SRBC Quality Management Plan

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2.0 MANAGEMENT AND ORGANIZATION

2.1 Requirements

The U.S. Environmental Protection Agency (USEPA) has developed a mandatory Agency-wide Quality Assurance Program that requires all organizations performing work for USEPA to develop and operate management processes for assuring that data or information collected are of the needed and expected quality for their intended use. It also requires that environmental technology used for pollution control or waste remediation is designed, constructed, and operated according to defined specifications and protocols. These requirements apply to all organizations that conduct environmental data operations on behalf of USEPA through contracts, financial assistance agreements, and interagency agreements.

This document outlines the Quality Management Plan (QMP) for the Susquehanna River Basin Commission (Commission) and requires that the Quality Management Program have sufficient resources and authority to support the USEPA national program effort.

2.2 QMP Goal

The goal of the QMP is to ensure that all environmental data obtained by the Commission will be scientifically valid, defensible, and of known and acceptable precision and accuracy. This goal can be achieved by ensuring that adequate quality assurance (QA) steps and procedures are used throughout the entire monitoring process (from initial study planning through data usage).

2.3 Policy

It is the policy of the Commission that:

- All environmental data generated for the USEPA will be of known and acceptable quality. This quality, and the associated level of effort of the required QA activities, will meet the needs of each program's intended use of the data. The data quality information developed for all environmental data will be documented and available.

- An acceptable and cost-effective program of QA activities will be developed and implemented at the onset of each environmental data operation to help ensure that the necessary level of data quality is achieved.

- All Commission monitoring activities will ensure that acceptable QA requirements are included and implemented in applicable subcontracted services. The Quality Assurance Coordinator, Project Quality Assurance Manager, and project managers will ensure that all staff working on a project will execute the project according to approved quality management documents, identify and correct areas of deficiencies, and ensure staff received adequate training to perform project tasks.

2.4 Commission Organizational Structure

See Figure 1 for Commission Organizational Structure and Figure 2 for Commission Quality Assurance Management Structure.

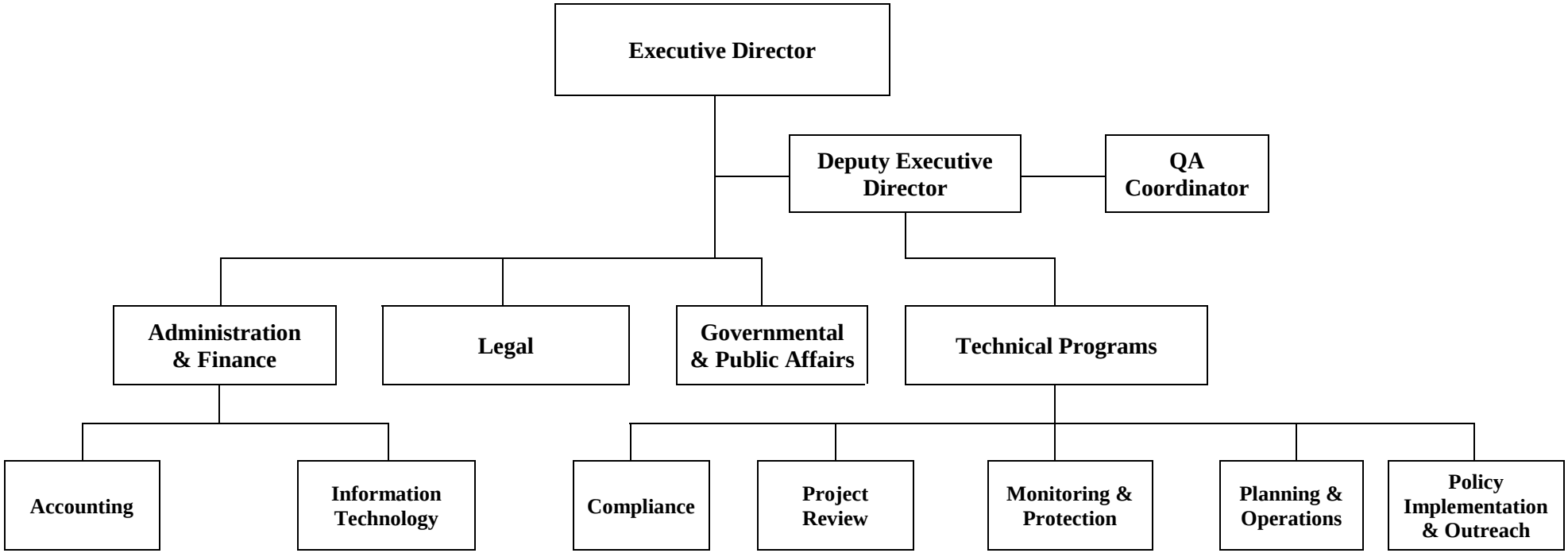

Figure 1. Susquehanna River Basin Commission Organizational Structure

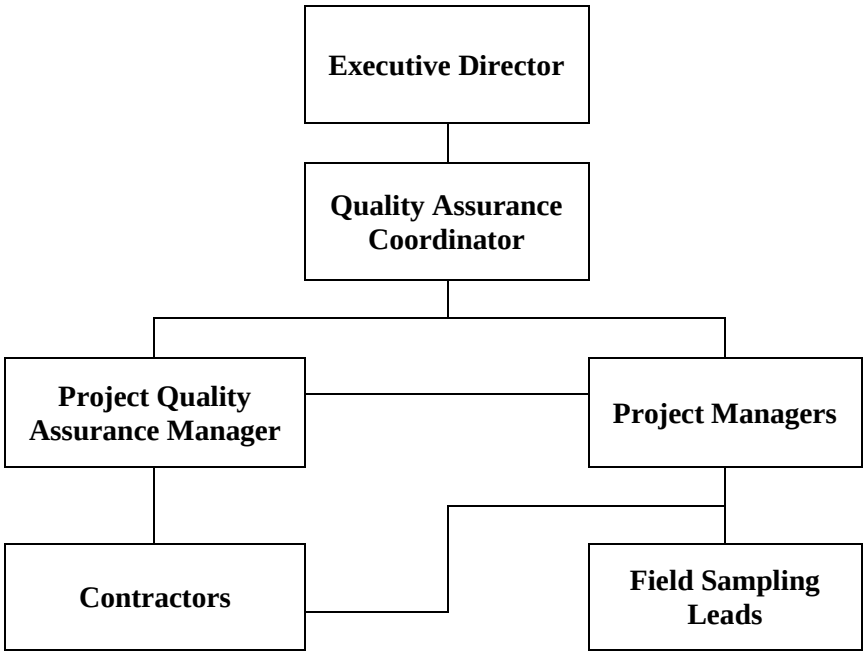

Figure 2. Susquehanna River Basin Commission Quality Assurance Management Structure

2.5 Roles and Responsibilities

2.5.1 Executive Director

The Executive Director has the overall authority and responsibility for implementation of USEPA's QA requirements.

2.5.2 Quality Assurance Coordinator (QAC)

The QAC has the authority and responsibility for directing QA activities within the Commission and in all areas covered by this QMP. The QAC is the official point of contact for all QA matters with the USEPA. The QAC is not and will not be directly involved in generating, compiling, and/or evaluating raw environmental data.

The QAC will delegate activities to and supervises the work of the Project Quality Assurance Manager (PQAM). The QAC will review and approve all Quality Assurance Project Plans (QAPPs), contracts for subcontractors performing required activities requiring QA, and QA-related sections of new contracts. The QAC will assist with designing QA requirements for new studies. The QAC will be responsible for maintaining documentation for all QAPPs and communications with USEPA.

The QAC will intervene on behalf of the Commission to take appropriate corrective action or provide additional resources when, where, and however needed to correct identified deficiencies. The QAC will keep the Commission Executive Team and USEPA Region III's Office of Analytical Services and Quality Assurance (OASQA) informed of QA needs, problems, and overall status. The QAC will obtain technical assistance from OASQA when necessary.

2.5.3 Project Quality Assurance Manager (PQAM)

The PQAM coordinates with the QAC and Project Managers. The PQAM also coordinates with USEPA on administrative compliance. The PQAM is not and will not be directly involved in generating, compiling, and/or evaluating raw environmental data.

The PQAM prepares project QAPPs and coordinates submittal, revisions, and approvals of the QAPPs by both Commission and USEPA personnel. The PQAM coordinates and conducts field audits of each individual project to ensure compliance with the project QAPP. The PQAM communicates with subcontractors regarding contracts, quality assurance protocols, and any issues that may arise. The PQAM reports both resolved and unresolved issues to the QAC for awareness and mediation, if necessary.

The PQAM also coordinates Commission participation with the National Field Quality Assurance (NFQA) program with U.S. Geological Survey (USGS) staff in the New Cumberland, PA, field office.

2.5.4 Project Managers

Project Managers will coordinate directly with the PQAM on QA requirements to satisfy the data quality needs of the project. The Project Manager is responsible for ensuring that field personnel are adequately briefed on the QAPP and making periodic checks for compliance with the QA requirements. The Project Manager will also alert the PQAM as to any suspected or known QA issues with subcontractors.

2.5.5 Field Sampling Leads

Field sampling leads will coordinate and review QA requirements with the appropriate Project Managers to ensure that all environmental data obtained meet the needs of the study.

2.6 Communication and Reporting

Lines of communication and reporting of QA program status/needs will be maintained to ensure that an effective QA program is implemented within the Commission. These lines of communication are illustrated in Figure 2.

The QAC will have direct access to the Executive Director, Deputy Executive Director, Director of Administration and Finance, supervisors, Project Managers, and the laboratory directors on specific QA matters as problems arise. The QAC will keep the Executive Director, Executive Team, PQAM, and Project Managers informed of the performance of the data production systems and of any problems and needs.

The PQAM will communicate with Project Managers and subcontractors and will report to the QAC to identify issues and ensure correction.

The Project Managers will distribute a project's QAPP to the Field Sampling Leads. The Project Managers will oversee project operations and adequately respond to identified program problems and needs (including needs for resources as determined by the QAC or PQAM) and to ensure correction. The Project Managers will report issues to the PQAM.

Field sampling leads and other staff who are involved in environmental data collection and operations will review this QMP in order to be aware of the Commission's policy and requirements. The QAC will submit an annual QA status report to the OASQA.

Commission Project Managers meet monthly during section meetings and discuss QA issues on an as-needed basis. Commission staff is encouraged to make suggestions for quality improvement on an ongoing basis. Suggestions are solicited during monthly section meetings, during the Commission's annual field training day, and during annual project QA audits by the QA Coordinator.

3.0 QUALITY SYSTEM COMPONENTS

3.1 Quality Management Plan (QMP)

The Commission's QMP provides the policy and requirements for establishing a QA program to ensure that all environmental data collection and data usage conform to the goal and policy set forth in the Management and Organization Section. This plan is to be prepared by the QAC, reviewed by the Executive Team, and then submitted for approval by the Executive Director, Deputy Executive Director, USEPA Project Officer, and USEPA Regional Quality Assurance Coordinators. The QMP will be accessible on the Commission's website (www.srbc.net) and will be maintained electronically on the Commission's server. The QMP will be resubmitted for approval every five years.

The provisions of this QMP are applicable to the following Commission programs (current as of the preparation of this QMP), as they are partially funded by USEPA:

1. Subbasin Survey Programs
2. Eel Restoration Monitoring Program
3. Large Rivers Assessment Program
4. Abandoned Mine Drainage Restoration Program
5. Specialized Annual Projects such as:
   a. Harmful Algal Blooms
   b. Dam Removal Study
6. Chesapeake Bay Nutrient and Suspended Sediment Monitoring
7. Member state support

Other Commission projects may be deemed applicable as determined by the Executive Director, Executive Team, QAC, and appropriate Commission Project Managers. These projects may include, but are not limited to: public water supply monitoring, aquatic resource surveys, ecological flow studies, and other work conducted on behalf of member state or federal agencies.

3.2 Quality Assurance Project Plan (QAPP)

Adequate Quality Assurance/Quality Control (QA/QC) must be applied throughout a project's operation to ensure that the data collected are of known and acceptable quality. The intended uses and quality of the data will be defined before data collection begins and will take into

account the needs of secondary users as appropriate. Data quality objectives (DQOs) are established at the inception of a project, and essential QA elements are incorporated into project operations as appropriate. Assistance in establishing DQOs is found in USEPA's Guidance on Systematic Planning Using the Data Quality Objectives Process (USEPA, 2006). Those QA elements which will be incorporated into project operations, whether by Commission staff or subcontractors by all programs are outlined in USEPA's guidance documents.

Commission project QAPPs are developed using USEPA's Guidance for Quality Assurance Project Plans (USEPA, 2002) and Quality Assurance Project Plan Development Tool (USEPA, 2021). The specific requirements and level(s) of effort applicable to each QA elements will be described in each individual project's QAPP. A QAPP will specify the mechanism by which timely corrective action can be taken if data quality becomes degraded. A QAPP must be reviewed and approved by USEPA prior to initiation of any data collection activity. All Commission QAPPs will be maintained electronically within a project-designated workspace on the Commission's network.

3.3 Standard Operating Procedures (SOPs)

SOPs are effective tools for ensuring that all individuals conduct routine and repetitive procedures in the same way. These procedures include, in part, sampling procedures and calibration of field meters and equipment. These SOPs will be written by the technical personnel who are trained in those procedures and will be reviewed by Project Managers and the QAC. The QAC must approve all SOPs before they are implemented. When certain procedures used by other agencies are adopted by the Commission, the agencies' publications describing the procedures will be kept on file for all staff to review. Guidance for preparing SOPs can be found in USEPA's Guidance for Preparing Standard Operating Procedures (USEPA, 2007). All SOPs will be accessible on the Commission's network.

4.0 PERSONNEL QUALIFICATIONS AND TRAINING

The Commission's policy regarding employee training is to "encourage excellence in its staff by affording opportunities for professional growth and development, the Commission will maintain an ongoing program, contingent upon the Commission's approved budget, to provide for specialized work-related training requirements for all employees. Training needs shall be determined as part of the employee's performance objectives for each year."

The Director of Administration and Finance will coordinate with appropriate management staff to establish the educational, technical, and experience requirements for personnel filling positions requiring environmental data collection and usage. All staff must have adequate education, training, and experience to meet their designated responsibilities. The Program Manager, in coordination with the Director of Administration and Finance, will be responsible for identifying any statutory, regulatory, or professional certification required to perform certain operations. Technical and managerial staff will be given opportunities to attend appropriate training courses in order to maintain proficiency. The Director of Administration and Finance will maintain training records in the personnel files.

The QAC and PQAM will continuously train on USEPA requirements for QMPs, the DQOs process, and QAPPs through workshops, webinars, and individual meetings with USEPA QA coordinators.

All new personnel will attend the annual spring field training session and go through a period of on-the-job training by working with individuals proficient in the assigned tasks. Each staff member collecting or compiling data will be evaluated during project QA field audits for adherence to QA requirements. Failures to adequately follow procedure will be addressed by the QAC and PQAM immediately. Each staff member collecting or compiling data will participate in the annual USGS NFQA program, and issues pertaining to equipment or staff execution will be addressed by the QAC and PQAM immediately. During quarterly check-in meetings with supervisors, or during other times of the year when necessary, corrective action or retraining will be planned to ensure future QA compliance.

All staff will be urged to obtain necessary training throughout the year. Supervisors and managers will discuss training opportunities and needs during quarterly check-in meetings and in July of each year when objectives for the next year are set. Where appropriate, staff participate in technical workshops to expand their knowledge in their areas of expertise. Staff proficiency in environmental data collection and management is demonstrated in written reports and presentations before peer groups (workshops, conferences, and regional interagency committees) of project results.

5.0 PROCUREMENT OF ITEMS AND SERVICES

The Director of Administration and Finance will coordinate with the QAC, PQAM, and individual Project Managers to ensure that appropriate QA/QC requirements are included in all arrangements with subcontractors and services that require QA.

5.1 Equipment and Other Items

Project Managers procuring field equipment will ensure that the specifications meet the needs of current and future projects and DQOs. The QAC will review and approve the specifications before any purchases are made.

5.2 Laboratory Services

The QAC will ensure that the subcontracting laboratory has proper certifications and accreditations and a quality system that is documented in a Laboratory Quality Manual. The laboratory's QA/QC plan must be acceptable and adequate to meet the QA objectives for Commission projects. The laboratory must demonstrate its ability to perform the required analyses. The QAC, PQAM, and Project Managers will ensure that the analytical data submitted by the laboratory meet all of the QA requirements included in the contract.

Project QAPPs will specify what actions (i.e., duplicate samples, blanks) field personnel will take to provide a check on the validity of laboratory results.

5.3 Other Subcontractors

Contracts with other appropriate subcontractors will be reviewed by the QAC to ensure that adequate QA requirements have been included in the contract. The QAC also will review the subcontractor's QA plan for consistency with USEPA and Commission requirements.

6.0 DOCUMENTS AND RECORDS

Adequate precautions must be taken during the reduction, manipulation, and storage of data in order to prevent the introduction of errors, loss of data, or misinterpretation of the data. To this end, the QAC will ensure the following:

1. All quality-related documents will be assigned a document control number.

2. The QMP will be reviewed annually by the QAC. Revised QMPs will be reviewed by appropriate management staff, approved by the Executive Director, and submitted to USEPA along with the USEPA Pre-submittal Quality Assurance Document Review Checklist for approval. A revised QMP shall be submitted every five years or more frequently if changes have occurred within the Commission's Quality System Components section. The QMP and revisions will be stored electronically on the Commission's network and published on the Commission's website.

3. All technical guidance documents and SOPs will be prepared and reviewed by Project Managers, technical personnel, and appropriate management staff to ensure that the procedures are valid. The QAC also will review and approve the guidance documents and SOPs to ensure that they meet the needs of current projects.

4. All QAPPs written by the Project Managers will be reviewed by the appropriate supervisors and approved by the QAC. The QAPP will then be submitted to OASQA, as part of the USEPA grant application process, for review and approval. For non-USEPA related projects that require a QAPP, the above steps will be followed, except for the final submittal to USEPA.

5. All biological, habitat, water quality, and discharge data will be organized into a standard format in a centralized Access computer database. The formatting will be compatible with other USEPA formats (i.e., Chesapeake Bay Program data format or USEPA's Water Quality Exchange) so that data transfers and usage can be accomplished with minimal reformatting. All appropriate data will be transferred to USEPA's Water Quality Exchange annually.

6. An Access database with SQL tables will be used for environmental data storage. This system will be capable of receiving all properly reduced data; screening and validating

data to identify and reject outliers, errors, or otherwise unacceptable data; preparing, sorting, and inputting all acceptable data into the data storage files; providing all stored data points with associated QA "labels" when USEPA guidance is provided; and making all data readily available to potential users.

7. Proper checks will be made at all data handling points from receipt of samples at the subcontracting laboratory to the Commission staff member entering the data into the data storage system. These checks include the following:
    a. All data must be recorded clearly and accurately on all field sheets. All field sheets must be turned in to the Project Manager.
    b. Laboratory results will be sent to the Project Managers, who will match the laboratory reports with the duplicate copies of the field sheets to ensure that all samples are accounted for.
    c. All data must be transferred from field sheets and laboratory reports completely and accurately. The individual entering data into the database will check each data entry. A separate printout of the new data entries will be made and checked by the Project Manager to ensure that the data are entered correctly. The Project Manager will make an entry into the database when QA has been completed for each dataset.
    d. A back-up of the database will be made daily.

8. All revised QMPs, guidance documents, QAPPs, and SOPs will be identified by placing the word “Revised” and date of revision below the Document Control Number. All QAPPs and SOPs will be maintained electronically on the Commission’s server for staff access. The QMP will be placed on the Commission’s website.

9. All QA field notes and laboratory reports will be kept on file for three years.

10. Results of external performance audits and internal QA project reports will be kept on file by the QAC for three years.

11. QA reports from the QAC and Project Managers are electronically filed with other project documents.

7.0 COMPUTER HARDWARE AND SOFTWARE

The Manager of Information Technology is responsible for maintaining, upgrading, and replacing all equipment. The Manager of Information Technology also ensures that proper hardware and software are in place for the Commission and works closely with the end users to ensure that they have the proper computer tools to perform their work. When certain specialized software (e.g., Geographic Information Systems software) is obtained, an individual that is proficient in the use of the software will be designated as responsible for maintaining and updating the software and supporting documentation. The QAC and supervisors will review and approve any purchase requests for computer equipment and software before final approval is

given by the Executive Director or Director of Administration and Finance, according to the provisions of the Commission's administrative manual.

When upgrading or replacing equipment, the Manager of Information Technology will coordinate with the QAC, Project Managers, and the end users involved in environmental data operations in order to establish the needs and requirements of the Project Managers and end users, and the technical specifications of the proposed hardware. The Manager of Information Technology will evaluate the specifications to determine compatibility with the existing network specifications and the needs of other network users, research several options, and make recommendations to the program managers and the Executive Director or Director of Administration and Finance for final approval and purchase.

Computer software to be purchased for specific data operations will be reviewed by the Project Managers and supervisors to ensure that the needs of the project will be met prior to requesting the software. When software is obtained from other agencies, the Commission Project Manager and/or the user will contact the other agency's user to discuss the capabilities of the program to determine whether the software will meet the needs of the project. If custom software is needed, the Project Managers will work closely with the programmer to ensure that the final product will meet the requirements. The Project Managers and supervisors will coordinate with the project contractors to ensure that the contractual requirements and standards are met.

The technical specifications of all software purchased for use in environmental data operations will be reviewed by the QAC to ensure that the requirements of the project and the needs of the Project Manager are met. The Manager of Information Technology will review the specifications to ensure that the software is compatible with the Commission's hardware system.

When new computer hardware and/or software are installed, they will be tested to verify that the Commission's specifications have been met. When the hardware and software configurations are changed, the changed configuration will be tested to ensure that the change has not impacted project and/or program objectives. The results of all testing will be documented and maintained by the Manager of Information Technology.

8.0 PLANNING

The planning process for projects must include direct communication between USEPA, appropriate local, state, regional, and federal agencies, and the Commission to ensure that there is a clear understanding of the needs and expectations of the product or result to be provided. When appropriate, the Commission's advisory committees will be included in the planning process. The QAC will oversee project planning from inception to completion and submit a report on the adequacy of the planning process to the Deputy Executive Director.

Planning for projects involving the generation, acquisition, and use of environmental data will identify the users of the product to be generated, identify the needs and expectations of the user both in terms of technical and quality goals, translate those needs and expectations into specifications to produce the desired result, consider cost and schedule constraints under which

the project is to be performed, identify the acceptance criteria or measures of performance to satisfy the needs and expectations of the user, and document the results of the planning process in the QAPP as described above in the Quality System Components and Documents and Records sections.

Project Managers will establish the data needs and expectations, Data Quality Objectives (DQOs), and acceptance criteria and discuss them with any subcontractor that will collect environmental data for the Commission. The contractor will prepare a QAPP based on the requirements established and submit them for review and approval by the Commission Project Manager and QAC.

The quality of all data must be assessed after they are generated and before they are used in order to ensure that they are satisfying the data user's needs and project requirements. This assessment should focus on five basic aspects of the data:

1. Accuracy – Can the data's accuracy be determined, how was it determined, and is it acceptable for the planned use?

2. Precision – Can the data's precision be determined, how was it determined, and is it acceptable for the planned use?

3. Completeness – Are there a sufficient amount of data available for the planned use?

4. Representativeness – Generally, how well do the data represent actual conditions at the sampling location, considering the original study design, sampling methods, analytical methods, etc., which were used?

5. Comparability – Generally, how comparable is the group of data with respect to several factors, including:
    a. Consistency of reporting units;
    b. Standardized siting, sampling, and methods of analysis; and
    c. Standardized data format.

All of these factors will initially be considered when designing a study and will be addressed in all QAPPs. These factors will also be considered when using data generated without an approved QAPP or an equivalent planning document. Additional guidance can be obtained from USEPA's "Data Quality Assessment: A Reviewer's Guide," EPA QA/G-9R, February 2006, and "Data Quality Assessment: Statistical Methods for Practitioners," EPA QA/G-9S, February 2006.

9.0 IMPLEMENTATION OF WORK PROCESSES

Each project is overseen by a Project Manager who is responsible for initiating the project, implementing project tasks, and overseeing work to be done by technical staff and any subcontractors. Project Managers communicate progress in project tasks to the Program Manager, project funding agency, and any interagency technical review groups that may have an interest in project outcomes.

In addition to field and laboratory audits, critical task elements performed by each staff member are reviewed annually by the staff member's supervisor, the Program Manager, and the Deputy Executive Director. As discussed previously in the Personnel Qualifications and Training Section, the supervisor and staff member will identify additional training needed in the upcoming year to correct deficiencies or prepare for new assignments. Commission technical staff adhere to a set of basic Commission Standard Operating Procedures (SOPs). Those Commission staff who work on Chesapeake Bay Program Office (CBPO) projects follow CBPO-issued SOPs.

10.0 ASSESSMENT AND RESPONSE

Several activities are necessary to ensure an adequate system of QA program operation, review, audits, and QA plan approval. Additionally, guidance provided by USEPA's "Guidance on Assessing Quality Systems," EPA QA/G-3, March 2003, will be used, as applicable, to assess the Commission's quality management system.

10.1 Review of QA Program, QAPPs, and SOPs

The QAC will review and approve all existing programs, future program plans, project plans, and subcontracting agreements to ensure that acceptable QA/QC activities and requirements are included, that proper QA was considered at the project's inception, and that the project will be able to produce data of required quality in a reliable and cost-effective manner. Project Managers and technical personnel will review all technical guidance documents and SOPs, at least annually, to ensure that they are current and correct. Revisions will be made as necessary and submitted to the QAC for approval. They will also make recommendations on new procedures that may improve the quality of results and the quality management system. The QAC will take appropriate action to incorporate the recommendations into the quality management system.

10.2 Reviews/Audits of Performance

Effective management of the QA activities requires periodic program assessment on which corrective actions can be based. The PQAM will conduct field audits of all projects. The Commission welcomes both internal and external reviews and audits of staff operations or contracted services. These audits will assess the adequacy of, and adherence to, the respective QA plans.

10.2.1 External Review/Audits of Performance

All staff who collect data will participate in the National Field Quality Assessment Program, conducted annually by the U.S. Geological Survey. This program audits proper meter calibration and use by staff to isolate errors attributable to equipment malfunction or to user error. The PQAM coordinates staff participation in this program and submits results to the QAC. Errors are researched to determine likely cause. An individual failing an audit will be required to repeat the test. Failure of the retest will result in retraining, usually through on-the-job training with personnel that are proficient in their work. The need for additional formal training will be determined by the Monitoring and Protection Program Manager, Project Manager, and/or the QAC and will be required as the opportunity arises. If faulty equipment is determined to be the source of the error, the equipment will be repaired or replaced.

10.2.2 Internal Review/Audits of Performance

Project Managers will observe the activities of field personnel to ensure that the procedures established in the QAPP and SOPs are followed. Any deficiencies identified will be corrected immediately and noted on field data sheets so that all project personnel can be briefed on the correct procedures.

The PQAM will accompany field sampling leads at least once a year to observe and document adherence to a project's QAPP using a standardized QA field trip checklist. On occasion, the PQAM may make unannounced checks to observe staff compliance with the QAPP. The QAC, PQAM, and Project Managers will have the authority to stop work in progress if an adverse condition that will immediately affect the quality of results is identified. Any required corrective actions will be reported to the QAC and corrected immediately by the Project Manager. These corrective actions may include defective equipment, the need for additional training, or the need for additional resources. The QAC will submit a report of findings and the corrective actions taken, if any, to the Executive Director and other Commission staff as necessary.

An annual field training session, attended by the QAC, PQAM, Project Managers, and field sampling staff, is held to review, discuss, and demonstrate all sampling and data collection protocols in May or June each year before the main field season starts. Outside agencies will be included when necessary to clarify specific aspects of protocols or to provide additional training opportunities for Commission staff. Any required corrective actions noted during this training session will be documented by the QAC and will be taken immediately, as necessary, by the QAC and will be reported to the Executive Director and other Commission staff as necessary.

Each Project Manager will coordinate the submission of blanks and duplicate water quality samples to the contract laboratory for analysis as outlined in individual project QAPPs.

All work will be performed according to procedures established in the QAPPs for specific projects and in SOPs. These QAPPs and SOPs will be prepared as prescribed above in the Quality System Components section. The QAC will conduct assessments as described in this same section to ensure that work is being performed as planned. Project Managers will ensure that all personnel assigned to the project have reviewed the QAPP and appropriate SOPs and are fully aware of the QA requirements.

Supervisors and managers of all project staff, including the PQAM and QAC, will include adherence to QA standards as part of the annual performance evaluation.

11.0 QUALITY IMPROVEMENT

As described in the Management and Organization Section, the QAC is responsible for overseeing all aspects of QA activities within the Commission, including identifying, responding to, and resolving identified QA program problems and needs. It is important that the QAC, with sufficient support from upper management, take appropriate action when, how, and where necessary to resolve problem(s). The QAC will keep upper level management and OASQA advised of all program problems, needs, and overall status.

Each QAPP will specify system control limits that will indicate the need for corrective action when they are violated. The QA plan will also describe procedures and requirements for establishing and maintaining QA reporting or feedback channels to ensure that early and effective corrective action can be taken when data quality is compromised.

The PQAM, with assistance from the Project Managers, is responsible for evaluating the status of current QA activities and planning and implementing quality improvement activities. In order to accomplish this task, the PQAM must take advantage of the quality checks described in the previous sections of this QMP as follows:

1. The QMP, QAPPs, SOPs, and other guidance documents must be reviewed annually and revised as necessary, to ensure that the QA guidance and procedures support the DQOs. The revised documents should be discussed with the appropriate Project Managers and field personnel to ensure that the revisions are clearly understood.

2. Results of any external performance audits should be maintained and periodically evaluated to determine whether any trend in an individual's performance can be detected. If there are indications that an individual's performance is deteriorating, the individual should be considered for additional training.

3. The PQAM will accompany project personnel at least once a year and occasionally make unannounced checks to observe adherence to the QAPP. Any variance from prescribed procedures will be corrected immediately. The PQAM will discuss negative findings with the Project Manager and the field person, as soon as possible, to ensure that the proper procedures are understood, or whether additional training is necessary.

4. Project Managers are responsible to ensure that field personnel are briefed adequately on the QAPP and to make periodic checks for compliance with the QA requirements. Any variance from prescribed procedures should be discussed with the individual and corrected immediately. Project Managers will report their findings to the PQAM and discuss further corrective actions, if necessary.

5. Field personnel will report any equipment problems to the Project Managers and discuss the need for repairs or new equipment. Project Managers will report the findings to the

PQAM, who will report them as necessary to the QAC. The QAC will make appropriate recommendations to the Deputy Executive Director, Director of Administration and Finance, and/or Executive Director.

6. All personnel will be provided the opportunity to apply for additional training to improve their understanding of QA requirements and their proficiency for implementing QA procedures.

7. The QAC and Project Managers will maintain a record of quality checks made, the findings, and any corrective actions taken. The QAC will submit a report to the Executive Director, at least annually. Corrective actions on major deficiencies that require the Executive Director's approval will be reported immediately.

12.0 REFERENCES

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