onsite or at a secured offsite storage facility. Documents are maintained in the DRC pursuant to the terms described in the Document Retention Schedule (DRS). The Anchor QEA DRP dictates the procedures for checking-in and checking-out files from these centrally-located file areas.

Documents identified for retention at the DRC should be packed in storage boxes and given to the DRA. A Records Transfer Storage List (RTSL) must be filled out for each box which identifies the contents of the box by function, type of documents, project name and number (where applicable), and length of time to be stored at DRC. The RTSL information is entered in a database along with the projected destruction date. Each box is externally labeled and the RTSL placed inside before being stored.

For security purposes, all requests for documents stored at the DRC must be approved by the Anchor QEA Project Manager and must be made to the DRA. All documents borrowed from the DRC are to be kept complete, in their proper order and in DRC storage boxes to ensure that such documents are not lost or mixed with active files at the office or facility. Borrowed documents are to be returned promptly to the DRA in the original DRC boxes. Persons requesting documents from the DRC should not keep copies of such documents unless it is for a purpose approved in advance by upper management (e.g., litigation or tax audit). All copies of documents borrowed from the DRC should be destroyed as soon as the purpose requiring their reproduction has been served.

Stored documents, regardless of media, are to be destroyed at the end of the retention periods established by the DRS. The DRC will annually review stored documents and identify those scheduled for destruction in accordance with the DRS.

5.2 Quality Assurance Documents

Documents that specify quality-related requirements and instructions include the QMP, QAPPs, sampling and analysis plans, SOPs, and quality program guidance documents.

The QMP is prepared, reviewed, approved, distributed, maintained, and revised according to procedures set forth in Section 9. QAPPs, sampling and analysis plans, and SOPs are prepared by Anchor QEA personnel and provided to the Project Manager and QA Manager for review, revision, if necessary, and approval. Quality guidance documents developed in-house are reviewed by the QA Manager. Most of the in-house quality guidance documents are formatted as SOPs covering specific project-related activities such as model code

development, documentation, QA procedures, and computer system administration. Other in-house quality guidance documents include SOPs for field inspection, sample collection/handling, analytical protocols, data review/validation, engineering design, construction management, and planning/permitting.

The QA Manager is responsible for ensuring that all quality-related documents, including the QMP and QAPPs, are current. Should one of these plans become outdated, the QA Manager will determine the status of the plan and initiate appropriate action. The QA Manager will be responsible for maintaining copies of the revised and approved QAPPs, according to the DRS.

5.3 Confidential Documents

Some documents collected, received, or generated may, due to nature and content, be classified as confidential documents. Documents of this category may be, but are not limited to, attorney-client communications, technical memoranda and reports, internal and external e-mails, delivered and received facsimiles, data files, phone and meeting logs, or financial records. Confidential documents shall be maintained securely in a fashion consistent with that outlined in the DRP. Only those Anchor QEA staff and others with authorization from upper management can access these files.

5.4 Maintaining Document Integrity

Following all required Anchor QEA documented policies and action regarding records management, the DRA, and all other Anchor QEA staff with access to potentially sensitive documents and records (i.e., audit reports and performance evaluation reports) will take special care to preserve the integrity of these documents. If sensitive or confidential documents are to be used by other staff, due care will be used, in order to maintain integrity of the data.

6 COMPUTER HARDWARE AND SOFTWARE

The purpose of this section is to describe the processes used for administering QA practices for environmental data, managing computer hardware and software, and securing information resources. These processes are important parts of the Anchor QEA QA program.

6.1 Information Technology Management

Systems administration, including support of computer hardware and software, is performed by our in-house Information Technology (IT) team. This group is managed by Anchor QEA's Director of Information Technology, and is responsible for maintaining and upgrading systems; designing and monitoring the corporate Wide Area Network (WAN); administering the corporate email, file, and data servers; backing up and archiving company data; providing disaster recovery and retrieval for systems, devices, and data; and implementing and administering security policies. Specific practices are described in the following sections.

6.2 Management Practices for Environmental Data

The quality of data collected by, or generated from computer programs, shall be the responsibility of the appropriate Anchor QEA Project Manager. The Project Manager shall ensure that project staff follows management practices for data quality. Data quality is ensured by:

- Inspection and testing of requirements for data quality during application development
- Inspection and testing of software programs to ensure data quality requirements can be met
- Second-party review of entered data
- Verification of laboratory electronic data deliverables from contract laboratories

6.3 Computer Hardware

The sophisticated analyses conducted by Anchor QEA engineers require state-of-the-art computer hardware to process complex large-scale spatial, multi-year computer model simulations, and manage large databases. As such, the technical staff members have access to

their own individual computer as well as several high-speed computers for model simulations and GIS analyses. Workstations are installed and maintained by the System Administrators. High-speed printers and scanners, accessible throughout the network, are also available for use by the staff as well as selected laptops for mobile computing.

Anchor QEA's networks are supported by Microsoft Server 2003-based domain controllers. System security consists of authentication to critical resources through a hierarchy of corporate firewalls and Microsoft's Active Directory (AD). Access to email and file servers are allowed through the use of AD Domain-based usernames and passwords, and through the use of email and hardware firewalls, and anti-spam and anti-virus software. Workstations and servers are protected from low and high voltage conditions through the use of battery-based backup power supplies (Uninteruptable Power Supplies or UPS devices). These devices "condition" the electrical power before it reaches the computer and network hardware and protects against brief power outages, thus protecting the integrity of files (e.g., data, documents, and computer simulation information) and hardware.

The IT Group monitors the need for new hardware upgrades or purchases so as to support the activities of the company. They are also responsible for maintaining a detailed inventory list of all hardware used throughout the company. When a hardware need is identified, System Administrators perform research and create a list of options to fulfill the upgrade needs. The QA Manager does a cost-benefit analysis to select the most cost-effective upgrade option. The final procurement is made through recognized vendors and the components are thoroughly tested on test-bed systems before being deployed company-wide to reduce issues relating to compatibility and stability. On some occasions, training is provided to the staff on the use of new hardware, such as the operation of a new scanner. The Computer System Administrators Group is responsible for maintaining all purchase records, registering the hardware, and making sure that the most up-to-date drivers are installed. They strive to be kept continually informed of the latest trends in information technology and data security.

6.4 Commercial Software

The Software Management Policy (SMP) will be used to effectively control the distribution and use of commercial software packages throughout the company. As part of the SMP,

specifications for commercial computer software will be determined prior to purchase to ensure that the software will fulfill the performance requirements of its intended application. In addition, the software will be tested immediately after installation to determine if its performance conforms to the specifications. Development and implementation of the SMP is the responsibility of the QA Manager and the IT Group.

The IT Group sets the standards for computer software and tools on workstations. The Systems Administrators are responsible for installing and maintaining workstation software and updating users on new versions of software and their benefits. These responsibilities also include ensuring that anti-virus software is up-to-date, maintaining a list of software site licenses, and renewing technical support agreements for commercial software. Each workstation is login and password protected such that only System Administrators control software installation.

6.5 In-House Software

A significant portion of Anchor QEA's work involves the development and application of custom ("in-house") software, including data management, analysis, visualization, and modeling or simulation applications. The QA Manager and QA Committee are responsible for developing and implementing QA procedures that relate to in-house software development.

Extensive quality control procedures regarding the development, testing, documentation, and control of this in-house computer software have been developed and implemented by the QA Committee. These QA procedures make it possible to provide error-free results for clients. For situations when an error does occur, documentation procedures for software development and control make it possible to efficiently fix the error.

6.6 Computer Modeling

Application of a computer model to a project requires that QA procedures be used to ensure that error-free model simulations have been completed. Highly complex modeling projects are undertaken at Anchor QEA and the complexity of these projects greatly increases the possibility of errors occurring during the development, execution, and evaluation of

simulations. As a result, rigorous QA procedures have been developed to produce error-free model simulations. These procedures are applied to all projects; project-specific modifications can be made to the general procedures so as to customize the QA process for a particular project.

Development and implementation of QA procedures for computer modeling are the joint responsibility of the QA Manager and QA Committee. Proper application of these QA procedures to a specific project that involves computer modeling is the responsibility of the Project Manager.

6.7 Information Security

Anchor QEA values and protects its information resources, such as electronic databases and other electronic files. Security measures are in place to protect Anchor QEA's information resources from potential loss and misuse. The System Administrators are responsible for ensuring that measures are in place.

AD domain login and password controls regulate access to critical files. The System Administrators designate passwords for network access. Files or directories with sensitive information are protected through the AD user/group permissions based structure. A hierarchy of hardware-based firewall security systems regulate in-going and out-going Internet activity. This system secures the network against unwanted outside access. Anti-virus software is installed on each workstation and file server. System administrators update and monitor the firewall security system and anti-virus software. Using Postini ™, our email is scanned for malware, spyware, and spam prior to entering our network.

To prevent damage to server hardware from overheating, System Administrators monitor the climate of the computer server room. Power supply backup systems are in place on servers and selected workstations to prevent data loss due to short-term power outages.

System Administrators perform daily tape backups of electronic files as part of a four-week rotation. One set of backups is kept onsite on a backup to disk job (B2D), all mission critical servers operating system drives are imaged and backed-up to disk and to tape. All laptop

hard drives are imaged and backed-up to disk and to tape. One week of backup files is kept offsite. Two remaining week tape sets (the fourth is active) are kept in a fireproof safe onsite for quick access to restore lost or damaged files. System Administrators perform a backup of all network files every three months and keep this tape archive offsite in permanent storage.

Projects are periodically archived at the discretion of the Project Manager. Project staff members, under the direction of the Project Manager, are responsible for the archiving of the necessary files and storage of backup tapes. User archives occur when an employee leaves the company. System administrators are responsible for the archiving and storage of these files.

7 PLANNING

Quality management planning at Anchor QEA begins at the company level and is an integral part of the QMP. To address the particular quality issues associated with specific projects, quality management planning also occurs at the project level.

7.1 Company Planning

The QMP emphasizes the importance of quality in all Anchor QEA products and activities; it outlines requirements for the development of QA procedures. The QMP provides the framework for planning, implementing, and assessing quality in all aspects of environmental data collection and analysis. The QMP also serves as a guide for the assignment of QA responsibilities.

7.2 Project Planning

All activities related to the generation, analysis, and use of environmental data will be planned and documented through a systemic planning process, with regard to the QMP, to ensure the generation of the type and quality of environmental data needed for their intended use. The systemic planning process may include, as needed, the development of a QAPP, a Health and Safety Plan (HASP), and a Field Sampling Plan (FSP) or Sampling and Analysis Plan (SAP). The Project Manager, QA Manager, and technical staff develop these documents on a project-specific basis. QAPPs shall conform to the requirements set forth in EPA Requirements for Quality Assurance Project Plans (EPA 2001). The development of data quality criteria and appropriate sampling design shall make use of DQOs as systemic planning tools.

All elements of project planning shall be the responsibility of the Project Manager. He/she will coordinate among all persons and groups responsible for implementation. The components of the systemic planning process include:

- Identification of all key personnel, including a description of their roles and responsibilities
- Identification of data suppliers and users
- A description of project goals and objectives
- Project schedule, including regulatory and contractual requirements, and project

budget
- Identification of data requirements and how collected data will be used to support project objectives
- Determination of the appropriate quantity of data and specification of performance criteria for measuring quality
- Outline of QA activities necessary to assess quality performance criteria
- Details of data collection, including how, when, and where the data will be obtained, as well as identification of limitations
- Description of data analysis and evaluation
- QAPP review and approval procedures
- HASP and FSP development

7.2.1 Identification of Project Staff

The first step in the planning process shall be the identification of the Project Manager, who will guide the planning activities and identify the project staff. Additionally, the Project Manager will identify all participants in the planned activity including service suppliers, data generators, data analyzers, and end users of the data.

An understanding of roles and responsibilities will be conveyed by the Project Manager to all participants. The appropriate types of technical review and levels of support required for the project will be determined by the Project Manager. The Project Manager will assign staff members to the project based on the expertise, experience, and availability of staff.

7.2.2 Identification of Data Suppliers and Users

The Project Manager will identify data suppliers and users in the planning process. Identification of the roles of various participants in planning, implementation, and assessment activities is included in the planning process. Data suppliers include sampling subcontractors and analytical laboratories. Data users include the Project Manager, technical staff, clients, and regulating agencies. The identification of data suppliers and users will be documented in project-specific work plans.

7.2.3 Description of Project Goals, Objectives, and Research Questions

A description of the project goals and objectives will be included in the planning process. The establishment of DQOs, as described in Section 2.2, shall be incorporated into study objectives, to ensure that data collection activities are optimized for obtaining quality data. The Project Manager shall be responsible for describing project goals and objectives, which will be documented in project-specific work plans.

7.2.4 Project Schedule, Regulatory and Contractual Requirements, and Budget

The project schedule will be developed during the planning process, including deadlines required by applicable regulations and contract obligations. Budget estimates will be provided during the planning process. This process will highlight any budgetary or schedule constraints, and incorporate them into the project design. The project schedule and budget will be prepared by the Project Manager and incorporated into project work plans.

7.2.5 Data Requirements and Usage

The type and quantity of data required, and how the data will be used to support the objectives of the project, will be identified during the planning process. Project design will include specifications for statistical methods, as well as other interpretation and analysis requirements. DQOs will serve as a guide in this process. Requirements for status reports, interim work results, and results of assessment activities will be identified and documented in the planning process. Restrictions on the use of interim work results will be defined and documented with the data. These requirements will be developed by the Project Manager and incorporated into the QAPP.

7.2.6 Performance Criteria

Performance criteria for measuring data quality will be specified in the planning process. All data obtained through environmental data collection activities will be assessed, verified, and qualified according to their intended use. Performance measures for environmental data collection activities should be quantified to the extent practicable. Quantification should be dependent on the expected technical capabilities of the measurement systems to be used and

on the intended use of the data. Criteria should include: level of precision required from measurement data; objectives for accuracy, completeness, comparability, and representativeness; data quality assessments; validation/verification of results; documentation establishing that desired results were achieved; and conformance to regulatory requirements. These criteria will be developed by the Project Manager.

7.2.7 QA Activities

Specification of QA activities necessary to assess the quality performance criteria will be included in the planning process. Examples include QA samples for field and laboratory audits, technical assessments, and performance evaluations. According to specifications identified during the planning process, key variables that determine or directly affect the quality of results will be identified and controlled. Anchor QEA environmental data collection activities will be designed to make sure that the data are traceable to the procedures used to generate the data and the staff involved in generating or collecting the data. Data transfer, reduction, verification, and validation requirements will be identified by the Project Manager.

7.2.8 Details of Data Collection

A description of how, when, and where environmental data are obtained will be included in the planning process. This description is to be documented in the project FSP and will be prepared by the Project Manager. Any data collection limitations will be identified in the planning process, including the collection of data from external sources.

7.2.9 Analysis, Evaluation, and Assessment of Data

A description of how data will be analyzed and evaluated to assess whether data meets quality performance criteria will be included in the planning process. This description will be developed by the Project Manager.

7.2.10 Quality Assurance Project Plan Review and Approval

In the development, review, approval, implementation, and revision of a QAPP, Anchor QEA will follow EPA Requirements for Quality Assurance Project Plans (EPA 2001).

Additional guidance may be obtained from EPA Guidance for Quality Assurance Project Plans (EPA 2002). The Project Manager will be responsible for the preparation of the QAPP, with assistance from the technical staff. The QAPP will be reviewed and approved for implementation by appropriate personnel, clients, and regulatory agencies before commencement of the project. The QAPP will address each applicable element listed in EPA QA/R-5. If an EPA QA/R-5 QAPP element does not apply to the project, a statement as to why the element is not applicable will be included in the QAPP.

7.3 Analytical Requirements

The characterization of environmental media is accomplished through the collection and analysis of collected samples. Analyses of chemical and/or physical properties of collected samples form the basis for characterization. Thus, the analytical methods must be specific and sensitive enough to accomplish the objectives of the project, as well as meet the data quality goals associated with those objectives.

7.4 Field Sampling Plan

FSPs will be developed for field sampling and analysis activities on a project-specific basis. FSPs will document the sampling and analysis methods to be employed for the collection of environmental data. The FSP will be prepared in conjunction with the QAPP to ensure that QAPP elements are incorporated into all sampling and analysis activities. The Project Manager will develop the FSP, with assistance from the technical staff.

7.5 Health and Safety

HASPs will be developed for field sampling activities on a project-specific basis. The Anchor QEA Health and Safety Procedures Manual (Anchor QEA 2009) will form the basis for the HASP. HASPs will describe the responsibilities, training requirements, protective equipment, and standard operating procedures required for the project. The Project Manager will develop the HASP, with assistance from the technical staff. The HASP will be discussed with project personnel and will be available for employee inspection and review while work activities are underway. A qualified person will be designated by Anchor QEA to implement the HASP during the field activities.

8 IMPLEMENTATION OF WORK PROCESS

Anchor QEA work programs will be performed at the highest possible level of quality to ensure that customer needs and requirements are met. Environmental programs conducted by or on behalf of Anchor QEA shall be implemented in accordance with approved plans. Changes, additions, or exceptions to the plans shall be approved and documented prior to implementation. Implementation of QA programs takes place at the company and project levels.

8.1 Company Quality Assurance

Upper management is committed to ensuring that environmental data and analyses are of sufficient quantity and quality to meet project objectives. This commitment is documented through the development and implementation of the QMP. Any revisions to the QMP will be processed in the same manner as the original document. QMP revisions will be drafted by the QA Committee and submitted to the QA Manager for approval. The QA Manager will provide general oversight for implementation of the QA program.

The QA Manager will ensure that QA policies are in accordance with the QMP. These policies and procedures address the identification of operations needing standardized procedures, the process for preparation of procedures, and the review and approval of the adequacy of the standardized operating procedures.

The Project Manager is responsible for overseeing documentation of project-related QA policies and procedures. The QA Committee will provide support and oversight in the generation of such documents. The QA project supervisor is responsible for ensuring that project personnel are knowledgeable about and are implementing the QA procedures. The procedures will also serve as a training guide for new staff members.

Many repetitive procedures that are routinely used can be standardized and documented as SOPs. Once established, these SOPs can be cited in the QAPPs, contract proposals, or other similar documents. SOPs relating to QA activities will be reviewed and approved annually by the QA Committee and maintained by the appropriate staff member. Tasks or functions that may be effectively addressed within a SOP include, but are not limited to: sampling

design; sampling procedures; collection methods; calibration and use of models; data validation; engineering design; construction management; planning and permitting; document preparation; and document retention. SOPs are written by staff members familiar with the procedures being described. The approving authority for an SOP is the Project Manager.

The QA Manager is responsible for keeping the SOPs current in accordance with the QMP. The SOP will be redeveloped in the same manner it was initially created under the supervision of the QA Manager. As with a new SOP, the Project Manager will review and approve the updated SOP. Procedures will have the revision date in the title of the document. When a new procedure is created or an old procedure is updated, a memo will be distributed by the Project Manager to the technical staff. The Project Manager removes obsolete or superseded documents from the active Anchor QEA files in accordance with the DRP.

The use of the procedures is dictated by the guidelines outlined in this QMP. The QA Manager and QA Committee train and instruct the Project Managers in the use of the QA policies. In turn, the Project Manager will instruct staff members on how to implement QA procedures and ensure that QA policies are being followed.

8.2 Project Implementation

QA is implemented on the project level using two primary methods. First, the appropriate QA procedures and processes are applied to the various aspects of a project (e.g., data collection, data analysis, computer model analysis, engineering design, and report preparation). The Project Manager is responsible for determining and applying the appropriate QA procedures and processes for the different components of a specific project. The QA Manager and QA Committee will assist the Project Manager, as needed, in the application of QA procedures and processes to a project.

Second, a QAPP will be developed for components of a project that require this level of QA documentation (e.g., field studies and data collection). A QAPP will be approved by the Project Manager and will address the process for implementing environmental data

operations according to the approved planning documents. Each QAPP will outline those specific activities that ensure the generation of quality data. A QAPP will also identify criteria for collecting or selecting data sufficient to support work product. Descriptions of procedures for preparation, review and approval of QAPPs will also be included. Evaluation parameters will be outlined to ensure that the work described in the QAPP is being performed according to the plan. The QAPP will also include provisions to ensure that individuals with QA responsibilities have been properly trained. A definition of the level of management oversight will be provided in accordance with the importance of the particular project and the intended use of the project results.

Any changes to the QAPP will be documented and approved in writing through an amended QAPP. Revisions are to be made as needed under the supervision of the Project Manager. Document titles will include the date of revision, allowing the staff members to identify the most up-to-date QAPP. The Project Manager is responsible for removing obsolete QAPPs from the active files, archiving the superseded documents, and informing the project staff members of the updated QAPP. The Project Manager will verify that the changes in the QAPP are being implemented as described.

9 ASSESSMENT AND RESPONSE

This section of the QMP describes how Anchor QEA will assess the effectiveness of its QA program. Anchor QEA will use a variety of internal assessments, including management and technical reviews, and performance evaluations, to ensure that QA procedures are implemented successfully.

9.1 Review of the Quality Management Plan

The QA practices and procedures described in the QMP will be assessed semi-annually and if needed, updated or revised at that time. The QA Manager is responsible for coordinating the effort, arranging for assistance from qualified personnel, and incorporating the recommended changes. QMP revision may be required under conditions such as:

- Expiration of the five-year life span of the QMP
- Reorganization of existing functions that affect programs covered by the QMP
- Major changes in missions and responsibilities
- Assessment findings requiring corrective actions and response

9.2 Quality Assurance Program Assessment

Anchor QEA will employ a variety of QA assessment tools to provide a better understanding of the components of the quality system and to provide a basis for improving the system. The assessment tools that may be used in determining the effectiveness of the QA program are described below.

A Management System Review (MSR) is an independent assessment of Anchor QEA's QA management practices and is typically performed by the QA Committee. MSRs address the effectiveness of management controls in achieving and assuring data quality, the adequacy of resources and personnel devoted to QA functions, the effectiveness of training and assessments, and the applicability of data quality requirements. MSRs can identify significant QA concerns and areas of needed improvement, as well as point out noteworthy accomplishments.

MSRs are generally conducted and documented by an internal review team that has no perceived conflict of interest. The review focuses on the adherence to the QMP and the

implementation of QA practices. An attempt will be made to conduct an MSR once every three to five years. Most MSRs will examine elements including:

- Assessment of the overall effectiveness of the QA management system, as measured by its adherence to the QMP
- Procedures for developing DQOs
- Procedures for developing and approving QAPPs
- The effectiveness of existing QAPP guidance and QAPPs
- Procedures for developing and approving SOPs
- Responsibilities and authorities of various managers and QA personnel for implementing the QA program
- Degree of management support
- Level of financial and other resources committed to implementing the quality system

9.3 Performance Evaluations

There are two kinds of performance evaluations. The first is the standard accountability review. These are conducted and documented for each employee semi-annually, although quarterly reviews are recommended. One of the purposes of the review is to have supervisors and peers assess the work quality of the employee. Goals and accountabilities are established for the following year regarding any necessary improvements. The review may also identify areas for which additional training is needed. The evaluation is given by the employee's immediate supervisor.

The second method is the evaluation of products or services external and internal to Anchor QEA. This evaluation can encompass:

- Assessment of documents and procedures that are published by Anchor QEA
- Site actions overseen by Anchor QEA
- Laboratory work done for Anchor QEA
- Site or laboratory work collected for another party and then submitted to Anchor QEA
- Products purchased by Anchor QEA

An employee qualified (to be determined through the discretion of the QA Manager) to conduct these evaluations performs and documents them. These evaluations will be scheduled if required by the project, or on an as-needed basis.

9.4 Data Quality Assessments

A Data Quality Assessment (DQA) refers to the process used to determine whether the quality of a given data set is adequate for its intended use, using appropriate statistical tools. DQAs can be performed on all or selected projects involving data collection. The purpose of this type of evaluation is to determine whether the data collected are acceptable to the decision-maker or user for their intended use, since the data are ultimately meaningful only in this context.

A DQA involves a statistical comparison of the collected data with the Data Quality Objectives (DQOs) for the project. The intended use of the data is established by the project's developed DQOs. This evaluation and comparison will result in the determination that the data are usable or not usable for their intended purposes. Because planning, implementation, and assessment processes are ongoing, the exact timeline for a DQA is determined by the project life cycle. Guidance for this procedure is provided in Guidance for Data Quality Assessment (EPA 2000a). The Project Manager is responsible for determining when a DQA is needed.

9.5 Technical Review

A Technical Review (TR) is a documented critical review of project activities and products. This review is performed by one or more qualified reviewers who have expertise comparable to the project's performers, but who are independent of the project. The review is to determine that the work is technically adequate, competently performed, properly documented, and satisfies established technical and QA/QC requirements. EPA's Guidance on Technical Audits and Related Assessments (EPA 2000b) is available as guidance for performing technical audits or reviews. TRs will be conducted when specified by a project or on as-needed basis.

9.6 Responses and Corrective Actions

Responses to adverse conclusions from the findings and recommendations of assessments will be made in a timely matter. Conditions needing corrective action will be identified and the deficiency and recommended corrective action(s) will be communicated, both verbally and through documentation, to the Project Manager and discussed no later than the next project meeting.

The response to the corrective measures will be provided, detailing both short-term and long-term changes, within a specified timeframe. Verification of corrective actions will be conducted and documented to confirm the implementation of the agreed upon changes. The QA Manager is responsible for resolving any disputes arising from assessments.

10 QUALITY IMPROVEMENT

Upper management at Anchor QEA supports quality improvement by encouraging staff to continually adjust current work processes to: prevent quality problems; look for better, more efficient ways to work, maintain accuracy, sustain effective communication; and evaluate the effectiveness of current practices, policies, and procedures. Eliminating all quality problems in the final product is Anchor QEA's goal. Continual improvement is achieved through a constant evaluation of quality in company, project, and staff performance.

10.1 Company Processes

The QA Manager is responsible for ensuring that quality is continually improved on a company level. Supervisors are responsible for quality improvement in their employees' work. Employees are accountable for quality improvement on an individual level.

Good communication between staff members, clients, and other outside parties is an important part of identifying quality deficiencies. Continually looking for areas where quality can be improved aids in the prevention of conditions adverse to quality. To identify areas where quality should be improved, Anchor QEA has processes in place such as:

- Biannual performance reviews
- QA seminars held as needed
- QA Committee meetings held quarterly or more often as needed
- Semi-annual Strategic Planning Group meetings

In addition, all staff members are encouraged to promptly identify any issues impacting quality and continually look for ways to improve the quality of work.

As soon as a problem is identified, the employee, Project Manager, and QA Committee are responsible for timely action to correct, document, track, and determine the extent of the problem. The above parties are also responsible for proposing a solution that will prevent the problem from reoccurring. A proposed solution to a problem or a process improvement may be discussed in a QA seminar to obtain feedback from other technical staff members. Once a solution to a problem or a process improvement opportunity is identified and finalized, it is added to Anchor QEA's Standard Operating Procedures Manual.

10.2 Project Reviews

Project Managers are responsible for requesting project quality reviews and identifying where improvements can be made on a project-level. Project Managers will perform project reviews as needed. When a project-specific quality deficiency is identified, the affected staff members, the Project Manager, and the QA Committee are responsible for timely action to correct, document, track, and determine the extent of the problem. These parties are also responsible for proposing a solution that will prevent the problem from reoccurring. Once a solution to a problem or a process improvement opportunity is identified and finalized, it is added to the project's SOPs. All relevant parties will be informed of the problem, its extent, the solution, and the measures taken to prevent future problems.

11 REFERENCES

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