



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 7

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OFFICE OF THE
REGIONAL ADMINISTRATOR

JUN 06 2018

Carol S. Comer
Director
Missouri Department of Natural Resources
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Jefferson City, Missouri 65102-0176

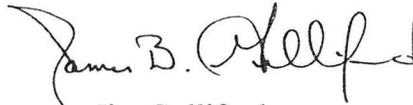
Dear Ms. Comer:

We have completed the review of the Quality Management Plan Revision 5.0 dated October 31, 2017, for the Missouri Department of Natural Resources. The document complies with the *U.S. Environmental Protection Agency Requirements for Quality Management Plans* (EPA QA/R-2, March 2001) and is approved. The original approval page and copy of the QMP are enclosed.

The anniversary date for the QMP is May 2023. The QMP must be updated appropriately and submitted on or before the anniversary date to the Regional Quality Assurance Manager for review and approval. If there are significant changes to your quality system before the anniversary date, a revised QMP must be submitted to the EPA for review and approval at the time the changes occur. Any minor revisions made to the QMP should be submitted to the Regional Quality Assurance Manager as a report when those changes occur.

If you have any questions, please call Diane Harris, Regional Quality Assurance Manager at (913)551-7258.

Sincerely,


Jim Gulliford

Enclosure

cc: Ed Galbraith, Director, Division of Environmental Quality, MDNR
Karla Wiseman, Quality Assurance Manager, MDNR

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ENVIRONMENTAL SERVICES



Quality Management Plan

Missouri Department of Natural Resources

Title and Approval Sheet

Handwritten signature of Carol S. Comer in black ink.

Carol S. Comer, Director
Missouri Department of Natural Resources

Date: 2-28-2018

Handwritten signature of Karla Wiseman in black ink.

Karla Wiseman, Quality Assurance Manager
Missouri Department of Natural Resources

Date: 11/1/17

Handwritten signature of Ed Galbraith in black ink.

Ed Galbraith, Division of Environmental Quality Director
Missouri Department of Natural Resources

Date: 12-03-17

Handwritten signature of Julie Allen in black ink.

Julie Allen, Division of Administrative Support Director
Missouri Department of Natural Resources

Date: 12/13/18

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Joe Gillman, Missouri Geological Survey Director
Missouri Department of Natural Resources

Date: 11-16-17



Ben Ellis, Missouri State Parks Director
Missouri Department of Natural Resources

Date: 11/9/2017



Diane Harris, Regional Quality Assurance Manager
U. S. Environmental Protection Agency Region VII

Date: 05/18/2018



Jim Gulliford, Regional Administrator
U. S. Environmental Protection Agency Region VII

Date: 6/6/18

Quality Management Plan

Document Title: Quality Management Plan for the Missouri Department of Natural Resources

Organization: Missouri Department of Natural Resources

Responsible Officials: Carol S. Comer, Director, Missouri Department of Natural Resources
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Plan Coverage

The Missouri Department of Natural Resources receives consolidated grant funds and enters into cooperative agreements with the U.S. Environmental Protection Agency (EPA) to operate programs under the following federal laws or their state equivalents: the Clean Water Act; Clean Air Act; Safe Drinking Water Act; Resource Conservation and Recovery Act; Comprehensive Environmental Response, Compensation, and Liability Act; and Toxic Substance Control Act. The Department also enters into cooperative agreements with other federal, state, and local partners. This quality management plan describes the policies, procedures, and management systems within the Department that are used to ensure the quality of environmental data and other natural resource data collected, stored, processed, produced, or used under interagency and financial assistance agreements. The Department applies this quality management plan to all program activities, including those activities not supported by federal funds.

This quality management plan has been prepared in accordance with EPA QA/R-2, March 2001 (reissued May 2006), *EPA Requirements for Quality Management Plans*. QA/R-2 is the policy document containing the specifications and requirements for Quality Management Plans.
<http://www.epa.gov/quality/qs-docs/r2-final.pdf> .

1. Management and Organization

1.1 Introduction

The Missouri Department of Natural Resources collects, stores, processes, produces, and uses a variety of environmental data and other natural resource data to aid in the protection, preservation, and enhancement of Missouri's natural, mineral, and cultural resources. The Department uses quality assurance practices consisting of policies, processes, procedures, specifications, standards, and documentation, which produce environmental data and other natural resource data of a quality that is adequate to meet project objectives and support agency decisions. Environmental data and other natural resource data is defined as any information that describes natural resource conditions, locations, and processes; ecological or health effects and consequences; or the performance of natural resource technology or methods. These data include information from measurements, models, and other sources.

The Department implements the quality system described in this document on a statewide basis. This document describes the management goals, policies, objectives, principles, organizational authority, responsibilities, accountability, and implementation activities for ensuring that environmental data and other natural resource data is of known and documented quality.

1.2 Quality Assurance Goal and Policy

Goal

The goal of the Department's quality management plan is to ensure that agency methods and decisions are based on data of known and adequate quality. To meet this goal, all environmental data and other natural resource data used by the Department must be of known and documented quality and origin. Furthermore, the Department's data management practices must collect, process, store, and use data in a manner that ensures adequate quality for the intended purpose. This goal can only be achieved by ensuring that adequate quality assurance steps and procedures are used throughout the entire data management process, from initial planning through data use.

Policy

It is the policy of the Department that:

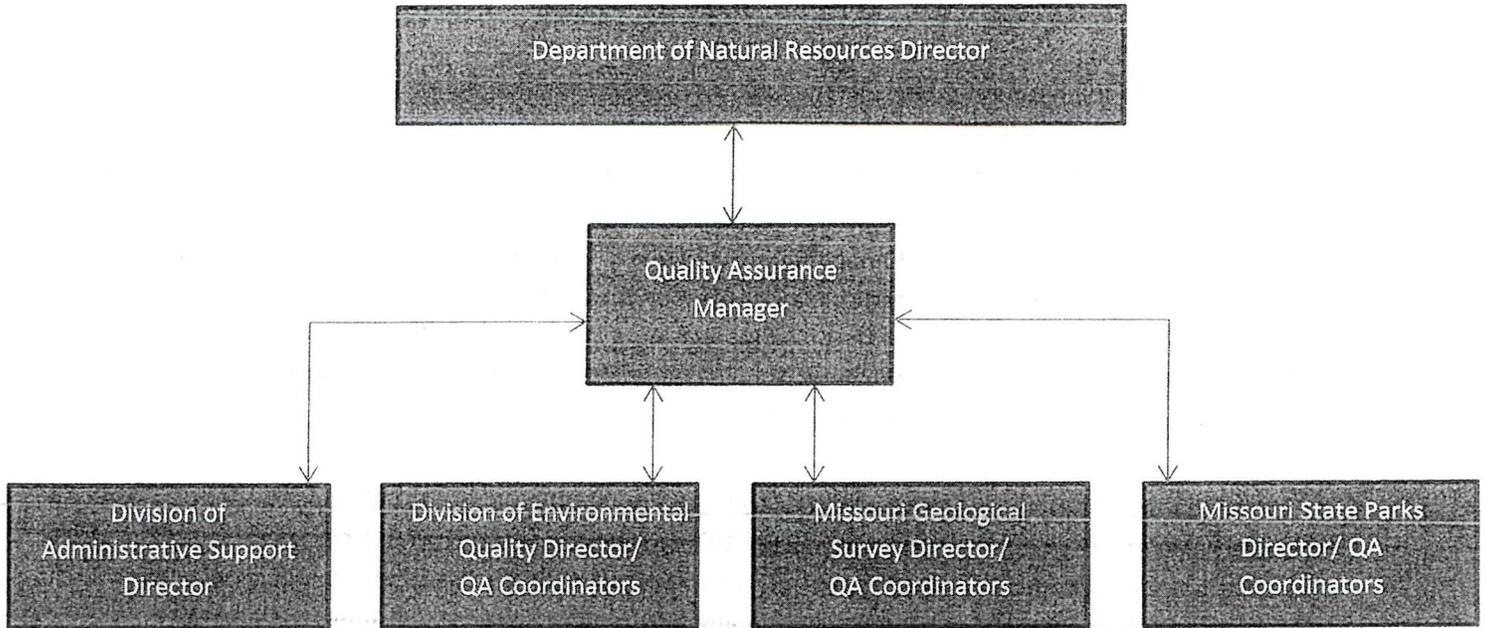
- The intended uses of data and data quality objectives are defined before each data collection effort begins. The Department ensures data quality objectives are met by developing and implementing quality control activities.
- A quality assurance project plan be developed for each data collection effort in accordance with the current EPA requirements (*EPA QA/R-5, March 2001 [reissued May 2006]*, EPA Requirements for Quality Assurance Project Plans. <http://www.epa.gov/quality/qs-docs/r5-final.pdf>) and identifies what resources are needed to support the project's quality assurance effort. The Department's project plans, associated project-specific sampling, or data collection plans document the intended

data uses, level of quality, project-specific quality control activities, and data acceptance criteria to meet the data quality objectives.

- Quality data be ensured from external parties by requiring that data received from a sub-grantee, a contractor, a regulated entity or other external party on which the Department makes decisions is supported by appropriate quality management procedures, as described in Section 2.3.
- Data and associated technology tools be managed to provide a foundation for achieving the priorities established through its strategic planning process. In cooperation with the Information Technology Services Division (ITSD), the Department systematically acquires and develops tools to continuously improve the quality of the information upon which natural resource decisions are based.
- Information resources be maintained to ensure that environmental and other natural resource decisions are based on data of a known quality. The Department generates, acquires, and manages environmental data and other natural resource data of a known quality to support agency decisions. The Department develops and documents data quality information for all environmental data and other natural resource data and makes this information available to the EPA, other data users and the public.

1.3 Organizational Chart and Functional Statements

The following chart illustrates the organizational structure of the Department and its divisions. The Quality Assurance (QA) manager reports directly to the division directors; however, the QA manager has independence in all quality assurance matters and may directly and independently interact and communicate with the Department Director. Following is a brief description of the function of each of these divisions.



Organizational charts with additional detail are available on the Department’s web site.

Division of Administrative Support

The Division of Administrative Support provides the Department administrative and management support for its current and future operations. This support includes budget development, internal audit, accounting, human resources, procurement, grants management, and facilities management activities.

Division of Environmental Quality

The Division of Environmental Quality helps Missourians prevent pollution; protects the public from exposure to harmful substances, emissions, discharges, and waste disposal practices; and works to improve the quality of air, water, and soil for sustainable use by the public, business, tourism, and agriculture.

Functions of the Environmental Quality programs and regional offices include:

Air Pollution Control Program – responsible for all air quality issues related to acid rain, air quality standards, asbestos removal, construction and operating permits, emissions inventory, emissions testing, gasoline vapor recovery, incineration, non-attainment areas, open burning permits, pollutant modeling, stack testing, toxic air emissions, and other air related issues.

Environmental Services Program – responsibilities include the state environmental laboratory and field staff assigned to environmental emergency response, air monitoring, air quality assurance, water and biological monitoring, landfill groundwater monitoring, and hazardous waste site sampling. The Chemical Analysis Section (CAS) serves as the Department’s primary environmental laboratory. The laboratory provides analytical testing and support vital to the Department, which is necessary to

evaluate and make decisions concerning drinking water safety, air and water quality, natural resource protection, and the protection of public health and safety.

Hazardous Waste Program – responsible for oversight of the treatment, storage, disposal and transportation of wastes that are classified as hazardous, petroleum above ground and underground storage tanks, registry of abandoned and uncontrolled sites, state and federal superfund sites, voluntary cleanup of hazardous substances, brownfields, and other hazardous substance related issues.

Soil and Water Conservation Program – responsibilities include providing financial incentives to landowners for implementing conservation practices that help prevent soil erosion and protect water resources. By promoting good farming techniques that help keep soil on the fields and waters clean, the program helps conserve the productivity of Missouri's working lands. The program also manages the nonpoint source management program.

Solid Waste Management Program – responsible for permitting and regulation of landfills and other solid waste processing facilities, enforcement of solid waste violations at permitted facilities and illegal dumps, addressing dumping issues, groundwater and gas monitoring at landfills, solid waste management planning, financial assistance, promoting recycling, waste reduction, and market development, and other solid waste related issues.

Water Protection Program/Public Drinking Water Branch – responsibilities include oversight of backflow prevention, boil orders, construction permits, cross connections, water quality testing and standards, lead contamination, water use (census), wellhead vulnerability assessments, and other related issues of public drinking water systems.

Water Protection Program/Water Pollution Control Branch – responsible for oversight of compliance review, land application, National Pollutant Discharge Elimination System Permits, wastewater pretreatment, storm water permits, water quality standards, animal waste management, and other water quality-related issues.

Regional Offices (Kansas City Regional Office, Northeast Regional Office, Southeast Regional Office, St. Louis Regional Office, Southwest Regional Office and satellite offices) – responsibilities include field inspections, complaint investigations and first-line troubleshooting on environmental issues for air pollution, drinking water, hazardous waste, solid waste, technical assistance, and water pollution. Environmental Emergency Response staff of the Environmental Services Program also operates out of the regional offices. Regional offices supervise activities in a number of satellite offices that conduct similar work within more local areas of operation.

Missouri Geological Survey

The Missouri Geological Survey is responsible for providing technical expertise for geologic and water resource issues and helping people understand, enhance, and protect our surface and subsurface

resources. The division interprets Missouri's geological setting, assesses the availability of Missouri's energy, mineral, and water resources, and ensures protection of groundwater resources.

The functions of the Missouri Geological Survey programs are:

Geological Survey Program – provides geologic and hydrologic support to other environmental programs in the Department, in support of EPA programs, and to the general public. Activities involve sampling of soil, bedrock, gas, and water for chemical, physical or microbial analysis, site characterization, and mineral evaluations. Staff also drill boreholes, install and plug wells, conduct borehole geophysical and video logging, conduct surface geophysical surveys and conduct water traces and spectrofluorometric analyses in characterizing hydrology and geology of waste disposal sites, spill sites, and the state of Missouri in general. They also regulate all well drilling activities in the state, including water wells, monitoring wells, heat pump wells, oil and gas wells, and mineral exploration test holes.

Land Reclamation Program - administers and enforces permitting and reclamation of coal and industrial mineral mines. The program mission is to assure the beneficial restoration of mined lands and to protect public health, safety and the environment from adverse effects of mining within the state. Mines are inspected monthly for indications that mined areas are reclaimed adequately. The program also administers the Metallic Minerals Waste Management Act by issuing permits for and inspecting metallic mineral mine waste disposal areas.

Water Resources Center – responsibilities include administering the development, conservation, and utilization of the state's water resources. The center's primary role is to provide technical advice and assistance on water use, planning, groundwater and surface water hydrology, and it regulates dams to ensure they meet minimum safety requirements. Issues involve interstate water availability and usage; public water well locations; water quality and quantity determinations; drought and flood response and planning; coordination and resolution of river basin issues; major water users data collection; wetlands research, conservation, and protection; groundwater and surface water contamination potential and prevention; water use registration; and the safety of regulated dams.

Missouri State Parks

Missouri State Parks administers Missouri's state parks and historic sites and coordinates statewide programs for outdoor recreation and trails. This division preserves and interprets the state's most outstanding natural landscapes and cultural landmarks and provides recreational opportunities compatible with those resources.

1.4 Applicability

This quality management plan applies to all offices within the Department and environmental data and other natural resource data requested, collected, and managed by the Department. This plan also applies to the Department's collection of environmental data and other natural resource data at the request of other agencies, such as the State Emergency Management Agency, Missouri Department of

Agriculture, U.S. Fish and Wildlife Service, Missouri Department of Conservation, the U.S. Natural Resources Conservation Service, and the U.S. Geological Survey.

1.5 Roles

Quality Assurance Manager

The Department Director has delegated the responsibility and authority to implement the Department's quality management plan to the QA manager. The QA manager reports to Program and Division Management; however, the QA manager has independence in all quality assurance matters and may directly and independently interact and communicate with the Department Director and division directors. This direct access to the Department Director allows the QA manager to independently elevate critical quality-related issues at the manager's discretion without approval or pre-notification. The QA manager is responsible for ensuring data quality by developing and documenting Department policies, procedures, and guidance; coordinating periodic revisions to the quality management plan; coordinating quality assurance training to Department staff; reviewing quality assurance project plans; supporting and advising staff in other quality assurance roles; and resolving elevated quality assurance issues.

Division Director Staff

Division director staff ensures quality data by advising the Department's QA manager and providing administration of all Department quality assurance activities. The Department's divisions are listed in Section 1.3, above.

Information Technology and Process Improvement Policy Director

The Department's Information Technology and Process Improvement Policy Director ensures quality data by guiding the Department's use of technology in the collection, storage, processing, and distribution of information. This position also establishes Department policy regarding information technology hardware purchases, software purchases, application development, application maintenance and enhancement, content storage, and geospatial data management. Other duties include collaborating with the Department's stakeholders, including the ITSD, other state agencies, federal agencies, and state associations to develop and maintain the best possible information technology system to support the Department's natural resources protection efforts.

Program/Office Director

A program/office director (e.g., environmental program director, regional office director) has overall responsibility for implementing all quality assurance requirements within their program/office. Quality data is supported by continuing education and training of staff about quality assurance and quality control; ensuring staff comply with the Department's quality assurance policies, processes, and procedures; assigning staff to quality assurance roles; committing adequate resources to the quality system; and evaluating the effectiveness of the quality system.

Quality Assurance Project Plan Coordinator

A QA project plan coordinator is responsible for coordinating the planning and development of quality assurance project plans for environmental data and other natural resource data collection projects and associated work plans. This position ensures quality data by coordinating the timely completion of these plans to support field and laboratory staff planning.

Quality Assurance Coordinator

A QA coordinator serves as the main point of contact for all quality assurance issues within a program/office. Each program/office, which generates or manages environmental data and other natural resource data, should have at least one QA coordinator. A QA coordinator ensures quality data by supervising development of data quality objectives and quality assurance project plans in their program/office. QA coordinators also assist the QA manager with revisions to the Quality Management Plan.

Quality Assurance Project Officer

A QA project officer is responsible for coordinating the planning and development of quality assurance project plans and ensuring all quality assurance requirements of the quality assurance project plans are met. They are responsible for timely completion of these plans to support planning activities of field and laboratory staff, and they ensure quality data by establishing clear data quality objectives and supervising project activities to achieve those objectives. Their duties may also include identifying and evaluating data from external sources for use in a project and managing data collection under the quality assurance project plan.

Laboratory Manager

The laboratory manager supervises all chemical analysis and data management for the Environmental Services Program. The laboratory manager implements established procedures to validate and verify analytical results. Quality data is supported by maintaining a broad understanding of the quality system; ensuring staff comply with the Department's quality assurance policies, processes, and procedures; assigning staff to quality assurance roles; establishing procedures to validate and verify analytical results; ensuring staff have appropriate training to implement the quality system; committing adequate resources to the quality system; and evaluating the effectiveness of the quality system.

Analyst

An analyst performs qualitative and quantitative analysis of drinking water, wastewater, soils, sludges, sediments, industrial wastes, air, and other matrices or matter to identify and confirm various contaminants, both natural and man-made. These contaminants include inorganic analytes, organic compounds, synthetic organic compounds, heavy metals, and biological contaminants, all of which may affect health, water quality, and natural resources. The analyst ensures quality data by completing and verifying all required quality control procedures to document the validity and quality of all sample test results. In addition, the analyst also provides the data necessary to evaluate and make natural resource decisions.

Field Staff

Field staff conduct field operations in support of natural resource protection and enhancement. While in the field, they may collect a variety of samples and field data (e.g. notes, diagrams, analytical data, and photographs). The field staff's findings may be documented in a field notebook, report, or other means. To ensure data quality, field staff collect and process data following the Department's established policies, guidance documents, and standard procedures.

1.6 Technical Activities or Programs Supported by the Quality System

The Department implements the quality system described in this document to support its programs that address:

- Air Quality
- Public Drinking Water
- Water Quality
- Water Resources
- Geology
- Solid & Hazardous Wastes
- Toxic Substances
- Radiation
- Risk Assessment
- Land Use/Reuse
- Long-Term Stewardship

Occasionally, the Department may collect environmental data or natural resource data in support of the Land Reclamation Program within the Missouri Geological Survey, the Missouri State Parks, or other agencies, such as the State Emergency Management Agency, Missouri Department of Agriculture, U.S. Fish and Wildlife Service, Missouri Department of Conservation, the U.S. Natural Resources Conservation Service, or U.S. Geological Survey. In these cases, the Department collects the data to support the environmental and natural resource statutory authority of one or more of the programs identified above.

1.7 Quality Management Plan Distribution and Training

The Department makes this quality management plan available to all staff by placing an electronic copy of the document on its Intranet web site. Each program or office is responsible for maintaining familiarity with the requirements of the quality management plan. Staff who sign quality assurance project plans (e.g., quality assurance project plan coordinator, quality assurance coordinator, quality assurance project officer, laboratory manager, etc.) must fully understand the requirements of this quality management plan.

In cooperation with the EPA, the Department occasionally provides quality assurance training for staff. The Department may also provide agency-specific quality assurance training or provide limited training to contractors and sub-grantees that provide data to the Department.

1.8 Dispute Resolution

For those situations in which technical issues or management issues regarding quality assurance are in dispute, all parties should make every effort to resolve disputes through discussion and negotiation. Resolution should be sought at the lowest practicable management level. Should agreement not be reached at this level, the issue will be resolved by the senior management team, consisting of affected program directors and division directors. The Department Director or designee has final dispute resolution authority on all Department quality assurance issues.

2. Quality System Description

2.1 Quality Management Plan

The Department maintains this quality management plan to describe the management policies, objectives, principles, organizational authority, responsibilities, accountability, and implementation plan for ensuring quality in the Department's environmental data and other natural resource data. It covers all intramural and extramural monitoring and measurement activities that generate and process environmental data and other natural resource data for use by the Department. The plan is written according to an EPA document titled *EPA Requirements for Quality Management Plans*.

The QA manager and QA coordinators review the quality management plan annually and revise the document as needed. The Department presents the quality management plan for EPA review and approval on a five-year cycle.

2.2 Data Quality Objective

The Department defines the intended use of data prior to beginning a data collection project. The data quality objectives process is used for all new data collection efforts. The Department implements the data quality objectives process based on an EPA document titled *Guidance on Systematic Planning Using the Data Quality Objectives Process*. In large part, the needed data quality determines the extent of the data quality objectives process. However, the Department uses the basic elements of the data quality objectives process for all data collection efforts.

2.3 Quality Assurance Project Plan

A quality assurance project plan documents the data quality objectives process, and describes how quality assurance and quality control are applied to an environmental data or other natural resource data operation to assure that the data obtained is of the type, quantity and quality needed to support agency decisions. EPA-funded environmental data activities require that the Department generate data only after approving a quality assurance project plan.

A QA project officer is responsible for coordinating the planning and development of each quality assurance project plan.

The quality assurance project plan describes in detail the necessary quality assurance, quality control, and other technical activities that must be implemented to ensure that the results of the work performed will meet the stated performance criteria.

The plan is divided into four groups: project management, data generation and acquisition, assessment and oversight, and data validation and usability. Project management elements address project history, project objectives, the roles and responsibilities of project participants, and other project management information. They ensure the project has a defined goal, the participants understand the goal and the approach to be used, and the planning outputs have been documented. Data generation and acquisition elements address project design and implementation. They ensure the Department uses and documents appropriate methods for sampling, measurement and analysis, data collection or generation, data handling, and quality control activities. Assessment and oversight elements address the activities for assessing the effectiveness of the project and its quality assurance and quality control activities. The assessment is meant to ensure that the quality assurance project plan is implemented as written. Data validation and usability elements address the quality assurance activities that occur after the data collection or generation phase of the project is completed. These elements ensure the data conform to the specified criteria, and therefore achieve the project objectives.

The Department requires a quality assurance project plan for all environmental data or other natural resource data collection efforts. The quality assurance project plan is prepared according to the current versions of EPA documents titled *EPA Requirements for Quality Assurance Project Plans*, *Guidance for Quality Assurance Project Plans*, and *Guidance for Quality Assurance Project Plans for Modeling*.

Quality Assurance Project Plan Review, Approval and Dissemination Process

Quality Assurance Project Plans for Data Collection by the Department

The program or office that is responsible for initiating the collection of environmental data or natural resource data will coordinate development of the QAPP and assign a QA project officer to this responsibility. The QA manager, the laboratory and field personnel within the Environmental Services Program and the QA coordinators are available to provide assistance to the assigned QA project officer. In some circumstances, laboratory or field personnel within the Environmental Services Program may draft or revise the QAPP. The draft quality assurance project plan is normally reviewed internally within the initiating program or office by the QA project officer's supervisor and by that program or office's QA coordinator. If the Environmental Services Program analyzes samples or conducts other work on the project, the document is reviewed by the staff in that program. Finally, the QA manager is responsible for reviewing and approving the document.

Once the quality assurance project plan has been finalized, the approval and signature process occurs in the following order; the QA project officer, the QA coordinator; the director of the initiating program or office; the Director of the Environmental Services Program, if it will analyze samples or conduct other work on the project; and the QA manager. Copies of each final quality assurance project plan will be

available in paper or electronically to each signatory and each staff member involved in collection or management of the project's environmental data. The QA project officer will review the quality assurance project plan annually and make revisions, as needed. At a minimum, the Department will revise and formally approve each quality assurance project plan every five years.

Quality Assurance Project Plans Where the Data Collection Occurs Externally

When the environmental data or natural resource data is collected by an external organization (e.g. contractors, subgrantees, owners and operators of permitted facilities, etc.), the Department implements a similar review and approval process. However, a representative of the external organization serves as the QA project officer. The program that will use the environmental data or natural resource data is responsible for ensuring that the quality assurance project plan is prepared in accordance with EPA Requirements for Quality Assurance Project Plans and EPA Guidance for Quality Assurance Project Plans. When the Department uses externally generated data, the program will require the external organization to use an accredited laboratory or submit documentation to the program's QA coordinator or the project officer designee to support subsequent data quality assessments for Department approval. The QA coordinator or a designee will review and approve the external quality assurance project plan. The QA manager, Environmental Services Program representatives, and the program QA coordinators will be available to provide assistance in reviewing the draft quality assurance project plan. Copies of each final quality assurance project plan will be available in paper or electronically to each signatory and each staff member involved in collection or management of the project's environmental data.

Because of resource constraints and to facilitate the Brownfields process, the EPA may request assistance from Missouri for the review and approval of quality assurance project plans for non-state EPA grantees. The EPA has authorized the state program to review and approve quality assurance project plans in lieu of the Regional QA manager. Review and approval of non-state EPA Brownfields grantee quality assurance project plans by a state program will be limited to those instances where there is mutual agreement among the parties involved (the state, EPA Region VII, and the grantee), and a relationship has been established between the state program and the non-state EPA grantee following the guidelines established by the state for its Brownfields program. The request for such assistance will be made through the EPA project officer in consultation with the Regional QA manager, as necessary. Oversight of the state's quality assurance project plan approval process for Brownfields will be part of the management system reviews process as described in section 11.2.1.2 of EPA's quality management plan. For Brownfields projects, once the quality assurance project plan has been finalized, the approval and signature process occurs in the following order: the QA project officer from the external party, who will be responsible for the data collection; the Department's project officer; the Director of the Hazardous Waste Program; and finally by the QA manager. Copies of each final quality assurance project plan will be available in paper or electronically to each signatory, as well as to each staff member, involved in collection or management of the project's environmental data.

Certification and Approval of Quality Assurance Project Plans

With the approval of this quality management plan, the EPA provides approval to the Department to certify and approve all quality assurance project plans, both internal and external, with the exception of quality assurance project plans developed in support of a Superfund Cooperative Agreement. When the environmental data is to be collected in support of a Superfund Cooperative Agreement, the quality assurance project plan will be developed and submitted to the EPA for approval in accordance with 40 CFR Part 35, Subpart O. Copies of the quality assurance project plans for federally funded activities will be available for inspection as part of the EPA's on-site program evaluation activities or upon request.

2.4 Sampling Plan

When a generic quality assurance project plan is followed, the Department prepares a sampling plan for the specific environmental data or other natural resource data collection effort. The sampling plan serves as an addendum to the quality assurance project plan and identifies the project-specific data quality objectives and quality control criteria that are different from those specified in the quality assurance project plan or provide more specific details. For anticipated samples, the sampling plan specifies the locations, frequency, and the analyses to be performed.

If the site-sampling plan is prepared by someone other than the QA project officer, the QA project officer will be responsible for reviewing and providing final approval. If the Sampling Plan is prepared by the QA project officer, staff in the office that collects the samples will review and provide comments on the plan and the QA project officer's supervisor or the programs QA coordinator is responsible for reviewing and providing final approval.

2.5 Standard Operating Procedure

The Department uses standard operating procedures (SOPs) to ensure quality environmental data by maintaining standard, consistent administrative and technical activities. The Department references these SOPs in quality assurance project plans to maintain known data quality on each project.

The SOPs are prepared utilizing the EPA document titled *Guidance for Preparing Standard Operating Procedures (SOPs)-QA/G-6 -(EPA/600/B-07/001)*. EPA QA/G-6 is designed to provide guidance in the preparation and use of an SOP within a quality system. SOPs are developed and implemented for environmental data collection, data operations, and technologies. Environmental data includes information collected directly from measurements, produced from models, and compiled from other sources such as databases or literature. Environmental technology includes pollution monitoring, measurement and control devices and systems, waste treatment processes and storage facilities, and site remediation technologies and their components that may be utilized to remove pollutants or contaminants from/or prevent them from entering the environment.

Programs are responsible for assigning a QA coordinator to facilitate SOP development and revisions. The author, or another person familiar with the procedure, typically reviews existing SOPs on a

scheduled interval basis, although SOPs may be revised any time there is a change in the procedure. Updates and changes are documented and dated.

New and revised SOPs undergo a peer review. Following a peer review, the SOPs are reviewed and approved by a supervisor, or designated QA coordinators. Program directors are responsible for maintaining the complete and up-to-date set of SOPs. The most current technical SOPs are posted on the Department's Intranet site, replacing any previous versions.

2.6 Management Systems Reviews

Quality System Review and Audit

Several activities are necessary to ensure the Department's quality system is effective and is achieving the goals outlined in this quality management plan. These activities include management systems reviews, technical system audits (see Section 10), performance evaluations, internal and external audits, peer reviews, and the quality assurance project plan review and approval process.

Review of the Quality System and Quality Assurance Project Plans:

QA coordinators are responsible for conducting internal audits, management systems reviews, and technical system audits in their respective programs and reporting findings to the QA manager. This function may be limited by staff training and capacity, and may as an alternative rely on EPA oversight through audits. The QA manager makes recommendations for corrections or modifications to address identified problems. Each QA project officer and manager ensures thorough review of all internal and external quality assurance project plans and sampling and analysis plans associated with environmental data and natural resource data collection activities. These audits and reviews ensure that acceptable quality assurance and quality control activities and requirements are included, that data quality objectives are established prior to the project's inception, and that the project will be able to produce data of the type, quantity, and quality desired in a documented and cost-effective manner.

External Data Quality Reviews and Performance Audits:

Effective implementation of the Department's quality system requires periodic external management systems reviews and performance audits to assess its effectiveness. The results of these reviews and audits will be used to revise the quality management plan, as appropriate.

2.7 Training

All personnel performing tasks and functions related to data collection will possess adequate education, training, and experience to satisfactorily perform all technical tasks assigned. The programs incorporate these education and training requirements into the position description forms and performance documents for each individual position. These documents define the level of expertise necessary for the particular staff position. The programs will develop and maintain annual training plans for staff responsible for data collection. The training plans will define the training courses necessary for each staff member to attain or maintain expertise needed to perform certain tasks associated with the

position (e.g. training for field staff involved in sample collection, chemists who conduct the analyses, etc.).

To the extent practicable, recognizing limitations on training availability, budget constraints and staff turnover, all personnel involved in quality assurance work should receive appropriate training for their specific roles.

All personnel involved in quality assurance and quality control, or primary or secondary data use should complete the EPA course, Orientation to Quality Assurance, or its equivalent.

In addition to the above training, all personnel serving to review and approve quality assurance documents or serving as primary data users should complete the EPA courses; Introduction to Data Quality Objectives, Introduction to Quality Assurance Project Plans, and Introduction to Data Quality Assessment or their equivalents.

The QA manager, the QA project plan coordinator, QA coordinators and designees who approve external quality assurance project plans should complete the EPA course, Introduction to EPA Quality System Requirements.

The planning and accomplishment of this training will be included in performance planning and appraisal documents or training logs maintained by the programs. The Department's quality assurance staff may assist in providing training for Department staff, recognizing that the EPA may remain the primary source of training and that the EPA provides appropriate modules for quality assurance training.

The Department has been an active participant in the EPA quality assurance and quality control training programs offered through EPA Region VII. The Department has encouraged both its line staff and managers to attend the training program. The EPA Regional QA manager will advise the Department QA manager of available quality assurance training opportunities for the Department's staff. The effectiveness of quality assurance training received by staff will be evaluated through internal and external assessments, evaluations, audits, and other means.

3. Competence

Hiring Practices

The Office of Administration establishes job classifications and eligibility requirements for nearly all positions at the Department. The Missouri Merit System provides a standardized, competitive selection process for recruitment and retention of a qualified workforce. The Office of Administration Division of Personnel maintains the approved individual position descriptions to ensure that the education and experience requirements meet the specifications of each job classification.

Performance Planning and Assessment

The Department closely monitors each newly hired staff member through a probationary period to evaluate his or her performance. Thereafter, each supervisor conducts annual performance evaluations for each staff member, based on the objectives which describe the essential duties of each position relative to the knowledge and competencies required for that position.

Training Plans

The Department addresses training as part of the annual performance evaluations and planning for individual staff. For staff that collects environmental data and other natural resource data through field observations, sample collection, sample analysis, or other means, the supervisor ensures quality data by including appropriate courses in the staff member's training plan. For staff who serve in a quality assurance role, the supervisor ensures quality data by including courses that are appropriate for that role. Throughout the year, the supervisor ensures that the training plan is followed.

Field Office Training

The Department maintains an on-line training portal for field staff. The portal contains both general and technical information to encourage consistency in field activities. The Department also maintains Procedures for Assistance, Compliance, and Enforcement manual to provide guidance for performing field activities and documentation.

Managers and experienced staff in field offices provide on-the-job training to new staff. This training familiarizes new employees with the Department's policies and procedures. It also familiarizes them with Missouri's statutory and regulatory requirements for the area in which they work. Managers also direct staff to training appropriate for their position.

The Department organizes periodic meetings between programmatic offices and field staff. These meetings reinforce the policies, guidance, and procedures of the Department.

Certification

Some quality assurance roles within the Department require third-party certification to perform a needed quality assurance function. The Department may enter into cooperative or other agreements with EPA or other federal agencies, which require that certain staff have certifications to perform particular quality assurance or sampling activities. Where these certifications are required, the respective program identifies these requirements in the applicable Quality Assurance Project Plan.

Documentation

The Department maintains the Competency Employee Record Tracking System to record the training and continued education of staff. The Department also tracks training of individual staff through the annual performance evaluation process.

4. Equipment and Supplies

Procurement

The Office of Administration is responsible for procurement and maintains state purchasing regulations, specifications and procedures, which ensure the quality of contracted activities. Department staff requesting the service provides input and are normally part of the bid evaluation team to ensure that the contract awarded meets the quality needed. The Office of Administration is responsible for ensuring the contractor meets the terms and conditions of the contract. The Department adheres to both the state and internal procurement procedures, which include review and approval by supervisory staff of all purchases for field equipment and supplies.

Operation

The Department operates field equipment and analytical equipment according to the owner's manual and other documentation provided by the manufacturer. If the Department has adopted an SOP for the equipment, staff will implement these procedures to ensure consistent quality.

5. Collection of Information

Field Observations

The Department documents its field activities through field notes, diagrams, reports, photographs, etc. The Department provides the Procedures for Assistance, Compliance, and Enforcement manual to field staff to guide field activities, including the collection of field information and other documentation of the field activities. To ensure the quality and consistency of information collected in the field, the Department maintains SOPs for collection and documentation of field observations.

Analytical Data

The Department analyzes field samples to support natural resource decisions. This includes decisions by the Department and other data users.

Samples are collected by field staff or by remote sampling equipment and handled according to established SOPs to ensure the quality and consistency of the resulting analytical data. Whether the analysis is conducted in the field or in the Department's laboratory, the Department operates analytical equipment according to the owner's manual and other documentation provided by the manufacturer. In cases where the Clean Water Act, Safe Drinking Water Act or other legislation require specific analytical procedures, including Standard Methods, these requirements must be met, regardless of manufacturer's documentation. If the Department has adopted an SOP for the equipment, staff follows this additional documentation to ensure consistent quality.

Information Provided to the Department According to Statute, Regulation, or Permit

Missouri statutes, Missouri regulations, federal regulations, and the conditions included in permits require that regulated entities provide a variety of information to the Department. The Department

reviews these submittals to ensure that the quality is consistent with the requirements of the statute, regulation or permit condition.

Other Information from External Sources

The Department uses information from external sources to make decisions. For contracts, sub-grants or agreements, which involve the collection of environmental data and other natural resource data, the Department ensures that the contract, sub-grant, or agreement addresses appropriate quality assurance requirements. To the extent possible, Department staff engages with external information sources to ensure they produce quality data. When the Department contracts for the collection of data to support agency decisions, the Department assures that the data collection is completed according to an approved quality assurance project plan.

When the Department enters contracts for services, subgrants or agreements, which involve the collection of environmental data or natural resource data, it ensures that all appropriate quality assurance requirements are met and documented. The varied responsibilities of the Department necessitate the use of data acquired by the Department that was independently managed, collected, and analyzed. To the extent possible, the Department will involve itself in these activities so that these external sources produce quality data. It is the goal of the Department that all environmental data and natural resource data used by the Department, including acquired data, is scientifically defensible.

External Quality Assurance Project Plans

External parties that generate data and report it to the Department will prepare quality assurance project plans before generating the data and will provide the quality assurance project plans to the Department for approval, except where noted below. The Department can develop standardized or generic quality assurance project plans for certain types of external activities that generate data. For example:

- Voluntary cleanup projects or projects conducted under risk-based corrective action procedures.
- Tank site cleanups conducted under Missouri Risk-Based Corrective Action Process for Petroleum Storage Tanks.
- Permitted wastewater treatment plants routine compliance monitoring data.
- Public water system compliance monitoring data analyzed at a certified drinking water laboratory.
- Miscellaneous data acquired by the Department that can be classified for specific uses, according to its age, quantity, accuracy, precision, completeness, representativeness, or comparability.
- Ambient air monitoring projects conducted by industrial sources.

6. Documentation and Records

The Department maintains documentation of its quality system to ensure that users of our environmental data and other natural resource data can determine its data quality.

The Department takes precautions during the reduction, manipulation, and storage of data to prevent errors and data loss in accordance with approved SOPs.

The Department maintains several databases to store and manage information about analytical data. Some of these information technology applications generate reports and other documentation of the quality system. A Laboratory Information Management System maintains information and data on all environmental samples received and analyzed at the Environmental Services Program laboratory. The system is used to log in samples collected, record results of analyses, and generate sample analyses and management reports.

The Department maintains and follows a policy for the retention of its records, including electronic records. Quality assurance records are maintained according to the State's General Retention Schedule, Administrative Operations, Series 21512/Policy and Planning Records (page 10). The Missouri Secretary of State requires state agencies to obtain the permission of the state archivist before the disposal of public records. This permission is given through authorized Retention and Disposal Schedules, which identify temporary records and records of permanent retention value. The QA manager identifies all quality assurance and quality control documents listed in the Department's records disposition schedule. The Department will implement the current agency records disposition schedule approved by the Secretary of State's Office for all quality assurance and quality control documents and records of environmental data and other natural resource data. All documents placed into one of the Department's physical file rooms or into one of the Department's digital content management systems must be addressed in the Retention and Disposal Schedules. Raw data and sample media retention may have project specific archiving requirements. These project specific requirements are documented in the respective quality assurance project plan.

The Department's custodian of records is responsible for the maintenance of records. Each QA coordinator maintains awareness of record requirements and ensures that each project officer maintains the records needed for the quality assurance project plan. Information to maintain includes but is not limited to significant quality assurance problems, corrective actions, corrective action progress plans, and recommendations. The QA coordinator provides this information to the QA manager, as needed.

The Environmental Services Program retains hard copy documents for two years before storing them at the Missouri State Data Center, where the documents will be retained for 25 years. Chain-of-custody documents are maintained in hardcopy.

Imaged copies of laboratory analysis reports, chain-of-custody documents, and performance testing sample analysis results will be made and maintained using the OnBase document imaging system on an in-house application server. The Laboratory Information Management system data is also maintained on this server. Back up is accomplished through the backup system on a nightly basis. All active files and previous versions of active files from the server hosting the images and Laboratory Information

Management system data are maintained off site and restorable within minutes. Individual instrument computers are linked on the private network inaccessible to outside networks. This allows the instrument raw data to be copied to the application server to be backed up along with the other files. Access to the instrument computers and private network is restricted to authorized personnel by magnetic badge security.

The development and maintenance of state quality assurance programs will also be included in the annual discussions between Department management and the EPA during the Performance Partnership Agreement process.

7. Computer Hardware and Software

This section describes how the Department manages the computer hardware and software used to support environmental programs and operations. It also describes the roles and responsibilities assigned to management and their staff.

- How Hardware is Evaluated to Ensure That it is Appropriate For The Intended Application – Hardware purchases are made through a partnership of Department end users' evaluation of their needs and hardware options with the input from the ITSD. ITSD staffs are data processing professionals who develop the annual computer hardware purchasing plans for the programs in the division. Additional levels of review are provided, as needed, by each division's IT Liaison within the Department and Senior IT Services Division staff assigned to the Department.
- How Hardware Changes Are Controlled to Reduce Performance Impact - The Department's executive staff approved a policy entitled Minimum Computer Configurations. This policy specifies minimum standards for desktop and laptop hardware and software. The recommended configurations are periodically reviewed by ITSD staff to determine if the Department should upgrade the minimum configuration. The Department's IT Liaison review process also helps to ensure that purchases meet or exceed this policy.
- How Software Developed by ITSD is Evaluated to Meet User Requirements - The ability of software developed in-house to meet user needs is based on two sources of input. First, users are asked to help develop the original specifications for their application. Secondly, users submit requests for additional features or problem corrections that are tracked in databases assigned to each major application. Users are also asked to help determine the order in which new features are added and problems should be prioritized for resolution.
- How Purchased Software is Evaluated to Meet Department Standards – The Department's executive staff approved a policy entitled Software Standards. This policy describes how the Department's standard software is evaluated and selected. The ITSD staff assigned to the Department is responsible for maintaining a current list of standard software. This software standard is periodically reviewed by the ITSD to determine if it is in the interest of the Department to continue to use and support particular software or to add software to the list.

- How Data Quality and Accuracy Standards Are Met - The computer applications that process data, include data entry edit routines and batch edits to ensure the data in the systems meet defined data quality and accuracy standards.

8. Planning

The Department uses the following primary planning documents: the budget documents; the Department's strategic plan; the performance partnership agreement and performance partnership grant work plans with EPA; the work plans associated with other federal grants and cooperative agreements; the annual work plans between the programs and the regional offices; and the quality assurance project plans and associated work plans.

When an environmental data or other natural resource data need has been identified, appropriate technical and quality assurance staffs begin the planning process and development of a quality assurance project plan. The Department uses the data quality objectives process to ensure that the resulting data will meet agency needs. The Department also has ongoing environmental data and other natural resource data operations for which the data needs are relatively constant from year to year. The quality assurance project plans or associated work plans for these data operations are reviewed and updated on an annual basis to meet the needs of the user of the environmental data and other natural resource data.

9. Implementation of Work Processes

Ultimately, the Department's management team is responsible for ensuring that the work is performed in accordance with appropriate planning documents. This quality management plan provides the framework for defining the procedures to ensure that environmental data and other natural resource data operations are implemented in accordance with an approved quality assurance project plan. The specific quality management roles and their associated responsibilities are described in Section 1.5 above.

Each year, the QA manager and the QA coordinators will review this quality management plan for needed changes. Every five years, the QA manager and the QA coordinators will perform a complete review of this quality management plan, make any needed changes, and initiate an approval process within the Department and the EPA.

The Department's management team and EPA representatives discuss the development and maintenance of state quality assurance programs during the performance partnership agreement process.

10. Assessments and Evaluations

Internal Review of Documentation

Supervisors overseeing the work of field staff, review documentation of field activities to ensure quality. They engage with field staff to resolve any documentation issues and approve documentation that meets the Department's policies, processes, guidance, and procedures.

Data Quality Assessments

A QA coordinator or other staff with appropriate expertise assesses the quality of data before it is used to make decisions, in order to ensure that it is satisfying the quality assurance requirements specified in the quality assurance project plan. The Department conducts data quality assessments according to EPA documents titled *Data Quality Assessment: A Reviewer's Guide* and *Data Quality Assessment: Statistical Methods for Practitioners*.

Quality System Audits and Management Systems Reviews

As stated in Section 2.6 of this Quality Management Plan, QA coordinators are responsible for conducting internal audits, management systems reviews, and technical system audits in their respective programs and reporting findings to the QA manager. This function may be limited by staff training and capacity, and may as an alternative rely on EPA oversight through audits. Each is a qualitative evaluation of a data collection operation and the Department's quality management structure, policies, practices, processes, and procedures to determine if these elements are adequate to ensure that the Department's data collection effort will yield the needed type and quality of data. These reviews are used to determine the effectiveness of, and adherence to, the quality system and the adequacy of resources and personnel provided to achieve and ensure quality.

The management systems reviews will be conducted by a review team with a minimum of two members according to the most current version of Guidance on Assessing Quality Systems (EPA QA-G3) for Preparing, Conducting, and Reporting the Results of Management Systems. Reviews of programs will include a random sampling of the projects for that program (a list of the projects will be requested from the program as part of the management systems review) to determine if the projects were correctly identified as including environmental data generation and use and if the quality assurance requirements, including approved quality assurance project plans prior to environmental data generation and use, were applied and adequately addressed. The management systems reviews will consist of meetings with the management of the Department reviewed program, interviews with personnel, and file reviews.

Results of the management systems review will be reported to management through a Draft Findings Report. The reviewed program will be given the opportunity to respond to the Draft Findings Report and to develop a Corrective Action Plan to address any issues identified as requiring corrective action. The Corrective Action Plan must identify the corrective action, responsible staff, and the projected completion date for each finding requiring corrective action. The QA manager will review the Corrective

Action Plan and prepare any necessary responses for discussion with the management of the reviewed organization or program.

Once any outstanding issues have been addressed and the corrective actions and schedule agreed upon by the QA manager and the reviewed program's management, a Final Report will be issued. The confirmation and implementation of the corrective actions will be done through the submittal of associated documents (e.g., a revised quality assurance project plan) to the QA manager for review or through a follow-up evaluation.

Management Independent Audits

The EPA conducts annual audits and the Inspector General's Office conducts periodic audits of the state's environmental programs. These audits normally include some type of review of the program's quality management system. The Department takes action that is needed to address the comments and recommendations from these audits. The QA manager responds to the EPA regarding the actions that are taken.

Technical System Audits

The Department conducts technical systems audits as thorough, systematic, on-site, qualitative evaluations of facilities, equipment, personnel, training, procedures, SOPs, recordkeeping, data validation, data management, and reporting aspects of field and laboratory activities. Technical systems audits typically include field audits of staff who conduct natural resource sampling activities. Auditors can stop field activities or take other actions to ensure the collection of quality information. The Department takes action to address audit findings. The Department conducts these audits based on an EPA document titled *Guidance on Technical Audits and Related Assessments for Environmental Data Operations*.

A technical systems audit can be conducted with the assistance from EPA Region VII, as requested. The responsibility for and the frequency of technical systems audits are specified in quality assurance project plans. The requirement for a technical systems audit should be described in a project specific or generic quality assurance project plan. A technical systems audit will result in completion of an assessment report in a timely manner including appropriate levels of review and approval as well as how and when corrective actions are to be taken in response to the findings.

Assessment and response action for analytical data quality are outlined in the standard operating procedure 2090: "Quality Control Procedures and Quality Control Charts," and will be conducted by the supervisor of the analytical laboratory in the Environmental Services Program.

External Reviews and Performance Audits

External parties, such as the EPA, occasionally conduct management systems reviews and performance audits on the Department's quality system to assess its effectiveness. The Department uses the results of these reviews and audits to revise the quality management plan, as appropriate.

Technical Independent Audits

The Department participates in the annual EPA Performance Audit Sample Program—Water Supply Series. The Department reviews data resulting from participation in this program for accuracy and takes action to address identified issues.

The EPA conducts tri-annual on-site laboratory audits to assess the laboratory procedures in order to maintain the Department's certification under the requirements of the Safe Drinking Water Act. The Department takes action to address audit findings.

The EPA, at the Department's request, conducts quality assurance oversight and quality control oversight of field inspection activities, including sample collection. The EPA reports its findings and the Department takes action to address these findings.

QA coordinators periodically audit staff that review and approve project plans prepared by external parties. Each QA coordinator informs the QA manager of their plans prior to conducting these audits and provides a report of the results after the audits are completed. The QA coordinators discuss the audit results with staff, the program director, and the QA manager. If any changes are required, staffs are informed of the necessary corrective actions that must be implemented in order for staff to remain a designee for reviewing and approving external quality assurance project plans.

11. Quality Improvement

The QA manager has the overall responsibility for identifying, planning, implementing, and evaluating the effectiveness of quality improvement activities and ensuring that corrective actions are taken to address quality system issues related to environmental data and other natural resource data operations. The project officers identified for each quality assurance project plan, field personnel, and laboratory personnel are responsible for identifying and recommending appropriate actions to correct any quality assurance deficiencies. Periodic coordination meetings are held to address issues related to specific quality assurance project plans and to recommend any necessary corrective actions.

EPA Region VII, in the performance of their responsibilities to conduct annual evaluations of the state's environmental programs and laboratories, also identifies any quality assurance deficiencies. Corrective actions can then be taken to maintain and improve the effectiveness of the quality system.

12. Reference Documents

Data Quality Assessment: A Reviewer's Guide (EPA QA/G-9R), February 2006

EPA Requirements for Quality Management Plans (EPA QA/R-2), March 2001, (reissued May 2006)

EPA Requirements for Quality Assurance Project Plans (EPA QA/R-5), March 2001, (reissued May 2006)

Guidance for Developing Quality Systems for Environmental Programs (EPA QA/G-1), November 2002, (reissued January 2008)

Guidance for Geospatial Data Quality Assurance Project Plans (EPA QA/G-5G), March 2003

Guidance on Assessing Quality Systems (EPA QA/G-3), March 2003

Guidance on Systematic Planning Using the Data Quality Objectives Process (EPA QA/G-4), February 2006

Guidance on Quality Assurance Project Plans (EPA QA/G-5), December 2002

Guidance on Choosing a Sampling Design for Environmental Data Collection (EPA QA/G-5S), December 2002

Guidance on Quality Assurance Project Plans for Modeling (EPA QA/G-5M), December 2002

Guidance for Preparing Standard Operating Procedures (SOPs) (EPA QA/G-6), April 2007

Guidance on Technical Audits and Related Assessments for Environmental Data Operations (EPA QA/G-7), January 2000, (reissued May 2006)

Guidance on Environmental Data Verification and Data Validation (EPA QA/G-8), November 2002, (reissued January 2008)

Data Quality Assessment: A Reviewer's Guide (EPA QA/G-9R), February 2006

Data Quality Assessment: Statistical Tools for Practitioners (EPA QA/G-9S), February 2006

Guidance for Developing a Training Program for Quality Systems (EPA QA/G-10), December 2000, (reissued May 2006)

Guidance on Quality Assurance for Environmental Technology Design, Construction and Operation (QA/G-11), January 2005

Overview of the EPA Quality System for Environmental Data and Technology (EPA/240/R-02/003), November 2002

Quality Management Plan for Region7, July 2006

